

DAIRY SCIENCE, MS

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 probing biological relationships at a fundamental mechanistic level, to bioinformatics and data analytics studying 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.

Two paths are available for graduate work leading to the Master of Science degree in Dairy Science. Students who plan to continue for the PhD degree, or who expect to enter fields of work involving research, should take the MS degree with a path in research. Students who wish to obtain more specialized training, but are not planning for a research career, may pursue a degree strictly through course work.

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

ADMISSIONS

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 a GPA of 3.2 or higher. Candidates with a lower GPA may be considered under special circumstances.

DOCUMENTS REQUIRED BY THE PROGRAM

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/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. 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 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 directly 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 30 credits
Credit Requirement

Minimum 16 credits
Residence Credit Requirement

Minimum 15 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 MS-course pathway: Complete coursework and review of literature (documentation of completion is required before MS defense) and final defense and examination.

MS-research pathway: Complete coursework and MS research (documentation of completion is required before MS defense) and final defense and examination.

Note: These pathways are internal to the program and represent different paths a student can follow to earn this degree. Pathway names do not appear in the Graduate School admissions application, and they will not appear on the transcript.

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.

REQUIRED COURSES

Students work with their committee to design a program of coursework that best meets the individual student's needs and interests. The resulting program of coursework must satisfy the departmental requirements as well as the requirements specified by the Graduate School.

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. Master's degree students are required to register for the seminar for credit once. Although attendance is required, registering for the seminar for credit is done the semester a student presents.

Enrollment Requirement

The program requires all funded students to be enrolled full time. For MS 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/>).

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

A minimum of 16 graduate credits must be taken while a graduate student at UW-Madison.

Undergraduate Credits Earned at Other Institutions or UW-Madison

No credits from a UW-Madison undergraduate degree may count toward the MS degree.

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

Courses taken post-BS as a University Special student do not automatically transfer toward a graduate degree. A maximum of 15 credits may be allowed for courses numbered 300 or above.

PROBATION

Refer to the Graduate School: Probation (<https://policy.wisc.edu/library/UW-1217/>) policy.

ADVISOR / COMMITTEE

Students are admitted to this degree program by their major professor. Following enrollment, the student and major professor determine members for their Mentor and Examination Committee. The committee consists of a minimum of three faculty members. At least two of the committee members must be tenure-track faculty in the Department of Animal and Dairy Sciences. The other committee member can be another faculty member from within or outside of the department or other scientist, as approved by the Research and Graduate Education Committee.

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 Mentor and 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 Mentor and Examination 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 Mentor and Examination Committee to plan their graduate curriculum and research program. During the first semester the student submits their Plan of Study (<https://andysci.wisc.edu/wp-content/uploads/sites/263/2020/10/Fillable-PDF-MS-Requirements-for-degree-in-research-ADS.pdf>) form to the Graduate Program Manager to obtain departmental approval from the Director of Graduate Studies.

The final thesis exam involves an oral defense of the research topic and general knowledge of animal nutrition, endocrinology & reproductive physiology, genetics and animal breeding, or meat science and muscle biology. All degree candidates must complete a satisfactory thesis. Instructions on preparing a master's thesis can be found on the UW Graduate School website (<https://grad.wisc.edu/current-students/masters-guide/>).

At the completion of the degree program, the candidate will take a final examination administered by the mentor and examination committee. The examination will be oral and includes questions relating to the candidate's graduate course program. The candidate will also be expected to defend the thesis.

CREDITS PER TERM ALLOWED

15 credits

TIME LIMITS

Completing the MS degree in the Dairy Science at the University of Wisconsin-Madison requires successful completion of the following items. These must be completed in a timely fashion, or the student will not be allowed to continue registration. Working closely with your advisor and

committee is essential for the successful completion of an MS. Please note that minimum requirements are provided; however, successful completion of the MS degree also requires making a research contribution to the scientific literature.

- Select the graduate program and form a MS mentor committee (by the end of 1st semester).
- Meet with your MS committee and approve the Plan of Study (<https://andysci.wisc.edu/wp-content/uploads/sites/263/2020/10/Fillable-PDF-MS-Requirements-for-degree-in-research-ADS.pdf>) (by the end of 2nd Semester)
- Complete coursework and MS research (documentation of completion is required before MS defense)
- Final defense and examination.

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/>)
- 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://employeeabilities.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 Student Assistance and Support (OSAS) (<https://osas.wisc.edu/>) (for all students to seek grievance assistance and support)
- 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 member's research requirements. No applicant will be seriously considered until they have 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 and Dairy Sciences Graduate Student Association (ASGSA), a student-led organization for graduate students at UW-Madison who are interested in animal and dairy-related sciences.

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