IX. Program outcomes and assessments (1-3 pages)

The Food Science faculty and staff are committed to the education of future Food Scientists. To that end faculty in the Food Science programs at WSU and at the UI have identified a single, comprehensive or superordinate outcome: Students who complete the program will demonstrate professional level competence in scientific reasoning in Food Sciences. This is the fifth year and assessment cycle for the program.

This assessment has three goals:

1. The assessment of student performance in Food Science's overarching outcome—demonstrating competent scientific reasoning—targets improvement in the ability of Food Science students to integrate information from multiple disciplines and to reason scientifically and critically.

2. The assessment supports WSU and UI institutional goals—quantitative and symbolic reasoning, critical and creative reasoning, information fluency, students' communication skills and their understanding of self and society.

3. The assessment will help identify weaknesses and strengths to help improve and promote the Food Science program.

Performance Criteria

In order to effectively demonstrate competent scientific reasoning in FS, students should be able to demonstrate the six essential subordinate or supporting outcomes that are aligned with WSU's institutionally generated student outcome goals and the UI 5 program learning outcomes.

Students who complete the FS curriculum will therefore demonstrate the ability to:

1. Identify, summarize, and define the issue or problem at hand.
2. Clearly state purposes, objectives, or hypotheses.
3. Present observations and results in a complete, logical and clear fashion.
4. Assess, discuss, and reconcile the supporting data/evidence acquired from the exercise/experiment in relation to the existing scientific literature.
5. Identify and assess conclusions, implications, and consequences.
6. Effectively organize and articulate information to promote understanding and communicate significance of the issue or problem.

Methods

Initially, ten faculty from the FSHN program at WSU and the University of Idaho in collaboration with assessment specialists from the Center for Teaching, Learning, & Technology participated in developing the outcomes criteria, or rubric, that reflect critical reasoning in FSHN. The rubric was adapted from the WSU Critical Thinking Rubric in order to identify key criteria experts expect from graduates who receive degrees in FSHN.
C. Brief summary of assessment results to date

For the Program as a whole:

A. Specific Outcomes

- **Alumni and Employer Surveys and Interviews based on IFT core competencies**
  Graduates responded that they were generally satisfied with their education; however, they also reported lower rates of adequate or better preparation in success skills involving group dynamics, some processing and engineering skills, and government regulations. Conversely, most of these skills were also the least frequently used by graduates in their careers. Success skills were the most frequently performed competencies, while food microbiology and safety, along with some engineering and processing skills, were used with the least frequency. Greater than 80% of the employers reported that the graduates' performance was adequate or better in all skill areas. The assessment suggested program improvement since a similar survey conducted in 2004, but also illuminated areas for improvement in teaching and learning. Specifically, graduates and employers emphasized course work stressing critical thinking skills, group dynamics, and government regulations. Graduates also highlighted the importance of internships and extracurricular activities for career preparation.

- **Assessment of Student Learning Outcomes Across the Curriculum Using Criteria for Scientific Reasoning 2003-2008**
  The program has made solid progress in formalizing and refining the assessment process of its three goals—student competence in scientific reasoning, relating the assessment of that competence to the Six WSU Institutional Goals of the Baccalaureate, and implementing a process that will help improve the Food Science program's coherence. However, measuring student outcomes is not enough, and student outcomes over the 5 cycles of assessment (see charts below) have remained unchanged, at a mean level hovering just below competency. The challenge to respond to the evidence has remained elusive, and a committee has been formed to explore the scholarship of teaching and learning in order to map the results of the assessment process to implications for teaching practice. The committee has been charged with establishing clear timelines and lines of responsibility for implementing improvements the assessment has effectively helped to reveal, most notably in regards to alignment of assignments with program and institutional goals, and to develop activities that will help faculty and students enunciate the outcomes.

- **Assessment of the Joint Food Science Curriculum of Washington State University and the University of Idaho by Graduates and Their Employers**
  Graduates of the joint food science program generally indicated satisfaction with their food science education and suggested that they have been adequately prepared for their jobs. Both students and employers indicated that most of the identified Success Skills are used daily on the job, and that graduates have been well prepared with Success Skills. Graduates and employers generally report adequate preparation in Food Processing and Engineering competence. Some significant differences (P < 0.05) have been found in perceived and assessed competence, however. Specifically, while students have indicated that they are well prepared with Food
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Chemistry and Analysis, Food Safety and Microbiology, and Applied Food Science competence, employers have reported only adequate preparation in Food Chemistry and Analysis, and Applied Food Science competence. Employers report poor preparation in Food Safety and Microbiology. The findings suggest that students need more curricular opportunities for developing these understandings and skills, and, no less important, additional opportunities have been recognized as needed for helping students develop more acuity in their self-evaluation. Because the survey models are based on the Institute of Food Technologists' requirements, it is expected that the surveys can be readily adopted by other institutions to assess student learning and program effectiveness.