

UNIVERSITY OF WISCONSIN-MADISON



Graduate Academic Policies And Procedures Handbook

Dairy Science

2017

Created 01/2017
Approved 03/31/2017

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DAIRY SCIENCE RESEARCH AND GRADUATE TRAINING OVERVIEW

The research programs within the Department of Dairy Science are focused on the biology of the dairy cow and applying that biological knowledge to practical management strategies for commercial dairy farms. Thus, our research is focused on supporting and driving innovation within the dairy industry. A major strength of our program is the clear focus that all of our programs and faculty have on the dairy cow and the dairy industry. All 12 faculty in our department have research as a portion of their appointment. The faculty with instructional appointments (eight faculty) primarily drive the basic and discovery research within the department. The six faculty with extension appointments (Kent Weigel has instructional, extension, and research responsibilities) primarily drive the application of the basic knowledge to the practical commercial dairy farm level. However due to the integration and focus of the department on the dairy cow, all faculty have some components of discovery and practical application within their individual research programs. Each individual researcher competes for resources for their specific laboratory, such as funding, herd usage, and personnel, and each has been highly successful in driving innovation and research publications within their discipline area. In addition, our faculty is excellent at collaborations and therefore some of our largest grants and some of our most highly cited research publications have multiple faculty, commonly from different disciplines (genetics-nutrition, nutrition-physiology etc), that are key drivers of the collaborative efforts.

Along with driving knowledge and innovation within the dairy industry, our research programs are focused on training graduate students in specific disciplines of dairy science. We continue to have 30-40 graduate students within our department each year. Essentially all of these students are on research fellowships that are based on funding obtained by individual faculty members. About half of our graduate students will obtain a Master's degree and about half of our students will complete a Ph.D. program. These two groups of students take many of the same classes, are integrated within the same laboratory programs, and are involved within all of the graduate activities of the department. Our department is dependent upon other departments for many of the courses that are taken by our graduate students including statistics, biochemistry, and advanced disciplinary courses. Our nutrition group has an exceptional course in Ruminant Nutritional Physiology, a two semester series that delivers the latest information on all aspects of nutritional physiology, from world experts on each topic, in a systematic fashion to our graduate students. Many of our faculty members (David Combs, Laura Hernandez, and Heather White) are also part of the Interdepartmental Graduate Program in Nutritional Sciences (IGPNS). This program provides many of the disciplinary courses and graduate interactions that are essential for our graduate students. Some of our faculty (Paul Fricke, Laura Hernandez, Milo Wiltbank) and many of our physiology graduate students are involved with the Endocrinology-Reproductive Physiology Program (ERPP). Our faculty members teach in graduate courses in ERPP (Laura Hernandez – Lactation in Pregnancy, Parturition, and Lactation; Milo Wiltbank – Endocrine Physiology, Pregnancy). In addition, the disciplines of nutrition, genetics, and physiology also have comprehensive graduate seminars (DS/AS departments) that keep graduate students abreast of the latest publications and developments within their discipline.

The students that complete an M.S. degree within our department are mainly focused on completing the required courses and completing a very specific research project. The majority of our M.S. students complete an M.S. in research and all of the requirements are specifically delineated in our M.S. Certification form*. Students can also obtain an M.S. in course which has a separate M.S. Certification form* but this is less common for our department at this time. Most of the students that complete their graduate training with an M.S. in the Department of Dairy Science obtain a position as a professional within the dairy industry. Some of our M.S. students continue into a Ph.D. program.

Students that graduate with a Ph.D. from the Department of Dairy Science go on to many different types of positions. Most of our Ph.D. students already have completed an M.S. degree prior to starting the Ph.D. degree, however it is possible to do a direct-admit Ph.D. program in certain cases. The current time from beginning of the Ph.D. program until completion of the Ph.D. averages 4.7 years. All of the requirements and schedules for obtaining the Ph.D. degree are clearly delineated in the Ph.D. Certification Form*.

The basic, discovery research within the Department of Dairy Science is primarily focused on understanding the intriguing biology of the high-producing lactating dairy cow. This research has been funded primarily by research grants from the U.S. Department of Agriculture (USDA), although grants from NIH have also been obtained by Dairy Science faculty. The applied research within the Department of Dairy Science is driven by a desire to provide practical, economical, humane, and scientifically-evaluated solutions for commercial dairy farms. Since six of our faculty members have extension appointments and all of our faculty are closely involved with the dairy industry and with extension personnel, the research solutions that are discovered within our department are very rapidly translated into field application. Funding for these programs come from internal sources, such as the Hatch Formula Grant funds from CALS, from private companies, and from external sources, particularly USDA. Thus, our integration of practical and discovery research programs continue to be a major strength of the Department of Dairy Science.

*See Appendix for all 3 certification forms

GENERAL DAIRY SCIENCE DEGREE INFORMATION

The Department of Dairy Science offers six different program areas for potential graduate students: Dairy Farm Management, Dairy Genetics, Dairy Nutrition, Milk Quality, Lactation Physiology, and Reproductive Physiology. We currently rank first nationally among all Dairy Science and animal biology programs according to the Academic Analytics Faculty Scholarly Productivity index. The department accepts new students in all three semesters (rolling admissions).

Dairy Farm Management

Faculty: Dr. Victor Cabrera, Dr. Bruce Jones

The graduate program in dairy cattle farm management gives students the foundation, the knowledge, and the skills to manage a dairy farm as a successful business enterprise. It involves understanding and mastering the integrated impact of critical farm management areas such as young stock rearing, nutrition and feeding, reproduction performance, production control, replacement decisions, genetic evaluations, health assessment and control, well-being and welfare advancement, economic and financial strength and environmental stewardship with the main purpose to promote world-class dairy farm milk production with a competitive advantage. Core courses are practical in nature focusing on developing “troubleshooting” abilities to analyze, detect and improve the overall performance of dairy farm operations. Students are expected to become data oriented systematic decision-makers with the use and development of computer applications and highly acquainted with diverse dairy farm production systems such as those highly technical, those with very low resource input and everything in between. Therefore, the program combines classroom instruction with hands-on experience, which is completed at the state-of-the-art UW dairy herd facilities and many other commercial dairy farms across Wisconsin – the state with the largest and most diverse dairy farm industry in the US.

Typically, M.S. level graduates find employment as educators with cooperative extension or technical colleges as well as representatives in research and sales at dairy farm provider companies in the areas of nutrition, breeding, pharmaceutical, machinery and construction. Students at the PhD level normally build their careers in academia (research, extension, and/or extension faculty at universities) in the allied industry (research and/or outreach) and private or public consulting.

Dairy Genetics

Faculty: Dr. Kent Weigel

The graduate program in animal genetics is interdepartmental, and students pursuing a M.S. or PhD in Dairy Science with emphasis in animal genetics work closely with faculty, graduate students, and post-doctoral research associates in Dairy Science. The primary research focus at present is genomic selection, with students working on topics such as: methods for prediction of breeding values using single nucleotide polymorphism (SNP) markers, assessing the relationship between genomic predictions and future progeny performance, prediction of future phenotypes using genomic data

and health history information, controlling inbreeding in modern breeding programs, development of cost-effective genotyping strategies, use of statistical models and machine learning algorithms to identify superior breeding stock, and the discovery and characterization of specific genes with large effects using genome-wide association studies. Strategies for using genetic and genomic information to improve traits such as fertility, calving ability, early postpartum health and feed utilization efficiency are a major emphasis. Students are expected to have a working knowledge of animal nutrition, reproductive biology and dairy management from their undergraduate studies. At the graduate level they will take courses in statistical methods, experimental design, molecular and quantitative genetics, computer science and bioinformatics.

Graduates at the M.S. level typically pursue employment with dairy cattle breeding companies, many of which have their domestic or global headquarters in Wisconsin, and graduates at the PhD level pursue research-based positions in academic institutions, government laboratories or private industry.

Dairy Nutrition

Faculty: Dr. David Combs, Dr. Randy Shaver, Dr. Michel Wattiaux, Dr. Heather White

The nutrition graduate program within the Department of Dairy Science is an internationally renowned group with research addressing questions spanning from applied to basic. Students pursuing a M.S. or Ph.D. in Dairy Science with emphasis in nutrition work in a shared laboratory space that fosters a collaborative training environment with other graduate students, post-doctoral research associates, and faculty. Research focus varies by faculty within the nutrition group and include forage quality and processing, starch utilization, fiber digestion, NDF analysis and modeling, lipid metabolism, milk fat depression, dietary nitrogen use efficiency, protein metabolism, amino acid balancing, byproducts and additives, methane emission and the linkages between nutrition and environmental impacts, hepatic metabolism, and metabolic disorders. Research within the nutrition group is highly collaborative and integral and involves collaboration with other disciplines within the Department of Dairy Science, researchers in other departments at the University of Wisconsin focusing on aspects of dairy production (Agricultural Engineering, Food Science, etc.), as well as other research groups worldwide. Opportunities for joint graduate training programs through the Department of Dairy Science and the US Dairy Forage Research Center (USDFRC), University of Wisconsin School of Veterinary Medicine, and the Interdepartmental Graduate Program in Nutritional Sciences (IGPNS) are available.

Graduates at the M.S. level typically pursue employment in industry with positions including field nutritionists, technical support, and laboratory technicians and graduates at the PhD level pursue research-based positions in academic institutions, government laboratories, or private industry.

Milk Quality

Faculty: Dr. Pamela Ruegg

The graduate program in Milk Quality is focused on the application of epidemiologic and laboratory techniques to solving practical problems that influence pre-harvest milk quality and safety on dairy farms. An integrated approach to prevention and treatment of mastitis is emphasized with the ultimate goal of improving the wellbeing of dairy cows by reducing the occurrence of mastitis, making appropriate treatment decisions when mastitis does occur and ensuring that milk meets quality standards of the global dairy market. A dynamic group of graduate students work on projects that encompass all of these focus areas. Research on how to prevent mastitis is currently directed at understanding the impact of exposure to a diversity of microorganisms that are found in the cows housing environment and in understanding how to maximize the use of new milking technologies. The appropriate usage of antimicrobials for treatment of clinical mastitis is a research priority and emphasis is placed on differentiation between cases that require antimicrobial treatment versus cases that spontaneously cure as a result of the inflammatory process. Our goal is to reduce antimicrobial usage by ensuring that antimicrobials are used only on cases that will benefit and when used, are used for an appropriate duration. As part of this goal we are working to improve the understanding and differentiation between inflammation and active infection. We are currently working to improve the understanding of the clinical importance of the microbiome of inflamed mammary gland quarters. Most of the research in milk quality is applied and involves the cooperation of commercial dairy farms.

In addition to departmental requirements, graduate students in milk quality typically take course in epidemiology, immunology, microbiology and molecular techniques. Students who complete masters degrees usually work in the dairy industry with pharmaceutical, nutritional or milking equipment companies while students who complete the Ph.D. are qualified to apply for academic positions or research careers with major companies.

Lactation Physiology

Faculty: Dr. Laura Hernandez

The graduate program in lactation physiology is focused on how the mammary gland utilizes nutrients to assemble milk. Additionally, it is focused on how hormones and growth factors made within the mammary gland coordinate maternal metabolism. Students in this area of research utilize multiple mammalian models (bovine, rodent, human, in vitro culture) to examine the ability of the mammary gland to function at capacity during lactation and in order for the mother to maintain adequate health status during this challenging physiological event. Furthermore, a combination of molecular and cellular biological techniques and models with applied research are to understand the ability of the mammary gland to function during lactation. Graduate students in this program are able to participate in joint graduate training programs through the Endocrine and Reproductive Physiology (ERP) and Interdepartmental Graduate Training Program in Nutritional Sciences (IGPNS).

Students completing the M.S. program in lactation physiology are able to obtain jobs as laboratory research associates, or technical support positions in the industry. Students completing a Ph.D. in the area of Lactation Physiology pursue careers research based positions at academic institutions, government agencies and private industry.

Reproductive Physiology

Faculty: Dr. Paul Fricke, Dr. Milo Wiltbank

The graduate program in reproductive physiology is focused on understanding the physiology underlying the many reproductive problems presented by modern dairy cattle and mitigating those problems through development of improved reproductive management strategies. Thus the graduate program spans basic as well as applied areas of reproduction, endocrine physiology, interactions between nutrition and reproduction, and development of hormonal synchronization protocols to improve reproductive performance. The reproduction group includes Drs. Wiltbank and Fricke who have independent laboratories but collaborate on a variety of research projects and work together to train graduate students. Dr. Wiltbank works in basic and applied areas focused on improving fertility in dairy cattle and understanding mechanisms underlying reproductive processes. Dr. Fricke works in more applied areas of reproduction to understand physiology and develop strategies for practical use to improve reproduction in dairy cattle. Graduate students in this program are able to earn their degree through Dairy Science or the Endocrinology-Reproductive Physiology (ERP) program.

Students completing the M.S. program in reproductive physiology are qualified to compete for jobs in the dairy industry including AI (artificial insemination) organizations, nutrition companies, and county extension agents. Students completing a Ph.D. in the area of reproductive physiology are qualified to pursue careers in research, teaching, or extension at academic institutions, government agencies, and private industry.

Interdepartmental Collaboration

Collaboration within the department and across the University allows for a wide range of individualized inter-disciplinary research. 12 faculty members and 8 affiliate faculty can mentor M.S., PhD and postdoctoral students in their laboratories. Faculty members' research and graduate training are funded by a wide variety of sources: NIH, NSF, USDA, state, non-profit foundations, and private/corporate grants.

The emphasis is on cutting edge research and students receive training in advanced scientific methodology and are often involved in the development of new technologies. Students may choose to do research ranging from applications of basic science relative to animal or human health to the application of developing technology for solving problems in animal breeding or production systems.

In addition to research, our students receive didactic academic training relative to their field of interest via advanced level courses taught in the Department of Dairy Science and by other departments in a number of schools and colleges across the UW Madison Campus.

Endocrinology & Reproductive Physiology Program (ERP)

<http://erp.wisc.edu/>

Interdepartmental Graduate Program in Nutritional Sciences (IGPNS)

<http://nutrisci.wisc.edu/graduate/m-s-ph-d/>

PROGRAM AUTHORITY

Graduate School

The Graduate School is the ultimate authority for granting M.S. and PhD degrees at the University of Wisconsin – Madison (“University”). The doctorate of philosophy is the highest degree conferred by the University, and it is never conferred solely as a result of any prescribed period of study, no matter how faithfully pursued. Rather, a PhD is a research degree and is granted on evidence of distinctive attainment in a specific field and on ability for independent investigation as demonstrated by a dissertation presenting original research or creative scholarship with a high degree of literary skill. The Department of Dairy Science administers the M.S. and PhD graduate degree programs under the authority of the Graduate School. If completed successfully, Dairy Science’s minimum requirements meet all Graduate School requirements for conferring a M.S. or Ph.D. degree. The Program is designed to prepare students for outstanding professional careers in research, teaching, and science communication.

Dairy Science Faculty and Committees

Program authority to set degree requirements beyond the minimum required by the Graduate School lies with the Dairy Science faculty. The policies described in this handbook have been approved by the Dairy Science faculty as a whole, and are subject to periodic review and update. Day-to-day Program administration is delegated by Dairy Science faculty to the Dairy Science Graduate Curriculum Committee, whose membership is appointed by the Chair of the Department of Dairy Science. The Graduate Curriculum Committee provides guidance to students and faculty with regard to Graduate School and Program requirements, and arbitrates any requests for exceptions to Dairy Science program requirements.

See appendices for listings of Dairy Science faculty, staff, and committee composition.

Key Individuals and Roles

Graduate Program Coordinator – Cathy Rook, rook@wisc.edu, 608-263-3308

Director of Graduate Studies – Milo Wiltbank, Wiltbank@wisc.edu, 608-263-9413

Department Chair – Kent Weigel, kent.weigel@wisc.edu, 608-263-4321

Administration & Payroll – Nancy Hilmanowski, nancy.hilmanowski@wisc.edu, 608-263-643

PROGRAM MISSION STATEMENT

The mission of the UW-Madison Department of Dairy Science is to discover, develop and disseminate knowledge that improves the quality of milk and the efficiency and profitability of its production around the world. Our work helps the dairy industry provide wholesome products to consumers in economical, humane and environmentally sound ways.

The UW-Madison Department of Dairy Science is internationally recognized for progressive dairy research and educational programs, We are leaders in supplying nutrition, genetics, lactation, reproduction, farm management and milk quality expertise.

We never lose sight of the real-world business of dairy production. Through our intensified business curriculum and our strong ties to the dairy industry, we provide dairy professionals with research-based knowledge they can use to improve their businesses.

Ph.D. REQUIREMENTS

To complete the Ph.D. degree in the Department of Dairy Science at 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 are essential for successful completion of a Ph.D. 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.

1. Form a Ph.D. mentor and examination Committee (by end of 1st semester).
2. Meet with approved Ph.D. Committee to approve coursework and immediate research plans (by end of 2nd Semester)
3. Schedule preliminary examination and file request for preliminary examination (by end of 4th semester).
4. Complete Written Preliminary Examination, Complete Oral Preliminary Examination (by end of 5th semester). If passed, Prelim Warrant should be signed and returned to Graduate School. Student will become a dissertator.
5. Complete research and thesis. Regular meetings with Committee are expected.
6. Request for final examination (includes documentation that exam requirements have been met)
7. Final Defense and Examination.

There are forms which must be completed, signed, and returned to the departmental student services coordinator at the proper times for each step listed. Students should be sure to keep a copy of all signed forms, warrants, etc. See appendices for a copy of the forms or visit the Dairy Science website.

<http://dysci.wisc.edu/dairy-science-certification-forms/>

Any changes to the certification paperwork must be communicated to the Graduate Coordinator and approved by the Graduate Chair.

Doctoral Minor

A doctoral minor is required by the Dairy Science department. Ph.D. students must complete a minor degree before they can be granted dissertator status. There are two minor degree options:

Option A External Minor: Requires a minimum of nine credits in a single department/program, such as Statistics or Computer Science. Selection of this option requires the approval of the minor department/program. Students interested in an Option A minor should contact the minor department.

Option B Distributed Minor: Requires a minimum of nine credits in one or more departments/programs and can include course work in the major department/program. Selection of this option requires the approval of your thesis committee.

Option A minors appear on the transcript with the name of the minor (i.e. Statistics).
Option B minor always appears on the transcript as Distributed.

Graduate Program Doctoral Level Program CALS

Dairy Science (247) Ph.D

Entered by: Milo Wiltbank

Title: Professor

Contact email: wiltbank@wisc.edu

Department: Dairy Science

Designated by: Kent Weigel

Knowledge and Skills Learning Goals

- To gain in-depth knowledge and understanding of current research in the specific area of animal biology and management that the student is working with during their Ph.D. degree.
- To develop the ability to critique scientific research including evaluation of the theories, research methods, statistical analyses of results, and discussion of results in relation to other studies in the student's field of interest.
- To understand the primary field of study from a biological and practical context.
- Demonstrates the ability to validly develop and execute a research study including development of a scientific hypothesis, selection and utilization of the most appropriate methodologies and practices to test the research hypothesis, valid statistical analysis of results, and clear, scientifically-valid discussion of research results.
- Demonstrates the ability to communicate science in their field both orally and in a written form.

Professional Conduct Learning Goals

- Recognizes and fosters ethical and professional conduct.

Additional Learning Goals

Approved? Yes

Submitted: 9/4/15 9:34

Department of Dairy Science ASSESSMENT PLAN:

Ph.D. Degree

School/College: College of Agricultural and Life Sciences

Graduate Degree/Major Program Name: Department of Dairy Science

Graduate Degree Level (M.S., M.A., Ph.D., DMA, etc.): Ph.D. in Research

Faculty Director Contact/Title: Milo Wiltbank, Professor and Chair of Graduate Committee

Primary Contact Information: wiltbank@wisc.edu

Student Learning Goals

1. Students will 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. Students will create research and scholarship that makes a substantive contribution to the field of Dairy Science.
3. Students will orally communicate complex ideas in a clear and understandable manner in a scientific, classroom, and/or industry setting.
4. Students will be able to statistically analyze data, summarize the results in tables and/or graphs, and provide valid interpretation of the results.
5. Students will communicate in accurate written English and in the format of a scientific journal, complex ideas and research results.
6. Students will foster ethical and professional conduct and have knowledge in a broad range of areas that are important for their professional development.

Plan for Assessing Each Student Learning Goal

Assessment Planning (How)	Learning Goals					
	1. Students will understand and summarize ideas and concepts, into a coherent biological model and research project.	2. Students will create research and scholarship that makes a substantive contribution to the field of Dairy Science.	3. Students will orally communicate complex ideas in a clear and understandable manner in a scientific, classroom, and/or industry setting.	4. Students will foster ethical and professional conduct and have knowledge in a broad range of areas	5. Students will be able to statistically analyze data, summarize results in tables and graphs, and provide valid interpretation of results.	6. Students will communicate in accurate written English and in the format of a scientific journal, complex ideas and research results.
1st Semester – Form Ph.D. mentor committee Meet each member	XX Indirect	XX Indirect	XX Indirect	XX Indirect		
2nd Semester – Meet with Ph.D. committee Approve Coursework Present research plan	XX Indirect	XX Indirect	XX Indirect	XX Indirect	XX Indirect	XX Indirect
By end of 5th Semester Complete Written Preliminary Exam Questions from each Ph.D. committee member	XX Direct				XX Direct	XX Direct
By end of 5th Semester Complete Oral Preliminary Exam Questions from each Ph.D. committee member			XX Direct			XX Direct

Assessment Planning (How)	Learning Goals					
	1. Students will understand and summarize ideas and concepts, into a coherent biological model and research project.	2. Students will create research and scholarship that makes a substantive contribution to the field of Dairy Science.	3. Students will orally communicate complex ideas in a clear and understandable manner in a scientific, classroom, and/or industry setting.	4. Students will foster ethical and professional conduct and have knowledge in a broad range of areas	5. Students will be able to statistically analyze data, summarize results in tables and graphs, and provide valid interpretation of results.	6. Students will communicate in accurate written English and in the format of a scientific journal, complex ideas and research results.
Each Year after achieving dissertator status Student will meet with Ph.D. committee to assess progress of research and training	XX Indirect	XX Indirect	XX Indirect	XX Indirect	XX Indirect	XX Indirect
Complete Research and Thesis Thesis will be evaluated by each committee member	XX Direct	XX Direct			XX Direct	XX Direct
Final Defense and Examination by the Ph.D Examination Committee	XX Direct		XX Direct	XX Direct	XX Direct	XX Direct
Timetable for Assessment	Annually	Annually	Annually	Annually	Annually	Annually

MASTERS IN RESEARCH REQUIREMENTS

To complete the M.S. degree in the Department of Dairy Science at 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 advisor and committee are essential for successful completion of an M.S. 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.

1. Form an M.S. mentor Committee (by end of 1st semester).
2. Meet with approved M.S. Committee to approve plan for coursework and immediate research plans (by end of 2nd Semester)
3. Complete Coursework and M.S. research (documentation of completion is required before M.S. defense)
4. Final Defense and Examination.

There are forms which must be completed, signed, and returned to the departmental student services coordinator at the proper times for each step listed. Students should be sure to keep a copy of all signed forms, warrants, etc. See appendices for copy of the forms.

MASTERS IN COURSE REQUIREMENTS

To complete the M.S. degree in course in the Department of Dairy Science at 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 are essential for successful completion of an M.S. degree.

1. Form an M.S. mentor Committee (by end of 1st semester).
2. Meet with approved M.S. Committee to approve plan for coursework and immediate research plans (by end of 2nd Semester)
3. Complete Coursework and Review of Literature (documentation of completion is required before M.S. defense)
4. Final Defense and Examination.

There are forms which must be completed, signed, and returned to the departmental student services coordinator at the proper times for each step listed. Students should be sure to keep a copy of all signed forms, warrants, etc. See appendices for copy of the forms.

Graduate Program Master's Level Program CALS

Dairy Science (247) Masters

Entered by: Milo Wiltbank

Title: Professor

Contact email: wiltbank@wisc.edu

Department: Dairy Science

Designated by: Kent Weigel

Knowledge and Skills Learning Goals

- To gain knowledge of current research in the specific area of animal biology and management that the student is working with during their Master's degree.
- To develop the ability to critique scientific research including evaluation of the theories, research methods, statistical analyses of results, and discussion of results in relation to other studies in the student's field of interest.
- To understand the primary field of study from a biological and practical context.
- Demonstrates the ability to select and utilize the most appropriate methodologies and practices to test research hypotheses.
- Demonstrates the ability to communicate science in their field both orally and in a written form.

Professional Conduct Learning Goals

- Recognizes and fosters ethical and professional conduct.

Additional Learning Goals

Approved? Yes

Submitted: 9/4/15 9:46

Department of Dairy Science ASSESSMENT PLAN:

M.S. Degree in Research

School/College: College of Agricultural and Life Sciences

Graduate Degree/Major Program Name: Department of Dairy Science

Graduate Degree Level (M.S., M.A., Ph.D., DMA, etc.): M.S. in Research

Faculty Director Contact/Title: Milo Wiltbank, Professor and Chair of Graduate Committee

Primary Contact Information: wiltbank@wisc.edu

Student Learning Goals

1. Students will 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. Students will create research and scholarship that makes a substantive contribution to the field of Dairy Science.
3. Students will orally communicate complex ideas in a clear and understandable manner in a scientific, classroom, and/or industry setting.
4. Students will be able to statistically analyze data, summarize the results in tables and/or graphs, and provide valid interpretation of the results.
5. Students will communicate in accurate written English and in the format of a scientific journal, complex ideas and research results.
6. Students will foster ethical and professional conduct and have knowledge in a broad range of areas that are important for their professional development.

Plan for Assessing Each Student Learning Goal

Assessment Planning (How)	Learning Goals					
	1. Students will understand and summarize ideas and concepts, into a coherent biological model and research project.	2. Students will create research and scholarship that makes a substantive contribution to the field of Dairy Science.	3. Students will orally communicate complex ideas in a clear and understandable manner in a scientific, classroom, and/or industry setting.	4. Students will foster ethical and professional conduct and have knowledge in a broad range of areas	5. Students will be able to statistically analyze data, summarize results in tables and graphs, and provide valid interpretation of results.	6. Students will communicate in accurate written English and in the format of a scientific journal, complex ideas and research results.
1st Semester – Form M.S. mentor committee Meet each member	XX Indirect	XX Indirect	XX Indirect	XX Indirect		
2nd Semester – Meet with M.S. committee Approve Coursework Present research plan	XX Indirect	XX Indirect	XX Indirect	XX Indirect	XX Indirect	XX Indirect
Each Year student will meet with M.S. committee	XX Indirect	XX Indirect	XX Indirect	XX Indirect	XX Indirect	XX Indirect
Complete Research and Thesis Thesis evaluated by each member	XX Direct	XX Direct			XX Direct	XX Direct
Final Defense and Examination by the M.S. Examination Committee	XX Direct		XX Direct	XX Direct	XX Direct	XX Direct
Timetable for Assessment	Annually	Annually	Annually	Annually	Annually	Annually

Dairy Science Advising Faculty



Department of Dairy Science Advising Faculty



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Associate Professor
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Pam Ruegg, Professor
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Affiliate Faculty



Nigel Cook, Professor, SVM
School of Veterinary Medicine
Chair, Department of Medical Sciences



Dorte Dopfer, Professor
School of Veterinary Medicine
Department of Medical Sciences



Brian Kirkpatrick, Professor
Department of Animal Sciences



Garrett Oetzel, Professor
School of Veterinary Medicine
Department of Medical Sciences



Theresa Ollivet, Assistant Professor
School of Veterinary Medicine
Department of Medical Sciences



Jess Reed, Professor
Department of Animal Sciences



Douglas Reinemann, Professor
Chair, Biological Systems Engineering



Garret Suen, Assistant Professor
Department of Bacteriology
Alfred Toepfer Faculty Fellow

Adjunct Professors



Wayne K. Coblenz, Professor
ARS Marshfield, USDFRC

Robert Fourdraine, Associate Professor
AgSource



John P. Goeser, Assistant Professor
Rock River Laboratories



Mary Beth Hall, Professor
US Dairy Forage Research Center



Ken Kalscheur, Assistant Professor
US Dairy Forage Research Center

Wenli Li, Assistant Professor
US Dairy Forage Research Center

Noah Litherland, Scientist
Vita Plus Corporation

Geoffrey Zanton, Assistant Professor
US Dairy Forage Research Center

Student Grievance Procedure

The Department of Dairy Science follows the guidelines set by the College of Agricultural and Life Sciences and has a Grievance Committee identified. If the grievance is against one of the committee members, the Department Chair or Committee Chair will recommend a substitute for that committee member.

<http://www.cals.wisc.edu/academics/undergraduate-programs/curriculum-information/student-grievance-procedure/>

In the College of Agricultural and Life Sciences any student who feels unfairly treated by a member of the College of Ag & Life Sciences (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 (Room 116 Agriculture Hall). 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 and student 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.

Matters of interpretation of academic requirements not primarily involving questions of fairness should come via the student's advisor to the college's Scholastic Policies and Actions Committee.

Upon Arrival on Campus

Activate your NetID

You will need your NetID and password to access the My UW-Madison portal at my.wisc.edu. To activate your NetID click on the ACTIVATE NETID button from the My UW Madison login screen. Enter your 10 digit student campus ID number and birthdate. The NetID you create and password you enter are keys to your access to the MyUW portal, make a record of it and keep it private. If you are unsure about your NetID and password, contact the DoIT Help Desk at 608-264-4357.

Attend New Graduate Student Welcome

Attend the New Graduate Student Welcome which is sponsored by the Graduate School in the spring and fall semesters, for current information please see <https://grad.wisc.edu/newstudents/>

Banking Information

If you need a US Bank Account for direct deposit of your paycheck there are several banks in the area where you can set up an account. One option is UW Credit Union located on the first floor of Union South (next to the room you get student ID photo in) or down one block at 1435 Monroe St. Other banks in the area are: Chase, Associated, and M&I.

Bus Pass

UW-Madison students have free year-round access to the Madison Metro Bus System through the Associated Students of Madison (ASM) student government organization. To get your free bus pass go to the Student Activity Center at 333 East Campus Mall on the 3rd floor. Pick-up usually starts the week before classes begin (see their website for dates, times and pick-up locations).

ASM Student Bus Pass <http://www.asm.wisc.edu/resources/buspass/>

Madison Metro: <http://www.cityofmadison.com/metro/>

International Student Services (ISS)

The [International Student Services](https://iss.wisc.edu/) (ISS) Office, located in the Red Gym (room 217), 716 Langdon Street (262-2044), provides orientation for new international students and assists students and their families in maintaining their non-immigrant visa status. The ISS website provides helpful information on adapting to a new culture. Their website is: <https://iss.wisc.edu/>

The ISS Office also houses the [Madison Friends of International Students](http://www.mfismadison.com/) (MFIS), a community organization of volunteers who wish to befriend and help international students through social activities, English classes, friendship groups, etc.

Madison Friends of International Students <http://www.mfismadison.com/>

[English as a Second Language website is: https://english.wisc.edu/esl/](https://english.wisc.edu/esl/)

[Greater University Tutorial Service](http://www.guts.wisc.edu/) (GUTS) <http://www.guts.wisc.edu/>

The [Writing Center](#) also provide English language assistance to international students
<http://www.writing.wisc.edu/>

Keys – Building/Lab

Please see the Lab Manager or your Advisor for keys you may need for your lab and/or after hours building keys. You must sign a key card and return the keys before you leave the UW. There is a \$75 lost key charge on each key.

Payroll/Health Insurance/Tax Forms

Complete and Return Tax forms to Nancy Hilmanowski – Room 263 Animal Sciences building. If you are an international student you will want to look at this website for tax treaty information (scroll down to Nonresident Aliens for Tax Purposes) <http://uwservice.wisc.edu/tax/filing-resources.php>

Complete and Return Direct Deposit Form to Nancy Hilmanowski – Room 263 Animal Sciences building.

Complete and Return Health Insurance Paperwork to Nancy Hilmanowski – Room 263 Animal Sciences building. If you would like additional information about the Health Insurance plans, please visit the “It’s Your Choice” website http://etf.wi.gov/members/benefits_state_health.htm Students without a car may want to pay attention to the location of doctor’s offices close to their housing.

Photo

You will need to stop in the Dairy Science office to have your photo taken, or send the graduate coordinator a recent photo of yourself (a head shot is fine). This photo will be used for the “Map” and used for the Department’s file.

Registering for Classes

The Registrar sends all new students registration information, including a PIN and first- available registration time, prior to the start of the semester. Continuing students receive their enrollment appointment time by email just prior to registration. You will need both your PIN and your student ID number to register.

Enrollment is done online through your Student Center in MyUW. To register, login to [My UW-Madison](#), then go to the Enrollment tab. You must register no later than the Friday of the first week of classes to avoid a late registration fee. Late registration fees are the student’s responsibility. If you have problems registering, contact the graduate coordinator. For general enrollment information, call the Registrar’s Office Helpline at (608) 262-0920, Monday-Friday, 7:45 a.m. to 4:25 p.m.

Both the “Class Search” and “Course Guide” are available to students through the MyUW. The Class Search is the real-time, online listing of course sections offered each term and is used to enroll in courses. The Course Guide is an online, searchable catalog of courses providing a broad spectrum of information including the ability to browse courses offered each term.

MyUW – to activate your NetID and password; to enroll in classes; to setup your WiscMail account; and to verify and update your mailing address and phone number <http://my.wisc.edu/>

Division of Information Technology (DoIT) – information for new students
<http://www.doit.wisc.edu/students/>

Information on forgotten MyUW NetID and passwords <http://kb.wisc.edu/helpdesk/page.php?id=2843>

Office of the Registrar - enrollment information, access to the course guide and public class search, and online tutorials and demonstrations <http://registrar.wisc.edu/>

WisCard

Every student at UW-Madison is required to have a campus ID card (also known as a WisCard). The WisCard office is located on the first floor of Union South and is open from 8:00 AM – 5:00 PM Monday through Friday. Please note that as the start of fall term gets closer, this office becomes busier and that students must be enrolled before they can be issued a WisCard. It is recommended that new students get a WisCard as soon as possible.

WisCard <http://www.wiscard.wisc.edu/>

The Guide to Graduate Student Life

The Guide to Graduate Student Life, produced by the Graduate School's Office of Professional Development and Communications, offers advice about the university and community from a students' perspective, particularly for new graduate students.

The pdf of the guide can be found at: https://grad.wisc.edu/wp-content/.../06/gradlife_2016_final-1.pdf

CALS Computer Lab

The College of Agricultural and Life Sciences (CALs) computer lab is located in the basement and on the ground floor of the Animal Sciences building — in rooms 145, 149, 150 and 204. The lab is open and free of charge (except for laser printing) to all University students, faculty and staff.

The facility is comprised of the CALs Statistical Consulting Service which aids researchers with their statistical needs, and a windows/macintosh microcomputer lab that also includes 2 computer classrooms that can be reserved for trainings or classroom use.

The CALs Computer Facility is managed by Tom Tabone (263-3942). An operator/consultant is also on duty at all times to help assist users (263-2817). Statistical assistance is by appointment

CALS Computer Lab <http://www.cals.wisc.edu/calslab/>

There are several other locations available to check out laptops, <http://ecs.library.wisc.edu/>.

Steenbock Library

Steenbock Memorial Library is the primary resource library for the students, faculty, and research staff of the University of Wisconsin-Madison's College of Agricultural and Life Sciences. It is located on the Ag Campus at 550 Babcock Drive. See their website: <https://www.library.wisc.edu/steenbock/>

Graduate School Academic Policies and Procedures

The Department of Dairy Science follows the academic policies and procedures developed by the Graduate School.

The Graduate School Office of Admissions and Academic Services developed the Academic Policies and Procedures document (sometimes referred to as “Guidelines” or “Handbook”) to help answer questions about Graduate School academic and administrative policies and procedures. The document is only available online, it is continuously updated and is the official document of record for Graduate School policies and procedures; changes made to the document are also available online.

In situations where policies have changed during a student’s time of enrollment, the Graduate School and the academic program, together with the student, may elect to enforce requirements that are in the best interest of the student. Please refer to the document or contact Admissions and Academic Services with any questions regarding Graduate School procedures and policies. Academic Policies and Procedures reflects current policies of the Graduate School, the Office of the Registrar, the Office of the Bursar, the Office of International Students Services (ISS), and other university units.

The Graduate School Office of Admissions and Academic Services is the Academic Dean’s Office for all graduate students. All student forms requiring the dean’s signature should be submitted to this office (for example, course change form, audit form, credit overload request form). This office also monitors satisfactory progress toward degree completion.

The topics in Academic Policies and Procedures are listed alphabetically. Entries are cross-referenced. Also included are tables (see the Appendices) to illustrate payroll benefits and other important information.

<https://grad.wisc.edu/acadpolicy/>

APPENDIX 1- Ph.D. Requirements – General Instructions

Dairy Science Ph.D. Requirements

To complete the Ph.D. degree in the Department of Dairy Science at 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. Working closely with your advisor and committee are essential for successful completion of a Ph.D. 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.

- I. Form a Ph.D. mentor and examination Committee (by end of 1st semester).
- II. Meet with your Ph.D. Committee to approve coursework and immediate research plans (by end of 2nd Semester)
- III. Schedule preliminary examination and file request for preliminary examination (by end of 4th semester).
- IV. Complete both Written Preliminary Examination and Oral Preliminary Examination (by end of 5th semester).

If passed, Preliminary Warrant should be signed and returned to Graduate School. Dissertator status is granted after successful completion of all coursework requirements, the qualifying written exam, and the preliminary oral exam.
- V. Complete research and thesis. Regular meetings with your Committee are expected.
- VI. Request for final examination (includes documentation that exam requirements have been met).
- VII. Final Defense and Examination.

The following forms must be completed, signed, and returned to departmental grad coordinator at the proper times. It is the grad coordinator's responsibility to review forms for completeness and obtain the signature of the Grad Committee Chair.

Be sure to keep a copy of all signed forms, warrants, etc.

Revised: 02/09/2017

Ph.D. Requirements - Preliminary Examination Committee

I. Ph.D. Mentor and Preliminary Examination Committee (This form must be completed and approved by end of the first semester.)

Name of Student:		Student ID:	
Discipline:			

Major professor and four committee members are required. Additional committee members may also be selected.

	Name	Department
Major professor:		
Committee member #1:		
Committee member #2:		
Committee member #3		
Committee member #4		

APPROVALS

	Student	Date
Signed:		
	Major Professor	Date
Approved:		
	Chair, Dairy Science Graduate Committee	Date
Approved:		

Instructions

1. A minimum of five faculty members are required. At least 3 of the committee members must be tenure-track faculty in the Department of Dairy Science.
2. One faculty member on the Committee must be from outside of the Dairy Science Department.
3. The graduate student requests the participation of the faculty on the committee.
4. The student, major professor, and chair of the Dairy Science Graduate Committee must approve of all members on this committee.
5. Changes to Ph.D. Committee must be submitted in writing to Graduate Committee.

**II. Required Courses to be completed prior to or during Ph.D. study
(This form must be completed and approved by the end of the second semester.)**

Student:		Student ID:	
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A. Biochemistry (must require Organic Chemistry as a prerequisite):

	Dept.	Course #	Course Title	Credits	Grade	Institution
Biochemistry						

B. Statistics:

1. A course in statistics (300 level or above)

	Dept.	Course #	Course Title	Credits	Grade	Institution
Statistics						

C. Dairy or Animal Science Courses

One course (300 level or higher, at least 2 credits, grade of B or better) in each of the following: animal genetics, ruminant or animal nutrition, animal physiology, and dairy cattle management.

	Dept.	Course #	Course Title	Credits	Grade	Institution
Genetics						
Nutrition						
Physiology						
Management						

D. Special Skills: Complete a course in 2 of the 3 following areas:

1. Educational principles (DS 799, Teaching or Extension Practicum or other approved course)
2. Technical Writing course or Writing Practicum
3. Advanced course in Philosophy of Science, History of Science, or Ethics of Science

Skill	Dept.	Course #	Course Title	Credits	Grade	Institution
1.						
2.						

APPROVALS

	Student	Date
Signed:		
	Major Professor	Date
Approved:		
	Chair, Dairy Science Graduate Committee	Date
Approved:		

Instructions for Plan of Study
(see next page for form to be completed)

Students must meet all Graduate School and Departmental requirements.

Students should discuss planned coursework with major professor and Ph.D. committee.

Departmental Requirements:

1. Minimum of 51 graduate credits (semester credits, courses numbered 300 or greater) after the BS degree. A minimum of 32 of these credits must be taken while a graduate student at UW-Madison (Minimum Graduate Residence Credit Requirement).

NOTE: Courses taken post-BS as a Special Student (not enrolled in a graduate program) do NOT automatically count toward a graduate degree. To use these credits toward a graduate degree, the student should obtain approval of the department and graduate school PRIOR to taking the courses.

2. At least 50% of the graduate coursework (26 credits) must be in courses designed for graduate work. In other words, courses numbered ≥ 700 or courses numbered 500-699 that are composed of at least 50% graduate students or courses that assess graduate students separately from undergraduates.
3. Minimum 3.0 Cumulative GPA (B average) in all graduate coursework taken at UW-Madison.
4. Minimum of 12 Credits of Dairy Science 990 (Research).
5. Graduate Seminar: A grade of B or better in Departmental Graduate Seminar (DySci 900 section 001) is required in the Spring Semester of each year.
6. Students should be advised that the above represent minimum requirements. Most students require coursework, research and time in excess of the minimum to successfully complete the Ph.D. degree. In addition, Ph.D. committees may suggest additional courses.
7. Prior to attaining dissertator status, full time students should register for 8-15 total credits (courses, seminars and research) per semester. Students conducting research should register for at least 1 credit of Dairy Science 990 during each semester when research is conducted.
8. After attaining dissertator status, the student must register for 3 credits per semester until graduation. During Spring Semester, 1 of these must be Graduate Seminar (900, section 1).
9. A doctoral minor is required by the Dairy Science department. Ph.D. students must complete a minor degree before they can be granted dissertator status. There are two minor degree options:

Option A External Minor: Requires a minimum of nine credits in a single department/program, such as Statistics or Computer Science. Selection of this option requires the approval of the minor department/program. Students interested in an Option A minor should contact the minor department.

Option B Distributed Minor: Requires a minimum of nine credits in one or more departments/programs and can include course work in the major department/program. Selection of this option requires the approval of your thesis committee.

10. Teaching (or extension) practicum 799 is encouraged and counts toward the credit total in points #1 and #2 above.

III. Plan of Study

(This form must be completed and approved by the end of the second semester.)

Student:		Student ID:	
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LIST PROPOSED GRADUATE COURSES. Credits should total at least 51 semester hours: Group together and total at least 26 credits from courses numbered ≥ 700 or 500-699 that are composed of at least 50% graduate students or courses that assess graduate students separately from undergraduates. Other courses should be listed separately. At least 32 credits must be taken at UW-Madison.

Course	Description	Credits	Institution

APPROVALS:

	Student	Date
Signed:		
	Major Professor	Date
Signed:		
	Committee Members	
Signed:		
Signed:		
Signed:		
	Chair, Dairy Science Graduate Committee	Date
Approved:		

IV. Request for Preliminary Examination
(This form must be approved prior to the end of the Fourth Semester)

	Name	Signature	Date
Student:			
Major Professor:			

Student and major professor should complete indicated sections. Dairy Science Graduate Coordinator will verify that all departmental requirements have been met, obtain signature of Graduate Committee Chair and request the Preliminary Exam Warrant.

GRADUATE DEPARTMENTAL SEMINAR (Dy Sci 900, Section 1, each Spring)

Fill in Semesters taken and grade. Last column is for Grad Coordinator Use.

Semester	Grade	Grad Coordinator Use

SEMINAR PRESENTATIONS (At least one prior to Preliminary Examination)

List Seminar presentations. Major Professor signature verifies satisfactory completion.

Date	Title	Location/Group	Major Prof. Signature

Checklist of requirements Student should use this as a guide, but leave the last column blank for Grad Coordinator use. **Grad Coordinator must complete this section prior to Chair's signature.**

	Requirement	Grad Coordinator Use
1.	Certification form filed and approved	
2.	Preliminary Examination Committee approved	
3.	Satisfactory Progress on coursework plan	
4.	Minimum GPA of 3.0	

APPROVED

	Chair, Dairy Science Graduate Committee	Date
Approved:		

Instructions for Preliminary Examination

All Ph.D. students are required to pass a qualifying examination before the end of the fifth semester of their Ph.D. program, after the majority of their coursework is completed. The purpose of the qualifying examination is not to evaluate progress on the thesis project. **The purpose of the qualifying examination is to assess the depth and breadth of knowledge and evaluate the candidate's ability for scientific reasoning.**

The qualifying examination will include two components: a written examination followed by an oral examination. The format (timing, location, open/closed book) of the written and oral examinations shall be determined by the major professor, agreed upon by the members of the Ph.D. committee, and approved by the chair of the Dairy Science Graduate Committee. The Ph.D. committee will be responsible for both the written and oral exam questions. The oral examination shall take place within 4 weeks of completion of the written examination. After completion of the written and oral components of the qualifying examination, the Ph.D. committee will determine whether the candidate has passed the examination. In the event of a failed examination, the candidate may ask the Ph.D. committee for an opportunity to retake the examination. This request must be written, and it must be submitted no later than 4 weeks after the first oral examination. The chair of the Dairy Science Graduate Committee must be copied on the request. The second examination will be with the same Ph.D. committee, will include both written and oral components, and must follow the same format as the first examination. The second examination must be completed within 6 months of the first examination, and if the second examination is failed the candidate will be terminated from the Dairy Science graduate program.

V. Plan and Dates for Ph.D. Preliminary Examinations
 (This form must be approved prior to the end of the fourth semester.)

Name of Student:	
-------------------------	--

Plan for Preliminary Examination:

Date of Written Examination:

Date of Oral Examination:

APPROVALS:

	Major Professor:	Date
Approved:		
	Committee Members:	
Signed:		
Signed:		
Signed:		
Signed:		
	Chair, Dairy Science Graduate Committee	Date
Approved:		

VI. Proposed Ph.D. Final Examination Committee:

(Note: This committee may be the same or different from Ph.D. Preliminary Examination Committee)

Name of Student:	
Discipline:	

1. A minimum of five faculty members are required. At least 3 members must be tenure-track faculty members from the Department of Dairy Science (see Appendix A for eligible faculty).
2. One faculty member must be from outside of the Dairy Science Department. The outside member must not be an affiliate of the Dairy Science Department

Major professor and four committee members are required. Additional committee members may also be selected.

	Name	Discipline	Department
Major professor:			
Committee member:			
Committee member:			
Committee member:			
Committee member:			

APPROVALS

	Student	Date
Signed:		
	Major Professor	Date
Approved:		
	Chair, Dairy Science Graduate Committee	Date
Approved:		

Ph.D. Requirements - Request for Ph.D. Final Examination Warrant

VII. Requirements to be met prior to Ph.D. Final Examination:

	Name	Signature	Date
Student:			
Major Professor:			

Fill in indicated spaces. The Department will then use this checklist to verify that all requirements have been met and request a warrant from the Graduate School.

SEMINAR PRESENTATIONS (Total of 3 during Graduate Program)

List Seminar presentations. Signature of Major Professor verifies satisfactory completion.

Date	Title	Location/Group	Major Prof. Signature

DEPARTMENTAL SEMINAR since preliminary exam

Fill in Semesters taken and grade.

Semester	Grade	Grad Coordinator Use

Checklist of Requirements (Grad Coordinator Use. Must be completed before Chair will sign.)

	Requirement	OK (Office)
1.	Passed preliminary exam	
2.	Completion of any deficiencies from preliminary examination	
3.	Completion of all coursework listed on certification form	
4.	Final Examination Committee approved	
5.	Completion of coursework plan, including 51 credits graduate coursework	
6.	Completion of 32 graduate credits at UW-Madison	
7.	Minimum GPA of 3.0	
8.	At least 12 Credits of research	
9.	Continuous enrollment since Preliminary exam	

APPROVED

	Chair, Dairy Science Graduate Committee	Date
Approved:		

Ph.D. Requirements – Potential Committee Members

**APPENDIX A
Faculty Eligibility for Dairy Science Ph.D. Committees**

Faculty with Primary Appointment in the Department of Dairy Science (no restrictions)	Faculty with Secondary or Affiliate Appointments in Department of Dairy Science (can be major professor or member of Ph.D. committee with at least 3 faculty with Primary Appointment in Dairy Science)	Clinical Faculty and Academic Staff with Primary, Secondary, or Affiliate Appointments in Department of Dairy Science (can be 5th member of Ph.D. committee)
Victor Cabrera	Nigel Cook	Matt Akins
Dave Combs	Dorte Dopfer	Wayne Coblentz
Paul Fricke	Brian Kirkpatrick	Robert Fourdraine
Laura Hernandez	Garrett Oetzel	John Goeser
Bruce Jones	Theresa L. Ollivett	Mary Beth Hall
Pam Ruegg	Jess Reed	Ken Kalscheur
Randy Shaver	Doug Reinemann	Noah Litherland
Michel Wattiaux	Garret Suen	Geoffrey Zanton
Kent Weigel		Wenli Li
Heather White		
Milo Wiltbank		
	Other Tenure-Track Faculty Member at UW-Madison	Other UW-Madison or External Scientist if Approved by Chair of the Departmental Graduate Program

APPENDIX 2- M.S. in Course Requirements – General Instructions

Dairy Science M.S. Degree in Course Requirements

To complete the M.S. degree in course in the Department of Dairy Science at 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 are essential for successful completion of an M.S.

- I.** Form an M.S. mentor Committee (by end of 1st semester).
- II.** Meet with your M.S. Committee. Approve plan for coursework and Review of Literature (by end of 2nd Semester)
- III.** Complete Coursework and Review of Literature (documentation of completion is required before M.S. defense)
- IV.** Final Defense and Examination.

The following forms must be completed, signed, and returned to departmental student services coordinator at the proper times.

Be sure to keep a copy of all signed forms, warrants, etc.

I. M.S. Mentor and Examination Committee
(This page must be completed and approved by end of the first semester.)

Name of Student:		Student ID:	
Discipline:			

Major professor and two committee members are required. Additional committee members may also be selected.

	Name	Department
Major professor:		
Committee member #1:		
Committee member #2:		

APPROVALS

	Student	Date
Signed:		
	Major Professor	Date
Approved:		
	Chair, Dairy Science Graduate Committee	Date
Approved:		

Instructions

1. A minimum of three faculty members is required. At least 2 of the committee members must be tenure-track faculty in the Department of Dairy Science (See Appendix A for eligible faculty).
2. The graduate student requests the participation of the faculty on the committee.
3. The student, major professor, and chair of the Dairy Science Graduate Committee must approve of all members on this committee.
4. Changes to M.S. Committee must be submitted in writing to Graduate Committee.

**II. Required Courses to be completed prior to or during M.S. study
(This page must be completed and approved by the end of the second semester.)**

Student:		Student ID:	
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A. Biochemistry:

	Dept.	Course #	Course Title	Credits	Grade	Institution
Biochemistry						

B. Statistics:

1. A course in statistics (300 level or above)

	Dept.	Course #	Course Title	Credits	Grade	Institution
Statistics						

C. Dairy or Animal Science Courses

One course (300 level or higher, at least 2 credits, grade of B or better) in each of the following: animal genetics, ruminant or animal nutrition, animal physiology, and dairy cattle management.

	Dept.	Course #	Course Title	Credits	Grade	Institution
Genetics						
Nutrition						
Physiology						
Management						

APPROVALS

	Student	Date
Signed:		
	Major Professor	Date
Approved:		
	Chair, Dairy Science Graduate Committee	Date
Approved:		

Instructions for Plan of Study (see next page for form to be completed) (This form must be completed by end of second semester)

Students must meet all Graduate School and Departmental requirements.

Students should discuss planned coursework with major professor and M.S. committee.

Departmental Requirements:

1. Minimum of 30 graduate credits (semester credits, courses numbered 300 or greater), after the B.S. degree. A minimum of 16 graduate credits must be taken while a graduate student at UW-Madison.

NOTE: Courses taken post-BS as a Special Student (not enrolled in a graduate program) do NOT automatically count toward a graduate degree. To use these credits toward a graduate degree, the student should obtain approval of the department and graduate school PRIOR to taking the courses.

2. Minimum 3.0 GPA (B average) in all graduate coursework taken at UW-Madison.
3. Seminar: a minimum of one seminar presentation. This seminar may be credit or non-credit, but should be a 30 minute or longer presentation of a scientific topic. Presentation must be made to the satisfaction of the Major Professor. On the examination request form is a checklist of seminars. These presentations should be attested to by your major professor's signature on the examination request.
4. Graduate Seminar: A grade of B or better in Departmental Graduate Seminar (DySci 900 section 001) is required in the Spring Semester of each year.
5. Satisfactory completion of a final examination related to discipline-specific knowledge. Passing the exam requires a majority (2 of 3) pass votes.
6. Full time students should register for 8-12 total credits (courses, seminars and research) per semester, regardless of whether they have met minimum credit requirements. Part-time students should consult their advisor for appropriate credits.
7. Maximum of 3 credits of Dairy Science 990 (Research)
8. Minimum of 24 credits of structured courses or 799 teaching practicum (not 900/950/951 seminar courses or 699 independent study or 990 research).
9. Minimum of 15 credits from courses numbered > 700 or courses numbered 500-699 that are composed of at least 50% graduate students.
10. Completion of a review of literature or other scholarly activity with a creative component (in written form). Examples include: review article in format of Journal of Dairy Science, an Extension document reviewing a novel management practice or new technology, or an applied research project.
11. Teaching (or extension) practicum 799 is encouraged and counts toward the credits total in points #1, #8, and #9 above.

III. Plan of Study

(This form must be completed and approved by the end of the second semester.)

Student:		Student ID:	
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LIST PROPOSED GRADUATE COURSES.

Credits should total at least 30 semester hours, with at least 15 credits in courses numbered > 700 or numbered 500-699 with at least 50% graduate student. At least 16 credits taken at UW-Madison.

Course	Description	Credits	Institution

APPROVALS:

	Student:	Date
Signed:		
	Major Professor:	Date
Approved:		
	Committee Members:	
Signed:		
Signed:		
Signed:		
	Chair, Dairy Science Graduate Committee	Date
Approved:		

Request for Final Examination

	Name	Signature	Date
Student			
Major Professor			

Student and major professor should complete indicated sections. Dairy Science Graduate Committee will verify that all departmental requirements have been met and request the Exam Warrant from the Graduate School.

SEMINAR PRESENTATIONS

List Seminar presentations. Signature of Major Professor verifies satisfactory completion.

Date	Title	Location/Group	Major Prof. Signature

GRADUATE DEPARTMENTAL SEMINAR (Dy Sci 900, Section 1, each Spring)

Fill in Semesters taken and grade. Last column is for Committee Use.

Semester	Grade	OK (Office Use)

Checklist of requirements (For Office Use Only). Student should use this as a guide, but leave the **OK column blank for office to use.**

	Requirement	OK (Office)
1.	Completion of all coursework listed on certification form.	
2.	Completion of 30 graduate credits	
3.	Minimum GPA of 3.0	
4.	Dairy Science 900, Section 1 each Spring (unless exception by graduate committee chair)	

For any exceptions to requirements, attach evidence of prior approval by Dairy Science Graduate Committee.

For any unsatisfactory evaluations, attach evidence of completion of Dairy Science Graduate Committee- approved make-up requirements.

APPROVED

	Chair, Dairy Science Graduate Committee	Date
Approved:		

APPENDIX A
Faculty Eligibility for Dairy Science M.S. and Ph.D. Committees

Faculty with Primary Appointment in the Department of Dairy Science (no restrictions)	Faculty with Secondary or Affiliate Appointments in Department of Dairy Science (can be major professor or member of MS committee with 2 other members with Primary Appointment in Dairy Science)	Clinical Faculty and Academic Staff with Primary, Secondary, or Affiliate Appointments in Department of Dairy Science (can be 3rd member of M.S.. committee)
Victor Cabrera	Nigel Cook	Matt Akins
Dave Combs	Dorte Dopfer	Wayne Coblentz
Paul Fricke	Daniel Gianola	Robert Fourdraine
Laura Hernandez	Brian Kirkpatrick	John Goeser
Bruce Jones	Garrett Oetzel	Mary Beth Hall
Pam Ruegg	Theresa L. Ollivett	Ken Kalscheur
Randy Shaver	Jess Reed	Noah Litherland
Michel Wattiaux	Doug Reinemann	Geoffrey Zanton
Kent Weigel	Garret Suen	Wenli Li
Heather White		
Milo Wiltbank		
	Other Tenure-Track Faculty Member at UW-Madison	Other UW-Madison or External Scientist if Approved by Chair of the Departmental Graduate Program

APPENDIX 3- M.S. in Research Requirements – General Instructions

Dairy Science M.S. in Research Requirements

To complete the M.S. degree in the Department of Dairy Science at 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 are essential for successful completion of an M.S. 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.

- I.** Form an M.S. mentor Committee (by end of 1st semester).
- II.** Meet with your M.S. Committee. Approve plan for coursework and immediate research plans (by end of 2nd Semester)
- III.** Complete Coursework and M.S. research (documentation of completion is required before M.S. defense)
- IV.** Final Defense and Examination.

The following forms must be completed, signed, and returned to departmental student services coordinator at the proper times.

Be sure to keep a copy of all signed forms, warrants, etc.

I. M.S. Mentor and Examination Committee
(This form must be completed and approved by end of the first semester.)

Name of Student:		Student ID:	
Discipline:			

Major professor and two committee members are required. Additional committee members may also be selected.

	Name	Department
Major professor:		
Committee member #1:		
Committee member #2:		

APPROVALS

	Student	Date
Signed:		
	Major Professor	Date
Approved:		
	Chair, Dairy Science Graduate Committee	Date
Approved:		

Instructions

1. A minimum of three faculty members is required. At least 2 of the committee members must be tenure-track faculty in the Department of Dairy Science (See Appendix A for eligible faculty).
2. The graduate student requests the participation of the faculty on the committee.
3. The student, major professor, and chair of the Dairy Science Graduate Committee must approve of all members on this committee.
4. Changes to M.S. Committee must be submitted in writing to Graduate Committee.

**II. Required Courses to be completed prior to or during M.S. study
(This form must be completed and approved by the end of the second semester.)**

Student:		Student ID:	
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A. Biochemistry:

	Dept.	Course #	Course Title	Credits	Grade	Institution
Biochemistry						

B. Statistics:

1. A course in statistics (300 level or above)

	Dept.	Course #	Course Title	Credits	Grade	Institution
Statistics						

C. Dairy or Animal Science Courses

One course (300 level or higher, at least 2 credits, grade of B or better) in each of the following: animal genetics, ruminant or animal nutrition, animal physiology, and dairy cattle management.

	Dept.	Course #	Course Title	Credits	Grade	Institution
Genetics						
Nutrition						
Physiology						
Management						

APPROVALS

	Student	Date
Signed:		
	Major Professor	Date
Approved:		
	Chair, Dairy Science Graduate Committee	Date
Approved:		

Instructions for Plan of Study
(see next page for form to be completed)

Students must meet all Graduate School and Departmental requirements.

Students should discuss planned coursework with major professor and M.S. committee.

Departmental Requirements:

1. Minimum of 30 graduate credits (semester credits, courses numbered 300 or greater), after the B.S. degree. A minimum of 16 graduate credits must be taken while a graduate student at UW-Madison.

NOTE: Courses taken post-BS as a Special Student (not enrolled in a graduate program) do NOT automatically count toward a graduate degree. To use these credits toward a graduate degree, the student should obtain approval of the department and graduate school PRIOR to taking the courses.

2. Minimum 3.0 GPA (B average) in all graduate coursework taken at UW-Madison.
3. Minimum of 6 Credits of Dairy Science 990 (Research) with a grade of B or better.
4. Seminar: a minimum of one seminar presentation. This seminar may be credit or non-credit, but should be a 30 minute or longer presentation of a scientific topic. Presentation must be made to the satisfaction of the Major Professor. On the examination request form is a checklist of seminars. These presentations should be attested to by your major professor's signature on the examination request. **An exit seminar presenting the results of thesis research and advertised for attendance to all faculty and students in the Dairy Science Department is required.**
5. Graduate Seminar: A grade of B or better in Departmental Graduate Seminar (DySci 900 section 001) is required in the Spring Semester of each year.
6. Satisfactory completion and defense of a thesis based on original research.
7. Satisfactory completion of a final examination covering defense of the thesis and discipline-specific knowledge. Passing the exam requires a majority (2 of 3) pass votes.
8. Students should be advised that the above represent minimum requirements. Most students require coursework, research and time in excess of the minimum to successfully complete the M.S. degree. In addition, M.S. committees may suggest additional courses.
9. Full time students should register for 8-12 total credits (courses, seminars and research) per semester, regardless of whether they have met minimum credit requirements. Part-time students should consult their advisor for appropriate credits. Students conducting research toward their degree should register for at least 1 credit of Dairy Science 990 during each semester when research is conducted.
10. Minimum of 15 credits from courses numbered ≥ 700 or courses numbered 500-699 that are composed of at least 50% graduate students.
11. Teaching (or extension) practicum 799 is encouraged and counts toward the credit total in points #1 and #10 above.

Request for Final Examination

	Name	Signature	Date
Student			
Major Professor			

Student and major professor should complete indicated sections. Dairy Science Graduate Committee will verify that all departmental requirements have been met and request the Exam Warrant from the Graduate School.

SEMINAR PRESENTATIONS

List Seminar presentations. Signature of Major Professor verifies satisfactory completion.

Date	Title	Location/Group	Major Prof. Signature

GRADUATE DEPARTMENTAL SEMINAR (Dy Sci 900, Section 1, each Spring)

Fill in Semesters taken and grade. Last column is for Committee Use.

Semester	Grade	OK (Office Use)

Checklist of requirements (For Office Use Only). Student should use this as a guide, but leave the **OK column blank for office to use.**

	Requirement	OK (Office)
1.	Completion of all coursework listed on certification form.	
2.	Completion of 30 graduate credits	
3.	Minimum GPA of 3.0	
4.	At least 6 Credits research	
5.	Dairy Science 900, Section 1 each Spring (unless exception by graduate committee chair)	

For any exceptions to requirements, attach evidence of prior approval by Dairy Science Graduate Committee.

For any unsatisfactory evaluations, attach evidence of completion of Dairy Science Graduate Committee-approved make-up requirements.

APPROVED

	Chair, Dairy Science Graduate Committee	Date
Approved:		

APPENDIX A
Faculty Eligibility for Dairy Science M.S. and Ph.D.
Committees

Faculty with Primary Appointment in the Department of Dairy Science (no restrictions)	Faculty with Secondary or Affiliate Appointments in Department of Dairy Science (can be major professor or member of MS committee with 2 other members with Primary Appointment in Dairy Science)	Clinical Faculty and Academic Staff with Primary, Secondary, or Affiliate Appointments in Department of Dairy Science (can be 3 rd member of M.S. committee)
Victor Cabrera	Nigel Cook	Matt Akins
Dave Combs	Dorte Dopfer	Wayne Coblenz
Paul Fricke	Daniel Gianola	Robert Fourdraine
Laura Hernandez	Brian Kirkpatrick	John Goeser
Bruce Jones	Garrett Oetzel	Mary Beth Hall
Pam Ruegg	Theresa L. Ollivett	Ken Kalscheur
Randy Shaver	Jess Reed	Noah Litherland
Michel Wattiaux	Doug Reinemann	Geoffrey Zanton
Kent Weigel	Garret Suen	Wenli Li
Heather White		
Milo Wiltbank		
	Other Tenure-Track Faculty Member at UW-Madison	Other UW-Madison or External Scientist if Approved by Chair of the Departmental Graduate Program

APPENDIX 4 - 2016-2017 Dairy Science Committee Appointments

EXECUTIVE	Kent Weigel (chair), Dave Combs, Paul Fricke, Pam Ruegg, Randy Shaver, Michel Wattiaux, Milo Wiltbank, Victor Cabrera, Bruce Jones
AWARDS	Paul Fricke (chair), Kent Weigel, George Shook, Nancy Hilmanowski
BUDGET	Kent Weigel (chair), Paul Fricke, Michel Wattiaux, Milo Wiltbank, Nancy Hilmanowski, Jessica Cederquist
CALS ANIMAL CARE AND USE	Sandy Bertics, Randy Shaver (alternate)Communications Ted Halbach (chair), Beth Heinze, Nancy Hilmanowski, Kent Weigel, Heather White, Paul Fricke, Alison Wedig
CURRICULUM	Michel Wattiaux (chair), Dave Combs, Ted Halbach, Kent Weigel, Laura Hernandez, Bruce Jones
EXTENSION	Paul Fricke (chair), Victor Cabrera, Pam Ruegg, Randy Shaver, Kent Weigel, Beth Heinze, Matt Akins, Bruce Jones
FACULTY SENATE	Victor Cabrera, Laura Hernandez
GOLF OUTING	Cathy Rook & Ted Halbach (co-chairs), Ric Grummer, Darren Bremmer, Kim Bremmer, Rob Rowbotham, Riley Miller, Bob Rowe, Alison Wedig, Chelsea Brander, Brian Kelroy, Sandy Larson, Jim Hoskens, Kent Weigel
GRADUATE CURRICULUM	Milo Wiltbank (chair), Victor Cabrera, Pam Ruegg, Kent Weigel, Dave Combs, Heather White
GRIEVANCE	Nancy Hilmanowski (chair), Kent Weigel, Michel Wattiaux ¹ , Milo Wiltbank ² , Paul Fricke ³ (¹ undergraduate, ² graduate, ³ faculty/staff)
HERD MANAGEMENT AND USE	Jessica Cederquist (chair), Dave Combs, Randy Shaver, Ted Halbach, Mike Maroney, Milo Wiltbank, Nigel Cook, Harry Momont, Simon Peek, Kent Weigel
INTERNATIONAL	Victor Cabrera (chair), Michel Wattiaux, Pam Ruegg, Kent Weigel, Paul Fricke, John Ferrick
MENTOR (AKINS)	Paul Fricke (chair), Dave Combs, Victor Cabrera, Wayne Coblentz, Kent Weigel
MENTOR (WHITE)	Milo Wiltbank (chair), Paul Fricke, Randy Shaver, Lou Armentano, Alan Attie, Kent Weigel
SCHOLARSHIPS	Kent Weigel (chair), Michel Wattiaux, Dave Combs, Ted Halbach
SOCIAL	Paul Fricke (chair), Cathy Rook, Nancy Hilmanowski, Tiago Barros, Liz Remick, Maria Jose Fuenzalida