DAIRY SCIENCE, M.S.

Two plans are available for graduate work leading to the Master of Science degree in Dairy Science. Students who plan to continue for the Ph.D. degree, or who expect to enter fields of work involving research, should take the M.S. degree with a track 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.

The department 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 US 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; improving forage quality; managing animal health and well-being; conducting metabolic and digestive processes in lactating ruminants; enhancing energy efficiency; studying digestive and metabolic processes in lactating ruminants; 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; studying digestive and metabolic processes in lactating ruminants; and developing and evaluating milking, feeding, record-keeping, and decision 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

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/).

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall Deadline</td>
<td>August 1</td>
</tr>
<tr>
<td>Spring Deadline</td>
<td>December 1</td>
</tr>
<tr>
<td>Summer Deadline</td>
<td>May 1</td>
</tr>
<tr>
<td>GRE (Graduate Record Examinations)</td>
<td>Not required but may be considered if available.</td>
</tr>
<tr>
<td>English Proficiency Test</td>
<td>Every applicant whose native language is not English or whose undergraduate instruction was not in English must provide an English proficiency test score and meet the Graduate School minimum requirements (<a href="https://grad.wisc.edu/apply/requirements/#english-proficiency">https://grad.wisc.edu/apply/requirements/#english-proficiency</a>).</td>
</tr>
<tr>
<td>Other Test(s) (e.g., GMAT, MCAT)</td>
<td>n/a</td>
</tr>
<tr>
<td>Letters of Recommendation Required</td>
<td>3</td>
</tr>
</tbody>
</table>

Undergraduate majors in biology, biochemistry, or genetics, as well as dairy or animal science, provide excellent background for graduate 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 program have a GPA of 3.2 or higher. Candidates with a lower GPA can 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. 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 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.

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.

**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**

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**

**MINIMUM GRADUATE SCHOOL 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.

**MAJOR REQUIREMENTS**

**MODE OF INSTRUCTION**

<table>
<thead>
<tr>
<th>Face to Face</th>
<th>Evening/Weekend</th>
<th>Online</th>
<th>Hybrid</th>
<th>Accelerated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Mode of Instruction Definitions

- **Accelerated**: Accelerated programs are offered at a fast pace that condenses the time to completion. Students are able to complete a program with minimal disruptions to careers and other commitments.
- **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.

**CURRICULAR REQUIREMENTS**

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Detail</th>
</tr>
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<tbody>
<tr>
<td>Minimum Credit Requirement</td>
<td>30 credits</td>
</tr>
<tr>
<td>Minimum Residence Credit Requirement</td>
<td>16 credits</td>
</tr>
<tr>
<td>Minimum Graduate Coursework Requirement</td>
<td>Half of degree coursework (15 credits out of 30 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 (<a href="https://registrar.wisc.edu/course-guide/">https://registrar.wisc.edu/course-guide/</a>).</td>
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</table>

Overall Graduate GPA Requirement: 3.00 GPA required.

Other Grade Requirements: No other specific grade requirements.

Assessments and Examinations:
- M.S.—course track: Complete coursework and review of literature (documentation of completion is required before M.S. defense) and final defense and examination.
- M.S.—research track: Complete coursework and M.S. research (documentation of completion is required before M.S. defense) and final defense and examination.

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

Language Requirements: No language requirements.

**REQUIRED COURSES**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>DY SCI 900</td>
<td>Seminar (Every graduate student in the department is required to take this course every spring.)</td>
<td>1</td>
</tr>
</tbody>
</table>

Biochemistry Course

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
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 Work from Other Institutions
A minimum of 16 graduate credits must be taken while a graduate student at UW–Madison.

UW–Madison Undergraduate
No credits from a UW–Madison undergraduate degree may count toward the M.S. degree.

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 if difference in tuition is paid.

PROBATION
In compliance with Graduate School policy, listed below, and at discretion of M.S. 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

The Dairy Science program offers six different program areas for potential graduate students: https://dysci.wisc.edu/prospective-students/graduate/. The focus of research or coursework varies from student to student and is dependent on the agreement of the student’s graduate committee. All M.S. students have guidelines to be completed prior to or during study as detailed in the Master’s Certification forms https://dysci.wisc.edu/dairy-science-certification-forms/. These areas include:

- Forming a mentor committee (by end of the first semester) for either M.S. plan:
  - M.S.–course track requirements
  - M.S.–research track requirements

Successful completion of the following items. 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 M.S. degree also requires making a research contribution to the scientific literature.

- Meet with the M.S. committee. Approve plan for coursework and review of literature and determine immediate research plans (by end of second semester)
  - With the mentor committee, form a plan of coursework (by end of the second semester) including:
    - Biochemistry
    - Statistics (300 level or above)
  - Dairy or Animal Science Courses:
    - Genetics (300 level or above, at least 2 credits with grade of B or better)
    - Nutrition (300 level or above, at least 2 credits with grade of B or better)
    - Physiology (300 level or above, at least 2 credits with grade of B or better)
    - Management (300 level or above, at least 2 credits with grade of B or better)

CREDITS PER TERM ALLOWED
15 credits

TIME CONSTRAINTS

Form an M.S. mentor committee by end of first semester.

Meet with M.S. committee to approve plan for coursework and review of literature by end of second semester.

Master’s degree students who have been absent for five 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.

GRIEVANCES AND APPEALS

These resources may be helpful in addressing your concerns:

- Bias or Hate Reporting (https://dosoo.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://dosoo.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://employeedisabilities.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 complaints involving students)
• Ombuds Office for Faculty and Staff (http://www.ombuds.wisc.edu/) (for complaints concerning employee issues)
• 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 to 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.

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 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

ANIMAL AND DAIRY SCIENCES
DEPARTMENT

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

Associate Professors
Hernandez, White

Assistant Professors
Adcock, Arriola Apelo, Dorea, Ferraretto, Guo, Laporta, Leone, Peñagaricano, Shanmuganayagam, Van Os

Instructors/Lecturers
Halbach, Kean, O’Rourke, Ronk, Williams

Student Services Coordinator
Liv Sandberg

Graduate Coordinator
Theresa Pillar