PCC Foods & Nutrition

Program Review

December 2017

Foods & Nutrition Program Review
2012 through 2017

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Foods & Nutrition - Program Review

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1. Program Overview:

A. What are the educational goals or objectives of this program/discipline? How do these compare with national or professional program/discipline trends or guidelines? Have they changed since the last review, or are they expected to change in the next five years?

Foods & Nutrition includes the study of human metabolism; foods and other forms of nutrient delivery that support human health; factors that can affect nutrient availability; food systems; and human health behaviors. Critical inquiries are made into how food and nutrition are marketed and how nutrition recommendations are developed. (from PCC F&N web page https://www.pcc.edu/programs/food-nutrition/)

Practically, PCC Foods & Nutrition courses during the past five years have had two primary intentions: 1) provide quality nutrition education that results in improved dietary practices that promote and maintain individual health and wellness and 2) prepare students in health-related pathways with a science-based grounding in nutrition knowledge that applies to personal and professional practice.

Academically speaking, nutritional science is a relatively young, interdisciplinary field in which research can appear to move at a glacial pace relative to nearly speed-of-light changes to our food supply and food system within the past fifty years. Conventionally, the practice of nutrition and dietetics has been the purview of a licensed and regulated profession with a relatively singular pathway toward attainment of registered dietitian/nutritionist (RD/RDN) status as the professional standard. Relatively recent scientific discoveries/theories (such as the Human Genome Project, Developmental Origins of Diet and Disease and Functional/Integrative Medicine) inform emerging areas of practice that are not all ready for prime time implementation. At the same time, the instant communication of electronic, digital, social and other forms of media create consumer interest and demand well in advance of proven data and science. This leads to confusion about dietary recommendations and uncertainty about who is qualified to provide reputable and accurate guidance.

The current national trend in academic preparation in the field of nutrition and dietetics is outlined in the “Future Education Model of the Accreditation Council for Education in Nutrition and Dietetics (ACEND) FAQ”- APPENDIX ONE and see: ACEND Future Ed Model. The Future Education Model outlines model degree programs for three academic degree level programs (**associate**, bachelor, and graduate). This vision is a significant departure for the profession

in that it adds an Associate Degree and a Graduate Degree. Currently, certification as RD/RDN is attained following successful completion of Baccalaureate degree, internship, and examination. By 2024, RD/RDN certification will require a Master's degree (interesting to note that this advanced degree does not currently need to be in nutrition but the masters in nutrition is expected to become the required degree sometime in the future). The Associate Degree leading to a Baccalaureate degree without immediate/concurrent completion of RD/RDN is expected to create a supportive professional position. "The Nutrition and Dietetic Associate" (NDA) is anticipated to increase consumer access to "credible food and nutrition information and services" in support of the RD/RDN (ACEND, see APPENDIX ONE.) ACEND has also referred to this new position as a "Nutrition Health Worker".

At community colleges across the country, the following appear as trends in food and nutrition programs:

- Culinary programs (with or without specific nutritional science components) MORE THAN 80 across the US and 4 in Oregon
- Food and Sustainable Agriculture (at least 25 nationally, 1 in development at Clackamas CC and reportedly at Chemeketa-unconfirmed)
- Dietary Technician Associate degree (about 39 nationally)
- Dietary Manager: there are no specific requirements for education, and there are multiple pathways to be eligible to sit for the Certified Dietary Manager exam.
- Nutrition and Dietetics Associate degree: (about 30 nationally)

  NOTE: The ACEND (see the previous section) just closed the application process to create a cohort of 60 Model Associate Degree programs in the USA to start in 2020.

At the state/regional level, the trend in community college foods and nutrition programs generally remains in the business of offering the equivalent of

- non-science pre-requisite personal nutrition course (like PCC FN 110).
- FN 225 as approved by the OCNE (Oregon Consortium for Nursing Education) as pre-requisite for applicants to any of 17 nursing programs in Oregon or other health-related fields.
- childhood nutrition education usually offered as part of Early Childhood Education curricula either by FN departments or Health Studies.

At PCC, additional nutrition course development and delivery has occurred in the past through other departments, primarily HE or FT (now Exercise Science) and include offerings such as "Weight and Personal Health", "Health, Food Systems

and the Environment", or "Nutrition for Fitness Instructors". For area community college nutrition course offerings, please see APPENDIX TWO.

Additionally, through the PCC CLIMB Center, a non-credit "Functional Nutrition" program qualifies graduates to sit for the national Holistic Nutrition Credentialing Board (HNCB) examination. The resulting credential "Board Certified in Holistic Nutrition" is conferred. It is assumed that this credential prepares participants for non-conventional or alternative practice opportunities such as naturopathic nutrition counseling. At this time, we are not aware of the credential qualifying for more conventional hospital positions. Employment and labor data has not been located or confirmed for this program.

At the state/regional level for four-year institutions, a dietetics program leading to RD/RDN is available at OSU. Currently, none of PCC's F&N courses are accepted for transfer into the dietetics program at OSU, but they are accepted for transfer to OSU for food science majors. The National University of Naturopathic Medicine (NUNM) in Portland established a bachelor's degree in Nutrition in September 2016. Students are required to have at least 60 hours of credits to transfer into the program, and PCC currently has a transfer agreement with NUNM. Students who graduate with this NUNM degree are not eligible to become an RD/RDN, and it is too early to know what job opportunities will result from this degree. OHSU offers a Master's/Dietetics Internship program that results in a Master's of Science in Nutrition and qualifies graduates to sit for the RD/RDN certification. There is no current pathway between OHSU and PCC for this degree.

Practically speaking**…**loss of traditional foodways, the proliferation of processed and ultra-processed foods, increased access to foods outside of the home, food insecurity, and lifestyle changes show a direct relationship to rising incidences of chronic disease and obesity in the United States and elsewhere. Research among community college students, in particular, reveals an alarmingly high incidence of food insecurity (Goldrick-Rab et al *Hungry and Homeless in College*, 2017 Link to Report) that underscores a pressing need to equip our students with knowledge and skills to develop a resiliency that leads to improved health outcomes for current and future generations. Escape from poverty through higher paying jobs as the result of higher education degrees and certificates from career technical programs are required to meet the minimum defense against the main economic causes of food insecurity. There is arguably an additional critical role of the community college in promoting food security and improving health outcomes. Loss of food literacy (the knowledge of and ability to utilize, prepare and consume healthful foods) is no longer the domain of the traditional family unit or the public school system. Home-making skills (not simply the home

economics class of yore) need to be taught, and the community colleges are being called upon to consider their role and responsibility to equip graduates with life skills that contribute to a healthful lifestyle.

As noted above, the ACEND has signaled a significant change to entry-level dietetics over the next five to seven years. At the time of this report, ACEND is evaluating applications to designate up to 60 community colleges nationally as its first cohort of Model Associate Degree programs. While it is uncertain at this moment whether the idea of the NDA (Nutrition and Dietetics Associate) will produce living wage employment, it is clear that the dominant professional organization is advocating for this position.

Additionally, Sustainable Food & Farming Systems has been an area of academic focus at numerous institutions across the country. Locally, PSU has created graduate and undergraduate certificates in Sustainable Food Systems. As noted above, many community colleges are creating similar programs and as noted elsewhere, PCC F&N and RC Sustainability/Learning Garden program explored this option.

Lifecycle nutrition, especially with the emergence of epigenetics and the critical health implications of the preconception woman of reproductive age and her offspring has underscored the need to address multigenerational impacts of nutrition. At the opposite end of the lifespan, the aging of the population has increased demand for credible and accurate nutritional science for older adults.

B. Briefly describe curricular, instructional, or other changes that were made <u>as a result of</u> your SAC's recommendations in the last program review and administrative response.

As a result of last review SAC recommendations:

1. Spring 2013 Assessment Plan

    - Completed to include Multi-Year Assessment plan for 2013/14 through 2018/19, For details, see APPENDIX THREE.

2. Maintain **two** full-time F&N faculty positions- **Implemented 2014 ONLY**
    - 2014 Fall to present: **one** FT position F&N faculty at SY: filled after an extended vacancy. As FDC, this faculty member initiated a case study of F&N programs at PCC SY and across the district to inform future strategic planning.
    - 2013 Fall to 2014 Summer: one FT F&N faculty at RC. This position is no longer FT.

3. Expand FN Course offerings
   2013/14: the following courses were developed under the Dietary Manager (DM) certificate program:
   - **DM 105: Food Safety: ServSafe and Local Food Production**
   - **DM 119: Life Cycle Nutrition**
   - **DM 129: Human Resources and Management for Dietary Managers**
   - **DM 139: Nutrition for Dietary Managers**

   June 2014: the program was suspended due to:
   - Lack of qualified Registered Dietitian and Certified Dietary Manager preceptors for required field experience;
   - Low student enrollment
   - Unreliable employment outlook
   - Please see APPENDIX FOUR

   2015: **FN 113 Everyday Cooking** was created by the F&N SAC as a 1-credit food laboratory course to be offered at PCC Rock Creek (RC) Teaching Kitchen Laboratory. (Initially offered as FN 199 course)

   2016: ECE and HE and F&N faculty met to review an ECE required course HE 262 Children's Health, Nutrition and Safety to assess whether the course continues to meet the ECE need as the course has evolved generally to be broader than ECE focus. No decision made at this time.

   2017: Developed experimental 1 credit course **FN 199F Farm to Preschool Nutrition** for implementation Fall 2017 to support ECE and also open to all students. Development of **FN 211 Healthy Aging and Nutrition** is underway- preparation for submission to Courseleaf anticipated by January 2018.

4. Build and utilize F&N Lab at Rock Creek for Dietary Manager program and other FN offerings as well as interdepartmental collaboration.
   - FN 113
     - Fall, Winter, and Spring quarters
   - Complementing academic instruction
     - Instructors from Health Studies, History, Biology, and Foreign Language have used the lab to supplement their classes
   - Community Education
     - Offers approximately three to four classes per quarter
   - The Rock Creek Sustainability and Learning Garden team

- Collaborate with the neighborhood elementary school and culminate their harvest with a food celebration
- Work with PCC students in a Seed to Supper program

- Very Special Events
  - Celebration of Food week
  - Celebrating the PCC Foundation

The RC SSH Division, which is charged with overseeing the facilities, is working with Risk Management to finalize a User Agreement policy to adopt so a greater number of programs can participate.

5. Increase online FN 225 sections and face-to-face FN 110 sections.

- Spring 2013, PCC offered 4 FN 110 sections: DL 3 F2F 1
- Spring 2017, PCC offered 6 FN 110 sections: DL 4 F2F 2
- Spring 2013, PCC offered 7 FN 225 sections: DL 3 F2F 4
- Spring 2017, PCC offered 9 FN 225 sections: DL 9 F2F 0

6. Enroll F&N instructors in online education training courses.
   - Eight of nine faculty have completed the online education training program at PCC, including FOOT/OIO.
   - Three faculty have completed the Improve Your Online Course (IYOC).

As a result of last review Administrative Response Suggestions and Observations:

1. Address need for instructor compliance and implementation of agreed-to strategies

   SAC meets at least two to three times per year and utilizes the LAC process to address gaps between course offerings as appropriate. For example, we began a review last spring of syllabi for all FN 225 instructors to compare assignments, reading, and the material covered. After Program Review, we will complete this assessment and determine if any course changes need to be considered.

2. Explore educational initiatives such as Service Learning

   Some challenges exist in equitably establishing Service Learning across campus and distance learning sections. Our DL courses in both FN 110 and FN 225 include students from all over the country and occasionally other parts of the world. At present, the most likely opportunities for Service Learning in F&N courses include optional assignments in support

of campus learning gardens. With the offering of FN 199F Farm to Preschool Nutrition in Fall 2017, a community-based activity is required.

3. Facilitate access and diversity in FN

- *Ongoing:* Emphasis on sharing students' culturally relevant experiences related to food; participation in Critical Race Theory workshops by at least three faculty;

- *2014-2015:* Several faculty worked with Karen Sorenson to review online courses for improving web accessibility or met individually with Disability Services counselors to address online course access for a student with visual impairment and to discuss supporting attendance for a student with Disability Services accommodation;

- *2016:* SAC discussed the need for accommodation of students with eating disorders and ways that F&N courses may exacerbate or uncover issues. At the spring SAC meeting, we had an in-service presentation by local eating disorder expert Valerie Edwards, RDN from Providence. She encouraged faculty to consider major revisions to one of our signature assignments- the 3-day dietary analysis. Edwards informed us that most practitioners advise their clients against doing such assignments. As a result:

    - Several faculty began to include language in the syllabus to alert students such as the following:

        Eating Disorders: Nutrition courses can sometimes trigger students with eating disorders (diagnosed or not) to experience symptoms of disordered thinking related to food. Please contact me privately to discuss accommodations in the course to avoid exacerbation of symptoms. Take care to stay healthy!

    - F&N SAC Chair met with Kaela Parks, Director of PCC Disability Services to discuss whether a formal accommodation process is needed for students with eating disorders. She described the concept of Universal Design and encouraged F&N faculty to consider a way to create the assignment that would not require students to disclose anything and would still accomplish the assignment goals.

- The SAC discussed the option to re-design the assignment such that all students have a choice to complete the dietary assessment for either themselves or someone else (Universal Design). At this time, four faculty include this option and others consider student requests individually.

4. Attend A-V equipment training

   - Faculty participation in IYOC (Improve Your Online Course) has resulted in development of video using Jing.

   - Melanie Budiman provided F&N SAC In-service on using Collaborate Ultra in Spring 2017;

5. Engage campus advisors to discuss Dietary Manager program and other advising issues for FN pre-requisites.

   - Previous sections address status of Dietary Manager program.

   - In collaboration and consultation with Health Advising staff, FN Sylvania has committed to offering at least one FN 225 face to face course every fall. This is in response to repeatedly offering then converting to DL when enrollment is too low. The converted DL section would fill to capacity. This left students who need the classroom environment without options. Beginning Fall 2017, SY will offer one section FN 225 face to face annually. Enrollment this term is 21 students. We are prepared to run this section every fall even if under-enrolled but are happy with enrollment numbers this fall. The Health Advising staff alert the dozens of students coming through their office monthly that they can expect to enroll for fall and to plan accordingly. We will continue to monitor this option.

   - F&N SAC has offered sections of FN 225 at Cascade campus and will offer the first F2F section of FN 110 at SE Campus Fall 2017. F&N SAC chair discussed option of Life Sciences faculty at Cascade teaching F&N courses F2F. However, F&N SAC requires that F&N faculty meet instructor qualifications and participation in F&N SAC. At this time, we continue to be willing and open to offer F2F courses at any and all campuses that demonstrate need.

   - Recent conversations between RC advisor and faculty member Michael Meagher revealed an apparent error that needs to be addressed as soon as possible. For reasons that are not yet clear, FN

110 Personal Nutrition is designated as a CTE course in the catalog and apparently has been for some time! This is an error since we have no CTE program in F&N. There are implications for enrollment as many students may not opt for the course and advisors don't recommend the course if they don't see it as contributing to credits or possible transfer.

2. Outcomes and Assessment:

Reflect on learning outcomes and assessment, teaching methodologies, and content in order to improve the quality of teaching, learning, and student success.

A. Course-Level Outcomes: The college expects course outcomes, as listed in the CCOG, are both assessable and assessed, with the intent that SACs will collaborate to develop a shared vision for course-level learning outcomes

i. What is the SAC process for review of course outcomes in your CCOGs to ensure that they are assessable?

We do not have an articulated process in place. Different faculty members have different approaches, ranging from specific exam or assignment evaluation related to course outcomes to linking outcome attainment to distance learning tools.

For FN 110, for example, faculty raised the need to review and revise course description and CCOGs in Fall 2014. This initiated a review process that resulted in updated CCOGs/description ultimately approved by Curriculum Committee by Spring 2016.

Spring 2015, the SAC reviewed FN 225 course description and CCOGs and determined no changes were indicated.

For course outcomes, specifically, the SAC chooses assessment measures based on course outcomes that apply to the specific LAC Core Outcome that is being assessed.

ii. Identify and give examples of changes made in instruction, to improve students' attainment of course outcomes, or outcomes of required course sequences (such as are found in MTH, WR, ESOL, BI, etc.) that were made as a result of the assessment of student learning.

For FN 110, a course outcome that was being assessed for LAC was "Use credible nutrition information to promote individual and community health." One of the assessment tools to determine attainment of benchmark to meet the Core Outcome associated with this course outcome was correct identification of food security definition. Upon completion of the LAC assessment, it was discovered that the benchmark was not met and upon further inquiry, we learned that not all FN 110 faculty were covering food security and hunger topics sufficiently. We provided resource materials to all faculty and reassessed one year later. Benchmarks were attained.

B. Addressing College Core Outcomes

i. Update the Core Outcomes Mapping Matrix. http://www.pcc.edu/resources/academic/core-outcomes/mapping-index.html

Please see APPENDIX FIVE.

C. For Lower Division Collegiate (Transfer) and Developmental Education Disciplines: Assessment of College Core Outcomes.

i. Briefly describe the evidence you have that students are meeting your Degree and Certificate outcomes.

FN 225 is LDC course that is annually assessed as part of the LAC process and demonstrates College Core Outcome achievement. The following sections provide additional detail.

As noted earlier, it just came to our attention that FN 110 is incorrectly classified as CTE and we are working with Anne Haberkern and Sally Earle to change this as soon as possible.

ii. Reflecting on the last five years of assessment, provide a brief summary of one or two of your best assessment projects, highlighting efforts made to improve students' attainment of the Core Outcomes. (If including any summary data in the report or an appendix, be sure to redact all student identifiers).

In 2012-13, we assessed the Core Outcomes: Critical Thinking, and Problem Solving. We identified two questions in our Dietary Analysis assignment that we would assess simultaneously and evaluated the results.
Conclusion: Students need to be guided to give more clear and concise answers. We agreed upon changes in question-wording to promote clearer answers. For example, most instructors made specific changes to the question component of the Diet Analysis. For example, instead of asking, "How did your eating behavior change during the study?" the question was changed to: "How did your eating habits change from your normal intake during the three days that you recorded your food intake? For example, people tend to eat healthier as a result of recording their intake. Please be specific; do not just say "I ate healthier these three days." As a result, students provided much more specific responses.

iii. Do you have evidence that the changes made were effective by having reassessed the same outcome? If so, please describe.

As noted earlier, in 2015-2016 we re-assessed the previous year's Communication and Professional Competence outcomes. During the 2014-2015 assessment, we realized that not all faculty were presenting food security theory and practice adequately and consistently. As a result, students did not meet the benchmark for items measuring this outcome. We subsequently provided all faculty members with background materials and re-assessed the outcome in 2015-2016 with marked improvements in meeting benchmarks.

iv. Evaluate your SAC's assessment cycle processes. What have you learned to improve your assessment practices and strategies?

We have a Multi-Year Assessment Plan for LDC that covers seven academic years from 2013/14 to 2018/19. (See APPENDIX THREE) We implement that plan, following guidance from the LAC. We have learned to be very specific in our practices and strategies, and strive to have outcomes that are measurable.

v. Are there any Core Outcomes that are particularly challenging for your SAC to assess. If yes, please identify which ones and the challenges that exist.

The issue for our SAC is not so much having a challenge with any particular Core Outcome, but more about the challenge of actually having the capacity to do more than a very cursory assessment every year due to lack of faculty capacity. We only have one full-time faculty member in the SAC at this time.

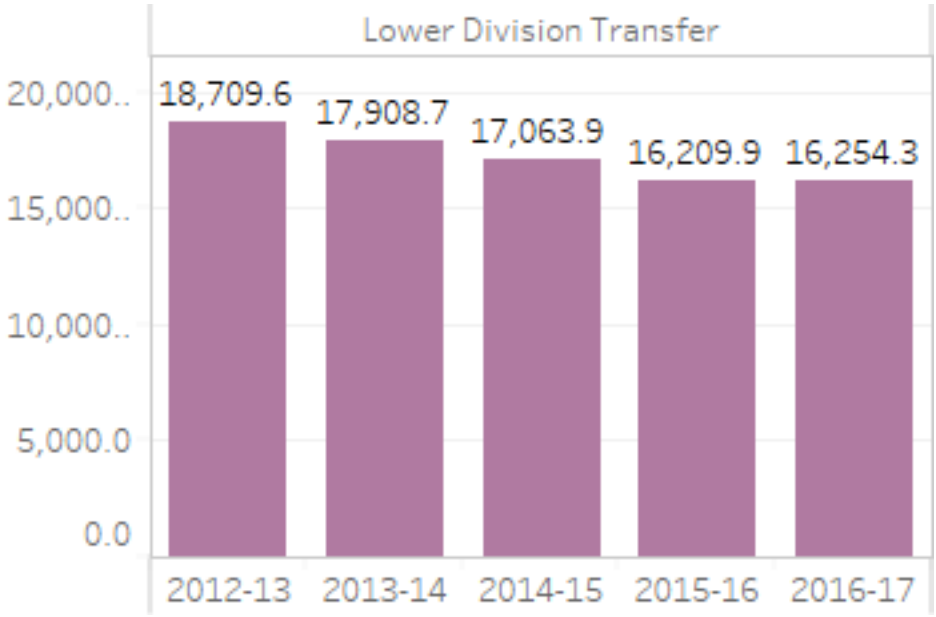
3. Other Instructional Issues

(Note: for questions A-C, specific information can be found at http://www.pcc.edu/ir/program_profiles/index.html)

A. Please review the data for course enrollments in your subject area. Are enrollments similar to college FTE trends in general, or are they increasing or decreasing at a faster rate? What factors (if any) within the control of your SAC may be influencing enrollments in your courses? What factors (if any) within the control of the college may be influencing enrollments in your courses?

In general, college-wide trends (regarding FTE) during the past five years have been declining.

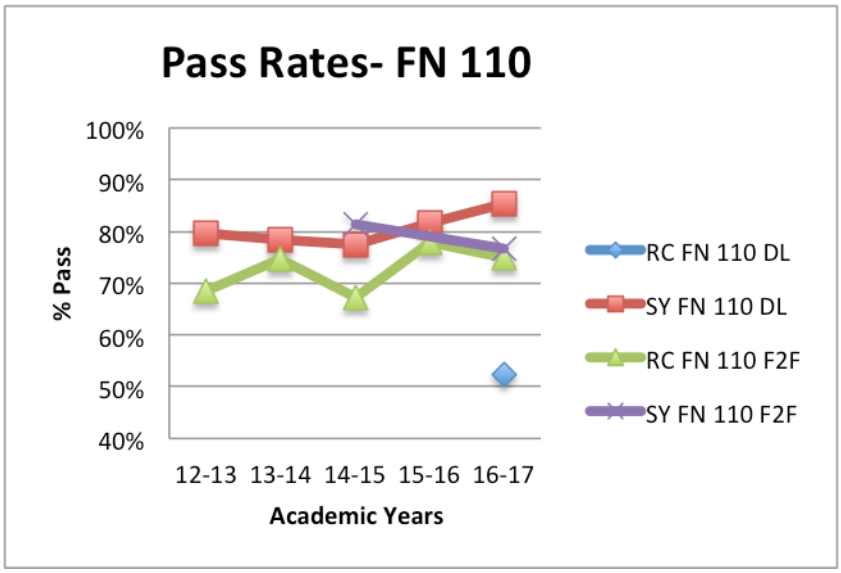
PCC 5 Year FTE Trends



https://www.pcc.edu/ir/factsheet/Factbook/201617/swrafte201617.html

Between 2012-13 and 2016-17, Foods and Nutrition enrollment trends showed a **10% increase** in total students across all campuses and distance learning. (It has not been a steady increase, however; there have been slight increases and decreases during this period). In 2012-13, Foods and Nutrition had 946 students total. In 2016-17, we had 1,047 students. Part of this increase is due to additional course offerings. At Rock Creek, we have added FN113 Everyday Nutrition Lab. During the program review period, Rock Creek has increased annual course offerings by nearly 100% from nine sections in 2012-2013 up to 16 sections in 2016-2017, being taught by 4 adjunct faculty. At Sylvania, we developed FN199F, a Farm to Preschool Nutrition Course offered Fall 2017. Our DL offerings have also increased. Source: A. Eggebrecht, PCC Institutional Effectiveness. See APPENDIX SIX.

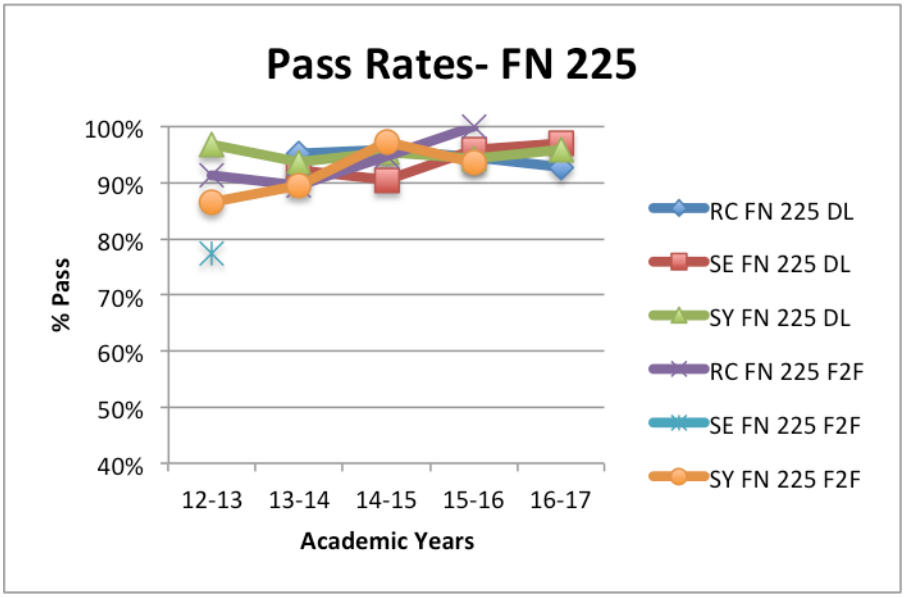
B. Please review the grades awarded for the courses in your program. What patterns or trends do you see? Are there any courses with consistently lower pass rates than others? Why do you think this is the case, how is your SAC addressing this?



During this period, in FN110 Personal Nutrition, approximately 70% of students earned A's and B's. This has remained fairly consistent.

FN110 students take this course for a variety of reasons, most commonly for personal interest or as an elective, so students are not motivated by program acceptance as pre-nursing students. FN 110 has no pre-requisites and is a typical introductory course.

The low pass rate during 2016-17 for the distance learning course offered at RC reflects the first term the course was offered through RC with two new instructors co-teaching the DL format for the first time after completing the PCC DL training.



During the same period, in FN225, Nutrition, approximately 90% of students earned A's and B's. The higher percentage is likely because most of these students are pre-nursing students who believe they need an A for acceptance into nursing school. They have taken science pre-requisites including BI 231 Human Anatomy & Physiology.

Average pass rates for all Foods and Nutrition courses have remained fairly steady from 2012-13 through 2016-17, at roughly 79-83% of students passing FN courses. Again, the pass rates are slightly higher in FN225 than in FN110 courses, for the same reasons described in the previous paragraph.

One strategy we could use, and many of our instructors do, is to use Course Progress Notifications (CPN's) to periodically alert students at risk of not passing. Particularly with FN 225, since the stakes are so high for competitive entry into nursing programs, most students will withdraw rather than receive a failing grade.

C. Which of your courses are offered online and what is the proportion of on-campus and online? For courses offered both via DL and on campus, are there differences in student success? If yes, describe the differences and how your SAC is addressing them.

Courses offered online: FN110 and FN225- also see above response.

The percentage of FN courses that were Distance Learning increased from **62%** of enrollments in 2012-13 to **87%** of enrollments in 2016-17.

At this point, there is no consistent difference in pass rates in FN110; it seems to vary from campus to campus, and no obvious trends are apparent.

The pass rates for FN225 from 2012/13 through 2016/27 are about 85-89% for face to face classes; pass rates for distance learning FN225 classes is 95-97%.

The longevity/consistency of FN faculty also contributes to a constant student success through stable program delivery.

D. Has the SAC made any curricular changes as a result of exploring/adopting educational initiatives (e.g., Community-Based Learning, Internationalization of the Curriculum, Inquiry-Based Learning, etc.)? If so, please describe.

We now offer FN113 Everyday Nutrition Lab, a hands-on course that applies nutrition principles to food preparation. This is not a result of an educational initiative per se, but an attempt to offer a course in which students can apply their knowledge. Nutrition education research demonstrates the efficacy of hands-on science education. Please see APPENDIX TEN.

We worked with PSU to adapt their Harvest for Healthy Kids (HFHK) curriculum into an experimental course for Fall 2017- FN 199F Farm to Preschool Nutrition. We were invited by PSU partners to participate in a research proposal that is national in scope to test online modules for HFHK- the result of the RFP is pending.

E. Are there any courses in the program that are offered as Dual Credit at area High Schools? If so, describe how the SAC develops and maintains relationships with the HS faculty in support of quality instruction.

We are not offering any Dual Credit courses at this time, but it would be worth considering to reach more students. NUNM has indicated interest in looking at Dual Credit/Early College opportunities between PCC and NUNM.

F. Please describe the use of Course Evaluations by the SAC. Have you developed SAC-specific questions? Has the information you have received been of use at the course/program/discipline level?

At this time, we have not developed any SAC specific questions. Instructors are allowed to review their Course Evaluations and make necessary changes to curriculum as they see fit. We have no formal process at this time of reviewing the evaluations on a SAC-wide level or implementing changes.

4. Needs of Students and the Community

A. Have there been any changes in the demographics of the student populations you serve? If there have been changes, how has this impacted curriculum, instruction or professional development?

Gender: No significant change in male and female enrollment. There has been a significant increase in the number of students choosing not to report gender, from 0.5% in 2012-13 (5 students) to 1.7% in 2016-17 (17 students).

Age: Under 20 age group has increased from 9.6% in 2012-13 (90) to 15.3% in 2016-17 (155). Ages 20-24 increased by 3 % and the age 25-49 group decreased from 62% in 2012-13 (580) to 52.5% in 2016-17 (531). Students 50+ remained stable at approximately 2.4%.

Race/Ethnicity: Relatively little change was seen among African American, Pacific Islander, Native American/Alaskan and White enrollment. Asian student enrollment increased from **6.2%** (58 students) in 2012-13 to **9.2%** (93 students) in 2016-17. Hispanic enrollment was **7.6%** in 2012-13 (71 students) increasing to **9%** (90 students) in 2016-17. Unreported decreased from 11% (103) to 7.6% (77) over the five year period.

See APPENDIX SEVEN for relevant data tables.

Impact to curriculum and instruction:

- Incorporate the Socio-Ecological Model of Health and Nutrition into the curriculum for FN 110 and FN 225 with focus on social determinants.
- Acknowledge student cultural diversity- instructors utilize student introductions and discussions to invite students to share cultural background and experience, especially as it relates to cuisine.
- Participation in Summer 2017 STEM Equity Professional Development at PCC introduced FN faculty to a variety of resources currently being

adapted for course integration to improve equity (especially gender) within the sciences.

B. What strategies are used within the program/discipline to facilitate success for students with disabilities? If known, to what extent are your students utilizing the resources offered by Disability Services? What does the SAC see as particularly challenging in serving these students?

Strategies employed:

- Testing accommodations per Disability Services (DS) recommendation.
- Reference to Disability Services in the syllabi to inform students of available services.
- Discussion within SAC to consider Universal Design as guiding principle for assignments to increase access, especially if students not formally assessed by DS.

We do not have hard data on student use of available resources from DS, but anecdotally, F&N faculty report an average of one student per section receiving formal DS accommodation.

- *2014-2015:* Several faculty worked with Karen Sorenson to review online courses for improving web accessibility or met individually with Disability Services counselors to address online course access for a student with visual impairment and to discuss supporting attendance for a student with Disability Services accommodation;

- *2016:* SAC discussed the need for accommodation of students with eating disorders and ways that F&N courses may exacerbate or uncover issues. At the spring SAC meeting, we had an in-service presented by local eating disorder expert Valerie Edwards, RDN from Providence. She encouraged faculty to consider major revisions to one of our signature assignments- the 3-day dietary analysis. Edwards informed us that most practitioners advise their clients against doing such assignments. As a result:

    - Several faculty began to include language in the syllabus to alert students such as the following:

        Eating Disorders: Nutrition courses can sometimes trigger students with eating disorders (diagnosed or not) to experience symptoms of disordered thinking related to food. Please contact

me privately to discuss accommodations in the course to avoid exacerbation of symptoms. Take care to stay healthy!

- F&N SAC Chair met with Kaela Parks, Director of PCC Disability Services to discuss whether a formal accommodation process is needed. She described the concept of Universal Design and encouraged F&N faculty to consider a way to create the assignment that would not require students to disclose anything and would still accomplish the assignment goals.
- The SAC discussed the option to re-design the assignment such that all students have a choice to complete the dietary assessment for either themselves or someone else (Universal Design). At this time, four of the FN faculty include this option and the others consider individual requests.

C. What strategies are used within the program/discipline to facilitate success for online students? What does the SAC see as particularly challenging in serving online students?

Strategies employed:

- Share course shells- the SAC chair works with DL liaison to identify course shell for adoption by new faculty.
- Participate in FOOT/OIO before delivering online instruction.
- Participate in online accessibility and Improve Your Online Course training.
- Hold SAC Meeting technology updates as requested.
- Require successful completion of online Syllabus quiz by the end of the first week of term.
- Encourage at least two to three weekly announcements to create frequent student contact.
- Utilize discussion assignments throughout the term to increase student interaction.
- Create online forum or bulletin board where students can post questions and comments 24/7 (can be anonymous) in order to promote dialogue.
- Create a video for instructor connection and deliver course introduction.
- Establish Thursday through Wednesday course “week” to minimize Sunday night last minute questions when the instructor may not be available. With most assignments due on Wednesdays, students may

have an easier time accessing the instructor for online office hours before the assignment due date. At least two faculty use this method.

Challenges:

- Promoting hands-on/interactive learning.
- Small group activities are difficult.
- Different time zones and geographic location of students may make it impossible to consider any 'real-time' chats or lectures.
- Some faculty express challenges adjusting to D2L upgrades, but mostly relatively smooth changes occur.
- Technology and popular student apps and websites present numerous opportunities for course materials to be widely shared, including exams. Academic integrity is vulnerable and deserves additional scrutiny.

D. Has feedback from students, community groups, transfer institutions, business, industry or government been used to make curriculum or instructional changes (if this has not been addressed elsewhere in this document)? If so, describe.

2014-16: Exploration for F&N to house a Sustainable Foods and Farms certificate/degree program opportunities in support of ongoing work initiated by the Learning Garden and Sustainability staff/faculty at PCC Rock Creek. Despite a rigorous examination, the Administration determined there was uncertainty in the job security/living wage opportunities to pursue further at this time. See APPENDIX EIGHT for White Paper.

2015: Collaborated with Life Sciences FDCs to offer 'lunchtime lecture session' on "Developmental Origins of Health and Disease" to approximately 75 students, faculty and staff delivered by guest speaker Dr. Susan Bagby, OHSU Moore Institute for Nutrition & Wellness.

2016-17: Needs Assessment with Gerontology, Human Services Studies and Exercise Science faculty related to the creation of FN Healthy Aging and Nutrition Course. Need for and student interest in an online 3-credit course has been identified and is under development (FN 211 Healthy Aging and Nutrition).

2017: Implemented the first annual PCC Nutrition Forum in partnership with OSHU Moore Institute for Nutrition & Wellness. Titled "The Health of Gen Z: Do We Have the Will to Nurture Healthier Futures for Our Kids?", This half-day forum held at PCC Rock Creek Event Center was attended by at least 179 registered guests, 45 at Rock Creek, simulcast to Sylvania, Southeast and Cascade Campuses reaching 12 participants and live-streamed by 127 individuals. An

additional 46 F&N 225 students accessed the event through a digital recording Students comprised 53% of attendees, followed by 37% staff/faculty and 20% from the community at large. See APPENDIX NINE for Evaluation results. Bob's Red Mill generously provided gift bags and grain items to attendees.

2017: Sylvania FDC co-chaired the Research subcommittee of the Housing and Food Insecurity Task Force. The F&N SAC is committed to being a resource, leader and partner in educating the PCC community about hunger, food insecurity and food security. We are exploring opportunities to pilot nutritious low-cost meals with the PCC Food Service Director.

5. Faculty:

Reflect on the composition, qualifications, and development of the faculty

A. Provide information on how the faculty instructional practices reflect the strategic intentions for Diversity, Equity, and Inclusion in PCC's Strategic Plan, Theme 5. What has the SAC done to further your faculty's inter-cultural competence, and creation of a shared understanding of diversity, equity and inclusion?

- Several faculty use introductions whether in person or online to offer an opportunity for students to self-identify with food cuisines and reflection on cultural impacts.
- Texts include ethnic food focus.
- The Socio-Ecological Model of Health and Nutrition offers a framework for clearly identifying the role of culture and social groups in development and expression of food customs and practices.
- SAC meetings often include a pot-luck, and we have diversity among faculty that is demonstrated by sharing of food traditions.
- As noted earlier, we have explored discipline-specific aspects of nutrition that resulted in consulation with DS and resulting Universal Design.

B. Report any changes the SAC has made to instructor qualifications since the last review and the reason for the changes. (Current Instructor Qualifications at http://www.pcc.edu/resources/academic/instructor-qualifications/index.html)

The experimental course FN 199F Farm to Preschool Nutrition is based on the "Harvest for Healthy Kids" curriculum developed in collaboration between PSU and Mt. Hood Early Head Start. Two of the original collaborators and curriculum

developers were identified as eminently and uniquely qualified to develop the course. A third 'guest presenter' (a PCC ECE grad!) was recruited by the faculty to assist the course delivery.. A request for waiver of instructor requirements was granted for the purposes of teaching this course only.

C. How have professional development activities of the faculty contributed to the strength of the program/discipline? If such activities have resulted in instructional or curricular changes, please describe.

- Improve Your Online Course (IYOC):
  - created course introduction video using Jing
  - added a Q & A Forum on the homepage
  - created "Coffee Shop Discussion Board" open 24/7 for students to discuss nutrition-related topics 'outside of class time.'
- TLC Workshops and other Campus Inservices:
  - Innovating for Food Justice: enhanced delivery of course material related to food systems, social justice and sustainability.
- STEM Equity:
  - NSF Getting Results for Community College Educators
  - Growth Mindset videos by Carol Dweck, Stanford
  - Implicit Association Test to uncover bias re: gender, careers and science
  - All of the above have provided a lens with which to review current course delivery with an eye toward enhancing active learning and incorporation of growth mindset
- PCC In-services:
  - learned about PCC resources to support students
  - increased insight about what students desire and expect from PCC
- Professional Associations, Awards and Conferences:
  - Allen Epp Service Award (four faculty)
  - One Multi-Year-Contract award
  - Registered Dietitian/Nutritionist Active status: 6 faculty
  - Registered Dietitian/Nutritionist Past status: 2 faculty
  - ACE Group Exercise and Personal Trainer Certifications
  - Certificate in Plant-Based Nutrition
  - Certificate in Mental Health First Aid
  - Certified Lactation Educator
  - DONA International Doula organization member

  - ServSafe certification and instructor certification
  - Member Chefs Association of St. Louis
  - Member International Food Technology Association
  - Member Agriculture, Food and Human Values Society

- Campus Book Club:
  - Small Teaching by James Lang
  - developed curricular changes that mix classroom activities to emphasize knowledge retrieval

6. Facilities, Instructional and Student Support

A. Describe how classroom space, classroom technology, laboratory space, and equipment impact student success.

The Food Lab at Rock Creek is our newest addition and offers a state of the art facility for hands-on nutrition and cooking classes; FN 113 Everyday Cooking provides an opportunity to apply foundational knowledge of food composition and nutritional values to food preparation. This course allows students the opportunity to plan meals, modify recipes and learn basic cooking techniques.

The F&N SAC is currently assessing whether the Community Kitchen at SE campus could provide suitable facilities to offer FN 113 at SE in the future.

B. Describe how students are using the library or other outside-the-classroom information resources (e.g., computer labs, tutoring, Student Learning Center). If courses are offered online, do students have online access to the same resources?

All students have access to Advising and Counseling office resources. Contact information is provided in the syllabi of online and face-to-face classes. Both face-to-face and distance learning students utilize academic accommodations (e.g., extended time on tests, extended deadlines, etc.)

For our Dietary Analysis assignment, all/most instructors use the ChooseMyPlate website for student projects. This website is free and accessible to everyone with internet access.

We have all required course textbooks on reserve at all campus libraries, available for 3-hour checkout, to increase student access to course materials.

Tutoring or Student Learning Center options for online students? Tutoring is not offered for FN students, either on campus or online.

C. Does the SAC have any insights on how students are using Academic Advising, Counseling, Student Leadership and Student Resource Centers (e.g., the Veterans, Women's, Multicultural, and Queer Centers)? What opportunities do you see to promote student success by collaborating with these services?

At this point, we have not gathered this information in any formal way. We could add links to these resource centers in our syllabi, but have not universally or consistently done so at this time. The faculty has referred students as indicated for Counseling, Student Care and Concern Incident report, Sylvania and Rock Creek Learning Garden volunteering. There is currently exploration of ways to support campus food pantries. Several FN faculty have included the following in their syllabus:

Any student who faces challenges securing their food or housing and believes this may affect their performance in the course is encouraged to contact the Dean of Students (heather.lang@pcc.edu) for support. Please notify me if you are comfortable in doing so. I may be able to provide referrals to resources. Here's a great link to many student services: Student Life

7. Career and Technical Education (CTE) Programs only.

To ensure that the curriculum keeps pace with changing employer needs and continues to successfully prepare students to enter a career field.

NOTE: Please see APPENDIX FOUR for materials developed in support and suspension of the Dietary Managers program. The program enrolled eight students Fall 2013 and was put on hold Spring 2014; program suspension was **2014-16:** Exploration for F&N to house a Sustainable Foods and Farms certificate/degree program opportunities in support of ongoing work initiated by the Learning Garden and Sustainability staff/faculty at PCC Rock Creek (APPENDIX EIGHT). Mostly due to uncertainty regarding living wage options for the graduates, the Administration decided not to pursue this program at this time.

8. Recommendations

A. What is the SAC planning to do to improve teaching and learning, student success, and degree or certificate completion, for on-campus and online students as appropriate?

F&N SAC Goals (November 2017)

- Maintain up-to-date knowledge and professional development in the field of nutritional science.
- Expand, offer more nutrition courses/skills that tie in with other disciplines and count toward a major track.
- Consider continuing education opportunities to support other health professions
- Offer F&N at all campuses.
- Establish hands on educational lab facilities at all campuses where enrollment supports them.
- Serve as a vital resource to the greater community where our courses provide exemplary nutrition education and our faculty are innovative leaders. Our students build creative/critical thinking skills that enable them to improve their own health and help others to do the same.
- Expand our collaborative relationships with the community to better support our students and strengthen our community ties.

With these in mind, the F&N SAC makes the following recommendations:

1. Expand student elective options by corrected classification of FN 110 and FN 113 as LDC rather than CTE courses. Market the courses.
2. Advocate for at least one FN course in the Gen Ed offerings, possibly as an interdisciplinary partnership with HE, ES and PE as well as external partner Moore Institute for Nutrition and Wellness.
3. Assess PCC role in ACEND vision to create Nutrition and Dietetics Associate.
4. Demonstrate efficacy of re-instating the second FT F&N Faculty position.
5. Continue to expand course offerings to other campuses as warranted.
6. Pilot and develop OER courses. FN 225 planned by Spring 2018.
7. Establish a Foods & Nutrition professional/community partner advisory group to identify opportunities for F&N engagement and expansion as warranted.
8. Participate in YESS/ATD by utilizing data to improve outcomes and address social disparities.

B. **What support do you need from the administration in order to carry out your planned improvements?** (For recommendations asking for financial resources, please present them in priority order. Understand that resources are limited and asking is not an assurance of immediate forthcoming support, but making administration aware of your needs may help them look for outside resources or alternative strategies for support.)

Financial resource requests

1. Re-establish second FT F&N faculty position to support recent 9.2% student FTE growth and anticipated future student FTE growth.
2. Provide faculty reassignment time and administrative support to investigate ACEND Nutrition and Dietetics Associate Degree applicability for PCC for 2019-2020 or earliest ACEND cohort application opening.
3. Consider options to require/enable increased PT faculty non-classroom responsibilities.
4. Upgrade PCC SE Community Kitchen to accommodate FN 113 offerings. We are currently assessing the existing facility to determine what changes are required versus optimal. Please see APPENDIX TEN for a sample of research articles that support the value of teaching kitchens in effective nutrition education.

Requests with no direct financial ask

1. Establish district-wide best practices/guidance to ensure academic integrity for DL courses. For example, a revision to the "What Works Well in Online Teaching at PCC" that addresses and updates technologies that students may use that compromise academic integrity. The F&N SAC believes that websites such as "Quizlet" and others are not well known to many faculty and greater attention to ongoing course revision and updating is necessary to ensure the highest academic integrity in online education.
2. Continue to provide support for OER development and incorporation into courses- F&N SAC intends to offer at least one pilot OER section for FN 225 by end of Spring 2018. Support to assist faculty in assessing the academic impact of this pilot will be helpful.
3. Provide PCC Web staff to support redesign of F&N home page to increase marketing and outreach effectiveness.
4. Support SY F&N efforts to promote food literacy through partnerships with ASPCC and other interested parties to secure grant funds to build multi-purpose teaching kitchen laboratory as part of HT renovations. (If we fund it…agree to build it!)

List of APPENDICES

FREQUENTLY ASKED QUESTIONS

Future Education Model Accreditation Standards for Programs in Nutrition and Dietetics

June, 2017

Accreditation Council for Education in Nutrition and Dietetics

the accrediting agency for the Academy of Nutrition and Dietetics

ACEND began work several years ago to develop standards for future education model associate, bachelor and graduate degree programs. This document is a compilation of the questions that have been asked about the *Future Education Model Accreditation Standards* and ACEND responses related to the future education model.

Future Education Model

Question: What data support the Future Education Model?

ACEND Response: The *Rationale Document*, published by ACEND, provides the environmental scan information and summarizes data collected from a wide array of stakeholders that supports the Future Education Model. The environmental scan included review of more than 100 relevant articles detailing research data, industry trends and the changing health care and business environments. In addition, four different data collection projects (focus groups, structured interviews, and two online surveys) were completed to gather information from stakeholder groups about future practice in nutrition and dietetics. More than 10,000 responses from practitioners, employers, educators, students, administrators and professionals working with nutrition and dietetics practitioners were evaluated. A competency gap analysis was completed to determine gaps between the current competencies and expected practice of nutrition and dietetics in the future. These gaps provided justification for the new education model that will be based on competencies to be demonstrated by future nutrition and dietetics practitioners. A multi-phase Delphi process, which involved educators, practitioners, employers and practitioners outside the profession of nutrition and dietetics, identified the needed competencies and performance indicators for future practice. The *Rationale Document*, which provides details on these results, can be viewed at www.eatrightprog.org/FutureModel.

Question: What does it mean when ACEND says that the future education model programs will be competency based?

ACEND Response: The future education model standards for associate, bachelor and graduate degree programs will delineate the competence expected of program graduates and provide performance indicators that help define the level of expected performance. Knowledge domain statements will not be included in the future education model standards. Programs will decide what knowledge base is needed by students to help prepare them to be able to demonstrate the required competence.

Question: The future education model includes integrated experiential learning in each degree level program, what does that mean?

ACEND Response: ACEND intends that the experiential learning components will be integrated with the coursework to prepare students to demonstrate the competencies for each of the academic degree level programs (associate, bachelor, graduate). ACEND will encourage innovation in how this experiential learning and its integration are done and will use the demonstration programs to help define options for how this integration might be accomplished.

Question: Is completion of one future education model degree program required to enter a higher degree level future education model program?

ACEND Response: Each of the future education model degree programs is intended to stand alone. ACEND did not set prerequisite requirements for each of the degree level programs. Rather, individual programs will set their own admission requirements. A future education model graduate degree program could for example, choose to require completion of the future education model bachelor degree program as a prerequisite, could require specific courses as prerequisites or could choose not to require any prerequisites.

Future Education Model (cont.)

Question: Why were the master's degree standards changed to graduate degree standards?

ACEND Response: ACEND received many comments encouraging development of standards for doctorate degree programs and had several programs question whether they could develop a doctorate program under the Future Education Model Master's Degree Standards. After much discussion, ACEND chose to add flexibility to the standards by identifying them as graduate degree standards and allowing both master's and doctorate degree demonstration programs to be developed. ACEND will collect data from these programs to inform the content and requirements in future standards.

Question: The competencies for the future education model graduate degree program are preparing graduates for a higher level of practice; is it realistic to achieve all of those competencies in a two year master's degree program, for example?

ACEND Response: The *Future Education Model Accreditation Standards* for master degree programs identify the competencies required of graduates of that program. Programs are allowed to determine the prerequisites for students to enter their program and could require coursework or experiences that demonstrate some of those competencies be achieved prior to entering the program.

Question: How will the associate degree prepared nutrition health worker differ from the current community health worker?

ACEND Response: The competencies expected of the associate degree prepared nutrition and dietetics practitioner are included in the future education model standards. The educational preparation for the nutrition health worker is planned as an associate degree and the competencies include specific foundational knowledge and practice skills in food and nutrition. Thus this practitioner will have more in-depth preparation and more knowledge specifically related to food and nutrition than community health workers who generally have many fewer hours of education, typically through a certificate program. There may be some overlap in the skill set between the two practitioners as it relates to health and cultural competency; the preparation that community health workers receive in earning a certificate may be able to be counted to meet some of the competencies required in the associate degree curriculum.

Question: What do the data ACEND collected suggest for future practice of the registered dietitian nutritionist?

ACEND Response: The data (environmental scan, focus groups, structured interviews, online surveys, competency development Delphi process) collected by ACEND revealed an emergence of non-traditional practice settings for the field of nutrition and dietetics, such as telenutrition. There is an expected expanding scope of practice for those working in the profession including an increased focus on disease prevention and integrative healthcare and the need for more knowledge in emerging areas such as genomics, telehealth, behavioral counseling, diet prescription and informatics. This work requires that health care professionals work more interprofessionally. Practitioners need to be able to read and apply scientific knowledge and interpret this knowledge for the public. Many of the stakeholders identified gaps in current competencies in areas of research, leadership/management skills, cultural care, basic food and culinary preparation and sustainability. Employers indicated the need for improved communication skills in nutrition and dietetics practitioners and an improved ability to understand the patient's community and cultural ecosystem. Employers also expressed a desire for stronger organizational leadership, project management, communication, patient assessment and practice skills. Employers indicated that more time might be needed in the preparation of future nutrition and dietetics practitioners to assure application of knowledge and demonstration of skills needed for effective practice. After thorough review of these data, ACEND believes that a minimum of a master degree will be needed to adequately prepare graduates with the complexity, depth and breadth of knowledge and skill needed for future practice as a registered dietitian nutritionist.

Future Education Model (cont.)

Question: Graduate degrees often focus on a specific area rather than a general area, why do the Future Education Model Accreditation Standards include competencies across multiple rather than specific areas of practice?

ACEND Response: Because stakeholders expressed the need for future nutrition and dietetics practitioners to be prepared with a broad spectrum of skills (professional research and practice skills; teamwork and communication skills; clinical client care skills; community and population health skills; leadership, management and organization skills; and food and foodservice systems), ACEND included all of these skill sets in its graduate degree program competencies. The *Future Education Model Accreditation Standards* do not specify the focus of the degree but do identify the competencies expected of graduates. Each programs will determine the focus and title of its graduate degree program.

Question: Will a program director need to assess all of the competencies and the performance indicators for a Future Education Model degree program?

ACEND Response: The *Future Education Model Accreditation Standards for Associate, Bachelor and Graduate Degree Programs* indicate that program directors will need to show, on their curriculum map, where the required competencies and any performance indicators that are included in the curriculum are being taught (Standard 4, Required Element 4.1). However, program directors will report assessment of only the required competencies in their Competency Assessment Plan (Standard 5, Required Element 5.1).

Question: Could future education model graduate degree programs admit students who have not completed an undergraduate dietetics program?

ACEND Response: The *Future Education Model Accreditation Standards* do not stipulate any prerequisite requirements for students entering the program. Each program will set the prerequisite requirements for admission into its program and will be responsible for ensuring that its graduates achieve the competencies specified for that degree level program.

Question: Under the Future Education Model Accreditation Standards can the hours of coursework or experiential learning from one degree level program be counted towards experiential learning of the next degree level?

ACEND Response: The *Future Education Model Accreditation Standards* require programs to have policies related to assessment of prior learning. The decision on whether previous course work or experiential learning will be recognized will be made by the program director.

Question: If future education model programs have different prerequisite requirements, will the quality of the graduates vary?

ACEND Response: The *Future Education Model Accreditation Standards* specify the competencies that will be expected of each graduate and include example performance indicators that students may complete to demonstrate competence. Programs may choose from the list of example performance indicators or develop their own performance indicators; it is not necessary for every student to perform every performance indicate in order to demonstrate competence. All graduates of Future Education Model programs will be expected to have achieved the same competencies. Program length may vary depending on the program's designed curriculum and the amount of time it takes to assure graduates meet all of the required competencies.

Question: Why are concentrations not required in the Future Education Model Accreditation Standards?

ACEND Response: The *Future Education Model Accreditation Standards* are preparing graduates with a higher level of skills across various areas of practice. Because many of these skills are new, ACEND did not want to overburden programs with the expectation that they needed to go beyond these competencies with a concentration. Although the *Future Education Model Accreditation Standards* do not include the expectation that programs will have a concentration, programs can still have a concentration, if they choose.

Program Impact (cont.)

Question: The Future Education Model has preparation of dietitian nutritionists occurring at the graduate level in the future; does that mean that bachelor degree level Didactic Programs in Dietetics (DPD) will need to close?

ACEND Response: ACEND is not planning to discontinue any of the programs that is currently accredits. DPD programs will continue to be accredited under the *2017 Accreditation Standards*. ACEND will test the *Future Education Model Accreditation Standards* with demonstration programs that voluntarily request accreditation under these standards. Outcomes data will be collected on the demonstration programs and its graduates. These data will be analyzed before ACEND makes decisions about implementation of the Future Education Model for all programs.

Question: The Future Education Model indicates that knowledge and experiential learning will be integrated in graduate level programs preparing dietitian nutritionists; does that mean free-standing Dietetic Internship (DI) programs will need to close or merge with a university program?

ACEND Response: ACEND is not planning to discontinue any of the programs that is currently accredits. DI programs will continue to be accredited under the *2017 Accreditation Standards*. ACEND will test the *Future Education Model Accreditation Standards* with demonstration programs that voluntarily request accreditation under these standards. Outcomes data will be collected on the demonstration programs and its graduates. These data will be analyzed before ACEND makes decisions about implementation of the Future Education Model for all programs. ACEND believes there may be many ways that Future Education Model graduate degree programs might be organized. The key difference from the current DPD/DI model is that the Future Education Model graduate degree programs will integrate the experiential learning with the didactic preparation to develop competencies. Students will apply once for a program that includes both components. The *Future Education Model Accreditation Standards* allow for multiple organizations to work in partnership to sponsor a program. One of the goals of the demonstration programs, that trial the *Future Education Model Accreditation Standards*, is to identify creative ways that university-based and operations-based programs collaborate to prepare students. ACEND will share those models with educators.

Question: The Future Education Model Accreditation Standards indicate preparation of nutrition and dietetics technicians at the bachelor's degree level; does that mean that associate degree Dietetic Technician (DT) program will need to close?

ACEND Response: ACEND is not planning to discontinue any of the programs that is currently accredits. DT programs will continue to be accredited under the *2017 Accreditation Standards*. ACEND will test the *Future Education Model Accreditation Standards* with demonstration programs that voluntarily request accreditation under these standards. Outcomes data will be collected on the demonstration programs and its graduates. These data will be analyzed before ACEND makes decisions about implementation of the Future Education Model for all programs.

Demonstration Programs

Question: What are the criteria for becoming a demonstration program and how many will ACEND select?

ACEND Response: Organizations interested in sponsoring a demonstration program under the *ACEND Future Education Model Accreditation Standards* should submit the Demonstration Program Application to ACEND. The application form and information about the application process are available on the ACEND website: www.eatrightpro.org/FutureModel. Organizations do not need to currently have an ACEND-accredited program to apply. The ACEND Board plans to select up to 60 programs total to be in the first cohort of demonstration programs and is seeking a representative sample of programs in terms of geographic location, program size, and proposed program structure. Programs desiring to be a demonstration program must complete the demonstration program application, which describes how the program will be in compliance with the *Future Education Model Accreditation Standards*, must be willing to attend required ACEND training and work with ACEND to gather program and graduate outcomes data.

Demonstration Programs (cont.)

Question: What support materials and training will be provided to demonstration programs?

ACEND Response: ACEND has developed several documents to assist programs in becoming a demonstration program. The ACEND website (www.eatrightpro.org/FutureModel) contains the application templates and Guidance Information, developed for each program type, to assist program directors. A webinar describing the application process also is available. Both online and in-person training on competency based education and competency assessment will be provided/required for program directors of selected demonstration programs. ACEND staff are available at ACEND@eatright.org or 1-800-877-1600 x5400 to answer questions.

Question: What financial incentives are there for a program to become a demonstration programs?

ACEND Response: ACEND is providing a number of financial incentives to help offset the cost of establishing a program accredited under the *Future Education Model Accreditation Standards*. The program change fee ($250), candidacy application fee ($2,500) and the 2019 annual accreditation fee ($1975) all are waived for demonstration programs. In addition, ACEND will cover registration and travel expenses for the program director to attend the in-person training session in early February, 2018.

Question: Will there be more than one call for demonstration programs?

ACEND Response: ACEND anticipates having several cohorts of demonstration programs. A date for the application period for a second cohort has not yet been set but is anticipated that it will occur sometime in 2018.

Question: I have a site visit for my current program scheduled for 2018; will I still need to do that site visit if I am submitting an application to be a demonstration program?

ACEND Response: Whether you have a site visit in 2018 will depend on what is planned for your existing program. If that program is continuing as an ACEND-accredited program, then you will need to write the self-study report and host a site visit for that program to maintain its accreditation. If that program is being reorganized into a Future Education Model program, then the timing of the site visit will likely change. The plans for your program should be described in your demonstration program application. ACEND will work with demonstration programs individually to finalize when their next self-study reports and site visit will occur.

Credentialing

Question: Will a credential be available for each degree level?

ACEND Response: The Commission on Dietetic Registration (CDR) ultimately has responsibility for credentialing decisions. CDR initiates new certifications based on surveys (practice audits) of nutrition and dietetics practice roles. The results of the practice audits are used to develop the certification examination content specifications. Graduates of the future education model graduate degree would be eligible to take the registration exam for dietitian nutritionists and graduates of the bachelor degree would be eligible to take the registration exam for nutrition and dietetics technicians. Currently there is not a credential available for the nutrition health worker; CDR could explore creating a credential once sufficient numbers of these practitioners are in the workforce.

Question: Will students need to have a bachelor degree to take the NDTR credentialing exam after January 1, 2024?

ACEND Response: The Commission on Dietetic Registration (CDR) sets the criteria for eligibility to take the exam to become a nutrition and dietetics technician, registered. Currently students who have at least an associate degree and a verification statement from an ACEND accredited NDTR program and those who have a bachelor degree and a verification statement from a DPD are eligible to take the NDTR credentialing exam. At this time, CDR has not made any changes to the eligibility requirements to take that exam. Complete information about eligibility requirements can be found on CDR's website www.cdrnet.org

Additional Topics

Question: What impact will the Future Education Model have on the resources needed by institutions providing education for future nutrition and dietetics students?

ACEND Response: ACEND will gather information from the demonstration programs on the resources needed, steps involved in transitioning to the *Future Education Model Accreditation Standards* and the innovative ways resources were used to ensure that students had met the required competencies.

Question: What impact will the Future Education Model have on the cost of education for future students who want to become a registered dietitian nutritionist (RDN)?

ACEND Response: Currently most students spend at least five years to prepare to become an RDN. Approximately 40% of students completing coordinated programs and 25% of students completing dietetic internships currently pay tuition to complete a concurrent master degree program, another 25% of internship students pay tuition to earn some graduate credit with the internship and many go on to complete their graduate degree. Less than 10% of students who complete an internship do not pay at least some tuition/fees to attend that internship. The exact cost of future education model programs is not yet known as demonstration programs have not yet been identified, but the cost of requiring a master degree for entry-level practice potentially may not exceed what students are currently paying to complete a master degree in a coordinated program or with a dietetic internship.

Question: What impact will the Future Education Model have on student diversity in nutrition and dietetics programs?

ACEND Response: Ethnic diversity in student enrollment in ACEND accredited programs has increased over the past 10 years. Most notably, the number of Hispanic students has nearly doubled. ACEND talked with other health profession accreditors (Physical Therapy, Pharmacy, Occupational Therapy) who have moved their education requirements to a graduate level and learned that this change did not decrease student diversity in those professions. In pharmacy, for example, under-represented minority students (Black, Hispanic, Native American) were 10.6% of the student population in 1988, prior to implementing their practice doctorate degree requirement, and 11.4% in 2012 after implementation. Diversity of students currently enrolled in dietetic internships combined with a graduate degree (males = 10%; under-represented minorities = 9%) and in coordinated programs at the graduate level (males = 10%; under-represented minorities = 11%) is similar to the diversity of students in dietetic internship programs that do not offer a graduate degree (males = 8%; under-represented minorities = 9%). The future education model includes preparation for careers in nutrition and dietetics at associate, bachelor and graduate degree levels allowing students many options for entry into future nutrition and dietetics careers and facilitating professional growth and development through subsequent degree levels. ACEND Standards encourage programs to foster diversity in their student selection process. ACEND currently monitors and will continue to monitor student diversity in all accredited programs.

Question: What programs will ACEND accredit in the future?

ACEND Response: ACEND currently accredits six types of programs: didactic programs in dietetics (DPD), dietetic internships (DI), coordinated programs (CP), dietetic technician (DT) programs, foreign dietitian education (FDE) programs and international dietitian education (IDE) programs under the *2017 Accreditation Standards*. ACEND reviews and revises these standards (as required by USDE every 5 years) and will release new Standards in 2022.

ACEND recently released the *Future Education Model Accreditation Standards for Associate (FA), Bachelor's (FB) and Graduate (FG) Degree Programs in Nutrition and Dietetics.* ACEND will begin accrediting demonstration program under these standards in 2018.

Thus, ACEND will be accrediting nine different types of programs for a period of time; the DPD, DI, CP, DT, FDE, and IDE programs will be accredited under the *2017 Accreditation Standards* and the FA, FB, and FG programs will be accredited under the *Future Education Model Accreditation Standards*. ACEND will collect data from these future education model programs and their graduates before making a decision on which types of programs to continue to accredit. At the time of that decision, ACEND will announce which program types it will continue to accredit in the future and which program types it will discontinue to accredit. If a decision is made to implement the Future Education Model for all programs, sufficient time (likely 10 years or more) would be given for programs to make the changes needed to come into compliance with these standards.

APPENDIX TWO

Oregon/Regional Community College Nutrition Course Offerings 2017

Area Community College	Course Number	Course Name	Credits
Rogue	FN 225	Nutrition	4
Umpqua	FN 225 FN 230	Human Nutrition Personal Nutrition	4 3
Linn-Benton (also has Culinary Arts)	Nutr 104 Nutr 225 NFM 225 HE 204	OSU Orientation General Nutrition General Human Nutrition Exercise and Wt Management	 3 4 3
Clark College	HLTH 100 HLTH 104 Nutr101 Nutr139/240	Food & Your Health Weight & Your Health Nutrition Nutrition in Healthcare II&III	2 2 3 (Nursing)
Central Oregon	FN 225	Nutrition	4
Clackamas	FN 110 FN 225	Personal Nutrition Nutrition	3 4
Lane	FN 110 FN 130 FN 190 FN 225	Personal Nutrition Family Food & Nutrition Sports Nutrition Nutrition	3 3 2 4
Chemeketa	NFM 225 NFM 240	Nutrition Nutrition in the Lifecycle	4 3
Oregon Coast	FN 110 FN 225	Personal Nutrition Human Nutrition	3 4
Tillamook Bay (also has Food Science & Technology)	FN 225	Nutrition	4
Southwestern Oregon (also has Culinary Arts)	FN 155 FN 180 CTE FN 225 FN 280 CTE	Nutrition in Early Childhood Internship Nutrition Internship	2? 4
Treasure Valley	FNUT 225	Nutrition	4

Text

Blue Mountain	HE 253 FN 225 FN 230	Personal Nutrition Nutrition Children, Families & Nutrition	3 4 3
Klamath (also has Culinary Arts)	HPE 225 ECE 201	Nutrition Nutrition in ECE	3 3
Columbia Gorge	FN 225	Nutrition	4
Clatsop	FN 225	Human Nutrition	4
Mt. Hood	HE 205 FN 225	Diet Appraisal Nutrition	1 4
PCC	FN 110 FN 113 FN 199F FN 225 HE 254 HE 262 HE 264 FT 103	Personal Nutrition Everyday Cooking Farm to Preschool Nutrition Nutrition Weight & Personal Health Children's Health, Nutrition & Safety Health, Food Systems & Environment Nutrition for Fitness Instructors	3 1 1 4 3 3 3 3
CLIMB	Functional Nutrition		Non-credit

Subject Area Committee Name: Foods & Nutrition	
SAC Contact's Name: Kate Malone Kimmich	*Contact's e-mail:* kate.malone@pcc.edu

Lower Division Collegiate (LDC) SACs have a collective responsibility for the development of students for the transfer and general education degrees (AAOT, AS, ASOT and AGS). These degrees have the college's Core Outcomes as their basis.

LDC SACs are encouraged to think broadly about how content in their discipline reflects the Core Outcomes. Whenever possible, each SAC should substantially address and assess all six of the Core Outcomes in at least one of their courses. If in the careful professional judgment of the faculty all of the Core Outcomes are not relevant to that SAC's academic mission, the SAC may choose to address and assess only four of the six Core Outcomes.

The standard approach to Core Outcome assessment at PCC is "*assess - address – reassess*." While SACs are free – and encouraged - to assess the Core Outcomes in ways that make sense to them, this basic assessment model should followed:

1. identify an area of concern regarding the student attainment of a specific aspect of a Core Outcome as it is reflected in your discipline
2. assess that area of concern
3. address your findings (if called-for)
4. reassess the Core Outcome using the same or similar assessment method/process when appropriate

The last step is central to the improvement model. Whatever model you use, Always ask: did our response help?

A SAC is expected to assess (or reassess) at least two outcomes per year. If all six outcomes are assessed, the cycle should be complete within six years (note that SACs who assess fewer outcomes will have a shorter cycle). However, some flexibility in the 'two per year/all six within six years' is allowed. For instance, a SAC may choose might choose to 'assess-address-reassess' a single core outcome within a calendar year: essentially conducting two similar assessment projects on the same outcome in the same year.

Some SACs may need more time to communicate and coordinate changes resulting from assessment. In these cases, a three-year time-frame for the "assess-address-reassess" process may be called-for. Check the Help Guide and your LAC coach for details.

PCC Core Outcomes

Communication (**C**)

Cultural Awareness (**CA**)

Community and Environmental Responsibility (**C&ER**)

Professional Competence (**PC**)

Critical Thinking and Problem Solving (**CT&PS**)

Self Reflection (**SR**)

*Multi-Year Assessment Plan**

Use the abbreviations above to fill-in the table below.

	2013-2014	*2014-2015*	*2015-2016*	*2016-2017*	*2017-2018*	*2018-2019*
Assess	C&ER / CA	C / PC				CT & PS / SR
Reassess			CT & PS / SR	C&ER / CA	C / PC	

*Using the standard model, SACs assess two core outcomes each year while cycling through all of the relevant Core Outcomes. Use the assess – address – reassess model whenever that model coincides with your SACs considered judgment.

Comments (Optional)

APPENDIX FOUR

TO: Portland Community College Degrees and Certificates Committee

FROM: Kate Malone Kimmich, Dietary Manager Certificate Program Director

SUBJECT: Dietary Manager Certificate Suspension

DATE: June 4, 2014

Rationale: The Dietary Manager Certificate program began Fall Quarter 2013 and was put on hold in Spring Quarter 2014. We recommend suspending the program for the following reasons:

- Lack of qualified Registered Dietitian and Certified Dietary Manager preceptors for required 150-hour field experience
    - Registered Dietitians employed as floating consultants in multiple facilities and/or already host students from area and out-of-area dietetic internships
    - Oregon does not require Dietary Managers to be Certified Dietary Managers by law

- Low student enrollment
    - Program enrollment: 8 students (Fall 2013); 0 students (Spring 2014)
        - Offered one course (DM 119: Nutrition Through the Lifecycle), Fall 2013
        - Planned program break Winter 2014 for faculty and preceptor recruitment
        - Attrition related to: family health, academic probation, financial barriers, concerns regarding employment outlook
    - Nationally, 89% of classroom-based CDM training programs have ≤5 examinees annually; 40% have 1 examinee (2013 Association of Nutrition and Foodservice Professionals report)

- Unreliable employment outlook
    - Oregon does not require Dietary Managers to be Certified Dietary Managers by law

From September 2013 – April 2014, the Program Director consulted the DM Advisory Council and numerous Oregon and Washington industry stakeholders, including dietary managers, certified dietary managers, food service directors, registered dietitians, program directors, and health care facility administrators regarding preceptor and student recruitment. Thereafter, the Program Director, SAC, and Rock Creek administrators recommended program suspension.

The suspension will not affect other curriculum.

Teach-out Plan: Not applicable as zero students are enrolled in the program at this time

Notifying Adjunct Faculty: Not applicable as there are no adjunct faculty associated with the program

PCC Catalog: The 2014 – 2015 Catalog will be amended to reflect suspension

Dietary Manager Certificate Advisory Council: Program Director to advise regarding suspension

Portland Community College

Dietary Manager Certificate Program

Director Resources & Responsibilities Handbook

2013 – 2014

The Dietary Manager Certificate Program Director is a full-time Foods & Nutrition Department faculty in the Social Science & Health Division. The Program Director currently serves as Chair of the Foods & Nutrition Subject Area Committee and reports to the Division Dean of Social Science & Health.

Teaching Responsibilities

DM 105: Food Safety: ServSafe and Local Food Production

DM 119: Life Cycle Nutrition

Earn and maintain ServSafe Instructor and Certified ServSafe Proctor certifications

Program Development Responsibilities

Develop and revise *DM 119: Lifecycle Nutrition*

Develop and revise DM 105: Food Safety: ServSafe and Local Food Production

Oversee development and instruction of *DM 129: Human Resources & Management for Dietary Managers*

Oversee development and instruction of *DM 139: Nutrition for Dietary Managers*

Work with Foods & Nutrition Department Chair to hire instructor for (1) DM 129: Human Resources and Management for Dietary Managers and (2) DM 139: Nutrition for Dietary Managers

Work with Foods & Nutrition Department Chair and Administrative Assistants to order textbooks and exam preparation materials

Secure and coordinate preceptors and field placement site locations for (1) DM 130: Dietary Manager Field Experience I and (2) DM 140: Dietary Manger Field Experience II

Oversee completion of clinical site entrance requirements (background check, immunizations, etc.)

Conduct preceptor trainings and serve as preceptor/field experience site contact

Oversee contract records between PCC Purchasing and field experience sites

Conduct program information sessions for current and prospective students

Advise prospective and current students

Coordinate student orientations

Develop and maintain admissions materials (applications, interview, etc.)

Coordinate Oregon ANFP student CDM exam scholarship

Develop and approve course and certificate changes

PCC Rock Creek Dietary Manager Certificate Program
Advisory Committee Minutes
November 19th, 2013
2:00 pm – 3:30 pm

Introductions

In attendance:

Michelle Kerr, DM (Kaiser)
Marissa Mitchell, DM (Marquis)
Jenny Dickow, DM (Holiday)
Marie (former PCC instructor)
Cindy Heilman, DTR (Higher Standards, Kind Dining)
Kristen Heckert , DM student
Kimberly Martin, DM Student
Kate Malone Kimmich, RD, DM Program Director
Karen Sanders, Dean, Social Sciences & Health
Michael Meagher, Chair, Health/Foods & Nutrition

Program Overview and updates

Kate shared programmatic updates

1. The group was asked for their input and opinion of our proposed modification of the DM Certificate from 16 to 17 credits by modifying DM 105 from one credit to two, including a practical field experience in local food production and food safety:
    a. I think it's a great idea
    b. We have our own garden [at their institution] that we can then utilize
    c. A lot of places would have use for this skill
    d. It's a hot topic - adding the sustainability piece
    e. It's a quality and perception issue ... we'll be able to provide fresh items
    f. With our elderly clients, it can bring back a flood of memories
    g. Oh... it's perfect
    h. I just wrote an article about this for the ANFP magazine!
    i. We want [the gardening component] to come from food services [versus activities]
    j. You're so ahead of the curve!
2. Foods & Nutrition Lab in the new Building 5 (earliest open date: Fall 2015)
    a. Developing it in a way to make it licensed for retail food production (incorporate Learning Garden produce, etc.)
    b. Noted that small business training key for DMs
3. DM Website
    a. Need to follow the PCC format
    b. Can be accessed here: http://catalog.pcc.edu/programsanddisciplines/foodandnutrition/

ACTION ITEM

- ALL: PLEASE REVIEW AND PROVIDE FEEDBACK TO KATE

4. Quick summary of program:
    a. DM 105 Food Safety: ServSafe ~~1~~ 2
    b. DM 119 Nutrition Through the Life Cycle 3
    c. DM 129 Food Service and Personnel Management 4
    d. DM 130 Dietary Manager Field Experience I 3
    e. DM 139 Nutrition for Dietary Managers 3

f. DM 140 Dietary Manager Field Experience II 2
g. Total Credits ~~16~~ 17

Instructor Search for DM 129: Human Resources and Management for Dietary Managers

Kate shared information for instructor search.
Ideas of sites and locations to promote include:

- Oregon Academy of Nutrition & Dietetics (OAND)
- Portland Academy of Nutrition & Dietetics (PAND)
- American College of Health Care Administrators (ACHCA)
- Dietetics in Health Care Communities (DHCC) – Janelle Asai, RD, President, 12/6/2013 meeting

Note: Application information will soon be available on the PCC Jobs page (Page still not updated)

NOTE regarding DM Instructor Qualifications handout/website:

• PLEASE ADD REGISTERED DIETITIAN AS THE FIRST INSTRUCTOR QUALIFICATION for DM 119 and DM 139. The website will be updated soon.

• The qualifications for DM 129 (Human Resources and Management for Dietary Managers are CORRECT.

Recruitment

1. Preceptor RDs and DMs for field placement
    a. Program is limited by number of preceptor locations available
    b. ANFP requires a total of 150 supervised field hours:
        i. **Per ANFP: "The Registered Dietitian preceptor is responsible for the entire 150 hours of field experience and directly supervises 25 of the 50 nutrition-related hours. Each field experience is precepted by a qualified preceptor with no less than one year of post-registration/certification, full-time equivalent employment in a practitioner role."**
    c. Kate posed the following questions:
        i. Can an interested facility take more than one intern?
        ii. Are there locations where a DM is present but no RD?
        iii. What creative solutions can be identified to address need?

ACTION ITEM

- ALL: PLEASE CONNECT WITH RDS AND DMS ... WHO MIGHT BE INTERESTED? FORWARD CONTACT INFORMATION TO KATE

2. Potential DM Advisory Committee members
    a. Karen Santos (Prestige)
    b. Mark Daugherty
    c. Linda Sanders
    d. Judy Madden
    e. Teresa Scollard (St. Vincent's)

Program Networking & Marketing

Kate requested ideas and strategies to promote the DM Certificate program
An initial list included:

-
- Fliers
- Brochures
- Website
- Tabling (with students)
- Social Media
- Videos
- LinkedIn
- Blogs
- Promote connection with sustainability
- Oregon Leading Age
- OHCA.com
- Hospitals Association
- Ecotrust
- American Association of Nursing Home Administrator
- Culinary Schools
- High schools
- Chefs

ACTION ITEM

- ALL: AS IDEAS OF LOCATIONS AND CITES EMERGE, SEND IDEAS TO KATE

Break-out Session

Kate led a break-out session where the Committee members developed ideas for classroom activities and course projects based on the DM 129 learning objectives. The ideas were then shared with the greater group.

Spring 2014 Meeting

It was discussed to combine the next Advisory Committee Meeting with a preceptor orientation meeting
Tentative:

- 1:30 pm – 3:00 pm Advisory Committee
- 3:00 pm – 3:30 pm Preceptor Orientation meeting

Suggested dates/times: Early May, mid-week

ACTION ITEM

- KEEP AN EYE OUT FOR SPRING 2014 DOODLE POLE TOWARDS SPRING ☺

Closing

FOODS AND NUTRITION

Rock Creek Campus
Bldg 3, Room ????
971-722-?????

CAREER AND PROGRAM DESCRIPTION

The study of foods and nutrition includes the study of the metabolism of the body in addition to the foods that supply the nutrients needed for human health and the factors that can affect nutrient availability. Inquiry into how nutrition is advertised, marketed and how recommendations are made is studied. At PCC, nutrition course offerings range from personal nutrition to the more life science intense nutrition course and dietary manager studies.

The Dietary Manager (DM) Certificate program prepares individuals to work in care facilities such as hospitals, skilled nursing facilities, assisted living facilities and some school and correctional facilities. The Dietary Manager is responsible for a safe food service environment, training and evaluation of foodservice staff. Additionally, the Dietary Manager screens clients' nutritional status, adjusts menus for clients with special diets and works with allied health care workers to ensure proper feeding of clients. A Dietary Manager works in a high-pressure environment with individuals in various capacities. The program provides the educational content to be qualified to take the national certification exam.

DEGREES AND CERTIFICATES OFFERED

Less than One-Year Certificate

Dietary Management

PREREQUISITES AND REQUIREMENTS

1. Reading 90 or equivalent placement scores
2. Math 20 or equivalent placement scores

DIETARY MANAGER LESS THAN ONE-YEAR CERTIFICATE

Minimum 16 credits. As part of the certificate, students must complete a minimum of 150 hours of field experience. Students must meet all certificate requirements.

Dietary Manager Certificate Credit Summary

DM	16
Credit Total	16

COURSE OF STUDY

The coursework listed below is required.

DM	105	Food Safety: SERVSAFE	1
DM	119	Nutrition through the Life Cycle	3
DM	129	Human Resources and Management for the Dietary Manager	4
DM	130	Dietary Manager Field Experience I	3
DM	139	Nutrition for Dietary Managers	3
DM	140	Dietary Manager Field Experience II	2

APPENDIX FIVE- FN Foods and Nutrition Core Outcomes Mapping Matrix

Course #	Course Name	CO 1	CO 2	CO 3	CO 4	CO 5	CO 6
FN 110	Personal Nutrition	1	1	1	1	1	2
FN 113	Everyday Cooking	1	1	2	1	1	2
FN 199F	Farm to Preschool Nutr	1	1	1	1	1	2
FN 225	Nutrition	2	2	3	2	2	2

Updated December 2017

APPENDIX SIX- Enrollment Data

Foods and Nutrition Enrollment Trends with Pass Rates by Modality

			Academic Year									
			2012-13		2013-14		2014-15		2015-16		2016-17	
			Enrollments	Pass Rate	Enrollments	Pass Rate	Enrollments	Pass Rate	Enrollments	Pass Rate	Enrollments	Pass Rate
Campus	**Modality**	**Course**	**Figure**	**Figure**	**Figure**	**Figure**	**Figure**	**Figure**	**Figure**	**Figure**	**Figure**	**Figure**
Rock Creek	On-Campus/Face-to-Face	FN 110	57	68.40%	79	74.70%	67	67.20%	68	77.90%	112	75.00%
		FN 199A	.	.	.	.	.	.	.	.	16	56.30%
		FN 225	174	91.40%	105	89.50%	76	94.70%	18	100.00%	.	.
	WEB/Distance Learning	FN 110	.	.	.	.	.	.	.	.	21	52.40%
		FN 225	.	.	21	95.20%	48	95.80%	110	94.50%	139	92.80%
Southeast	On-Campus/Face-to-Face	FN 225	22	77.30%	.	.	.	.	.	.	.	.
	WEB/Distance Learning	FN 225	.	.	77	92.20%	74	90.50%	95	95.80%	103	97.10%
Sylvania	On-Campus/Face-to-Face	FN 110	.	.	.	.	54	81.50%	.	.	30	76.70%
		FN 225	104	86.50%	94	89.40%	74	97.30%	47	93.60%	.	.
	WEB/Distance Learning	FN 110	271	79.70%	260	78.50%	231	77.50%	228	81.60%	219	85.40%
		FN 225	318	96.90%	301	93.70%	392	95.40%	377	94.20%	407	95.80%
TOTALS			**946**		**937**		**1016**		**943**		**1047**	

Source: A. Eggebrecht, PCC Institutional Effectiveness

APPENDIX 7

Race/Ethn		2012-13	2013-14	2014-15	2015-16	2016-17
Af. American	Headcounts	31	36	35	32	32
	% of Total Headcounts	3.3%	3.9%	3.5%	3.5%	3.2%
Asian	Headcounts	58	64	85	73	93
	% of Total Headcounts	6.2%	7.0%	8.6%	7.9%	9.2%
Hispanic	Headcounts	71	66	93	98	90
	% of Total Headcounts	7.6%	7.2%	9.4%	10.6%	8.9%
Multi-racial	Headcounts	32	50	43	62	69
	% of Total Headcounts	3.4%	5.4%	4.3%	6.7%	6.8%
Native Amer./ Alas	Headcounts	5	5	6	3	6
	% of Total Headcounts	0.5%	0.5%	0.6%	0.3%	0.6%
Pacific	Headcounts	4	4	5	2	4
	% of Total Headcounts	0.4%	0.4%	0.5%	0.2%	0.4%
Unreported	Headcounts	103	77	80	53	77
	% of Total Headcounts	11.0%	8.4%	8.0%	5.7%	7.6%
White	Headcounts	630	617	647	599	641
	% of Total Headcounts	67.5%	67.1%	65.1%	65.0%	63.3%
Grand Total	**Headcounts**	**934**	**919**	**994**	**922**	**1012**
	% of Total Headcounts	**99.9%**	**99.9%**	**100.0%**	**99.9%**	**100.0%**

APPENDIX 8-1

Foods & Nutrition Sustainable Agriculture Workgroup Proposal

Elaine Cole, PhD
Dana Fuller, MSW, GCSA
Alissa Leavitt, MPH, MCHES
Nora Lindsey
Debra Lippoldt, MS, RN

PCC has the opportunity to move from reacting to change to directing change by graduating one-of-a-kind thinkers, advocates, farmers, retailers, and restaurateurs who are leading the charge in how the nation thinks about food.

-FNAg Workgroup

Think Fearless: Ignite a Culture of Innovation PCC

Table of Contents

Executive Summary

Charge of the Workgroup

In Fall 2015, the College formed a Foods & Nutrition/Sustainable Agriculture (FNAg) Workgroup comprised of faculty, staff and administration. The charge of the group was to identify educational program needs that capitalize on the Rock Creek campus and community resources of the Learning Garden and the Foods & Nutrition Lab. Analysis to identify specific jobs directly connected to the field were completed.

Members from the work group connected with over 75 representatives from the agricultural industry, food system stakeholders, college and university faculty currently involved in similar programs, both in and outside of Oregon, and local business and industry leaders. Information was gathered through phone, face-to-face interviews and campus tours. The workgroup met several times between September 2015 and June 2016. During the meetings, information was shared and work was done to narrow down the multitude of possible focus areas within the broad field of "food systems."

To that end, we have identified challenges and provide recommendations to meet the charge given to the Workgroup.

Task Force Challenges

- The career trajectory for Sustainable Food Systems is not linear like other fields and employment data was challenging to locate.
- The field of Food Systems is very broad and it was difficult to know how to structure the curriculum without gathering additional information.
- There are other degrees and certificates in Oregon that are in this field and the Workgroup wanted to avoid duplicating efforts.

Justification of Need

In Oregon, the average age of a farmer is 60 years therefore growth and replacement of an aging workforce are factors in future jobs. The total number of job openings is projected to be much higher than the statewide average number of job openings for all related occupations through 2022. This occupation is expected to grow at a somewhat faster rate than the statewide average growth rate for all occupations through 2022. (See Appendix A for additional labor statistics).

A survey was created to solicit input on course offerings and was sent to related programs at PCC, posted to the Learning Garden Facebook page and sent to external partners in sustainable agriculture and culinary programs. 121 respondents (55% PCC students, 45% prospective PCC students) showed a growing desire for food systems related programming. (Appendix B)

Taskforce Recommendations

1. Curricula
    a. Seek to develop articulation and/or transfer agreements with 4-year partners related to Sustainable food Systems.
    b. Work with the Curriculum Office to develop Sustainable Food Systems certificate for Spring 2017 implementation.
    c. Continue to explore how Sustainable Farming & Foods (Sustainable Food Systems) certificate aligns with potential hospitality program at Cascade.
    d. Continue to have conversations with Community Education about piloting non-credit/credit program/courses at Rock Creek.
    e. Continue to explore AAS degree and other related certificates.
        i. Host culinary-themed focus group with the OSU Food Innovation Center and the Oregon Restaurant Association.
    f. Continue to explore interdisciplinary programming with Landscape Technology, Health Studies, Foods & Nutrition, Business, and Environmental Science.
    g. Work with FN SAC to update instructor qualifications
2. Develop Advisory Group for proposed certificate.
3. Investigate budget for proposed certificate and degree program.
4. Collaborate with grants office to search for relevant grant that address needs in the areas of focus.
    a. Apply for Oregon Department of Agriculture funding for the Specialty Crop Block grant. This will allow us to develop these specific classes and use enrollment data and student feedback to determine whether there is a need for an additional certificate, degree or transfer degree related to agriculture, food systems, or another related field.

To accurately develop the project's scope and necessary funding, the Workgroup recommends that in Fall 2016, the college enlist a coordinator/.5 release time to look at limitations and possibilities in order to develop an accurate budget. The deliverables are as follows:

1. Project analysis that details of the project and how it will be managed.
2. Program analysis that should confirm work done by the FNAg Workgroup and modified as necessary based on consultant/Advisory Group experience and input.
3. Complete the Preliminary Review form and submit to the Curriculum Office.
4. Project budget that would provide detailed estimates and funding methods.
5. Convene Industry Advisory Committee.
6. Draft Sustainable Food Systems certificate for Spring 2017 implementation.
7. Work with FN SAC to draft articulation and/or transfer agreements with 4-year partners.

Conclusion

The above recommendations, if implemented, will provide Rock Creek with an opportunity to:

1. Meet the changing needs of the industry
2. Invest in a healthier society
3. Invest in student retention
4. Directly address goals in the strategic plan
5. Be innovative

Given that sustainable food businesses in Portland are increasingly popular and Washington County has traditionally been an agricultural landscape, it is clear that PCC Rock Creek is uniquely situated to train the next sustainable food business leaders, sustainability professionals, and social justice food advocates. PCC Sustainable Food Systems Certificate graduates will have the opportunity to be leaders in working toward a more sustainable food system in a place where citizens are committed to and supportive of this value. Indeed, the world needs more individuals who are innovative on this topic.

The FNAg Workgroup recommends that PCC Rock Creek champion new ideas and programming to lead the food systems movement. PCC has the opportunity to move from reacting to change to directing change by graduating one-of-a-kind thinkers, advocates, foody system stakeholders, farmers, retailers, and restaurateurs who are leading the charge in how the nation thinks about food. Now is the time for PCC Rock Creek to be a leader by engaging in the emerging field of sustainable agriculture education. Let's move from reacting to change to directing change by graduating one-of-a-kind thinkers, advocates, farmers, retailers, and restaurateurs who are leading the charge in how the nation thinks about food

Proposal

Charge of the Workgroup

In Fall 2015, the College formed a Foods & Nutrition/Sustainable Agriculture (FNAg) Workgroup comprised of faculty, staff and administration. The charge of the group was to identify educational program needs that capitalize on the Rock Creek campus and community resources of the Learning Garden and the Foods & Nutrition Lab. Analysis to identify specific jobs directly connected to the field were completed.

Members from the work group contacted representatives from the agricultural industry, food system stakeholders, college and university faculty currently involved in similar programs, both in and outside of Oregon, and local business and industry leaders. Information was gathered through phone, face-to-face interviews and campus tours. The workgroup met several times between September 2015 and June 2016. During the meetings, information was shared and work was done to narrow down the multitude of possible focus areas within the broad field of "food systems".

Workgroup Process

The Workgroup was formed in Fall, 2015 and includes the following individuals:

Alissa Leavitt, MPH, MCHES Health Studies Faculty Rock Creek	Elaine Cole, PhD Sustainability Coordinator Rock Creek
Debra Lippoldt, MS, RN Faculty Department Chair Foods and Nutrition Sylvania	Nora Lindsey Learning Garden Coordinator Rock Creek
Dana Fuller, MSW, GCSA Division Dean, Social Science, Communication and Health Rock Creek	

Sustainable Agriculture Focus Group

For many years, there have been campus discussions, meetings and informal committee work to design a sustainable agriculture program. In 2013, a college-wide group of ≈40 interdisciplinary staff and faculty organized a Sustainable Agriculture Focus Group. This effort was terminated in 2014 and from these initial efforts, the FNAg Workgroup has developed this new iteration of the project and proposal.

Current Campus Resources

Learning Garden.

The PCC Rock Creek Learning Garden offers both informal and formal sustainable agriculture education opportunities that allow students to gain hands on experience in a diversity of areas within the food system, however there is much room for growth.. The campus has a 3.6-acre plot of land that includes 48 raised beds, ¾ acre of vegetables and flowers, 60 fruit trees, grapes, raspberries, blueberries, and more. Food is grown year round hydroponically and in a hoop house. More than 10,000 pounds of food is produced annually food for an on-campus farm stand, catering, donation to food banks and shelters, and for volunteers. With existing land, animals, and expertise, PCC Rock Creek is uniquely situated to use the campus as a living laboratory for teaching sustainable agriculture and food systems.

Foods & Nutrition Lab.

This space features six spacious learning stations where students have room to learn about, prepare and enjoy food. The lab is fully equipped with Electrolux ceramic top convection oven units, refrigerators, Hobart LXe dishwasher, Two Traulsen Refrigeration units in the storage room can be used for refrigeration/freezing or as a warming unit, anasonic commercial microwave oven, sinks, pots, pans, knives and other cookware. The instructor's station at the front of the classroom includes two large television screens projecting a live camera feed, allowing students to easily observe their teacher's technique.

Data Collection Efforts

The quantitative and qualitative data collected from over 50 individuals through focus groups and meetings with internal and external partners created the foundation from which the Workgroup developed this proposal. The Workgroup will be reviewing additional data from the Oregon State University Urban Farmer program, the Oregon State University Food Innovation Center and a survey report from Friends of Family Farmers. Each has agreed to share relevant data when the reports are final the end of June. This document will be updated with that information.

Additional Consultation from Internal Partners

Name	Title
Kate Kinder	Career Pathways
Marc Goldberg	Associate Vice President - Workforce Development and Community Education
Sheila Meserschmidt, MBA	PCC Institute for Health Professionals
Beth Molenkamp, MA	PACTEC Regional Coordinator Dual Credit Program Manager
Heidi Edwards	Outreach and Orientation Coordinator Rock Creek
David Sandrock, PhD	Landscape Technology Program

Andrew S. Garland-Forshee, Ph.D., HS-BCP	Early Education & Family Studies
Jan Abushakrah, PhD	Gerontology Program: Horticulture Therapy
Haydee Goldenberg	Career Exploration Center Coordinator

Meeting with External Contacts

The Rock Creek campus has hosted over a dozen loop tours to engage potential partners. Additionally, the following people have been consulted on this proposal through informational interviews and focus groups.

Name	Title
David Stone, PhD	Director, Food Innovation Center Oregon State University
Jason Ball	Resident Chef, Food Innovation Center Oregon State University
Amy Gilroy, MPH	Farm to School Manager Oregon Department of Agriculture
Jessica Gutgsell, RDN	Bionutritionist, Kitchen Coordinator Oregon Health & Science University
Gene Fritz	Oregon Health & Science University Oregon Restaurant Association (want to work on culinary themed focus group)
Maggie Michaels	Curriculum of Cuisine
Lora Wells	Culinary Arts Teacher Westview High School
Mary Masters	Culinary Arts Teacher Liberty High School
Erin Linhares	Culinary Arts Teacher Forest Grove High School
Heidi Larson	Culinary Arts Teacher Tualatin High School
Deanna Palm	President Hillsboro Chamber of Commerce
Stu O'Neill	Executive Director Rogue Farms

Weston Miller, Puhkarj Deol	Organic Gardening Certificate Program. OSU Extension
Chenoa Philabaum	New Seasons Market
Penelope (Penny) L. Diebel	Assistant Dean of Academic Programs College of Agricultural Sciences Oregon State University (Meeting in June)
Anna Garwood Sarah Canterberry	Growing Gardens
Dee Wetzel	Training and Education Coordinator Portland State University
Heather R. Morrow-Almeida, MPH	MCH Systems and Policy Analyst Public Health Division
Brian Wilke	Co-founder Oregon Culinary Institute (Meeting 6/23)
Joyce Dougherty	Director Oregon Department of Education Child Nutrition Programs
Abby Farmmantino	Airbnb Food + Drink Operations Manage
Jennifer Young, MPH, RDN	Policy Specialist Public Health Division
Susan Greathouse, MPH	WIC Nutrition & Local Services Manager Oregon Health Authority
Wendy Popkin	Executive Director, Education Foundation Oregon Restaurant & Lodging Association
Gene Fritz, Ed.M.	Academic Director – Culinary Arts Art Institute
Neeraja Havaligi, PhD	Biodiversity and Climate Change consultant
Megan Horst, PhD, AICP	Assistant Professor Portland State University
Molly Notarianni	Friends of Family Farmers
Janet Bean	HR Manager Beaverton Foods

Tia Henderson, PhD	Upstream Public Health

Current & Prospective Student Survey

Over the course of these meetings it was clear that the Workgroup needed to engage current and prospective PCC students. A survey was created to solicit input on course offerings and was sent to related programs at PCC, posted to the Learning Garden Facebook page and sent to external partners in sustainable agriculture and culinary programs. A request to participate in this Qualtrics survey was distributed through an online link in an email. The survey was open for 2 weeks. In total 121 respondents (55% PCC students, 45% prospective PCC students) showed a growing desire for food systems related programming. (Appendix B)

Justification for Certificate Program

Agriculture has found itself reframed amid a larger economic cluster commonly known as "food systems." Recent changes in consumer demand for food, food experience, food security, eating habits and lifestyles have opened the door to a host of economic and agricultural career opportunities.

In an era of climate change, resource limitations, growing population, increase in obesity and chronic illness, food injustice, etc, the food system must move to support and expand small-scale community food systems-focused agriculture. Half of American farmland is expected to change ownership in the next two decades. This could be an opportunity for young people, people of color, women, and anyone interested in small-scale, sustainable agriculture to succeed.

Currently only 5% of what we eat in the Portland region is sourced locally. A reasonable increase would have a tremendous economic impact and enable a major expansion of jobs in sustainable local food. (Megan Hurst, Personal Communication) As the food movement grows, the demand for college and university classes focusing on food systems has expanded. More than 70 community colleges, four-year colleges, and universities now have specific degree programs for sustainable agriculture or food systems. (Civil Eats, 2016)

Alignment with College Strategic Plan.

The proposed certificate and continued exploration for an AAS degree aligns with the following strategic plan efforts at the College:

- Think Fearless: Ignite a Culture of Innovation
- Think Accountable: Achieve Sustainable Excellence in All Operations
- Think Powerful: Transform the Community Through Opportunity
- Think Proud: Create a Nationally Renowned Culture for Diversity, Equity and Inclusion
- Think Bold: Drive Student Success

Sustainability.

This certificate program meets the sustainability goals of the College. The College has strengthened its commitments to sustainability, developed two iterations of its Climate Action Plan and has taken significant strides to reduce its environmental footprint and promote education for sustainable development.

Health Benefits of Proposed Program.

Urban agriculture has the potential to enhance the nutritional status of urban residents in general, and the urban poor in particular, by directly improving food security and nutritional adequacy. The benefits of gardening and food growing for health and wellbeing are well-documented in the literature (Van den Berg, 2015). By expanding the programming of the Learning Garden and the Foods & Nutrition Lab, students, faculty and staff will have more opportunities to congregate as healthy members of the Rock Creek community through the enjoyment of gardening, healthy foods, nutrition, and environmental stewardship.

Employment Data.

Although the career trajectory for sustainable food systems is not linear like other fields, students who complete sustainable agriculture programs are being hired after program completion. (See Appendix C and D) The growth of local food and farming is particularly important today as the world experiences climate disruption, energy shortages, and economic stress. Students who recognize crisis as an opportunity are gravitating to the study of sustainable farming, working toward careers in local food and green businesses, urban agriculture, permaculture, and related jobs in farm-based education, community development and advocacy.

The United States Department of Agriculture (USDA) recently reported a 144% increase in farm direct sales over a 5-year period indicating a healthy demand for this service. The local food movement has created jobs throughout the food supply chain and the demand for local food often exceeds supply.

The proposed certificate program is designed to provide a workforce for jobs that are created in support of local food production. 'Farm Educator', Garden Program Director', and 'Farm to School Coordinator' and similar job listings are appearing throughout the region. Employment of agricultural and food scientists is projected to grow 9 percent from 2012 to 2022, about as fast as the average for all occupations

Oregon Data.

In Oregon, the average age of a farmer is 60 years therefore growth and replacement of an aging workforce are factors in future jobs. The total number of job openings is projected to be much higher than the statewide average number of job openings for all related occupations through 2022. This occupation is expected to grow at a somewhat faster rate than the statewide average growth rate for all occupations through 2022. (See Appendix A for additional labor statistics)

National Trends.

Around the country, directors of sustainable agriculture programs (both formal and informal education), and program websites, report that students go on to work in some capacity of the food system. Program information from over 40 programs throughout the United States, was collected for reviewed by the Workgroup. A list of questions was asked of all programs and

responses to those questions with general program/facility information were provided to the Workgroup for review and discussion. (See Appendix X)

Graduates of the proposed certificate program will be equipped to begin or continue careers in the local and sustainable food system. The *Journal of Agriculture, Food Systems, and Community Development*'s February 2012 Call for Papers documents this growing field of employment; the call reads, "emerging regional food systems appear to be creating some new occupational opportunities, including the emergence of green-collar sustainable occupations such as farmer trainers, farm managers, agriculture teaching positions certifiers, and consultants."

Recent positions posted in Oregon that a graduate may be qualified for include:

Sector Types	**Types of Jobs**
Education (K-12, Higher Ed) School Food Service, Catering Restaurants Agriculture Non-profit supporting sustainable foods Food Companies Farmers Markets Grocery Stores Organic Farms Hospitals and Care Centers Community Gardens University Farms Food Security Organizations Community Development Organizations	Educator, Instructor School or Community Garden Coordinator Prep Cook, Purchaser Farm, Field, Garden, Compost, Greenhouse, Food Safety Managers Garden-based Nutrition Educator, Corporate Wellness Environmental Sustainability Coordinator Project Coordinator, Program Coordinator Manager Farmer Community Outreach and Education Community Organizer in Sustainable Agriculture Communications or Social Media Specialist, Web Developer Non-Profit Project Specialist Food Demonstrator, Purchasing Coordinator

Food-related Courses in Higher Education in Oregon

A few recent examples showcase the growth of food-related courses in higher education in Oregon:

o Marylhurst College in Portland, Oregon recently added a Master of Science in Food Systems and Society, which "focuses specifically on root causes of social inequality through the lens of the food system," according to program coordinator Emily Burruel.

o Portland State University added a graduate Food Systems certificate and they are working on undergraduate certificate.

o National College of Naturopathic Medicine, undergraduate degree in Nutrition.

o Clackamas Community College has a certificate in Urban Agriculture.

o Blue Mountain Community College.

o Oregon State University has over 100 related courses.

Current Programming using the Foods & Nutrition Lab

It is important to highlight some of the current uses of the Foods & Nutrition Lab:

- Community Education
    - Learning Garden coordinator Nora Lindsey is piloting the courses: Flower Arranging from the Garden
    - Artisan Bread Making course
    - And more
- The Food for Thought Expedition, a partnership between PCC's Rock Creek Campus and Springville K-8 School, hopes to transform 105 seventh and eighth graders into conscious consumers who will not only make healthier food choices later in life, but will understand the role food plays in the global society. They use the lab to learn about how to prepare the food they learn to grow in the Rock Creek Learning Garden.
- Social Science, Health, PE and Communications hosted a "Celebration of Food" weeklong event for faculty and staff.
- History Instructor used the lab for a lesson on Viking History.
- In collaboration with the International students program, a Health Instructor used the lab for two classes the Health, Food Systems & the Environment course.

Other Potential Uses of the Kitchen Lab

One of Workgroup contacts suggested that the Lab could be rented out for $2,000 per day by local chefs to provide staff training.

Taskforce Recommendations

1. Curricula
    a. Seek to develop articulation and/or transfer agreements with 4-year partners related to Sustainable food Systems.
    b. Work with the Curriculum Office to develop Sustainable Food Systems certificate for Spring 2017 implementation.
    c. Continue to explore how Sustainable Farming & Foods (Sustainable Food Systems) certificate aligns with potential hospitality program at Cascade.
    d. Continue to have conversations with Community Education about piloting non-credit/credit program/courses at Rock Creek.
    e. Continue to explore AAS degree and other related certificates.
        i. Host culinary-themed focus group with the OSU Food Innovation Center and the Oregon Restaurant Association.
    f. Continue to explore interdisciplinary programming with Landscape Technology, Health Studies, Foods & Nutrition, Business, and Environmental Science.
    g. Work with FN SAC to update instructor qualifications

2. Develop Advisory Group for proposed certificate.
3. Investigate budget for proposed certificate and degree program.
4. Collaborate with grants office to search for relevant grant that address needs in the areas of focus.
    a. Apply for Oregon Department of Agriculture funding for the Specialty Crop Block grant. This will allow us to develop these specific classes and use enrollment data and student feedback to determine whether there is a need for an additional certificate, degree or transfer degree related to agriculture, food systems, or another related field.

To accurately develop the project's scope and necessary funding, the Workgroup recommends that in Fall 2016, the college enlist a coordinator/.5 release time to look at limitations and possibilities in order to develop an accurate budget. The deliverables are as follows:

1. Project analysis that details of the project and how it will be managed.
2. Program analysis that should confirm work done by the FNAg Workgroup and modify it as necessary based on consultant/Advisory Group experience and input.
3. Complete the Preliminary Review form and submit to the Curriculum Office.
4. Project budget that would provide detailed estimates and funding methods.
5. Convene Industry Advisory Committee.
6. Draft Sustainable Food Systems certificate for Spring 2017 implementation.
7. Draft articulation and/or transfer agreements with 4-year partners.

Draft Budget Needs

Physical Infrastructure. See Master Plan - completed 2015 with help from Scott | Edwards Architecture, Lango Hansen Landscape Architects and Fortis Construction.

1. An outdoor covered lab space would serve as a classroom, rentable space for community partners, and a gathering space for the PCC community.
2. In addition to a classroom, it would house all compost operations, a wash station, and office space in one covered structure.
3. Learning Garden Coordinator and AmeriCorps or Farmhand Apprentice housing.
4. Maintenance and staffing plan with funding for these structures and key staff would be imperative to support the program and infrastructure.

Staffing.

1. To allow for most effective sustainable agriculture training and operational oversight and management, an on-campus house for a farm manager and/or interns, apprentices, and AmeriCorps service members is needed.

2. To engage in the mentioned initiatives, the Sustainability Coordinator position and the Learning Garden Coordinator position need to be full-time.
3. To engage in the mentioned initiatives, to coordinate the certificate program, and to implement other new programming, the Foods & Nutrition FT instructor position needs to be reinstated. In addition this person would help develop a strong recruitment program and materials to ensure the success of this new certificate.
4. To support the FN Lab classes, a Foods & Nutrition Lab Technician is needed to assist in the preparation and setting-up, storage, inventory, cleaning and proper storage and disposal of lab materials, food supplies, and kitchen equipment.
5. To support the garden and its operations, a permanent part or full time farmhand position is needed.
6. To support faculty in classes and volunteer management, two AmeriCorps positions need to be funded.

Draft Certificate Design (Pending Advisory Committee input)

This proposed certificate would be housed in the Foods & Nutrition SAC. The courses in this certificate program are designed to provide students with the required academic and technical skills to be successful in the development and operation of an environmentally sound, community-based, profitable small farm, garden or agriculture business. Students are to be trained in management approaches, product marketing, and the skills to assess local physical and environmental factors that affect the sustainability of a small farm operation. Emphasis is placed on entrepreneurial and field training. Students will also learn the basic principles of our economic system and government policies and programs relating to agriculture.

Within the coursework are embedded problem solving and critical thinking skills that enable the student develop creative solutions to problems encountered in small farm operations. Students are provided with a background in plant propagation, soils, organic farming methods, business and marketing.

Capacity.

The campus already offers relevant courses that fill consistently, including, but not limited to: Organic Gardening, Permaculture Design, and Soils and Plant Nutrition. These courses would only become more popular by adding a certificate credential. A small number of new classeses would be added. PCC currently has existing facilities that include the greenhouse, hoop house, Foods & Nutrition Lab and organic farm on the campus that will be utilized for the certificate program.

Sustainable Food Systems Certificate Requirements - 35 Credits		
Course	**Course Description**	**Credits**

NEW COURSE FN X: Intro to Garden & Farm Education	A hands-on field based course to teach both pedagogy and practice of engaging volunteers and students. There will also be a classroom component (lesson planning) and students will apply content learned and practice teaching and supervising students in the garden.	3
NEW COURSE Local/Regional Food Systems Lab	This course will explore Pacific Northwest food systems and regional crop production, examine channels of industrialized and localized food distribution and challenge the barriers to creating food secure communities.	1
NEW COURSE FN X: Intro to Food & Farm Systems	This course provides students with an interdisciplinary understanding of ecological, economic, political, and social systems as they relate to food and farming both regionally and globally.	3
HE 264: Health, Food Systems & the Environment	This course will examine how food systems influence human and environmental health. Students will explore the connections between sustainable agriculture concepts/practices, food systems, and personal and environmental health. Audit available. Community-based Learning with Garden Lab Project	3
FN 110: Personal Nutrition	Explores personal food habits and beliefs. Emphasizes practical application of nutrition knowledge to enhance general health. Analyze present diet and evaluate it according to latest nutritional guidelines. Basic nutrition course for students with little or no science background. Audit available.	3
FN X: Culinary Skills Lab	Provides an opportunity to apply foundational knowledge of food composition and nutritional values to food preparation. Explores skills in meal planning, recipe modification and basic cooking techniques.	1
ESR 140: Introduction to Environmental Sustainability	Introduces concepts of environmental sustainability and their applications. May include field trips. Prerequisites: WR 115, RD 115 and MTH 20 or equivalent placement test scores. Audit available.	4
NEW COURSE FN X:	This course is a hands on practicum in the Rock Creek Learning Garden, teaching all aspects of	3

4 Season Farming— Spring	seasonal crop production. This course includes visits to study and work on other local small scale farms.	
NEW COURSE FN X: 4 Season Farming— Summer	This course is a hands on practicum in the Rock Creek Learning Garden, teaching all aspects of seasonal crop production. This course includes visits to study and work on other local small scale farms.	3
NEW COURSE FN X: 4 Season Farming—Fall	This course is a hands on practicum in the Rock Creek Learning Garden, teaching all aspects of seasonal crop production. This course includes visits to study and work on other local small scale farms.	3
NEW COURSE FN X: 4 Season Farming—Winter	This course is a hands on practicum in the Rock Creek Learning Garden, teaching all aspects of seasonal crop production. This course includes visits to study and work on other local small scale farms.	3
NEW COURSE FN X: Farm and Food Entrepreneurship	This course allows students to explore multiple marketing opportunities for small farms including: farmer's market, CSA, restaurant, farm to school, and more. Students will gain hands on experience in all aspects of managing a farm stand. This will include crop planning, harvesting, post-harvest handling, packaging, pricing, selling, marketing, customer service, and food safety.	3
DM 10/FN 105:: Food Safety	Covers foodborne illnesses in food industry. Includes identifying and analyzing the factors which cause foodborne illnesses and food safety and sanitation through proper purchasing, preparation, handling and storage. Includes the ServSafe exam. (Add FSMA info)	2
Total Credits 35 credits		

Organic Farming & Gardening Certificate Electives - X Credits		
Course Description	Course Description	Credits
NEW COURSE FN X or LAT? Beekeeping		
NEW COURSE FN X:		3

Urban & Suburban Growing: Vertical, Rooftop, Hydroponic dutch bucket and NTF?, Hoop House ,		
FN X: Food Preservation lab		1
BA 223	Principles of Marketing	4
Grant writing?		
Hand tools and tool safety, garden and small farm equipment		
NEW COURSE LAT X: Edible Landscaping		
BI 163: Organic Gardening		4
CSS 200: Soils		4
LAT 109: Plant Propagation		3
BA 101: Intro to Business		4
BA 111: Intro to Accounting		3
BA 250: Small Business Management		3
HE 278: Human Health & the Environment		3
HE 251: Community/Public Health Issues		4
FN 225: Nutrition		4
ESR 171: Environmental Science: Biological Perspectives		4
LAT 106: Basic Horticulture		4
LAT courses as approved by advisor		

Permaculture summer		
HORT		

Certificate Enrollment.

Due to high levels of interest from existing and prospective students, we anticipate these classes will reach at least 16+ student enrollment and with an effective recruiting plan will become self-sustaining.

Certificate Audience.

The Workgroup has identified several potential participants of the proposed program:

- Food service prep staff in schools
- Teachers
- Community health workers
- Garden educators
- Caterers
- Public health professionals
- Health Educators
- Food System entrepreneurs
- Food management and safety professionals
- Recent high school graduates from culinary programs
- Landscape Technology students
- Horticulture Therapy students
- Early Childhood Education program students
- Nursing students and professionals
- Students that want to supplement a business degree
- Dietitians for CEUs
- Social Workers
- OHSU resident physicians
- 4-year transfer students
- Community members
- Returning veterans
- Students working in the foodservice industry
- Anyone with an interest in learning about sustainable food practices

Partner with 4-year institutions.

Develop transfer agreements with:

- Oregon State University (various tracks in agriculture)
- National College of Naturopathic Medicine (Bachelors Degree in nutrition

- Portland State University (Bachelor's degree in Community Health Education)

Future Opportunities

Due to the growing demand to improve the food system, there are many potential areas of growth for a Sustainable Foods System program at Rock Creek. For example:

- Food Science technician certificate or degree. In just seven years, the demand for food scientists in the United States alone will increase by 10%. (Occupational Outlook Handbook, U.S. Department of Labor, Bureau of Labor Statistics)
- PCC Rock Creek food cart that would provide students with cooking and management experience in a food cart setting. The cart could be used to provide food service to different campus locations.
- Community Supported Agriculture (CSA) would provide students with management experience and could be used to engage the wider Rock Creek community.
- With the Preschool re-opening, there are opportunities to partner with the Early Childhood Education program to implement the Farm to Preschool curriculum.
- Other Farm to School efforts. Oregon is home to more than 500 school gardens. In recent years, farm to school programs have received considerable support at the State level, with the goal of increasing food access and awareness. For example, all Oregon school districts can receive extra funds to buy and serve local foods, starting this fall, thanks to the Oregon legislature. Oregon has been a national leader in Farm to School and School Garden programs.
- Continue to build relationships with Food Services to offer seasonal food options. Work together to develop menus.
- Trend toward Fruit & Vegetable Prescription programs.
    - Participating healthcare providers give patients a “prescription” to eat fruits and vegetables. Patients are often also given support from dieticians, nutritional education classes, recipes and vouchers that are redeemable for produce, often at local farmers’ markets. Programs need participating health partners and participating vendors.
- Need in the industry to have people that understand both fresh produce production and microbial food safety.
    - The Food Safety Modernization Act (FSMA) calls for sweeping changes to the U.S. food safety system. Both the proposed Produce Safety Rule and the proposed Preventive Controls Rule may affect local food farmers.
- Not only within Oregon Department of Agriculture,, but in the certification and auditing world as a whole, there is a significant shortage of trained auditors available for organic, food safety, etc. (Personal Communication Kate L Allen)
- Grant opportunities.
    - Good search terms: education, food systems, alternative agriculture)

http://www.nifa.usda.gov/funding/bfrdp/bfrdp.html (USDA Beginning Farmer and Rancher Competitive Grants Program).

Conclusion

The above recommendations, if implemented, will provide Rock Creek with an opportunity to:

1. Meet the changing needs of the industry
2. Invest in a healthier society
3. Invest in student retention
4. Invest in the goals of the strategic plan
5. Be innovative

Given that sustainable food businesses in Portland are increasingly popular and Washington County has traditionally been an agricultural landscape, it is clear that PCC Rock Creek is uniquely situated to train the next sustainable food business leaders, sustainability professionals, and social justice food advocates. Certificate graduates will have the opportunity to be leaders in working toward a more sustainable food system in a place where citizens are committed to and supportive of this value. Indeed, the world needs more individuals who are innovative on this topic.

The FNAg Workgroup recommends that PCC Rock Creek champion new ideas and programming to lead the food systems movement. PCC has the opportunity to move from reacting to change to directing change by graduating one-of-a-kind thinkers, advocates, foody system stakeholders, farmers, retailers, and restaurateurs who are leading the charge in how the nation thinks about food. Now is the time for PCC Rock Creek to be a leader by engaging in the emerging field of sustainable agriculture education. Let's move from reacting to change to directing change by graduating one-of-a-kind thinkers, advocates, farmers, retailers, and restaurateurs who are leading the charge in how the nation thinks about food

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Appendix A: Employment Data

Farmers, Ranchers, and Other Agricultural Managers 119013							
Area	**2012 Employment**	**2022 Employment**	**Change**	**% Change**	**Annual Growth Openings**	**Annual Replacement Openings**	**Total Annual Openings**
Oregon	1,432	1,720	288	20.10%	29	23	52
	Average Hourly	**Average Annual**					
	$29.37	$61,092					
Farmworkers and Laborers, Crop, Nursery, and Greenhouse (452092)							
	2012 Employment	**2022 Employment**	**Change**	**% Change**	**Annual Growth Openings**	**Annual Replacment Openings**	**Total Annual Openings**
	20,287	24,013	3,726	18.4	373	616	989
	Average Hourly	**Average Annual**					
	10.31	21,449					
Agricultural and Food Science Technicians (194011)							
	2012 Employment	**2022 Employment**	**Change**	**% Change**	**Annual Growth Openings**	**Annual Replacment Openings**	**Total Annual Openings**
	611	714	103	16.9	10	22	32

	Average Hourly	**Average Annual**					
	19.15	39,824					
First-Line Supervisors of Farming, Fishing, and Forestry Workers (451011)							
	2012 Employment	**2022 Employment**	**Change**	**% Change**	**Annual Growth Openings**	**Annual Replacment Openings**	**Total Annual Openings**
	1,571	1,826	255	16.2	26	33	59
	Average Hourly	**Average Annual**					
	26.59	55,307					
Agricultural Workers, All Other (452099)							
	2012 Employment	**2022 Employment**	**Change**	**% Change**	**Annual Growth Openings**	**Annual Replacment Openings**	**Total Annual Openings**
	1,712	2076	362	21.1	36	52	88
	Average Hourly	**Average Annual**					
	13.91	28,936					
Food Scientists and Technologists (191012)							
	2012 Employment	**2022 Employment**	**Change**	**% Change**	**Annual Growth Openings**	**Annual Replacment Openings**	**Total Annual Openings**
	215	262	47	21.9	5	7	12
	Average Hourly	**Average Annual**					
	30.7	63,853					

Appendix B: Survey Data

How are you affiliated with Portland Community College?		
Current PCC Student	66	55%
Prospective PCC Student	55	45%

Which of these topics appeal to you the most in a certificate or associate's degree?			
	Certificate	**Associate's Degree**	**Total Responses**
Organic Farming & Gardening	51	44	95
Sustainable Food Systems	40	55	95
Farm/Garden Business Management	36	42	78
Food Service Management	34	25	59
Baking and Pastry	39	26	65
Culinary Arts	33	37	70

Question: Which potential new courses are you most interested in taking related to foods, nutrition, culinary and/or sustainable agriculture?	**As part of a food systems degree or certificate**	**As an elective for another program, transfer degree or general interest**	**Total Responses**
Food Preservation	53	37	90
Organic Vegetable Production	59	31	90
Food & Culture	53	36	89
Urban & Suburban Growing: Vertical, Rooftop, Hydroponic, Hoop House	51	35	86
Sustainable Cooking	55	31	86

Fermentation	44	42	86
International Foods	44	40	84
School Gardens	46	37	83
Soil Science & Management	58	24	82
Organic Farming Principles and Practices	55	24	79
Farm to Institution	56	22	78
Small Business Planning	48	30	78
Food Security & Food Justice	53	24	77
Food & Agricultural Policy	58	19	77
Beekeeping	44	32	76
Food Systems Careers Seminar	41	32	73
Introduction to Food Systems	51	21	72
Orchard & Perennial Fruit Production	44	28	72
Culinary Skills	44	26	70
Growing Food for Restaurants	41	29	70
Food Safety	47	22	69
Floral Design	30	38	68
Sustainable Restaurant Practices	43	25	68
Cut Flower Production	32	35	67
Food Entrepreneurship	46	20	66
Baking Techniques	36	30	66
Food Service & Preparation	39	20	59

Appendix C

The following is a sampling of schools around the country with sustainable agriculture education opportunities, compiled as part of a larger inventory of sustainable food initiatives in higher

education. Programs highlighted in green include formal academic programs at community colleges, specifically.

Institution	Type	Program	Career
Greenfield Community College	Community college	Farm and Food Systems Associate Degree	Transfer to: UMass Sustainable Food and Farming Program, Green Mountain College, Marlboro College; work at farm stand; work with local technical high school. "It is a leadership program, so students are empowered to lead" http://www.gcc.mass.edu/academics/programs/farm-and-food-systems/
Central Carolina Community College	Community college	Sustainable Agriculture Associate, Agricultural Sustainability Certificate, Sustainable Livestock Systems Certificate, Sustainable Vegetable Production Certificate	"Some students use their education to build sustainable farms, while others seek employment at established sustainable operations. Employment opportunities are found elsewhere through schools, parks and environmental centers. Jobs are available with non-profit organizations focusing on farmer advocacy." http://www.cccc.edu/sustainableag/
Wayne Community College	Community college	Associate in Applied Science – Sustainable Agriculture, certificate	Farm manager/owner/worker, organic gardener, integrated management pest scout, retail/wholesale crop production, livestock production, vineyards, related agriculture businesses/government/environmental agencies http://www.waynecc.edu/sustainable-ag/
Clackamas Community College	Community college	Urban Agriculture Certificate	Farm operation and management, community garden manager, farmer's market manager, school garden or community supported agriculture farm operator
Linn-Benton Community College	Community college	Profitable Small Farms Program – Certificate	Work on organic farms
Antioch University New England	Doctoral/ research	Environmental Studies PhD with a Food and	Shelburne Farms, Vermont Community Garden Network, Food Solutions New England, Intervale Center, Stonewall Farm, Cheshire County

		Environment Specialization	Conservation District, The Community Kitchen, Inc., University of Maine Cooperative Extension as Food Systems/Youth Development Professional
Colby-Sawyer College	Baccalaureate	Environmental Science and Studies Degree offer a Food and Agriculture Concentration	Peace Corps, Environmental Education Center, nursing qualification
Temple University	Research university	Certificate in Sustainable Agriculture, Minor in Sustainable Agriculture	"the garden has given a lot of people inspiration to do gardening/sustainability work in their daily lives. The group has built a strong network in the surrounding community, so opportunities arise from those connections that engage students beyond the garden."
Keene State College	Master's	Early Sprouts Garden (no formal ed)	Many go on to become early childhood teachers
Bergen Community College	Community college	Community Garden (no formal ed)	Environmental consultants, additional school (biology, sustainability studies), experiential educators
Kingsborough Community College	Community college	KCC Urban Farm (no formal ed)	Farm interns typically transfer to a four-year college to pursue a bachelor's degree
Pomona College	Liberal arts	Pomona College Organic Farm (no formal ed)	Small-scale farmers, landscapers, food justice and farm activists, homesteaders
University of Washington	Research university	UW Farm (no formal ed)	Food Education, start-up work: story of one student: http://food.washington.edu/2015/01/michelle-venetucci-alumni-profile/
Wesleyan University	Liberal arts	Long Lane Farm (no formal ed)	National Young Farmer's Coalition Membership Development Coordinator (http://www.youngfarmers.org/nyfc-welcomes-its-new-membership-development-coordinator/)
Massachusetts College of Liberal Arts	Liberal arts	Campus Garden (no formal ed)	Education/interpretation/grounds keeping with a land trust

As demonstrated in an inventory of sustainable agriculture education programs in higher education, over 30% of institutions have some kind of living laboratory for informal sustainable food/agriculture education, and over 90% of these programs have been initiated in the last 10 years. A smaller number of institutions have formalized education in this area, but these programs are also emerging rapidly in the form of certificates, associate's degrees, four-year degrees, and minors. It is evident that students are acquiring knowledge and skills on food and agriculture in venues beyond the traditional land-grant system.

Appendix D: Rogue Farm Groups Job Placement Information

South Willamette Chapter

Intern (2014)... is now back teaching at Chewonki, an environmental education organization in Maine that operates a farm

Intern (2014)... After Rogue Farm Corps she did the FIELD program up in Washington and is now working at Essex Farm in NY as an intern (whole-diet CSA program)

Intern (2015)...now working at a Mountain Bounty Farm, a mixed vegetable operation with 600+CSA and wholesale accounts, in California

Intern (2015)...doing FarmsNOW Apprenticeship program through RFC at Ruby and Amber's Farm

Intern (2015)...returned to Organic Redneck to be CSA manager

Intern (2015)...came back to Oregon in March 2016 after working at a dairy farm back in Ohio for the winter. She is now living and working at a permaculture place and the Log House while looking for the next steps to start her own farm.

Intern (2015)...after the program went back to Arizona. In June he'll be back in Oregon working at Fair Valley Farm near Eugene.

Rogue Valley Chapter

Intern (2014)... Piloted the FarmsNOW Apprenticeship program (2015) at By George Farm and is now doing a Seed Contract Incubator plot there for the 2016 season

Intern (2014)... Managing the no-till gardens at Hanely Farm in Central Point.

Intern (2014)... Volunteered on another property in the US Virgin Islands, and now managing a beginning farm project in Southeast Missouri- a 70 acre farm property, 35 acres rented for cattle grazing. We are using 4 acres around the house to plant fruit trees and perennials.

Intern (2013)... running Raptor Creek Farm at the Josephine County Food Bank after farming his own land for two years and then selling the place.

Intern (2013)... Education Director at Fairview Gardens, a 12-acre non-profit, educational farm.

Intern (2013)... Worked for Chickadee Farm in Southern Oregon, and then to a farm in Marin County, All Star Organics, and worked and am still working for an organic produce department in Marin. Has recently joined a shepard at a ranch south of Petaluma, CA. and will be fencing a 2 acre plot (less in year one) and growing organic produce, seed crops, and herbs.

Intern (2013)... Graduate Student in Nonprofit Management. Work with La Via Campesina on food sovereignty and agroecology movements.

Intern (2011)... Co-operates the Farm Kitchen, Rogue Valley's only Farm to Table & whole foods meals-to-go delivery service, sourcing local produce and meats from sustainable and organic family farms.

Intern (2009)... Went on to start his own farm, now is in school and working for an organic fertilizer company and wants to work with farmers to find new marketing methods and manage risk.

Intern (2009)... runs By George Farm and Creamery with his husband in the Little Applegate.

Unknown Intern… Helping manage a small, diversified veggie, berry and flower farm in Pescadero, CA

Portland Chapter
Intern (2015)... Started her own veg farm in CA after going through FarmsNext @ Fiddlehead Farm

Intern (2015)... Started her own flower farm (Fair Shake Farm) near Vancouver WA after going through FarmsNext @ Dancing Roots Farm

Intern (2015)... Working at Duncan Farm and Pumpkin Ridge Farm, in Washington County, OR.
Intern (2015)... Helping manage a diversified animal/vegetable farm in the Lehigh valley of Pennsylvania. We have summer and winter CSA's, a year round farmers market, restaurant partners, and have just started a meat CSA. www.wildfoxfarm.com

Central Oregon Chapter
Intern (2015)... Is working @ Rainshadow, her host farm. She is heading the goat dairy portion, and building an earthship on site.
Intern (2015)... Farming an acreage east of tow, in Alfalfa, and starting with small scale vegetable production.

Preliminary Review for New Degrees and Certificates, Programs and Disciplines

The development of new programs, degrees and certificates is an intensive endeavor, and occasionally much time and effort is invested in programs that the college may not be prepared to support. This process for preliminary approval is intended to help frame the initial conversations between faculty and their administrators in a collaborative discussion so as to ensure that the concepts embodied in new programs, degrees and certificates, as well as some critical basic support structures (people, funding etc.) are well-considered prior to significant developmental investment..

Two phases of preliminary review precede full program development and approval. It is recommended that Phase I, containing the most fundamental information, be completed, reviewed as described below and given preliminary approval before developing the information required in Phase II. (However, if the proposal is simple, leveraging existing curriculum and resources, it may be possible to do Phase I and Phase II in concert). Pre-approval must be secured prior to investing resources in program development, and prior to making a formal request via the Curriculum Office and processes. Pre-approval does not guarantee that the fully developed program will be ultimately approved, but does provide a strong platform for development.

Phase I

Discussions will include Faculty, all relevant Division Dean(s), Dean(s) of Instruction, Dean of Academic Affairs, Academic and Student Affairs Council, Vice President for Academic and Student Affairs.

Support from administration through this level is strongly recommended before continuing to Phase II.

Basic Information

Name of the New Program, Degree or Certificate: * Sustainable Foods & Farming

*Pending input from advisory committee

- ○ New Degree or certificate within an existing CTE Program AAS Degree
  - ○ AAS Degree
  - ○ AAS Degree Option
  - ○ 2 yr Certificate (two year)
  - ○ 1 yr Certificate (less than two year)
  - ○ <1 yr Certificate (including Career Pathway)
- ○ New Degree or certificate not associated with an existing CTE program
  - ○ AAS Degree
  - ○ AAS Degree Option
  - ○ 2 yr Certificate (two year)
  - ○ 1 yr Certificate (less than two year)
  - ○ <1 yr Certificate (including Career Pathway)
- ○ Transfer Program or Discipline
- ○ Developmental Education Program
- ○ Other: _____

Program/Discipline Degree and Certificate Description and Rationale

Program Summary: Please describe the program, summarizing its educational and career objectives and its relationship to the College's Mission* and Strategic Plan. If this is a new area of instruction, provide reasons why the proposal is now considered central to the college's mission and ongoing development.

*Portland Community College advances the region's long-term vitality by delivering accessible, quality education to support the academic, professional, and personal development of the diverse students and communities we serve.

This proposed certificate would be housed in the Foods & Nutrition SAC. The courses in this certificate program are designed to provide students with the required academic and technical skills to be successful in the development and operation of an environmentally sound, community-based, profitable small farm, garden or agriculture business. Students are to be trained in management approaches, product marketing, and the skills to assess local, physical and environmental factors that affect the sustainability of a small farm operation. Emphasis is placed on entrepreneurial and field training. Students will also learn the basic principles of our economic system and government policies and programs related to agriculture.

Within the coursework are embedded problem solving and critical thinking skills that enable the student to develop creative solutions to problems encountered in small farm operations. Students are provided with hands-on experience in plant propagation, soil building and composting, organic farming methods, business and marketing.

Rationale/Needs statement for this new program/degree/certificate: How does it address the economic and/or educational needs of students, the community and/or the State of Oregon? Describe how the level of need was determined.

In Fall 2015, the College formed a Foods & Nutrition/Sustainable Agriculture (FNAg) Workgroup comprised of faculty, staff and administration. The charge of the group was to identify educational program needs that capitalize on the Rock Creek campus and community resources of the Learning Garden and the Foods & Nutrition Lab. Analysis to identify specific jobs directly connected to the field were completed.

Members from the work group contacted representatives from the agricultural industry, food system stakeholders, college and university faculty currently involved in similar programs, both in and outside of Oregon, and local business and industry leaders. Information was gathered through phone, face-to-face interviews and campus tours. The workgroup met several times between September 2015 and June 2016. During the meetings, information was shared and work was done to narrow down the multitude of possible focus areas within the broad field of "food systems".

Workgroup Process

The Workgroup was formed in Fall, 2015 and includes the following individuals:

Alissa Leavitt, MPH, MCHES Health Studies Faculty Rock Creek	Elaine Cole, PhD Sustainability Coordinator Rock Creek
Debra Lippoldt, MS, RN Faculty Department Chair Foods and Nutrition Sylvania	Nora Lindsey Learning Garden Coordinator Rock Creek
Dana Fuller, MSW, GCSA Division Dean, Social Science, Communication and Health Rock Creek	

Sustainable Agriculture Focus Group

For many years, there have been campus discussions, meetings and informal committee work to design a sustainable agriculture program. In 2013, a college-wide group of ≈40 interdisciplinary staff and faculty organized a Sustainable Agriculture Focus Group. This effort was terminated in 2014 and from these initial efforts, the FNAg Workgroup has developed this new iteration of the project and proposal.

Data Collection Efforts

The quantitative and qualitative data collected from over 50 individuals through focus groups and meetings with internal and external partners created the foundation from which the Workgroup developed this proposal. The Workgroup will be reviewing additional data from the Oregon State University Urban Farmer program, the Oregon State University Food Innovation Center and a survey report from Friends of Family Farmers. Each has agreed to share relevant data when the reports are final the end of June. This document will be updated with that information.

Additional Consultation from Internal Partners

Name	Title
Kate Kinder	Career Pathways
Marc Goldberg	Associate Vice President - Workforce Development and Community Education
Sheila Meserschmidt, MBA	PCC Institute for Health Professionals
Beth Molenkamp, MA	PACTEC Regional Coordinator Dual Credit Program Manager
Heidi Edwards	Outreach and Orientation Coordinator Rock Creek
David Sandrock, PhD	Landscape Technology Program
Andrew S. Garland-Forshee, Ph.D., HS-BCP	Early Education & Family Studies
Jan Abushakrah, PhD	Gerontology Program: Horticulture Therapy
Haydee Goldenberg	Career Exploration Center Coordinator

Meeting with External Contacts

The Rock Creek campus has hosted over a dozen loop tours to engage potential partners. Additionally, the following people have been consulted on this proposal through informational interviews and focus groups.

Name	Title
David Stone, PhD	Director, Food Innovation Center Oregon State University
Jason Ball	Resident Chef, Food Innovation Center Oregon State University
Amy Gilroy, MPH	Farm to School Manager Oregon Department of Agriculture
Jessica Gutgsell, RDN	Bionutritionist, Kitchen Coordinator Oregon Health & Science University
Gene Fritz	Oregon Health & Science University Oregon Restaurant Association (want to work on culinary themed focus group)
Maggie Michaels	Curriculum of Cuisine
Lora Wells	Culinary Arts Teacher Westview High School

Mary Masters	Culinary Arts Teacher Liberty High School
Erin Linhares	Culinary Arts Teacher Forest Grove High School
Heidi Larson	Culinary Arts Teacher Tualatin High School
Deanna Palm	President Hillsboro Chamber of Commerce
Stu O'Neill	Executive Director Rogue Farms
Weston Miller, Puhkarj Deol	Organic Gardening Certificate Program. OSU Extension
Chenoa Philabaum	New Seasons Market
Penelope (Penny) L. Diebel	Assistant Dean of Academic Programs College of Agricultural Sciences Oregon State University (Meeting in June)
Anna Garwood Sarah Canterberry	Growing Gardens
Dee Wetzel	Training and Education Coordinator Portland State University
Heather R. Morrow-Almeida, MPH	MCH Systems and Policy Analyst Public Health Division
Brian Wilke	Co-founder Oregon Culinary Institute (Meeting 6/23)
Joyce Dougherty	Director Oregon Department of Education Child Nutrition Programs
Abby Farmmantino	Airbnb Food + Drink Operations Manage
Jennifer Young, MPH, RDN	Policy Specialist Public Health Division
Susan Greathouse, MPH	WIC Nutrition & Local Services Manager Oregon Health Authority
Wendy Popkin	Executive Director, Education Foundation Oregon Restaurant & Lodging Association
Gene Fritz, Ed.M.	Academic Director – Culinary Arts Art Institute
Neeraja Havaligi, PhD	Biodiversity and Climate Change consultant
Megan Horst, PhD, AICP	Assistant Professor Portland State University
Molly Notarianni	Friends of Family Farmers
Janet Bean	HR Manager Beaverton Foods

Tia Henderson, PhD	Upstream Public Health

Current & Prospective Student Survey

Over the course of these meetings it was clear that the Workgroup needed to engage current and prospective PCC students. A survey was created to solicit input on course offerings and was sent to related programs at PCC, posted to the Learning Garden Facebook page and sent to external partners in sustainable agriculture and culinary programs. A request to participate in this Qualtrics survey was distributed through an online link in an email. The survey was open for 2 weeks. In total 121 respondents (55% PCC students, 45% prospective PCC students) showed a growing desire for food systems related programming. (Appendix B)

Justification for Certificate Program

Agriculture has found itself reframed amid a larger economic cluster commonly known as "food systems." Recent changes in consumer demand for food, food experience, food security, eating habits and lifestyles have opened the door to a host of economic and agricultural career opportunities.

In an era of climate change, resource limitations, growing population, increase in obesity and chronic illness, food injustice, etc, the food system must move to support and expand small-scale community food systems-focused agriculture. Half of American farmland is expected to change ownership in the next two decades. This could be an opportunity for young people, people of color, women, and anyone interested in small-scale, sustainable agriculture to succeed.

Currently only 5% of what we eat in the Portland region is sourced locally. A reasonable increase would have a tremendous economic impact and enable a major expansion of jobs in sustainable local food. (Megan Hurst, Personal Communication) As the food movement grows, the demand for college and university classes focusing on food systems has expanded. More than 70 community colleges, four-year colleges, and universities now have specific degree programs for sustainable agriculture or food systems. (Civil Eats, 2016)

Alignment with College Strategic Plan.

The proposed certificate and continued exploration for an AAS degree aligns with the following strategic plan efforts at the College:

- Think Fearless: Ignite a Culture of Innovation
- Think Accountable: Achieve Sustainable Excellence in All Operations
- Think Powerful: Transform the Community Through Opportunity
- Think Proud: Create a Nationally Renowned Culture for Diversity, Equity and Inclusion
- Think Bold: Drive Student Success

Sustainability.

This certificate program meets the sustainability goals of the College. The College has strengthened its commitments to sustainability, developed two iterations of its Climate Action Plan and has taken significant strides to reduce its environmental footprint and promote education for sustainable development.

Health Benefits of Proposed Program.

Urban agriculture has the potential to enhance the nutritional status of urban residents in general, and the urban poor in particular, by directly improving food security and nutritional adequacy. The benefits of gardening and food growing for health and wellbeing are well-documented in the literature (Van den Berg, 2015). By expanding the programming of the Learning Garden and the Foods & Nutrition Lab, students, faculty and staff will have more opportunities to congregate as healthy members of the Rock Creek community through the enjoyment of gardening, healthy foods, nutrition, and environmental stewardship.

<u>Labor Market information</u>: For programs designed to prepare students for immediate employment, document the potential employment opportunities of graduates and outlook for jobs in the region. If there are employers who have requested establishment of the program please describe their specific employment needs.

Employment Data.

Although the career trajectory for sustainable food systems is not linear like other fields, students who complete sustainable agriculture programs are being hired after program completion. (See Appendix C and D in Project Proposal) The growth of local food and farming is particularly important today as the world experiences climate disruption, energy shortages, and economic stress. Students who recognize crisis as an opportunity are gravitating to the study of sustainable farming, working toward careers in local food and green businesses, urban agriculture, permaculture, and related jobs in farm-based education, community development and advocacy.

The United States Department of Agriculture (USDA) recently reported a 144% increase in farm direct sales over a 5-year period indicating a healthy demand for this service. The local food movement has created jobs throughout the food supply chain and the demand for local food often exceeds supply.

The proposed certificate program is designed to provide a workforce for jobs that are created in support of local food production. 'Farm Educator', Garden Program Director', and 'Farm to School Coordinator' and similar job listings are appearing throughout the region. Employment of agricultural and food scientists is projected to grow 9 percent from 2012 to 2022, about as fast as the average for all occupations

Oregon Data.

In Oregon, the average age of a farmer is 60 years therefore growth and replacement of an aging workforce are factors in future jobs. The total number of job openings is projected to be much higher than the statewide average number of job openings for all related occupations through 2022. This occupation is expected to grow at a somewhat faster rate than the statewide average growth rate for all occupations through 2022. (See Appendix A in Project Proposal for additional labor statistics)

National Trends.

Around the country, directors of sustainable agriculture programs (both formal and informal education), and program websites, report that students go on to work in some capacity of the food system. Program information from over 40 programs throughout the United States, was collected for reviewed by the Workgroup. A list of questions was asked of all programs and responses to those questions with general program/facility information were provided to the Workgroup for review and discussion.

Graduates of the proposed certificate program will be equipped to begin or continue careers in the local and sustainable food system. The *Journal of Agriculture, Food Systems, and Community Development*'s February 2012 Call for Papers documents this growing field of employment; the call reads, "emerging regional food systems appear to be creating some new occupational opportunities, including the emergence of green-collar sustainable occupations such as farmer trainers, farm managers, agriculture teaching positions certifiers, and consultants."

Recent positions posted in Oregon that a graduate may be qualified for include:

Sector Types	Types of Jobs
Education (K-12, Higher Ed)	Educator, Instructor
School Food Service, Catering	School or Community Garden Coordinator
Restaurants	Prep Cook, Purchaser
Agriculture	Farm, Field, Garden, Compost, Greenhouse, Food Safety Managers
Non-profit supporting sustainable foods	Garden-based Nutrition Educator, Corporate Wellness
Food Companies	Environmental Sustainability Coordinator
Farmers Markets	Project Coordinator, Program Coordinator
Grocery Stores	Manager
Organic Farms	Farmer
Hospitals and Care Centers	Community Outreach and Education
Community Gardens	Community Organizer in Sustainable Agriculture
University Farms	Communications or Social Media Specialist, Web Developer
Food Security Organizations	Non-Profit Project Specialist
Community Development Organizations	Food Demonstrator, Purchasing Coordinator

Transfer – identify similar programs at other OUS /private universities to which students may continue their studies.

The FNAg Workgroup is currently in discussion with 4-year institutions to develop transfer agreements with:

- Oregon State University (various tracks in agriculture)
- National College of Naturopathic Medicine (Bachelors Degree in nutrition
- Portland State University (Bachelor's degree in Community Health Education)

Academic Structure and Support:

Campus/Division proposing this new program/certificate: Rock Creek Social Science/Health PE & Communications

Where and how will this program be housed/supported? This proposed certificate would be housed in the Foods & Nutrition SAC

Where will courses be offered? Rock Creek to start

Does this program replace any existing program(s)? No

Is it closely aligned with any other program(s)? Not necessarily closely aligned, but this program is interdisciplinary in nature with Landscape Technology, Health Studies, Foods & Nutrition, Business, and Environmental Science.

Is this primarily a restructure/consolidation of existing courses and resources? No

Describe anticipated faculty and other personnel (classified, AP or administrative) requirements:
To accurately develop the project's scope and necessary funding, the Workgroup recommends that in Fall 2016, the college enlist a coordinator/.5 release time to look at limitations and possibilities in order to develop an accurate budget. The deliverables are as follows:

1. Project analysis that details of the project and how it will be managed.
2. Program analysis that should confirm work done by the FNAg Workgroup and modify it as necessary based on consultant/Advisory Group experience and input.
3. Complete the Preliminary Review form and submit to the Curriculum Office.
4. Project budget that would provide detailed estimates and funding methods.
5. Convene Industry Advisory Committee.
6. Draft Sustainable Food Systems certificate for Spring 2017 implementation.
7. Draft articulation and/or transfer agreements with 4-year partners.

Draft Budget Needs

Staffing.

1. To allow for most effective sustainable agriculture training and operational oversight and management, an on-campus house for a farm manager and/or interns, apprentices, and AmeriCorps service members is needed.

2. To engage in the mentioned initiatives, the Sustainability Coordinator position and the Learning Garden Coordinator position need to be full-time.

3. To engage in the mentioned initiatives, to coordinate the certificate program, and to implement other new programming, the Foods & Nutrition FT instructor position needs to be reinstated. In addition this person would help develop a strong recruitment program and materials to ensure the success of this new certificate.

4. To support the FN Lab classes, a Foods & Nutrition Lab Technician is needed to assist in the preparation and setting-up, storage, inventory, cleaning and proper storage and disposal of lab materials, food supplies, and kitchen equipment.

5. To support the garden and its operations, a permanent part or full time farmhand position is needed.

6. To support faculty in classes and volunteer management, two AmeriCorps positions need to be funded.

Describe anticipated space requirements:

Physical Infrastructure. See Master Plan - completed 2015 with help from Scott | Edwards Architecture, Lango Hansen Landscape Architects and Fortis Construction.

1. An outdoor covered lab space would serve as a classroom, rentable space for community partners, and a gathering space for the PCC community.

2. In addition to a classroom, it would house all compost operations, a wash station, and office space in one covered structure.

3. Learning Garden Coordinator and AmeriCorps or Farmhand Apprentice housing.

4. Maintenance and staffing plan with funding for these structures and key staff would be imperative to support the program and infrastructure.

Describe anticipated needs for technology: equipment and software:

TBD

Describe anticipated funding/revenue source(s) for the program:

The FNAg Workgroup has plans to collaborate with grants office to search for relevant grant that address needs in the areas of focus.

For example, it has been suggested by external partners that PCC apply for Oregon Department of Agriculture funding for the Specialty Crop Block grant. This will allow us to develop these specific classes and use enrollment data and student feedback to determine whether there is a need for an additional certificate, degree or transfer degree related to agriculture, food systems, or another related field.
There are additional Grant opportunities.

- Good search terms: education, food systems, alternative agriculture)

http://www.nifa.usda.gov/funding/bfrdp/bfrdp.html (USDA Beginning Farmer and Rancher Competitive Grants Program).

How will this degree/certificate or discipline be SAC-supported:

- ○ **within an existing SAC? Which one?** Foods & Nutrition SAC
- ○ **with the formation of a new SAC?**
  Has an Administrative Liaison been identified? _____

Signatures:

In addition to indicating support of the proposal, Deans warrant that this phase has been discussed with Faculty, all relevant Division Dean(s), Dean(s) of Instruction, Dean of Academic Affairs, Academic and Student Affairs Council, Vice President for Academic and Student Affairs.

Division Dean PRINT NAME HERE _____ _____
signature date

Dean of Instruction PRINT NAME HERE _____ _____
signature date

Campus President PRINT NAME HERE _____ _____
signature date

Phase II -- Please include all information from Phase I, updated as appropriate, and supply additional information outlined below:

Timeline

Proposed Beginning Date Spring 2017

Has Curriculum Office been consulted regarding the deadlines necessary to meet this date?

Goals and Objectives

Describe the purpose, goals and objectives of this program or discipline, and how these relate to the College Core Outcomes?

The courses in this certificate program are designed to provide students with the required academic and technical skills to be successful in the development and operation of an environmentally sound, community-based, profitable small farm, garden or agriculture business. Students are to be trained in management approaches, product marketing, and the skills to assess local, physical and environmental factors that affect the sustainability of a small farm operation. Emphasis is placed on entrepreneurial and field training. Students will also learn the basic principles of our economic system and government policies and programs related to agriculture.

Within the coursework are embedded problem solving and critical thinking skills that enable the student to develop creative solutions to problems encountered in small farm operations. Students are provided with hands-on experience in plant propagation, soil building and composting, organic farming methods, business and marketing.

The proposed certificate and continued exploration for an AAS degree aligns with the following strategic plan efforts at the College:

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- Think Bold: Drive Student Success

Sustainability.

This certificate program meets the sustainability goals of the College. The College has strengthened its commitments to sustainability, developed two iterations of its Climate Action Plan and has taken significant strides to reduce its environmental footprint and promote education for sustainable development.

Learning Outcomes and Assessment

In the table below, identify the anticipated <u>degree and certificate student learning outcomes</u> (add more rows as necessary), identify which College Core Outcome(s)s each aligns to, and indicate briefly how student achievement of each outcome will be assessed. (For assistance with outcomes and or assessment, contact the Learning Assessment Chair for an Outcomes/Assessment Coach).

Draft Outcomes (pending Advisory Committee approval)

Outcome	Aligned w/ Core Outcome(s) [COM, CER, CA, CTPS, PC, SR]	Brief Description of Assessmen
Demonstrate an understanding small scale of food systems, practices and how food gets to market.	Community and Environmental Responsibility, Critical Thinking and Problem Solving	Skills to assess local, physical and environmental factors that affect the sustainability of a small farm operation.
Demonstrate an understanding of food safety principles and practices related to food production and direct market sales.	Critical Thinking and Problem Solving	Become ServSafe Certified and have a demonstrated understanding of Good Agricultural Practices (GAPs).
Demonstrate an understanding of organic farming principles, methods and practices.	Professional Competence	Demonstrates how to grow food in a sustainable, ecologically sound and socially just manner in a hoop house, greenhouse and outside.
Demonstrated ability to develop and deliver agriculture-based educational curriculum for students of all ages.	Communication	Teach at least 12 times to a variety of audiences in the garden and or classroom setting.
Preparation of a personal business/marketing plan for small farm operation or other food/ag related business.	Professional Competence	Work with a client to produce a business plan for a small food or agriculture-related business.
Understand all aspects of how a food is grown and sold at a market stand.	Community and Environmental Responsibility:, Professional Competence	At least one quarter (Spring, summer, Fall) of practicum experience with the on campus Portlandia Farm Standia.

Admission Requirements

Are there special admission requirements (prerequisites and/or other) for students in this program?
No (pending feedback)

Explain the admission process: Application process, limited entry (pending feedback)

Describe how these requirements are intended to assure that students are prepared to complete the program.

Curriculum

Outline all curricular requirements for the proposed program, including prerequisites, general education, specialization, capstone, and any other relevant component requirements.

Draft Certificate Design (Pending Advisory Committee feedback)

The campus already offers relevant courses that fill consistently, including, but not limited to: Organic Gardening, Permaculture Design, and Soils and Plant Nutrition. These courses would only become more popular by adding a certificate credential. A small number of new classeses would be added. PCC currently has existing facilities that include a greenhouse, hoop house, Foods & Nutrition Lab and organic farm on the campus that will be utilized for the certificate program.

Sustainable Food Systems Certificate Requirements - 35 Credits		
Course	**Course Description**	**Credits**
NEW COURSE FN X: Intro to Garden & Farm Education	A hands-on field based course to teach both pedagogy and practice of engaging volunteers and students. There will be a classroom component (lesson planning) and students will apply content learned and practice teaching and supervising students (K-12-adults) in the garden.	3
NEW COURSE Local/Regional Food Systems Lab	This course will explore Pacific Northwest food systems and regional crop production, examine channels of industrialized and localized food distribution and challenge the barriers to creating food secure communities.	1
NEW COURSE FN X: Intro to Food & Farm Systems	This course provides students with an interdisciplinary understanding of ecological, economic, political, and social systems as they relate to food and farming both regionally and globally.	3
HE 264: Health, Food Systems & the Environment	This course will examine how food systems influence human and environmental health. Students will explore the connections between sustainable agriculture concepts/practices, food systems, and personal and environmental health. Audit available. Community-based Learning with Garden Lab Project	3
FN 110: Personal Nutrition	Explores personal food habits and beliefs. Emphasizes practical application of nutrition knowledge to enhance general health. Analyze present diet and evaluate it according to latest nutritional guidelines. Basic nutrition course for students with little or no science background. Audit available.	3
FN X: Culinary Skills Lab	Provides an opportunity to apply foundational knowledge of food composition and nutritional values to food preparation. Explores skills in meal planning, recipe modification and basic cooking techniques. Seasonal food from the Learning Garden will be used in hands on cooking.	1
ESR 140: Introduction to Environmental Sustainability	Introduces concepts of environmental sustainability and their applications. May include field trips. Prerequisites: WR 115, RD 115 and MTH 20 or equivalent placement test scores. Audit available.	4
NEW COURSE	This course is a hands on practicum in the Rock Creek Learning Garden,	3

FN X: 4 Season Farming— Spring	teaching all aspects of seasonal crop production. This course includes visits to study and work on other local small scale farms.	
NEW COURSE FN X: 4 Season Farming— Summer	This course is a hands on practicum in the Rock Creek Learning Garden, teaching all aspects of seasonal crop production. This course includes visits to study and work on other local small scale farms.	3
NEW COURSE FN X: 4 Season Farming— Fall	This course is a hands on practicum in the Rock Creek Learning Garden, teaching all aspects of seasonal crop production. This course includes visits to study and work on other local small scale farms.	3
NEW COURSE FN X: 4 Season Farming— Winter	This course is a hands on practicum in the Rock Creek Learning Garden, teaching all aspects of seasonal crop production. This course includes visits to study and work on other local small scale farms.	3
NEW COURSE FN X: Farm and Food Entrepreneurship	This course allows students to explore multiple marketing opportunities for small farms including: farmer's market, CSA, restaurant, farm to school, plant sales and more. Students will gain hands on experience in all aspects of managing a farm stand. This will include crop planning, harvesting, post-harvest handling, packaging, pricing, selling, marketing, customer service, and food safety.	3
DM 10/FN 105:: Food Safety	Covers foodborne illnesses in food industry. Includes identifying and analyzing the factors which cause foodborne illnesses and food safety and sanitation through proper purchasing, preparation, handling and storage. Includes the ServSafe exam. (Add FSMA info)	2
Total Credits 35 credits		

Organic Farming & Gardening Certificate Electives - X Credits		
Course Description	Course Description	Credits
NEW COURSE FN X Introduction to Beekeeping	This course is an introduction into beekeeping and is designed for new beekeepers. It will cover topics such as bee biology and behavior, hive management, swarming, equipment and products. The PCC Rock Creek Apiary will serve as a learning lab with the intention to give you the information, knowledge, experience and support to manage your own Langstroth beehive.	1?
NEW COURSE Growing Techniques for the Urban Farmer FN X:	Using PCC Rock Creek's learning labs this course will explore vertical growing, container and hoop house gardening, and hydroponic systems including dutch bucket and nutrient film technique. You will also see examples of green roofs. In this hands-on course you will practice propagating food in a variety of these systems.	3

FN X: Food Preservation lab	This course will provide an introductory sampling of many of the basic food preservation techniques such as: dehydrating, blanching and freezing, hot water bath canning, pickling, fermenting, and making vinegars and shrubs. You will be learning, eating and preserving with seasonally grown fruit, vegetables and herbs from our Learning Garden.	1
BA 223	Principles of Marketing	4
A to Z Grantwriting-online community education class	Learn how to research and develop relationships with potential funding sources, organize grantwriting campaigns, and prepare proposals.	
LAT 115. Tool and Equipment Safety, Operation and Maintenance.	Introduces common tools and equipment used in landscaping and gardening. Covers safe operation and maintenance of common tools and equipment. Provides the opportunity for hands-on experience with tools and equipment for example; walk-behind rototiller, weed wacker, propane weed burner, push mower, vermicompost harvesting with electrical winch, etc.	3
NEW COURSE LAT X: Edible Landscaping	Using PCC Rock Creek's verdant campus grounds and Learning Garden, students will gain hands-on experience in creating and maintaining edible landscapes. The class will be engaged in design and planting on campus as a part of class..	3
BI 163: Organic Gardening		4
CSS 200: Soils		4
LAT 109: Plant Propagation		3
BA 101: Intro to Business		4
BA 111: Intro to Accounting		3
BA 250: Small Business Management		3
HE 278: Human Health & the Environment		3
HE 251: Community/Public Health Issues		4
FN 225: Nutrition		4
ESR 171: Environmental Science: Biological Perspectives		4
LAT 106: Basic		4

Horticulture		
LAT courses as approved by advisor		
HORT 285: Permaculture Design- summer	Covers principles of permaculture for both urban & rural applications and sustainable human settlements. Covers landscape analysis, ecological planning & design methods, organic food production, food security, natural soil improvement, integrated animal systems, water harvesting, conservation and management, forest gardening, techniques and design strategies. Upon completion of this course students will be awarded a Permaculture Design Certificate through the Cascadia Permaculture Institute.	
HORT		

Will the program lead to external certification/licensure? _____ YES __X___NO
If YES, in what field/specialty, and by what professional organization?

Will special accreditation be sought? _____YES ___X__ NO
IF YES, by what group?
By what date?

Will program or any related courses be offered off-campus? _____YES __X___ NO
IF YES, at what address?

How much? (Specify number of courses and related credits)
Via Distance Education? _____ YES _____ NO

Enrollment

What are the projected enrollments?
Year One ___16_____ Year Two___16_____ Year Three _____16_____

How were these projections determined?
Through discussions with external and internal partners and enrollment data from similar programs

What planning has been made for the possibility that anticipated enrollment estimates are not achievable?

The FNAg Workgroup is collaborating with Non-credit to offer courses as both credit and non-credit and this effort would increase enrollment.

Faculty and Academic Leadership

List name and/or qualifications of each current faculty member who will teach required and/or elective courses within the program/degree or certificate:

Adjunct Faculty

Elaine Cole, PhD
Sustainability Coordinator
Rock Creek

Nora Lindsey
Learning Garden Coordinator
Rock Creek

others to be determined

Is faculty release time needed to develop the program? __Yes____ If so:

Existing and/or new faculty? existing faculty to coordinate the project through the curriculum approval process.

how much/how long?

Will new faculty need to be hired? ___ Yes**_____ If so:**

How many: ____2-3 adjunct faculty_____

When will this search take place? _____TBD_____

What qualifications will be required? _____TBD_____

Additional Support Staff needed? (Classified, AP (including Perkins advisor), other?) _____

Explain:

Staffing.

1. To allow for most effective sustainable agriculture training and operational oversight and management, an on-campus house for a farm manager and/or interns, apprentices, and AmeriCorps service members is needed.

2. To engage in the mentioned initiatives, the Sustainability Coordinator position and the Learning Garden Coordinator position need to be full-time.

3. To engage in the mentioned initiatives, to coordinate the certificate program, and to implement other new programming, the Foods & Nutrition FT instructor position needs to be reinstated. In addition this person would help develop a strong recruitment program and materials to ensure the success of this new certificate.

4. To support the FN Lab classes, a Foods & Nutrition Lab Technician is needed to assist in the preparation and setting-up, storage, inventory, cleaning and proper storage and disposal of lab materials, food supplies, and kitchen equipment.

5. To support the garden and its operations, a permanent part or full time farmhand position is needed.

6. To support faculty in classes and volunteer management, two AmeriCorps positions need to be funded.

7. Adjunct staff to develop course outcomes and learning objectives.

Dept. Chair: **New or Existing (identify)** Michael Meagher (existing chair Foods & Nutrition Rock Creek)

If new, estimate release/compensation anticipated: _____
(based on current FDC compensation formula)

SAC Chair: **New or Existing (identify)** Debra Lippoldt, MS, RN
Faculty Department Chair, Foods and Nutrition, Sylvania

Division Dean/SAC Liaison: (identify) Dana Fuller

Dean of Instruction: (identify) Cheryl Scott

Anticipated Expenses and Resources

Are additional resources needed to implement this program?
If no, please explain:

If yes, indicate whether funds are expected to come from Reallocated (R) or New Funding (N).

	$ needed Year 1	R *	N	$ needed Year 3	R *	N
Personnel[#]						
Equipment						
Technology- Hardware						
Technology- Software						
Materials/Supplies						
Laboratories other Capital Expenditures						
Total						

[#] http://intranet.pcc.edu/departments/finance/budget/ see: Estimating Salaries and Benefits for FY2014

*** For funds obtained from reallocation or leveraging of internal resources, explain funding source.**

Are there any other initial or ongoing costs?

Are any other resources available to provide support?

Review by Associate VP for Finance _____ _____
Signature Date

Library

What is the extent of the current library holdings in the program area?

What additional library materials will be necessary or helpful to support the students in the program? Please comment on anticipated student access for such materials.

A small library of materials could be added

Signatures:

Division Dean(s): _____ ___ **Recommended**
Deans(s) of instruction: _____ ___ **Recommended**
Campus President(s) : _____ ___ **Recommended**
VP for Acad and Stud Affairs: _____ ___ **Recommended**
College President: _____ ___ **Pre-Approved**

Send completed and signed form, including both sections (Phase I and II) to the Curriculum Office (DC, 4th Floor). Requests for new Degrees and Certificates will not be added to the committee agenda unless presidential Pre-approval has been secured.
Note: Pre-approval does not guarantee ultimate approval of the proposed program, degree or certificate.

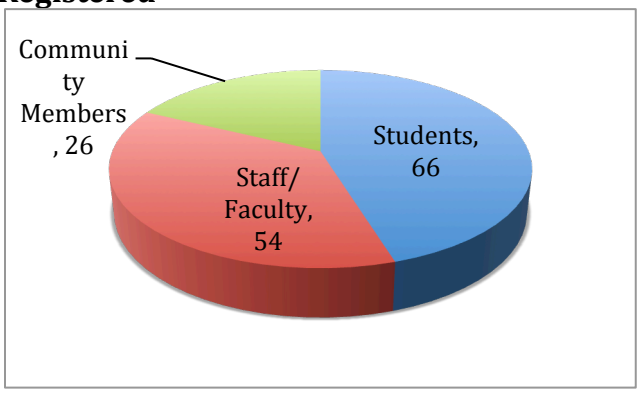
APPENDIX 9

The Health of Gen Z- Event Evaluation February 2017

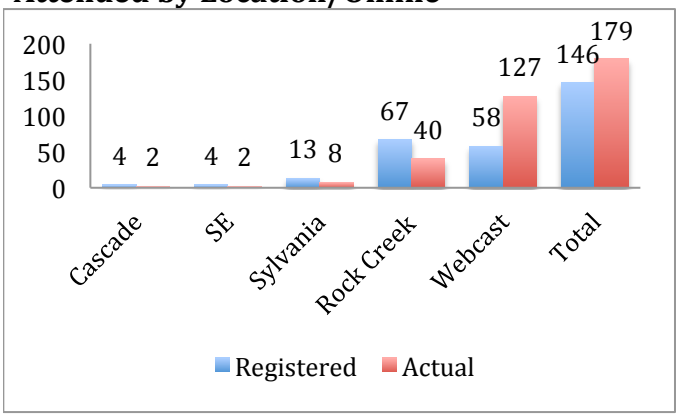
Debra Lippoldt, PCC Sylvania Foods and Nutrition

Registered: 146 for day of event 46 for recorded event

Registered



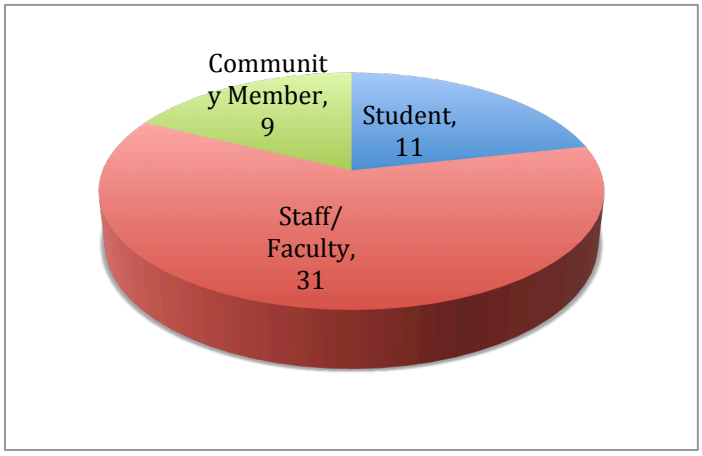
Attended by Location/Online



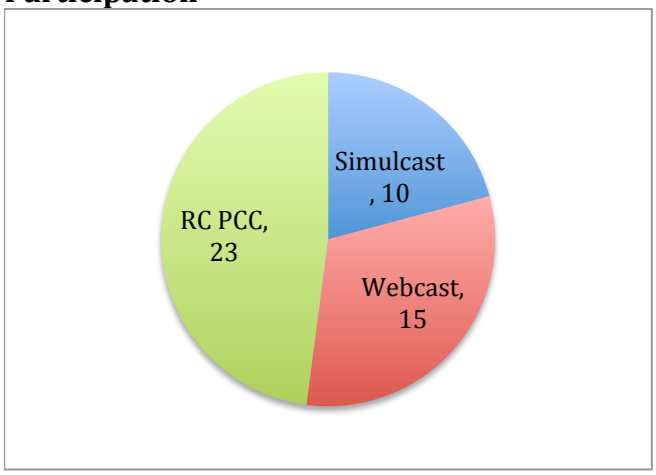
NOTE: Media Services identified 130 actual separate ISP addresses accessing via Webcast

Event Evaluation: via Online Survey up to one week post event
Responses: n=51 (35% of registered)

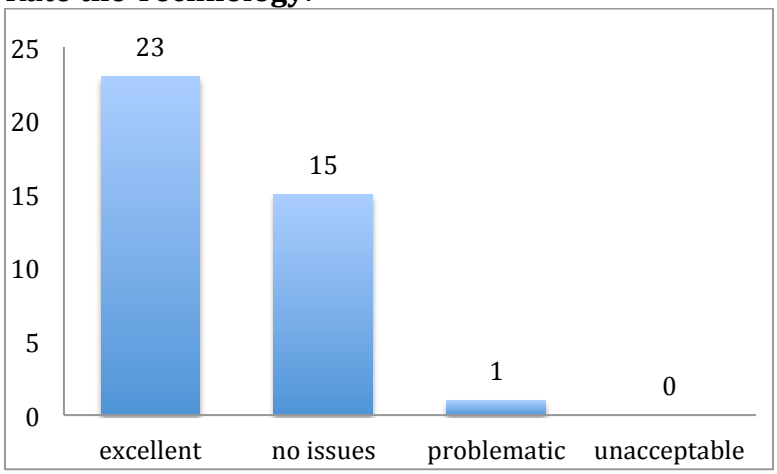
I am a…



Respondents by Location of Participation



Rate the Technology:



Facility and Refreshments also well-received.

Comments:

Used my phone to attend and there were no issues

There was a minor issue with getting the simulcast started, but once switching rooms it went well.

Everything was wonderful - registration,food, room, sound and speakers. Good job!

at home

Did not sttend but PCC Event Center at RC is a great facility

Refreshments Comments

NA

Good selection. I appreciated that it was available during the entire morning.

Did not attend so dont know about cafe food

Speaker presented information I will use in class, life, and/or profession.

	Strongly Disagree	Disagree	Agree	Strongly Agree	Overall Avg
Thornburg	1	0	12	35	3.69
Nigg	0	1	19	26	3.57
Purnell	0	1	18	28	3.57

Comments:

Thornburg:

I missed this speaker due to a class

I did not hear the first speaker but hope to watch the event again if possible.

Missed it

Nigg

Excellent and as I said I would like to watch the entire program again.

Spoke a litte fast

Purnell

Yes, I took many notes but would still like to review the workshop again.

Share any ways you might apply information presented today.

Share with those I work with and make additions to programs being created

It was fun

I will definitely share this with my family and friends. Also keep it in mind during my studies in the medical field.

I teach an Adapted PE class and a several Pilates classes. I have been sharing some of the information I heard but I really could benefit from a "repeat performance." Thank YOU very much for doing all the work to make this event happen and I do hope we continue these topics soon. (I believe I sent an email stating about the same thing last week) Many thanks!

Personally, I will try and have my son with ADHD take fish oil pills, or serve more fish. :) I haven't decided how to incorporate this information into my classes.

I have a young daughter and her friends, and I'm trying to pass on the importance of nutrition to the next generation, and the generation after that. It really impacts the next generations what we eat today. Also, I have an ADHD kid, and will try to apply some of what Joel Nigg covered.

While my professional goal is to be a nutritionist that helps people with medical conditions via nutrition, this event helps me with a small project in my current biology class.

Inform my teenage daughter of the significance of a healthy diet for her and her future children.

Pass it along to my family, especially children & grandchildren

Great topics and very thorough.

Continue to explore: -diet related health conditions through life cycle stages -impact of food additives on health -factors influencing obesity.

I will share this research with numerous organizations I work with in the area of nutrition education. I was very impressed with all of the presentations and will easily share this research with my daily contacts.

Research during lecture

For general health and to update students for good health practices while studying

It was a fascinating discussion about epigenetics and how lifestyle can influence future generations.

My 2 kids have ADHD. The information was great for me both personally and professionally.

Even more reason to avoid High fructose corn syrup! Now if only I could afford the regular sugar Coke & Cola...

Online discussions

I intend to eventually go on to grad school to work in nutrition research. This is helpful now, for information I can offer my clients, but it is also helpful to show more potential avenues for this type of research.

I love to use information about diebeties and chronic disease

Teaching nursing students and personal knowlege

Teaching health courses

Interested in future events? YES- 50 people

Topics/Comments

Future Topics/Comments

I could appreciate the nutrition bent here, but I really appreciated the second presenter because he touched on the multifactoral nature of many of these issues and health outcomes. I would love to see future environmental health oriented conferences!

Chronic stress and the effects on fetal development Placenta development and its link to health or chronic disease

Anything related to cardiovascular is an interest to me.

It seemed like such a waste to have so much food and beverages for just two of us at our Simulcast location. We took home as much as we could but a lot was left behind unfortunately. :)

I would love to hear of any research that gets done that builds on the concept of developmental programming and diet/neurodevelopmental disorders, and if they pertain to autism.

Great job! Wonderful information!

Thank you!

Excellent presentations, effective use of Simulcast and event organized very well. Thank you to all presenters, participants and organizers- R

I'm very pleased that PCC has partnered with the OHSU Moore Institute. This research needs to get out to those in the community and I'm grateful PCC is interested in being that avenue. Many thanks!

Some topic on stress and anxiety related to student life while they are also handling Life :)

Loved the speakers, the ability to watch anywhere, snacks, etc. Would love to see this continue!

Thank you very much for offering this!

Great Presenters! I hope you organize another one:)

Thank you for all of your hard work and for putting this together!

Very interesting stuff! Wish I was able to login to see the earlier parts.

Nutritional information to support exercise programs

Very much appreciated the event. Great that it was open and free. Kuddos. I would like to hear more from Kent Thornburg. He seemed to have very applicable info. facts and everyday habits and life.

Thank you for putting this together!

I love the event because it helped me to focus on health issues our community facing and reduce by implementing nutritional education to our community.

More on similar topic would be great

Fantastic event, thank you all!

I needed to leave early due to work conflicts. Wanted to stay for the Obesity and Diabetes.

Great conference overall!! Would love to have access to the slides/materials they presented. Would like to have the statistics and images.

APPENDIX 10-1

Nutrition Education in an Era of Global Obesity and Diabetes: Thinking Outside the Box

David M. Eisenberg, MD, and Jonathan D. Burgess

Abstract

In an era when rates of obesity, diabetes, and other lifestyle-related diseases challenge medical educators and governments worldwide, it is necessary to consider novel educational strategies, both didactic and experiential, whereby current and future health professionals can be better prepared to proactively advise and teach patients enhanced self-care skills (e.g., diet, movement, stress management, and enhanced behavioral change).

In this Perspective, the authors summarize current circumstances involving rising rates of obesity and diabetes worldwide, the lack of nutrition- and lifestyle-related curricular requirements for professional medical certification, societal trends regarding modern food culture and food availability in health care settings, and the misalignment of financial incentives to promote health.

The authors assess what elements of self-care should or should not be required within future curricula and certification exams. They consider how best to educate trainees about diet and how to "translate" nutrition, exercise, and behavioral science knowledge into practical advice. They explore several ideas for reforming nutrition education, including "teaching kitchens" as required laboratory classes for nutrition and lifestyle instruction, wearable technologies for tracking behaviors and physiological data relating to lifestyle choices, and the prospect of hospitals and other medical venues serving as exemplars of healthy, delicious food options. Finally, the authors argue that "salutogenesis"—the study of the creation and maintenance of health and well-being—should assume its rightful position alongside the study of "pathogenesis"—disease diagnosis and treatment—in medical education and practice.

In 1960, Americans spent three times as much on food ($74 billion) as they did on health care ($27 billion). In 2012, Americans spent twice as much on health care ($2.9 trillion) as they did on food ($1.38 trillion). Over the past five decades, food costs have increased 18-fold; health care costs, 102-fold.[1,2]

Our Current Situation

Although genetics are an important consideration in health, during the past half-century our genes have not measurably altered, and yet we are significantly more overweight, obese, and prone to lifestyle-related diseases. Today, one-third of the U.S. population is obese. Two-thirds are overweight. The medical costs of obesity in the United States are estimated to be as high as 20.6% of total health care costs.[3] Additionally, three-quarters of health care dollars are spent on chronic lifestyle-related diseases.[4] Diabetes alone is estimated to cost the United States $245 billion per year.[5] In 1960, U.S. diabetes rates were 1% of the population, with the majority of cases diagnosed as type 1 diabetes.[6] Today 9.3% of U.S. citizens are diabetic, with the overwhelming majority suffering from type 2 diabetes.[7]

As the editors of the *Lancet* remarked: "The fact that Type 2 diabetes, a largely preventable disorder, has reached epidemic proportions is a public health humiliation. A strong, integrative, and imaginative response is required in which the limits of drug treatment and the opportunities of Civil Society are recognized."[8]

These societal trends are even more alarming among children. Childhood obesity has trebled since 1970.[9,10] One-third of children born after 2000 are expected to develop type 2 diabetes during their lifetime.[11] Writing in the *New England Journal of Medicine* about generational epidemiological trends, Olshansky et al[12] noted, "There is now evidence that America's children will be the first in the nation's history to live shorter lives than their parents."

These disease trends are spreading worldwide. Rates of obesity and diabetes across the developing world are accelerating at a more rapid pace than here in the United States. For example, in 1980, the incidence of childhood overweight and obesity in China was less than 2%. It is now more than 15% in boys and 9% in girls. In China's large cities with populations of at least 1 million, 25% of boys and 16% of girls are overweight or obese. This extraordinary demographic transformation has occurred in a single generation.[13]

In 2000, 15% of all diabetics in the world lived in China. Today, it is one-third.[14–16] Combining the prevalence of diabetes in China and India, half of all humans living with diabetes reside in these two "developing" nations.[17]

The *New York Times Magazine* exposé "The extraordinary science of addictive junk food" introduced the notion that food science engineers have systematically combined sugar, salt, fat, and "pleasing mouth feel" to design processed foods which increasingly appear to be biologically addictive.[18] Recent studies offer plausible neurophysiological

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J.D. Burgess is a third-year student, Geisel School of Medicine at Dartmouth, Hanover, New Hampshire.

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doi: 10.1097/ACM.0000000000000682

mechanisms whereby repeated exposure to highly processed foods that are high in sugar, salt, and unhealthy fats leads to addictive behaviors.[19,20] As such, medical educators must also now be aware of these biological imperatives complicating the task of advising patients about healthier diets and lifestyle.

From the vantage point of fundamental lifestyle choices, evidence exists that chronic illnesses could be postponed or prevented. For example, data from the Nurses Study,[21] which includes 116,000 participants, suggest that individuals who do not smoke, are not overweight, exercise modestly, have a good but not necessarily exemplary diet, and drink a glass or less of wine or spirits daily reduce their risk of coronary artery disease by 82%. Importantly, fewer than 3% of the survey population met these seemingly manageable self-care criteria.[21] Similar findings exist for many other lifestyle illnesses in men and women. The challenge is, how do we, as medical educators, alter these regrettable statistics on a societal scale?

The field of medicine maintains unique influence in guiding patients and public policy to encourage healthful choices. However, only 27% of U.S. medical schools teach the recommended 25 hours of nutrition.[22,23] On average, U.S. medical schools offer 19.6 hours of nutrition-related education across four years of medical education.[22] This corresponds to less than 1% of estimated total lecture hours. Moreover, the majority of this educational content relates to biochemistry, not diets or practical, food-related decision making.

Among entering medical students, 71% think nutrition is clinically important. Upon graduation, however, fewer than half believe that nutrition is clinically relevant.[24] Once in practice, fewer than 14% of physicians believe they were adequately trained in nutritional counseling.[25]

Unfortunately, there are few external incentives to improve nutrition education in medical school. Current United States Medical Licensing Examination tests evaluate biochemical knowledge and information relating to nutritional deficiencies, but no standardized patient examinations test the knowledge or skills of medical trainees to advise a patient seeking guidance with regard to evidence-based diet and lifestyle modification and optimization.[26]

At the postgraduate level, with regard to board certification exam requirements for internal medicine certification, the word "nutrition" is not mentioned in the required proficiencies.[27] More surprisingly, to become a cardiologist in the United States, fellows must complete 10 cardio versions and 100 cardiac catheterizations, but requirements in nutrition counseling are not included.[28] Medical educators and licensing boards must significantly raise their requirements regarding nutrition science and lifestyle counseling if we expect the next generation of trainees to study and master this material.[29]

Additionally, financial incentives to enhance diet and lifestyle choices are nearly absent at best and totally misaligned at worst. Current payment systems for hospitals and the majority of "health" providers predominantly remain "fee for service." Coronary bypass surgeries may cost over $100,000 per operation, but many services that may reduce the risks of cardiovascular events are still not reimbursed.[30,31]

In addition to external incentives, a rethinking of the role of nutrition in medical education must include awareness of the external environment, including our health care food environments. Indeed, 63% of medical schools maintain at least one fast food franchise at their affiliated hospitals.[32] Many U.S. hospitals serve foods that are inherently unhealthy. A consequence of such food availability is that patients may erroneously perceive the status quo to be acceptable from a medical perspective.[33] It is not.

Thinking Outside the Box

Is there evidence, albeit circumstantial, that *cooking* may impact weight and health?

Among industrialized countries, the United States and the United Kingdom were the most obese nations in 2000.[34] At that time, both France and Italy, which have extensive and widely appreciated culinary traditions, observed far lower rates of obesity in their respective populations. Paradoxically, across a range of countries, those nations in which citizens spent more time preparing food had lower rates of obesity. For example, in 2000, French and Italian citizens spent an average of 19 minutes more per day cooking than did Americans. By contrast, British adults spent the same time cooking as their U.S. counterparts and exhibited comparable obesity rates.[34] Although this does not constitute a causal relationship, it raises a provocative idea—namely, that cooking may have a role to play in a population's health.

We add to this provocative idea the caveat that most overweight individuals do not wish to be overweight—that they are aware of "healthier choices" but feel "stuck" in their perceived inability to change. Most were never taught to cook. Health professionals have not been trained to guide or refer them toward resources that can improve their skills with regard to enhanced self-care behavior.

Healthy Kitchens, Healthy Lives

So, why not consider an atypical alliance? What if medical schools partnered with culinary schools and schools of public health to form "a united front?" Why not encourage medical, public health, and culinary experts to share notes, skills, questions, and novel ideas as to how these three communities can partner to diminish rates of obesity and diabetes?

This was the rationale for the launch of the educational continuing medical education program "Healthy Kitchens, Healthy Lives—Caring for Our Patients and Ourselves" (HKHL) in 2006.[35] This annual conference, jointly sponsored by the Harvard School of Public Health, the Culinary Institute of America, and the Samueli Institute, has attracted more than 3,500 health professionals. The conference blends didactic and experiential learning through academic lectures, cooking demonstrations, and hands-on cooking attended by all 400 conference registrants across a variety of instructional kitchens.

The conference was partly inspired by the work of Erica Frank,[36] who has demonstrated that for physicians, practicing a healthful behavior oneself was the most consistent and powerful predictor of physicians counseling patients about these same behaviors. As examples, exercise, smoking, seat belt use, and sunscreen use by physicians predict their counseling patients about these identical

practices. Perhaps, we theorized, how a physician eats (and cooks) can influence the ways in which he or she advises patients about food, diet, and self-care.

At HKHL, over four days, attendees receive updates on relevant nutrition science; how to cook healthy, delicious, easy-to-make, affordable recipes and family meals; the importance of movement and exercise prescription as counterparts to a healthful diet; and the relevance of mindfulness to help individuals optimize behavior and change habits for the better, often facilitated by trained professionals (e.g., health coaches or registered dietitians trained in motivational interviewing). This information is then "translated" through the tasting of 325 healthy, delicious dishes over four days, along with practical examples of mindfulness, exercise, and health coaching techniques. Additionally, attendees enter instructional kitchens in groups of 8 to 10 and, with culinary instructors guiding them, learn to prepare, from scratch, a broad range of healthy, delicious, affordable, and easy-to-make vegetables, whole grains, salads, proteins, etc., from every culinary tradition. This experiential aspect of this educational design, we believe, is critical to enhanced learning on the part of trainees.

In 2013, we published the results of a survey of previous HKHL attendees (387 total participants; 192 MDs), testing the idea that the inclusion of culinary education in the form of cooking demonstrations and hands-on cooking, as adjuncts to traditional didactic nutrition-related presentations, would result in measurable positive changes in personal and professional nutrition-related behaviors.[37] Our preliminary results suggested that this occurred. (See Figure 1.)

"Teaching kitchens" as classrooms for nutrition

The principles of HKHL may be incorporated into medical schools and residency programs. One example of this is at the Geisel School of Medicine at Dartmouth, where HKHL alumni are creating curricula for medical students and internal medicine residents. Nutrition didactics will be taught in lecture format, and cooking classes will be offered through partnerships with area culinary class venues near the college. Tulane University School of Medicine has launched a culinary medicine initiative, including a teaching kitchen. This program includes curricular modules for medical students and the option of an elective clinical "rotation" at a professional cooking school. These and future medical curricula will inform the process whereby medical trainees learn to "translate" nutrition and behavioral science into practical advice for themselves and their patients.

From another vantage point, it has been reasonably investigated that regardless of the initial benefits of specific diets, almost all diets have high recidivism rates at 12 to 18 months.[38] It is also true that many interventions that recommend a diet do so without properly teaching the skills necessary to follow such diets (i.e., there are nutritional recommendations, but few or no cooking instructions). Here we, propose the concept of a "teaching kitchen and self-care curriculum." As envisioned, the teaching kitchen is conceptually a place where individuals can learn nutrition facts and shopping and cooking skills, and receive information and personalized guidance about exercise, mindfulness, and behavioral optimization, informed by reflection about one's motivations for change. Its instructors would ideally include medical professionals, chef instructors, registered dieticians, exercise trainers, mindfulness teachers, and health coaches.

It is further proposed that this model be formally tested, in observational and controlled settings, to explore the possibility that a multidisciplinary approach, involving diet, cooking, movement, mindfulness, and behavioral change practices will prove to be superior to existing "diet" strategies and may lead to more sustained, constructive changes in behavior, physiology, quality of life, and, potentially, costs. Importantly, the teaching kitchen concept described is not a "diet" or "weight loss" program but, rather, a reference guide to necessary self-care "skills for life."

Teaching kitchens can and should be available to populations, regardless of socioeconomic status. A demonstration of a preliminary teaching kitchen in underserved populations is the Share Our Strength's Cooking Matters program. This six-week course, which combines hands-on cooking classes with nutrition information and supermarket tours, operates in 45 U.S. states and Washington, DC, and reached 23,236 participants in 2012 alone. Cooking Matters's internal evaluations demonstrate their participants' improved nutrition choices, home cooking, and label reading.[39]

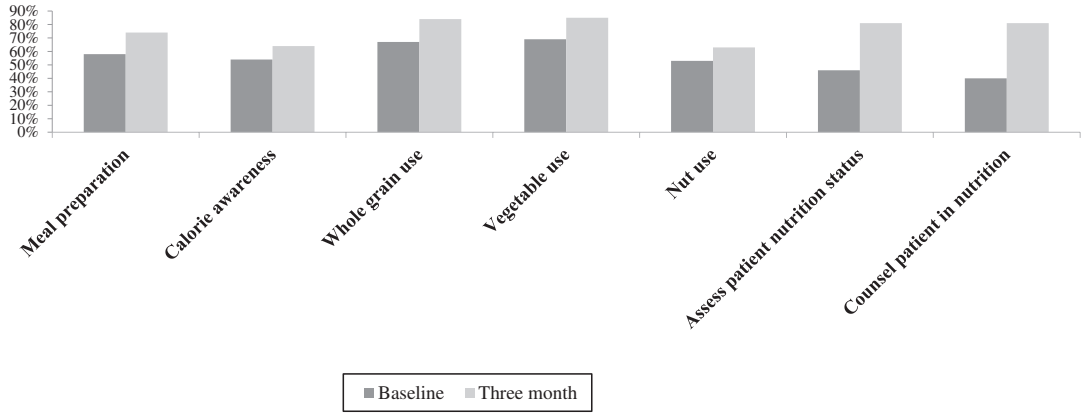

Figure 1 Personal and professional nutrition-related behaviors of 192 MD participants in the Healthy Kitchens, Healthy Lives conference. The data presented here were originally reported in Eisenberg DM, Myrdal Miller A, McManus K, Burgess J, Bernstein AM. Enhancing medical education to address obesity: "See one. Taste one. Cook one. Teach one." JAMA Intern Med. 2013;173:470–472. All comparisons $P \leq .05$.

Setting a healthy example

It is also worth considering the option of having hospitals and health centers build and take pride in exemplary cafeterias, restaurants, and food service programs, many of which could include the same healthful, delicious, accessible recipes being taught in the aforementioned teaching kitchens. A pioneering institution in this regard is the West Bloomfield Hospital in Michigan, which boasts healthy, organic, affordable cafeteria offerings and inpatient, on-demand dining prepared by trained chefs. Interestingly, family members who visit patients at this hospital frequently order from an identical menu as the patients, thereby helping to subsidize this novel program. The hospital also includes a hydroponic, organically certified greenhouse which provides about 15% of the vegetable produce for the hospital year-round. Moreover, the high-tech greenhouse serves as an educational magnet for school children across the entire region.[40]

The point is that hospitals and other health care venues have the ability become premier examples of healthful yet delicious, affordable, sustainable foods in any community.

Ingredients for education reform

Returning to the topic of education reform, shouldn't the latest science about nutrition, exercise, mindfulness practices, and behavioral change (and addictions rehab) be required knowledge for future medical graduates? Might required (or encouraged) experiential learning also be viewed as useful, if not essential? Is it unreasonable to view teaching kitchens as potentially necessary "learning laboratories" for nutritional instruction for health care professionals? We have biology, chemistry, and anatomy laboratory classes to supplement biology, chemistry, and anatomy didactic requirements—why not teaching kitchens as futuristic nutrition laboratory classes to establish required competencies for medical professionals? One's ability to translate nutrition information is essentially limited or enhanced by one's ability to cook or, at the very least, better understand how foods are typically prepared. Having medical professionals with basic proficiency in nutrition science and culinary arts may be an important ingredient in educational reform.

It is worth noting that registrants of the 2014 HKHL conference were asked if their medical organizations had already built a demonstration or teaching kitchen facility, or had plans to build one within 24 months. Of the 430 registrants, 129 responded that teaching kitchens were already in existence or were being planned at their respective organizations. This observation has been replicated (and exceeded) among 2015 HKHL registrants. As such, this "outside the box" notion is garnering attention at a rapid pace.

Simply incorporating nutrition and lifestyle instruction into medical education will not be enough, however. Lifestyle and health-related behaviors occur almost entirely outside the doctor's offices, and so methods to scale and extend healthy behavior education into the "life-space" are also needed.

Innovations enabling healthy choices

Another related trend which must be monitored and harnessed by medical professionals involves wearable devices and Internet-based applications capable of providing static or real-time information relating to diet, exercise, and relevant physiological tracking. Food and health-related "apps" are among the most popular worldwide. Novel wearable devices capable of tracking activity and a range of biometrics are gaining societal acceptance.[41,42] Although a systematic review of this literature is beyond the scope of this manuscript, we, as educators, must embrace these trends in an effort to meet patients where they are—and likely will be—in the years ahead. Moreover, current and future health care trainees as well as patients who are "digital natives" will surely welcome the marriage of wearable device technology and routine medical care.

We now know that many people eat "mindlessly." That is to say that they are not sufficiently "present" or "mindful" to taste their food optimally, nor are they routinely mindful of the nutritional value (or lack thereof) and calories consumed. Recently, medical researchers have demonstrated that mindless eating predictably leads to increased caloric consumption,[43] whereas a modest amount of "mindfulness training" can lead to weight reduction or a decrease in unhealthful food cravings.[44] The benefits of mindfulness training for medical students and proactive clinicians have been reported elsewhere.[45–47] Significant efforts are under way at a variety of U.S. medical schools, including Georgetown University, the University of Cincinnati, Oregon Health Sciences University, and Stanford University, to incorporate mindfulness training into undergraduate and graduate medical education.

In addition, the field of "health coaching" has matured over the past decade. Health coaches, who tend to be medical and allied health professionals who have received postgraduate training in a range of psychological techniques (e.g., motivational interviewing), are equipped in ways many conventionally trained clinicians are not, to enable patients to change those lifestyle behaviors which have seemed immutable. Trained health coaches can do this through regular "coaching" sessions which rely far less on the predominant "expert model" (i.e., this is your problem and this is what you should do) as compared with the coaching model, which relies far more on an elicitation, from the patient, as to what the patient wishes to work on changing; motives for changing; ambivalences about making the necessary commitments; and resolve and confidence—or lack thereof—to change. A recent study by Appel et al[48] showcased the power of having primary care providers join with trained health coaches to enable a large percentage of obese, inner-city, middle-aged patients to lose weight and to maintain weight loss over 24 months. In the future, we can imagine armies of certified health coaches working with primary care physicians and specialists to enable patients to alter their behaviors for the purpose of primary or secondary prevention of common lifestyle-related diseases such as obesity, diabetes, cardiovascular disease, and cancer.

And yet, with few exceptions, neither "mindfulness training," nor "health coaching" are common components of existing medical education or training. Perhaps these should be considered for inclusion in future required curricula on a broad basis.

Putting "Salutogenesis" on Par With "Pathogenesis"

To achieve the necessary broader directional shift, "salutogenesis," the "mirror image" of "pathogenesis," must be elevated to its rightful place in medical education.[49,50]

Here is a question for future medical practitioners, researchers, and educators: To what extent can specific lifestyle choices reduce the risk of developing serious disease among those patients carrying the relevant genes as risk factors? This conundrum is at the core of "epigenetics," which is an accepted scientific frontier and includes an exploration of gene–diet interactions in determining weight loss and maintanence.[51,52] So, let us consider that "personalized medicine" in the 21st century will involve a *combination* of timeless wisdom regarding diet, mental reflection, and physical activity, in addition to new knowledge generated through biomedical discovery and advances in genetics, diagnosis, disease treatment, and technology. A nearly exclusive focus on high-tech strategies, however, will not meet societal needs.

Salutogenesis is defined as "the process through which health and well-being are produced" (see Figure 2). Most of current medical curricula, worldwide, focus on pathogenesis and its manifestations as they relate to disease initiation, diagnosis, treatment, and management. What if future required curricula included didactic and experiential learning modules about nutrition and diet, exercise and movement, sleep and rest, mindfulness and its application to self-care, as well as the latest science regarding the optimization of behavioral change (i.e., health coaching techniques)?

Because most of our current curricula, training, and health care delivery models focus on pathogenesis, diagnostic procedures, and interventional strategies (i.e., disease care), what might a "redesign" of future delivery models (and medical education) look like if they were to simultaneously dive deeply into what is being learned about the promotion and maintenance of health—that is, "salutogenesis"? For the sake of discussion, let's consider future health care models, accessible to the majority of the population, which provide state-of-the-science, "high-tech" diagnostic and interventional strategies, which are collectively aimed at addressing disease (i.e., "pathogenesis"), as well as new core elements of conventional health care (not disease care), which promote wellness (i.e., "salutogenesis").

As depicted in Figure 3, we will increasingly be informed by discoveries relating genetics (and epigenetics) to disease risk; we will rightfully continue to invest heavily in basic, mechanistic, and clinical research; and we will continue to rely on hospital care. However, lengths of stay will likely continue to diminish over time, as will the overall ratio of inpatient to outpatient medical education. Much of medical and health care will be delivered by ambulatory and allied health professionals who must, in this futuristic model, become professionally "bilingual" in both disease diagnosis and treatment in addition to health creation and maintenance.

As envisioned, primary care and allied health professionals will work closely with their hospital-based colleagues in selected instances, but will also increasingly work with colleagues responsible for movement and exercise training; nutrition and culinary (i.e., cooking) instruction; those with expertise in "stress management," ranging from psychopharmacology to psychotherapy to mindfulness instruction; and health coaches, who can provide guidance with regard to health-enhancing behavioral change strategies.

Today, if one sought such "comprehensive" care, he or she would have to be extraordinarily wealthy, educated, and well connected to receive all of the intended services. That said, if access to this theoretical model could demonstrate enhanced clinical outcomes, reduced medical care expenditures, improved quality of life, and enhanced societal productivity, why would we not want to pursue these imaginary future models of health care delivery for future generations? What's more, why should we not prepare the next generation of medical professionals to be conversant in each of these health-related areas and serve as the implementers of these designs? After all, the students we teach today will be practicing medicine well beyond 2050.

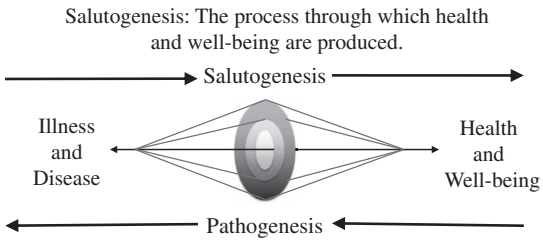

Figure 2 The relationship between pathogenesis, the mechanism by which a disease is caused, and salutogenesis, the process through which health and well-being are produced. Credit: Wayne B. Jonas, MD, and Samueli Institute (www.SamueliInstitute.org). Reproduced with permission.

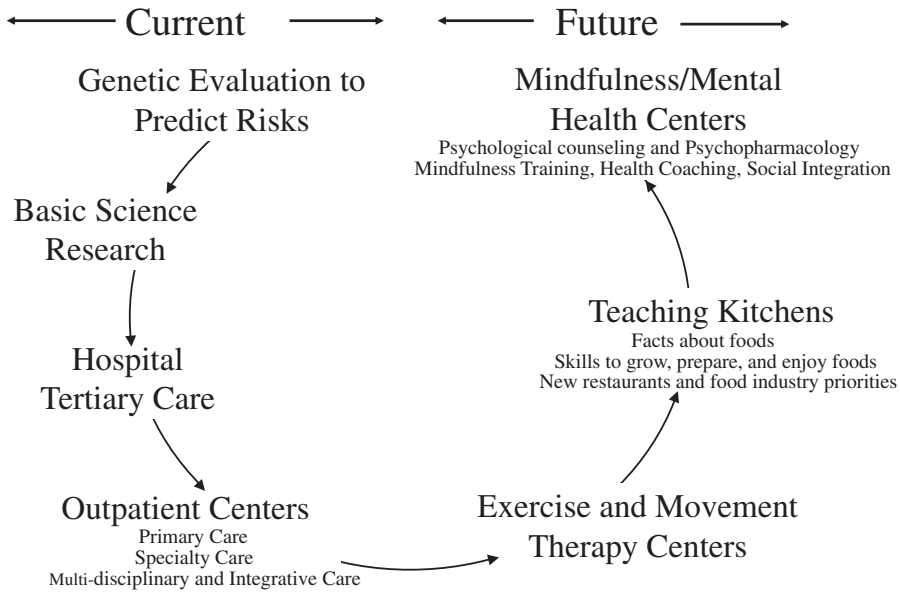

Figure 3 A model for health systems of the future.

Implications for Medical Educators

Here, we offer a number of recommendations for realizing the vision we have described. Although some of the recommendations below are already gaining momentum, medical educators may select to champion one or more of the following suggestions at their respective educational institutions:

1) Required courses in nutrition, exercise, stress management, and sleep hygiene.
2) Required competency examinations covering factual knowledge and advisory skill in all of the aforementioned areas, as prerequisites for professional certification.
3) The establishment of teaching kitchens for laboratory instruction in nutrition, paralleling the continued use of biology, chemistry, and anatomy labs for instruction in these required areas.
4) Increased emphasis on and further development of clinical assessment tools (e.g., OSCEs) to be used for training and evaluation relating to lifestyle counseling.
5) Hospitals and ambulatory care venues with exceptional cafeterias, restaurants, teaching kitchens, and inpatient menus showcasing foods that are healthy, delicious, affordable, and easy to make. These options would replace commonplace, highly processed alternatives.
6) The incorporation of data from wearable or implantable devices as routine elements of the medical record.
7) Instruction and training in self-regulatory methods, including mind–body and mindfulness techniques.
8) A disruptive realignment of financial incentives leaving behind "fee for service" domination in favor of "pay for performance" incentives and financial bonuses for keeping people *well*.
9) Having medical doctors, and all allied health care professionals, leading by example with regard to diet, as was the case when medical professionals quit smoking in the 1970s, due in part to overwhelming scientific evidence, thereby catalyzing the successful "movement" to lower smoking rates in the United States. Why not do the same with regard to a diminished intake of less healthy foods and "food-like substances?"

We offer these suggestions with the intention of elevating the prominence of nutrition science, self-care, lifestyle medicine, and behavioral optimization and placing them on par with existing educational requirements relating to disease mechanisms, diagnosis, treatment, and management. Such a combined approach, if embraced, could expand the culture and content of medical education to better address the great health challenges of our time, including the ways we eat, move, think, sleep, and relate to one another in our global village.

What are we, the educators, waiting for?

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APPENDIX 10-2

RESEARCH BRIEF

Cooking Classes Outperform Cooking Demonstrations for College Sophomores

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ABSTRACT

Objective: To determine if cooking classes improve subjects' knowledge, attitudes, and behaviors toward cooking.

Design: Comparison of outcomes of 2 treatment groups (demonstration vs hands-on cooking classes) using pre- and posttests.

Setting: University cooking laboratories.

Participants: First-semester sophomores (n = 65) who were 25% male with a mean age of 19.7 years.

Intervention: The intervention group (n = 33) attended 4 2-hour cooking classes, based on Social Learning Theory, and a supermarket tour. The demonstration group (n = 32) attended a cooking demonstration. Subjects completed 6 surveys.

Main Outcome Measures: Changes in attitudes, knowledge, and behaviors regarding cooking.

Analysis: Descriptive statistics were used to compare demographic variables. Analysis of covariance and chi-square analyses were used to compare outcome variables.

Results: Analysis revealed no gender differences. Participants displayed positive shifts on attitude scales. The intervention group had a pattern of larger positive shifts (0.4-0.7 vs 0.1-0.5 gain), some of which were statistically significant. Participants displayed positive, but not statistically significant, shifts in knowledge and some behaviors.

Conclusion and Implications: The intervention group experienced more statistically significant gains in attitudes and appeared to have a better pattern of gains in cooking-related knowledge and behaviors. Given limited resources, demonstration cooking classes could reach larger audiences in varied settings, but the impact would likely be weaker than that of cooking classes.

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KEY WORDS: cooking, food preparation, college students, Social Learning Theory

(*J Nutr Educ Behav.* 2004;36:197-203.)

INTRODUCTION

The American lifestyle and diet have changed dramatically over recent decades.[1-3] People lead faster-paced lives with less free time, desire convenience products, and are less physically active than they used to be.[4-6] They are eating more convenience foods and fewer home-prepared meals.[1,3,7] Among persons aged 19 to 29, individuals reported eating 57% of their meals at home in 1996 compared with 73% in 1978.[1] These individuals also consumed 31% of their meals at restaurants and fast-food establishments in 1996 compared with 15% in 1978.[1] In 2000, 41% of Americans reported eating 3 or more commercially prepared meals a week compared with 36% in 1992.[3] The increased frequency of eating away from home is of concern because of the potential to contribute to adverse health consequences.[1,3,8]

With the proliferation of convenience foods and the changing demographics of American households, children are less likely to learn the skills to cook—skills they once learned from their parents and schools.[9,10] In a study of British adults, the authors concluded that without cooking skills, individuals are more likely to eat out and eat premade meals.[11] Learning to cook empowers people to prepare healthful meals, provides a strong sense of personal achievement, involves all 5 senses, and provides the knowledge that allows people to judge more healthful alternatives when eating away from home.[11,12]

A limited number of studies, programs, and reviews were found that examine the link between teaching cooking skills and changes in behavior, attitudes, and knowledge toward cooking and healthful eating.[1,9,13-17] Improving cooking skills could increase behavioral intentions to eat more fruits, vegetables, and whole grains[14] and increase consumption of fruits[2] and vegetables.[2,17] Studies have also shown that cooking skills lead to increased cooking frequency[13];

improved knowledge, preferences, and self-efficacy toward and interest in cooking[14]; and decreased food costs.[16] Thus, providing most individuals with cooking skills might empower them to eat more healthful diets.[14-17]

College students are on appropriate population for targeting basic cooking skills classes. Upon moving out of the dormitories, many students shop and prepare meals for themselves for the first time. Acquiring basic cooking skills will provide them with the knowledge, tools, and confidence to make more healthful meals.

The objectives of this cooking intervention were to (1) improve knowledge and attitudes toward cooking; (2) improve cooking skills; (3) increase confidence in cooking abilities; (4) decrease eating out, taking out, and/or eating prepackaged meals; and (5) increase the number of home-prepared meals. The hypothesis is that the intervention group would see larger gains in attitudes, behaviors, and knowledge regarding cooking than the demonstration group.

DESCRIPTION OF INTERVENTION

The study, conducted in the fall of 2002, involved college sophomores at Colorado State University (CSU). Students were recruited from student dining facilities and sophomore-level classes in the spring and fall of 2002, respectively. Self-selected subjects were randomly assigned to the 1-hour cooking demonstration or intervention groups. Subjects in the intervention group attended 4 2-hour basic cooking skills classes and a 45-minute supermarket tour over a 4-week period. All subjects were assessed at 6 different time points using one of 3 different survey tools. Approval for this project was obtained from the university's human research committee.

Educational Materials

Subjects in both groups received identical recipes and information sheets which addressed knife skills, pantry supplies, cooking equipment, and shopping tips. Recipes (n = 16) covered 4 topics: wraps and salads, 15-minute dinners, 1-pot dinners, and stir-fries. The recipes contained few instructions to minimize preparation difficulty and small ingredient lists to limit cost, which was estimated for each recipe. The recipes also contained easy to find ingredients, included vegetarian options, and focused on ingredient substitutability to reflect participants' tastes and budgets.

Class Sessions

All classes were taught by the principal investigator. This investigator has significant culinary experience, including cooking professionally at various restaurants and 2 years experience teaching a French culinary technique laboratory at CSU. Additional assistance was provided by a faculty member who is a nationally certified executive chef and a certified culinary educator.

Demonstration group subjects attended a 1-hour class, which included a brief lecture on basic cooking skills and a cooking demonstration that included the 4 cooking class topics. Subjects had the opportunity to sample the prepared food and ask questions.

Cooking classes began with a brief lecture on the day's topic, followed by a laboratory session in which students prepared recipes related to the day's topic. After preparing their meals, participants described their recipes and how they made them. They then sampled all of the dishes. In addition, subjects had the opportunity to make wrap sandwiches with the leftovers to take home. Intervention subjects also attended a 45-minute supermarket tour that included strategies for buying produce, meat, bulk foods, and other perishable foods.

Social Learning Theory

The intervention group design used all of the tenets of Social Learing Theory.[18] The environmental component of reciprocal determinism was addressed by providing recipes and cooking equipment (incentives for completing the classes and surveys) for the students' home kitchens. Classes were designed to improve their expectations and expectancies regarding cooking. Expectations are the probable outcomes of a given situation or behavior perceived by the individual, for example, ''I don't know how to cook'' or ''If I cook, I can save money.'' The expectancies are the values (positive or negative) placed on the expectations that act as motivators or barriers, for example, cooking is fun or easy. Self-efficacy was addressed as the students performed the desired behavior. Students' behavioral capabilities were presumably increased as they were taught and practiced the skills necessary to perform the desired behavior. Modeling, observational learning, and vicarious reinforcement were incorporated as students watched each other prepare the meals, explained to each other how they prepared the meals, and then ate the food prepared.

Surveys

Participants completed 3 different surveys: an eating habits survey (1 time; baseline before intervention), a cooking survey (2 times; preintervention and 3 months postintervention), and a food preparation survey (3 times; 1, 2, and 3 months postintervention).

The eating habits survey focused on childhood dietary patterns, including eating habits, past experiences with food preparation and shopping, prior cooking education, and attitudes toward cooking. It was administered at the 2 recruitment periods. Ethnicity was not assessed because the student population at CSU is not diverse.

The cooking survey focused on attitudes, behaviors, and knowledge related to cooking. Both groups completed this survey at the beginning of the demonstration or first cooking class (preintervention) and at 3 months postintervention.

The food preparation survey was a 72-hour food preparation recall. Students received this electronic mail survey on Thursday. They were asked, for the previous 9 meals, if they cooked, ate leftovers, ate premade meals, ate out or ate takeout, or skipped meals. Students were also asked if they shared recipes with friends and if they taught their friends the cooking skills they learned. The food preparation survey was administered on the third Thursday of each month for 3 consecutive months after the classes ended.

An expert panel of nutrition education researchers established the content validity of the eating habits survey, cooking survey, and food preparation survey. The panel consisted of 2 nutrition professors, 1 bionutritionist, and 2 chefs. Both the eating habits survey and the cooking survey were tested for reliability using the test–retest method with 25 students in an introductory-level nutrition class for non-nutrition majors. All questions were assessed for reliability using Pearson's correlations, percentage agreement, and paired *t* tests. All questions had correlations and/or percent agreements above .70 or 70%, respectively. Paired *t* test analysis showed no significant differences between the means at time 1 and time 2. Attitude and knowledge scales were verified using Cronbach α. Items that showed an interitem correlation of $> .70$ were grouped together to create individual scales.

As an incentive and a thank you, students in both groups received cooking equipment if they completed all of the classes and surveys. Equipment choices were individually tailored for each participant based on what they indicated that they needed at the demonstration or first class.

Analysis

Demographic and outcome measures were analyzed using the Statistical Package for the Social Sciences, version 11.5 (SPSS Inc, Chicago, Ill). Chi-square was used to compare groups on the following variables: gender, parental involvement in shopping or cooking and teaching these behaviors, previous nutrition and cooking class enrollment, and knowing how to cook. Groups were compared using *t* tests on the following demographic information: age, childhood dinner patterns, childhood shopping or meal preparation behavior, and attitudes regarding healthful food and cooking. Analysis of covariance was used to compare the groups on all attitude, behavior, and knowledge outcome scales. All outcome measures were controlled for potentially confounding variables, when necessary, including gender, pretest scores, ability to cook prior to the intervention, history of cooking class enrollment, and prior knowledge of food shopping. Chi-square analysis was used to analyze all food preparation recall behavior.

Costs

The costs incurred in offering cooking classes or cooking demonstrations can vary widely, but typical expenses will relate to the following: food, facilities and equipment, printed materials, incentives, and instructor time. The total food costs of the 23 classes were $1500, which included $250 in food donations. The total cost for incentives was $1000. The average food cost was $65 per class. The average food cost was $22 per participant for the entire program. These figures would vary with the type of class (demonstration vs intervention), the number of students, and the types of items prepared. Costs were minimized by bulk shopping, using

Table 1. Demographics and Background Variables According to Group

Variable	Demonstration (n = 32), n (%)	Intervention (n = 33), n (%)
Age (y), mean (SD)	19.8 (1.1)	19.6 (0.7)
Gender		
Male	4 (12.5)	12 (36.0)*
Female	28 (87.5)	21 (64.0)
Do you know how to grocery shop? (yes)	32 (100.0)	33 (100.0)
Do you know how to cook? (yes)	32 (97.0)	31 (93.9)
Have you ever taken a cooking class? (yes)	14 (42.4)	7 (21.2)
Do you own any cookbooks? (yes)	21 (63.4)	22 (66.7)
Have you ever taken a nutrition class? (yes)	25 (75.8)	19 (57.6)
Growing up, who... (check all that apply)†		
Shopped for your family's groceries?		
Mom	30 (93.8)	33 (100.0)
Dad	17 (53.1)	23 (69.7)
Taught you to shop?		
Mom	26 (81.3)	29 (87.9)
Dad	12 (37.5)	14 (42.4)
Cooked for your family?		
Mom	31 (96.9)	32 (97.0)
Dad	22 (68.8)	27 (81.8)
Taught you how to cook?		
Mom	28 (87.5)	28 (84.9)
Dad	14 (43.8)	21 (63.6)*
Attitudes (number of items in scale)‡	LS Mean (SEM)	
Eating healthful food is important to me (2)	4.5 (0.5)	4.5 (0.5)
Preparing healthful food is too hard (3)	3.1 (0.8)	3.0 (0.7)
I like to cook (4)	4.0 (0.7)	4.2 (0.5)
I feel comfortable food shopping (5)	4.0 (0.6)	3.9 (0.7)

*$P < .05$.

†In addition to parents, choices included sibling, self, caregiver, and other.

‡All attitudes questions were based on a 5-point Likert scale (5 = strongly agree).

LS indicates least squares; SEM = standard error of the means.

leftovers, teaching some classes on concurrent days, which led to less waste, and the purchasing of items on sale. The teaching facilities and equipment were donated by the Department of Food Science and Human Nutrition. Costs of printed material (recipes, handouts) were insignificant. The instructor's and assistant's time was donated.

SURVEY FINDINGS

The demonstration (n = 32) and intervention groups (n = 33) were sophomores with a mean age of 19.7 years (Table 1). The only 2 statistically significant differences between the groups at baseline were gender (13% vs 36% male, respectively) and households in which the father taught the respondent to cook (44% vs 64%, respectively). There were no statistically significant differences seen on any outcome measures by gender or age among yes/no responders when they were asked if they knew how to cook prior to the intervention, previous cooking class experience, or grocery shopping knowledge.

Over 90% of participants indicated that they knew how to cook, and all knew how to grocery shop. Many reported having previously taken a cooking class (42% [demonstration] versus 21% [intervention]). Respondents expressed positive attitudes about cooking, shopping, and eating healthful food but expressed neutral feelings regarding the difficulty of preparing healthful food (see Table 1).

In almost 75% of the households, mothers were the primary food preparers and primary cooking teachers. Fathers participated in many daily cooking and shopping roles. On average, fathers cooked for their families in 75% of the households, taught cooking in 54% of the households, and shopped for their family's groceries in 61% of the households. On average, the father was the primary food preparer in 20% of households and the primary cooking teacher in 24% of households.

At the 3-month posttest (Table 2), there were statistically significant differences in attitudes that favored the interven-

Table 2. 3-Month Posttest Attitudes, Behaviors, and Knowledge According to Group

	Group		Group	
	Demonstration (n = 26)	Intervention (n = 26)	Demonstration (n = 26)	Intervention (n = 26)
Variable[†]	3 Months Post LS Mean (SEM)		Difference Scores LS Mean (SEM)	
Attitudes (number of items in scale)[‡]				
Cooking helps you eat more healthfully and save money (3)	4.3 (0.1)	4.6 (0.1)	0.1 (0.1)	0.4 (0.1)*
Cooking is hard and takes too much time (3)	3.8 (0.1)	3.9 (0.1)	0.3 (0.1)	0.4 (0.1)
I like to cook (3)	4.3 (0.1)	4.6 (0.1)**	0.1(0.1)	0.4 (0.1)**
I feel confident using various cooking techniques (4)	4.4 (0.1)	4.6 (0.1)	0.3 (0.1)	0.7 (0.1)**
I feel comfortable buying produce and reading food labels (2)	4.4 (0.1)	4.4 (0.1)	0.1 (0.1)	0.4 (0.1)
Cooking meals is expensive (1)	3.8 (0.1)	3.9 (0.1)	0.5 (0.2)	0.6 (0.2)
Behavior (number of items in scale)				
How many...				
Servings of fruits/vegetables do you eat a day? (2)	4.7 (0.1)	4.7 (0.1)	0.1 (0.1)	0.1 (0.1)
Meals do you eat a day? (1)	2.7 (0.1)	2.8 (0.1)	−0.1 (0.1)	0.0 (0.1)
Snacks do you eat a day? (1)	1.6 (0.2)	1.6 (0.2)	−0.3 (0.2)	−0.1 (0.2)
Nights a week do you cook dinner? (1)	4.6 (0.2)	4.9 (0.2)	0.1 (0.3)	0.4 (0.3)
Nights a week do you eat premade dinners? (1)	1.2 (0.2)	1.0 (0.2)	0.3 (0.3)	−0.3 (0.3)
Nights a week do you eat out/take out food for dinner? (1)	1.0 (0.1)	1.0 (0.1)	−0.3 (0.2)	−0.2 (0.2)
Nights a week do your skip dinner? (1)	0.1 (0.1)	0.2 (0.1)	−0.2 (0.1)	0.1 (0.1)
Times a month do you go shopping? (1)	3.2 (0.1)	3.1 (0.1)	−0.1 (0.1)	−0.3 (0.1)
Knowledge (number of items in scale)				
I know how to use a knife and stir-fry (4)[§]	3.1 (0.1)	3.4 (0.1)	1.3 (0.2)	1.3 (0.2)

[†]Analysis of covariance for 3-month post-test with pretest as a covariate significance between pairs: *$P < .05$; **$P < .01$.
[‡]Based on a 5-point Likert scale (5 = strongly agree).
[§]Based on a 4-point scale (4 = all answers were correct).
LS indicates least square; SEM, standard error of the means.

tion group including liking to cook (0.1 [demonstration] vs 0.4 [intervention] gain, respectively), the benefits of cooking (0.1 vs 0.4 gain, respectively), and confidence using various cooking techniques (0.3 vs 0.7 gain, respectively). All participants showed a similar positive shift in knowledge of cooking skills (1.3 gain on a 4-item scale). It is worth noting that on a weekly basis, participants ate premade dinners 1.2 (demonstration) versus 1.0 (intervention) nights a week.

Relative to food preparation behavior on Monday, Tuesday, and Wednesday, participants frequently skipped breakfast (22% [demonstration] vs 26% [intervention]) and ate leftovers for lunch (18% vs 20%, respectively). Both groups were more likely to cook or prepare dinner (61% vs 62%, respectively) than eat out or take out dinner (15% vs 20%, respectively). The remaining participants indicated that they ate leftovers or skipped meals for dinner. The intervention group appeared to eat out and take out less frequently for all meals than did the demonstration group (9.4% vs 15.9%, respectively; insignificant difference). Respondents frequently reported teaching others what they learned in class (67% vs 72%, respectively) and sharing recipes with others (69% vs 83%, respectively).

DISCUSSION

It is difficult to compare food preparation behavior across studies owing to several factors, including assessing behaviors for different number of days, days of the week, or time of year. In addition, there are numerous definitions of ''cook,'' ''premade,'' and ''take out'' that people use to describe their food preparation behaviors. Lastly, there were no other studies with college students, per se.

Of our respondents, 32% indicated that they had taken a cooking class, which was lower than a National Food Alliance study in 1993 that found that 66% of children aged 7 to 15 learned to cook at school.[19] It is worth noting that in 1998, students enrolled in 28% fewer credit hours in consumer and homemaker education classes than in 1982.[20] This highlights the decreased frequency with which students are learning cooking skills in school prior to college.

Although both groups demonstrated a positive shift regarding confidence (self-efficacy) using various cooking techniques; the intervention group had statistically significant gains. This positive shift in self-efficacy is consistent with Liquori et al, who reported that elementary schoolchildren reported increases in self-efficacy toward cooking after taking cooking classes.[14] Participants in both the demonstration and cooking groups demonstrated a pattern of positive shifts regarding cooking knowledge, which is also consistent with the findings of Liquori et al.[14] In the present study, respondents frequently taught others what they learned in class and shared their recipes with others, which suggests an extended effect of the classes.

Participants reported eating out or taking out food for dinner 20% (demonstration) versus 15% (intervention) of nights. Participants ate out or took out 15.9% (demonstration) versus 9.4% (intervention) of all meals over 3 consecutive midweek days. This finding was significantly lower than the findings of Nielsen et al, who reported that, in 1996, people aged 19 to 29 years ate 43.2% of all meals away from home.[1] However, Nielsen et al reported on 2 nonconsecutive 24-hour food recalls over a 10-day period, which makes it difficult to compare findings between the 2 studies. The frequency of eating out is an important consideration because Guthrie et al determined that meals eaten away from home have more calories and less micronutrients than do foods prepared at home.[21] These findings highlight that knowing how to cook can lead to a more healthful diet.

Respondents prepared 57% of all meals over 3 consecutive midweek days compared with 46% of all meals prepared as reported by Bielunski, who examined food preparation behaviors over 7 days among adults aged 18 to over 65 years old.[10] The differences between these studies could be because our participants were younger and we examined only 3 midweek days. People tend to cook more during the week and eat out more on the weekends.

Respondents cooked or prepared breakfast 65% of the time but frequently skipped breakfast (22% vs 26%). The latter is consistent with the research of Haines et al, who found that 25% of American adults skip breakfast daily,[22] suggesting that our sample was similar to other study populations in this regard. Participants frequently ate leftovers for lunch (18% vs 20%), which could indicate a cooking class effect because classes encouraged them to make larger quantities of food which resulted in leftovers for future meals. Respondents cooked or prepared dinner 62% of the time, which was lower than the results found by Bielunski, who reported that respondents cooked or prepared dinner 84% of the time,[10] but the latter study was 10 years old and had an older population.

Limitations

There were a number of limitations to this study. A larger sample size might have resulted in more statistical significance among participants on outcome measures. A control group might have identified the normal changes that students make at this age. It is unknown how much students would have improved their cooking skills simply by living on their own without the aid of cooking classes.

Students self-selected for the class, indicating that they were already interested and self-motivated, so the results may not be generalized to the entire student population. As with any self-reported assessment, there is the potential for reporting errors and a bias toward socially desirable responses. However, this was mitigated by repeating measures over time. For example, the respondents reported cooking or preparing dinner with similar frequencies on the cooking surveys and food preparation surveys, which highlights consistency in reporting by the subjects. A ceiling effect

was found for a number of outcome measures. In spite of these limitations, we can draw a number of conclusions with a fair degree of confidence.

The cooking class intervention program provided some evidence to validate the program's hypotheses. Subjects in the intervention group experienced significant improvements in attitudes compared with the demonstration group. There were no significant differences among groups related to consumption of takeout, prepackaged, and home-cooked meals. It should be noted that whereas the intervention group saw larger positive shifts, the demonstration group did appear to make positive shifts on some scales regarding attitudes, behavior, and knowledge.

Cooking classes can be an effective tool for improving participants' attitudes, behaviors, and knowledge regarding cooking. Given limited resources, cooking demonstrations may be a reasonable way to reach larger audiences in varied settings, but the impact will likely be weaker than cooking classes.

IMPLICATIONS FOR RESEARCH AND PRACTICE

Because this was an exploratory study, future research should focus on examining additional variables, developing more effective evaluation tools, and looking at different program designs, for example, spreading classes over a longer or varied time period (1/month compared with 1/week) or waiting until the spring semester of sophomore year so that students can adjust to living on their own first (and avoid information overload). Adding a topic on quick breakfasts might be useful because such a high percentage of participants skipped breakfast. More comprehensive evaluation tools and strategies would allow for a greater understanding of the changes and processes of change of students. These could include tracking participants for a longer time interval, assessing background family demographics in more detail (family makeup, dietary and cooking habits), and doing more extensive food preparation and dietary assessment surveys.

The demonstration class format may be an effective strategy if financial and time constraints prevent using a cooking class format. A series of demonstration classes might strengthen the impact. The 1-hour demonstration format can be adapted to meet the individual needs of the class participants. In addition, by preparing food ahead of time and using a small portable stove, this type of class can be taught in almost any setting, including schools of all types, dormitories, recreation centers, and religious centers. It is recommended that presenters focus on quick, easy, and inexpensive recipes with a high degree of ingredient substitutability. Lastly, it is possible to train people to teach this type of class and therefore bypass the need to pay a trained chef, but the possible effect of using instructors with different characteristics (gender, age, cooking experience) should be examined.

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Strategies for Nutrition Education and Behavior Change

The 6-step procedural model proposed by Isobel Contento and described in "Using a Theory-Driven Approach to Design a Professional Development Workshop," *J Nutr Educ Behav*. 2003;35:312-318, is from a forthcoming textbook by Contento titled *Strategies for Nutrition Education and Behavior Change.*

Society for Nutrition Education's Eight Child Nutrition Education Priorities

These priorities were outlined in a recent letter from Society for Nutrition Education (SNE) to the Institute of Medicine, Committee on Prevention of Obesity in Children and Youth Workshop.

- Enhance and strengthen child nutrition education, promotion and environmental efforts by adding a state-level infrastructure and networking component to the United States Department of Agriculture (USDA) Team Nutrition program.
- Increase funding for nutrition education and promotion efforts to a total of $50 million.
- Provide expanded authority and funds to USDA in order to fully cover all food and beverage sales and enforce regulations on school campuses throughout the school day for schools that participate in the National School Lunch or School Breakfast program.
- Promote initiatives, such as 5 A Day, that would help increase all types of fruit and vegetable intake among child nutrition program participants.
- Require USDA to conduct regular and periodic reviews (at least every 5 years) of the Women, Infants and Children Supplemental Nutrition Program (WIC) food package to assure that the food packages are consistent with health and nutrition recommendations as well as nutrition education and promotion efforts.
- Support full funding for the WIC program to reach all nutritionally at-risk eligible women and children with nutrition services and supplemental foods.
- Maintain the nutrition and health mission of WIC. Increase the Nutrition Services and Administration funding to assure quality nutrition education services. Provide adequate funding to accompany additional related administrative and client service requirements, such as substance abuse, education, immunization, screeening, etc.
- Support the WIC Farmer's Market Nutrition Program reauthorization and secure independent funding stream by decoupling from the WIC caseload funding mechanism.

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ORIGINAL RESEARCH

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Feasibility Pilot Study of a Teaching Kitchen and Self-Care Curriculum in a Workplace Setting

Abstract: Objective. *To examine the feasibility of a prototype Teaching Kitchen (TK) self-care intervention that offers the combination of culinary, nutrition, exercise, and mindfulness instruction with health coaching; and to describe research methods whereby the impact of TK models can be scientifically assessed.* Design. *Feasibility pilot study. Subjects were recruited, screened, and consented to participate in 14- or 16-week programs. Feasibility was assessed through ease of recruitment and attendance. One-sample* t *tests and generalized estimating equation models were used to compare differences in groups.* Setting. *Workplace.* Subjects. *Two cohorts of 20 employees and their partners.* Results. *All 40 participants completed the program with high attendance (89%) and response rates on repeated assessments. Multiple changes were observed in biomarkers and self-reported behaviors from baseline to postprogram including significant (*P < *.05) decreases from baseline to postprogram in body weight (−2.8 kg), waist circumference (−2.2 in.), systolic and diastolic blood pressure (−7.7 and −6.3 mm Hg, respectively), and total cholesterol (−7.5 mg/dL). While changes in all of the aforementioned biomarkers persisted over the 12-month follow-up (n = 32), only changes in waist circumference and diastolic blood pressure remained statistically different at 12 months.* Conclusions. *These study findings suggest that a TK curriculum is feasible within a workplace setting and that its impact on relevant behavioral and clinical outcomes can be scientifically assessed.*

Keywords: nutrition education; culinary instruction; health coaching; mindfulness; exercise; optimizing behavioral change

> "Diets" may be insufficient to bend the global trajectory with regard to chronic diseases associated with suboptimal lifestyle choices.

In the setting of dramatic increases in rates of obesity, diabetes, and other lifestyle-related chronic conditions, innovative strategies whereby individuals learn skills to improve the ways they eat, move, and think are in high demand. One such strategy involves the development of Teaching Kitchens (TKs) and TK-related curricula that include nutrition education, culinary instruction, enhanced movement and exercise, mindfulness training, and health coaching. Importantly, TKs and their related strategies and curricula are currently being designed as "learning laboratories" across multiple organizations, including universities (eg, Dartmouth, Princeton, Stanford, University of California, Los Angeles, University of California, San Diego, University of Minnesota, University of Texas Medical Branch, University of Vermont, Vanderbilt, and others), corporate worksites (eg, Google, Compass), organizations in Italy and Japan, and community settings (eg, Sampson Family YMCA in Pittsburgh and L.A. Kitchen). This pilot study was an initial attempt to describe, implement, and test the feasibility of a TK curriculum in a worksite setting.

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With obesity, type 2 diabetes, and heart disease on the rise in the United States and globally,[1-6] there is continued interest in educational programs that can predictably alter the health care trajectories of those who have already developed chronic health challenges or are at elevated risk for developing them.[3] Most diet programs show evidence of helping people reduce their cardiovascular risk through weight loss; however, the effects of various diet programs are typically short lived, and the magnitude of benefit is typically small.[4,5,7] In light of these observations, "diets" may be insufficient to bend the global trajectory with regard to chronic diseases associated with suboptimal lifestyle choices.

Innovative approaches to weight management, cardiovascular risk reduction, and improved health outcomes are emerging in the literature, and include cooking programs,[8-11] mindfulness training,[12,13] exercise[14-16] and digital activity monitoring technology,[17-19] and individualized health coaching.[20,21] Existing studies are still modest in size and have included only one or a subset of all of the above-mentioned self-care strategies. The TK self-care curriculum evaluated in this study is based on the *Healthy Kitchens, Healthy Lives*® medical education conference offered annually at the Culinary Institute of America (CIA) since 2006.[22] In 2013, Eisenberg et al studied changes in self-reported nutrition-related behaviors among health care professionals attending this conference and found statistically significant improvements between baseline and 3 months after the conference in self-reported behaviors such as frequency of cooking their own meals; frequency of vegetable, nut, and whole grain consumption; ability to assess a patient's nutrition status; and ability to advise overweight or obese patients regarding nutritional or lifestyle habits.[23] The present study customized this educational content for use by a general population to determine its potential for changing behaviors known to affect health risks.

In this article, we have 2 objectives. The first objective is to report on a feasibility study to test the hypothesis that an interdisciplinary prototype TK curriculum, which includes nutrition education, hands on cooking instruction, encouragement to enhance movement and regular exercise, mindfulness training, and personalized health coaching, is (*a*) feasible for a worksite population and (*b*) has the potential to favorably affect relevant behaviors, biomarkers, and health outcomes. The second objective is to describe research methods whereby the impact of TK models can be scientifically assessed with regard to changes in (*a*) behavior, (*b*) relevant clinical outcomes, and (*c*) costs.

Methods

Program Design and Facilities

Research staff worked with subject matter experts in the fields of nutrition, culinary arts, exercise, health coaching, and mindfulness to develop a TK self-care curriculum that combines didactic instruction with experiential learning in each of the above-mentioned areas. The program included one 2.5-hour evening meeting per week and one 5-hour Saturday meeting every other weekend over the course of the 16 weeks (80 hours for the first cohort; scaled back to 70 hours over 14 weeks for the second cohort due to scheduling constraints of the CIA). The classes for this feasibility study took place at the CIA's campus in Hyde Park, New York, for its access to auditorium-style demonstration kitchens for the weekday didactic class and hands-on TKs for the weekend participatory cooking classes.

During the weekday classes, which were facilitated by a research member (either an MD, RD, or MPH), participants watched a chef educator demonstrate cooking techniques necessary to prepare simple, healthy meals at home (eg, whole grain cookery, stock and soup basics, salad composition, and salad dressing techniques). Participants then listened to a lecture by a subject matter expert and/or participated in discussions about one of the other educational topics, including nutrition, movement, and mindfulness.

Individuals had access to all course materials through a secured online course management system and were encouraged to try the various cooking techniques and other life skills at home throughout the week. There were no dietary prescriptions, and the intake during the study was ad libitum. However, the educational components, for example, didactic instruction with regard to why certain foods should be encouraged and others discouraged and the scientific rationale for these recommendations, were conveyed in the hope of altering subjects' dietary choices and behaviors over time. With complementary access to a local gym facility and a personal activity-tracking device provided by the study, individuals were encouraged to increase their physical activity throughout the program. Participants were also matched with a paid certified health coach (through *Wellcoaches*®) who provided regular 30-minute phone calls up to once a week throughout the duration of the 14- to 16-week program in order to help participants leverage their personal motivation to change relevant behaviors. The research team created a general overview of the curriculum but made minor changes to the weekly classes based on weekly feedback from participants.

During the biweekly Saturday classes, study subjects participated in hands-on culinary lessons in a CIA TK, working in assigned teams of 5 to create the recipes demonstrated by chef instructors in the weekday classes of the previous 2 weeks. They shared a "mindful" lunch (practiced techniques to savor and appreciate eating) of the foods they prepared, and listened to a registered dietitian share tips for enjoying nutritionally balanced and properly portioned meals. They then participated in a group discussion about their experiences, challenges, and successes with each element of the program.

The program ended with a banquet event in which teams were tasked with the preparation of a menu of unique dishes (inspired by the basic techniques taught in class) to be shared with their families and "judged" by the instructional team. Participants also had the option of reading aloud excerpts from personal

statements they were asked to write to express what they had learned from the program and what they were committed to continuing.

Participants and Recruitment

Two cohorts of CIA employees, from whom chefs were excluded, were invited to participate in this pilot program, which was approved by Harvard T.H. Chan School of Public Health's Institutional Review Board. Recruitment occurred at 2 intervals, once in October 2013 for enrollment of the first cohort, and once in February 2014 for enrollment of the second cohort. Each cohort was capped at 20 participants due to kitchen constraints at the CIA.

An email was sent to the CIA's employee population with a description of the study and expectations for participation. Interested employees emailed the study coordinator to set up an appointment to be screened, and interested spouses or partners of employees were also invited to participate and be screened. To be eligible for enrollment, potential study participants had to be between the ages of 18 and 70 years, be employees, and commit to attending all of the study-related activities. We gave priority to those with self-reported metabolic risk factors and excluded anyone with a diagnosis of cancer, unstable angina or other significant cardiovascular condition, psychiatric condition requiring psychopharmacologic medications; prior or planned bariatric surgery; pregnant or planning to become pregnant over the next year; or self-reported average consumption of >14 alcoholic drinks per week. The expectations of participants were that they attend all classes, practice cooking at home, use their gym membership, and participate in health coaching sessions. There were no direct incentives beyond the free resources and food provided as part of the program.

Instruments and Outcome Measures

Feasibility was assessed through recruitment and attendance records and adherence to the data collection protocol. Participants also had regular opportunities to provide feedback, including the completion of a short evaluation form after each weekday class along with a midpoint satisfaction survey.

Biometric and self-reported behavioral outcomes were assessed 4 times: at baseline, after the 14- or 16-week educational intervention, 6 months, and 12 months. Participants had biometric screenings at each interval through a local HealthQuest facility to measure height, weight, waist circumference, blood pressure, as well as fasting glucose, total cholesterol, high-density lipoprotein (HDL), low-density lipoprotein (LDL), and triglycerides. Participants also completed, at the same 4 intervals, a packet of 6 validated instruments to assess behavioral changes in each of the domains addressed in the curriculum, including cooking frequency and confidence,[24] dietary intake,[25] exercise frequency and intensity,[26] mindful eating practices[27] and other measures of stress,[28] and perceived well-being.[29]

Because few published studies have examined changes in food purchasing from this type of nutrition education intervention, we attempted to assess the feasibility of receipt collection for tracking potential changes in food purchases over time. Participants were instructed to collect all food-related receipts for a 1-week interval at baseline, midpoint, and postprogram.

Data Analysis

Biometric and behavioral data were combined for both cohorts and analyzed using SAS version 9 (SAS Institute, Inc, Cary, NC). For continuous outcome measures, 1-sample paired Student's *t* tests were used to test for statistically significant differences between baseline and postprogram, 6 months, and 12 months. For categorical outcome measures, the differences between baseline and postprogram, 6 months, and 12 months were tested through generalized estimating equations models for repeated measures. Questionnaires were also evaluated for their usefulness in assessing the desired outcomes for inclusion in future studies.

Qualitative feedback data from baseline questions involving motivations and aspirations, the midpoint surveys, weekly feedback surveys, and personal statements were also collected. During this pilot phase, we informally used these data to help refine classes; however, we did not include formal methods for qualitative assessment.

Receipts for food purchases from stores and restaurants over a 1-week period at baseline, midpoint, and postprogram periods were collected and manually entered into a database. We created categories of food purchases into "healthier" versus "less healthy" items by modifying food lists created by French et al[30] in a similar receipt collection investigation. We adapted these food categories with the most up to date dietary data used to create the Alternative Healthy Eating Index[31] to create our own food categories (see the appendix for food category lists created for this pilot study).

Results

Feasibility Assessments

CIA employees (excluding culinary staff; n = 482) were sent 2 emails per cohort for recruitment into the study. Within 14 days of this notice, approximately 13% (n = 63) of eligible employees expressed interest in participating, and 15 indicated interest in having their spouse or partner be considered for enrollment in the study. Sixty-five people were screened, and ultimately, 40 people, or 8.3% of all eligible and 52.4% of employees expressing interest (33 employees, 7 non–employee spouses), were enrolled. The 40 study participants ranged in age from 23 to 67 years (mean = 47.5), were predominately female (70%), overweight or obese (93%), and represented a wide range of work departments (including facilities/housekeeping, financial aid, residence life, human resources, admissions, career services, and others) and individual cooking abilities and self-care aspirations. At baseline, most

Table 1.

Baseline Characteristics of Study Participants.

	Cohort 1	Cohort 2
N	20	20
Mean age (range)	47 (23-67)	48 (31-66)
% Female	75%	65%
Number of singles	14	10
Number of couples	3	5
Children at home	40%	25%
Obese (BMI > 30)	11 (55%)	14 (70%)
Overweight or obese (BMI > 25)	18 (90%)	19 (95%)
Elevated waist circumference (>35 in. women, >40 in. men)	15 (75%)	14 (70%)
High blood pressure (≥130/85 mg/dL)	12 (60%)	5 (25%)
High total cholesterol (≥200 mg/dL)	7[a] (37%)	7 (35%)
High triglycerides (≥150 mg/dL)	7[a] (37%)	5 (25%)
High fasting blood sugar (≥100 mg/dL)	4[a] (21%)	5 (25%)
Metabolic syndrome[b]	8[a] (42%)	3 (15%)
No known metabolic risk factors	4 (20%)	5 (25%)

Abbreviations: BMI, body mass index; HDL, high-density lipoprotein.
[a]N = 19, as the local laboratory was unable to process the baseline blood work of one study subject.
[b]Metabolic syndrome Is clinically classified as having at least 3 of the 5 metabolic risk factors: elevated waist circumference (>35 in. women, >40 in. men), high triglycerides (≥150), low HDL (≤40 men, ≤50 women), high blood pressure (≥130/85), high fasting blood sugar (≥100).

participants (80%) had at least one elevated cardiovascular risk factor and 11 (27.5%) had metabolic syndrome, while 22.5% had no known risk factors. There were 8 couples that jointly participated in all classes, and about one third of participants had children living at home (Table 1).

Program completion was 100% for both cohorts with no dropouts and high attendance rates (86% in Cohort 1, 92% in Cohort 2). Response rates for completing pre-post questionnaires and obtaining blood tests were ~100% for all measures (Note: HDL was only collected for Cohort 2), and dropped to 90% at 6 months and 80% at 12 months, owing in part to 4 subjects changing employment during the follow-up period.

Biometric Assessments

Pilot biometric data from baseline to 14 to 16 weeks (Table 2) suggested statistically significant ($P < .05$) decreases in body weight, BMI, waist circumference, systolic and diastolic blood pressure, and total cholesterol in our sample of 40. Changes in triglycerides, HDL, and LDL trended down, while fasting glucose increased slightly, but none of these measures was statistically significantly different at the end of the educational intervention.

Biometric data at 6 months (n = 37) suggested a persistence of significant ($P < .05$) changes from baseline for weight (−4.2 kg [SD 6.5]), systolic blood pressure (−10.08 mm Hg [SD 119.07]), diastolic blood pressure (−8.24 mm Hg [SD 11.72]), and waist circumference (−3.24 in. [SD 3.09]); but were no longer statistically significant for changes in total cholesterol (−5.22 mg/dL [SD 20.45]; $P = .13$). Changes in triglycerides ($P = .22$), HDL ($P = .78$), LDL ($P = .40$), and blood glucose ($P = .73$) remained nonsignificant.

At 12 months (n = 32), only changes from baseline in diastolic blood pressure (−4.25 [SD 9.37]) and waist circumference (−3.21 in. [SD 3.22]) remained statistically significant ($P < .05$). Changes continued to trend downward as compared with baseline, but were no longer statistically significant for decreases in weight (−1.3 kg [SD 6.33]; $P = .26$), and systolic blood pressure (−4.63 mm Hg [SD 17.21]; $P = 0.14$) at 12 months; and changes in other biometric measures remained nonsignificant.

Behavioral Change Assessments

Overall, we observed self-reported changes in a range of behaviors toward more desirable health habits taught in our program as assessed by the outcome instruments used (Table 3). Table 4 summarizes responses from the questionnaire regarding cooking patterns. These show improvements from baseline to end of program in the following measures: cooking meals from scratch at home more often, cooking convenience and ready-made meals less often, reading nutrition labels on purchased foods more often, and feeling more confident cooking, following a recipe, tasting new foods, and cooking new foods and recipes. All of these improvements persisted but appeared to have diminished slightly at 6 and 12 months.

We collected approximately 400 food purchase receipts in total from all of the participants. Ninety-seven percent of the households submitted at least one food receipt; however, the complete receipt

Table 2.

Changes in Biometrics at Baseline and Immediate Postintervention (16 or 14 Weeks) for Both Cohorts (n = 39[a]).

Outcome	Baseline Mean (SD)	Postintervention Mean (SD)	Mean Change	% Change	*P* Value[b]
Weight (kg)	92.7 (25.7)	89.9 (24.6)	−2.8 (4.0)	−1.2%	<0.05
BMI (kg/m^2)	33.3 (8.4)	32.3 (8.1)	−1.0 (1.5)	−2.7%	<0.05
Waist circumference (in.)	41.3 (8.0)	39.5 (7.9)	−2.2 (2.8)	−4.6%	<0.05
SBP (mm Hg)	134.3 (20.0)	126.5 (17.5)	−7.7 (15.5)	−5.6%	<0.05
DBP (mm Hg)	82.0 (10.2)	75.7 (11.9)	−6.3 (9.1)	−7.9%	<0.05
Total cholesterol (mg/dL)	187.1 (41.7)	179.5 (41.9)	−7.5 (23.1)	−4.4%	<0.05
Triglycerides (mg/dL)	124.5 (93.8)	112.3 (53.5)	−12.2 (70.1)	−9.8%	0.28
HDL (mg/dL)	52.4 (17.5)	50.5 (14.3)	−1.9 (4.9)	−3.6%	0.10
LDL (mg/dL)[c]	105.0 (34.5)	102.4 (33.6)	−2.6 (14.7)	−2.5%	0.44
Fasting glucose (mg/dL)	110.0 (53.3)	112.3 (53.7)	2.4 (13.5)	+2.1%	0.28

Abbreviations: BMI, body mass index; SBP, systolic blood pressure; DBP, diastolic blood pressure; HDL, high-density lipoprotein; LDL, HDL, low-density lipoprotein.
[a]N = 39 instead of 40 because measurements were not available for one participant due to a logistical lab error.
[b]The baseline to postintervention difference for continuous variables were tested using 1-sample paired Student's *t* tests. $P < .05$ indicates statistically significant differences.
[c]LDL measures were only taken in Cohort 2, N = 20.

Table 3.

Questionnaires Used to Assess Behavioral Change.

Domain Assessed	Reason(s) for Choosing This Instrument	Suggestive Observations From Pilot Study Data[a]	Questionnaire Recommended for Use in Future Studies and Rationale
I. Dietary Intake/Eating Profile[25]	Short, simple 21-item validated tool with aggregate score that distinguishes characteristics of a healthy versus less healthy diet.	Increased consumption of dark leafy greens, fish/seafood, and whole grains, and less beef/pork/lamb, processed meat, refined grains, and baked goods.	Questions did not capture as extensive dietary changes as encouraged in our program (eg, eating freshly prepared whole foods vs processed food). We will consider a modification of the assessment tool we used, possibly the "blinded" Food Frequency Questionnaire[38] along with a 3-day food diary.

(continued)

Table 3. (continued)

Domain Assessed	Reason(s) for Choosing This Instrument	Suggestive Observations From Pilot Study Data[a]	Questionnaire Recommended for Use in Future Studies and Rationale
II. Cooking Frequency and Confidence[24]	Limited number of validated cooking assessments available. This 17-item tool captures changes in cooking frequency and confidence in 7 questions.	Cooked convenience/ready-made meals less often. Read food labels more often. More confident about: ability to cook from basic ingredients, following a simple recipe, tasting new foods, and preparing and cooking new foods and recipes.	Questions clear and easy to understand; however, some questions in this instrument were not specific to skills taught in the program.
			Consider changing to assess self-efficacy and attitudes toward cooking.[39]
III. Exercise Frequency & Intensity[26]	Validated, simple and widely used assessment tool to measure MET-hours/week.	Suggestive increases in: METs-hour week, walking pace, number of days per week of exercise, number of flights of stairs climbed daily.	Consider changing to International Physical Activity Questionnaire for Adults[40] to assess more specific exercise and movement habits; however, more complete assessments and data tracking using wearable devices to be considered.
IV. Perceived Stress[28]	Validated, widely used, 10-item tool to assess changes in the levels of experienced stress.	Suggestive decrease from higher stress at baseline to average stress levels at the end of the 14- to 16-week program.	Questions easy and interpretable from study participant and analysis perspective.
			Continue to use this instrument.
V. Well-being[29]	Validated 26-item tool used in similar health intervention studies to capture 6 categories of physical and emotional well-being.	Suggestive improvements in: perceived sense of disease risk, physical response to diet, meal preparation and time costs, inconvenience for family and outside of home, and food deprivation and dissatisfaction.	Questions not directly relatable to lessons taught in our program. Data collected were not clearly interpretable.
			Consider changing to RAND 36-Item Short Form Health Survey[41] using subscales for general health, energy/fatigue, and emotional well-being.
VI. Mindful Eating[27]	Validated 28-item tool with one aggregate score that focuses specifically on mindful eating practices.	No average changes in mindful eating as assessed by total score using this instrument.	Continue to use this instrument for now as it is the only validated mindful eating tool currently available; however, a more global assessment of mindfulness may be preferable.
		This lack of change in scores was inconsistent with subjective descriptions by participants.	

[a]Pilot study was not powered to provide stable estimates from statistical analyses. These results are only suggestive of trends seen in this sample of 40 from baseline to end of the intervention at 16 or 14 weeks. Many of these suggestive trends were no longer observed or lessened throughout the 12-month follow-up period. Identical questionnaires were used at all 4 time points and responses may not reflect self-perceived changes from baseline, but rather from the last time subjects were asked the same question. In future studies, we may develop our own additional questionnaires, such as surveys to assess perceived creativity and work-life balance; and wording of all instruments may explicitly ask respondents to compare their current behaviors or perceptions to those assessed previously (ie, at baseline or as compared with specific prior interval assessment).

Table 4.

Self-Reported Cooking Frequency and Confidence in the Kitchen.

Frequency/Confidence Performing Task, n = 40	Time of Assessment	% Never/Not at All	% Sometimes/ Somewhat	% Always/Very	# of Responses
1. How often do you cook convenience and ready-made meals	Pre	20.5	66.7	12.8	39
	Post	45.0	55.0	0	40
	6 months	50.0	50.0	0	36
	12 months	37.5	53.1	9.4	32
2. How often do you prepare and cook a main meal from basic ingredients	Pre	18.4	55.3	26.3	38
	Post	0	46.2	53.9	39
	6 months	0	55.9	44.1	34
	12 months	0	56.3	43.75	32
3. How confident do you feel about being able to cook from basic ingredients	Pre	10.3	38.5	51.3	39
	Post	0	17.5	82.5	40
	6 months	0	2.8	97.2	36
	12 months	0	12.5	87.5	32
4. How confident do you feel about following a simple recipe	Pre	0	30.8	69.2	39
	Post	0	5.1	94.9	39
	6 months	0	5.6	94.4	36
	12 months	0	6.3	93.8	32
5. How confident do you feel about tasting new foods	Pre	0	41.0	59.0	39
	Post	0	17.5	82.5	40
	6 months	0	25	75	36
	12 months	0	21.9	78.1	32
6. How confident do you feel about preparing and cooking new foods and recipes	Pre	5.13	46.2	48.7	39
	Post	0	25	75	40
	6 months	0	22.2	77.8	36
	12 months	3.1	21.9	75	32
7. Do you read nutrition labels on purchased foods	Pre	15	57.5	27.5	40
	Post	0	27.5	70	40
	6 months	0	25.7	74.3	35
	12 months	0	34.4	65.6	32

collection protocol requiring a full week of all food and restaurant receipts was only completed by 60% of the participants, making results from any of the analyses highly prone to selection bias and therefore our analyses are not reported. Additionally, we found our receipt collection methodology, with paper copies of receipts from supermarkets, restaurants, and convenience stores, cumbersome. Moreover, the lack of computerized data entry systems made this approach inefficient and of questionable reliability. Regular use of a personal activity monitoring device (pedometer) throughout the duration of the program varied with 65% of Cohort 1 compared to 100% of Cohort 2 wearing the devices. Seven participants lost the device and received a replacement. In addition, 90% (n = 36) of participants accessed the gym facility at least one time, but frequency of use varied with less than half (45%, n = 18) of participants having accessed the gym 10 or more times during the study period. (Note: Some subjects belonged to other gym facilities, precluding their use of the gym facility that was offered as part of this pilot study.) Ten individuals (25%) continued their membership (at their own expense) at the participating gym after the program.

Participants were matched with 1 of 4 health coaches based on logistics of scheduling and were encouraged to talk with their health coach once a week. The majority (73%) of all participants consulted with their health coach more than every other week for 14 to 16 weeks, with few missed appointments or late cancellations (<5%). The feedback with regard to health coaching was positive as multiple participants conveyed the perception that health coaches customized the program for each individual by (*a*) helping them identify personal motivations and (*b*) talking through personalized strategies for implementing new life skills learned during the educational intervention.

Discussion

To our knowledge, this is the first study to investigate the feasibility of an interdisciplinary approach to improved health and wellness that includes hands-on culinary instruction, mindfulness training, and health coaching, in addition to nutrition education and physical activity promotion. We conducted this pilot with the involvement of CIA (nonculinary) employees as proxies for employees at other self-insured organizations across the United States. Our results suggest that this prototype TK self-care curriculum was feasible in this particular workplace setting given the ease of recruitment, 100% program completion, high attendance, and high response rates on repeated assessments. It is important to note that this was the first implementation of this prototype TK program and therefore not necessarily representative of all potential TK models in terms of choice of facilities, core content, feasibility and effectiveness.

It is also worth noting that this model, unlike interventions that are based on restrictive "diets," allowed for an ad libitum food intake on the part of TK trainees, thereby allowing them to establish new dietary habits in the absence of strict prohibitions and the concomitant feelings of perceived deprivation which often accompany many "diets." As such, this prototype model may be of interest to individuals who are not interested in restrictive "diets," or those for whom "diets" have not led to successful and sustained behavioral and clinical change.

This program was well received by the study subjects most likely because of its interdisciplinary approach, incorporating both didactic and experiential learning in a group setting, and access to individualized health coaching. Little is known about the combined effect of multiple components and/or their relative contribution to observed changes in relevant outcomes. A growing body of research is showing the positive effects of health coaching,[32] and we feel that this is a critical component of future models of sustainable, enhanced behavior change. Additionally, the US National Board of Medical Examiners has partnered with the National Consortium for Credentialing Health & Wellness Coaches to create a certification for health coaches,[33] thereby setting core competency standards in an area relevant to the future refinement of TK programs.

As we observed in our pilot, physiological and behavioral changes that study subjects experienced during the intervention appeared to diminish over the course of 12 months and this, in hindsight, may have been due to the lack of built-in follow-up support after month 4 in the initial prototype protocol. This was due to financial limitations of the pilot. Prior studies have indicated that ongoing reinforcement of learned behavioral change is essential to the formation of sustained change.[32] More built-in follow-up opportunities, along with additional ongoing offerings of a TK program for employees in a worksite setting, may serve to engage additional employees and thereby shift a corporate worksite in the direction of enhanced, and more sustained, self-care and wellness, thereby promoting a "culture of health."

This prototype TK curriculum, which was designed with extensive input from professional chef educators at the CIA, included the conceptual notion of "technique driven, recipe inspired" culinary instruction. This is typical of professional culinary instruction and was viewed as a key asset to this novel curricular model. Instead of teaching trainees how to make an individual "recipe," each week was focused on 1 or 2 essential culinary "techniques" (such as how to make a soup, or a whole grain, or a salad and salad dressing) with the goal of showcasing a core technique instead of an individual recipe using that technique. Once the technique had been applied to any singular recipe, trainees were shown and encouraged to apply this core technique to variations of the initial recipe (ie, a range of soups, salads, and whole grain dishes) but with a customization of essential ingredients, spices, flavorings, and presentations. As such, this "technique driven, recipe inspired" aspect of this TK prototype curriculum was a unique feature of this prototype TK curriculum.

While subjects in this pilot study stated that their culinary skills had improved over the course of 14 to 16 weeks (and investigators and chefs overseeing the pilot observed this to be true), we did not collect objective data (ie, photos, videos, blind tastings) to confirm these self-reported data. There is currently no validated tool whereby culinary skills, competencies, and proficiencies—or their improvement over time—can be objectively measured. Instead, the current state of the science relies entirely on self-report, which may be highly unreliable.

Importantly, this is a limitation of this study and all current studies involving culinary instruction. Moreover, this highlights the need for the development of such evaluative tools, ideally with the combined input of researchers, trained chefs, and relevant experts in emerging technologies, for example, computerized visual recognition platforms.

Regarding the tracking of physical activity, the personal activity monitors we used were in their early phases of development and, as such, were sometimes cumbersome for the participants to wear. It was not uncommon for a participant to lose them. Additionally, the format by which the data were collected was difficult to manipulate and incomplete (because of lost monitors). We therefore chose not to analyze these data, but rather to work on further refinements of this aspect for future TK trials. Specifically, future studies will benefit from emerging IT platforms that allow for data capture from all commercially available energy tracking devices, regardless of manufacturer, and these will be routinely employed in clinical trials involving counseling in the areas of movement and exercise.

An additional limitation of this study was the setting of the CIA, where employees were recruited as proxies for employees at other corporate organizations and worked in proximity to kitchen facilities that are not generally representative of facilities currently available at worksites, schools, universities, and community-based venues. Use of the CIA's demonstration and TKs raises the question as to whether this model is feasible and replicable elsewhere and, therefore, generalizable. As dozens of US health care facilities and corporate worksites have already built demonstration and/or TK facilities, we see this as a trend that may allow for an expansion of this line of inquiry for use by employees, K-12 and university students, patients, and community-based populations nationwide.[3,34,35]

While this pilot made use of a built-in kitchen, another approach would be to refine the curriculum to be delivered using portable, or "pop-up," kitchen facilities consisting of inexpensive cook tops, portable ovens, and access to cafeteria sinks and refrigerators. This "pop-up" approach, ideally suitable for any worksite (or school/community venue) with a cafeteria, could potentially address relevant concerns about the need to minimize start-up costs and increase the program's scalability and generalizability at sites that do not envision the build out of expensive, built in, kitchen facilities.

In our case, the cost of developing and implementing this pilot curriculum, including research personnel time in addition to culinary instruction and food costs, was prohibitively expensive (ie, several hundred thousand dollars over 2 years) and only made possible due to generous donor support and in-kind contributions by the coauthors' partnering institutions. The bulk of these expenses, however, related to the research infrastructure (such as salary support for co-investigators) necessary to recruit and follow study participants over 12 months. By comparison, the food costs per subject were estimated at $400 per person per cohort.

Further refinement of this prototype curriculum will need to explore how it can be made more cost-effective and readily accessible to larger audiences using videotaped and other web-based components. The curriculum will also need to be customized for different high- and low-risk populations, with or without spousal/partner participation, across different workplaces, kitchen facilities, socioeconomic populations, and community settings. Lastly, future evaluations will benefit from the incorporation of relevant financial data to assess potential cost-saving benefits for employees and their third-party payers, some of which may be enhanced by employee incentive programs as are occurring more frequently across the corporate landscape.[36,37] These future refinements are precisely the goals of the recently launched Teaching Kitchen Collaborative, which involves 32 member organizations with TK programs.[34]

This TK intervention should be viewed as an "initial prototype" with the understanding that there will likely be a range of TK models that, over time, can and should be implemented, evaluated, and refined for their application to different populations, including (*a*) patients with increased cardiovascular risk; (*b*) employees with and without chronic disease at worksites; (*c*) students in K-12, college, and university settings; (*d*) retirees; (*e*) community populations; (*f*) military and VA populations, and others. In addition, TK curricula, if implemented and shown to be replicable and effective, should, ideally, be customized in order to meet the specific needs, aspirations, and financial requirements of each individual population and setting. This portfolio of research is being planned by the recently launched Teaching Kitchen Collaborative.[34]

Our results suggest that a TK and self-care curriculum involving hands-on culinary education, mindfulness training, health coaching, nutrition instruction, and exercise promotion is feasible and that the impact of TK programs on relevant behavioral and clinical outcomes can be measured. Given trends with regard to obesity and diabetes, and in light of societal aspirations to move from a fee for service to a capitated scheme of medical reimbursement, thereby incentivizing patients, providers, and payers to keep people well,[35] additional research involving the models and parallel curricula being devised by additional groups with TKs is recommended.

In terms of future research in this area, it will be important to demonstrate that TK curricula are or are not (*a*) replicable from site to site; (*b*) adaptable to a range of study populations; (*c*) capable of demonstrating predictable changes in behaviors, clinical outcomes, and, ideally, costs; (*d*) superior to existing, popular "diets" in terms of changes over time and sustainability of these changes over time; and (*e*) capable of demonstrating sufficient return on investment to warrant third party payment and/or inclusion in employee benefits.

Appendix

List of Food Categories Created for This Pilot Study.

Meats and Eggs	
Leaner meats: more healthy	Poultry, fish
Eggs and egg substitutes: more healthy	Shell eggs, egg beaters, carton egg whites
Red or processed meats: less healthy	Beef, pork, lamb, lunchmeat, hotdogs
Vegetables (including greens, tomatoes, avocados)	
Whole vegetables: more healthy	Fresh, canned, frozen vegetables
Modified vegetables: less healthy	Vegetables in cream sauce, fried potatoes
Fruits	
Whole fruits: more healthy	Fresh, canned, frozen, dried unsweetened fruits
Modified fruits: less healthy	Canned in syrup, applesauce, sweetened fruits
Grains	
Whole grain products: more healthy	Whole grain bread, cornmeal, plain popcorn
Simple carbohydrate products: less healthy	White bread, sugary cereals, pie crusts
Beans/Legumes/Pulses	
Whole products: more healthy	Dry or canned beans, peas, chickpeas
Modified products: less healthy	Refried beans, baked beans
Nuts/Seeds	
Whole products: more healthy	Walnuts, sunflower seeds, natural peanut butter
Modified products: less healthy	Honey-roasted peanuts, peanut butter with added sugars
Fats	
Plant-based fats: more healthy	Olive oil, canola oil, vegetable shortening
Animal-based fats: less healthy	Butter, lard
Trans fats: less healthy	Margarine
Snacks and Sweets	
Salty snacks: less healthy	Chips, pretzels, flavored popcorn
Sweetened snack foods: less healthy	Cookies, donuts, ice cream, sweetened yogurt

(continued)

Appendix. (continued)

Beverages	
Noncaloric beverages: more healthy	Water, unsweetened tea, coffee
100% fruit/vegetable juices: more healthy	V8, Tropicana orange juice
Sugar-sweetened beverages: less healthy	Sugary sodas, sweetened tea
Premade Foods	
Prepackaged entrees: less healthy	Frozen pizza, canned soup
Deli foods (otherwise unclassifiable): less healthy	Coleslaw, potato salad
Eating Out (for counts and dollar amounts only)	
Leaner meat or vegetarian entrée: more healthy	Grilled chicken salad, veggie burger
Side dish, fried: less healthy	French fries, onion rings
Appetizer: less healthy	Egg roll, mozzarella sticks
Red or processed meat entrée: less healthy	Hamburger, pork chop
Side dish, nonfried: more healthy	Cooked vegetable, side salad
Dessert/sweetened snacks: less healthy	Milkshake, doughnut

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FREQUENTLY ASKED QUESTIONS

Future Education Model Accreditation Standards for Programs in Nutrition and Dietetics

June, 2017

Accreditation Council for Education in Nutrition and Dietetics

the accrediting agency for the Academy of Nutrition and Dietetics

ACEND began work several years ago to develop standards for future education model associate, bachelor and graduate degree programs. This document is a compilation of the questions that have been asked about the *Future Education Model Accreditation Standards* and ACEND responses related to the future education model.

Future Education Model

Question: What data support the Future Education Model?

ACEND Response: The *Rationale Document*, published by ACEND, provides the environmental scan information and summarizes data collected from a wide array of stakeholders that supports the Future Education Model. The environmental scan included review of more than 100 relevant articles detailing research data, industry trends and the changing health care and business environments. In addition, four different data collection projects (focus groups, structured interviews, and two online surveys) were completed to gather information from stakeholder groups about future practice in nutrition and dietetics. More than 10,000 responses from practitioners, employers, educators, students, administrators and professionals working with nutrition and dietetics practitioners were evaluated. A competency gap analysis was completed to determine gaps between the current competencies and expected practice of nutrition and dietetics in the future. These gaps provided justification for the new education model that will be based on competencies to be demonstrated by future nutrition and dietetics practitioners. A multi-phase Delphi process, which involved educators, practitioners, employers and practitioners outside the profession of nutrition and dietetics, identified the needed competencies and performance indicators for future practice. The *Rationale Document*, which provides details on these results, can be viewed at www.eatrightprog.org/FutureModel.

Question: What does it mean when ACEND says that the future education model programs will be competency based?

ACEND Response: The future education model standards for associate, bachelor and graduate degree programs will delineate the competence expected of program graduates and provide performance indicators that help define the level of expected performance. Knowledge domain statements will not be included in the future education model standards. Programs will decide what knowledge base is needed by students to help prepare them to be able to demonstrate the required competence.

Question: The future education model includes integrated experiential learning in each degree level program, what does that mean?

ACEND Response: ACEND intends that the experiential learning components will be integrated with the coursework to prepare students to demonstrate the competencies for each of the academic degree level programs (associate, bachelor, graduate). ACEND will encourage innovation in how this experiential learning and its integration are done and will use the demonstration programs to help define options for how this integration might be accomplished.

Question: Is completion of one future education model degree program required to enter a higher degree level future education model program?

ACEND Response: Each of the future education model degree programs is intended to stand alone. ACEND did not set prerequisite requirements for each of the degree level programs. Rather, individual programs will set their own admission requirements. A future education model graduate degree program could for example, choose to require completion of the future education model bachelor degree program as a prerequisite, could require specific courses as prerequisites or could choose not to require any prerequisites.

Future Education Model (cont.)

Question: Why were the master's degree standards changed to graduate degree standards?

ACEND Response: ACEND received many comments encouraging development of standards for doctorate degree programs and had several programs question whether they could develop a doctorate program under the Future Education Model Master's Degree Standards. After much discussion, ACEND chose to add flexibility to the standards by identifying them as graduate degree standards and allowing both master's and doctorate degree demonstration programs to be developed. ACEND will collect data from these programs to inform the content and requirements in future standards.

Question: The competencies for the future education model graduate degree program are preparing graduates for a higher level of practice; is it realistic to achieve all of those competencies in a two year master's degree program, for example?

ACEND Response: The *Future Education Model Accreditation Standards* for master degree programs identify the competencies required of graduates of that program. Programs are allowed to determine the prerequisites for students to enter their program and could require coursework or experiences that demonstrate some of those competencies be achieved prior to entering the program.

Question: How will the associate degree prepared nutrition health worker differ from the current community health worker?

ACEND Response: The competencies expected of the associate degree prepared nutrition and dietetics practitioner are included in the future education model standards. The educational preparation for the nutrition health worker is planned as an associate degree and the competencies include specific foundational knowledge and practice skills in food and nutrition. Thus this practitioner will have more in-depth preparation and more knowledge specifically related to food and nutrition than community health workers who generally have many fewer hours of education, typically through a certificate program. There may be some overlap in the skill set between the two practitioners as it relates to health and cultural competency; the preparation that community health workers receive in earning a certificate may be able to be counted to meet some of the competencies required in the associate degree curriculum.

Question: What do the data ACEND collected suggest for future practice of the registered dietitian nutritionist?

ACEND Response: The data (environmental scan, focus groups, structured interviews, online surveys, competency development Delphi process) collected by ACEND revealed an emergence of non-traditional practice settings for the field of nutrition and dietetics, such as telenutrition. There is an expected expanding scope of practice for those working in the profession including an increased focus on disease prevention and integrative healthcare and the need for more knowledge in emerging areas such as genomics, telehealth, behavioral counseling, diet prescription and informatics. This work requires that health care professionals work more interprofessionally. Practitioners need to be able to read and apply scientific knowledge and interpret this knowledge for the public. Many of the stakeholders identified gaps in current competencies in areas of research, leadership/management skills, cultural care, basic food and culinary preparation and sustainability. Employers indicated the need for improved communication skills in nutrition and dietetics practitioners and an improved ability to understand the patient's community and cultural ecosystem. Employers also expressed a desire for stronger organizational leadership, project management, communication, patient assessment and practice skills. Employers indicated that more time might be needed in the preparation of future nutrition and dietetics practitioners to assure application of knowledge and demonstration of skills needed for effective practice. After thorough review of these data, ACEND believes that a minimum of a master degree will be needed to adequately prepare graduates with the complexity, depth and breadth of knowledge and skill needed for future practice as a registered dietitian nutritionist.

Future Education Model (cont.)

Question: Graduate degrees often focus on a specific area rather than a general area, why do the Future Education Model Accreditation Standards include competencies across multiple rather than specific areas of practice?

ACEND Response: Because stakeholders expressed the need for future nutrition and dietetics practitioners to be prepared with a broad spectrum of skills (professional research and practice skills; teamwork and communication skills; clinical client care skills; community and population health skills; leadership, management and organization skills; and food and foodservice systems), ACEND included all of these skill sets in its graduate degree program competencies. The *Future Education Model Accreditation Standards* do not specify the focus of the degree but do identify the competencies expected of graduates. Each programs will determine the focus and title of its graduate degree program.

Question: Will a program director need to assess all of the competencies and the performance indicators for a Future Education Model degree program?

ACEND Response: The *Future Education Model Accreditation Standards for Associate, Bachelor and Graduate Degree Programs* indicate that program directors will need to show, on their curriculum map, where the required competencies and any performance indicators that are included in the curriculum are being taught (Standard 4, Required Element 4.1). However, program directors will report assessment of only the required competencies in their Competency Assessment Plan (Standard 5, Required Element 5.1).

Question: Could future education model graduate degree programs admit students who have not completed an undergraduate dietetics program?

ACEND Response: The *Future Education Model Accreditation Standards* do not stipulate any prerequisite requirements for students entering the program. Each program will set the prerequisite requirements for admission into its program and will be responsible for ensuring that its graduates achieve the competencies specified for that degree level program.

Question: Under the Future Education Model Accreditation Standards can the hours of coursework or experiential learning from one degree level program be counted towards experiential learning of the next degree level?

ACEND Response: The *Future Education Model Accreditation Standards* require programs to have policies related to assessment of prior learning. The decision on whether previous course work or experiential learning will be recognized will be made by the program director.

Question: If future education model programs have different prerequisite requirements, will the quality of the graduates vary?

ACEND Response: The *Future Education Model Accreditation Standards* specify the competencies that will be expected of each graduate and include example performance indicators that students may complete to demonstrate competence. Programs may choose from the list of example performance indicators or develop their own performance indicators; it is not necessary for every student to perform every performance indicate in order to demonstrate competence. All graduates of Future Education Model programs will be expected to have achieved the same competencies. Program length may vary depending on the program's designed curriculum and the amount of time it takes to assure graduates meet all of the required competencies.

Question: Why are concentrations not required in the Future Education Model Accreditation Standards?

ACEND Response: The *Future Education Model Accreditation Standards* are preparing graduates with a higher level of skills across various areas of practice. Because many of these skills are new, ACEND did not want to overburden programs with the expectation that they needed to go beyond these competencies with a concentration. Although the *Future Education Model Accreditation Standards* do not include the expectation that programs will have a concentration, programs can still have a concentration, if they choose.

Program Impact (cont.)

Question: The Future Education Model has preparation of dietitian nutritionists occurring at the graduate level in the future; does that mean that bachelor degree level Didactic Programs in Dietetics (DPD) will need to close?

ACEND Response: ACEND is not planning to discontinue any of the programs that is currently accredits. DPD programs will continue to be accredited under the *2017 Accreditation Standards*. ACEND will test the *Future Education Model Accreditation Standards* with demonstration programs that voluntarily request accreditation under these standards. Outcomes data will be collected on the demonstration programs and its graduates. These data will be analyzed before ACEND makes decisions about implementation of the Future Education Model for all programs.

Question: The Future Education Model indicates that knowledge and experiential learning will be integrated in graduate level programs preparing dietitian nutritionists; does that mean free-standing Dietetic Internship (DI) programs will need to close or merge with a university program?

ACEND Response: ACEND is not planning to discontinue any of the programs that is currently accredits. DI programs will continue to be accredited under the *2017 Accreditation Standards*. ACEND will test the *Future Education Model Accreditation Standards* with demonstration programs that voluntarily request accreditation under these standards. Outcomes data will be collected on the demonstration programs and its graduates. These data will be analyzed before ACEND makes decisions about implementation of the Future Education Model for all programs. ACEND believes there may be many ways that Future Education Model graduate degree programs might be organized. The key difference from the current DPD/DI model is that the Future Education Model graduate degree programs will integrate the experiential learning with the didactic preparation to develop competencies. Students will apply once for a program that includes both components. The *Future Education Model Accreditation Standards* allow for multiple organizations to work in partnership to sponsor a program. One of the goals of the demonstration programs, that trial the *Future Education Model Accreditation Standards*, is to identify creative ways that university-based and operations-based programs collaborate to prepare students. ACEND will share those models with educators.

Question: The Future Education Model Accreditation Standards indicate preparation of nutrition and dietetics technicians at the bachelor's degree level; does that mean that associate degree Dietetic Technician (DT) program will need to close?

ACEND Response: ACEND is not planning to discontinue any of the programs that is currently accredits. DT programs will continue to be accredited under the *2017 Accreditation Standards*. ACEND will test the *Future Education Model Accreditation Standards* with demonstration programs that voluntarily request accreditation under these standards. Outcomes data will be collected on the demonstration programs and its graduates. These data will be analyzed before ACEND makes decisions about implementation of the Future Education Model for all programs.

Demonstration Programs

Question: What are the criteria for becoming a demonstration program and how many will ACEND select?

ACEND Response: Organizations interested in sponsoring a demonstration program under the *ACEND Future Education Model Accreditation Standards* should submit the Demonstration Program Application to ACEND. The application form and information about the application process are available on the ACEND website: www.eatrightpro.org/FutureModel. Organizations do not need to currently have an ACEND-accredited program to apply. The ACEND Board plans to select up to 60 programs total to be in the first cohort of demonstration programs and is seeking a representative sample of programs in terms of geographic location, program size, and proposed program structure. Programs desiring to be a demonstration program must complete the demonstration program application, which describes how the program will be in compliance with the *Future Education Model Accreditation Standards*, must be willing to attend required ACEND training and work with ACEND to gather program and graduate outcomes data.

Demonstration Programs (cont.)

Question: What support materials and training will be provided to demonstration programs?

ACEND Response: ACEND has developed several documents to assist programs in becoming a demonstration program. The ACEND website (www.eatrightpro.org/FutureModel) contains the application templates and Guidance Information, developed for each program type, to assist program directors. A webinar describing the application process also is available. Both online and in-person training on competency based education and competency assessment will be provided/required for program directors of selected demonstration programs. ACEND staff are available at ACEND@eatright.org or 1-800-877-1600 x5400 to answer questions.

Question: What financial incentives are there for a program to become a demonstration programs?

ACEND Response: ACEND is providing a number of financial incentives to help offset the cost of establishing a program accredited under the *Future Education Model Accreditation Standards*. The program change fee ($250), candidacy application fee ($2,500) and the 2019 annual accreditation fee ($1975) all are waived for demonstration programs. In addition, ACEND will cover registration and travel expenses for the program director to attend the in-person training session in early February, 2018.

Question: Will there be more than one call for demonstration programs?

ACEND Response: ACEND anticipates having several cohorts of demonstration programs. A date for the application period for a second cohort has not yet been set but is anticipated that it will occur sometime in 2018.

Question: I have a site visit for my current program scheduled for 2018; will I still need to do that site visit if I am submitting an application to be a demonstration program?

ACEND Response: Whether you have a site visit in 2018 will depend on what is planned for your existing program. If that program is continuing as an ACEND-accredited program, then you will need to write the self-study report and host a site visit for that program to maintain its accreditation. If that program is being reorganized into a Future Education Model program, then the timing of the site visit will likely change. The plans for your program should be described in your demonstration program application. ACEND will work with demonstration programs individually to finalize when their next self-study reports and site visit will occur.

Credentialing

Question: Will a credential be available for each degree level?

ACEND Response: The Commission on Dietetic Registration (CDR) ultimately has responsibility for credentialing decisions. CDR initiates new certifications based on surveys (practice audits) of nutrition and dietetics practice roles. The results of the practice audits are used to develop the certification examination content specifications. Graduates of the future education model graduate degree would be eligible to take the registration exam for dietitian nutritionists and graduates of the bachelor degree would be eligible to take the registration exam for nutrition and dietetics technicians. Currently there is not a credential available for the nutrition health worker; CDR could explore creating a credential once sufficient numbers of these practitioners are in the workforce.

Question: Will students need to have a bachelor degree to take the NDTR credentialing exam after January 1, 2024?

ACEND Response: The Commission on Dietetic Registration (CDR) sets the criteria for eligibility to take the exam to become a nutrition and dietetics technician, registered. Currently students who have at least an associate degree and a verification statement from an ACEND accredited NDTR program and those who have a bachelor degree and a verification statement from a DPD are eligible to take the NDTR credentialing exam. At this time, CDR has not made any changes to the eligibility requirements to take that exam. Complete information about eligibility requirements can be found on CDR's website www.cdrnet.org

Additional Topics

Question: What impact will the Future Education Model have on the resources needed by institutions providing education for future nutrition and dietetics students?

ACEND Response: ACEND will gather information from the demonstration programs on the resources needed, steps involved in transitioning to the *Future Education Model Accreditation Standards* and the innovative ways resources were used to ensure that students had met the required competencies.

Question: What impact will the Future Education Model have on the cost of education for future students who want to become a registered dietitian nutritionist (RDN)?

ACEND Response: Currently most students spend at least five years to prepare to become an RDN. Approximately 40% of students completing coordinated programs and 25% of students completing dietetic internships currently pay tuition to complete a concurrent master degree program, another 25% of internship students pay tuition to earn some graduate credit with the internship and many go on to complete their graduate degree. Less than 10% of students who complete an internship do not pay at least some tuition/fees to attend that internship. The exact cost of future education model programs is not yet known as demonstration programs have not yet been identified, but the cost of requiring a master degree for entry-level practice potentially may not exceed what students are currently paying to complete a master degree in a coordinated program or with a dietetic internship.

Question: What impact will the Future Education Model have on student diversity in nutrition and dietetics programs?

ACEND Response: Ethnic diversity in student enrollment in ACEND accredited programs has increased over the past 10 years. Most notably, the number of Hispanic students has nearly doubled. ACEND talked with other health profession accreditors (Physical Therapy, Pharmacy, Occupational Therapy) who have moved their education requirements to a graduate level and learned that this change did not decrease student diversity in those professions. In pharmacy, for example, under-represented minority students (Black, Hispanic, Native American) were 10.6% of the student population in 1988, prior to implementing their practice doctorate degree requirement, and 11.4% in 2012 after implementation. Diversity of students currently enrolled in dietetic internships combined with a graduate degree (males = 10%; under-represented minorities = 9%) and in coordinated programs at the graduate level (males = 10%; under-represented minorities = 11%) is similar to the diversity of students in dietetic internship programs that do not offer a graduate degree (males = 8%; under-represented minorities = 9%). The future education model includes preparation for careers in nutrition and dietetics at associate, bachelor and graduate degree levels allowing students many options for entry into future nutrition and dietetics careers and facilitating professional growth and development through subsequent degree levels. ACEND Standards encourage programs to foster diversity in their student selection process. ACEND currently monitors and will continue to monitor student diversity in all accredited programs.

Question: What programs will ACEND accredit in the future?

ACEND Response: ACEND currently accredits six types of programs: didactic programs in dietetics (DPD), dietetic internships (DI), coordinated programs (CP), dietetic technician (DT) programs, foreign dietitian education (FDE) programs and international dietitian education (IDE) programs under the *2017 Accreditation Standards*. ACEND reviews and revises these standards (as required by USDE every 5 years) and will release new Standards in 2022.

ACEND recently released the *Future Education Model Accreditation Standards for Associate (FA), Bachelor's (FB) and Graduate (FG) Degree Programs in Nutrition and Dietetics.* ACEND will begin accrediting demonstration program under these standards in 2018.

Thus, ACEND will be accrediting nine different types of programs for a period of time; the DPD, DI, CP, DT, FDE, and IDE programs will be accredited under the *2017 Accreditation Standards* and the FA, FB, and FG programs will be accredited under the *Future Education Model Accreditation Standards*. ACEND will collect data from these future education model programs and their graduates before making a decision on which types of programs to continue to accredit. At the time of that decision, ACEND will announce which program types it will continue to accredit in the future and which program types it will discontinue to accredit. If a decision is made to implement the Future Education Model for all programs, sufficient time (likely 10 years or more) would be given for programs to make the changes needed to come into compliance with these standards.

APPENDIX TWO

Oregon/Regional Community College Nutrition Course Offerings 2017

Area Community College	Course Number	Course Name	Credits
Rogue	FN 225	Nutrition	4
Umpqua	FN 225 FN 230	Human Nutrition Personal Nutrition	4 3
Linn-Benton (also has Culinary Arts)	Nutr 104 Nutr 225 NFM 225 HE 204	OSU Orientation General Nutrition General Human Nutrition Exercise and Wt Management	 3 4 3
Clark College	HLTH 100 HLTH 104 Nutr101 Nutr139/240	Food & Your Health Weight & Your Health Nutrition Nutrition in Healthcare II&III	2 2 3 (Nursing)
Central Oregon	FN 225	Nutrition	4
Clackamas	FN 110 FN 225	Personal Nutrition Nutrition	3 4
Lane	FN 110 FN 130 FN 190 FN 225	Personal Nutrition Family Food & Nutrition Sports Nutrition Nutrition	3 3 2 4
Chemeketa	NFM 225 NFM 240	Nutrition Nutrition in the Lifecycle	4 3
Oregon Coast	FN 110 FN 225	Personal Nutrition Human Nutrition	3 4
Tillamook Bay (also has Food Science & Technology)	FN 225	Nutrition	4
Southwestern Oregon (also has Culinary Arts)	FN 155 FN 180 CTE FN 225 FN 280 CTE	Nutrition in Early Childhood Internship Nutrition Internship	2? 4
Treasure Valley	FNUT 225	Nutrition	4

Text

Blue Mountain	HE 253 FN 225 FN 230	Personal Nutrition Nutrition Children, Families & Nutrition	3 4 3
Klamath (also has Culinary Arts)	HPE 225 ECE 201	Nutrition Nutrition in ECE	3 3
Columbia Gorge	FN 225	Nutrition	4
Clatsop	FN 225	Human Nutrition	4
Mt. Hood	HE 205 FN 225	Diet Appraisal Nutrition	1 4
PCC	FN 110 FN 113 FN 199F FN 225 HE 254 HE 262 HE 264 FT 103	Personal Nutrition Everyday Cooking Farm to Preschool Nutrition Nutrition Weight & Personal Health Children's Health, Nutrition & Safety Health, Food Systems & Environment Nutrition for Fitness Instructors	3 1 1 4 3 3 3 3
CLIMB	Functional Nutrition		Non-credit

Subject Area Committee Name: Foods & Nutrition	
SAC Contact's Name: Kate Malone Kimmich	*Contact's e-mail:* kate.malone@pcc.edu

Lower Division Collegiate (LDC) SACs have a collective responsibility for the development of students for the transfer and general education degrees (AAOT, AS, ASOT and AGS). These degrees have the college's Core Outcomes as their basis.

LDC SACs are encouraged to think broadly about how content in their discipline reflects the Core Outcomes. Whenever possible, each SAC should substantially address and assess all six of the Core Outcomes in at least one of their courses. If in the careful professional judgment of the faculty all of the Core Outcomes are not relevant to that SAC's academic mission, the SAC may choose to address and assess only four of the six Core Outcomes.

The standard approach to Core Outcome assessment at PCC is "*assess - address – reassess*." While SACs are free – and encouraged - to assess the Core Outcomes in ways that make sense to them, this basic assessment model should followed:

1. identify an area of concern regarding the student attainment of a specific aspect of a Core Outcome as it is reflected in your discipline
2. assess that area of concern
3. address your findings (if called-for)
4. reassess the Core Outcome using the same or similar assessment method/process when appropriate

The last step is central to the improvement model. Whatever model you use, Always ask: did our response help?

A SAC is expected to assess (or reassess) at least two outcomes per year. If all six outcomes are assessed, the cycle should be complete within six years (note that SACs who assess fewer outcomes will have a shorter cycle). However, some flexibility in the 'two per year/all six within six years' is allowed. For instance, a SAC may choose might choose to 'assess-address-reassess' a single core outcome within a calendar year: essentially conducting two similar assessment projects on the same outcome in the same year.

Some SACs may need more time to communicate and coordinate changes resulting from assessment. In these cases, a three-year time-frame for the "assess-address-reassess" process may be called-for. Check the Help Guide and your LAC coach for details.

PCC Core Outcomes

Communication (**C**)

Cultural Awareness (**CA**)

Community and Environmental Responsibility (**C&ER**)

Professional Competence (**PC**)

Critical Thinking and Problem Solving (**CT&PS**)

Self Reflection (**SR**)

*Multi-Year Assessment Plan**

Use the abbreviations above to fill-in the table below.

	2013-2014	*2014-2015*	*2015-2016*	*2016-2017*	*2017-2018*	*2018-2019*
Assess	C&ER / CA	C / PC				CT & PS / SR
Reassess			CT & PS / SR	C&ER / CA	C / PC	

*Using the standard model, SACs assess two core outcomes each year while cycling through all of the relevant Core Outcomes. Use the assess – address – reassess model whenever that model coincides with your SACs considered judgment.

Comments (Optional)

APPENDIX FOUR

TO: Portland Community College Degrees and Certificates Committee

FROM: Kate Malone Kimmich, Dietary Manager Certificate Program Director

SUBJECT: Dietary Manager Certificate Suspension

DATE: June 4, 2014

Rationale: The Dietary Manager Certificate program began Fall Quarter 2013 and was put on hold in Spring Quarter 2014. We recommend suspending the program for the following reasons:

- Lack of qualified Registered Dietitian and Certified Dietary Manager preceptors for required 150-hour field experience
    - Registered Dietitians employed as floating consultants in multiple facilities and/or already host students from area and out-of-area dietetic internships
    - Oregon does not require Dietary Managers to be Certified Dietary Managers by law

- Low student enrollment
    - Program enrollment: 8 students (Fall 2013); 0 students (Spring 2014)
        - Offered one course (DM 119: Nutrition Through the Lifecycle), Fall 2013
        - Planned program break Winter 2014 for faculty and preceptor recruitment
        - Attrition related to: family health, academic probation, financial barriers, concerns regarding employment outlook
    - Nationally, 89% of classroom-based CDM training programs have ≤5 examinees annually; 40% have 1 examinee (2013 Association of Nutrition and Foodservice Professionals report)

- Unreliable employment outlook
    - Oregon does not require Dietary Managers to be Certified Dietary Managers by law

From September 2013 – April 2014, the Program Director consulted the DM Advisory Council and numerous Oregon and Washington industry stakeholders, including dietary managers, certified dietary managers, food service directors, registered dietitians, program directors, and health care facility administrators regarding preceptor and student recruitment. Thereafter, the Program Director, SAC, and Rock Creek administrators recommended program suspension.

The suspension will not affect other curriculum.

Teach-out Plan: Not applicable as zero students are enrolled in the program at this time

Notifying Adjunct Faculty: Not applicable as there are no adjunct faculty associated with the program

PCC Catalog: The 2014 – 2015 Catalog will be amended to reflect suspension

Dietary Manager Certificate Advisory Council: Program Director to advise regarding suspension

Portland Community College

Dietary Manager Certificate Program

Director Resources & Responsibilities Handbook

2013 – 2014

The Dietary Manager Certificate Program Director is a full-time Foods & Nutrition Department faculty in the Social Science & Health Division. The Program Director currently serves as Chair of the Foods & Nutrition Subject Area Committee and reports to the Division Dean of Social Science & Health.

Teaching Responsibilities

DM 105: Food Safety: ServSafe and Local Food Production

DM 119: Life Cycle Nutrition

Earn and maintain ServSafe Instructor and Certified ServSafe Proctor certifications

Program Development Responsibilities

Develop and revise *DM 119: Lifecycle Nutrition*

Develop and revise DM 105: Food Safety: ServSafe and Local Food Production

Oversee development and instruction of *DM 129: Human Resources & Management for Dietary Managers*

Oversee development and instruction of *DM 139: Nutrition for Dietary Managers*

Work with Foods & Nutrition Department Chair to hire instructor for (1) DM 129: Human Resources and Management for Dietary Managers and (2) DM 139: Nutrition for Dietary Managers

Work with Foods & Nutrition Department Chair and Administrative Assistants to order textbooks and exam preparation materials

Secure and coordinate preceptors and field placement site locations for (1) DM 130: Dietary Manager Field Experience I and (2) DM 140: Dietary Manger Field Experience II

Oversee completion of clinical site entrance requirements (background check, immunizations, etc.)

Conduct preceptor trainings and serve as preceptor/field experience site contact

Oversee contract records between PCC Purchasing and field experience sites

Conduct program information sessions for current and prospective students

Advise prospective and current students

Coordinate student orientations

Develop and maintain admissions materials (applications, interview, etc.)

Coordinate Oregon ANFP student CDM exam scholarship

Develop and approve course and certificate changes

PCC Rock Creek Dietary Manager Certificate Program
Advisory Committee Minutes
November 19th, 2013
2:00 pm – 3:30 pm

Introductions

In attendance:

Michelle Kerr, DM (Kaiser)
Marissa Mitchell, DM (Marquis)
Jenny Dickow, DM (Holiday)
Marie (former PCC instructor)
Cindy Heilman, DTR (Higher Standards, Kind Dining)
Kristen Heckert , DM student
Kimberly Martin, DM Student
Kate Malone Kimmich, RD, DM Program Director
Karen Sanders, Dean, Social Sciences & Health
Michael Meagher, Chair, Health/Foods & Nutrition

Program Overview and updates

Kate shared programmatic updates

1. The group was asked for their input and opinion of our proposed modification of the DM Certificate from 16 to 17 credits by modifying DM 105 from one credit to two, including a practical field experience in local food production and food safety:
    a. I think it's a great idea
    b. We have our own garden [at their institution] that we can then utilize
    c. A lot of places would have use for this skill
    d. It's a hot topic - adding the sustainability piece
    e. It's a quality and perception issue ... we'll be able to provide fresh items
    f. With our elderly clients, it can bring back a flood of memories
    g. Oh... it's perfect
    h. I just wrote an article about this for the ANFP magazine!
    i. We want [the gardening component] to come from food services [versus activities]
    j. You're so ahead of the curve!
2. Foods & Nutrition Lab in the new Building 5 (earliest open date: Fall 2015)
    a. Developing it in a way to make it licensed for retail food production (incorporate Learning Garden produce, etc.)
    b. Noted that small business training key for DMs
3. DM Website
    a. Need to follow the PCC format
    b. Can be accessed here: http://catalog.pcc.edu/programsanddisciplines/foodandnutrition/

ACTION ITEM

- ALL: PLEASE REVIEW AND PROVIDE FEEDBACK TO KATE

4. Quick summary of program:
    a. DM 105 Food Safety: ServSafe ~~1~~ 2
    b. DM 119 Nutrition Through the Life Cycle 3
    c. DM 129 Food Service and Personnel Management 4
    d. DM 130 Dietary Manager Field Experience I 3
    e. DM 139 Nutrition for Dietary Managers 3

f. DM 140 Dietary Manager Field Experience II 2
g. Total Credits ~~16~~ 17

Instructor Search for DM 129: Human Resources and Management for Dietary Managers

Kate shared information for instructor search.
Ideas of sites and locations to promote include:

- Oregon Academy of Nutrition & Dietetics (OAND)
- Portland Academy of Nutrition & Dietetics (PAND)
- American College of Health Care Administrators (ACHCA)
- Dietetics in Health Care Communities (DHCC) – Janelle Asai, RD, President, 12/6/2013 meeting

Note: Application information will soon be available on the PCC Jobs page (Page still not updated)

NOTE regarding DM Instructor Qualifications handout/website:

• PLEASE ADD REGISTERED DIETITIAN AS THE FIRST INSTRUCTOR QUALIFICATION for DM 119 and DM 139. The website will be updated soon.

• The qualifications for DM 129 (Human Resources and Management for Dietary Managers are CORRECT.

Recruitment

1. Preceptor RDs and DMs for field placement
    a. Program is limited by number of preceptor locations available
    b. ANFP requires a total of 150 supervised field hours:
        i. **Per ANFP: "The Registered Dietitian preceptor is responsible for the entire 150 hours of field experience and directly supervises 25 of the 50 nutrition-related hours. Each field experience is precepted by a qualified preceptor with no less than one year of post-registration/certification, full-time equivalent employment in a practitioner role."**
    c. Kate posed the following questions:
        i. Can an interested facility take more than one intern?
        ii. Are there locations where a DM is present but no RD?
        iii. What creative solutions can be identified to address need?

ACTION ITEM

- ALL: PLEASE CONNECT WITH RDS AND DMS ... WHO MIGHT BE INTERESTED? FORWARD CONTACT INFORMATION TO KATE

2. Potential DM Advisory Committee members
    a. Karen Santos (Prestige)
    b. Mark Daugherty
    c. Linda Sanders
    d. Judy Madden
    e. Teresa Scollard (St. Vincent's)

Program Networking & Marketing

Kate requested ideas and strategies to promote the DM Certificate program
An initial list included:

-
- Fliers
- Brochures
- Website
- Tabling (with students)
- Social Media
- Videos
- LinkedIn
- Blogs
- Promote connection with sustainability
- Oregon Leading Age
- OHCA.com
- Hospitals Association
- Ecotrust
- American Association of Nursing Home Administrator
- Culinary Schools
- High schools
- Chefs

ACTION ITEM

- ALL: AS IDEAS OF LOCATIONS AND CITES EMERGE, SEND IDEAS TO KATE

Break-out Session

Kate led a break-out session where the Committee members developed ideas for classroom activities and course projects based on the DM 129 learning objectives. The ideas were then shared with the greater group.

Spring 2014 Meeting

It was discussed to combine the next Advisory Committee Meeting with a preceptor orientation meeting
Tentative:

- 1:30 pm – 3:00 pm Advisory Committee
- 3:00 pm – 3:30 pm Preceptor Orientation meeting

Suggested dates/times: Early May, mid-week

ACTION ITEM

- KEEP AN EYE OUT FOR SPRING 2014 DOODLE POLE TOWARDS SPRING ☺

Closing

FOODS AND NUTRITION

Rock Creek Campus
Bldg 3, Room ????
971-722-?????

CAREER AND PROGRAM DESCRIPTION

The study of foods and nutrition includes the study of the metabolism of the body in addition to the foods that supply the nutrients needed for human health and the factors that can affect nutrient availability. Inquiry into how nutrition is advertised, marketed and how recommendations are made is studied. At PCC, nutrition course offerings range from personal nutrition to the more life science intense nutrition course and dietary manager studies.

The Dietary Manager (DM) Certificate program prepares individuals to work in care facilities such as hospitals, skilled nursing facilities, assisted living facilities and some school and correctional facilities. The Dietary Manager is responsible for a safe food service environment, training and evaluation of foodservice staff. Additionally, the Dietary Manager screens clients' nutritional status, adjusts menus for clients with special diets and works with allied health care workers to ensure proper feeding of clients. A Dietary Manager works in a high-pressure environment with individuals in various capacities. The program provides the educational content to be qualified to take the national certification exam.

DEGREES AND CERTIFICATES OFFERED

Less than One-Year Certificate

Dietary Management

PREREQUISITES AND REQUIREMENTS

1. Reading 90 or equivalent placement scores
2. Math 20 or equivalent placement scores

DIETARY MANAGER LESS THAN ONE-YEAR CERTIFICATE

Minimum 16 credits. As part of the certificate, students must complete a minimum of 150 hours of field experience. Students must meet all certificate requirements.

Dietary Manager Certificate Credit Summary

DM	16
Credit Total	16

COURSE OF STUDY

The coursework listed below is required.

DM	105	Food Safety: SERVSAFE	1
DM	119	Nutrition through the Life Cycle	3
DM	129	Human Resources and Management for the Dietary Manager	4
DM	130	Dietary Manager Field Experience I	3
DM	139	Nutrition for Dietary Managers	3
DM	140	Dietary Manager Field Experience II	2

APPENDIX FIVE- FN Foods and Nutrition Core Outcomes Mapping Matrix

Course #	Course Name	CO 1	CO 2	CO 3	CO 4	CO 5	CO 6
FN 110	Personal Nutrition	1	1	1	1	1	2
FN 113	Everyday Cooking	1	1	2	1	1	2
FN 199F	Farm to Preschool Nutr	1	1	1	1	1	2
FN 225	Nutrition	2	2	3	2	2	2

Updated December 2017

APPENDIX SIX- Enrollment Data

Foods and Nutrition Enrollment Trends with Pass Rates by Modality

			Academic Year									
			2012-13		2013-14		2014-15		2015-16		2016-17	
			Enrollments	Pass Rate	Enrollments	Pass Rate	Enrollments	Pass Rate	Enrollments	Pass Rate	Enrollments	Pass Rate
Campus	**Modality**	**Course**	**Figure**	**Figure**	**Figure**	**Figure**	**Figure**	**Figure**	**Figure**	**Figure**	**Figure**	**Figure**
Rock Creek	On-Campus/Face-to-Face	FN 110	57	68.40%	79	74.70%	67	67.20%	68	77.90%	112	75.00%
		FN 199A	.	.	.	.	.	.	.	.	16	56.30%
		FN 225	174	91.40%	105	89.50%	76	94.70%	18	100.00%	.	.
	WEB/Distance Learning	FN 110	.	.	.	.	.	.	.	.	21	52.40%
		FN 225	.	.	21	95.20%	48	95.80%	110	94.50%	139	92.80%
Southeast	On-Campus/Face-to-Face	FN 225	22	77.30%	.	.	.	.	.	.	.	.
	WEB/Distance Learning	FN 225	.	.	77	92.20%	74	90.50%	95	95.80%	103	97.10%
Sylvania	On-Campus/Face-to-Face	FN 110	.	.	.	.	54	81.50%	.	.	30	76.70%
		FN 225	104	86.50%	94	89.40%	74	97.30%	47	93.60%	.	.
	WEB/Distance Learning	FN 110	271	79.70%	260	78.50%	231	77.50%	228	81.60%	219	85.40%
		FN 225	318	96.90%	301	93.70%	392	95.40%	377	94.20%	407	95.80%
TOTALS			**946**		**937**		**1016**		**943**		**1047**	

Source: A. Eggebrecht, PCC Institutional Effectiveness

APPENDIX 7

Race/Ethn		2012-13	2013-14	2014-15	2015-16	2016-17
Af. American	Headcounts	31	36	35	32	32
	% of Total Headcounts	3.3%	3.9%	3.5%	3.5%	3.2%
Asian	Headcounts	58	64	85	73	93
	% of Total Headcounts	6.2%	7.0%	8.6%	7.9%	9.2%
Hispanic	Headcounts	71	66	93	98	90
	% of Total Headcounts	7.6%	7.2%	9.4%	10.6%	8.9%
Multi-racial	Headcounts	32	50	43	62	69
	% of Total Headcounts	3.4%	5.4%	4.3%	6.7%	6.8%
Native Amer./ Alas	Headcounts	5	5	6	3	6
	% of Total Headcounts	0.5%	0.5%	0.6%	0.3%	0.6%
Pacific	Headcounts	4	4	5	2	4
	% of Total Headcounts	0.4%	0.4%	0.5%	0.2%	0.4%
Unreported	Headcounts	103	77	80	53	77
	% of Total Headcounts	11.0%	8.4%	8.0%	5.7%	7.6%
White	Headcounts	630	617	647	599	641
	% of Total Headcounts	67.5%	67.1%	65.1%	65.0%	63.3%
Grand Total	**Headcounts**	**934**	**919**	**994**	**922**	**1012**
	% of Total Headcounts	**99.9%**	**99.9%**	**100.0%**	**99.9%**	**100.0%**

APPENDIX 8-1

Foods & Nutrition Sustainable Agriculture Workgroup Proposal

Elaine Cole, PhD
Dana Fuller, MSW, GCSA
Alissa Leavitt, MPH, MCHES
Nora Lindsey
Debra Lippoldt, MS, RN

PCC has the opportunity to move from reacting to change to directing change by graduating one-of-a-kind thinkers, advocates, farmers, retailers, and restaurateurs who are leading the charge in how the nation thinks about food.

-FNAg Workgroup

Think Fearless: Ignite a Culture of Innovation PCC

Table of Contents

Executive Summary

Charge of the Workgroup

In Fall 2015, the College formed a Foods & Nutrition/Sustainable Agriculture (FNAg) Workgroup comprised of faculty, staff and administration. The charge of the group was to identify educational program needs that capitalize on the Rock Creek campus and community resources of the Learning Garden and the Foods & Nutrition Lab. Analysis to identify specific jobs directly connected to the field were completed.

Members from the work group connected with over 75 representatives from the agricultural industry, food system stakeholders, college and university faculty currently involved in similar programs, both in and outside of Oregon, and local business and industry leaders. Information was gathered through phone, face-to-face interviews and campus tours. The workgroup met several times between September 2015 and June 2016. During the meetings, information was shared and work was done to narrow down the multitude of possible focus areas within the broad field of "food systems."

To that end, we have identified challenges and provide recommendations to meet the charge given to the Workgroup.

Task Force Challenges

- The career trajectory for Sustainable Food Systems is not linear like other fields and employment data was challenging to locate.
- The field of Food Systems is very broad and it was difficult to know how to structure the curriculum without gathering additional information.
- There are other degrees and certificates in Oregon that are in this field and the Workgroup wanted to avoid duplicating efforts.

Justification of Need

In Oregon, the average age of a farmer is 60 years therefore growth and replacement of an aging workforce are factors in future jobs. The total number of job openings is projected to be much higher than the statewide average number of job openings for all related occupations through 2022. This occupation is expected to grow at a somewhat faster rate than the statewide average growth rate for all occupations through 2022. (See Appendix A for additional labor statistics).

A survey was created to solicit input on course offerings and was sent to related programs at PCC, posted to the Learning Garden Facebook page and sent to external partners in sustainable agriculture and culinary programs. 121 respondents (55% PCC students, 45% prospective PCC students) showed a growing desire for food systems related programming. (Appendix B)

Taskforce Recommendations

1. Curricula
    a. Seek to develop articulation and/or transfer agreements with 4-year partners related to Sustainable food Systems.
    b. Work with the Curriculum Office to develop Sustainable Food Systems certificate for Spring 2017 implementation.
    c. Continue to explore how Sustainable Farming & Foods (Sustainable Food Systems) certificate aligns with potential hospitality program at Cascade.
    d. Continue to have conversations with Community Education about piloting non-credit/credit program/courses at Rock Creek.
    e. Continue to explore AAS degree and other related certificates.
        i. Host culinary-themed focus group with the OSU Food Innovation Center and the Oregon Restaurant Association.
    f. Continue to explore interdisciplinary programming with Landscape Technology, Health Studies, Foods & Nutrition, Business, and Environmental Science.
    g. Work with FN SAC to update instructor qualifications
2. Develop Advisory Group for proposed certificate.
3. Investigate budget for proposed certificate and degree program.
4. Collaborate with grants office to search for relevant grant that address needs in the areas of focus.
    a. Apply for Oregon Department of Agriculture funding for the Specialty Crop Block grant. This will allow us to develop these specific classes and use enrollment data and student feedback to determine whether there is a need for an additional certificate, degree or transfer degree related to agriculture, food systems, or another related field.

To accurately develop the project's scope and necessary funding, the Workgroup recommends that in Fall 2016, the college enlist a coordinator/.5 release time to look at limitations and possibilities in order to develop an accurate budget. The deliverables are as follows:

1. Project analysis that details of the project and how it will be managed.
2. Program analysis that should confirm work done by the FNAg Workgroup and modified as necessary based on consultant/Advisory Group experience and input.
3. Complete the Preliminary Review form and submit to the Curriculum Office.
4. Project budget that would provide detailed estimates and funding methods.
5. Convene Industry Advisory Committee.
6. Draft Sustainable Food Systems certificate for Spring 2017 implementation.
7. Work with FN SAC to draft articulation and/or transfer agreements with 4-year partners.

Conclusion

The above recommendations, if implemented, will provide Rock Creek with an opportunity to:

1. Meet the changing needs of the industry
2. Invest in a healthier society
3. Invest in student retention
4. Directly address goals in the strategic plan
5. Be innovative

Given that sustainable food businesses in Portland are increasingly popular and Washington County has traditionally been an agricultural landscape, it is clear that PCC Rock Creek is uniquely situated to train the next sustainable food business leaders, sustainability professionals, and social justice food advocates. PCC Sustainable Food Systems Certificate graduates will have the opportunity to be leaders in working toward a more sustainable food system in a place where citizens are committed to and supportive of this value. Indeed, the world needs more individuals who are innovative on this topic.

The FNAg Workgroup recommends that PCC Rock Creek champion new ideas and programming to lead the food systems movement. PCC has the opportunity to move from reacting to change to directing change by graduating one-of-a-kind thinkers, advocates, foody system stakeholders, farmers, retailers, and restaurateurs who are leading the charge in how the nation thinks about food. Now is the time for PCC Rock Creek to be a leader by engaging in the emerging field of sustainable agriculture education. Let's move from reacting to change to directing change by graduating one-of-a-kind thinkers, advocates, farmers, retailers, and restaurateurs who are leading the charge in how the nation thinks about food

Proposal

Charge of the Workgroup

In Fall 2015, the College formed a Foods & Nutrition/Sustainable Agriculture (FNAg) Workgroup comprised of faculty, staff and administration. The charge of the group was to identify educational program needs that capitalize on the Rock Creek campus and community resources of the Learning Garden and the Foods & Nutrition Lab. Analysis to identify specific jobs directly connected to the field were completed.

Members from the work group contacted representatives from the agricultural industry, food system stakeholders, college and university faculty currently involved in similar programs, both in and outside of Oregon, and local business and industry leaders. Information was gathered through phone, face-to-face interviews and campus tours. The workgroup met several times between September 2015 and June 2016. During the meetings, information was shared and work was done to narrow down the multitude of possible focus areas within the broad field of "food systems".

Workgroup Process

The Workgroup was formed in Fall, 2015 and includes the following individuals:

Alissa Leavitt, MPH, MCHES Health Studies Faculty Rock Creek	Elaine Cole, PhD Sustainability Coordinator Rock Creek
Debra Lippoldt, MS, RN Faculty Department Chair Foods and Nutrition Sylvania	Nora Lindsey Learning Garden Coordinator Rock Creek
Dana Fuller, MSW, GCSA Division Dean, Social Science, Communication and Health Rock Creek	

Sustainable Agriculture Focus Group

For many years, there have been campus discussions, meetings and informal committee work to design a sustainable agriculture program. In 2013, a college-wide group of ≈40 interdisciplinary staff and faculty organized a Sustainable Agriculture Focus Group. This effort was terminated in 2014 and from these initial efforts, the FNAg Workgroup has developed this new iteration of the project and proposal.

Current Campus Resources

Learning Garden.

The PCC Rock Creek Learning Garden offers both informal and formal sustainable agriculture education opportunities that allow students to gain hands on experience in a diversity of areas within the food system, however there is much room for growth.. The campus has a 3.6-acre plot of land that includes 48 raised beds, ¾ acre of vegetables and flowers, 60 fruit trees, grapes, raspberries, blueberries, and more. Food is grown year round hydroponically and in a hoop house. More than 10,000 pounds of food is produced annually food for an on-campus farm stand, catering, donation to food banks and shelters, and for volunteers. With existing land, animals, and expertise, PCC Rock Creek is uniquely situated to use the campus as a living laboratory for teaching sustainable agriculture and food systems.

Foods & Nutrition Lab.

This space features six spacious learning stations where students have room to learn about, prepare and enjoy food. The lab is fully equipped with Electrolux ceramic top convection oven units, refrigerators, Hobart LXe dishwasher, Two Traulsen Refrigeration units in the storage room can be used for refrigeration/freezing or as a warming unit, anasonic commercial microwave oven, sinks, pots, pans, knives and other cookware. The instructor's station at the front of the classroom includes two large television screens projecting a live camera feed, allowing students to easily observe their teacher's technique.

Data Collection Efforts

The quantitative and qualitative data collected from over 50 individuals through focus groups and meetings with internal and external partners created the foundation from which the Workgroup developed this proposal. The Workgroup will be reviewing additional data from the Oregon State University Urban Farmer program, the Oregon State University Food Innovation Center and a survey report from Friends of Family Farmers. Each has agreed to share relevant data when the reports are final the end of June. This document will be updated with that information.

Additional Consultation from Internal Partners

Name	Title
Kate Kinder	Career Pathways
Marc Goldberg	Associate Vice President - Workforce Development and Community Education
Sheila Meserschmidt, MBA	PCC Institute for Health Professionals
Beth Molenkamp, MA	PACTEC Regional Coordinator Dual Credit Program Manager
Heidi Edwards	Outreach and Orientation Coordinator Rock Creek
David Sandrock, PhD	Landscape Technology Program

Andrew S. Garland-Forshee, Ph.D., HS-BCP	Early Education & Family Studies
Jan Abushakrah, PhD	Gerontology Program: Horticulture Therapy
Haydee Goldenberg	Career Exploration Center Coordinator

Meeting with External Contacts

The Rock Creek campus has hosted over a dozen loop tours to engage potential partners. Additionally, the following people have been consulted on this proposal through informational interviews and focus groups.

Name	Title
David Stone, PhD	Director, Food Innovation Center Oregon State University
Jason Ball	Resident Chef, Food Innovation Center Oregon State University
Amy Gilroy, MPH	Farm to School Manager Oregon Department of Agriculture
Jessica Gutgsell, RDN	Bionutritionist, Kitchen Coordinator Oregon Health & Science University
Gene Fritz	Oregon Health & Science University Oregon Restaurant Association (want to work on culinary themed focus group)
Maggie Michaels	Curriculum of Cuisine
Lora Wells	Culinary Arts Teacher Westview High School
Mary Masters	Culinary Arts Teacher Liberty High School
Erin Linhares	Culinary Arts Teacher Forest Grove High School
Heidi Larson	Culinary Arts Teacher Tualatin High School
Deanna Palm	President Hillsboro Chamber of Commerce
Stu O'Neill	Executive Director Rogue Farms

Weston Miller, Puhkarj Deol	Organic Gardening Certificate Program. OSU Extension
Chenoa Philabaum	New Seasons Market
Penelope (Penny) L. Diebel	Assistant Dean of Academic Programs College of Agricultural Sciences Oregon State University (Meeting in June)
Anna Garwood Sarah Canterberry	Growing Gardens
Dee Wetzel	Training and Education Coordinator Portland State University
Heather R. Morrow-Almeida, MPH	MCH Systems and Policy Analyst Public Health Division
Brian Wilke	Co-founder Oregon Culinary Institute (Meeting 6/23)
Joyce Dougherty	Director Oregon Department of Education Child Nutrition Programs
Abby Farmmantino	Airbnb Food + Drink Operations Manage
Jennifer Young, MPH, RDN	Policy Specialist Public Health Division
Susan Greathouse, MPH	WIC Nutrition & Local Services Manager Oregon Health Authority
Wendy Popkin	Executive Director, Education Foundation Oregon Restaurant & Lodging Association
Gene Fritz, Ed.M.	Academic Director – Culinary Arts Art Institute
Neeraja Havaligi, PhD	Biodiversity and Climate Change consultant
Megan Horst, PhD, AICP	Assistant Professor Portland State University
Molly Notarianni	Friends of Family Farmers
Janet Bean	HR Manager Beaverton Foods

Tia Henderson, PhD	Upstream Public Health

Current & Prospective Student Survey

Over the course of these meetings it was clear that the Workgroup needed to engage current and prospective PCC students. A survey was created to solicit input on course offerings and was sent to related programs at PCC, posted to the Learning Garden Facebook page and sent to external partners in sustainable agriculture and culinary programs. A request to participate in this Qualtrics survey was distributed through an online link in an email. The survey was open for 2 weeks. In total 121 respondents (55% PCC students, 45% prospective PCC students) showed a growing desire for food systems related programming. (Appendix B)

Justification for Certificate Program

Agriculture has found itself reframed amid a larger economic cluster commonly known as "food systems." Recent changes in consumer demand for food, food experience, food security, eating habits and lifestyles have opened the door to a host of economic and agricultural career opportunities.

In an era of climate change, resource limitations, growing population, increase in obesity and chronic illness, food injustice, etc, the food system must move to support and expand small-scale community food systems-focused agriculture. Half of American farmland is expected to change ownership in the next two decades. This could be an opportunity for young people, people of color, women, and anyone interested in small-scale, sustainable agriculture to succeed.

Currently only 5% of what we eat in the Portland region is sourced locally. A reasonable increase would have a tremendous economic impact and enable a major expansion of jobs in sustainable local food. (Megan Hurst, Personal Communication) As the food movement grows, the demand for college and university classes focusing on food systems has expanded. More than 70 community colleges, four-year colleges, and universities now have specific degree programs for sustainable agriculture or food systems. (Civil Eats, 2016)

Alignment with College Strategic Plan.

The proposed certificate and continued exploration for an AAS degree aligns with the following strategic plan efforts at the College:

- Think Fearless: Ignite a Culture of Innovation
- Think Accountable: Achieve Sustainable Excellence in All Operations
- Think Powerful: Transform the Community Through Opportunity
- Think Proud: Create a Nationally Renowned Culture for Diversity, Equity and Inclusion
- Think Bold: Drive Student Success

Sustainability.

This certificate program meets the sustainability goals of the College. The College has strengthened its commitments to sustainability, developed two iterations of its Climate Action Plan and has taken significant strides to reduce its environmental footprint and promote education for sustainable development.

Health Benefits of Proposed Program.

Urban agriculture has the potential to enhance the nutritional status of urban residents in general, and the urban poor in particular, by directly improving food security and nutritional adequacy. The benefits of gardening and food growing for health and wellbeing are well-documented in the literature (Van den Berg, 2015). By expanding the programming of the Learning Garden and the Foods & Nutrition Lab, students, faculty and staff will have more opportunities to congregate as healthy members of the Rock Creek community through the enjoyment of gardening, healthy foods, nutrition, and environmental stewardship.

Employment Data.

Although the career trajectory for sustainable food systems is not linear like other fields, students who complete sustainable agriculture programs are being hired after program completion. (See Appendix C and D) The growth of local food and farming is particularly important today as the world experiences climate disruption, energy shortages, and economic stress. Students who recognize crisis as an opportunity are gravitating to the study of sustainable farming, working toward careers in local food and green businesses, urban agriculture, permaculture, and related jobs in farm-based education, community development and advocacy.

The United States Department of Agriculture (USDA) recently reported a 144% increase in farm direct sales over a 5-year period indicating a healthy demand for this service. The local food movement has created jobs throughout the food supply chain and the demand for local food often exceeds supply.

The proposed certificate program is designed to provide a workforce for jobs that are created in support of local food production. 'Farm Educator', Garden Program Director', and 'Farm to School Coordinator' and similar job listings are appearing throughout the region. Employment of agricultural and food scientists is projected to grow 9 percent from 2012 to 2022, about as fast as the average for all occupations

Oregon Data.

In Oregon, the average age of a farmer is 60 years therefore growth and replacement of an aging workforce are factors in future jobs. The total number of job openings is projected to be much higher than the statewide average number of job openings for all related occupations through 2022. This occupation is expected to grow at a somewhat faster rate than the statewide average growth rate for all occupations through 2022. (See Appendix A for additional labor statistics)

National Trends.

Around the country, directors of sustainable agriculture programs (both formal and informal education), and program websites, report that students go on to work in some capacity of the food system. Program information from over 40 programs throughout the United States, was collected for reviewed by the Workgroup. A list of questions was asked of all programs and

responses to those questions with general program/facility information were provided to the Workgroup for review and discussion. (See Appendix X)

Graduates of the proposed certificate program will be equipped to begin or continue careers in the local and sustainable food system. The *Journal of Agriculture, Food Systems, and Community Development*'s February 2012 Call for Papers documents this growing field of employment; the call reads, "emerging regional food systems appear to be creating some new occupational opportunities, including the emergence of green-collar sustainable occupations such as farmer trainers, farm managers, agriculture teaching positions certifiers, and consultants."

Recent positions posted in Oregon that a graduate may be qualified for include:

Sector Types	**Types of Jobs**
Education (K-12, Higher Ed) School Food Service, Catering Restaurants Agriculture Non-profit supporting sustainable foods Food Companies Farmers Markets Grocery Stores Organic Farms Hospitals and Care Centers Community Gardens University Farms Food Security Organizations Community Development Organizations	Educator, Instructor School or Community Garden Coordinator Prep Cook, Purchaser Farm, Field, Garden, Compost, Greenhouse, Food Safety Managers Garden-based Nutrition Educator, Corporate Wellness Environmental Sustainability Coordinator Project Coordinator, Program Coordinator Manager Farmer Community Outreach and Education Community Organizer in Sustainable Agriculture Communications or Social Media Specialist, Web Developer Non-Profit Project Specialist Food Demonstrator, Purchasing Coordinator

Food-related Courses in Higher Education in Oregon

A few recent examples showcase the growth of food-related courses in higher education in Oregon:

o Marylhurst College in Portland, Oregon recently added a Master of Science in Food Systems and Society, which "focuses specifically on root causes of social inequality through the lens of the food system," according to program coordinator Emily Burruel.

o Portland State University added a graduate Food Systems certificate and they are working on undergraduate certificate.

o National College of Naturopathic Medicine, undergraduate degree in Nutrition.

o Clackamas Community College has a certificate in Urban Agriculture.

o Blue Mountain Community College.

o Oregon State University has over 100 related courses.

Current Programming using the Foods & Nutrition Lab

It is important to highlight some of the current uses of the Foods & Nutrition Lab:

- Community Education
    - Learning Garden coordinator Nora Lindsey is piloting the courses: Flower Arranging from the Garden
    - Artisan Bread Making course
    - And more
- The Food for Thought Expedition, a partnership between PCC's Rock Creek Campus and Springville K-8 School, hopes to transform 105 seventh and eighth graders into conscious consumers who will not only make healthier food choices later in life, but will understand the role food plays in the global society. They use the lab to learn about how to prepare the food they learn to grow in the Rock Creek Learning Garden.
- Social Science, Health, PE and Communications hosted a "Celebration of Food" weeklong event for faculty and staff.
- History Instructor used the lab for a lesson on Viking History.
- In collaboration with the International students program, a Health Instructor used the lab for two classes the Health, Food Systems & the Environment course.

Other Potential Uses of the Kitchen Lab

One of Workgroup contacts suggested that the Lab could be rented out for $2,000 per day by local chefs to provide staff training.

Taskforce Recommendations

1. Curricula
    a. Seek to develop articulation and/or transfer agreements with 4-year partners related to Sustainable food Systems.
    b. Work with the Curriculum Office to develop Sustainable Food Systems certificate for Spring 2017 implementation.
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3. Investigate budget for proposed certificate and degree program.
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    a. Apply for Oregon Department of Agriculture funding for the Specialty Crop Block grant. This will allow us to develop these specific classes and use enrollment data and student feedback to determine whether there is a need for an additional certificate, degree or transfer degree related to agriculture, food systems, or another related field.

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4. Project budget that would provide detailed estimates and funding methods.
5. Convene Industry Advisory Committee.
6. Draft Sustainable Food Systems certificate for Spring 2017 implementation.
7. Draft articulation and/or transfer agreements with 4-year partners.

Draft Budget Needs

Physical Infrastructure. See Master Plan - completed 2015 with help from Scott | Edwards Architecture, Lango Hansen Landscape Architects and Fortis Construction.

1. An outdoor covered lab space would serve as a classroom, rentable space for community partners, and a gathering space for the PCC community.
2. In addition to a classroom, it would house all compost operations, a wash station, and office space in one covered structure.
3. Learning Garden Coordinator and AmeriCorps or Farmhand Apprentice housing.
4. Maintenance and staffing plan with funding for these structures and key staff would be imperative to support the program and infrastructure.

Staffing.

1. To allow for most effective sustainable agriculture training and operational oversight and management, an on-campus house for a farm manager and/or interns, apprentices, and AmeriCorps service members is needed.

2. To engage in the mentioned initiatives, the Sustainability Coordinator position and the Learning Garden Coordinator position need to be full-time.
3. To engage in the mentioned initiatives, to coordinate the certificate program, and to implement other new programming, the Foods & Nutrition FT instructor position needs to be reinstated. In addition this person would help develop a strong recruitment program and materials to ensure the success of this new certificate.
4. To support the FN Lab classes, a Foods & Nutrition Lab Technician is needed to assist in the preparation and setting-up, storage, inventory, cleaning and proper storage and disposal of lab materials, food supplies, and kitchen equipment.
5. To support the garden and its operations, a permanent part or full time farmhand position is needed.
6. To support faculty in classes and volunteer management, two AmeriCorps positions need to be funded.

Draft Certificate Design (Pending Advisory Committee input)

This proposed certificate would be housed in the Foods & Nutrition SAC. The courses in this certificate program are designed to provide students with the required academic and technical skills to be successful in the development and operation of an environmentally sound, community-based, profitable small farm, garden or agriculture business. Students are to be trained in management approaches, product marketing, and the skills to assess local physical and environmental factors that affect the sustainability of a small farm operation. Emphasis is placed on entrepreneurial and field training. Students will also learn the basic principles of our economic system and government policies and programs relating to agriculture.

Within the coursework are embedded problem solving and critical thinking skills that enable the student develop creative solutions to problems encountered in small farm operations. Students are provided with a background in plant propagation, soils, organic farming methods, business and marketing.

Capacity.

The campus already offers relevant courses that fill consistently, including, but not limited to: Organic Gardening, Permaculture Design, and Soils and Plant Nutrition. These courses would only become more popular by adding a certificate credential. A small number of new classeses would be added. PCC currently has existing facilities that include the greenhouse, hoop house, Foods & Nutrition Lab and organic farm on the campus that will be utilized for the certificate program.

Sustainable Food Systems Certificate Requirements - 35 Credits		
Course	**Course Description**	**Credits**

NEW COURSE FN X: Intro to Garden & Farm Education	A hands-on field based course to teach both pedagogy and practice of engaging volunteers and students. There will also be a classroom component (lesson planning) and students will apply content learned and practice teaching and supervising students in the garden.	3
NEW COURSE Local/Regional Food Systems Lab	This course will explore Pacific Northwest food systems and regional crop production, examine channels of industrialized and localized food distribution and challenge the barriers to creating food secure communities.	1
NEW COURSE FN X: Intro to Food & Farm Systems	This course provides students with an interdisciplinary understanding of ecological, economic, political, and social systems as they relate to food and farming both regionally and globally.	3
HE 264: Health, Food Systems & the Environment	This course will examine how food systems influence human and environmental health. Students will explore the connections between sustainable agriculture concepts/practices, food systems, and personal and environmental health. Audit available. Community-based Learning with Garden Lab Project	3
FN 110: Personal Nutrition	Explores personal food habits and beliefs. Emphasizes practical application of nutrition knowledge to enhance general health. Analyze present diet and evaluate it according to latest nutritional guidelines. Basic nutrition course for students with little or no science background. Audit available.	3
FN X: Culinary Skills Lab	Provides an opportunity to apply foundational knowledge of food composition and nutritional values to food preparation. Explores skills in meal planning, recipe modification and basic cooking techniques.	1
ESR 140: Introduction to Environmental Sustainability	Introduces concepts of environmental sustainability and their applications. May include field trips. Prerequisites: WR 115, RD 115 and MTH 20 or equivalent placement test scores. Audit available.	4
NEW COURSE FN X:	This course is a hands on practicum in the Rock Creek Learning Garden, teaching all aspects of	3

4 Season Farming— Spring	seasonal crop production. This course includes visits to study and work on other local small scale farms.	
NEW COURSE FN X: 4 Season Farming— Summer	This course is a hands on practicum in the Rock Creek Learning Garden, teaching all aspects of seasonal crop production. This course includes visits to study and work on other local small scale farms.	3
NEW COURSE FN X: 4 Season Farming—Fall	This course is a hands on practicum in the Rock Creek Learning Garden, teaching all aspects of seasonal crop production. This course includes visits to study and work on other local small scale farms.	3
NEW COURSE FN X: 4 Season Farming—Winter	This course is a hands on practicum in the Rock Creek Learning Garden, teaching all aspects of seasonal crop production. This course includes visits to study and work on other local small scale farms.	3
NEW COURSE FN X: Farm and Food Entrepreneurship	This course allows students to explore multiple marketing opportunities for small farms including: farmer's market, CSA, restaurant, farm to school, and more. Students will gain hands on experience in all aspects of managing a farm stand. This will include crop planning, harvesting, post-harvest handling, packaging, pricing, selling, marketing, customer service, and food safety.	3
DM 10/FN 105:: Food Safety	Covers foodborne illnesses in food industry. Includes identifying and analyzing the factors which cause foodborne illnesses and food safety and sanitation through proper purchasing, preparation, handling and storage. Includes the ServSafe exam. (Add FSMA info)	2
Total Credits 35 credits		

Organic Farming & Gardening Certificate Electives - X Credits		
Course Description	Course Description	Credits
NEW COURSE FN X or LAT? Beekeeping		
NEW COURSE FN X:		3

Urban & Suburban Growing: Vertical, Rooftop, Hydroponic dutch bucket and NTF?, Hoop House ,		
FN X: Food Preservation lab		1
BA 223	Principles of Marketing	4
Grant writing?		
Hand tools and tool safety, garden and small farm equipment		
NEW COURSE LAT X: Edible Landscaping		
BI 163: Organic Gardening		4
CSS 200: Soils		4
LAT 109: Plant Propagation		3
BA 101: Intro to Business		4
BA 111: Intro to Accounting		3
BA 250: Small Business Management		3
HE 278: Human Health & the Environment		3
HE 251: Community/Public Health Issues		4
FN 225: Nutrition		4
ESR 171: Environmental Science: Biological Perspectives		4
LAT 106: Basic Horticulture		4
LAT courses as approved by advisor		

Permaculture summer		
HORT		

Certificate Enrollment.

Due to high levels of interest from existing and prospective students, we anticipate these classes will reach at least 16+ student enrollment and with an effective recruiting plan will become self-sustaining.

Certificate Audience.

The Workgroup has identified several potential participants of the proposed program:

- Food service prep staff in schools
- Teachers
- Community health workers
- Garden educators
- Caterers
- Public health professionals
- Health Educators
- Food System entrepreneurs
- Food management and safety professionals
- Recent high school graduates from culinary programs
- Landscape Technology students
- Horticulture Therapy students
- Early Childhood Education program students
- Nursing students and professionals
- Students that want to supplement a business degree
- Dietitians for CEUs
- Social Workers
- OHSU resident physicians
- 4-year transfer students
- Community members
- Returning veterans
- Students working in the foodservice industry
- Anyone with an interest in learning about sustainable food practices

Partner with 4-year institutions.

Develop transfer agreements with:

- Oregon State University (various tracks in agriculture)
- National College of Naturopathic Medicine (Bachelors Degree in nutrition

- Portland State University (Bachelor's degree in Community Health Education)

Future Opportunities

Due to the growing demand to improve the food system, there are many potential areas of growth for a Sustainable Foods System program at Rock Creek. For example:

- Food Science technician certificate or degree. In just seven years, the demand for food scientists in the United States alone will increase by 10%. (Occupational Outlook Handbook, U.S. Department of Labor, Bureau of Labor Statistics)
- PCC Rock Creek food cart that would provide students with cooking and management experience in a food cart setting. The cart could be used to provide food service to different campus locations.
- Community Supported Agriculture (CSA) would provide students with management experience and could be used to engage the wider Rock Creek community.
- With the Preschool re-opening, there are opportunities to partner with the Early Childhood Education program to implement the Farm to Preschool curriculum.
- Other Farm to School efforts. Oregon is home to more than 500 school gardens. In recent years, farm to school programs have received considerable support at the State level, with the goal of increasing food access and awareness. For example, all Oregon school districts can receive extra funds to buy and serve local foods, starting this fall, thanks to the Oregon legislature. Oregon has been a national leader in Farm to School and School Garden programs.
- Continue to build relationships with Food Services to offer seasonal food options. Work together to develop menus.
- Trend toward Fruit & Vegetable Prescription programs.
    - Participating healthcare providers give patients a “prescription” to eat fruits and vegetables. Patients are often also given support from dieticians, nutritional education classes, recipes and vouchers that are redeemable for produce, often at local farmers’ markets. Programs need participating health partners and participating vendors.
- Need in the industry to have people that understand both fresh produce production and microbial food safety.
    - The Food Safety Modernization Act (FSMA) calls for sweeping changes to the U.S. food safety system. Both the proposed Produce Safety Rule and the proposed Preventive Controls Rule may affect local food farmers.
- Not only within Oregon Department of Agriculture,, but in the certification and auditing world as a whole, there is a significant shortage of trained auditors available for organic, food safety, etc. (Personal Communication Kate L Allen)
- Grant opportunities.
    - Good search terms: education, food systems, alternative agriculture)

http://www.nifa.usda.gov/funding/bfrdp/bfrdp.html (USDA Beginning Farmer and Rancher Competitive Grants Program).

Conclusion

The above recommendations, if implemented, will provide Rock Creek with an opportunity to:

1. Meet the changing needs of the industry
2. Invest in a healthier society
3. Invest in student retention
4. Invest in the goals of the strategic plan
5. Be innovative

Given that sustainable food businesses in Portland are increasingly popular and Washington County has traditionally been an agricultural landscape, it is clear that PCC Rock Creek is uniquely situated to train the next sustainable food business leaders, sustainability professionals, and social justice food advocates. Certificate graduates will have the opportunity to be leaders in working toward a more sustainable food system in a place where citizens are committed to and supportive of this value. Indeed, the world needs more individuals who are innovative on this topic.

The FNAg Workgroup recommends that PCC Rock Creek champion new ideas and programming to lead the food systems movement. PCC has the opportunity to move from reacting to change to directing change by graduating one-of-a-kind thinkers, advocates, foody system stakeholders, farmers, retailers, and restaurateurs who are leading the charge in how the nation thinks about food. Now is the time for PCC Rock Creek to be a leader by engaging in the emerging field of sustainable agriculture education. Let's move from reacting to change to directing change by graduating one-of-a-kind thinkers, advocates, farmers, retailers, and restaurateurs who are leading the charge in how the nation thinks about food

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Appendix A: Employment Data

Farmers, Ranchers, and Other Agricultural Managers 119013							
Area	**2012 Employment**	**2022 Employment**	**Change**	**% Change**	**Annual Growth Openings**	**Annual Replacement Openings**	**Total Annual Openings**
Oregon	1,432	1,720	288	20.10%	29	23	52
	Average Hourly	**Average Annual**					
	$29.37	$61,092					
Farmworkers and Laborers, Crop, Nursery, and Greenhouse (452092)							
	2012 Employment	**2022 Employment**	**Change**	**% Change**	**Annual Growth Openings**	**Annual Replacment Openings**	**Total Annual Openings**
	20,287	24,013	3,726	18.4	373	616	989
	Average Hourly	**Average Annual**					
	10.31	21,449					
Agricultural and Food Science Technicians (194011)							
	2012 Employment	**2022 Employment**	**Change**	**% Change**	**Annual Growth Openings**	**Annual Replacment Openings**	**Total Annual Openings**
	611	714	103	16.9	10	22	32

	Average Hourly	**Average Annual**					
	19.15	39,824					
First-Line Supervisors of Farming, Fishing, and Forestry Workers (451011)							
	2012 Employment	**2022 Employment**	**Change**	**% Change**	**Annual Growth Openings**	**Annual Replacment Openings**	**Total Annual Openings**
	1,571	1,826	255	16.2	26	33	59
	Average Hourly	**Average Annual**					
	26.59	55,307					
Agricultural Workers, All Other (452099)							
	2012 Employment	**2022 Employment**	**Change**	**% Change**	**Annual Growth Openings**	**Annual Replacment Openings**	**Total Annual Openings**
	1,712	2076	362	21.1	36	52	88
	Average Hourly	**Average Annual**					
	13.91	28,936					
Food Scientists and Technologists (191012)							
	2012 Employment	**2022 Employment**	**Change**	**% Change**	**Annual Growth Openings**	**Annual Replacment Openings**	**Total Annual Openings**
	215	262	47	21.9	5	7	12
	Average Hourly	**Average Annual**					
	30.7	63,853					

Appendix B: Survey Data

How are you affiliated with Portland Community College?		
Current PCC Student	66	55%
Prospective PCC Student	55	45%

Which of these topics appeal to you the most in a certificate or associate's degree?			
	Certificate	**Associate's Degree**	**Total Responses**
Organic Farming & Gardening	51	44	95
Sustainable Food Systems	40	55	95
Farm/Garden Business Management	36	42	78
Food Service Management	34	25	59
Baking and Pastry	39	26	65
Culinary Arts	33	37	70

Question: Which potential new courses are you most interested in taking related to foods, nutrition, culinary and/or sustainable agriculture?	**As part of a food systems degree or certificate**	**As an elective for another program, transfer degree or general interest**	**Total Responses**
Food Preservation	53	37	90
Organic Vegetable Production	59	31	90
Food & Culture	53	36	89
Urban & Suburban Growing: Vertical, Rooftop, Hydroponic, Hoop House	51	35	86
Sustainable Cooking	55	31	86

Fermentation	44	42	86
International Foods	44	40	84
School Gardens	46	37	83
Soil Science & Management	58	24	82
Organic Farming Principles and Practices	55	24	79
Farm to Institution	56	22	78
Small Business Planning	48	30	78
Food Security & Food Justice	53	24	77
Food & Agricultural Policy	58	19	77
Beekeeping	44	32	76
Food Systems Careers Seminar	41	32	73
Introduction to Food Systems	51	21	72
Orchard & Perennial Fruit Production	44	28	72
Culinary Skills	44	26	70
Growing Food for Restaurants	41	29	70
Food Safety	47	22	69
Floral Design	30	38	68
Sustainable Restaurant Practices	43	25	68
Cut Flower Production	32	35	67
Food Entrepreneurship	46	20	66
Baking Techniques	36	30	66
Food Service & Preparation	39	20	59

Appendix C

The following is a sampling of schools around the country with sustainable agriculture education opportunities, compiled as part of a larger inventory of sustainable food initiatives in higher

education. Programs highlighted in green include formal academic programs at community colleges, specifically.

Institution	Type	Program	Career
Greenfield Community College	Community college	Farm and Food Systems Associate Degree	Transfer to: UMass Sustainable Food and Farming Program, Green Mountain College, Marlboro College; work at farm stand; work with local technical high school. "It is a leadership program, so students are empowered to lead" http://www.gcc.mass.edu/academics/programs/farm-and-food-systems/
Central Carolina Community College	Community college	Sustainable Agriculture Associate, Agricultural Sustainability Certificate, Sustainable Livestock Systems Certificate, Sustainable Vegetable Production Certificate	"Some students use their education to build sustainable farms, while others seek employment at established sustainable operations. Employment opportunities are found elsewhere through schools, parks and environmental centers. Jobs are available with non-profit organizations focusing on farmer advocacy." http://www.cccc.edu/sustainableag/
Wayne Community College	Community college	Associate in Applied Science – Sustainable Agriculture, certificate	Farm manager/owner/worker, organic gardener, integrated management pest scout, retail/wholesale crop production, livestock production, vineyards, related agriculture businesses/government/environmental agencies http://www.waynecc.edu/sustainable-ag/
Clackamas Community College	Community college	Urban Agriculture Certificate	Farm operation and management, community garden manager, farmer's market manager, school garden or community supported agriculture farm operator
Linn-Benton Community College	Community college	Profitable Small Farms Program – Certificate	Work on organic farms
Antioch University New England	Doctoral/ research	Environmental Studies PhD with a Food and	Shelburne Farms, Vermont Community Garden Network, Food Solutions New England, Intervale Center, Stonewall Farm, Cheshire County

		Environment Specialization	Conservation District, The Community Kitchen, Inc., University of Maine Cooperative Extension as Food Systems/Youth Development Professional
Colby-Sawyer College	Baccalaureate	Environmental Science and Studies Degree offer a Food and Agriculture Concentration	Peace Corps, Environmental Education Center, nursing qualification
Temple University	Research university	Certificate in Sustainable Agriculture, Minor in Sustainable Agriculture	"the garden has given a lot of people inspiration to do gardening/sustainability work in their daily lives. The group has built a strong network in the surrounding community, so opportunities arise from those connections that engage students beyond the garden."
Keene State College	Master's	Early Sprouts Garden (no formal ed)	Many go on to become early childhood teachers
Bergen Community College	Community college	Community Garden (no formal ed)	Environmental consultants, additional school (biology, sustainability studies), experiential educators
Kingsborough Community College	Community college	KCC Urban Farm (no formal ed)	Farm interns typically transfer to a four-year college to pursue a bachelor's degree
Pomona College	Liberal arts	Pomona College Organic Farm (no formal ed)	Small-scale farmers, landscapers, food justice and farm activists, homesteaders
University of Washington	Research university	UW Farm (no formal ed)	Food Education, start-up work: story of one student: http://food.washington.edu/2015/01/michelle-venetucci-alumni-profile/
Wesleyan University	Liberal arts	Long Lane Farm (no formal ed)	National Young Farmer's Coalition Membership Development Coordinator (http://www.youngfarmers.org/nyfc-welcomes-its-new-membership-development-coordinator/)
Massachusetts College of Liberal Arts	Liberal arts	Campus Garden (no formal ed)	Education/interpretation/grounds keeping with a land trust

As demonstrated in an inventory of sustainable agriculture education programs in higher education, over 30% of institutions have some kind of living laboratory for informal sustainable food/agriculture education, and over 90% of these programs have been initiated in the last 10 years. A smaller number of institutions have formalized education in this area, but these programs are also emerging rapidly in the form of certificates, associate's degrees, four-year degrees, and minors. It is evident that students are acquiring knowledge and skills on food and agriculture in venues beyond the traditional land-grant system.

Appendix D: Rogue Farm Groups Job Placement Information

South Willamette Chapter

Intern (2014)... is now back teaching at Chewonki, an environmental education organization in Maine that operates a farm

Intern (2014)... After Rogue Farm Corps she did the FIELD program up in Washington and is now working at Essex Farm in NY as an intern (whole-diet CSA program)

Intern (2015)...now working at a Mountain Bounty Farm, a mixed vegetable operation with 600+CSA and wholesale accounts, in California

Intern (2015)...doing FarmsNOW Apprenticeship program through RFC at Ruby and Amber's Farm

Intern (2015)...returned to Organic Redneck to be CSA manager

Intern (2015)...came back to Oregon in March 2016 after working at a dairy farm back in Ohio for the winter. She is now living and working at a permaculture place and the Log House while looking for the next steps to start her own farm.

Intern (2015)...after the program went back to Arizona. In June he'll be back in Oregon working at Fair Valley Farm near Eugene.

Rogue Valley Chapter

Intern (2014)... Piloted the FarmsNOW Apprenticeship program (2015) at By George Farm and is now doing a Seed Contract Incubator plot there for the 2016 season

Intern (2014)... Managing the no-till gardens at Hanely Farm in Central Point.

Intern (2014)... Volunteered on another property in the US Virgin Islands, and now managing a beginning farm project in Southeast Missouri- a 70 acre farm property, 35 acres rented for cattle grazing. We are using 4 acres around the house to plant fruit trees and perennials.

Intern (2013)... running Raptor Creek Farm at the Josephine County Food Bank after farming his own land for two years and then selling the place.

Intern (2013)... Education Director at Fairview Gardens, a 12-acre non-profit, educational farm.

Intern (2013)... Worked for Chickadee Farm in Southern Oregon, and then to a farm in Marin County, All Star Organics, and worked and am still working for an organic produce department in Marin. Has recently joined a shepard at a ranch south of Petaluma, CA. and will be fencing a 2 acre plot (less in year one) and growing organic produce, seed crops, and herbs.

Intern (2013)... Graduate Student in Nonprofit Management. Work with La Via Campesina on food sovereignty and agroecology movements.

Intern (2011)... Co-operates the Farm Kitchen, Rogue Valley's only Farm to Table & whole foods meals-to-go delivery service, sourcing local produce and meats from sustainable and organic family farms.

Intern (2009)... Went on to start his own farm, now is in school and working for an organic fertilizer company and wants to work with farmers to find new marketing methods and manage risk.

Intern (2009)... runs By George Farm and Creamery with his husband in the Little Applegate.

Unknown Intern… Helping manage a small, diversified veggie, berry and flower farm in Pescadero, CA

Portland Chapter
Intern (2015)... Started her own veg farm in CA after going through FarmsNext @ Fiddlehead Farm

Intern (2015)... Started her own flower farm (Fair Shake Farm) near Vancouver WA after going through FarmsNext @ Dancing Roots Farm

Intern (2015)... Working at Duncan Farm and Pumpkin Ridge Farm, in Washington County, OR.
Intern (2015)... Helping manage a diversified animal/vegetable farm in the Lehigh valley of Pennsylvania. We have summer and winter CSA's, a year round farmers market, restaurant partners, and have just started a meat CSA. www.wildfoxfarm.com

Central Oregon Chapter
Intern (2015)... Is working @ Rainshadow, her host farm. She is heading the goat dairy portion, and building an earthship on site.
Intern (2015)... Farming an acreage east of tow, in Alfalfa, and starting with small scale vegetable production.

Preliminary Review for New Degrees and Certificates, Programs and Disciplines

The development of new programs, degrees and certificates is an intensive endeavor, and occasionally much time and effort is invested in programs that the college may not be prepared to support. This process for preliminary approval is intended to help frame the initial conversations between faculty and their administrators in a collaborative discussion so as to ensure that the concepts embodied in new programs, degrees and certificates, as well as some critical basic support structures (people, funding etc.) are well-considered prior to significant developmental investment..

Two phases of preliminary review precede full program development and approval. It is recommended that Phase I, containing the most fundamental information, be completed, reviewed as described below and given preliminary approval before developing the information required in Phase II. (However, if the proposal is simple, leveraging existing curriculum and resources, it may be possible to do Phase I and Phase II in concert). Pre-approval must be secured prior to investing resources in program development, and prior to making a formal request via the Curriculum Office and processes. Pre-approval does not guarantee that the fully developed program will be ultimately approved, but does provide a strong platform for development.

Phase I

Discussions will include Faculty, all relevant Division Dean(s), Dean(s) of Instruction, Dean of Academic Affairs, Academic and Student Affairs Council, Vice President for Academic and Student Affairs.

Support from administration through this level is strongly recommended before continuing to Phase II.

Basic Information

Name of the New Program, Degree or Certificate: * Sustainable Foods & Farming

*Pending input from advisory committee

- ○ New Degree or certificate within an existing CTE Program AAS Degree
  - ○ AAS Degree
  - ○ AAS Degree Option
  - ○ 2 yr Certificate (two year)
  - ○ 1 yr Certificate (less than two year)
  - ○ <1 yr Certificate (including Career Pathway)
- ○ New Degree or certificate not associated with an existing CTE program
  - ○ AAS Degree
  - ○ AAS Degree Option
  - ○ 2 yr Certificate (two year)
  - ○ 1 yr Certificate (less than two year)
  - ○ <1 yr Certificate (including Career Pathway)
- ○ Transfer Program or Discipline
- ○ Developmental Education Program
- ○ Other: _____

Program/Discipline Degree and Certificate Description and Rationale

Program Summary: Please describe the program, summarizing its educational and career objectives and its relationship to the College's Mission* and Strategic Plan. If this is a new area of instruction, provide reasons why the proposal is now considered central to the college's mission and ongoing development.

*Portland Community College advances the region's long-term vitality by delivering accessible, quality education to support the academic, professional, and personal development of the diverse students and communities we serve.

This proposed certificate would be housed in the Foods & Nutrition SAC. The courses in this certificate program are designed to provide students with the required academic and technical skills to be successful in the development and operation of an environmentally sound, community-based, profitable small farm, garden or agriculture business. Students are to be trained in management approaches, product marketing, and the skills to assess local, physical and environmental factors that affect the sustainability of a small farm operation. Emphasis is placed on entrepreneurial and field training. Students will also learn the basic principles of our economic system and government policies and programs related to agriculture.

Within the coursework are embedded problem solving and critical thinking skills that enable the student to develop creative solutions to problems encountered in small farm operations. Students are provided with hands-on experience in plant propagation, soil building and composting, organic farming methods, business and marketing.

<u>Rationale/Needs statement for this new program/degree/certificate</u>: How does it address the economic and/or educational needs of students, the community and/or the State of Oregon? Describe how the level of need was determined.

In Fall 2015, the College formed a Foods & Nutrition/Sustainable Agriculture (FNAg) Workgroup comprised of faculty, staff and administration. The charge of the group was to identify educational program needs that capitalize on the Rock Creek campus and community resources of the Learning Garden and the Foods & Nutrition Lab. Analysis to identify specific jobs directly connected to the field were completed.

Members from the work group contacted representatives from the agricultural industry, food system stakeholders, college and university faculty currently involved in similar programs, both in and outside of Oregon, and local business and industry leaders. Information was gathered through phone, face-to-face interviews and campus tours. The workgroup met several times between September 2015 and June 2016. During the meetings, information was shared and work was done to narrow down the multitude of possible focus areas within the broad field of "food systems".

Workgroup Process

The Workgroup was formed in Fall, 2015 and includes the following individuals:

Alissa Leavitt, MPH, MCHES Health Studies Faculty Rock Creek	Elaine Cole, PhD Sustainability Coordinator Rock Creek
Debra Lippoldt, MS, RN Faculty Department Chair Foods and Nutrition Sylvania	Nora Lindsey Learning Garden Coordinator Rock Creek
Dana Fuller, MSW, GCSA Division Dean, Social Science, Communication and Health Rock Creek	

Sustainable Agriculture Focus Group

For many years, there have been campus discussions, meetings and informal committee work to design a sustainable agriculture program. In 2013, a college-wide group of ≈40 interdisciplinary staff and faculty organized a Sustainable Agriculture Focus Group. This effort was terminated in 2014 and from these initial efforts, the FNAg Workgroup has developed this new iteration of the project and proposal.

Data Collection Efforts

The quantitative and qualitative data collected from over 50 individuals through focus groups and meetings with internal and external partners created the foundation from which the Workgroup developed this proposal. The Workgroup will be reviewing additional data from the Oregon State University Urban Farmer program, the Oregon State University Food Innovation Center and a survey report from Friends of Family Farmers. Each has agreed to share relevant data when the reports are final the end of June. This document will be updated with that information.

Additional Consultation from Internal Partners

Name	Title
Kate Kinder	Career Pathways
Marc Goldberg	Associate Vice President - Workforce Development and Community Education
Sheila Meserschmidt, MBA	PCC Institute for Health Professionals
Beth Molenkamp, MA	PACTEC Regional Coordinator Dual Credit Program Manager
Heidi Edwards	Outreach and Orientation Coordinator Rock Creek
David Sandrock, PhD	Landscape Technology Program
Andrew S. Garland-Forshee, Ph.D., HS-BCP	Early Education & Family Studies
Jan Abushakrah, PhD	Gerontology Program: Horticulture Therapy
Haydee Goldenberg	Career Exploration Center Coordinator

Meeting with External Contacts

The Rock Creek campus has hosted over a dozen loop tours to engage potential partners. Additionally, the following people have been consulted on this proposal through informational interviews and focus groups.

Name	Title
David Stone, PhD	Director, Food Innovation Center Oregon State University
Jason Ball	Resident Chef, Food Innovation Center Oregon State University
Amy Gilroy, MPH	Farm to School Manager Oregon Department of Agriculture
Jessica Gutgsell, RDN	Bionutritionist, Kitchen Coordinator Oregon Health & Science University
Gene Fritz	Oregon Health & Science University Oregon Restaurant Association (want to work on culinary themed focus group)
Maggie Michaels	Curriculum of Cuisine
Lora Wells	Culinary Arts Teacher Westview High School

Mary Masters	Culinary Arts Teacher Liberty High School
Erin Linhares	Culinary Arts Teacher Forest Grove High School
Heidi Larson	Culinary Arts Teacher Tualatin High School
Deanna Palm	President Hillsboro Chamber of Commerce
Stu O'Neill	Executive Director Rogue Farms
Weston Miller, Puhkarj Deol	Organic Gardening Certificate Program. OSU Extension
Chenoa Philabaum	New Seasons Market
Penelope (Penny) L. Diebel	Assistant Dean of Academic Programs College of Agricultural Sciences Oregon State University (Meeting in June)
Anna Garwood Sarah Canterberry	Growing Gardens
Dee Wetzel	Training and Education Coordinator Portland State University
Heather R. Morrow-Almeida, MPH	MCH Systems and Policy Analyst Public Health Division
Brian Wilke	Co-founder Oregon Culinary Institute (Meeting 6/23)
Joyce Dougherty	Director Oregon Department of Education Child Nutrition Programs
Abby Farmmantino	Airbnb Food + Drink Operations Manage
Jennifer Young, MPH, RDN	Policy Specialist Public Health Division
Susan Greathouse, MPH	WIC Nutrition & Local Services Manager Oregon Health Authority
Wendy Popkin	Executive Director, Education Foundation Oregon Restaurant & Lodging Association
Gene Fritz, Ed.M.	Academic Director – Culinary Arts Art Institute
Neeraja Havaligi, PhD	Biodiversity and Climate Change consultant
Megan Horst, PhD, AICP	Assistant Professor Portland State University
Molly Notarianni	Friends of Family Farmers
Janet Bean	HR Manager Beaverton Foods

Tia Henderson, PhD	Upstream Public Health

Current & Prospective Student Survey

Over the course of these meetings it was clear that the Workgroup needed to engage current and prospective PCC students. A survey was created to solicit input on course offerings and was sent to related programs at PCC, posted to the Learning Garden Facebook page and sent to external partners in sustainable agriculture and culinary programs. A request to participate in this Qualtrics survey was distributed through an online link in an email. The survey was open for 2 weeks. In total 121 respondents (55% PCC students, 45% prospective PCC students) showed a growing desire for food systems related programming. (Appendix B)

Justification for Certificate Program

Agriculture has found itself reframed amid a larger economic cluster commonly known as "food systems." Recent changes in consumer demand for food, food experience, food security, eating habits and lifestyles have opened the door to a host of economic and agricultural career opportunities.

In an era of climate change, resource limitations, growing population, increase in obesity and chronic illness, food injustice, etc, the food system must move to support and expand small-scale community food systems-focused agriculture. Half of American farmland is expected to change ownership in the next two decades. This could be an opportunity for young people, people of color, women, and anyone interested in small-scale, sustainable agriculture to succeed.

Currently only 5% of what we eat in the Portland region is sourced locally. A reasonable increase would have a tremendous economic impact and enable a major expansion of jobs in sustainable local food. (Megan Hurst, Personal Communication) As the food movement grows, the demand for college and university classes focusing on food systems has expanded. More than 70 community colleges, four-year colleges, and universities now have specific degree programs for sustainable agriculture or food systems. (Civil Eats, 2016)

Alignment with College Strategic Plan.

The proposed certificate and continued exploration for an AAS degree aligns with the following strategic plan efforts at the College:

- Think Fearless: Ignite a Culture of Innovation
- Think Accountable: Achieve Sustainable Excellence in All Operations
- Think Powerful: Transform the Community Through Opportunity
- Think Proud: Create a Nationally Renowned Culture for Diversity, Equity and Inclusion
- Think Bold: Drive Student Success

Sustainability.

This certificate program meets the sustainability goals of the College. The College has strengthened its commitments to sustainability, developed two iterations of its Climate Action Plan and has taken significant strides to reduce its environmental footprint and promote education for sustainable development.

Health Benefits of Proposed Program.

Urban agriculture has the potential to enhance the nutritional status of urban residents in general, and the urban poor in particular, by directly improving food security and nutritional adequacy. The benefits of gardening and food growing for health and wellbeing are well-documented in the literature (Van den Berg, 2015). By expanding the programming of the Learning Garden and the Foods & Nutrition Lab, students, faculty and staff will have more opportunities to congregate as healthy members of the Rock Creek community through the enjoyment of gardening, healthy foods, nutrition, and environmental stewardship.

<u>Labor Market information</u>: For programs designed to prepare students for immediate employment, document the potential employment opportunities of graduates and outlook for jobs in the region. If there are employers who have requested establishment of the program please describe their specific employment needs.

Employment Data.

Although the career trajectory for sustainable food systems is not linear like other fields, students who complete sustainable agriculture programs are being hired after program completion. (See Appendix C and D in Project Proposal) The growth of local food and farming is particularly important today as the world experiences climate disruption, energy shortages, and economic stress. Students who recognize crisis as an opportunity are gravitating to the study of sustainable farming, working toward careers in local food and green businesses, urban agriculture, permaculture, and related jobs in farm-based education, community development and advocacy.

The United States Department of Agriculture (USDA) recently reported a 144% increase in farm direct sales over a 5-year period indicating a healthy demand for this service. The local food movement has created jobs throughout the food supply chain and the demand for local food often exceeds supply.

The proposed certificate program is designed to provide a workforce for jobs that are created in support of local food production. 'Farm Educator', Garden Program Director', and 'Farm to School Coordinator' and similar job listings are appearing throughout the region. Employment of agricultural and food scientists is projected to grow 9 percent from 2012 to 2022, about as fast as the average for all occupations

Oregon Data.

In Oregon, the average age of a farmer is 60 years therefore growth and replacement of an aging workforce are factors in future jobs. The total number of job openings is projected to be much higher than the statewide average number of job openings for all related occupations through 2022. This occupation is expected to grow at a somewhat faster rate than the statewide average growth rate for all occupations through 2022. (See Appendix A in Project Proposal for additional labor statistics)

National Trends.

Around the country, directors of sustainable agriculture programs (both formal and informal education), and program websites, report that students go on to work in some capacity of the food system. Program information from over 40 programs throughout the United States, was collected for reviewed by the Workgroup. A list of questions was asked of all programs and responses to those questions with general program/facility information were provided to the Workgroup for review and discussion.

Graduates of the proposed certificate program will be equipped to begin or continue careers in the local and sustainable food system. The *Journal of Agriculture, Food Systems, and Community Development*'s February 2012 Call for Papers documents this growing field of employment; the call reads, "emerging regional food systems appear to be creating some new occupational opportunities, including the emergence of green-collar sustainable occupations such as farmer trainers, farm managers, agriculture teaching positions certifiers, and consultants."

Recent positions posted in Oregon that a graduate may be qualified for include:

Sector Types	Types of Jobs
Education (K-12, Higher Ed)	Educator, Instructor
School Food Service, Catering	School or Community Garden Coordinator
Restaurants	Prep Cook, Purchaser
Agriculture	Farm, Field, Garden, Compost, Greenhouse, Food Safety Managers
Non-profit supporting sustainable foods	Garden-based Nutrition Educator, Corporate Wellness
Food Companies	Environmental Sustainability Coordinator
Farmers Markets	Project Coordinator, Program Coordinator
Grocery Stores	Manager
Organic Farms	Farmer
Hospitals and Care Centers	Community Outreach and Education
Community Gardens	Community Organizer in Sustainable Agriculture
University Farms	Communications or Social Media Specialist, Web Developer
Food Security Organizations	Non-Profit Project Specialist
Community Development Organizations	Food Demonstrator, Purchasing Coordinator

Transfer – identify similar programs at other OUS /private universities to which students may continue their studies.

The FNAg Workgroup is currently in discussion with 4-year institutions to develop transfer agreements with:

- Oregon State University (various tracks in agriculture)
- National College of Naturopathic Medicine (Bachelors Degree in nutrition
- Portland State University (Bachelor's degree in Community Health Education)

Academic Structure and Support:

Campus/Division proposing this new program/certificate: Rock Creek Social Science/Health PE & Communications

Where and how will this program be housed/supported? This proposed certificate would be housed in the Foods & Nutrition SAC

Where will courses be offered? Rock Creek to start

Does this program replace any existing program(s)? No

Is it closely aligned with any other program(s)? Not necessarily closely aligned, but this program is interdisciplinary in nature with Landscape Technology, Health Studies, Foods & Nutrition, Business, and Environmental Science.

Is this primarily a restructure/consolidation of existing courses and resources? No

Describe anticipated faculty and other personnel (classified, AP or administrative) requirements:
To accurately develop the project's scope and necessary funding, the Workgroup recommends that in Fall 2016, the college enlist a coordinator/.5 release time to look at limitations and possibilities in order to develop an accurate budget. The deliverables are as follows:

1. Project analysis that details of the project and how it will be managed.
2. Program analysis that should confirm work done by the FNAg Workgroup and modify it as necessary based on consultant/Advisory Group experience and input.
3. Complete the Preliminary Review form and submit to the Curriculum Office.
4. Project budget that would provide detailed estimates and funding methods.
5. Convene Industry Advisory Committee.
6. Draft Sustainable Food Systems certificate for Spring 2017 implementation.
7. Draft articulation and/or transfer agreements with 4-year partners.

Draft Budget Needs

Staffing.

1. To allow for most effective sustainable agriculture training and operational oversight and management, an on-campus house for a farm manager and/or interns, apprentices, and AmeriCorps service members is needed.

2. To engage in the mentioned initiatives, the Sustainability Coordinator position and the Learning Garden Coordinator position need to be full-time.

3. To engage in the mentioned initiatives, to coordinate the certificate program, and to implement other new programming, the Foods & Nutrition FT instructor position needs to be reinstated. In addition this person would help develop a strong recruitment program and materials to ensure the success of this new certificate.

4. To support the FN Lab classes, a Foods & Nutrition Lab Technician is needed to assist in the preparation and setting-up, storage, inventory, cleaning and proper storage and disposal of lab materials, food supplies, and kitchen equipment.

5. To support the garden and its operations, a permanent part or full time farmhand position is needed.

6. To support faculty in classes and volunteer management, two AmeriCorps positions need to be funded.

Describe anticipated space requirements:

Physical Infrastructure. See Master Plan - completed 2015 with help from Scott | Edwards Architecture, Lango Hansen Landscape Architects and Fortis Construction.

1. An outdoor covered lab space would serve as a classroom, rentable space for community partners, and a gathering space for the PCC community.

2. In addition to a classroom, it would house all compost operations, a wash station, and office space in one covered structure.

3. Learning Garden Coordinator and AmeriCorps or Farmhand Apprentice housing.

4. Maintenance and staffing plan with funding for these structures and key staff would be imperative to support the program and infrastructure.

Describe anticipated needs for technology: equipment and software:

TBD

Describe anticipated funding/revenue source(s) for the program:

The FNAg Workgroup has plans to collaborate with grants office to search for relevant grant that address needs in the areas of focus.

For example, it has been suggested by external partners that PCC apply for Oregon Department of Agriculture funding for the Specialty Crop Block grant. This will allow us to develop these specific classes and use enrollment data and student feedback to determine whether there is a need for an additional certificate, degree or transfer degree related to agriculture, food systems, or another related field.
There are additional Grant opportunities.

- Good search terms: education, food systems, alternative agriculture)

http://www.nifa.usda.gov/funding/bfrdp/bfrdp.html (USDA Beginning Farmer and Rancher Competitive Grants Program).

How will this degree/certificate or discipline be SAC-supported:

- ○ **within an existing SAC? Which one?** Foods & Nutrition SAC
- ○ **with the formation of a new SAC?**
  Has an Administrative Liaison been identified? _____

Signatures:

In addition to indicating support of the proposal, Deans warrant that this phase has been discussed with Faculty, all relevant Division Dean(s), Dean(s) of Instruction, Dean of Academic Affairs, Academic and Student Affairs Council, Vice President for Academic and Student Affairs.

Division Dean PRINT NAME HERE _____ _____
signature date

Dean of Instruction PRINT NAME HERE _____ _____
signature date

Campus President PRINT NAME HERE _____ _____
signature date

Phase II -- Please include all information from Phase I, updated as appropriate, and supply additional information outlined below:

Timeline

Proposed Beginning Date Spring 2017

Has Curriculum Office been consulted regarding the deadlines necessary to meet this date?

Goals and Objectives

Describe the purpose, goals and objectives of this program or discipline, and how these relate to the College Core Outcomes?

The courses in this certificate program are designed to provide students with the required academic and technical skills to be successful in the development and operation of an environmentally sound, community-based, profitable small farm, garden or agriculture business. Students are to be trained in management approaches, product marketing, and the skills to assess local, physical and environmental factors that affect the sustainability of a small farm operation. Emphasis is placed on entrepreneurial and field training. Students will also learn the basic principles of our economic system and government policies and programs related to agriculture.

Within the coursework are embedded problem solving and critical thinking skills that enable the student to develop creative solutions to problems encountered in small farm operations. Students are provided with hands-on experience in plant propagation, soil building and composting, organic farming methods, business and marketing.

The proposed certificate and continued exploration for an AAS degree aligns with the following strategic plan efforts at the College:

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- Think Powerful: Transform the Community Through Opportunity
- Think Proud: Create a Nationally Renowned Culture for Diversity, Equity and Inclusion
- Think Bold: Drive Student Success

Sustainability.

This certificate program meets the sustainability goals of the College. The College has strengthened its commitments to sustainability, developed two iterations of its Climate Action Plan and has taken significant strides to reduce its environmental footprint and promote education for sustainable development.

Learning Outcomes and Assessment

In the table below, identify the anticipated <u>degree and certificate student learning outcomes</u> (add more rows as necessary), identify which College Core Outcome(s)s each aligns to, and indicate briefly how student achievement of each outcome will be assessed. (For assistance with outcomes and or assessment, contact the Learning Assessment Chair for an Outcomes/Assessment Coach).

Draft Outcomes (pending Advisory Committee approval)

Outcome	Aligned w/ Core Outcome(s) [COM, CER, CA, CTPS, PC, SR]	Brief Description of Assessmen
Demonstrate an understanding small scale of food systems, practices and how food gets to market.	Community and Environmental Responsibility, Critical Thinking and Problem Solving	Skills to assess local, physical and environmental factors that affect the sustainability of a small farm operation.
Demonstrate an understanding of food safety principles and practices related to food production and direct market sales.	Critical Thinking and Problem Solving	Become ServSafe Certified and have a demonstrated understanding of Good Agricultural Practices (GAPs).
Demonstrate an understanding of organic farming principles, methods and practices.	Professional Competence	Demonstrates how to grow food in a sustainable, ecologically sound and socially just manner in a hoop house, greenhouse and outside.
Demonstrated ability to develop and deliver agriculture-based educational curriculum for students of all ages.	Communication	Teach at least 12 times to a variety of audiences in the garden and or classroom setting.
Preparation of a personal business/marketing plan for small farm operation or other food/ag related business.	Professional Competence	Work with a client to produce a business plan for a small food or agriculture-related business.
Understand all aspects of how a food is grown and sold at a market stand.	Community and Environmental Responsibility:, Professional Competence	At least one quarter (Spring, summer, Fall) of practicum experience with the on campus Portlandia Farm Standia.

Admission Requirements

Are there special admission requirements (prerequisites and/or other) for students in this program?
No (pending feedback)

Explain the admission process: Application process, limited entry (pending feedback)

Describe how these requirements are intended to assure that students are prepared to complete the program.

Curriculum

Outline all curricular requirements for the proposed program, including prerequisites, general education, specialization, capstone, and any other relevant component requirements.

Draft Certificate Design (Pending Advisory Committee feedback)

The campus already offers relevant courses that fill consistently, including, but not limited to: Organic Gardening, Permaculture Design, and Soils and Plant Nutrition. These courses would only become more popular by adding a certificate credential. A small number of new classeses would be added. PCC currently has existing facilities that include a greenhouse, hoop house, Foods & Nutrition Lab and organic farm on the campus that will be utilized for the certificate program.

Sustainable Food Systems Certificate Requirements - 35 Credits		
Course	**Course Description**	**Credits**
NEW COURSE FN X: Intro to Garden & Farm Education	A hands-on field based course to teach both pedagogy and practice of engaging volunteers and students. There will be a classroom component (lesson planning) and students will apply content learned and practice teaching and supervising students (K-12-adults) in the garden.	3
NEW COURSE Local/Regional Food Systems Lab	This course will explore Pacific Northwest food systems and regional crop production, examine channels of industrialized and localized food distribution and challenge the barriers to creating food secure communities.	1
NEW COURSE FN X: Intro to Food & Farm Systems	This course provides students with an interdisciplinary understanding of ecological, economic, political, and social systems as they relate to food and farming both regionally and globally.	3
HE 264: Health, Food Systems & the Environment	This course will examine how food systems influence human and environmental health. Students will explore the connections between sustainable agriculture concepts/practices, food systems, and personal and environmental health. Audit available. Community-based Learning with Garden Lab Project	3
FN 110: Personal Nutrition	Explores personal food habits and beliefs. Emphasizes practical application of nutrition knowledge to enhance general health. Analyze present diet and evaluate it according to latest nutritional guidelines. Basic nutrition course for students with little or no science background. Audit available.	3
FN X: Culinary Skills Lab	Provides an opportunity to apply foundational knowledge of food composition and nutritional values to food preparation. Explores skills in meal planning, recipe modification and basic cooking techniques. Seasonal food from the Learning Garden will be used in hands on cooking.	1
ESR 140: Introduction to Environmental Sustainability	Introduces concepts of environmental sustainability and their applications. May include field trips. Prerequisites: WR 115, RD 115 and MTH 20 or equivalent placement test scores. Audit available.	4
NEW COURSE	This course is a hands on practicum in the Rock Creek Learning Garden,	3

FN X: 4 Season Farming— Spring	teaching all aspects of seasonal crop production. This course includes visits to study and work on other local small scale farms.	
NEW COURSE FN X: 4 Season Farming— Summer	This course is a hands on practicum in the Rock Creek Learning Garden, teaching all aspects of seasonal crop production. This course includes visits to study and work on other local small scale farms.	3
NEW COURSE FN X: 4 Season Farming— Fall	This course is a hands on practicum in the Rock Creek Learning Garden, teaching all aspects of seasonal crop production. This course includes visits to study and work on other local small scale farms.	3
NEW COURSE FN X: 4 Season Farming— Winter	This course is a hands on practicum in the Rock Creek Learning Garden, teaching all aspects of seasonal crop production. This course includes visits to study and work on other local small scale farms.	3
NEW COURSE FN X: Farm and Food Entrepreneurship	This course allows students to explore multiple marketing opportunities for small farms including: farmer's market, CSA, restaurant, farm to school, plant sales and more. Students will gain hands on experience in all aspects of managing a farm stand. This will include crop planning, harvesting, post-harvest handling, packaging, pricing, selling, marketing, customer service, and food safety.	3
DM 10/FN 105:: Food Safety	Covers foodborne illnesses in food industry. Includes identifying and analyzing the factors which cause foodborne illnesses and food safety and sanitation through proper purchasing, preparation, handling and storage. Includes the ServSafe exam. (Add FSMA info)	2
Total Credits 35 credits		

Organic Farming & Gardening Certificate Electives - X Credits		
Course Description	Course Description	Credits
NEW COURSE FN X Introduction to Beekeeping	This course is an introduction into beekeeping and is designed for new beekeepers. It will cover topics such as bee biology and behavior, hive management, swarming, equipment and products. The PCC Rock Creek Apiary will serve as a learning lab with the intention to give you the information, knowledge, experience and support to manage your own Langstroth beehive.	1?
NEW COURSE Growing Techniques for the Urban Farmer FN X:	Using PCC Rock Creek's learning labs this course will explore vertical growing, container and hoop house gardening, and hydroponic systems including dutch bucket and nutrient film technique. You will also see examples of green roofs. In this hands-on course you will practice propagating food in a variety of these systems.	3

FN X: Food Preservation lab	This course will provide an introductory sampling of many of the basic food preservation techniques such as: dehydrating, blanching and freezing, hot water bath canning, pickling, fermenting, and making vinegars and shrubs. You will be learning, eating and preserving with seasonally grown fruit, vegetables and herbs from our Learning Garden.	1
BA 223	Principles of Marketing	4
A to Z Grantwriting-online community education class	Learn how to research and develop relationships with potential funding sources, organize grantwriting campaigns, and prepare proposals.	
LAT 115. Tool and Equipment Safety, Operation and Maintenance.	Introduces common tools and equipment used in landscaping and gardening. Covers safe operation and maintenance of common tools and equipment. Provides the opportunity for hands-on experience with tools and equipment for example; walk-behind rototiller, weed wacker, propane weed burner, push mower, vermicompost harvesting with electrical winch, etc.	3
NEW COURSE LAT X: Edible Landscaping	Using PCC Rock Creek's verdant campus grounds and Learning Garden, students will gain hands-on experience in creating and maintaining edible landscapes. The class will be engaged in design and planting on campus as a part of class..	3
BI 163: Organic Gardening		4
CSS 200: Soils		4
LAT 109: Plant Propagation		3
BA 101: Intro to Business		4
BA 111: Intro to Accounting		3
BA 250: Small Business Management		3
HE 278: Human Health & the Environment		3
HE 251: Community/Public Health Issues		4
FN 225: Nutrition		4
ESR 171: Environmental Science: Biological Perspectives		4
LAT 106: Basic		4

Horticulture		
LAT courses as approved by advisor		
HORT 285: Permaculture Design- summer	Covers principles of permaculture for both urban & rural applications and sustainable human settlements. Covers landscape analysis, ecological planning & design methods, organic food production, food security, natural soil improvement, integrated animal systems, water harvesting, conservation and management, forest gardening, techniques and design strategies. Upon completion of this course students will be awarded a Permaculture Design Certificate through the Cascadia Permaculture Institute.	
HORT		

Will the program lead to external certification/licensure? _____ YES __X___NO
If YES, in what field/specialty, and by what professional organization?

Will special accreditation be sought? _____YES ___X__ NO
IF YES, by what group?
By what date?

Will program or any related courses be offered off-campus? _____YES __X___ NO
IF YES, at what address?

How much? (Specify number of courses and related credits)
Via Distance Education? _____ YES _____ NO

Enrollment

What are the projected enrollments?
Year One ___16_____ Year Two___16_____ Year Three _____16_____

How were these projections determined?
Through discussions with external and internal partners and enrollment data from similar programs

What planning has been made for the possibility that anticipated enrollment estimates are not achievable?

The FNAg Workgroup is collaborating with Non-credit to offer courses as both credit and non-credit and this effort would increase enrollment.

Faculty and Academic Leadership

List name and/or qualifications of each current faculty member who will teach required and/or elective courses within the program/degree or certificate:

Adjunct Faculty

Elaine Cole, PhD
Sustainability Coordinator
Rock Creek

Nora Lindsey
Learning Garden Coordinator
Rock Creek

others to be determined

Is faculty release time needed to develop the program? __Yes____ If so:

Existing and/or new faculty? existing faculty to coordinate the project through the curriculum approval process.

how much/how long?

Will new faculty need to be hired? ___ Yes**_____ If so:**

How many: ____2-3 adjunct faculty_____

When will this search take place? _____TBD_____

What qualifications will be required? _____TBD_____

Additional Support Staff needed? (Classified, AP (including Perkins advisor), other?) _____

Explain:

Staffing.

1. To allow for most effective sustainable agriculture training and operational oversight and management, an on-campus house for a farm manager and/or interns, apprentices, and AmeriCorps service members is needed.

2. To engage in the mentioned initiatives, the Sustainability Coordinator position and the Learning Garden Coordinator position need to be full-time.

3. To engage in the mentioned initiatives, to coordinate the certificate program, and to implement other new programming, the Foods & Nutrition FT instructor position needs to be reinstated. In addition this person would help develop a strong recruitment program and materials to ensure the success of this new certificate.

4. To support the FN Lab classes, a Foods & Nutrition Lab Technician is needed to assist in the preparation and setting-up, storage, inventory, cleaning and proper storage and disposal of lab materials, food supplies, and kitchen equipment.

5. To support the garden and its operations, a permanent part or full time farmhand position is needed.

6. To support faculty in classes and volunteer management, two AmeriCorps positions need to be funded.

7. Adjunct staff to develop course outcomes and learning objectives.

Dept. Chair: **New or Existing (identify)** Michael Meagher (existing chair Foods & Nutrition Rock Creek)

If new, estimate release/compensation anticipated: _____
(based on current FDC compensation formula)

SAC Chair: **New or Existing (identify)** Debra Lippoldt, MS, RN
Faculty Department Chair, Foods and Nutrition, Sylvania

Division Dean/SAC Liaison: (identify) Dana Fuller

Dean of Instruction: (identify) Cheryl Scott

Anticipated Expenses and Resources

Are additional resources needed to implement this program?
If no, please explain:

If yes, indicate whether funds are expected to come from Reallocated (R) or New Funding (N).

	$ needed Year 1	R *	N	$ needed Year 3	R *	N
Personnel[#]						
Equipment						
Technology- Hardware						
Technology- Software						
Materials/Supplies						
Laboratories other Capital Expenditures						
Total						

[#] http://intranet.pcc.edu/departments/finance/budget/ see: Estimating Salaries and Benefits for FY2014

*** For funds obtained from reallocation or leveraging of internal resources, explain funding source.**

Are there any other initial or ongoing costs?

Are any other resources available to provide support?

Review by Associate VP for Finance _____ _____
Signature Date

Library

What is the extent of the current library holdings in the program area?

What additional library materials will be necessary or helpful to support the students in the program? Please comment on anticipated student access for such materials.

A small library of materials could be added

Signatures:

Division Dean(s): _____ ___ **Recommended**
Deans(s) of instruction: _____ ___ **Recommended**
Campus President(s) : _____ ___ **Recommended**
VP for Acad and Stud Affairs: _____ ___ **Recommended**
College President: _____ ___ **Pre-Approved**

Send completed and signed form, including both sections (Phase I and II) to the Curriculum Office (DC, 4th Floor). Requests for new Degrees and Certificates will not be added to the committee agenda unless presidential Pre-approval has been secured.
Note: Pre-approval does not guarantee ultimate approval of the proposed program, degree or certificate.

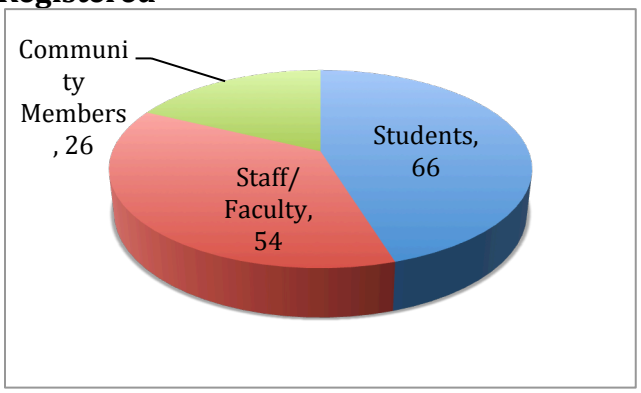
APPENDIX 9

The Health of Gen Z- Event Evaluation February 2017

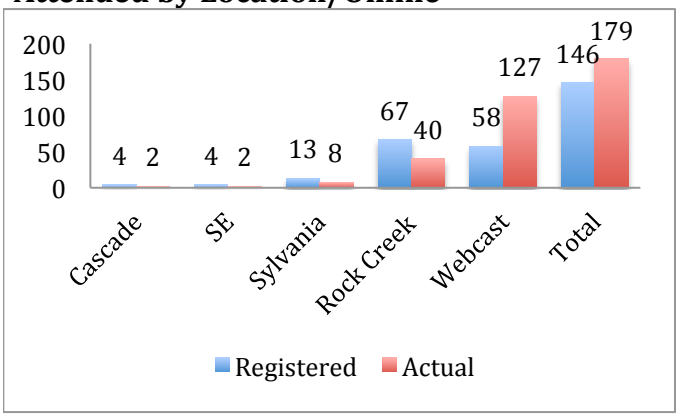
Debra Lippoldt, PCC Sylvania Foods and Nutrition

Registered: 146 for day of event 46 for recorded event

Registered



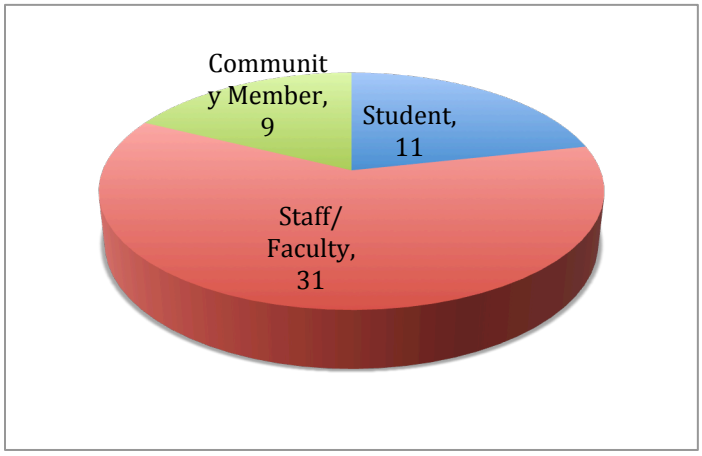
Attended by Location/Online



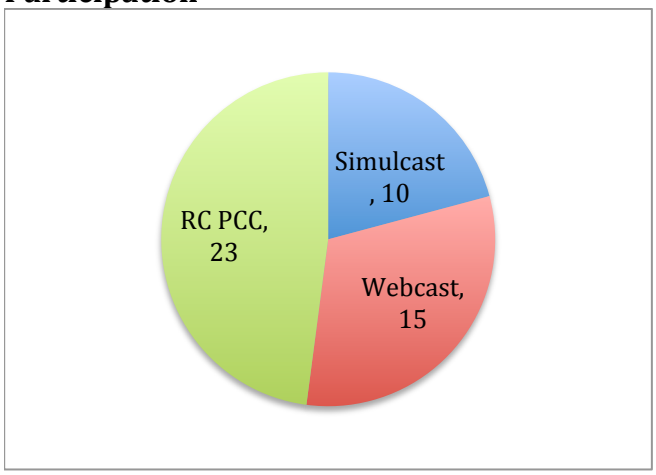
NOTE: Media Services identified 130 actual separate ISP addresses accessing via Webcast

Event Evaluation: via Online Survey up to one week post event
Responses: n=51 (35% of registered)

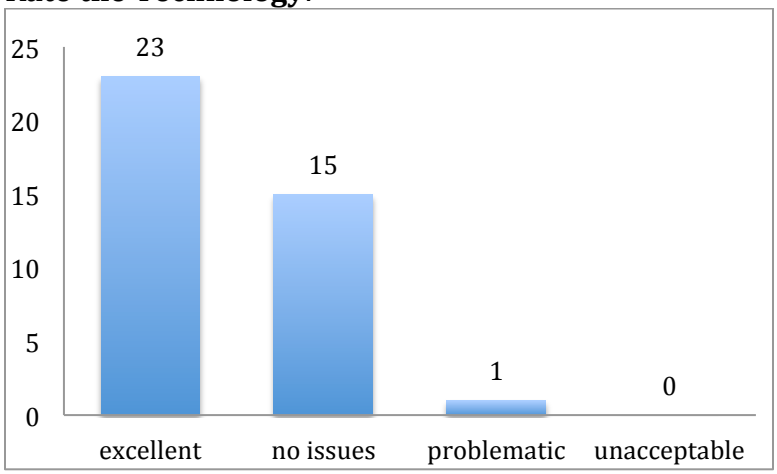
I am a…



Respondents by Location of Participation



Rate the Technology:



Facility and Refreshments also well-received.

Comments:

Used my phone to attend and there were no issues

There was a minor issue with getting the simulcast started, but once switching rooms it went well.

Everything was wonderful - registration,food, room, sound and speakers. Good job!

at home

Did not sttend but PCC Event Center at RC is a great facility

Refreshments Comments

NA

Good selection. I appreciated that it was available during the entire morning.

Did not attend so dont know about cafe food

Speaker presented information I will use in class, life, and/or profession.

	Strongly Disagree	Disagree	Agree	Strongly Agree	Overall Avg
Thornburg	1	0	12	35	3.69
Nigg	0	1	19	26	3.57
Purnell	0	1	18	28	3.57

Comments:

Thornburg:

I missed this speaker due to a class

I did not hear the first speaker but hope to watch the event again if possible.

Missed it

Nigg

Excellent and as I said I would like to watch the entire program again.

Spoke a litte fast

Purnell

Yes, I took many notes but would still like to review the workshop again.

Share any ways you might apply information presented today.

Share with those I work with and make additions to programs being created

It was fun

I will definitely share this with my family and friends. Also keep it in mind during my studies in the medical field.

I teach an Adapted PE class and a several Pilates classes. I have been sharing some of the information I heard but I really could benefit from a "repeat performance." Thank YOU very much for doing all the work to make this event happen and I do hope we continue these topics soon. (I believe I sent an email stating about the same thing last week) Many thanks!

Personally, I will try and have my son with ADHD take fish oil pills, or serve more fish. :) I haven't decided how to incorporate this information into my classes.

I have a young daughter and her friends, and I'm trying to pass on the importance of nutrition to the next generation, and the generation after that. It really impacts the next generations what we eat today. Also, I have an ADHD kid, and will try to apply some of what Joel Nigg covered.

While my professional goal is to be a nutritionist that helps people with medical conditions via nutrition, this event helps me with a small project in my current biology class.

Inform my teenage daughter of the significance of a healthy diet for her and her future children.

Pass it along to my family, especially children & grandchildren

Great topics and very thorough.

Continue to explore: -diet related health conditions through life cycle stages -impact of food additives on health -factors influencing obesity.

I will share this research with numerous organizations I work with in the area of nutrition education. I was very impressed with all of the presentations and will easily share this research with my daily contacts.

Research during lecture

For general health and to update students for good health practices while studying

It was a fascinating discussion about epigenetics and how lifestyle can influence future generations.

My 2 kids have ADHD. The information was great for me both personally and professionally.

Even more reason to avoid High fructose corn syrup! Now if only I could afford the regular sugar Coke & Cola...

Online discussions

I intend to eventually go on to grad school to work in nutrition research. This is helpful now, for information I can offer my clients, but it is also helpful to show more potential avenues for this type of research.

I love to use information about diebeties and chronic disease

Teaching nursing students and personal knowlege

Teaching health courses

Interested in future events? YES- 50 people

Topics/Comments

Future Topics/Comments

I could appreciate the nutrition bent here, but I really appreciated the second presenter because he touched on the multifactoral nature of many of these issues and health outcomes. I would love to see future environmental health oriented conferences!

Chronic stress and the effects on fetal development Placenta development and its link to health or chronic disease

Anything related to cardiovascular is an interest to me.

It seemed like such a waste to have so much food and beverages for just two of us at our Simulcast location. We took home as much as we could but a lot was left behind unfortunately. :)

I would love to hear of any research that gets done that builds on the concept of developmental programming and diet/neurodevelopmental disorders, and if they pertain to autism.

Great job! Wonderful information!

Thank you!

Excellent presentations, effective use of Simulcast and event organized very well. Thank you to all presenters, participants and organizers- R

I'm very pleased that PCC has partnered with the OHSU Moore Institute. This research needs to get out to those in the community and I'm grateful PCC is interested in being that avenue. Many thanks!

Some topic on stress and anxiety related to student life while they are also handling Life :)

Loved the speakers, the ability to watch anywhere, snacks, etc. Would love to see this continue!

Thank you very much for offering this!

Great Presenters! I hope you organize another one:)

Thank you for all of your hard work and for putting this together!

Very interesting stuff! Wish I was able to login to see the earlier parts.

Nutritional information to support exercise programs

Very much appreciated the event. Great that it was open and free. Kuddos. I would like to hear more from Kent Thornburg. He seemed to have very applicable info. facts and everyday habits and life.

Thank you for putting this together!

I love the event because it helped me to focus on health issues our community facing and reduce by implementing nutritional education to our community.

More on similar topic would be great

Fantastic event, thank you all!

I needed to leave early due to work conflicts. Wanted to stay for the Obesity and Diabetes.

Great conference overall!! Would love to have access to the slides/materials they presented. Would like to have the statistics and images.

APPENDIX 10-1

Nutrition Education in an Era of Global Obesity and Diabetes: Thinking Outside the Box

David M. Eisenberg, MD, and Jonathan D. Burgess

Abstract

In an era when rates of obesity, diabetes, and other lifestyle-related diseases challenge medical educators and governments worldwide, it is necessary to consider novel educational strategies, both didactic and experiential, whereby current and future health professionals can be better prepared to proactively advise and teach patients enhanced self-care skills (e.g., diet, movement, stress management, and enhanced behavioral change).

In this Perspective, the authors summarize current circumstances involving rising rates of obesity and diabetes worldwide, the lack of nutrition- and lifestyle-related curricular requirements for professional medical certification, societal trends regarding modern food culture and food availability in health care settings, and the misalignment of financial incentives to promote health.

The authors assess what elements of self-care should or should not be required within future curricula and certification exams. They consider how best to educate trainees about diet and how to "translate" nutrition, exercise, and behavioral science knowledge into practical advice. They explore several ideas for reforming nutrition education, including "teaching kitchens" as required laboratory classes for nutrition and lifestyle instruction, wearable technologies for tracking behaviors and physiological data relating to lifestyle choices, and the prospect of hospitals and other medical venues serving as exemplars of healthy, delicious food options. Finally, the authors argue that "salutogenesis"—the study of the creation and maintenance of health and well-being—should assume its rightful position alongside the study of "pathogenesis"—disease diagnosis and treatment—in medical education and practice.

In 1960, Americans spent three times as much on food ($74 billion) as they did on health care ($27 billion). In 2012, Americans spent twice as much on health care ($2.9 trillion) as they did on food ($1.38 trillion). Over the past five decades, food costs have increased 18-fold; health care costs, 102-fold.[1,2]

Our Current Situation

Although genetics are an important consideration in health, during the past half-century our genes have not measurably altered, and yet we are significantly more overweight, obese, and prone to lifestyle-related diseases. Today, one-third of the U.S. population is obese. Two-thirds are overweight. The medical costs of obesity in the United States are estimated to be as high as 20.6% of total health care costs.[3] Additionally, three-quarters of health care dollars are spent on chronic lifestyle-related diseases.[4] Diabetes alone is estimated to cost the United States $245 billion per year.[5] In 1960, U.S. diabetes rates were 1% of the population, with the majority of cases diagnosed as type 1 diabetes.[6] Today 9.3% of U.S. citizens are diabetic, with the overwhelming majority suffering from type 2 diabetes.[7]

As the editors of the *Lancet* remarked: "The fact that Type 2 diabetes, a largely preventable disorder, has reached epidemic proportions is a public health humiliation. A strong, integrative, and imaginative response is required in which the limits of drug treatment and the opportunities of Civil Society are recognized."[8]

These societal trends are even more alarming among children. Childhood obesity has trebled since 1970.[9,10] One-third of children born after 2000 are expected to develop type 2 diabetes during their lifetime.[11] Writing in the *New England Journal of Medicine* about generational epidemiological trends, Olshansky et al[12] noted, "There is now evidence that America's children will be the first in the nation's history to live shorter lives than their parents."

These disease trends are spreading worldwide. Rates of obesity and diabetes across the developing world are accelerating at a more rapid pace than here in the United States. For example, in 1980, the incidence of childhood overweight and obesity in China was less than 2%. It is now more than 15% in boys and 9% in girls. In China's large cities with populations of at least 1 million, 25% of boys and 16% of girls are overweight or obese. This extraordinary demographic transformation has occurred in a single generation.[13]

In 2000, 15% of all diabetics in the world lived in China. Today, it is one-third.[14–16] Combining the prevalence of diabetes in China and India, half of all humans living with diabetes reside in these two "developing" nations.[17]

The *New York Times Magazine* exposé "The extraordinary science of addictive junk food" introduced the notion that food science engineers have systematically combined sugar, salt, fat, and "pleasing mouth feel" to design processed foods which increasingly appear to be biologically addictive.[18] Recent studies offer plausible neurophysiological

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mechanisms whereby repeated exposure to highly processed foods that are high in sugar, salt, and unhealthy fats leads to addictive behaviors.[19,20] As such, medical educators must also now be aware of these biological imperatives complicating the task of advising patients about healthier diets and lifestyle.

From the vantage point of fundamental lifestyle choices, evidence exists that chronic illnesses could be postponed or prevented. For example, data from the Nurses Study,[21] which includes 116,000 participants, suggest that individuals who do not smoke, are not overweight, exercise modestly, have a good but not necessarily exemplary diet, and drink a glass or less of wine or spirits daily reduce their risk of coronary artery disease by 82%. Importantly, fewer than 3% of the survey population met these seemingly manageable self-care criteria.[21] Similar findings exist for many other lifestyle illnesses in men and women. The challenge is, how do we, as medical educators, alter these regrettable statistics on a societal scale?

The field of medicine maintains unique influence in guiding patients and public policy to encourage healthful choices. However, only 27% of U.S. medical schools teach the recommended 25 hours of nutrition.[22,23] On average, U.S. medical schools offer 19.6 hours of nutrition-related education across four years of medical education.[22] This corresponds to less than 1% of estimated total lecture hours. Moreover, the majority of this educational content relates to biochemistry, not diets or practical, food-related decision making.

Among entering medical students, 71% think nutrition is clinically important. Upon graduation, however, fewer than half believe that nutrition is clinically relevant.[24] Once in practice, fewer than 14% of physicians believe they were adequately trained in nutritional counseling.[25]

Unfortunately, there are few external incentives to improve nutrition education in medical school. Current United States Medical Licensing Examination tests evaluate biochemical knowledge and information relating to nutritional deficiencies, but no standardized patient examinations test the knowledge or skills of medical trainees to advise a patient seeking guidance with regard to evidence-based diet and lifestyle modification and optimization.[26]

At the postgraduate level, with regard to board certification exam requirements for internal medicine certification, the word "nutrition" is not mentioned in the required proficiencies.[27] More surprisingly, to become a cardiologist in the United States, fellows must complete 10 cardio versions and 100 cardiac catheterizations, but requirements in nutrition counseling are not included.[28] Medical educators and licensing boards must significantly raise their requirements regarding nutrition science and lifestyle counseling if we expect the next generation of trainees to study and master this material.[29]

Additionally, financial incentives to enhance diet and lifestyle choices are nearly absent at best and totally misaligned at worst. Current payment systems for hospitals and the majority of "health" providers predominantly remain "fee for service." Coronary bypass surgeries may cost over $100,000 per operation, but many services that may reduce the risks of cardiovascular events are still not reimbursed.[30,31]

In addition to external incentives, a rethinking of the role of nutrition in medical education must include awareness of the external environment, including our health care food environments. Indeed, 63% of medical schools maintain at least one fast food franchise at their affiliated hospitals.[32] Many U.S. hospitals serve foods that are inherently unhealthy. A consequence of such food availability is that patients may erroneously perceive the status quo to be acceptable from a medical perspective.[33] It is not.

Thinking Outside the Box

Is there evidence, albeit circumstantial, that *cooking* may impact weight and health?

Among industrialized countries, the United States and the United Kingdom were the most obese nations in 2000.[34] At that time, both France and Italy, which have extensive and widely appreciated culinary traditions, observed far lower rates of obesity in their respective populations. Paradoxically, across a range of countries, those nations in which citizens spent more time preparing food had lower rates of obesity. For example, in 2000, French and Italian citizens spent an average of 19 minutes more per day cooking than did Americans. By contrast, British adults spent the same time cooking as their U.S. counterparts and exhibited comparable obesity rates.[34] Although this does not constitute a causal relationship, it raises a provocative idea—namely, that cooking may have a role to play in a population's health.

We add to this provocative idea the caveat that most overweight individuals do not wish to be overweight—that they are aware of "healthier choices" but feel "stuck" in their perceived inability to change. Most were never taught to cook. Health professionals have not been trained to guide or refer them toward resources that can improve their skills with regard to enhanced self-care behavior.

Healthy Kitchens, Healthy Lives

So, why not consider an atypical alliance? What if medical schools partnered with culinary schools and schools of public health to form "a united front?" Why not encourage medical, public health, and culinary experts to share notes, skills, questions, and novel ideas as to how these three communities can partner to diminish rates of obesity and diabetes?

This was the rationale for the launch of the educational continuing medical education program "Healthy Kitchens, Healthy Lives—Caring for Our Patients and Ourselves" (HKHL) in 2006.[35] This annual conference, jointly sponsored by the Harvard School of Public Health, the Culinary Institute of America, and the Samueli Institute, has attracted more than 3,500 health professionals. The conference blends didactic and experiential learning through academic lectures, cooking demonstrations, and hands-on cooking attended by all 400 conference registrants across a variety of instructional kitchens.

The conference was partly inspired by the work of Erica Frank,[36] who has demonstrated that for physicians, practicing a healthful behavior oneself was the most consistent and powerful predictor of physicians counseling patients about these same behaviors. As examples, exercise, smoking, seat belt use, and sunscreen use by physicians predict their counseling patients about these identical

practices. Perhaps, we theorized, how a physician eats (and cooks) can influence the ways in which he or she advises patients about food, diet, and self-care.

At HKHL, over four days, attendees receive updates on relevant nutrition science; how to cook healthy, delicious, easy-to-make, affordable recipes and family meals; the importance of movement and exercise prescription as counterparts to a healthful diet; and the relevance of mindfulness to help individuals optimize behavior and change habits for the better, often facilitated by trained professionals (e.g., health coaches or registered dietitians trained in motivational interviewing). This information is then "translated" through the tasting of 325 healthy, delicious dishes over four days, along with practical examples of mindfulness, exercise, and health coaching techniques. Additionally, attendees enter instructional kitchens in groups of 8 to 10 and, with culinary instructors guiding them, learn to prepare, from scratch, a broad range of healthy, delicious, affordable, and easy-to-make vegetables, whole grains, salads, proteins, etc., from every culinary tradition. This experiential aspect of this educational design, we believe, is critical to enhanced learning on the part of trainees.

In 2013, we published the results of a survey of previous HKHL attendees (387 total participants; 192 MDs), testing the idea that the inclusion of culinary education in the form of cooking demonstrations and hands-on cooking, as adjuncts to traditional didactic nutrition-related presentations, would result in measurable positive changes in personal and professional nutrition-related behaviors.[37] Our preliminary results suggested that this occurred. (See Figure 1.)

"Teaching kitchens" as classrooms for nutrition

The principles of HKHL may be incorporated into medical schools and residency programs. One example of this is at the Geisel School of Medicine at Dartmouth, where HKHL alumni are creating curricula for medical students and internal medicine residents. Nutrition didactics will be taught in lecture format, and cooking classes will be offered through partnerships with area culinary class venues near the college. Tulane University School of Medicine has launched a culinary medicine initiative, including a teaching kitchen. This program includes curricular modules for medical students and the option of an elective clinical "rotation" at a professional cooking school. These and future medical curricula will inform the process whereby medical trainees learn to "translate" nutrition and behavioral science into practical advice for themselves and their patients.

From another vantage point, it has been reasonably investigated that regardless of the initial benefits of specific diets, almost all diets have high recidivism rates at 12 to 18 months.[38] It is also true that many interventions that recommend a diet do so without properly teaching the skills necessary to follow such diets (i.e., there are nutritional recommendations, but few or no cooking instructions). Here we, propose the concept of a "teaching kitchen and self-care curriculum." As envisioned, the teaching kitchen is conceptually a place where individuals can learn nutrition facts and shopping and cooking skills, and receive information and personalized guidance about exercise, mindfulness, and behavioral optimization, informed by reflection about one's motivations for change. Its instructors would ideally include medical professionals, chef instructors, registered dieticians, exercise trainers, mindfulness teachers, and health coaches.

It is further proposed that this model be formally tested, in observational and controlled settings, to explore the possibility that a multidisciplinary approach, involving diet, cooking, movement, mindfulness, and behavioral change practices will prove to be superior to existing "diet" strategies and may lead to more sustained, constructive changes in behavior, physiology, quality of life, and, potentially, costs. Importantly, the teaching kitchen concept described is not a "diet" or "weight loss" program but, rather, a reference guide to necessary self-care "skills for life."

Teaching kitchens can and should be available to populations, regardless of socioeconomic status. A demonstration of a preliminary teaching kitchen in underserved populations is the Share Our Strength's Cooking Matters program. This six-week course, which combines hands-on cooking classes with nutrition information and supermarket tours, operates in 45 U.S. states and Washington, DC, and reached 23,236 participants in 2012 alone. Cooking Matters's internal evaluations demonstrate their participants' improved nutrition choices, home cooking, and label reading.[39]

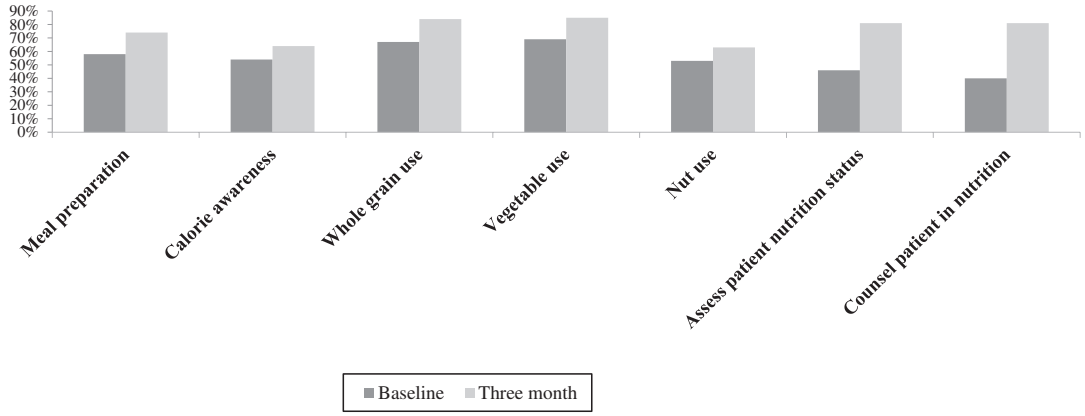

Figure 1 Personal and professional nutrition-related behaviors of 192 MD participants in the Healthy Kitchens, Healthy Lives conference. The data presented here were originally reported in Eisenberg DM, Myrdal Miller A, McManus K, Burgess J, Bernstein AM. Enhancing medical education to address obesity: "See one. Taste one. Cook one. Teach one." JAMA Intern Med. 2013;173:470–472. All comparisons $P \leq .05$.

Setting a healthy example

It is also worth considering the option of having hospitals and health centers build and take pride in exemplary cafeterias, restaurants, and food service programs, many of which could include the same healthful, delicious, accessible recipes being taught in the aforementioned teaching kitchens. A pioneering institution in this regard is the West Bloomfield Hospital in Michigan, which boasts healthy, organic, affordable cafeteria offerings and inpatient, on-demand dining prepared by trained chefs. Interestingly, family members who visit patients at this hospital frequently order from an identical menu as the patients, thereby helping to subsidize this novel program. The hospital also includes a hydroponic, organically certified greenhouse which provides about 15% of the vegetable produce for the hospital year-round. Moreover, the high-tech greenhouse serves as an educational magnet for school children across the entire region.[40]

The point is that hospitals and other health care venues have the ability become premier examples of healthful yet delicious, affordable, sustainable foods in any community.

Ingredients for education reform

Returning to the topic of education reform, shouldn't the latest science about nutrition, exercise, mindfulness practices, and behavioral change (and addictions rehab) be required knowledge for future medical graduates? Might required (or encouraged) experiential learning also be viewed as useful, if not essential? Is it unreasonable to view teaching kitchens as potentially necessary "learning laboratories" for nutritional instruction for health care professionals? We have biology, chemistry, and anatomy laboratory classes to supplement biology, chemistry, and anatomy didactic requirements—why not teaching kitchens as futuristic nutrition laboratory classes to establish required competencies for medical professionals? One's ability to translate nutrition information is essentially limited or enhanced by one's ability to cook or, at the very least, better understand how foods are typically prepared. Having medical professionals with basic proficiency in nutrition science and culinary arts may be an important ingredient in educational reform.

It is worth noting that registrants of the 2014 HKHL conference were asked if their medical organizations had already built a demonstration or teaching kitchen facility, or had plans to build one within 24 months. Of the 430 registrants, 129 responded that teaching kitchens were already in existence or were being planned at their respective organizations. This observation has been replicated (and exceeded) among 2015 HKHL registrants. As such, this "outside the box" notion is garnering attention at a rapid pace.

Simply incorporating nutrition and lifestyle instruction into medical education will not be enough, however. Lifestyle and health-related behaviors occur almost entirely outside the doctor's offices, and so methods to scale and extend healthy behavior education into the "life-space" are also needed.

Innovations enabling healthy choices

Another related trend which must be monitored and harnessed by medical professionals involves wearable devices and Internet-based applications capable of providing static or real-time information relating to diet, exercise, and relevant physiological tracking. Food and health-related "apps" are among the most popular worldwide. Novel wearable devices capable of tracking activity and a range of biometrics are gaining societal acceptance.[41,42] Although a systematic review of this literature is beyond the scope of this manuscript, we, as educators, must embrace these trends in an effort to meet patients where they are—and likely will be—in the years ahead. Moreover, current and future health care trainees as well as patients who are "digital natives" will surely welcome the marriage of wearable device technology and routine medical care.

We now know that many people eat "mindlessly." That is to say that they are not sufficiently "present" or "mindful" to taste their food optimally, nor are they routinely mindful of the nutritional value (or lack thereof) and calories consumed. Recently, medical researchers have demonstrated that mindless eating predictably leads to increased caloric consumption,[43] whereas a modest amount of "mindfulness training" can lead to weight reduction or a decrease in unhealthful food cravings.[44] The benefits of mindfulness training for medical students and proactive clinicians have been reported elsewhere.[45–47] Significant efforts are under way at a variety of U.S. medical schools, including Georgetown University, the University of Cincinnati, Oregon Health Sciences University, and Stanford University, to incorporate mindfulness training into undergraduate and graduate medical education.

In addition, the field of "health coaching" has matured over the past decade. Health coaches, who tend to be medical and allied health professionals who have received postgraduate training in a range of psychological techniques (e.g., motivational interviewing), are equipped in ways many conventionally trained clinicians are not, to enable patients to change those lifestyle behaviors which have seemed immutable. Trained health coaches can do this through regular "coaching" sessions which rely far less on the predominant "expert model" (i.e., this is your problem and this is what you should do) as compared with the coaching model, which relies far more on an elicitation, from the patient, as to what the patient wishes to work on changing; motives for changing; ambivalences about making the necessary commitments; and resolve and confidence—or lack thereof—to change. A recent study by Appel et al[48] showcased the power of having primary care providers join with trained health coaches to enable a large percentage of obese, inner-city, middle-aged patients to lose weight and to maintain weight loss over 24 months. In the future, we can imagine armies of certified health coaches working with primary care physicians and specialists to enable patients to alter their behaviors for the purpose of primary or secondary prevention of common lifestyle-related diseases such as obesity, diabetes, cardiovascular disease, and cancer.

And yet, with few exceptions, neither "mindfulness training," nor "health coaching" are common components of existing medical education or training. Perhaps these should be considered for inclusion in future required curricula on a broad basis.

Putting "Salutogenesis" on Par With "Pathogenesis"

To achieve the necessary broader directional shift, "salutogenesis," the "mirror image" of "pathogenesis," must be elevated to its rightful place in medical education.[49,50]

Here is a question for future medical practitioners, researchers, and educators: To what extent can specific lifestyle choices reduce the risk of developing serious disease among those patients carrying the relevant genes as risk factors? This conundrum is at the core of "epigenetics," which is an accepted scientific frontier and includes an exploration of gene–diet interactions in determining weight loss and maintanence.[51,52] So, let us consider that "personalized medicine" in the 21st century will involve a *combination* of timeless wisdom regarding diet, mental reflection, and physical activity, in addition to new knowledge generated through biomedical discovery and advances in genetics, diagnosis, disease treatment, and technology. A nearly exclusive focus on high-tech strategies, however, will not meet societal needs.

Salutogenesis is defined as "the process through which health and well-being are produced" (see Figure 2). Most of current medical curricula, worldwide, focus on pathogenesis and its manifestations as they relate to disease initiation, diagnosis, treatment, and management. What if future required curricula included didactic and experiential learning modules about nutrition and diet, exercise and movement, sleep and rest, mindfulness and its application to self-care, as well as the latest science regarding the optimization of behavioral change (i.e., health coaching techniques)?

Because most of our current curricula, training, and health care delivery models focus on pathogenesis, diagnostic procedures, and interventional strategies (i.e., disease care), what might a "redesign" of future delivery models (and medical education) look like if they were to simultaneously dive deeply into what is being learned about the promotion and maintenance of health—that is, "salutogenesis"? For the sake of discussion, let's consider future health care models, accessible to the majority of the population, which provide state-of-the-science, "high-tech" diagnostic and interventional strategies, which are collectively aimed at addressing disease (i.e., "pathogenesis"), as well as new core elements of conventional health care (not disease care), which promote wellness (i.e., "salutogenesis").

As depicted in Figure 3, we will increasingly be informed by discoveries relating genetics (and epigenetics) to disease risk; we will rightfully continue to invest heavily in basic, mechanistic, and clinical research; and we will continue to rely on hospital care. However, lengths of stay will likely continue to diminish over time, as will the overall ratio of inpatient to outpatient medical education. Much of medical and health care will be delivered by ambulatory and allied health professionals who must, in this futuristic model, become professionally "bilingual" in both disease diagnosis and treatment in addition to health creation and maintenance.

As envisioned, primary care and allied health professionals will work closely with their hospital-based colleagues in selected instances, but will also increasingly work with colleagues responsible for movement and exercise training; nutrition and culinary (i.e., cooking) instruction; those with expertise in "stress management," ranging from psychopharmacology to psychotherapy to mindfulness instruction; and health coaches, who can provide guidance with regard to health-enhancing behavioral change strategies.

Today, if one sought such "comprehensive" care, he or she would have to be extraordinarily wealthy, educated, and well connected to receive all of the intended services. That said, if access to this theoretical model could demonstrate enhanced clinical outcomes, reduced medical care expenditures, improved quality of life, and enhanced societal productivity, why would we not want to pursue these imaginary future models of health care delivery for future generations? What's more, why should we not prepare the next generation of medical professionals to be conversant in each of these health-related areas and serve as the implementers of these designs? After all, the students we teach today will be practicing medicine well beyond 2050.

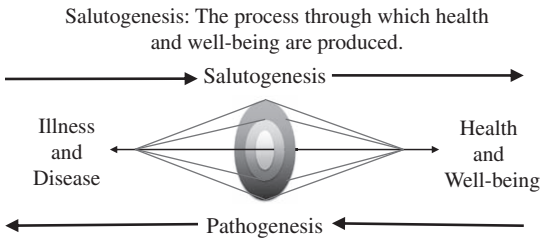

Figure 2 The relationship between pathogenesis, the mechanism by which a disease is caused, and salutogenesis, the process through which health and well-being are produced. Credit: Wayne B. Jonas, MD, and Samueli Institute (www.SamueliInstitute.org). Reproduced with permission.

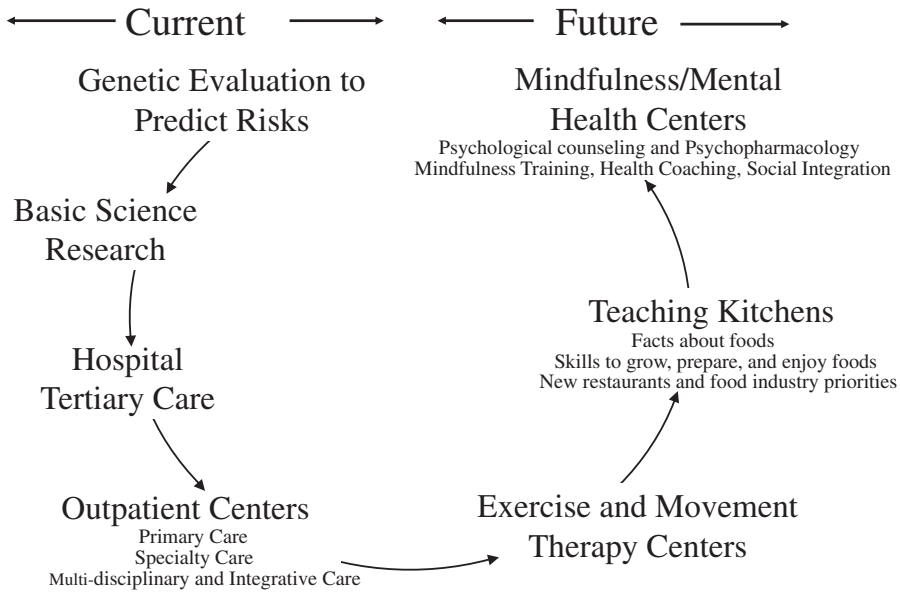

Figure 3 A model for health systems of the future.

Implications for Medical Educators

Here, we offer a number of recommendations for realizing the vision we have described. Although some of the recommendations below are already gaining momentum, medical educators may select to champion one or more of the following suggestions at their respective educational institutions:

1) Required courses in nutrition, exercise, stress management, and sleep hygiene.
2) Required competency examinations covering factual knowledge and advisory skill in all of the aforementioned areas, as prerequisites for professional certification.
3) The establishment of teaching kitchens for laboratory instruction in nutrition, paralleling the continued use of biology, chemistry, and anatomy labs for instruction in these required areas.
4) Increased emphasis on and further development of clinical assessment tools (e.g., OSCEs) to be used for training and evaluation relating to lifestyle counseling.
5) Hospitals and ambulatory care venues with exceptional cafeterias, restaurants, teaching kitchens, and inpatient menus showcasing foods that are healthy, delicious, affordable, and easy to make. These options would replace commonplace, highly processed alternatives.
6) The incorporation of data from wearable or implantable devices as routine elements of the medical record.
7) Instruction and training in self-regulatory methods, including mind–body and mindfulness techniques.
8) A disruptive realignment of financial incentives leaving behind "fee for service" domination in favor of "pay for performance" incentives and financial bonuses for keeping people *well*.
9) Having medical doctors, and all allied health care professionals, leading by example with regard to diet, as was the case when medical professionals quit smoking in the 1970s, due in part to overwhelming scientific evidence, thereby catalyzing the successful "movement" to lower smoking rates in the United States. Why not do the same with regard to a diminished intake of less healthy foods and "food-like substances?"

We offer these suggestions with the intention of elevating the prominence of nutrition science, self-care, lifestyle medicine, and behavioral optimization and placing them on par with existing educational requirements relating to disease mechanisms, diagnosis, treatment, and management. Such a combined approach, if embraced, could expand the culture and content of medical education to better address the great health challenges of our time, including the ways we eat, move, think, sleep, and relate to one another in our global village.

What are we, the educators, waiting for?

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Ethical approval: Reported as not applicable.

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APPENDIX 10-2

RESEARCH BRIEF

Cooking Classes Outperform Cooking Demonstrations for College Sophomores

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ABSTRACT

Objective: To determine if cooking classes improve subjects' knowledge, attitudes, and behaviors toward cooking.

Design: Comparison of outcomes of 2 treatment groups (demonstration vs hands-on cooking classes) using pre- and posttests.

Setting: University cooking laboratories.

Participants: First-semester sophomores (n = 65) who were 25% male with a mean age of 19.7 years.

Intervention: The intervention group (n = 33) attended 4 2-hour cooking classes, based on Social Learning Theory, and a supermarket tour. The demonstration group (n = 32) attended a cooking demonstration. Subjects completed 6 surveys.

Main Outcome Measures: Changes in attitudes, knowledge, and behaviors regarding cooking.

Analysis: Descriptive statistics were used to compare demographic variables. Analysis of covariance and chi-square analyses were used to compare outcome variables.

Results: Analysis revealed no gender differences. Participants displayed positive shifts on attitude scales. The intervention group had a pattern of larger positive shifts (0.4-0.7 vs 0.1-0.5 gain), some of which were statistically significant. Participants displayed positive, but not statistically significant, shifts in knowledge and some behaviors.

Conclusion and Implications: The intervention group experienced more statistically significant gains in attitudes and appeared to have a better pattern of gains in cooking-related knowledge and behaviors. Given limited resources, demonstration cooking classes could reach larger audiences in varied settings, but the impact would likely be weaker than that of cooking classes.

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KEY WORDS: cooking, food preparation, college students, Social Learning Theory

(*J Nutr Educ Behav.* 2004;36:197-203.)

INTRODUCTION

The American lifestyle and diet have changed dramatically over recent decades.[1-3] People lead faster-paced lives with less free time, desire convenience products, and are less physically active than they used to be.[4-6] They are eating more convenience foods and fewer home-prepared meals.[1,3,7] Among persons aged 19 to 29, individuals reported eating 57% of their meals at home in 1996 compared with 73% in 1978.[1] These individuals also consumed 31% of their meals at restaurants and fast-food establishments in 1996 compared with 15% in 1978.[1] In 2000, 41% of Americans reported eating 3 or more commercially prepared meals a week compared with 36% in 1992.[3] The increased frequency of eating away from home is of concern because of the potential to contribute to adverse health consequences.[1,3,8]

With the proliferation of convenience foods and the changing demographics of American households, children are less likely to learn the skills to cook—skills they once learned from their parents and schools.[9,10] In a study of British adults, the authors concluded that without cooking skills, individuals are more likely to eat out and eat premade meals.[11] Learning to cook empowers people to prepare healthful meals, provides a strong sense of personal achievement, involves all 5 senses, and provides the knowledge that allows people to judge more healthful alternatives when eating away from home.[11,12]

A limited number of studies, programs, and reviews were found that examine the link between teaching cooking skills and changes in behavior, attitudes, and knowledge toward cooking and healthful eating.[1,9,13-17] Improving cooking skills could increase behavioral intentions to eat more fruits, vegetables, and whole grains[14] and increase consumption of fruits[2] and vegetables.[2,17] Studies have also shown that cooking skills lead to increased cooking frequency[13];

improved knowledge, preferences, and self-efficacy toward and interest in cooking[14]; and decreased food costs.[16] Thus, providing most individuals with cooking skills might empower them to eat more healthful diets.[14-17]

College students are on appropriate population for targeting basic cooking skills classes. Upon moving out of the dormitories, many students shop and prepare meals for themselves for the first time. Acquiring basic cooking skills will provide them with the knowledge, tools, and confidence to make more healthful meals.

The objectives of this cooking intervention were to (1) improve knowledge and attitudes toward cooking; (2) improve cooking skills; (3) increase confidence in cooking abilities; (4) decrease eating out, taking out, and/or eating prepackaged meals; and (5) increase the number of home-prepared meals. The hypothesis is that the intervention group would see larger gains in attitudes, behaviors, and knowledge regarding cooking than the demonstration group.

DESCRIPTION OF INTERVENTION

The study, conducted in the fall of 2002, involved college sophomores at Colorado State University (CSU). Students were recruited from student dining facilities and sophomore-level classes in the spring and fall of 2002, respectively. Self-selected subjects were randomly assigned to the 1-hour cooking demonstration or intervention groups. Subjects in the intervention group attended 4 2-hour basic cooking skills classes and a 45-minute supermarket tour over a 4-week period. All subjects were assessed at 6 different time points using one of 3 different survey tools. Approval for this project was obtained from the university's human research committee.

Educational Materials

Subjects in both groups received identical recipes and information sheets which addressed knife skills, pantry supplies, cooking equipment, and shopping tips. Recipes (n = 16) covered 4 topics: wraps and salads, 15-minute dinners, 1-pot dinners, and stir-fries. The recipes contained few instructions to minimize preparation difficulty and small ingredient lists to limit cost, which was estimated for each recipe. The recipes also contained easy to find ingredients, included vegetarian options, and focused on ingredient substitutability to reflect participants' tastes and budgets.

Class Sessions

All classes were taught by the principal investigator. This investigator has significant culinary experience, including cooking professionally at various restaurants and 2 years experience teaching a French culinary technique laboratory at CSU. Additional assistance was provided by a faculty member who is a nationally certified executive chef and a certified culinary educator.

Demonstration group subjects attended a 1-hour class, which included a brief lecture on basic cooking skills and a cooking demonstration that included the 4 cooking class topics. Subjects had the opportunity to sample the prepared food and ask questions.

Cooking classes began with a brief lecture on the day's topic, followed by a laboratory session in which students prepared recipes related to the day's topic. After preparing their meals, participants described their recipes and how they made them. They then sampled all of the dishes. In addition, subjects had the opportunity to make wrap sandwiches with the leftovers to take home. Intervention subjects also attended a 45-minute supermarket tour that included strategies for buying produce, meat, bulk foods, and other perishable foods.

Social Learning Theory

The intervention group design used all of the tenets of Social Learing Theory.[18] The environmental component of reciprocal determinism was addressed by providing recipes and cooking equipment (incentives for completing the classes and surveys) for the students' home kitchens. Classes were designed to improve their expectations and expectancies regarding cooking. Expectations are the probable outcomes of a given situation or behavior perceived by the individual, for example, ''I don't know how to cook'' or ''If I cook, I can save money.'' The expectancies are the values (positive or negative) placed on the expectations that act as motivators or barriers, for example, cooking is fun or easy. Self-efficacy was addressed as the students performed the desired behavior. Students' behavioral capabilities were presumably increased as they were taught and practiced the skills necessary to perform the desired behavior. Modeling, observational learning, and vicarious reinforcement were incorporated as students watched each other prepare the meals, explained to each other how they prepared the meals, and then ate the food prepared.

Surveys

Participants completed 3 different surveys: an eating habits survey (1 time; baseline before intervention), a cooking survey (2 times; preintervention and 3 months postintervention), and a food preparation survey (3 times; 1, 2, and 3 months postintervention).

The eating habits survey focused on childhood dietary patterns, including eating habits, past experiences with food preparation and shopping, prior cooking education, and attitudes toward cooking. It was administered at the 2 recruitment periods. Ethnicity was not assessed because the student population at CSU is not diverse.

The cooking survey focused on attitudes, behaviors, and knowledge related to cooking. Both groups completed this survey at the beginning of the demonstration or first cooking class (preintervention) and at 3 months postintervention.

The food preparation survey was a 72-hour food preparation recall. Students received this electronic mail survey on Thursday. They were asked, for the previous 9 meals, if they cooked, ate leftovers, ate premade meals, ate out or ate takeout, or skipped meals. Students were also asked if they shared recipes with friends and if they taught their friends the cooking skills they learned. The food preparation survey was administered on the third Thursday of each month for 3 consecutive months after the classes ended.

An expert panel of nutrition education researchers established the content validity of the eating habits survey, cooking survey, and food preparation survey. The panel consisted of 2 nutrition professors, 1 bionutritionist, and 2 chefs. Both the eating habits survey and the cooking survey were tested for reliability using the test–retest method with 25 students in an introductory-level nutrition class for non-nutrition majors. All questions were assessed for reliability using Pearson's correlations, percentage agreement, and paired *t* tests. All questions had correlations and/or percent agreements above .70 or 70%, respectively. Paired *t* test analysis showed no significant differences between the means at time 1 and time 2. Attitude and knowledge scales were verified using Cronbach α. Items that showed an interitem correlation of $> .70$ were grouped together to create individual scales.

As an incentive and a thank you, students in both groups received cooking equipment if they completed all of the classes and surveys. Equipment choices were individually tailored for each participant based on what they indicated that they needed at the demonstration or first class.

Analysis

Demographic and outcome measures were analyzed using the Statistical Package for the Social Sciences, version 11.5 (SPSS Inc, Chicago, Ill). Chi-square was used to compare groups on the following variables: gender, parental involvement in shopping or cooking and teaching these behaviors, previous nutrition and cooking class enrollment, and knowing how to cook. Groups were compared using *t* tests on the following demographic information: age, childhood dinner patterns, childhood shopping or meal preparation behavior, and attitudes regarding healthful food and cooking. Analysis of covariance was used to compare the groups on all attitude, behavior, and knowledge outcome scales. All outcome measures were controlled for potentially confounding variables, when necessary, including gender, pretest scores, ability to cook prior to the intervention, history of cooking class enrollment, and prior knowledge of food shopping. Chi-square analysis was used to analyze all food preparation recall behavior.

Costs

The costs incurred in offering cooking classes or cooking demonstrations can vary widely, but typical expenses will relate to the following: food, facilities and equipment, printed materials, incentives, and instructor time. The total food costs of the 23 classes were $1500, which included $250 in food donations. The total cost for incentives was $1000. The average food cost was $65 per class. The average food cost was $22 per participant for the entire program. These figures would vary with the type of class (demonstration vs intervention), the number of students, and the types of items prepared. Costs were minimized by bulk shopping, using

Table 1. Demographics and Background Variables According to Group

Variable	Demonstration (n = 32), n (%)	Intervention (n = 33), n (%)
Age (y), mean (SD)	19.8 (1.1)	19.6 (0.7)
Gender		
Male	4 (12.5)	12 (36.0)*
Female	28 (87.5)	21 (64.0)
Do you know how to grocery shop? (yes)	32 (100.0)	33 (100.0)
Do you know how to cook? (yes)	32 (97.0)	31 (93.9)
Have you ever taken a cooking class? (yes)	14 (42.4)	7 (21.2)
Do you own any cookbooks? (yes)	21 (63.4)	22 (66.7)
Have you ever taken a nutrition class? (yes)	25 (75.8)	19 (57.6)
Growing up, who... (check all that apply)†		
Shopped for your family's groceries?		
Mom	30 (93.8)	33 (100.0)
Dad	17 (53.1)	23 (69.7)
Taught you to shop?		
Mom	26 (81.3)	29 (87.9)
Dad	12 (37.5)	14 (42.4)
Cooked for your family?		
Mom	31 (96.9)	32 (97.0)
Dad	22 (68.8)	27 (81.8)
Taught you how to cook?		
Mom	28 (87.5)	28 (84.9)
Dad	14 (43.8)	21 (63.6)*
Attitudes (number of items in scale)‡	LS Mean (SEM)	
Eating healthful food is important to me (2)	4.5 (0.5)	4.5 (0.5)
Preparing healthful food is too hard (3)	3.1 (0.8)	3.0 (0.7)
I like to cook (4)	4.0 (0.7)	4.2 (0.5)
I feel comfortable food shopping (5)	4.0 (0.6)	3.9 (0.7)

*$P < .05$.

†In addition to parents, choices included sibling, self, caregiver, and other.

‡All attitudes questions were based on a 5-point Likert scale (5 = strongly agree).

LS indicates least squares; SEM = standard error of the means.

leftovers, teaching some classes on concurrent days, which led to less waste, and the purchasing of items on sale. The teaching facilities and equipment were donated by the Department of Food Science and Human Nutrition. Costs of printed material (recipes, handouts) were insignificant. The instructor's and assistant's time was donated.

SURVEY FINDINGS

The demonstration (n = 32) and intervention groups (n = 33) were sophomores with a mean age of 19.7 years (Table 1). The only 2 statistically significant differences between the groups at baseline were gender (13% vs 36% male, respectively) and households in which the father taught the respondent to cook (44% vs 64%, respectively). There were no statistically significant differences seen on any outcome measures by gender or age among yes/no responders when they were asked if they knew how to cook prior to the intervention, previous cooking class experience, or grocery shopping knowledge.

Over 90% of participants indicated that they knew how to cook, and all knew how to grocery shop. Many reported having previously taken a cooking class (42% [demonstration] versus 21% [intervention]). Respondents expressed positive attitudes about cooking, shopping, and eating healthful food but expressed neutral feelings regarding the difficulty of preparing healthful food (see Table 1).

In almost 75% of the households, mothers were the primary food preparers and primary cooking teachers. Fathers participated in many daily cooking and shopping roles. On average, fathers cooked for their families in 75% of the households, taught cooking in 54% of the households, and shopped for their family's groceries in 61% of the households. On average, the father was the primary food preparer in 20% of households and the primary cooking teacher in 24% of households.

At the 3-month posttest (Table 2), there were statistically significant differences in attitudes that favored the interven-

Table 2. 3-Month Posttest Attitudes, Behaviors, and Knowledge According to Group

	Group		Group	
	Demonstration (n = 26)	Intervention (n = 26)	Demonstration (n = 26)	Intervention (n = 26)
Variable[†]	3 Months Post LS Mean (SEM)		Difference Scores LS Mean (SEM)	
Attitudes (number of items in scale)[‡]				
Cooking helps you eat more healthfully and save money (3)	4.3 (0.1)	4.6 (0.1)	0.1 (0.1)	0.4 (0.1)*
Cooking is hard and takes too much time (3)	3.8 (0.1)	3.9 (0.1)	0.3 (0.1)	0.4 (0.1)
I like to cook (3)	4.3 (0.1)	4.6 (0.1)**	0.1(0.1)	0.4 (0.1)**
I feel confident using various cooking techniques (4)	4.4 (0.1)	4.6 (0.1)	0.3 (0.1)	0.7 (0.1)**
I feel comfortable buying produce and reading food labels (2)	4.4 (0.1)	4.4 (0.1)	0.1 (0.1)	0.4 (0.1)
Cooking meals is expensive (1)	3.8 (0.1)	3.9 (0.1)	0.5 (0.2)	0.6 (0.2)
Behavior (number of items in scale)				
How many...				
Servings of fruits/vegetables do you eat a day? (2)	4.7 (0.1)	4.7 (0.1)	0.1 (0.1)	0.1 (0.1)
Meals do you eat a day? (1)	2.7 (0.1)	2.8 (0.1)	−0.1 (0.1)	0.0 (0.1)
Snacks do you eat a day? (1)	1.6 (0.2)	1.6 (0.2)	−0.3 (0.2)	−0.1 (0.2)
Nights a week do you cook dinner? (1)	4.6 (0.2)	4.9 (0.2)	0.1 (0.3)	0.4 (0.3)
Nights a week do you eat premade dinners? (1)	1.2 (0.2)	1.0 (0.2)	0.3 (0.3)	−0.3 (0.3)
Nights a week do you eat out/take out food for dinner? (1)	1.0 (0.1)	1.0 (0.1)	−0.3 (0.2)	−0.2 (0.2)
Nights a week do your skip dinner? (1)	0.1 (0.1)	0.2 (0.1)	−0.2 (0.1)	0.1 (0.1)
Times a month do you go shopping? (1)	3.2 (0.1)	3.1 (0.1)	−0.1 (0.1)	−0.3 (0.1)
Knowledge (number of items in scale)				
I know how to use a knife and stir-fry (4)[§]	3.1 (0.1)	3.4 (0.1)	1.3 (0.2)	1.3 (0.2)

[†]Analysis of covariance for 3-month post-test with pretest as a covariate significance between pairs: *$P < .05$; **$P < .01$.
[‡]Based on a 5-point Likert scale (5 = strongly agree).
[§]Based on a 4-point scale (4 = all answers were correct).
LS indicates least square; SEM, standard error of the means.

tion group including liking to cook (0.1 [demonstration] vs 0.4 [intervention] gain, respectively), the benefits of cooking (0.1 vs 0.4 gain, respectively), and confidence using various cooking techniques (0.3 vs 0.7 gain, respectively). All participants showed a similar positive shift in knowledge of cooking skills (1.3 gain on a 4-item scale). It is worth noting that on a weekly basis, participants ate premade dinners 1.2 (demonstration) versus 1.0 (intervention) nights a week.

Relative to food preparation behavior on Monday, Tuesday, and Wednesday, participants frequently skipped breakfast (22% [demonstration] vs 26% [intervention]) and ate leftovers for lunch (18% vs 20%, respectively). Both groups were more likely to cook or prepare dinner (61% vs 62%, respectively) than eat out or take out dinner (15% vs 20%, respectively). The remaining participants indicated that they ate leftovers or skipped meals for dinner. The intervention group appeared to eat out and take out less frequently for all meals than did the demonstration group (9.4% vs 15.9%, respectively; insignificant difference). Respondents frequently reported teaching others what they learned in class (67% vs 72%, respectively) and sharing recipes with others (69% vs 83%, respectively).

DISCUSSION

It is difficult to compare food preparation behavior across studies owing to several factors, including assessing behaviors for different number of days, days of the week, or time of year. In addition, there are numerous definitions of ''cook,'' ''premade,'' and ''take out'' that people use to describe their food preparation behaviors. Lastly, there were no other studies with college students, per se.

Of our respondents, 32% indicated that they had taken a cooking class, which was lower than a National Food Alliance study in 1993 that found that 66% of children aged 7 to 15 learned to cook at school.[19] It is worth noting that in 1998, students enrolled in 28% fewer credit hours in consumer and homemaker education classes than in 1982.[20] This highlights the decreased frequency with which students are learning cooking skills in school prior to college.

Although both groups demonstrated a positive shift regarding confidence (self-efficacy) using various cooking techniques; the intervention group had statistically significant gains. This positive shift in self-efficacy is consistent with Liquori et al, who reported that elementary schoolchildren reported increases in self-efficacy toward cooking after taking cooking classes.[14] Participants in both the demonstration and cooking groups demonstrated a pattern of positive shifts regarding cooking knowledge, which is also consistent with the findings of Liquori et al.[14] In the present study, respondents frequently taught others what they learned in class and shared their recipes with others, which suggests an extended effect of the classes.

Participants reported eating out or taking out food for dinner 20% (demonstration) versus 15% (intervention) of nights. Participants ate out or took out 15.9% (demonstration) versus 9.4% (intervention) of all meals over 3 consecutive midweek days. This finding was significantly lower than the findings of Nielsen et al, who reported that, in 1996, people aged 19 to 29 years ate 43.2% of all meals away from home.[1] However, Nielsen et al reported on 2 nonconsecutive 24-hour food recalls over a 10-day period, which makes it difficult to compare findings between the 2 studies. The frequency of eating out is an important consideration because Guthrie et al determined that meals eaten away from home have more calories and less micronutrients than do foods prepared at home.[21] These findings highlight that knowing how to cook can lead to a more healthful diet.

Respondents prepared 57% of all meals over 3 consecutive midweek days compared with 46% of all meals prepared as reported by Bielunski, who examined food preparation behaviors over 7 days among adults aged 18 to over 65 years old.[10] The differences between these studies could be because our participants were younger and we examined only 3 midweek days. People tend to cook more during the week and eat out more on the weekends.

Respondents cooked or prepared breakfast 65% of the time but frequently skipped breakfast (22% vs 26%). The latter is consistent with the research of Haines et al, who found that 25% of American adults skip breakfast daily,[22] suggesting that our sample was similar to other study populations in this regard. Participants frequently ate leftovers for lunch (18% vs 20%), which could indicate a cooking class effect because classes encouraged them to make larger quantities of food which resulted in leftovers for future meals. Respondents cooked or prepared dinner 62% of the time, which was lower than the results found by Bielunski, who reported that respondents cooked or prepared dinner 84% of the time,[10] but the latter study was 10 years old and had an older population.

Limitations

There were a number of limitations to this study. A larger sample size might have resulted in more statistical significance among participants on outcome measures. A control group might have identified the normal changes that students make at this age. It is unknown how much students would have improved their cooking skills simply by living on their own without the aid of cooking classes.

Students self-selected for the class, indicating that they were already interested and self-motivated, so the results may not be generalized to the entire student population. As with any self-reported assessment, there is the potential for reporting errors and a bias toward socially desirable responses. However, this was mitigated by repeating measures over time. For example, the respondents reported cooking or preparing dinner with similar frequencies on the cooking surveys and food preparation surveys, which highlights consistency in reporting by the subjects. A ceiling effect

was found for a number of outcome measures. In spite of these limitations, we can draw a number of conclusions with a fair degree of confidence.

The cooking class intervention program provided some evidence to validate the program's hypotheses. Subjects in the intervention group experienced significant improvements in attitudes compared with the demonstration group. There were no significant differences among groups related to consumption of takeout, prepackaged, and home-cooked meals. It should be noted that whereas the intervention group saw larger positive shifts, the demonstration group did appear to make positive shifts on some scales regarding attitudes, behavior, and knowledge.

Cooking classes can be an effective tool for improving participants' attitudes, behaviors, and knowledge regarding cooking. Given limited resources, cooking demonstrations may be a reasonable way to reach larger audiences in varied settings, but the impact will likely be weaker than cooking classes.

IMPLICATIONS FOR RESEARCH AND PRACTICE

Because this was an exploratory study, future research should focus on examining additional variables, developing more effective evaluation tools, and looking at different program designs, for example, spreading classes over a longer or varied time period (1/month compared with 1/week) or waiting until the spring semester of sophomore year so that students can adjust to living on their own first (and avoid information overload). Adding a topic on quick breakfasts might be useful because such a high percentage of participants skipped breakfast. More comprehensive evaluation tools and strategies would allow for a greater understanding of the changes and processes of change of students. These could include tracking participants for a longer time interval, assessing background family demographics in more detail (family makeup, dietary and cooking habits), and doing more extensive food preparation and dietary assessment surveys.

The demonstration class format may be an effective strategy if financial and time constraints prevent using a cooking class format. A series of demonstration classes might strengthen the impact. The 1-hour demonstration format can be adapted to meet the individual needs of the class participants. In addition, by preparing food ahead of time and using a small portable stove, this type of class can be taught in almost any setting, including schools of all types, dormitories, recreation centers, and religious centers. It is recommended that presenters focus on quick, easy, and inexpensive recipes with a high degree of ingredient substitutability. Lastly, it is possible to train people to teach this type of class and therefore bypass the need to pay a trained chef, but the possible effect of using instructors with different characteristics (gender, age, cooking experience) should be examined.

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Strategies for Nutrition Education and Behavior Change

The 6-step procedural model proposed by Isobel Contento and described in "Using a Theory-Driven Approach to Design a Professional Development Workshop," *J Nutr Educ Behav*. 2003;35:312-318, is from a forthcoming textbook by Contento titled *Strategies for Nutrition Education and Behavior Change.*

Society for Nutrition Education's Eight Child Nutrition Education Priorities

These priorities were outlined in a recent letter from Society for Nutrition Education (SNE) to the Institute of Medicine, Committee on Prevention of Obesity in Children and Youth Workshop.

- Enhance and strengthen child nutrition education, promotion and environmental efforts by adding a state-level infrastructure and networking component to the United States Department of Agriculture (USDA) Team Nutrition program.
- Increase funding for nutrition education and promotion efforts to a total of $50 million.
- Provide expanded authority and funds to USDA in order to fully cover all food and beverage sales and enforce regulations on school campuses throughout the school day for schools that participate in the National School Lunch or School Breakfast program.
- Promote initiatives, such as 5 A Day, that would help increase all types of fruit and vegetable intake among child nutrition program participants.
- Require USDA to conduct regular and periodic reviews (at least every 5 years) of the Women, Infants and Children Supplemental Nutrition Program (WIC) food package to assure that the food packages are consistent with health and nutrition recommendations as well as nutrition education and promotion efforts.
- Support full funding for the WIC program to reach all nutritionally at-risk eligible women and children with nutrition services and supplemental foods.
- Maintain the nutrition and health mission of WIC. Increase the Nutrition Services and Administration funding to assure quality nutrition education services. Provide adequate funding to accompany additional related administrative and client service requirements, such as substance abuse, education, immunization, screeening, etc.
- Support the WIC Farmer's Market Nutrition Program reauthorization and secure independent funding stream by decoupling from the WIC caseload funding mechanism.

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ORIGINAL RESEARCH

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Feasibility Pilot Study of a Teaching Kitchen and Self-Care Curriculum in a Workplace Setting

Abstract: Objective. *To examine the feasibility of a prototype Teaching Kitchen (TK) self-care intervention that offers the combination of culinary, nutrition, exercise, and mindfulness instruction with health coaching; and to describe research methods whereby the impact of TK models can be scientifically assessed.* Design. *Feasibility pilot study. Subjects were recruited, screened, and consented to participate in 14- or 16-week programs. Feasibility was assessed through ease of recruitment and attendance. One-sample* t *tests and generalized estimating equation models were used to compare differences in groups.* Setting. *Workplace.* Subjects. *Two cohorts of 20 employees and their partners.* Results. *All 40 participants completed the program with high attendance (89%) and response rates on repeated assessments. Multiple changes were observed in biomarkers and self-reported behaviors from baseline to postprogram including significant (*P < *.05) decreases from baseline to postprogram in body weight (−2.8 kg), waist circumference (−2.2 in.), systolic and diastolic blood pressure (−7.7 and −6.3 mm Hg, respectively), and total cholesterol (−7.5 mg/dL). While changes in all of the aforementioned biomarkers persisted over the 12-month follow-up (n = 32), only changes in waist circumference and diastolic blood pressure remained statistically different at 12 months.* Conclusions. *These study findings suggest that a TK curriculum is feasible within a workplace setting and that its impact on relevant behavioral and clinical outcomes can be scientifically assessed.*

Keywords: nutrition education; culinary instruction; health coaching; mindfulness; exercise; optimizing behavioral change

> "Diets" may be insufficient to bend the global trajectory with regard to chronic diseases associated with suboptimal lifestyle choices.

In the setting of dramatic increases in rates of obesity, diabetes, and other lifestyle-related chronic conditions, innovative strategies whereby individuals learn skills to improve the ways they eat, move, and think are in high demand. One such strategy involves the development of Teaching Kitchens (TKs) and TK-related curricula that include nutrition education, culinary instruction, enhanced movement and exercise, mindfulness training, and health coaching. Importantly, TKs and their related strategies and curricula are currently being designed as "learning laboratories" across multiple organizations, including universities (eg, Dartmouth, Princeton, Stanford, University of California, Los Angeles, University of California, San Diego, University of Minnesota, University of Texas Medical Branch, University of Vermont, Vanderbilt, and others), corporate worksites (eg, Google, Compass), organizations in Italy and Japan, and community settings (eg, Sampson Family YMCA in Pittsburgh and L.A. Kitchen). This pilot study was an initial attempt to describe, implement, and test the feasibility of a TK curriculum in a worksite setting.

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With obesity, type 2 diabetes, and heart disease on the rise in the United States and globally,[1-6] there is continued interest in educational programs that can predictably alter the health care trajectories of those who have already developed chronic health challenges or are at elevated risk for developing them.[3] Most diet programs show evidence of helping people reduce their cardiovascular risk through weight loss; however, the effects of various diet programs are typically short lived, and the magnitude of benefit is typically small.[4,5,7] In light of these observations, "diets" may be insufficient to bend the global trajectory with regard to chronic diseases associated with suboptimal lifestyle choices.

Innovative approaches to weight management, cardiovascular risk reduction, and improved health outcomes are emerging in the literature, and include cooking programs,[8-11] mindfulness training,[12,13] exercise[14-16] and digital activity monitoring technology,[17-19] and individualized health coaching.[20,21] Existing studies are still modest in size and have included only one or a subset of all of the above-mentioned self-care strategies. The TK self-care curriculum evaluated in this study is based on the *Healthy Kitchens, Healthy Lives*® medical education conference offered annually at the Culinary Institute of America (CIA) since 2006.[22] In 2013, Eisenberg et al studied changes in self-reported nutrition-related behaviors among health care professionals attending this conference and found statistically significant improvements between baseline and 3 months after the conference in self-reported behaviors such as frequency of cooking their own meals; frequency of vegetable, nut, and whole grain consumption; ability to assess a patient's nutrition status; and ability to advise overweight or obese patients regarding nutritional or lifestyle habits.[23] The present study customized this educational content for use by a general population to determine its potential for changing behaviors known to affect health risks.

In this article, we have 2 objectives. The first objective is to report on a feasibility study to test the hypothesis that an interdisciplinary prototype TK curriculum, which includes nutrition education, hands on cooking instruction, encouragement to enhance movement and regular exercise, mindfulness training, and personalized health coaching, is (*a*) feasible for a worksite population and (*b*) has the potential to favorably affect relevant behaviors, biomarkers, and health outcomes. The second objective is to describe research methods whereby the impact of TK models can be scientifically assessed with regard to changes in (*a*) behavior, (*b*) relevant clinical outcomes, and (*c*) costs.

Methods

Program Design and Facilities

Research staff worked with subject matter experts in the fields of nutrition, culinary arts, exercise, health coaching, and mindfulness to develop a TK self-care curriculum that combines didactic instruction with experiential learning in each of the above-mentioned areas. The program included one 2.5-hour evening meeting per week and one 5-hour Saturday meeting every other weekend over the course of the 16 weeks (80 hours for the first cohort; scaled back to 70 hours over 14 weeks for the second cohort due to scheduling constraints of the CIA). The classes for this feasibility study took place at the CIA's campus in Hyde Park, New York, for its access to auditorium-style demonstration kitchens for the weekday didactic class and hands-on TKs for the weekend participatory cooking classes.

During the weekday classes, which were facilitated by a research member (either an MD, RD, or MPH), participants watched a chef educator demonstrate cooking techniques necessary to prepare simple, healthy meals at home (eg, whole grain cookery, stock and soup basics, salad composition, and salad dressing techniques). Participants then listened to a lecture by a subject matter expert and/or participated in discussions about one of the other educational topics, including nutrition, movement, and mindfulness.

Individuals had access to all course materials through a secured online course management system and were encouraged to try the various cooking techniques and other life skills at home throughout the week. There were no dietary prescriptions, and the intake during the study was ad libitum. However, the educational components, for example, didactic instruction with regard to why certain foods should be encouraged and others discouraged and the scientific rationale for these recommendations, were conveyed in the hope of altering subjects' dietary choices and behaviors over time. With complementary access to a local gym facility and a personal activity-tracking device provided by the study, individuals were encouraged to increase their physical activity throughout the program. Participants were also matched with a paid certified health coach (through *Wellcoaches*®) who provided regular 30-minute phone calls up to once a week throughout the duration of the 14- to 16-week program in order to help participants leverage their personal motivation to change relevant behaviors. The research team created a general overview of the curriculum but made minor changes to the weekly classes based on weekly feedback from participants.

During the biweekly Saturday classes, study subjects participated in hands-on culinary lessons in a CIA TK, working in assigned teams of 5 to create the recipes demonstrated by chef instructors in the weekday classes of the previous 2 weeks. They shared a "mindful" lunch (practiced techniques to savor and appreciate eating) of the foods they prepared, and listened to a registered dietitian share tips for enjoying nutritionally balanced and properly portioned meals. They then participated in a group discussion about their experiences, challenges, and successes with each element of the program.

The program ended with a banquet event in which teams were tasked with the preparation of a menu of unique dishes (inspired by the basic techniques taught in class) to be shared with their families and "judged" by the instructional team. Participants also had the option of reading aloud excerpts from personal

statements they were asked to write to express what they had learned from the program and what they were committed to continuing.

Participants and Recruitment

Two cohorts of CIA employees, from whom chefs were excluded, were invited to participate in this pilot program, which was approved by Harvard T.H. Chan School of Public Health's Institutional Review Board. Recruitment occurred at 2 intervals, once in October 2013 for enrollment of the first cohort, and once in February 2014 for enrollment of the second cohort. Each cohort was capped at 20 participants due to kitchen constraints at the CIA.

An email was sent to the CIA's employee population with a description of the study and expectations for participation. Interested employees emailed the study coordinator to set up an appointment to be screened, and interested spouses or partners of employees were also invited to participate and be screened. To be eligible for enrollment, potential study participants had to be between the ages of 18 and 70 years, be employees, and commit to attending all of the study-related activities. We gave priority to those with self-reported metabolic risk factors and excluded anyone with a diagnosis of cancer, unstable angina or other significant cardiovascular condition, psychiatric condition requiring psychopharmacologic medications; prior or planned bariatric surgery; pregnant or planning to become pregnant over the next year; or self-reported average consumption of >14 alcoholic drinks per week. The expectations of participants were that they attend all classes, practice cooking at home, use their gym membership, and participate in health coaching sessions. There were no direct incentives beyond the free resources and food provided as part of the program.

Instruments and Outcome Measures

Feasibility was assessed through recruitment and attendance records and adherence to the data collection protocol. Participants also had regular opportunities to provide feedback, including the completion of a short evaluation form after each weekday class along with a midpoint satisfaction survey.

Biometric and self-reported behavioral outcomes were assessed 4 times: at baseline, after the 14- or 16-week educational intervention, 6 months, and 12 months. Participants had biometric screenings at each interval through a local HealthQuest facility to measure height, weight, waist circumference, blood pressure, as well as fasting glucose, total cholesterol, high-density lipoprotein (HDL), low-density lipoprotein (LDL), and triglycerides. Participants also completed, at the same 4 intervals, a packet of 6 validated instruments to assess behavioral changes in each of the domains addressed in the curriculum, including cooking frequency and confidence,[24] dietary intake,[25] exercise frequency and intensity,[26] mindful eating practices[27] and other measures of stress,[28] and perceived well-being.[29]

Because few published studies have examined changes in food purchasing from this type of nutrition education intervention, we attempted to assess the feasibility of receipt collection for tracking potential changes in food purchases over time. Participants were instructed to collect all food-related receipts for a 1-week interval at baseline, midpoint, and postprogram.

Data Analysis

Biometric and behavioral data were combined for both cohorts and analyzed using SAS version 9 (SAS Institute, Inc, Cary, NC). For continuous outcome measures, 1-sample paired Student's *t* tests were used to test for statistically significant differences between baseline and postprogram, 6 months, and 12 months. For categorical outcome measures, the differences between baseline and postprogram, 6 months, and 12 months were tested through generalized estimating equations models for repeated measures. Questionnaires were also evaluated for their usefulness in assessing the desired outcomes for inclusion in future studies.

Qualitative feedback data from baseline questions involving motivations and aspirations, the midpoint surveys, weekly feedback surveys, and personal statements were also collected. During this pilot phase, we informally used these data to help refine classes; however, we did not include formal methods for qualitative assessment.

Receipts for food purchases from stores and restaurants over a 1-week period at baseline, midpoint, and postprogram periods were collected and manually entered into a database. We created categories of food purchases into "healthier" versus "less healthy" items by modifying food lists created by French et al[30] in a similar receipt collection investigation. We adapted these food categories with the most up to date dietary data used to create the Alternative Healthy Eating Index[31] to create our own food categories (see the appendix for food category lists created for this pilot study).

Results

Feasibility Assessments

CIA employees (excluding culinary staff; n = 482) were sent 2 emails per cohort for recruitment into the study. Within 14 days of this notice, approximately 13% (n = 63) of eligible employees expressed interest in participating, and 15 indicated interest in having their spouse or partner be considered for enrollment in the study. Sixty-five people were screened, and ultimately, 40 people, or 8.3% of all eligible and 52.4% of employees expressing interest (33 employees, 7 non–employee spouses), were enrolled. The 40 study participants ranged in age from 23 to 67 years (mean = 47.5), were predominately female (70%), overweight or obese (93%), and represented a wide range of work departments (including facilities/housekeeping, financial aid, residence life, human resources, admissions, career services, and others) and individual cooking abilities and self-care aspirations. At baseline, most

Table 1.

Baseline Characteristics of Study Participants.

	Cohort 1	Cohort 2
N	20	20
Mean age (range)	47 (23-67)	48 (31-66)
% Female	75%	65%
Number of singles	14	10
Number of couples	3	5
Children at home	40%	25%
Obese (BMI > 30)	11 (55%)	14 (70%)
Overweight or obese (BMI > 25)	18 (90%)	19 (95%)
Elevated waist circumference (>35 in. women, >40 in. men)	15 (75%)	14 (70%)
High blood pressure (≥130/85 mg/dL)	12 (60%)	5 (25%)
High total cholesterol (≥200 mg/dL)	7[a] (37%)	7 (35%)
High triglycerides (≥150 mg/dL)	7[a] (37%)	5 (25%)
High fasting blood sugar (≥100 mg/dL)	4[a] (21%)	5 (25%)
Metabolic syndrome[b]	8[a] (42%)	3 (15%)
No known metabolic risk factors	4 (20%)	5 (25%)

Abbreviations: BMI, body mass index; HDL, high-density lipoprotein.
[a]N = 19, as the local laboratory was unable to process the baseline blood work of one study subject.
[b]Metabolic syndrome Is clinically classified as having at least 3 of the 5 metabolic risk factors: elevated waist circumference (>35 in. women, >40 in. men), high triglycerides (≥150), low HDL (≤40 men, ≤50 women), high blood pressure (≥130/85), high fasting blood sugar (≥100).

participants (80%) had at least one elevated cardiovascular risk factor and 11 (27.5%) had metabolic syndrome, while 22.5% had no known risk factors. There were 8 couples that jointly participated in all classes, and about one third of participants had children living at home (Table 1).

Program completion was 100% for both cohorts with no dropouts and high attendance rates (86% in Cohort 1, 92% in Cohort 2). Response rates for completing pre-post questionnaires and obtaining blood tests were ~100% for all measures (Note: HDL was only collected for Cohort 2), and dropped to 90% at 6 months and 80% at 12 months, owing in part to 4 subjects changing employment during the follow-up period.

Biometric Assessments

Pilot biometric data from baseline to 14 to 16 weeks (Table 2) suggested statistically significant ($P < .05$) decreases in body weight, BMI, waist circumference, systolic and diastolic blood pressure, and total cholesterol in our sample of 40. Changes in triglycerides, HDL, and LDL trended down, while fasting glucose increased slightly, but none of these measures was statistically significantly different at the end of the educational intervention.

Biometric data at 6 months (n = 37) suggested a persistence of significant ($P < .05$) changes from baseline for weight (−4.2 kg [SD 6.5]), systolic blood pressure (−10.08 mm Hg [SD 119.07]), diastolic blood pressure (−8.24 mm Hg [SD 11.72]), and waist circumference (−3.24 in. [SD 3.09]); but were no longer statistically significant for changes in total cholesterol (−5.22 mg/dL [SD 20.45]; $P = .13$). Changes in triglycerides ($P = .22$), HDL ($P = .78$), LDL ($P = .40$), and blood glucose ($P = .73$) remained nonsignificant.

At 12 months (n = 32), only changes from baseline in diastolic blood pressure (−4.25 [SD 9.37]) and waist circumference (−3.21 in. [SD 3.22]) remained statistically significant ($P < .05$). Changes continued to trend downward as compared with baseline, but were no longer statistically significant for decreases in weight (−1.3 kg [SD 6.33]; $P = .26$), and systolic blood pressure (−4.63 mm Hg [SD 17.21]; $P = 0.14$) at 12 months; and changes in other biometric measures remained nonsignificant.

Behavioral Change Assessments

Overall, we observed self-reported changes in a range of behaviors toward more desirable health habits taught in our program as assessed by the outcome instruments used (Table 3). Table 4 summarizes responses from the questionnaire regarding cooking patterns. These show improvements from baseline to end of program in the following measures: cooking meals from scratch at home more often, cooking convenience and ready-made meals less often, reading nutrition labels on purchased foods more often, and feeling more confident cooking, following a recipe, tasting new foods, and cooking new foods and recipes. All of these improvements persisted but appeared to have diminished slightly at 6 and 12 months.

We collected approximately 400 food purchase receipts in total from all of the participants. Ninety-seven percent of the households submitted at least one food receipt; however, the complete receipt

Table 2.

Changes in Biometrics at Baseline and Immediate Postintervention (16 or 14 Weeks) for Both Cohorts (n = 39[a]).

Outcome	Baseline Mean (SD)	Postintervention Mean (SD)	Mean Change	% Change	*P* Value[b]
Weight (kg)	92.7 (25.7)	89.9 (24.6)	−2.8 (4.0)	−1.2%	<0.05
BMI (kg/m^2)	33.3 (8.4)	32.3 (8.1)	−1.0 (1.5)	−2.7%	<0.05
Waist circumference (in.)	41.3 (8.0)	39.5 (7.9)	−2.2 (2.8)	−4.6%	<0.05
SBP (mm Hg)	134.3 (20.0)	126.5 (17.5)	−7.7 (15.5)	−5.6%	<0.05
DBP (mm Hg)	82.0 (10.2)	75.7 (11.9)	−6.3 (9.1)	−7.9%	<0.05
Total cholesterol (mg/dL)	187.1 (41.7)	179.5 (41.9)	−7.5 (23.1)	−4.4%	<0.05
Triglycerides (mg/dL)	124.5 (93.8)	112.3 (53.5)	−12.2 (70.1)	−9.8%	0.28
HDL (mg/dL)	52.4 (17.5)	50.5 (14.3)	−1.9 (4.9)	−3.6%	0.10
LDL (mg/dL)[c]	105.0 (34.5)	102.4 (33.6)	−2.6 (14.7)	−2.5%	0.44
Fasting glucose (mg/dL)	110.0 (53.3)	112.3 (53.7)	2.4 (13.5)	+2.1%	0.28

Abbreviations: BMI, body mass index; SBP, systolic blood pressure; DBP, diastolic blood pressure; HDL, high-density lipoprotein; LDL, HDL, low-density lipoprotein.
[a]N = 39 instead of 40 because measurements were not available for one participant due to a logistical lab error.
[b]The baseline to postintervention difference for continuous variables were tested using 1-sample paired Student's *t* tests. $P < .05$ indicates statistically significant differences.
[c]LDL measures were only taken in Cohort 2, N = 20.

Table 3.

Questionnaires Used to Assess Behavioral Change.

Domain Assessed	Reason(s) for Choosing This Instrument	Suggestive Observations From Pilot Study Data[a]	Questionnaire Recommended for Use in Future Studies and Rationale
I. Dietary Intake/Eating Profile[25]	Short, simple 21-item validated tool with aggregate score that distinguishes characteristics of a healthy versus less healthy diet.	Increased consumption of dark leafy greens, fish/seafood, and whole grains, and less beef/pork/lamb, processed meat, refined grains, and baked goods.	Questions did not capture as extensive dietary changes as encouraged in our program (eg, eating freshly prepared whole foods vs processed food). We will consider a modification of the assessment tool we used, possibly the "blinded" Food Frequency Questionnaire[38] along with a 3-day food diary.

(continued)

Table 3. (continued)

Domain Assessed	Reason(s) for Choosing This Instrument	Suggestive Observations From Pilot Study Data[a]	Questionnaire Recommended for Use in Future Studies and Rationale
II. Cooking Frequency and Confidence[24]	Limited number of validated cooking assessments available. This 17-item tool captures changes in cooking frequency and confidence in 7 questions.	Cooked convenience/ready-made meals less often. Read food labels more often. More confident about: ability to cook from basic ingredients, following a simple recipe, tasting new foods, and preparing and cooking new foods and recipes.	Questions clear and easy to understand; however, some questions in this instrument were not specific to skills taught in the program.
			Consider changing to assess self-efficacy and attitudes toward cooking.[39]
III. Exercise Frequency & Intensity[26]	Validated, simple and widely used assessment tool to measure MET-hours/week.	Suggestive increases in: METs-hour week, walking pace, number of days per week of exercise, number of flights of stairs climbed daily.	Consider changing to International Physical Activity Questionnaire for Adults[40] to assess more specific exercise and movement habits; however, more complete assessments and data tracking using wearable devices to be considered.
IV. Perceived Stress[28]	Validated, widely used, 10-item tool to assess changes in the levels of experienced stress.	Suggestive decrease from higher stress at baseline to average stress levels at the end of the 14- to 16-week program.	Questions easy and interpretable from study participant and analysis perspective.
			Continue to use this instrument.
V. Well-being[29]	Validated 26-item tool used in similar health intervention studies to capture 6 categories of physical and emotional well-being.	Suggestive improvements in: perceived sense of disease risk, physical response to diet, meal preparation and time costs, inconvenience for family and outside of home, and food deprivation and dissatisfaction.	Questions not directly relatable to lessons taught in our program. Data collected were not clearly interpretable.
			Consider changing to RAND 36-Item Short Form Health Survey[41] using subscales for general health, energy/fatigue, and emotional well-being.
VI. Mindful Eating[27]	Validated 28-item tool with one aggregate score that focuses specifically on mindful eating practices.	No average changes in mindful eating as assessed by total score using this instrument.	Continue to use this instrument for now as it is the only validated mindful eating tool currently available; however, a more global assessment of mindfulness may be preferable.
		This lack of change in scores was inconsistent with subjective descriptions by participants.	

[a]Pilot study was not powered to provide stable estimates from statistical analyses. These results are only suggestive of trends seen in this sample of 40 from baseline to end of the intervention at 16 or 14 weeks. Many of these suggestive trends were no longer observed or lessened throughout the 12-month follow-up period. Identical questionnaires were used at all 4 time points and responses may not reflect self-perceived changes from baseline, but rather from the last time subjects were asked the same question. In future studies, we may develop our own additional questionnaires, such as surveys to assess perceived creativity and work-life balance; and wording of all instruments may explicitly ask respondents to compare their current behaviors or perceptions to those assessed previously (ie, at baseline or as compared with specific prior interval assessment).

Table 4.

Self-Reported Cooking Frequency and Confidence in the Kitchen.

Frequency/Confidence Performing Task, n = 40	Time of Assessment	% Never/Not at All	% Sometimes/ Somewhat	% Always/Very	# of Responses
1. How often do you cook convenience and ready-made meals	Pre	20.5	66.7	12.8	39
	Post	45.0	55.0	0	40
	6 months	50.0	50.0	0	36
	12 months	37.5	53.1	9.4	32
2. How often do you prepare and cook a main meal from basic ingredients	Pre	18.4	55.3	26.3	38
	Post	0	46.2	53.9	39
	6 months	0	55.9	44.1	34
	12 months	0	56.3	43.75	32
3. How confident do you feel about being able to cook from basic ingredients	Pre	10.3	38.5	51.3	39
	Post	0	17.5	82.5	40
	6 months	0	2.8	97.2	36
	12 months	0	12.5	87.5	32
4. How confident do you feel about following a simple recipe	Pre	0	30.8	69.2	39
	Post	0	5.1	94.9	39
	6 months	0	5.6	94.4	36
	12 months	0	6.3	93.8	32
5. How confident do you feel about tasting new foods	Pre	0	41.0	59.0	39
	Post	0	17.5	82.5	40
	6 months	0	25	75	36
	12 months	0	21.9	78.1	32
6. How confident do you feel about preparing and cooking new foods and recipes	Pre	5.13	46.2	48.7	39
	Post	0	25	75	40
	6 months	0	22.2	77.8	36
	12 months	3.1	21.9	75	32
7. Do you read nutrition labels on purchased foods	Pre	15	57.5	27.5	40
	Post	0	27.5	70	40
	6 months	0	25.7	74.3	35
	12 months	0	34.4	65.6	32

collection protocol requiring a full week of all food and restaurant receipts was only completed by 60% of the participants, making results from any of the analyses highly prone to selection bias and therefore our analyses are not reported. Additionally, we found our receipt collection methodology, with paper copies of receipts from supermarkets, restaurants, and convenience stores, cumbersome. Moreover, the lack of computerized data entry systems made this approach inefficient and of questionable reliability. Regular use of a personal activity monitoring device (pedometer) throughout the duration of the program varied with 65% of Cohort 1 compared to 100% of Cohort 2 wearing the devices. Seven participants lost the device and received a replacement. In addition, 90% (n = 36) of participants accessed the gym facility at least one time, but frequency of use varied with less than half (45%, n = 18) of participants having accessed the gym 10 or more times during the study period. (Note: Some subjects belonged to other gym facilities, precluding their use of the gym facility that was offered as part of this pilot study.) Ten individuals (25%) continued their membership (at their own expense) at the participating gym after the program.

Participants were matched with 1 of 4 health coaches based on logistics of scheduling and were encouraged to talk with their health coach once a week. The majority (73%) of all participants consulted with their health coach more than every other week for 14 to 16 weeks, with few missed appointments or late cancellations (<5%). The feedback with regard to health coaching was positive as multiple participants conveyed the perception that health coaches customized the program for each individual by (*a*) helping them identify personal motivations and (*b*) talking through personalized strategies for implementing new life skills learned during the educational intervention.

Discussion

To our knowledge, this is the first study to investigate the feasibility of an interdisciplinary approach to improved health and wellness that includes hands-on culinary instruction, mindfulness training, and health coaching, in addition to nutrition education and physical activity promotion. We conducted this pilot with the involvement of CIA (nonculinary) employees as proxies for employees at other self-insured organizations across the United States. Our results suggest that this prototype TK self-care curriculum was feasible in this particular workplace setting given the ease of recruitment, 100% program completion, high attendance, and high response rates on repeated assessments. It is important to note that this was the first implementation of this prototype TK program and therefore not necessarily representative of all potential TK models in terms of choice of facilities, core content, feasibility and effectiveness.

It is also worth noting that this model, unlike interventions that are based on restrictive "diets," allowed for an ad libitum food intake on the part of TK trainees, thereby allowing them to establish new dietary habits in the absence of strict prohibitions and the concomitant feelings of perceived deprivation which often accompany many "diets." As such, this prototype model may be of interest to individuals who are not interested in restrictive "diets," or those for whom "diets" have not led to successful and sustained behavioral and clinical change.

This program was well received by the study subjects most likely because of its interdisciplinary approach, incorporating both didactic and experiential learning in a group setting, and access to individualized health coaching. Little is known about the combined effect of multiple components and/or their relative contribution to observed changes in relevant outcomes. A growing body of research is showing the positive effects of health coaching,[32] and we feel that this is a critical component of future models of sustainable, enhanced behavior change. Additionally, the US National Board of Medical Examiners has partnered with the National Consortium for Credentialing Health & Wellness Coaches to create a certification for health coaches,[33] thereby setting core competency standards in an area relevant to the future refinement of TK programs.

As we observed in our pilot, physiological and behavioral changes that study subjects experienced during the intervention appeared to diminish over the course of 12 months and this, in hindsight, may have been due to the lack of built-in follow-up support after month 4 in the initial prototype protocol. This was due to financial limitations of the pilot. Prior studies have indicated that ongoing reinforcement of learned behavioral change is essential to the formation of sustained change.[32] More built-in follow-up opportunities, along with additional ongoing offerings of a TK program for employees in a worksite setting, may serve to engage additional employees and thereby shift a corporate worksite in the direction of enhanced, and more sustained, self-care and wellness, thereby promoting a "culture of health."

This prototype TK curriculum, which was designed with extensive input from professional chef educators at the CIA, included the conceptual notion of "technique driven, recipe inspired" culinary instruction. This is typical of professional culinary instruction and was viewed as a key asset to this novel curricular model. Instead of teaching trainees how to make an individual "recipe," each week was focused on 1 or 2 essential culinary "techniques" (such as how to make a soup, or a whole grain, or a salad and salad dressing) with the goal of showcasing a core technique instead of an individual recipe using that technique. Once the technique had been applied to any singular recipe, trainees were shown and encouraged to apply this core technique to variations of the initial recipe (ie, a range of soups, salads, and whole grain dishes) but with a customization of essential ingredients, spices, flavorings, and presentations. As such, this "technique driven, recipe inspired" aspect of this TK prototype curriculum was a unique feature of this prototype TK curriculum.

While subjects in this pilot study stated that their culinary skills had improved over the course of 14 to 16 weeks (and investigators and chefs overseeing the pilot observed this to be true), we did not collect objective data (ie, photos, videos, blind tastings) to confirm these self-reported data. There is currently no validated tool whereby culinary skills, competencies, and proficiencies—or their improvement over time—can be objectively measured. Instead, the current state of the science relies entirely on self-report, which may be highly unreliable.

Importantly, this is a limitation of this study and all current studies involving culinary instruction. Moreover, this highlights the need for the development of such evaluative tools, ideally with the combined input of researchers, trained chefs, and relevant experts in emerging technologies, for example, computerized visual recognition platforms.

Regarding the tracking of physical activity, the personal activity monitors we used were in their early phases of development and, as such, were sometimes cumbersome for the participants to wear. It was not uncommon for a participant to lose them. Additionally, the format by which the data were collected was difficult to manipulate and incomplete (because of lost monitors). We therefore chose not to analyze these data, but rather to work on further refinements of this aspect for future TK trials. Specifically, future studies will benefit from emerging IT platforms that allow for data capture from all commercially available energy tracking devices, regardless of manufacturer, and these will be routinely employed in clinical trials involving counseling in the areas of movement and exercise.

An additional limitation of this study was the setting of the CIA, where employees were recruited as proxies for employees at other corporate organizations and worked in proximity to kitchen facilities that are not generally representative of facilities currently available at worksites, schools, universities, and community-based venues. Use of the CIA's demonstration and TKs raises the question as to whether this model is feasible and replicable elsewhere and, therefore, generalizable. As dozens of US health care facilities and corporate worksites have already built demonstration and/or TK facilities, we see this as a trend that may allow for an expansion of this line of inquiry for use by employees, K-12 and university students, patients, and community-based populations nationwide.[3,34,35]

While this pilot made use of a built-in kitchen, another approach would be to refine the curriculum to be delivered using portable, or "pop-up," kitchen facilities consisting of inexpensive cook tops, portable ovens, and access to cafeteria sinks and refrigerators. This "pop-up" approach, ideally suitable for any worksite (or school/community venue) with a cafeteria, could potentially address relevant concerns about the need to minimize start-up costs and increase the program's scalability and generalizability at sites that do not envision the build out of expensive, built in, kitchen facilities.

In our case, the cost of developing and implementing this pilot curriculum, including research personnel time in addition to culinary instruction and food costs, was prohibitively expensive (ie, several hundred thousand dollars over 2 years) and only made possible due to generous donor support and in-kind contributions by the coauthors' partnering institutions. The bulk of these expenses, however, related to the research infrastructure (such as salary support for co-investigators) necessary to recruit and follow study participants over 12 months. By comparison, the food costs per subject were estimated at $400 per person per cohort.

Further refinement of this prototype curriculum will need to explore how it can be made more cost-effective and readily accessible to larger audiences using videotaped and other web-based components. The curriculum will also need to be customized for different high- and low-risk populations, with or without spousal/partner participation, across different workplaces, kitchen facilities, socioeconomic populations, and community settings. Lastly, future evaluations will benefit from the incorporation of relevant financial data to assess potential cost-saving benefits for employees and their third-party payers, some of which may be enhanced by employee incentive programs as are occurring more frequently across the corporate landscape.[36,37] These future refinements are precisely the goals of the recently launched Teaching Kitchen Collaborative, which involves 32 member organizations with TK programs.[34]

This TK intervention should be viewed as an "initial prototype" with the understanding that there will likely be a range of TK models that, over time, can and should be implemented, evaluated, and refined for their application to different populations, including (*a*) patients with increased cardiovascular risk; (*b*) employees with and without chronic disease at worksites; (*c*) students in K-12, college, and university settings; (*d*) retirees; (*e*) community populations; (*f*) military and VA populations, and others. In addition, TK curricula, if implemented and shown to be replicable and effective, should, ideally, be customized in order to meet the specific needs, aspirations, and financial requirements of each individual population and setting. This portfolio of research is being planned by the recently launched Teaching Kitchen Collaborative.[34]

Our results suggest that a TK and self-care curriculum involving hands-on culinary education, mindfulness training, health coaching, nutrition instruction, and exercise promotion is feasible and that the impact of TK programs on relevant behavioral and clinical outcomes can be measured. Given trends with regard to obesity and diabetes, and in light of societal aspirations to move from a fee for service to a capitated scheme of medical reimbursement, thereby incentivizing patients, providers, and payers to keep people well,[35] additional research involving the models and parallel curricula being devised by additional groups with TKs is recommended.

In terms of future research in this area, it will be important to demonstrate that TK curricula are or are not (*a*) replicable from site to site; (*b*) adaptable to a range of study populations; (*c*) capable of demonstrating predictable changes in behaviors, clinical outcomes, and, ideally, costs; (*d*) superior to existing, popular "diets" in terms of changes over time and sustainability of these changes over time; and (*e*) capable of demonstrating sufficient return on investment to warrant third party payment and/or inclusion in employee benefits.

Appendix

List of Food Categories Created for This Pilot Study.

Meats and Eggs	
Leaner meats: more healthy	Poultry, fish
Eggs and egg substitutes: more healthy	Shell eggs, egg beaters, carton egg whites
Red or processed meats: less healthy	Beef, pork, lamb, lunchmeat, hotdogs
Vegetables (including greens, tomatoes, avocados)	
Whole vegetables: more healthy	Fresh, canned, frozen vegetables
Modified vegetables: less healthy	Vegetables in cream sauce, fried potatoes
Fruits	
Whole fruits: more healthy	Fresh, canned, frozen, dried unsweetened fruits
Modified fruits: less healthy	Canned in syrup, applesauce, sweetened fruits
Grains	
Whole grain products: more healthy	Whole grain bread, cornmeal, plain popcorn
Simple carbohydrate products: less healthy	White bread, sugary cereals, pie crusts
Beans/Legumes/Pulses	
Whole products: more healthy	Dry or canned beans, peas, chickpeas
Modified products: less healthy	Refried beans, baked beans
Nuts/Seeds	
Whole products: more healthy	Walnuts, sunflower seeds, natural peanut butter
Modified products: less healthy	Honey-roasted peanuts, peanut butter with added sugars
Fats	
Plant-based fats: more healthy	Olive oil, canola oil, vegetable shortening
Animal-based fats: less healthy	Butter, lard
Trans fats: less healthy	Margarine
Snacks and Sweets	
Salty snacks: less healthy	Chips, pretzels, flavored popcorn
Sweetened snack foods: less healthy	Cookies, donuts, ice cream, sweetened yogurt

(continued)

Appendix. (continued)

Beverages	
Noncaloric beverages: more healthy	Water, unsweetened tea, coffee
100% fruit/vegetable juices: more healthy	V8, Tropicana orange juice
Sugar-sweetened beverages: less healthy	Sugary sodas, sweetened tea
Premade Foods	
Prepackaged entrees: less healthy	Frozen pizza, canned soup
Deli foods (otherwise unclassifiable): less healthy	Coleslaw, potato salad
Eating Out (for counts and dollar amounts only)	
Leaner meat or vegetarian entrée: more healthy	Grilled chicken salad, veggie burger
Side dish, fried: less healthy	French fries, onion rings
Appetizer: less healthy	Egg roll, mozzarella sticks
Red or processed meat entrée: less healthy	Hamburger, pork chop
Side dish, nonfried: more healthy	Cooked vegetable, side salad
Dessert/sweetened snacks: less healthy	Milkshake, doughnut

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Impact of Metal Ions in Nutrition: How a Student Seminar Is Catalyzing Change among Students, Faculty, and Society in a Small Town of Northern India

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Abstract

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