

DAIRY SCIENCE, B.S.

OVERVIEW

Studying the biology and management of dairy cows can lead to improvements in dairy production, animal welfare, human nutrition, and environmental protections. Students in the dairy science major learn all of these principles while embracing innovation and technology to meet needs in the dairy industry. The Department of Animal and Dairy Sciences, home of the undergraduate program in dairy science, produces skilled leaders who address the challenges of animal health and welfare, land and water stewardship, precision livestock farming, food safety, and biomedical advancements.

A 10:1 student-faculty ratio and small classes allow for meaningful connections. Out-of-classroom learning opportunities, such as internships on farms or with agribusiness, give students the training they need for successful 21st-century careers. Students can also gain valuable experience in research labs or in the student-operated Dairy Cattle Center.

Students majoring in dairy science are working toward a variety of careers that require a strong background in animal biology including agribusiness, dairy farm management, technical services and consulting, research, and teaching. Students also prepare for veterinary medicine or graduate school.

Learn through hands-on, real-world experiences

UW–Madison has cows on campus. The Dairy Cattle Center is located near classrooms giving students access to cows during lab sessions. But dairy science isn't just about milking cows—it includes genetics, nutrition, lactation, and biological and digital technologies that are relevant to the dairy industry and beyond. Out-of-the-classroom experiences are the norm for dairy science students, with 100 percent of students completing an internship or field experience.

Field courses include dairy nutrition and dairy cattle judging. Lab courses cover dairy herd management, lactation, reproduction, and dairy cattle improvement. Students solve problems through field trips to working commercial dairy operations.

Build community and networks

Madison is an ideal location for the study of dairy science. It is a vibrant city—home to many large agribusinesses—that's also located close to dairy farms. Students volunteer in a variety of activities directed by the Badger Dairy Club (<https://win.wisc.edu/organization/badgerdairyclub/>). The largest effort is their work at the World Dairy Expo, an international dairy event held in Madison.

Customize a path of study

Dairy science students can customize their coursework to fit their career goals with a large variety of classes in the department. The major can be combined with other majors such as agricultural business management, genetics and genomics, life science communications, or agronomy. Students can also pursue Honors in Dairy Science.

Make a strong start

Students can take an introductory seminar course that helps them develop an individualized four-year course plan, learn about internships and job opportunities, and discuss leadership development opportunities.

Gain global perspective

Dairy science majors are encouraged to go on study abroad programs, where they can immerse themselves in research or field experiences. In recent years, a program to central Mexico has focused on global agricultural, rural development, and the relationship between the U.S. and Mexican dairy industries, and many students have completed a semester abroad in The Netherlands. Students can explore studying abroad as a Dairy Science major by utilizing the Dairy Science Major Advising Page. Students work with their advisor and the CALS study abroad office to identify appropriate programs.

HOW TO GET IN

To declare this major, students must be admitted to UW–Madison and the College of Agricultural and Life Sciences (CALS). For information about becoming a CALS first-year or transfer student, see Entering the College (<http://guide.wisc.edu/undergraduate/agricultural-life-sciences/#enteringthecollegertext>).

Students who attend Student Orientation, Advising, and Registration (SOAR) with the College of Agricultural and Life Sciences have the option to declare this major at SOAR. Students may otherwise declare after they have begun their undergraduate studies. For more information, contact the advisor listed in the Contact Box for the major.

REQUIREMENTS

UNIVERSITY GENERAL EDUCATION REQUIREMENTS

All undergraduate students at the University of Wisconsin–Madison are required to fulfill a minimum set of common university general education requirements to ensure that every graduate acquires the essential core of an undergraduate education. This core establishes a foundation for living a productive life, being a citizen of the world, appreciating aesthetic values, and engaging in lifelong learning in a continually changing world. Various schools and colleges will have requirements in addition to the requirements listed below. Consult your advisor for assistance, as needed. For additional information, see the university Undergraduate General Education Requirements (<http://guide.wisc.edu/undergraduate/#requirementsforundergraduatestudytext>) section of the *Guide*.

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|-------------------|--|
| General Education | <ul style="list-style-type: none"> • Breadth—Humanities/Literature/Arts: 6 credits • Breadth—Natural Science: 4 to 6 credits, consisting of one 4- or 5-credit course with a laboratory component; or two courses providing a total of 6 credits • Breadth—Social Studies: 3 credits • Communication Part A & Part B * • Ethnic Studies * • Quantitative Reasoning Part A & Part B * |
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* The mortarboard symbol appears before the title of any course that fulfills one of the Communication Part A or Part B, Ethnic Studies, or Quantitative Reasoning Part A or Part B requirements.

COLLEGE OF AGRICULTURAL AND LIFE SCIENCES REQUIREMENTS

In addition to the University General Education Requirements, all undergraduate students in CALS must satisfy a set of college and major requirements. Courses may not double count within university requirements (General Education and Breadth) or within college requirements (First-Year Seminar, International Studies, Science, and Capstone), but courses counted toward university requirements may also be used to satisfy a college and/or a major requirement; similarly, courses counted toward college requirements may also be used to satisfy a university and/or a major requirement.

COLLEGE REQUIREMENTS FOR ALL CALS B.S. DEGREE PROGRAMS

Code	Title	Credits
Quality of Work: Students must maintain a minimum cumulative grade point average of 2.000 to remain in good standing and be eligible for graduation.		
Residency: Students must complete 30 degree credits in residence at UW–Madison after earning 86 credits toward their undergraduate degree.		
First Year Seminar (http://guide.wisc.edu/undergraduate/agricultural-life-sciences/#CALSThirdYearSeminarCourses)		1
International Studies (http://guide.wisc.edu/undergraduate/agricultural-life-sciences/#CALSThirdYearSeminarCourses)		3
Physical Science Fundamentals		4-5
CHEM 103	General Chemistry I	
or CHEM 108	Chemistry in Our World	
or CHEM 109	Advanced General Chemistry	
Biological Science		5
Additional Science (Biological, Physical, or Natural)		3
Science Breadth (Biological, Physical, Natural, or Social)		3
CALS Capstone Learning Experience: included in the requirements for each CALS major (see "Major Requirements") (http://guide.wisc.edu/undergraduate/agricultural-life-sciences/#CALSCapstoneRequirement)		

MAJOR REQUIREMENTS

Code	Title	Credits
Mathematics and Statistics		
Select one of the following (or may be satisfied by placement exam):		3-5
MATH 112	Algebra	
MATH 114	Algebra and Trigonometry	
MATH 171	Calculus with Algebra and Trigonometry I	
Select one of the following:		3
STAT 301	Introduction to Statistical Methods	
or STAT 371	Introductory Applied Statistics for the Life Sciences	
Chemistry		

Select one of the following: 4-5

CHEM 103 & CHEM 104	General Chemistry I and General Chemistry II
CHEM 109	Advanced General Chemistry

Biology

Select one of the following options: 9-10

Option 1:

ZOOLOGY/ BIOLOGY 101	Animal Biology
ZOOLOGY/ BIOLOGY 102	Animal Biology Laboratory
AGRONOMY 100	Principles and Practices in Crop Production

Option 2:

ZOOLOGY/ BIOLOGY 101	Animal Biology
ZOOLOGY/ BIOLOGY 102	Animal Biology Laboratory
BOTANY/ BIOLOGY 130	General Botany

Option 3:

BIOLOGY/ BOTANY/ ZOOLOGY 151	Introductory Biology
BIOLOGY/ BOTANY/ ZOOLOGY 152	Introductory Biology

Select one of the following: 3

GENETICS 466	Principles of Genetics
CHEM 341	Elementary Organic Chemistry
CHEM 343	Organic Chemistry I
MICROBIO 101	General Microbiology
MICROBIO 303	Biology of Microorganisms
M M & I 341	Immunology

Biochemistry

Select one of the following: 3-6

BIOCHEM 301	Survey of Biochemistry
BIOCHEM 501	Introduction to Biochemistry
BIOCHEM 507 & BIOCHEM 508	General Biochemistry I and General Biochemistry II

Economics

Select one of the following: 4

A A E 215	Introduction to Agricultural and Applied Economics
ECON 101	Principles of Microeconomics

Dairy Science Core

AN SCI/DY SCI 101	Introduction to Animal Sciences	3
AN SCI/DY SCI 102	Introduction to Animal Sciences Laboratory	1
DY SCI 233	Dairy Herd Management I	3
DY SCI 234	Dairy Herd Management II	3
AN SCI/DY SCI/ NUTR SCI 311	Comparative Animal Nutrition	3
AN SCI/DY SCI 361	Introduction to Animal and Veterinary Genetics	2

AN SCI/DY SCI 362 or AN SCI/DY SCI 363	Veterinary Genetics Principles of Animal Breeding	2
AN SCI/DY SCI 373	Animal Physiology	3
DY SCI 378	Lactation Physiology	3
AN SCI/DY SCI 414	Ruminant Nutrition & Metabolism	3
AN SCI/DY SCI 434	Reproductive Physiology	3
Capstone		
DY SCI 399	Coordinative Internship/ Cooperative Education	1-8
DY SCI 535	Dairy Farm Management Practicum	3
Dairy Science Electives		
Select at least 3 credits from:		3
AN SCI 135	Grand Challenges and Career Opportunities in Animal and Dairy Sciences	
DY SCI 205	Dairy Cattle Improvement Programs	
DY SCI 289	Honors Independent Study ¹	
DY SCI 299	Independent Study ¹	
DY SCI/ AN SCI 370	Livestock Production and Health in Agricultural Development	
DY SCI 375	Special Topics ¹	
DY SCI/ AGRONOMY 471	Food Production Systems and Sustainability	
DY SCI/AN SCI/ FOOD SCI/ SOIL SCI 472	Animal Agriculture and Global Sustainable Development	
DY SCI/AN SCI/ FOOD SCI/ SOIL SCI 473	International Field Study in Animal Agriculture and Sustainable Development	
DY SCI 534	Reproductive Management of Dairy Cattle	
DY SCI 681	Senior Honors Thesis ¹	
DY SCI 682	Senior Honors Thesis ¹	
DY SCI 699	Special Problems ¹	
Total Credits		65-79

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Consult with your advisor for details.

UNIVERSITY DEGREE REQUIREMENTS

Total Degree To receive a bachelor's degree from UW–Madison, students must earn a minimum of 120 degree credits. The requirements for some programs may exceed 120 degree credits. Students should consult with their college or department advisor for information on specific credit requirements.

Residency Degree candidates are required to earn a minimum of 30 credits in residence at UW–Madison. "In residence" means on the UW–Madison campus with an undergraduate degree classification. "In residence" credit also includes UW–Madison courses offered in distance or online formats and credits earned in UW–Madison Study Abroad/Study Away programs.

Quality of Work Undergraduate students must maintain the minimum grade point average specified by the school, college, or academic program to remain in good academic standing. Students whose academic performance drops below these minimum thresholds will be placed on academic probation.

LEARNING OUTCOMES

1. Gain knowledge of current and emerging research based information in animal biology and management sciences to support dairy production.
2. Gain intellectual, practical and attitudinal skills needed to identify and solve problems and challenges facing dairy producers and allied industries.
3. Gain in life-long learning skills to enable graduates to adapt to changing technological, economic and social circumstances throughout their professional career.

FOUR-YEAR PLAN

FOUR-YEAR PLAN SAMPLE DAIRY SCIENCE FOUR-YEAR PLAN

Freshman

Fall	Credits	Spring	Credits
AGRONOMY 100	4	A A E 215	4
DY SCI/AN SCI 101	3	CHEM 103	4
AN SCI/DY SCI 102	1	DY SCI 205	2
AN SCI 135	1	COMM B Course	3
MATH 112	3	Elective	3
COMM A Course	3		
15		16	

Total Credits 31

Sophomore

Fall	Credits	Spring	Credits
CHEM 104	5	DY SCI 234	3
DY SCI 233	3	DY SCI/AN SCI/ FOOD SCI/ SOIL SCI 472 ¹	1
STAT 371	3	BIOLOGY/ ZOOLOGY 101	3
Ethnic Studies	3	BIOLOGY/ ZOOLOGY 102	2
		BIOCHEM 301	3
		Elective	3
14		15	

Total Credits 29

Junior

Fall	Credits	Spring	Credits
DY SCI/AN SCI 370	3	DY SCI/AN SCI/ NUTR SCI 311	3
DY SCI 378	3	DY SCI/AN SCI 361	2

DY SCI 399	1-6 DY SCI/AN SCI 362 or 363	2
Genetics prereq core	3 DY SCI/AN SCI 373	3
Social Science (or Humanities)	3 DY SCI/ AGRONOMY 471 (or elective course)	3
	Humanities	3
13-18		16

Total Credits 29-34

Senior

Fall	Credits	Spring	Credits
DY SCI/AN SCI 414		3 DY SCI 534	3
DY SCI/AN SCI 434		3 Elective Courses	9
DY SCI 535		3 Humanities (or Social Science)	3
Elective Courses	6		
15		15	

Total Credits 30

SAMPLE DAIRY SCIENCE FOUR-YEAR PLAN—PRE-VETERINARY

Freshman

Fall	Credits	Spring	Credits
CHEM 103		4 A A E 215	4
DY SCI/AN SCI 101		3 CHEM 104	5
AN SCI/DY SCI 102		1 DY SCI 205	2
AN SCI 135		1 Ethnic Studies (or Comm A)	3
MATH 221	5		
COMM A Course (or Ethnic Studies)	3		
17		14	

Total Credits 31

Sophomore

Fall	Credits	Spring	Credits
BIOLOGY/BOTANY/ ZOOLOGY 151		5 DY SCI 234	3
DY SCI 233		3 DY SCI/AN SCI/ FOOD SCI/ SOIL SCI 472 ¹	1
STAT 371		3 BIOLOGY/BOTANY/ ZOOLOGY 152	5
DY SCI/AN SCI 370		3 Humanities	3
		Social Science	3
14		15	

Total Credits 29

Junior

Fall	Credits	Spring	Credits
CHEM 343		3 DY SCI/AN SCI/ NUTR SCI 311	3
DY SCI 378		3 DY SCI/AN SCI 373	3
GENETICS 466		3 BIOCHEM 501	3

DY SCI 399	1-6 DY SCI/AN SCI 361	2
Elective	3 DY SCI/AN SCI 362 or 363	2
	Elective (undergraduate research recommended)	3
13-18		16

Total Credits 29-34

Senior

Fall	Credits	Spring	Credits
DY SCI/AN SCI 414		3 DY SCI 534	3
DY SCI/AN SCI 434		3 PHYSICS 104	4
DY SCI 535		3 DY SCI/AN SCI 320	3
PHYSICS 103		4 DY SCI 699 (or elective)	1-3
DY SCI 699 (or elective)		1-3 Elective	3
14-16		14-16	

Total Credits 28-32

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Students are encouraged to apply for DY SCI/AN SCI/FOOD SCI/ SOIL SCI 473, a summer study abroad experience associated with this course.

ADVISING AND CAREERS

Advising

Each dairy science student receives one-on-one guidance from their academic advisor. Academic advisors will help students build an individualized, four-year plan. Students are encouraged to take part in research experiences and internships.

Career Opportunities

As students find their career interests, faculty working in those fields serve as career advisors to help students make progress toward their goals.

Undergraduates in dairy science prepare for a variety of career opportunities. Science-related career opportunities include research, quality control, communications, patent law, pharmaceuticals, food testing, and human nutrition. Animal agriculture career opportunities include veterinary medicine, animal nutrition and consulting, dairy genetics, herd management, information technology, and business.

Dairy science graduates are in high demand by employers and receive job offers with competitive salaries.

PEOPLE

ANIMAL AND DAIRY SCIENCES DEPARTMENT

Professors

Weigel, Kent (Chair)
Khatib, Hasan (Associate Chair)
Adcock, Sarah
Arriola Apelo, Sebastian
Cabrera, Victor
Claus, Jim

Crenshaw, Thomas
 Dorea, Joao
 Ferraretto, Luiz
 Fricke, Paul
 Guo, Wei
 Hernandez, Laura
 Kirkpatrick, Brian
 Laporta, Jimena
 Leone, Vanessa
 Mantovani, Hilario
 Ortega, Sofia
 Parrish, John
 Peñagaricano, Francisco
 Reed, Jess
 Richards, Mark
 Ricke, Steve
 Rosa, Guilherme
 Shanmuganayagam, Dhanansayan (Dhanu)
 Sindelar, Jeffrey
 Van Os, Jennifer
 Wattiaux, Michel
 White, Heather
 Wiltbank, Milo

Instructors/Lecturers

Halbach, Theodore
 Kean, Ron
 O'Rourke, Bernadette
 Ronk, Eric

Advisor

Sandberg, Liv

Link to: <https://andysci.wisc.edu/about-us/faculty-and-staff/>

WISCONSIN EXPERIENCE

Internships

In the dairy science program, 100 percent of students complete an internship or field experience. The department offers an internship course under the guidance of a faculty or staff member.

UW–Madison's proximity to farms, agribusinesses, and events—such as World Dairy Expo—provide undergraduates with unique networking experiences and valuable hands-on learning.

Research experience

More than half of the students complete a research project under mentorship from a faculty member. Dairy science researchers are internationally recognized specialists in nutrition, genetics, lactation, reproduction, animal welfare, herd management, and more. Students can take on research projects with faculty members for either course credit or pay, depending on the opportunity.

Student organizations

The Badger Dairy Club (<https://win.wisc.edu/organization/badgerdairyclub/>) is a large, motivated student organization on campus with more than 75 members of various majors who share a passion for the dairy industry. Students are involved in dairy industry events that provide leadership and networking opportunities. Highlights of the club's activities include work at the World Dairy Expo, hosting the Badger Invitational Sale, volunteering at the Wisconsin 4-H Dairy Bowl and FFA Dairy Judging Contests, and club trips.

There are other opportunities for students to get involved in agriculture-related organizations on campus such as Collegiate FFA (<http://collegiateffamadison.weebly.com/>), Association of Women in Agriculture (<http://awamadison.org/>), Babcock House (<https://win.wisc.edu/organization/babcockhouse/>), and Alpha Gamma Rho (<https://win.wisc.edu/organization/agr/>).

Competitive teams

Students can join competitive teams that take part in Intercollegiate Dairy Judging (<https://andysci.wisc.edu/uw-madison-dairy-judging/>), the North American Intercollegiate Dairy Challenge (<https://andysci.wisc.edu/national-north-american-intercollegiate-dairy-challenge/>), and the Animal Welfare Assessment Contest (<https://www.awjac.org/#YPcEjUxOnct>).

Global engagement

Dairy science students are encouraged to study abroad; the department offers globally focused courses that look at livestock production, health, animal agriculture, and sustainable development, including a summer field study program focused on animal agriculture. Students can find more information on the International Academic Programs website (<https://www.studyabroad.wisc.edu/>) and the CALS study abroad advising page (<https://cals.wisc.edu/academics/undergraduate-students/international-programs/study-abroad-advising/>).

In addition to study abroad programs, the dairy science major offers several courses that cover animal systems and their improvement in developing countries, the world role of U.S. animal agriculture, and food production related to human and environmental health, land use, and social justice.

Community engagement and volunteering

Students volunteer at a number of activities directed by the Badger Dairy Club. The largest effort is their work at the World Dairy Expo, an international dairy event held in Madison. There students have the unique opportunity to be directly involved in the event working behind the scenes before, during, and after the show.

On campus, the Morgridge Center for Public Service (<https://morgridge.wisc.edu/>) provides resources to help students connect with volunteer opportunities based on their interests and goals.

RESOURCES AND SCHOLARSHIPS

RESOURCES AND SCHOLARSHIPS

The department offers more than 30 scholarships and awards more than \$170,000 annually.

Students across the College of Agricultural and Life Sciences receive more than \$1.25 million in scholarships annually. Learn more about college scholarships here (<https://cals.wisc.edu/academics/undergraduate-students/financing-your-education/cals-scholarships/>).

UW–Madison has specialized facilities offering students hands-on dairy science experiences, including:

- The Dairy Cattle Center is home to more than 80 dairy cows on campus in a tie-stall barn.

- A network of off-campus Agricultural Research Stations (<https://ars.wisc.edu/>) serve as living laboratories for dairy research to enhance research taking place on campus.
- The Babcock Dairy Plant is a fully operational dairy plant with a retail store selling dairy products. Students can find part-time work and experience in a wide range of dairy processing jobs.