

SOUTH DAKOTA BOARD OF REGENTS

Full Board

AGENDA ITEM: 36 – B

DATE: April 1-2, 2015

SUBJECT: New Program: SDSU Minor in Meat Science

South Dakota State University (SDSU) requests authorization to offer a baccalaureate minor in Meat Science. The minor will allow greater emphasis in the food animal industry and provide education on consumer issues from production to consumption of meat products. In addition, the minor will benefit students pursuing careers in other aspects of animal production. SDSU views the Meat Science minor as a critical content area for South Dakota’s strong agricultural focus.

The US Department of Labor estimates 9% job growth through 2022 of agricultural and food scientists. SDSU estimates graduating 8 students per year with the Meat Science minor after full implementation.

The proposed curriculum does not require the addition of any new courses. The minor will consist of 18 credit hours. SDSU is not requesting new resources for the proposed minor.

RECOMMENDED ACTION OF THE EXECUTIVE DIRECTOR

Approve SDSU’s new program proposal for a Minor in Meat Science as described in Attachment I.

**South Dakota Board of Regents
New Baccalaureate Degree Minor**

University:	South Dakota State University
Title of Proposed Minor:	Meat Science
Degree(s) in which minor may be earned:	Bachelor of Science
Existing related majors or minors:	Animal Science (B.S.); Agricultural Systems Technology (B.S.); Nutrition and Food Science (B.S.); Food Safety (Minor)
Proposed Implementation (term):	Fall 2015
Proposed CIP Code:	01.0906

University Approval

To the Board and the Executive Director: I certify that I have read this proposal, that I believe it to be accurate, and that it has been evaluated and approved as provided by university policy.

David L. Chisone

January 5, 2015

President of the University

Date

After approval by the President, a signed copy of the proposal should be transmitted to the Executive Director. Only after Executive Director review should the proposal be posted on the university web site and the Board staff and the other universities notified of the URL.

1. Do you have a major in this area? _____ Yes x No

2. If you do not have a major in this area, explain how the proposed minor relates to your mission.

South Dakota State University (SDSU) requests authorization to offer a baccalaureate minor in Meat Science. SDSU is designated as the land-grant university in the state of South Dakota with well-established programs in agriculture and animal sciences (BOR Policy 1:10:2). Meat science is a critical content area for the State with its strong agricultural focus.

Meat Science is an integral part of the Animal Science major, and meat processing is a critical component of the food animal industry. Thus, all students in an Animal Science major will continue to be required to complete at least one course in Meat Science. The minor allows a greater emphasis in this aspect of the food animal industry, providing more in-depth study in muscle biology, meat product development, food safety, and consumer issues from production to consumption of meat products.

3. How will the proposed minor benefit students?

With increasing global demand for high quality protein foods of animal origin, the job outlook for agricultural and food scientists is bright, with employment expected to grow 9% from 2012 to 2022 (Bureau of Labor Statistics, Occupational Outlook Handbook, 2014¹).

¹ <http://www.bls.gov/ooh/life-physical-and-social-science/agricultural-and-food-scientists.htm>

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The meat industry offers a wide range of career opportunities, which fit within the broader categories of agricultural and food scientists and food technologists. Everyone in the industry has a responsibility for food safety. There are ongoing efforts to develop new meat products and address consumer and producer questions. A minor in Meat Science will allow Animal Science majors to clearly identify their additional training and focus on meat science. Furthermore, students who pursue minors in both Meat Science and Food Safety would be highly competitive for careers in the meat industry.

A Meat Science minor will also be beneficial to students pursuing careers in other aspects of animal production. The ultimate goal of livestock production is animal protein for human consumption, or meat and meat products. Students completing a Meat Science minor will have demonstrated their understanding of how all aspects of livestock production affect the production of animal protein for human consumption. On a global basis, the demand for meat and meat products continues to grow and the broader understanding of meat and livestock production will be needed to develop sustainable systems, which meet a growing global demand.

Food Science majors focus on the science of production, processing, preservation, packaging and distribution of safe, wholesome and nutritious foods, and will benefit from the complementary courses in the Meat Science minor. The minor may also be of interest to Dairy Production majors. The Meat Science minor provides additional specialization applicable to a very large segment of the food industry, and will make these students highly competitive for positions in the meats processing industry. Students in the Agricultural Systems Technology major with a focus on processing will also benefit by clearly identifying the additional focus on meat science principles, which apply in the development of food processing systems.

An additional benefit is preparation for graduate school. There are many career opportunities that require advanced degrees focused on meat science and/or food safety, such as R & D positions, food safety managers, manufacturing or operations managers, and quality assurance technicians and managers. The American Meat Science website currently lists 18 positions from companies such as Smithfield-Farmland, Kraft Foods-Oscar Mayer, Cargill, and Perdue Foods. Whether Animal Science, Nutrition and Food Science, or Agricultural Systems Technology majors, the Meat Science minor will prepare students for graduate school and make them highly sought after graduate students across the country.

4. Provide estimated enrollments and completions in the table below and explain how the estimates were developed.

	Fiscal Years*			
	1st	2nd	3rd	4th
Estimates	FY 16	FY 17	FY 18	FY 19
Students in the minor (fall)	5	10	15	20
Completions by graduates	0	3	5	8

* Do not include current year.

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The AS 345 Value-Added Meat Products course is offered each spring, and currently averages an enrollment of 25 students, the majority of which are Animal Science majors. These students have already indicated additional interest in meat science, as this is not a mandatory course, but is one of many possible 300 and 400 level Animal Science courses. A reasonable estimate is that 20% of these students would pursue a minor in Meat Science.

The new minor is not expected to draw appreciable numbers of students away from existing minors. The existing Food Safety minor currently has 19 students, of which only one is an Animal Science major. The Food Safety minor attracts students primarily from Dairy Science and Food Science, whereas the Meat Science minor is expected to attract students primarily from Animal Science.

5. What is the rationale for the curriculum?

Based on input from professionals in meat and livestock industry companies such as Tyson Foods, Inc., Smithfield Foods, Merck Animal Health, Zoetis, Kraft Foods/Oscar Mayer, ConAgra Foods and others; along with input from colleagues at peer institutions, there is a growing demand for college graduates trained in meat science. Meat science is a field of study that combines aspects of animal science and food science. The evaluation of nutrition, genetics and management on the growth and development of animal tissues is combined with the postmortem conversion of muscle to meat, and then followed by further processing and product development to ultimately provide consumers with muscle food products that are nutritious and highly palatable and desirable. These basic principles are covered in Meat Science minor programs at Iowa State University and The Ohio State University. The curriculum outlined for the Meat Science minor at SDSU is similar to the programs at these institutions.

The curriculum outlined begins with an introduction to meat science principles and practical application (AS 241-241L), and is followed by a more in-depth look at specific attributes of meat products, combined with practical application in the development of value-added meat products (AS 345-345L.) Students have a choice of an intensive study of the physical and chemical components of meat and muscle biology (AS 451/551) or a solid foundation in food safety and application of Hazard Analysis of Critical Control Points (HACCP) in the meat industry (AS 350) for the third required classroom course. The AS 441/551 option provides a strong background for graduate study and/or careers in fresh meat quality, while the AS 350 course will be valuable in nearly all meat and food industry related careers. A required independent study (AS 492) or internship (AS 494) provides an emphasis on developing research skills or gaining industry experience.

In the electives, students may select groups of courses that provide further specialization in food safety, product development, or the fresh or processed meats industry.

6. Complete the tables below. Explain any exceptions to BOR policy being requested.

A. Distribution of Credit Hours

Meat Science	Credit Hours	Percent
Requirements in Minor	10-12	55% - 67%

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Electives in the Minor	6-8	33% - 45%
Total	18	100%

B. Required Courses in the Minor

Prefix	Number	Course Title	New*	Hours
AS	241-241L	Introduction to Meat Science and Lab	N	3
AS	345-345L	Value Added Meat Products and Lab	N	3
Choose one of the following:				
AS	350	Meat Product Safety and HACCP	N	3
AS	441-541	Advanced Meat Science	N	3
Choose one of the following:				
AS	491	Independent Study	N	1-2
AS	494	Internship	N	1-3
		Subtotal, required		10-12

* New: Y= yes, N = no.

C. Elective Courses in the Minor: List courses that may be taken as electives in the minor. Indicate any new courses to be added specifically for the minor.

Prefix	Number	Course Title	New*	Hours
AS	200	Introduction to Meat Judging	N	1-2
AS	285	Livestock Evaluation and Marketing	N	3
AS	400	Judging Team – Meats	N	1-2
AST	443-443L	Food Processing and Engineering Fundamentals and Lab	N	3
HMG	251	Foodservice Sanitation	N	1
MICR	311-311L	Food Microbiology and Lab	N	4
NFS	251	Food Safety and Technology	N	3
NFS	341-341L	Food Science and Lab	N	4
NFS	351-351L	Principles of Food Processing and Lab	N	3
NFS	360-360L	Food Chemistry and Lab	N	4
NFS	451-451L/ 551-551L	New Product Development and Lab	N	4

7. What outcomes will be expected for all students who complete the minor? How will these outcomes be achieved?

Graduates with a Meat Science Minor will be highly competitive candidates and have multiple opportunities for employment in positions directly or indirectly related to meat production or food processing. They will also be strong candidates for Masters' Degree programs focused on Meat Science. Below are student learning outcomes, followed by the list of course which address each outcome.

Students completing a Meat Science minor will:

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1. Describe the various aspects of the meat and livestock industries and how they interrelate and function, including knowledge of how pre-harvest factors impact food safety and product quality.
 - AS 241-241L Introduction to Meat Science and Lab
 - AS 345-345L Value Added Meat Products and Lab
 - AS 350 Meat Product Safety and HACCP
 - AS 441-541 Advanced Meat Science
 - AS 200 Introduction to Meat Judging
 - AS 285 Livestock Evaluation and Marketing
 - AS 400 Judging Team – Meats

2. Understand the global role of meat products in human health and nutrition and livestock production, and contribute to problem-solving food demands in the 21st century.
 - AS 241-241L Introduction to Meat Science and Lab
 - AS 345-345L Value Added Meat Products and Lab
 - AS 350 Meat Product Safety and HACCP
 - AS 441-541 Advanced Meat Science
 - AS 200 Introduction to Meat Judging
 - AS 285 Livestock Evaluation and Marketing
 - AS 400 Judging Team – Meats
 - NFS 341-341L Food Science and Lab

3. Apply knowledge of the basic physical and chemical components of meat and their influence on specific attributes of meat and meat products to development of new and improvement of existing meat products.
 - AS 345-345L Value Added Meat Products and Lab
 - AS 441-541 Advanced Meat Science
 - AST 443-443L Food Processing and Engineering Fundamentals and Lab
 - NFS 341-341L Food Science and Lab
 - NFS 351-351L Principles of Food Processing and Lab
 - NFS 360-360L Food Chemistry and Lab
 - NFS 451/551 New Product Development and Lab

4. Describe the scientific and technological procedures involved in the processing of meat animals and preservation of meat products.
 - AS 345-345L Value Added Meat Products and Lab
 - AS 441-541 Advanced Meat Science
 - AST 443-443L Food Processing and Engineering Fundamentals and Lab
 - NFS 351-351L Principles of Food Processing and Lab
 - NFS 360-360L Food Chemistry and Lab
 - NFS 451/551 New Product Development and Lab

5. Describe the food safety issues as related to the meat industry, and apply the principles of Hazard Analysis Critical Control Points.
 - AS 241-241L Introduction to Meat Science and Lab

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- AS 350 Meat Product Safety and HACCP
 - HMGT 251 Foodservice Sanitation
 - MICR 311-311L Food Microbiology and Lab
 - NFS 251 Food Safety and Technology
 - NFS 351-351L NFS 351-351L Principles of Food Processing and Lab
6. Recognize the role of today's consumer in the meat and livestock industries.
- AS 241-241L Introduction to Meat Science and Lab
 - AS 345-345L Value Added Meat Products and Lab
 - AS 350 Meat Product Safety and HACCP
 - AS 441-541 Advanced Meat Science
 - AS 200 Introduction to Meat Judging
 - AS 285 Livestock Evaluation and Marketing
 - AS 400 Judging Team – Meats
 - HMGT 251 Foodservice Sanitation
 - NFS 251 Food Safety and Technology
 - NFS 341-341L Food Science and Lab
 - NFS 351-351L Principles of Food Processing and Lab
 - NFS 451/551 New Product Development and Lab

Required courses AS 491 Independent Study and AS 494 Internship will include individual goals for each student which contribute to one or more of the learning outcomes outlined above.

8. What instructional technologies will be used to teach courses in the minor? *This refers to the instructional technologies used to teach the new courses in the minor and NOT the technology applications students are expected to learn.*

There are no new courses proposed for the minor.

9. Is the University is requesting authorization to provide the minor to students at an off-campus location or by distance delivery? If yes, explain. *If off-campus or distance delivery authorization is not requested, enter "None."*

None

10. Costs, Budget & Resources: Explain the amount and source(s) of any one-time and continuing investments in personnel, professional development, release time, instructional technology and software, other O&M, facilities, etc needed to implement the minor.

All courses are currently being taught. There will be a minimal investment in personnel time of current meat science faculty to explain the minor and its advantages to faculty advisors in Animal Science, Nutrition and Food Science and Ag Systems Technology.