

DAIRY SCIENCE, PHD

The Animal and Dairy Sciences Department offers one of the most comprehensive animal and dairy science graduate programs in the country. Faculty interests and research funding span diverse areas of focus with emphases ranging from *in vivo* and *in vitro* studies that probe biological relationships at a fundamental mechanistic level, to using bioinformatics and data analytics to study fundamental biology and development of decision support tools for dairy farm management. The common thread through these varied interests is the motivation to address current practical issues in animal agriculture.

Development of an individual course of study is flexible to meet the needs of students with varied interests. Fundamental training in basic science fields related to the area of interest is required. There are nine program areas for prospective applicants to review and choose from – see website (<https://andysci.wisc.edu/>). Minimum admissions requirements of the Graduate School must be met. Specific degree requirements are available from the department.

Graduate students in the department are a mix of domestic students from within and outside of Wisconsin, and international students from multiple countries. This diversity brings a national and global perspective to research, instruction, extension, and cultural understanding. Graduates find employment in academic teaching and research, in professional veterinary or medical degree programs, in industrial research in the food and feed industries, in laboratory research programs with governmental and international agencies, private corporations, and in industrial or institutional management positions requiring a high level of scientific training.

The greatest share of PhD training will be achieved through selection and pursuit of a research project in a discipline of animal and dairy sciences in which the student has a strong interest. Students exercise individual initiative in the planning and execution of research projects. Every effort is made to start students on research problems early in their graduate careers.

RESEARCH FOCUS AREAS

Students may choose to focus on the areas of nutrition, rumen microbiology, reproductive physiology– endocrinology, lactational physiology, genetics, animal breeding, animal behavior, muscle biology, meat science, cell biology, animal health, immunity and toxicology, international agriculture or precision agriculture. Considerable opportunity for study exists in joint programs with bacteriology, toxicology, biochemistry, the interdepartmental graduate program in nutritional sciences, genetics, endocrinology, reproductive physiology training program, food science, physiology, agricultural and applied economics, biometry, cellular and molecular biology, pharmaceutical sciences, chemical and biological engineering, bio-engineering, comparative biosciences, and anatomy.

ADMISSIONS

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Please consult the table below for key information about this degree program's admissions requirements. The program may have more detailed

admissions requirements, which can be found below the table or on the program's website.

Graduate admissions is a two-step process between academic programs and the Graduate School. **Applicants must meet the minimum requirements (<https://grad.wisc.edu/apply/requirements/>) of the Graduate School as well as the program(s).** Once you have researched the graduate program(s) you are interested in, apply online (<https://grad.wisc.edu/apply/>).

Requirements	Detail
Fall Deadline	May 1 for international applicants; August 1 for domestic applicants
Spring Deadline	October 1 for international applicants; December 1 for domestic applicants
Summer Deadline	March 1 for international applicants; May 1 for domestic applicants
GRE (Graduate Record Examinations)	Not required but may be considered if available.
English Proficiency Test	Every applicant whose native language is not English, or whose undergraduate instruction was not exclusively in English, must provide an English proficiency test score earned within two years of the anticipated term of enrollment. Refer to the Graduate School: Minimum Requirements for Admission policy: https://policy.wisc.edu/library/UW-1241 (https://policy.wisc.edu/library/UW-1241/).
Other Test(s) (e.g., GMAT, MCAT)	n/a
Letters of Recommendation Required	3

Students with satisfactory undergraduate or graduate training in any biological science including emphasis on basic science courses will have suitable backgrounds for graduate studies in Dairy Science. Typically, students admitted to the program have GPAs of 3.2 or higher. Candidates with a lower GPA may be considered for admission under special circumstances.

REQUIRED DOCUMENTS

1. Personal statement/reasons for graduate study: see website. (<https://grad.wisc.edu/prospective/prepare/statement/>)
2. Three letters of recommendation. The process for letters of recommendation is explained on this website (<https://grad.wisc.edu/apply/#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. Transcripts or academic records from each institution attended. These need to be scanned and uploaded with the electronic application. Original official transcripts will be required by the Graduate School if a department recommends an applicant for admission.

The Graduate School Checklist outlines 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

It is recommended that applicants contact departmental faculty directly to determine openings in the lab and an interest in their area of research. Students are admitted to the program if a faculty member agrees to accept the candidate into their research group and to provide laboratory/desk space and research support, and upon the approval of the Graduate School. The faculty member also decides whether to offer an assistantship to the candidate. 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. Graduate faculty can recommend domestic applicants up until two weeks prior to the start of the semester and recommend international applications up until 11 weeks prior to the start of the semester.

FUNDING

FUNDING

GRADUATE SCHOOL RESOURCES

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 restrictions related to funding.

PROGRAM RESOURCES

Financial assistance may be available to qualified individuals in the form of research assistantships, teaching assistantships, or fellowships. Funding does not come from the department, but from the faculty member agreeing to advise the new student. Therefore, students join labs 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

MINIMUM GRADUATE SCHOOL REQUIREMENTS

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

MAJOR REQUIREMENTS

MODE OF INSTRUCTION

Face to Face	Evening/ Weekend	Online	Hybrid	Accelerated
Yes	No	No	No	No

Mode of Instruction Definitions

Accelerated: Accelerated programs are offered at a fast pace that condenses the time to completion. Students typically take enough credits aimed at completing the program in a year or two.

Evening/Weekend: Courses meet on the UW-Madison campus only in evenings and/or on weekends to accommodate typical business schedules. Students have the advantages of face-to-face courses with the flexibility to keep work and other life commitments.

Face-to-Face: Courses typically meet during weekdays on the UW-Madison Campus.

Hybrid: These programs combine face-to-face and online learning formats. Contact the program for more specific information.

Online: These programs are offered 100% online. Some programs may require an on-campus orientation or residency experience, but the courses will be facilitated in an online format.

CURRICULAR REQUIREMENTS

Requirement Detail

Minimum
Credit
Requirement

Minimum
Residence
Credit
Requirement

Minimum
Graduate
Coursework
Requirement

26 credits must be graduate-level coursework. Refer to the Graduate School: Minimum Graduate Coursework (50%) Requirement policy: <https://policy.wisc.edu/library/UW-1244> (<https://policy.wisc.edu/library/UW-1244/>).

Courses must be agreed upon by the student's graduate committee members and approved by Director of Graduate Study.

Overall
Graduate
GPA
Requirement

3.00 GPA required. Refer to the Graduate School: Grade Point Average (GPA) Requirement policy: <https://policy.wisc.edu/library/UW-1203> (<https://policy.wisc.edu/library/UW-1203/>).

Other Grade
Requirements

n/a

Assessments and Examinations Schedule preliminary examination and file request with the Graduate Program Manager at least four weeks prior to the exam date 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. The student must submit a request for final examination (including documentation that exam requirements have been met) to the Graduate Program Manager at least four weeks prior to the exam date. The thesis must be submitted to the committee at least two weeks prior to the exam.

The candidate is required to present an exit seminar on their dissertation research and to subsequently defend the thesis orally. The thesis must be acceptable from both scientific and literary standpoints. The committee administers the thesis defense. Deposit of the doctoral dissertation to the Graduate School is required.

Language Requirements Language requirements are determined on an individual basis with the major professor and will depend on the area of concentration within the department.

Graduate School Breadth Requirement All doctoral students are required to complete a doctoral minor or graduate/professional certificate. Refer to the Graduate School: Breadth Requirement in Doctoral Training policy: <https://policy.wisc.edu/library/UW-1200> (<https://policy.wisc.edu/library/UW-1200/>).

REQUIRED COURSES

Seminar Requirement

The animal and dairy sciences graduate seminar DY SCI 900 features outside speakers, UW faculty, and graduate students in the department presenting their research or defending their thesis. This course is offered during the fall and spring semesters. Attendance is required at this seminar series by all dairy science graduate students. PhD students are required to register for the seminar for credit twice. Although attendance is required, registering for the seminar for credit is done the semester a student presents.

Research Requirement

Minimum of 12 credits of research (AN SCI 990).

Teaching Requirement

All students in the Dairy Science PhD program are required to complete a teaching practicum, usually DY SCI 799. Each student is expected to work with their faculty advisor to identify an opportunity within the department for the student to engage in teaching. This requirement is broadly defined and could include assisting an animal and dairy sciences faculty member with classroom teaching or acting as a teaching assistant in a course outside of the department.

Technical Writing Requirement

All students in the Dairy Science PhD program are required to complete a technical writing course, usually LSC 560.

Enrollment Requirement

The program requires all funded students to be enrolled full time. For PhD students this means at least 8 credits in the fall and spring term and at least 2 credits in the summer term. Students funded by another program should check with the payroll and benefits coordinator of that department to learn their requirements for enrollment. Unfunded students should follow the Graduate School's rules on enrollment (<https://grad.wisc.edu/documents/enrollment-requirements/>).

The remainder of the course requirements for the PhD in Dairy Science will be selected to meet the student's specific needs and to ensure breadth and depth as determined through consultation with their major professor and members of their committee.

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

PRIOR COURSEWORK

Graduate Credits Earned at Other Institutions

Refer to the Graduate School: Transfer Credits for Prior Coursework (<https://policy.wisc.edu/library/UW-1216/>) policy.

Undergraduate Credits Earned at Other Institutions or UW-Madison

Refer to the Graduate School: Transfer Credits for Prior Coursework (<https://policy.wisc.edu/library/UW-1216/>) policy.

Credits Earned as a Professional Student at UW-Madison (Law, Medicine, Pharmacy, and Veterinary careers)

Refer to the Graduate School: Transfer Credits for Prior Coursework (<https://policy.wisc.edu/library/UW-1216/>) policy.

Credits Earned as a University Special student at UW-Madison

Refer to the Graduate School: Transfer Credits for Prior Coursework (<https://policy.wisc.edu/library/UW-1216/>) policy.

PROBATION

In compliance with Graduate School policy, listed below, and at discretion of PhD 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 (courses numbered 300 or above with the "Grad 50%" attribute), 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

All Dairy Science PhD students are admitted to this degree program by their major professor. Following matriculation, the student and major professor determine membership for their PhD Mentor and Preliminary Examination Committee. A minimum of four faculty members are required for the PhD Mentor and Preliminary Examination Committee. At least three of the committee members must be faculty in the Department of Animal and Dairy Sciences. One faculty member on the committee must be from outside of the Department of Animal and Dairy Sciences.

The graduate student formally requests the participation of the faculty on the committee. The student, major professor, and the Director of Graduate Studies must approve of all members on this committee. Once the committee signs the PhD mentor and preliminary examination committee form, the student must turn in the signed copy to the Graduate Program Manager for review. The Graduate Program Manager will submit the form for review and approval by the Director of Graduate Studies. Changes to a PhD Committee must be submitted in writing to the Graduate Program Manager for approval by the Director of Graduate Studies. Students should meet with their committee at least once per year.

Students must meet with their PhD Mentor and Preliminary Examination Committee during their first year to complete their plan of study form (<https://andysci.wisc.edu/wp-content/uploads/sites/263/2020/10/Fillable-PhD-requirements-for-Dept-of-Animal-and-Dairy-Sciences.pdf>). Courses taken prior to entering the Dairy Science program may be considered as a substitute if approved by the student's PhD Mentor and Preliminary Examination Committee. Once the committee has approved the Plan of Study paperwork, the student must turn in the signed copy to the Graduate Program Manager for review. The Graduate Program Manager will submit the form for review and approval by the Director of Graduate Studies. The plan of study paperwork must be approved before a student can request their preliminary warrant. Any changes to the certification paperwork must be communicated to the Graduate Program Manager and approved by the Director of Graduate Studies.

CREDITS PER TERM ALLOWED

15 credits

TIME LIMITS

To complete the PhD degree in 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 register. Please note that minimum requirements are provided, however successful completion of the PhD degree requires achievement of the standing of demonstrated scientist, through your PhD program and by making a significant research contribution to the scientific literature.

- Select Graduate Program, form a PhD Mentor and Examination Committee (by end of 2nd semester).
- Meet with your PhD Committee. Approve coursework and immediate research plans (by end of 2nd Semester)
- Schedule preliminary examination and file request for preliminary examination (by end of 4th semester).

- Complete written preliminary examination, complete oral preliminary examination (by end of 5th semester).
 - If passed, warrant should be signed and returned to Graduate School. You will be a dissertator.
- Complete research and thesis. Regular meetings with your committee are expected.
- Request for final examination (includes documentation that exam requirements have been met).
- Successfully complete final defense and examination.

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.

Refer to the Graduate School: Time Limits (<https://policy.wisc.edu/library/UW-1221/>) policy.

GRIEVANCES AND APPEALS

These resources may be helpful in addressing your concerns:

- Bias or Hate Reporting (<https://doso.students.wisc.edu/bias-or-hate-reporting/>)
- Graduate Assistantship Policies and Procedures (<https://hr.wisc.edu/policies/gapp/#grievance-procedure>)
- Hostile and Intimidating Behavior Policies and Procedures (<https://hr.wisc.edu/hib/>)
 - Office of the Provost for Faculty and Staff Affairs (<https://facstaff.provost.wisc.edu/>)
- Dean of Students Office (<https://doso.students.wisc.edu/>) (for all students to seek grievance assistance and support)
- Employee Assistance (<http://www.eao.wisc.edu/>) (for personal counseling and workplace consultation around communication and conflict involving graduate assistants and other employees, post-doctoral students, faculty and staff)
- Employee Disability Resource Office (<https://employee disabilities.wisc.edu/>) (for qualified employees or applicants with disabilities to have equal employment opportunities)
- Graduate School (<https://grad.wisc.edu/>) (for informal advice at any level of review and for official appeals of program/departmental or school/college grievance decisions)
- Office of Compliance (<https://compliance.wisc.edu/>) (for class harassment and discrimination, including sexual harassment and sexual violence)
- Office of Student Conduct and Community Standards (<https://conduct.students.wisc.edu/>) (for conflicts involving students)
- Ombuds Office for Faculty and Staff (<http://www.ombuds.wisc.edu/>) (for employed graduate students and post-docs, as well as faculty and staff)
- Title IX (<https://compliance.wisc.edu/titleix/>) (for concerns about discrimination)

College of Agricultural and Life Sciences: Grievance Policy

In the College of Agricultural and Life Sciences (CALS), any student who feels unfairly treated by a member of the CALS faculty or staff has the right to complain about the treatment and to receive a prompt hearing. Some complaints may arise from misunderstandings or communication

breakdowns and be easily resolved; others may require formal action. Complaints may concern any matter of perceived unfairness.

To ensure a prompt and fair hearing of any complaint, and to protect the rights of both the person complaining and the person at whom the complaint is directed, the following procedures are used in the College of Agricultural and Life Sciences. Any student, undergraduate or graduate, may use these procedures, except employees whose complaints are covered under other campus policies.

1. The student should first talk with the person at whom the complaint is directed. Most issues can be settled at this level. Others may be resolved by established departmental procedures.
2. If the student is unsatisfied, and the complaint involves any unit outside CALS, the student should seek the advice of the dean or director of that unit to determine how to proceed.
 - a. If the complaint involves an academic department in CALS the student should proceed in accordance with item 3 below.
 - b. If the grievance involves a unit in CALS that is not an academic department, the student should proceed in accordance with item 4 below.
3. The student should contact the department's grievance advisor within 120 calendar days of the alleged unfair treatment. The departmental administrator can provide this person's name. The grievance advisor will attempt to resolve the problem informally within 10 working days of receiving the complaint, in discussions with the student and the person at whom the complaint is directed.
 - a. If informal mediation fails, the student can submit the grievance in writing to the grievance advisor within 10 working days of the date the student is informed of the failure of the mediation attempt by the grievance advisor. The grievance advisor will provide a copy to the person at whom the grievance is directed.
 - b. The grievance advisor will refer the complaint to a department committee that will obtain a written response from the person at whom the complaint is directed, providing a copy to the student. Either party may request a hearing before the committee. The grievance advisor will provide both parties a written decision within 20 working days from the date of receipt of the written complaint.
 - c. If the grievance involves the department chairperson, the grievance advisor or a member of the grievance committee, these persons may not participate in the review.
 - d. If not satisfied with departmental action, either party has 10 working days from the date of notification of the departmental committee action to file a written appeal to the CALS Equity and Diversity Committee. A subcommittee of this committee will make a preliminary judgement as to whether the case merits further investigation and review. If the subcommittee unanimously determines that the case does not merit further investigation and review, its decision is final. If one or more members of the subcommittee determine that the case does merit further investigation and review, the subcommittee will investigate and seek to resolve the dispute through mediation. If this mediation attempt fails, the subcommittee will bring the case to the full committee. The committee may seek additional information from the parties or hold a hearing. The committee will present a written recommendation to the dean who will provide a final decision within 20 working days of receipt of the committee recommendation.
4. If the alleged unfair treatment occurs in a CALS unit that is not an academic department, the student should, within 120 calendar days of the alleged incident, take his/her grievance directly to the Associate

Dean of Academic Affairs. The dean will attempt to resolve the problem informally within 10 working days of receiving the complaint. If this mediation attempt does not succeed the student may file a written complaint with the dean who will refer it to the CALS Equity and Diversity Committee. The committee will seek a written response from the person at whom the complaint is directed, subsequently following other steps delineated in item 3d above.

OTHER

The Dairy Science program has a rolling admission policy. Campus visits are recommended along with direct program faculty contact. Funding may be available for a research assistant position from a faculty member if an applicant meets the faculty's research requirements. No applicant will be seriously considered until the applicant has submitted a complete application to the UW-Madison Graduate School with the supporting documentation.

PROFESSIONAL DEVELOPMENT

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.

PROGRAM RESOURCES

The Animal and Dairy Sciences graduate programs encourage students to develop Individual Development Plans (<https://grad.wisc.edu/pd/idp/>) in collaboration with their major advisor to facilitate professional development. Besides the extensive opportunities offered across the campus at large, students in the Animal and Dairy Sciences program also benefit from activities and programs provided by the Animal Science Graduate Student Association (ASGSA), a student-led organization for graduate students at UW-Madison who are interested in animal and dairy-related science.

LEARNING OUTCOMES

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

PEOPLE

ANIMAL AND DAIRY SCIENCES DEPARTMENT

Professors

Weigel (Chair), Khatib (Associate Chair), Cabrera, Claus, Crenshaw, Fricke, Kirkpatrick, Richards, Ricke, Rosa, Sindelar, Wattiaux, Wiltbank

Associate Professors

Hernandez, Gragg, White

Assistant Professors

Adcock, Arriola Apelo, Dorea, Ferraretto, Guo, Laporta, Leone, Mantovani, Ortega, Peñagaricano, Rostoll-Cangiano, Van Os

Instructors/Lecturers

Halbach, Kean, O'Rourke, Ronk, Williams

Student Services Coordinator

Liv Sandberg

Graduate Program Manager

Megan Sippel