Dairy Science, Ph.D.

Training for the Ph.D. degree prepares the candidate for a career of university teaching, research, and extension; for research in industrial or government laboratories; or for technical service in industry. The department office maintains specific information concerning career placements.

The greatest share of Ph.D. training will be achieved through selection and pursuit of a research project in a phase of dairy science in which the student has a strong interest. Students exercise individual initiative in the planning and execution of research projects. Because of the long-term nature of large-animal research, every effort is made to start students on research problems early in their graduate careers.

A minor in dairy science is available to doctoral students majoring in other departments. The information and required forms can be found on this website (https://dysci.wisc.edu/dairy-science-certification-forms). Contact the department for specific requirements or questions.

The Department of Dairy Science offers one of the most comprehensive dairy science graduate programs in the country. Faculty interests and research funding in dairy science span diverse areas of focus. Fundamental training in basic science fields related to these phases of dairy science is required. Minimum admissions requirements of the Graduate School must be met. Specific degree requirements are available from the department.

There are six program areas for prospective applicants to review and choose from—see website (https://dysci.wisc.edu/prospective-students/graduate).

Students are offered a challenging research and educational opportunity in well-equipped laboratories with modern instrumentation. Students in dairy cattle nutrition may work in collaboration with laboratories of the U.S. Dairy Forage Research Center as well as those of the dairy science department. Dairy cattle at four locations are maintained by the department for both intensive and extensive experimental work.

Research is directed toward gaining greater understanding of the biology of dairy species with emphasis on dairy cattle, and improving usefulness of these species to society by modifying milk composition, improving animal health, assessing environmental impact, and enhancing economic efficiency. Current research emphases include developing and using molecular markers and genome maps to improve accuracy of selection and speed the rate of genetic improvement; developing and applying statistical methods for estimating genetic merit of individual animals and genetic parameters of populations from performance records; studying digestive and metabolic processes in lactating ruminants to improve production efficiency and health; enhancing utilization of forage nutrients by high-producing cows through modifications of the forage plants, harvesting and storage methods, and supplemental ration ingredients; development of reproduction management programs that optimize facility and profitability of dairy farms; understanding regulation of ovarian function and the regulation of fertility in lactating dairy cows; and organizational systems that contribute to profitable dairy enterprises in a changing dairy economy; management factors affecting animal health and well-being.

About one-half of the department graduate students are domestic students, with two-thirds of those students Wisconsin residents, one-third out-of-state students, and one-half of the graduate students are international students. This diversity brings a national and global perspective to research, instruction, extension, and cultural understanding.

Admissions

Master’s degrees in biology, biochemistry, or genetics, as well as dairy or animal science, provide excellent background for doctoral study in dairy science. Regardless of major, preparation should include biology (molecular, cellular, and population), physiology, chemistry (general and organic), mathematics (through calculus), and physics. Typically, students admitted to the doctoral program have a GPA of 3.2 or higher. Candidates without a master’s degree can be considered under special circumstances.

Documents Required By Our Department:

1. Personal statement/reasons for graduate study: see website. (https://grad.wisc.edu/prospective/prepare/statement)
2. Three letters of recommendation. The process for letter of recommendation is explained on this website. (https://grad.wisc.edu/admissions/faq/#rec) Letters should be from faculty who are familiar with your academic abilities and goals. Letters from supervisors that provide a character reference are also acceptable. The letters of recommendation should be submitted with the online application.
3. Official transcripts or academic records from each institution attended. These can be scanned and included with the electronic application. Original official transcripts will be required by the Graduate School if a department recommends applicant for admission.

The Graduate School Checklist tells you what you must include in your electronic application: see website. (https://grad.wisc.edu/admissions/process)

International students should apply as early as possible. If you are recommended for admission and admitted, extra time will be needed to process visa documents.

Faculty Review of Completed Applications:

Most applicants have contacted departmental faculty directly with respect to an interest in their area of research. This means that a faculty member may be aware of an applicant’s name and background prior to reviewing a completed application for Graduate School. It is recommended that applicants contact the faculty member(s) with the area(s) of research that interests them and that they wish to pursue.

If a faculty member is interested in a completed application, the applicant will be contacted by them personally. If a faculty member is interested in accepting an applicant, a recommendation for admission will be sent to the Graduate School. The Graduate School will make the final determination for admission.

Our graduate faculty have approximately two weeks prior to the start of the semester to recommend domestic students and approximately six weeks prior to the start of the semester to recommend international students.
GRADUATE SCHOOL ADMISSIONS
Graduate admissions is a two-step process between academic degree programs and the Graduate School. Applicants must meet requirements of both the program(s) and the Graduate School. Once you have researched the graduate program(s) you are interested in, apply online (https://grad.wisc.edu/admissions).

FUNDING
Resources to help you afford graduate study might include assistantships, fellowships, traineeships, and financial aid. Further funding information (https://grad.wisc.edu/funding) is available from the Graduate School. Be sure to check with your program for individual policies and processes related to funding.

PROGRAM RESOURCES
Research assistantships are awarded to well-qualified students on a competitive basis. Around 70 percent of M.S. and Ph.D. candidates in dairy science are supported by research assistantships. Funding does not come from the department, but from the faculty member agreeing to advise the new student. Therefore, a student joins a lab directly instead of doing rotations. Funding is awarded on a competitive basis and may be renewed annually pending satisfactory progress. Terms of these appointments are defined in the letter of offer to the student.

REQUIREMENTS
Review the Graduate School minimum academic progress and degree requirements (http://guide.wisc.edu/graduate/#policiesandrequirementstext), in addition to the program requirements listed below.

MINIMUM GRADUATE SCHOOL REQUIREMENTS
MODE OF INSTRUCTION
Face to Face Evening/Weekend Online Hybrid Accelerated
Yes No No No No

Mode of Instruction Definitions
Evening/Weekend: These programs are offered in an evening and/or weekend format to accommodate working schedules. Enjoy the advantages of on-campus courses and personal connections, while keeping your day job. For more information about the meeting schedule of a specific program, contact the program.
Online: These programs are offered primarily online. Many available online programs can be completed almost entirely online with all online programs offering at least 50 percent or more of the program work online. Some online programs have an on-campus component that is often designed to accommodate working schedules. Take advantage of the convenience of online learning while participating in a rich, interactive learning environment. For more information about the online nature of a specific program, contact the program.
Hybrid: These programs have innovative curricula that combine on-campus and online formats. Most hybrid programs are completed on-campus with a partial or completely online semester. For more information about the hybrid schedule of a specific program, contact the program.

CURRICULAR REQUIREMENTS
Minimum Credit Requirement
Minimum Residence Credit Requirement
Minimum Graduate Coursework Requirement
Half of degree coursework (26 credits out of 51 total credits) must be completed graduate-level coursework; courses with the Graduate Level Coursework attribute are identified and searchable in the university's Course Guide.
Overall Graduate GPA Requirement
3.00 GPA required.
Other Grade Requirements
No other specific grade requirements.
Assessments and Examinations
Schedule preliminary examination and file request for preliminary examination (by end of fourth semester).
Complete written preliminary examination; complete oral preliminary examination (by end of fifth semester). If passed, warrant should be signed and returned to the Graduate School. Student will be a dissertator.
Complete research and thesis. Regular meetings with the committee are expected. Request for final examination (includes documentation that exam requirements have been met). Final defense and examination.

Language Requirements
No language requirements.
Doctoral Minor/ Breadth Requirements
All doctoral students are required to complete a minor.

REQUIRED COURSES
Code Title Credits
DY SCI 900 Seminar (Every graduate student in the department is required to take this course every spring.) 1
Biochemistry course (must require Organic Chemistry as a prerequisite)
Statistics course
Dairy or Animal Science Courses
One course (at least 2 credits, grade of B or better) in each of the following:
Animal Genetics
Ruminant or Animal Nutrition
Animal Physiology
Dairy Cattle Management
There are no other specific courses required. Depending on which of the six program areas of research is involved, the doctoral graduate student and their mentor committee decide on a plan of study to be completed during the research program. All selected courses must be agreed upon by the student’s graduate committee members and approved by department certification committee. There are forms developed by the department certification committee that provide written guidelines and must be processed in a timely manner for Ph.D. students in the dairy science program, https://dysci.wisc.edu/dairy-science-certification-forms/. All submitted forms are reviewed by the certification committee chairperson.

### Special Skills
- Complete a course in two of the following three areas:
  - Educational Principles (DY SCI 799 or other approved course)
  - Technical Writing course or Writing Practicum
  - Advanced course in Philosophy of Science, History of Science, or Ethics of Science

### POLICIES

#### GRADUATE SCHOOL POLICIES

The Graduate School’s Academic Policies and Procedures (https://grad.wisc.edu/acadpolicy) provide essential information regarding general university policies. Program authority to set degree policies beyond the minimum required by the Graduate School lies with the degree program faculty. Policies set by the academic degree program can be found below.

#### MAJOR-SPECIFIC POLICIES

### GRADUATE PROGRAM HANDBOOK


### PRIOR COURSEWORK

**Graduate Work from Other Institutions**

The department may decide to accept coursework completed outside of the student’s graduate career at UW-Madison when those courses are rigorous and meet the expectations of a graduate work for the degree. Coursework earned five or more years prior to admission to a master’s degree or coursework earned ten or more years prior to admission to a doctoral degree is not allowed to satisfy requirements.

**UW–Madison Undergraduate**

For well-prepared advanced students, the department may decide to accept up to 7 credits, numbered 300 or above, completed at UW-Madison toward fulfillment of minimum degree credit requirements. These credits would not be allowed to count toward the 50% graduate coursework minimum unless taken at the 700 level or above.

**UW–Madison University Special**

Courses taken post-B.S. as a University Special student do not automatically count toward a graduate degree. A maximum of 15 credits may be allowed for courses numbered 300 or above as fulfillment of the minimum graduate residence credits. UW-Madison coursework taken as a University Special Student would not be allowed to count toward the 50% graduate coursework minimum unless taken at the 700 level or above.

If Special student credits are applied toward a UW-Madison graduate degree, it will be required to pay the difference between the cost of the Special student credits and graduate credits.

### PROBATION

In compliance with Graduate School policy, listed below, and at discretion of Ph.D. committee.

- If students were admitted on probation and they satisfy the conditions outlined at the time of admission, probationary status will be removed automatically. Once their studies have begun, students are expected to make satisfactory progress toward their degree.
- Students must be in good academic standing with the Graduate School, their program, and their advisor. The Graduate School regularly reviews the record of any student who received grades of BC, C, D, F, or I in graduate-level courses (300 or above), or grades of U in research and thesis. This review could result in academic probation with a hold on future enrollment, and the student may be suspended from graduate studies.

The Graduate School may also put students on probation for incompletes not cleared within one term. All incomplete grades must be resolved before a degree is granted.

### ADVISOR / COMMITTEE

To complete the Ph.D. degree in the Department of Dairy Science, successful completion of the following items is required. These must be completed in a timely fashion or the student will not be allowed to continue registration. Please note that minimum requirements are provided, however successful completion of the Ph.D. requires achievement of the standing of demonstrated scientist, through your Ph.D. program and by making a significant research contribution to the scientific literature.

- Form a Ph.D. mentor and examination committee (by end of first semester).
- Meet with the Ph.D. committee. Develop and approve a plan of coursework consistent with approved research plans (by end of second semester).

### CREDITS PER TERM ALLOWED

15 credits

### TIME CONSTRAINTS

Form a Ph.D. mentor and examination committee by end of first semester.

Meet with the Ph.D. committee. Approve coursework and immediate research plans by end of second semester.

Schedule preliminary examination and file request for preliminary examination by end of fourth semester.

Complete written preliminary examination; complete oral preliminary examination by end of fifth semester.
A candidate for a doctoral degree who fails to take the final oral examination and deposit the dissertation within five years after passing the preliminary examination may be required to take another preliminary examination and to be admitted to candidacy a second time.

Doctoral degree students who have been absent for ten or more consecutive years lose all credits that they have earned before their absence. Individual programs may count the coursework students completed prior to their absence for meeting program requirements; that coursework may not count toward Graduate School credit requirements.

OTHER

The Department of Dairy Science has a rolling admission policy. Campus visits are recommended along with direct departmental faculty contacts. Funding may be available for a research assistant position from a faculty member if an applicant meets their research requirements. No applicant can be seriously considered until they have submitted an application to the UW-Madison Graduate School with the supporting documentation.

PROFESSIONAL DEVELOPMENT

GRADUATE SCHOOL RESOURCES

Take advantage of the Graduate School’s professional development resources (https://grad.wisc.edu/pd) to build skills, thrive academically, and launch your career.

LEARNING OUTCOMES

1. Understand and summarize ideas and concepts, into a coherent biological model, research problem(s), and research project that will go beyond the current boundaries of knowledge within Dairy Science.

2. Create research and scholarship that makes a substantive contribution to the field of Dairy Science.

3. Orally communicate complex ideas in a clear and understandable manner in a scientific, classroom, and/or industry setting.

4. Statistically analyze data, summarize the results in tables and/or graphs, and provide valid interpretation of the results.

5. Communicate in accurate written English and in the format of a scientific journal, complex ideas and research results.

6. Foster ethical and professional conduct and have knowledge in a broad range of areas that are important for their professional development.

PEOPLE

Faculty: Professors Weigel (chair), Combs, Fricke, Jones, Ruegg, Shaver, Wattiaux, Wiltbank; Associate Professors Cabrera, Hernandez; Assistant Professors White, Arriola Apelo; Affiliate Professors Cook, Dopfer, Kirkpatrick, Oetzel, Ollivett, Reed, Reinemann, Suen