

FOOD SCIENCE GRADUATE PROGRAM REVIEW

Description of Departmental/Program Review Process

The Food Science Graduate Program at Oklahoma State University is an inter-departmental program involving faculty from the departments of Animal Science, Horticulture and Landscape Architecture, Biochemistry and Molecular Biology, Plant and Soil Sciences, Biosystems and Agricultural Engineering, Agricultural Economics and Nutritional Sciences. This interdepartmental program was started in the late 1960's and was primarily administered through the department of Animal Science until the fall of 2002. This was done since virtually all Food Science Graduate Students at Oklahoma State University prior to that time were being advised by faculty members in the department of Animal Science due to the fact that Food Science programs were not active in other departments. In the fall of 2002 a Food Science Graduate Coordinating Committee was appointed by the Dean of the Graduate College. This was brought about primarily due to the expansion of the Food Science research efforts on campus as a result of the opening of the new Food & Agricultural Products Research & Technology Center that housed food science faculty from the various departments. Along with the opening of the Center there was an increase in Food Science Graduate Students in departments other than Animal Science.

The Charter adopted by the Food Science Graduate faculty is as follows:

CHARTER
Graduate Food Science Program
Graduate Faculty Group
and
Coordinating Committee

The Food Science Graduate Faculty Group is made up of all faculty who advise graduate students in the Interdepartmental Food Science Graduate Program. The group will meet two times each year (fall and spring semester).

A coordinating committee will consist of ten members (in addition to the Program Coordinator) including at least one faculty member from each department participating in the interdepartmental program. The Coordinator will serve as chair of the group and the committee. The Associate Dean of the College of Agricultural

Sciences & Natural Resources, with appropriate input from his/her counter-part in the College of Human & Environmental Sciences and appropriate department heads, will appoint the Coordinator and committee members.

The coordinating committee will have program coordination responsibilities in the following general areas:

- *Curriculum development and recommendations*
- *Program requirements*
- *Admission requirements and coordination*
- *Recruitment*
- *Coordination with the Graduate College*
- *Coordination with cooperating academic departments*
- *Development and coordination of Food Science courses*
- *Development and communication of guidelines, recommendations, requirements and other actions affecting the Food Science Graduate program, faculty and students*

The coordinating committee will develop recommendations in these areas to be submitted to the Food Science Graduate Faculty membership for approval.

The Coordinating Committee will meet as needed at least twice each semester.

Expansion or contraction of the Coordinating Committee's areas of responsibility or scope of responsibility within areas shall be at the pleasure of the Food Science Graduate Faculty.

“Food Science is an interdisciplinary graduate program designed to provide an opportunity for students to acquire basic knowledge of food industry encompassing the biological and physical sciences. The increasing complexity of the problems involved in the production, processing and utilization of food demands increased fundamental knowledge to solve these problems. There is a great demand for personnel with advanced training in the broad area of food science to staff research and quality assurance facilities of industry, universities, and the federal government.” (University Catalog, 2003-2004).

“Admission to either the Master Science or Doctor of Philosophy degree programs in Food Science requires an undergraduate major in Food Science, Animal Science, Dairy Science, Biochemistry, Human Nutrition, Microbiology or Poultry Science. Students majoring in other curricula may qualify by remedying specific undergraduate deficiencies recognized by the students graduate committee. A student enrolling in a degree program must have been accepted by an advisor prior to official admission. The GRE is required for admission plus three letters of reference sent to the Graduate Programs Coordinator.” (University Catalog, 2003-2004).

The Food Science graduate faculty coordinating committee has reviewed the program. This was done to determine what changes and/or needs were required to enhance the program. The members of this committee are:

Dr. Stanley E. Gilliland (FAPC/ANSci) Chair
Dr. Christina DeWitt (ANSci)
Dr. Nurhan Dunford (FAPC/Plant & Soil Sci)
Dr. Margaret Hinds (Nutr. Sci)
Dr. Rodney Holcomb (FAPC/Ag Econ)
Dr. William McGlynn (FAPC/Hort & L.A.)
Dr. Brad Morgan (ANSci)
Dr. Peter Muriana (FAPC/ANSci)
Dr. Patricia Rayas-Duarte (FAPC/Biochem)
Dr. Barbara Stoecker (Nutr. Sci)

RECOMMENDATIONS FROM PREVIOUS REVIEW

The last review of the Food Science Graduate Program was incorporated in with the last review of the department of Animal Science. No specific recommendations for the Graduate Food Science Program were evident in that review. However the newly formed Food Science Graduate Coordinating Committee has recognized several needs. Among these is a need for visibility of the program in order to attract or recruit students. Another is to develop more graduate level food science courses.

A subcommittee has developed a website which will be online soon. This will have a link from the website of the Institute of Food Technologists that is an organization of professional food scientists with members from around the world. This will provide potential for broad visibility of the program.

With respect to the development of new food science graduate courses the numbers of FTE's assigned to members of the food science faculty is not sufficiently great to permit much activity in this area. The primary teaching responsibility of these faculty members has been to teach courses which are needed to support the undergraduate foods option programs in the department of Animal Science and/or the department of Biosystems & Agricultural Engineering. In order to solve the need for more graduate level food science courses there is a need for increased FTE's in teaching in Food Science at Oklahoma State University.

PROGRAM CENTRALITY

A. Goals and Objectives of Degree Programs

Degree Program: Master of Science and Doctor of Philosophy in Food Science.

Program Clientele: Students with a B.S. degree wanting to acquire more basic knowledge of the biological and/or physical aspects involved in processing and utilization of foods.

Program Objectives:

1. To train graduate students for positions related to food processing in industry, government or academia.
2. To develop the student's ability to think and apply the principles of one or more of the disciplines of food science (chemistry, microbiology, nutrition, economics or engineering) in solving needs of the food industry.
3. To provide a critical component for the Food Science Research Program at Oklahoma State University.

Expected Outcomes:

1. Graduates of the program to fill numerous food-related positions in quality control, research, teaching and/or extension in academia, industry or government agencies.

It is not anticipated that a student would be able to address all of the needs in Food Science since it is a rather broad area involving several disciplines. Graduates of our program should be well trained in perhaps only one discipline within food science so that they can provide the best of input into solving the needs related to providing consumers with an adequate and desirable food supply.

PROGRAM CURRICULUM AND STRUCTURE

A. Program Structure

There are no specific degree requirement sheets available for the Master of Science or Doctor of Philosophy degree in Food Science. As for most graduate programs, the graduate college requires for the Master of Science Degree Program 30 credit hours, six of which are for the research and thesis component. The Doctor of Philosophy Degree Program requires sixty hours beyond the Master of Science Degree Program requirements including thirty hours of credit for the research and thesis component. Since Food Science is a multi-disciplined degree area, each graduate student's plan of study is tailored to meet the needs of that particular student. Academic background of the student is taken into consideration as well as the specific discipline areas within Food Science the student is emphasizing (i.e. chemistry, microbiology, engineering, etc.).

B. Distance Education

Currently there are no courses offered through the Food Science Graduate Program by electronic or distance delivery methods.

C. Articulation Agreement

There are no agreements with community colleges for the advanced degree in Food Science at Oklahoma State University.

D. Multi-Disciplinary Programs

The Graduate Program in Food Science is an inter-disciplinary program. Faculty members from the participating departments are involved in developing the plans of study and research activities of the individual graduate students. Normally faculty from more than one department are involved in each Graduate Advisory Committee, thus the multi-disciplinary input is more or less assured.

PROGRAM RESOURCES

Since the Food Science Graduate Program at Oklahoma State University is an inter-departmental program any departmental expenditures related to the program will be through the academic departments involved. For this reason the expenditures associated with the program are not included in this report. There are no specific funds set-aside separately for the Food Science Inter-departmental Graduate Program.

NEW FACILITIES AND MAJOR EQUIPMENT

The bulk of the research activities associated with the Graduate Program in Food Science at Oklahoma State University are centered in the Oklahoma Food & Agricultural Products Research & Technology Center on the OSU campus. This Center is focused entirely on research and outreach activities related to the value added food and agricultural products industry in the state of Oklahoma. Most of the Food Science graduate faculty members are housed in the Center and thus their research programs are conducted in the facilities contained therein. Graduate students are an important component of the Center's research program.

PRODUCTIVITY

Enrollment

This report will cover those courses that are specifically utilized by food science graduate students for their degree programs. It will not include support courses.

Fall	Headcount Enrollment		Grade Point Average of Majors	
	MS	PhD	MS	PhD
1999	9	9	3.49	3.70
2000	12	6	3.57	3.68
2001	16	4	3.53	3.65
2002	13	3	3.52	3.55
2003	14	8	3.57	3.67

DEGREES CONFERRED

Year	Degrees Conferred	
	MS	PhD
1998-1999	9	0
1999-2000	1	1
2000-2001	2	1
2001-2002	6	2
2002-2003	1	1

STUDENT DEMAND FOR ACADEMIC UNIT OFFERINGS

In this section we have listed those courses specifically designed for graduate level food science education and have not included support courses. Those support courses will have been listed in the individual departments.

Student Demand for Graduate Level Courses that Include Food Science Graduate Level Instruction*

Year	Student Graduate Credit Hours	No. of Courses/Sections (Lecture/Discussion Only)	% Classes Taught by Tenure/Tenure Track Faculty	Student Faculty Ratio (Faculty Only)
1998-1999	736	8	100	1:23**
1999-2000	747	9	100	1:17**
2000-2001	724	10	100	1:11**
2001-2002	712	10	100	1:20**
2002-2003	774	10	100	1:22**

* Includes the following classes:

ANSI 5213	Advances in Meat Science
NSCI 5870	Food Product Development
BAE 5423	Food Rheology
BAE 6580	Food Rheology (Problems)
HORT 5423	Post Harvest Physiology
ANSI 5110	Seminar
ANSI 6110	Seminar
ANSI 5010	Special Problems
ANSI 5120	Special Topics in Food Science

** Does not include Research & Thesis credit hours since these would be 1:1 each

QUALITY OF THE PROGRAM

Program Faculty

Faculty Qualifications

Name	Faculty Status (Regular or Adjunct) & Dept.	Faculty Program FTE	Highest Degree Earned		Related Work Experience (Years)
			Type	HEGIS	
Arjmandi, Bahram	Reg/NSCI	1	Ph.D.	0424	22
Bellmer, Danielle	Reg/BSE	1	Ph.D.	0925	8
Bowser, Timothy	Reg/BSE	1	Ph.D.	0925	11
DeWitt, Christina	Reg/ANSI	1	Ph.D.	0113	7
Dunford, Nurhan	Reg/PASS	1	Ph.D.	0925	9
Gilliland, Stanley	Reg/ANSI	1	Ph.D.	0113	39
Hinds, Margaret	Reg/NSCI	1	Ph.D.	0113	12
Holcomb, Rodney	Reg/AGEC	1	Ph.D.	0111	7
McGlynn, William	Reg/HORT	1	Ph.D.	0113	5
Maness, Niels	Reg/HORT	1	Ph.D.	0102	17
Morgan, James	Reg/ANSI	1	Ph.D.	0104	13
Muriana, Peter	Reg/ANSI	1	Ph.D.	0113	14
Rayas-Duarte Patricia	Reg/BIOC	1	Ph.D.	0113	16
Stoecker, Barbara	Reg/NSCI	1	Ph.D.	0424	34
Wei, Cheng-I	Reg/NCSI	1	Ph.D.	0411	23

PROGRAM DEMAND/NEED

Occupation Manpower Demand

There continues to be a great demand for students with advanced training (i.e. graduate training) in the field of Food Science in industry, academia and government organizations.

Graduates from the Food Science Graduate Degree Program at Oklahoma State University

compete very well with graduates from other universities for these employment opportunities. The employment opportunities for students with advanced degrees in Food Science has increased in recent years within the state of Oklahoma. Thus the programs' demand seems to be increasing.

SOME VITAL NEEDS FOR THE PROGRAMS

The importance of food science training cannot be overstated with regard to consumer needs. Consumers today are more and more interested in convenience foods that require a much higher degree of processing. This in turn requires more highly trained individuals for the industry. It also requires a considerable amount of effort in the field of product development. Food safety also is a major item of concern in consumers today. Consumers in our country expect any food they buy in the supermarket to be safe to eat without concern over the presence of food borne pathogens and/or toxic agents.

PROGRAM DUPLICATION

There are no other degree programs at OSU that provide training specifically related to food processing as does the Food Science Graduate Program. Thus this Graduate Program is unique in bringing together the expertise of faculty from several departments in training students at the graduate level for important positions in the industry and in other academic institutions.

SUMMARY AND RECOMMENDATIONS

Strengths of the Program

The major strength of the Food Science Graduate Program at Oklahoma State University lie in the individual faculty members involved from a number of different departments which includes expertise in the area of food safety, food chemistry, food engineering, product development and processing technologies. The research facilities available for training graduate students in the area of food science research are among the best in the country. We are one of

the only universities in the United States that has the capabilities under one roof that exist in the Oklahoma Food & that Products Research & Technology Center. This Center provides an excellent facility for training students, not only with regard to the ability to conduct research in food science but to interact with industry in doing that research. One of the objectives of the Center is to provide support for the value added industry in Oklahoma. This requires cooperative work with the industry.

AREAS FOR IMPROVEMENT

The primary area of improvement needed in or Food Science Graduate Program is to make available more graduate level courses specifically focused on Food Science topics. We recognize that this is an area that is very difficult to deliver under the present budgetary constraints. The number of FTE's for teaching among our Food Science Faculty members is low, thus it is difficult for sufficient time to be devoted to the development of new, advance level courses in this area.

RECOMMENDATIONS FOR ACTIONS

One of the primary cures for the needs with regard to increasing the availability of courses would of course be to increase the numbers of teaching FTEs in the food science faculty. However the faculty which are in place at Oklahoma State University today have major responsibilities in the area of research and/or extension, thus in order to achieve this will require the addition of new positions which have major teaching components.