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INTRODUCTION

This document presents the policies of the Department of Animal Sciences that relate to graduate students that pursue a Masters (M.S.) degree or a Doctor of Philosophy (Ph.D.) degree in Animal Sciences and is intended to supplement the Graduate School Handbook of The Ohio State University (http://www.gradsch.ohio-state.edu/Depo/PDF/Handbook.pdf). Policies established in that handbook will be referenced when appropriate and therefore are not repeated in this Handbook. Students pursuing a professionally-oriented Masters of Animal Sciences (MAS, non–thesis) should refer to the MAS Handbook (in approval process).

The guidelines provided in this document establish policy regarding such factors as appointments, time commitments, work loads, and benefits with the aim of establishing uniform and equitable Departmental appointment and employment practices for graduate students.

STATEMENT OF GOALS

The mission of the graduate program is to attract and train intelligent and highly motivated students to become highly proficient contributors to society throughout their careers. The attributes necessary to achieve this goal are instilled in various ways. Basic knowledge of the sciences and their application to questions regarding function, management, and use of animals is imparted in formal courses offered both within the Department and in departments offering graduate level courses in the biological, mathematical, and statistical sciences. Through coursework, graduate students are required to develop the necessary depth in their given discipline of study and are also encouraged to acquire breadth in their understanding of the field of animal sciences to properly prepare them for careers in this field.

Growth and versatility of students as scientists are fostered by having them work, at all phases of the scientific process (e.g. research, teaching), with faculty who are actively engaged in research.

Every opportunity is given to students to hone their abilities to communicate effectively. All serve as teaching assistants and are required to prepare and deliver seminars. Many of the graduate level courses in the Department require the writing of extensive papers and presentation to other students enrolled in the course. All are required to prepare written proposals for the research they will perform in pursuit of their degree. Annual reviews of progress are conducted to ensure students are on track to graduate in a timely manner.

Appropriate ethical behavior and the ability to make appropriate decisions regarding ethical matters is conveyed primarily by the example set by faculty. However, such training is also conveyed more explicitly in formal and informal meetings of faculty and students and in portions of formal courses offered by the Department.

FIELDS OF STUDY

Degrees Offered

The Graduate Program in Animal Sciences offers both the Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees. Training is offered in both applied and basic aspects of animal sciences. Faculty members conduct research in genetics, tissue biology, meat science, physiology, nutritional sciences, immunology, environmental nutrient management, animal welfare, and microbiology.

The M.S. degree is designed to provide academic training beyond the Bachelor of Science (B.S.) degree in preparation for further graduate education or careers in research, industry, or extension. The primary
objective of the Ph.D. program is to prepare students for positions that: 1) involve application of knowledge to various aspects of the animal enterprise, 2) are devoted to pursuit of knowledge in the discipline in which the student was trained, or 3) are in the research segments of industry or various agencies of government. It is the expectation that all graduates will be capable of producing scientific output of high quality and in desirable quantity for a prolonged period of time.

APPLICATION, ADMISSION, REGISTRATION, SCHEDULING
Graduate School Handbook Sections II & III

Application & Admission
Admission to the Department of Animal Sciences Graduate Program is competitive and selective. We strongly encourage applicants to follow the application procedures outlined below to be considered for admittance to the Animal Sciences Graduate Studies Program. Because admission is dependent upon an available faculty advisor, applicants who have not made personal contact with faculty members prior to or during the application process may not be admitted.

Therefore, applicants should:

- Review research areas (http://ansci.osu.edu/research/) within the Department
- Identify research area(s) of interest
- Review faculty profiles (http://ansci.osu.edu/faculty/)
- Contact faculty members to discuss research and study opportunities
- Apply to the University Graduate School on-line through the OSU Graduate Admissions Office (http://www.gradsch.ohio-state.edu/applying-to-ohio-state.html)

Alternatively, applicants expressing an interest in doing graduate training in a particular area may be contacted by a professor in the area of their interest. If no area(s) of preference is indicated, the likelihood of admission will be substantially diminished.

To be considered for admission, students must have earned a B.S. or equivalent or professional degree from an accredited college or university and have a minimum of a 3.0 cumulative point-hour ratio (based on a 4.0 scale) in all previous undergraduate and graduate work. The Graduate Record Examination (GRE) is required, with a score of 300 (verbal plus quantitative; 1000 under previous scoring) or greater required. Students not meeting these requirements may be considered for conditional admittance. An additional requirement for international applicants includes a minimum score of 550 on the paper-based Test of English as a Foreign Language (TOEFL), 79 on the internet-based TOEFL, 82 on the Michigan English Language Assessment Battery (MELAB), or 7.0 on the International English Language Testing System (IELTS).

After a complete application is received, decisions regarding admissability into the graduate program are typically made at the next monthly meeting of the Graduate Studies Committee (GSC). In general, applicants who have identified an advisor who is willing to accept the applicant, and meet the criteria for admission will be categorized as admissible, with the final notification of admission dependent upon confirmation by the advisor that funding to support the student is available. In occasional cases students are permitted to self-fund themselves if this approach is approved by their advisor. Faculty will be notified of the decision by the GSC on students they wish to admit within 1 to 2 days and the expectation is that they will respond to the GSC Chair and Coordinator within 2 weeks regarding funding and final acceptance. For exceptional applicants that have not identified a potential advisor(s) at the time of review of their application, the Graduate Program Coordinator (Ms. Debra Gallagher, gallagher.7@osu.edu) will notify faculty with relevant
interest in their area of study. This notification will include the student's area of interest, grade point average, GRE scores, TOEFL score, home country, and previous universities they have attended. Complete applications can be provided via email to interested faculty. If no interest is expressed for this student within 2 weeks, the student will be denied admission.

Recommendations for admission by the GSC on an individual applicant may be for regular, conditional or provisional status. The respective meanings are explained in Section II.4 of the Graduate School Handbook. The conditions to be fulfilled by the student will be defined by the GSC of the Department of Animal Sciences. The change from a conditional to regular status is automatic if the student has fulfilled the conditions given at the time of admission, is in good academic standing, and has met satisfactorily the general expectations for Animal Sciences graduate students.

**Continuing from an M.S. obtained in Animal Sciences to a Ph.D. program**

Students obtaining their M.S. degree in the Department of Animal Sciences who wish to proceed in the Ph.D. program of the Department must submit a request in writing to the GSC. This letter should be accompanied by a completed graduate program transfer form (http://www.gradsch.ohio-state.edu/Depo/PDF/TransferGradProgram.pdf). In addition, letters from the advisor and each member of the Graduate Advisory Committee must be provided. In the letters, the Advisor and Committee should explain why the student should be considered for the Ph.D. program. **This information should be submitted at least one semester prior to the anticipated time of graduation.**

**Registration & Scheduling (Section III - Graduate School Handbook)**

**Transfer Credit**

Graduate credit earned at another university may be transferred to this University. However, there are limitations and restrictions on the number of credits that can be counted (See Sections IV.2, VI.1 [M.S. students] and VII.2 [Ph.D. students] of OSU Graduate Handbook). In this case, there are specific residency requirements that must be met through coursework at OSU. The following minimum conditions must be satisfied to transfer graduate credit:

1. Graduate credit was earned as a graduate student at an accredited university
2. A minimum grade of "B" or satisfactory was earned in each course to be transferred
3. The GSC approves the transfer

**Course Credits**

The Department stipulates a minimum course load of three credit hours per semester for all graduate students that are not employees (0.75 – 1.0 FTE) of the Department of Animal Sciences. Students (M.S. and pre-candidacy Ph.D. students) that are receiving an associateship or fellowship must register for 16 credits each semester and 8 credits each summer session. Coursework taken during the May session will count towards the total of the summer session. Full-time enrollment for post-candidacy Ph.D. students is 3 hours, and hours in excess of 3 can only be taken in special circumstances and by permission of the OSU Graduate School.

A student pursuing the M.S. degree must earn a minimum of 30 graduate credit hours and 80% of these required credit hours must be completed at OSU over a period of at least 2 semesters. A student must be registered for at least 3 graduate credit hours the semester or summer session in which graduation is expected.
A Ph.D. requires a minimum of 80 graduate credit hours beyond the baccalaureate degree. If an M.S. has been earned at another institution, it must be transferred to OSU and a minimum of 50 graduate credit hours beyond the Master’s degree is required. If the student earned an M.S. at OSU, coursework beyond that required for an M.S. can be counted towards this minimum (Section VII.2). A student must be registered for at least 3 graduate credit hours during the semester(s) or session(s) of the candidacy examination and the semester or session of the final oral examination. Students are also required to be enrolled in a minimum of 3 hours in the semester or session of expected graduation, except when they meet the “End of Semester or Summer Session” criteria (Section VI.5). The residency requirement (Section VII.2) must be fulfilled after an M.S. or after the first 30 hours of graduate credit is earned. This requirement includes a minimum of 24 graduate credits earned at OSU, 2 consecutive pre-candidacy terms (2 semesters or a semester and summer session) of full-time enrollment at OSU and a minimum of 6 credits over 2 terms (2 semesters or a semester and a summer session) after admission to candidacy.

Specific Course Requirements

Research Credits (ANIMSCI 8998 and 8999)

Research credit hours represent work that students are completing towards their research degree. Students working on an M.S. degree must register for ANIMSCI 8998, whereas students earning a Ph.D. register for ANIMSCI 8999.

Seminar (ANIMSCI 8881, 8880, 8882, 8883, 8884, 8885, 8888)

All graduate students are expected to enroll and participate in the Animal Sciences 888x series of seminars each semester. Refer to page 7 of this document for specific seminar presentation requirements. During Autumn semester the general seminar, 8881, is offered and all graduate students must register for this course. Disciplinary seminars (8882, 8883, 8884, 8885 and 8888) will be offered each Spring semester and students must enroll in one of these courses each Spring semester. An interdisciplinary seminar (8880) is offered in the Spring for students located in Wooster. Seminar in other departments may be substituted during Spring semester if pre-approved by the student’s advisory committee. There is no seminar requirement for Summer Session.

Scientific Philosophy and the Work of Scientists (ANIMSCI 8000)

All Ph.D. students are required to take this course within the first year of their program. This is not a requirement for M.S. students.

Recommended Course Sequence in Statistics

A variety of statistics courses exist for graduate students and specific courses should be based upon the student’s prior coursework and the recommendations from the advisory committee. For students that have only undergraduate statistics/data analysis courses, the GSC recommends the following sequence:

PLNTPTH 5550 - Quantitative Methods for Agricultural Scientists
-for basic statistical methods and procedures

ANIMSCI 7000 - Applied Biometrics
-to develop skills for analyses of biological data through SAS
HCS 8887 - Experimental Design
-an optional course to provide additional depth in design of biological experiments

The hours counted toward the degree will consist of graded course work (4000 level and above except for Animal Sciences courses which must be 5000 level or greater), as well as research (8998 and/or 8999) and seminar credits. No specific combination of coursework and 8998/8999 credit is required. Most students typically complete a core of courses ranging from 15 to 40 credit hours in areas required to meet the training needs of their research discipline. The general and discipline specific learning goals for the Animal Sciences Graduate Program are outlined in Appendix A of this document. The specific courses to be included are initially determined by the advisor with input from the graduate student. This coursework plan should then be reviewed and approved by the student’s advisory committee at its first meeting. The courses to be taken will largely depend upon the nature of the research to be completed, the student's former academic record, and the professional goals of the student. It is also recommended that the student’s curriculum include a minimum of two graduate level Animal Sciences courses (5000 level or greater) that are outside the student’s discipline to increase their breadth of understanding of the animal sciences. This component of coursework may not be necessary for students that enter the Animal Sciences graduate program with previous breadth at the graduate level in other disciplines of the animal sciences. Some of the potential courses to fulfill this category are listed below.

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<th>Course #</th>
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<td>5032</td>
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<td>5070</td>
<td>Nutritional Immunology in Animal Systems</td>
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<td>5100</td>
<td>Advanced Growth and Development</td>
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<td>5530</td>
<td>Comparative Animal Nutrient Metabolism</td>
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<td>6060</td>
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<td>6067</td>
<td>Physiology of Lactation</td>
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<tr>
<td>6090</td>
<td>Anaerobic Microbiology</td>
<td>3</td>
</tr>
<tr>
<td>7730</td>
<td>Advanced Topics in Ruminant Nutrition</td>
<td>3</td>
</tr>
<tr>
<td>8780</td>
<td>Molecular Biology Techniques</td>
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Graduate courses in the Department of Animal Sciences are not available for "Credit by Examination” (EM). Students are allowed to repeat a course if they received below a "B” and their advisor thinks it would be beneficial for the student.

All graduate courses in the Department of Animal Sciences are graded "A-E" except seminar (888x series), special projects (6193, 6194, 8193, 9193), and research credit (8998 or 8999). These courses are graded either Satisfactory (S) or Unsatisfactory (U). It is imperative that continuing students schedule classes as soon as registration opens to avoid substantial late fees assessed by the University, as well as to guarantee a place in class.

**Academic Standards**

Students must meet the minimum 3.0 cumulative grade point average and reasonable progress towards the requirements outlined in the *Graduate School Handbook*, Section V.1. The GSC will periodically review grades and reasonable progress.
Permanent Record

The Department of Animal Sciences maintains a confidential file on each graduate student. This file contains: 1) letters of recommendation and the previous transcripts, 2) courses taken and grades earned, 3) courses taught or assisted along with letters of evaluation by the professor in charge, 4) seminars given, 5) advisory committee approval, 6) approved research proposal, 7) proposed plan of study and expected completion date, 8) annual evaluation reports, and 9) thesis defense and candidacy examination results.

Communication

Graduate students are required to be included in the Animal Sciences graduate student listserv. Important information is distributed via this route. To activate your OSU Internet Username and create a password, go to: www.oit.ohio-state.edu and click on “Activate OSU Internet Username”, then follow the prompts. An OSU Internet Username takes the form lastname.#, for example, gallagher.7.

GENERAL EXPECTATIONS

Participation in teaching and research programs of the Department are essential components of the student’s training. The major professor of each student has the responsibility for evaluating the student’s research activity. The professor teaching each course in which the student assists has the responsibility of evaluating the performance of the student as a teaching assistant and working with the student to improve the student’s teaching skills. Graduate students should also feel free to discuss their performance with the professor.

All graduate students are encouraged to participate in activities beyond those directly related to their teaching and research responsibilities. Such activities include seminars, clubs (especially the Animal Sciences Graduate Student Association), committees, extension education and other forms of support contributing to Departmental missions.

There is an expectation that all graduate students in the Department of Animal Sciences will conduct themselves in a professional and respectful manner. Students are referred to the OSU Student Code of Conduct (http://studentaffairs.osu.edu/cse/). If a student has questions regarding this standard, they should discuss this with their Advisor. Noncompliance with the code may justify dismissal from the program.

Health and Safety

Refer to the Department of Animal Sciences document entitled Department of Animal Sciences Employee Health and Safety Information. At OSU, employee health and safety is a primary concern. As a result, Employee Health Services, Environmental Health and Safety, and the Office of Responsible Research Practices require training and health monitoring, dependent on individual job responsibilities, to protect not only the employee, but also research subjects (both human and animal). This document includes training and health registration requirements for OSU employees, and a checklist is provided to help with deciding which requirements are applicable to you. Detailed instructions are included for accessing online training and reporting documents.

The United States Department of Agriculture has determined that all individuals at The Ohio State University who are involved with biomedical research must complete Animal Care and Use Training. An online course is available through the Office of Research, University Laboratory Animal Resources (ULAR) at https://r1.osu.edu/secure/education/. For questions regarding the educational requirements or courses offered contact the Office of Responsible Research Practices (ORRP) at (614) 688-8457 or www.orrp.osu.edu.
Research safety training is required for all graduate students. The Office of Environmental Health and Safety (http://ehs.osu.edu/) offers on-line tutorials to fulfill training requirements. Students working in laboratories with hazardous chemicals must complete Lab Standard Training. Individuals working in laboratory environments that do not meet requirements of the OSHA Laboratory Standard are required to complete Hazard Communication for Laboratory Personnel. All others are required to complete Generic Hazard Communication Online for all non-laboratory personnel. The laboratory safety training requirement also includes specific training for activities particular to an individual workgroup or laboratory. Upon completion of online training, print out the final pages of the module, retain the original and submit a copy to your unit or laboratory training coordinator. You are also required to familiarize yourself with the Department of Animal Sciences Hazard Communication Program and the Chemical Hygiene Plan as amended for the laboratory/unit in which you are working.

The Occupational Health Registry must be completed by individuals working with animals or in a research laboratory. This is a risk assessment that is evaluated by Environmental Health and Safety to determine if there may be a need for the employee to be seen by Employee Health Services to monitor health. The form can be accessed at https://rf.osu.edu/secure/ochre.

Occupational Health and Safety training is required for all persons at the university where a risk assessment indicates that your work will bring you into potential contact with chemicals, biological agents, or materials that may be hazardous. The objective of this training is to help you recognize these hazards and to prevent harmful exposures to them. The training must be retaken every 3 years. The course is available through the Office of Research at https://rf.osu.edu/secure/education/.

OSU employees must complete Building Emergency Training, OSU BEAP (EOEP) which provides an overview of the University wide plan describing what to do in the event of an emergency. Topics covered in the tutorial include evacuation plans, severe weather emergencies, fires, bomb threats, utility outages and workplace violence. The online course is available through The Office of Environmental Health and Safety at www.ehs.osu.edu.

Building Emergency Action Plans, BEAP, have been developed for each building. Familiarize yourself with the plan for your building. Find the plans on the Animal Sciences website: www.ansci.osu.edu, or see the Building Coordinator.

In the event of a work related injury, follow the requirements of the OSU employee accident reporting system. Seek appropriate treatment (for non-emergencies refer to form for treatment sites) and complete an accident report using the guidelines provided (http://hr.osu.edu/forms/accidentrpt.pdf). Submit a copy of the completed report to the Department Safety Coordinator, Ms. Ann Ottobre, 101 Plumb Hall.

**Teaching Assignments**

All students are assigned teaching experiences as part of their degree requirements. The minimum degree requirement for all students is at least one course as TA for M.S. students and two as TA for Ph.D. students. Assignments may relate to teaching or extension activities. Students receiving associationships will be required to participate in additional assignments as part of their 20 hours per week service to the Department. Teaching assignments are made by the GSC.

**Seminars**

An M.S. student is required to give one full-length seminar (35 to 40 minutes) or two meeting format presentations (i.e. patterned after a platform presentation as a scientific meeting; 10-12 minutes) in the general seminar course (ANIMSCI 8881). In addition, an M.S. student is required to give a second seminar
of a comprehensive nature on their research preceding their final M.S. examination.

A Ph.D. student is required to give one full-length seminar (30 to 40 minutes) or two meeting format presentations (10-12 minutes) in the general seminar course (ANIMSCI 8881) prior to admission to candidacy and a second seminar of a comprehensive nature on their research preceding their final Ph.D. examination.

The seminar presented prior to the final examination is referred to as an “exit seminar” and is typically presented during the hour preceding the thesis/dissertation defense. Students should submit the date, time and title of their seminar/exam to the Graduate Coordinator at least a week in advance so that a notice can be sent to Departmental personnel. **The above seminar requirements are the minimum, and M.S. and Ph.D. students are often expected to present additional seminars at the discretion of instructors in the 888x seminar series.** We encourage students to embrace these opportunities to give seminars, as this is an essential aspect of graduate student training.

**ADVISORS, COMMITTEES, RESEARCH PROPOSALS and ANNUAL EVALUATION**

The graduate student - graduate faculty advisor relationship is established by mutual consent between the advisor and the student and is developed before the student's acceptance into the graduate program. Decisions regarding requests for changes in advisor are made by the GSC. Information regarding committees and their structure are listed below and in the Graduate School Handbook.

**Graduate Advisory Committees**

The advisor, in consultation with the student, will identify members of the Graduate Advisory Committee. The student is responsible for contacting potential committee members to determine if they are willing to serve on their graduate committee. The overall role of the Graduate Advisory Committee is to provide guidance to the graduate student throughout the course of graduate study and to ensure that the program is of sufficient rigor to warrant a graduate degree. The form to be used for this is attached as Appendix B. In the section of this form that requests a “Brief Statement of Research Problem”, be sure to include enough information for the GSC to be able to deem the appropriateness of your proposed committee (not just the title or one or two sentences). To request membership for OSU Graduate Faculty outside of the Department, it is important to indicate their home department. If this person is not affiliated with OSU, it is necessary to petition their inclusion on the committee as described below.

**Advisory Committee Composition**

**M.S. Advisory Committee:** The minimum number of committee members, including the advisor, is three, and the committee should provide for both expertise in the specific area of study and some breadth of expertise to broaden the student’s awareness of diverse scientific principles. The Advisory Committee must include a minimum of two OSU Graduate Faculty members; including the advisor. The student will consult with their advisor regarding the makeup of the committee. After consensus is achieved and the faculty members have agreed to serve, the student completes the Graduate Advisory Committee Form and provides this to their advisor. The advisor will then submit this form to the GSC by the end of the student’s first semester of enrollment for evaluation by the GSC. The GSC will evaluate the committee make-up for appropriateness with respect to the proposed research focus of the student, and the GSC may make suggestions for alternative or additional committee members.

**Ph.D. Advisory Committee:** The minimum number of committee members, including the advisor, is four. The Advisory Committee must consist of a) a minimum of three OSU Graduate Faculty members including the advisor and b) one member must be from an OSU department other than Animal Sciences or from an
entity external to OSU. This second requirement may be waived if the advisor and student can provide compelling justification for having a Ph.D. committee limited to only Animal Sciences faculty. The student will consult with their advisor regarding the makeup of the committee. After consensus is achieved and the selected faculty members have agreed to serve, the student completes the Graduate Advisory Committee Form and provides this to their advisor. The advisor will then submit this form to the GSC during the second term (semester and/or summer session) of enrollment for evaluation by the GSC. The GSC will evaluate the committee make-up for appropriateness with respect to the proposed research focus of the student, and the GSC may make suggestions for alternative or additional committee members.

**Ph.D. Candidacy Exam Committee:** In many cases, the same Advisory committee will administer the candidacy exam for the student. However, it is important to note that the Graduate School has a requirement for four, rather than three, members of the Graduate Faculty at OSU (including the advisor) for the Candidacy Exam Committee. Therefore, if the Advisory Committee only has the minimum of three Graduate Faculty members from OSU, it will be necessary for the advisor and student to recruit an additional OSU Graduate Faculty members to fully participate in both the written and oral portions of the Candidacy exam. This additional member that will be recruited for purposes of the Candidacy exam should be indicated as such on the Graduate Advisory Committee Form.

**Committee members that are not Graduate Faculty of OSU:** The inclusion of committee members who are not OSU Graduate Faculty may be acceptable. Approval of these members is achieved through petition to the GSC and subsequent approval by the Graduate School. Outside experts do not need to hold Adjunct Faculty appointments to serve on an Advisory Committee. The procedure for making such a request is initiated by the student and their advisor at the time they are preparing the Graduate Advisory Committee form. A *Petition Form Graduate Committee and Examinations* must be submitted by the student (available at: [http://www.gradsch.ohio-state.edu/Depo/PDF/Committee_and_Exam_Petition_form.pdf](http://www.gradsch.ohio-state.edu/Depo/PDF/Committee_and_Exam_Petition_form.pdf)). The CV of the outside expert should be submitted to the GSC in conjunction with the petition. The GSC will evaluate the request and the CV. If the GSC is supportive of this arrangement, the GSC will forward the petition along with the expert’s CV to the Graduate School.

**Research Proposal**

Upon approval of the Advisory Committee by the GSC, the student, in consultation with their advisor, will submit a research proposal to the Advisory Committee and schedule the initial committee meeting. The research proposal of Ph.D. students is expected to represent a more thorough series of experiments than the proposal of M.S. students. Research for the Ph.D. is expected to test a more comprehensive set of hypotheses.

The research proposal is to be submitted to the Advisory Committee during the second term (semester and/or summer session) of enrollment for M.S. students and the third term (semester and/or summer session) of enrollment for Ph.D. students. The research proposal should be prepared in close consultation with the major professor and include the hypothesis, specific objectives, rationale, and general approaches for the proposed research. When the research proposal is distributed to the Advisory Committee members, a date will be set for an Advisory Committee meeting. At this meeting, the Advisory Committee will determine if the proposal itself, the proposed research objectives and the proposed coursework of the student are sufficient for completion of the degree. A copy of the research proposal along with a signed cover page (Appendix C) indicating approval by all committee members of the research and coursework plan of the student must be submitted to the Departmental GSC by the end of the second or third semester of enrollment for M.S. and Ph.D. students, respectively. If the committee indicates that the Research Proposal is not acceptable, the
student will have one month to submit a revised proposal and gain approval. For Ph.D. students, the approved research proposal **must** be submitted to the GSC before scheduling of the candidacy exam.

**Deviations from approved Research Proposals or Advisory Committee Forms**

Occasionally, circumstances warrant the redirection of a M.S. or Ph.D. program’s research focus. However, to maintain rigor and consistency across the Department’s entire graduate program, deviations in committee structure must be approved by the GSC in response to a revised Graduate Advisory Committee form. This form should be submitted for evaluation immediately and well in advance of scheduling the Candidacy Exam for Ph.D. students or Final Oral Exam for either the M.S. or Ph.D students. If the research objectives change significantly, the student and advisor should prepare a modified research proposal that is signed by the Advisory Committee and submitted to the GSC for placement in the student’s permanent file.

**Enforcement**

Failure to submit the required form and research proposal (or modified form and proposal, if it deviated from the prior submissions—see previous section) to the GSC may result in withdrawal of Departmental funding to the student and jeopardize the chances of funding for future students of the advisor. **Doctoral students will not be permitted to begin the candidacy exam until a fully approved research proposal has been submitted.**

**Forms**

Most forms referred to in this document and included in the appendix can also be found in electronic format at: [http://www.gradsch.ohio-state.edu/forms-library.html](http://www.gradsch.ohio-state.edu/forms-library.html).

**Annual Review**

All students are required to submit an annual review form, signed by both the student and their advisor, at the end of Spring semester each year, regardless of starting date for their program. (See Appendix D)

**MASTER OF SCIENCE PROGRAM**  
*Graduate Studies Handbook Section VI*

**Degree Offered**

The Department of Animal Sciences offers a thesis-based M.S. program, as well as a non-thesis Masters degree (MAS described in a separate handbook). Degree requirements for an M.S. involve both research and teaching. The type of research will depend upon the field of interest.

**Course Requirements**

The courses required will be highly dependent on the area of research, the previous coursework that the student has completed and career goals of the student. The curriculum will be determined by the advisor, with input from the student, and will subsequently be assessed and approved by the student’s Graduate Advisory Committee.

**General Expectations**

It is recognized that backgrounds, interests, and aspirations of students in the M.S. program are varied. Those to whom the M.S. degree will be awarded are expected to possess a common core of knowledge and
intellectual competence. To this end the Graduate Faculty expect all successful candidates to have attained:

1. A basic understanding of chemistry, physics, and mathematics
2. A sound general knowledge of biology, organic chemistry, biochemistry, microbiology, anatomy, physiology, and genetics
3. An appreciation and understanding of the scientific method

A more complete description of expected learning goals is provided in Appendix A.

A final exit seminar is required. This seminar must summarize the research completed and be open to all members of the Department of Animal Sciences.

**Master of Science Examination**

A draft thesis **must** be presented to all members of the M.S. Examination Committee at least one week prior to the scheduled final oral examination. The M.S. Examination typically focuses on the thesis problem, but also tests the student’s knowledge of related areas. The exam shall be scheduled for a full 2 hours, not including the exit seminar presentation. An additional 30 minutes must be added to the exam in the event that a member is joining the exam via video conferencing. Students must request permission for a video conference (http://www.gradsch.ohio-state.edu/Depo/PDF/Committee_and_Exam_Petition_form.pdf). The exam is closed, and only members of the committee may be in attendance. Unanimous approval by the Advisory Committee is required for satisfactory completion of the M.S. examination. For information about the thesis and its submission see the Graduate School Handbook, Section VI.4.

**Time Limits**

An M.S. student should have at least half of the curriculum that has been approved by the Advisory Committee completed by the end of the first year. As outlined above in the Policy on Graduate Advisory Committees, the project proposal should be approved by the end of the second term. The duration of an M.S. program is approximately 2 years. A student must finish an M.S. degree within 6 years after starting the M.S. program. Time limit guidelines have been established for students holding associateships or fellowships (see Associateships section below).

**Publications**

A thesis is expected to contain a comprehensive review of the literature, rationale for the experimentation, objectives, experimental design, results, and discussion (Guidelines for Formatting Theses, Dissertations and D.M.A. Documents, http://www.gradsch.ohio-state.edu/Depo/PDF/Guidelines.pdf). Preparation of a manuscript for submission to a peer-reviewed journal is strongly encouraged.

**DOCTOR OF PHILOSOPHY PROGRAM**

*Graduate School Handbook Section VII*

**General Expectations**

An M.S. degree in the Animal Sciences or a related discipline should be earned prior to beginning the Ph.D. program. Exceptional undergraduate students will be considered for direct entry into the Ph.D. program.

All students are required to participate regularly in the Departmental seminar program. The ability to organize and present complex material and ideas in a well-ordered and lucid manner must be demonstrated by the completion of a worthy dissertation and a final exit seminar, open to all members of the Department of
Animal Sciences, which summarizes the research completed for the Ph.D.

**Candidacy Examination**

The Candidacy Examination is both written and oral. The written portion is administered by the Advisory Committee. The standard format for the written exam is that each committee member will be asked to submit questions related to the student’s research area and/or regarding concepts in which they feel the student should be proficient; as a result of either coursework or informal training. The members should submit a bank of questions that they feel should be completed in 8 hours by the student. Students will receive questions from an individual committee member at 8 am on a prearranged day and must submit final answers to their advisor by 5 pm the same day. The return time of these answers should be verified by either an email posting time or by the advisor in writing. Questions can be “open book” or “closed book”. For open book questions, the references that the student can use must be delineated (e.g. full internet access; access to a set of reference materials supplied by the committee member, etc.). For closed book questions or limited access open book questions, the GSC will provide the student with a computer with no internet access capability (no Wi-Fi card) to complete their exams except in cases where the student wishes to write their answers. Regardless of open or closed book exams, students should be provided a quiet room in which to work with minimal interruptions. For closed book or limited access exams, there can be no other computers located in this space and the student will surrender their cell phone and other mobile devices to their advisor or designee for the duration of the exam. Lunch should be consumed on site for closed or limited access exams. The entire written candidacy exam must be completed in a maximum of two weeks.

The oral portion is administered by the Advisory Committee and may also include a Graduate School Representative if it is a second attempt to enter candidacy. The Candidacy Examination is designed to test the student's knowledge and ability to relate and apply knowledge in his or her field. The oral exam is attended only by members of the Candidacy Exam Committee and is limited to 2 hours. An additional 30 minutes must be added to the exam in the event that a member is joining the exam via video conferencing. Students must request video conference as described in the OSU Graduate Handbook using the petition form (http://www.gradsch.ohio-state.edu/Depo/PDF/Committee_and_Exam_Petition_form.pdf). Successful completion of the examination requires a unanimous vote of satisfactory by all members of the Committee. In the event that the examination is deemed unsatisfactory, refer to Section VII.4 of the Graduate School Handbook.

After the Candidacy Examination is successfully completed, the student may only register for three (3) credit hours per semester. Exceptions to this are rare but can be petitioned by the advisor to the GSC and the Graduate School.

**Dissertation**

The Department requires an in-depth dissertation research project carried out in accordance with the guidelines outlined in this document. The Ph.D. dissertation should exhibit original and independent thought and describe research that is designed to address a specific issue in the discipline area. A *draft of the dissertation must be approved by all members of the Final Oral Examination Committee at least 14 days before the scheduled examination. In order to permit the committee members adequate time to review the draft, it should be delivered to the committee members a minimum of 3 days before this deadline.* For additional information about the dissertation, see Graduate School Handbook, Section VII.9.

**Final Oral Examination**

The Final Oral Examination is given at least 14 days after the student’s Advisory Committee has approved the dissertation draft. The Advisory Committee plus a Graduate School Representative administer this
examination. This exam is not only to defend the dissertation but is also to determine the student's ability to synthesize independent thought and to logically interpret experimental results. The exam shall be scheduled for a full 2 hours, not including a seminar presentation. An additional 30 minutes must be added to the exam in the event that a member is joining the exam via video conferencing. Students must request video conference (see http://www.gradsch.ohio-state.edu/Depo/PDF/Committee_and_Exam_Petition_form.pdf). Only members of the committee may be in attendance at the exam. See VII.6 of the Graduate School Handbook for specific requirements. The satisfactory completion of the examination requires agreement of all members of the Committee including the Graduate School Representative.

**Time Limits**

Generally, the first year of a Ph.D. program will include course work, Advisory Committee selection, approval of the plan of studies (courses to be taken), development of a research proposal for a dissertation problem of originality and merit, and active participation in ongoing research work. The second year should yield progress toward conducting that project, completion of course work and passing of the Candidacy Examination (See Policy on Graduate Advisory Committees section (above) for more details). The third year would likely be the culmination of the program with the final defense of the thesis and publication of the research results. For exceptional students that enter the Ph.D. program without an M.S. degree, the typical duration of a Ph.D. program would be 4 to 5 years. Time limit guidelines have been established for students holding associateships or fellowships (see Associateships section below). If a student fails to submit the final copy of the dissertation to the Graduate School within 5 years of being admitted to candidacy, the candidacy is canceled.

**Publications**

The scholarly pursuit of a Ph.D. degree should produce original and useful knowledge. Papers drawn from this dissertation should be submitted for publication in a peer-reviewed journal.

**FINANCIAL AID**

Fellowships, along with half-time and quarter-time graduate associateships, are available through the Department and University for outstanding graduate students. Information regarding various fellowships is distributed to qualified individuals approximately one month prior to the deadline for application/nomination. Some first-year fellowships have an application deadline of January 7th (November 30 for international applicants). Stipends for graduate associateships vary from year-to-year but are competitive with other leading institutions. Application for admission also constitutes application for graduate associateships; however, specific additional information may be required for certain fellowships.

**Cost of Study**

Current tuition and fees per semester for full-time study (16 semester hours) are listed in The Ohio State University Graduate School Bulletin. Tuition (University fees) is covered by the Department, University, or funds of the advisor for those on graduate associateships and fellowships.

**Cost of Living**

University housing in dormitories or apartments is supplemented by reasonable private off-campus housing. Limited graduate student housing is available at Wooster.
GRADUATE ASSOCIATE/FELLOWSHIP POLICIES
Graduate School Handbook Section XI & X

Associateship Offer

Associateships are awarded at the discretion of the Chair of the Department of Animal Sciences. Primary considerations in such decisions are the qualifications of the applicant and the productivity of the advisor. In addition, the Chair also takes into account the number of departmentally funded students that an individual professor has and the date funded students are anticipated to finish. Provision of supplemental support from soft-money is encouraged. Requests for funding should be submitted in writing to the Department Chair.

Note about Worker’s Compensation

Students on assistantships must report any work related injury or illness within 72 hours. If medical treatment is needed, you should go to either the Employee Health Services or Student Health Services. Please take an Employee Accident Report with you. Contact the Graduate Program Coordinator to receive guidance on how to proceed in this instance.

Fellowship recipients are not eligible for Workers' Compensation as they are not officially considered as employees of the University. Fellowship recipients are not paid for services, but, rather, have received an award to support their training. If fellowship recipients are injured while performing fellowship duties, it is not a work-related injury (i.e., fellowship recipients do not work for the University). **These injuries should not be reported as work-related.**

Fellowship recipients should contact their health insurance carrier if they are injured while performing fellowship duties. If an insurance company needs proof of lack of Workers' Compensation coverage for fellowship recipients, the student may request a letter stating this policy from the Workers' Compensation Office at The Ohio State University.

Tax

Students holding graduate research associateships have tax withheld from each monthly paycheck. Those holding graduate fellowships, however, must file their taxes quarterly. For additional information, please contact the University Office of Human Resources or visit [http://www.state.oh.us/tax/](http://www.state.oh.us/tax/).

Time Limits

Associateship contracts are normally one year in duration with the expectation that the appointment will be renewed to cover a total of 2 years for M.S. degree candidates and a total of 3 years for Ph.D. degree candidates. For Ph.D. students that did not previously earn an M.S., the time limit is 4 years. Extension of associateships beyond this for direct enrolled Ph.D. students is at the discretion of the Department Chair. When 150 hours of credit are earned by the graduate student, the GSC Chair, Department Chair, and Associate Chair will be notified. When 174 hours are reached, the student and advisor will be warned that the student’s associateship will not be renewed unless extenuating circumstances exist. An expected graduation date will be negotiated with the Chair. At 200 hours or the next contract period, whichever comes first, the student will be ineligible for an associateship.
The Departmental GSC and the Department Chair reserve the right to dismiss a student from the program, or fail to renew an appointment, at any time when a student is not in good standing with either the Department or the Graduate School. To be in good standing, the student must have: at least a 3.0 cumulative grade point average, satisfactory job performance, sufficient progress toward completion of the degree, and the support of an academic advisor. Decisions to not renew a contract will be communicated in writing at least 2 weeks prior to termination of the current contract. Although the GSC will strive to maintain appointments, renewal of an appointment is also dependent upon availability of funds. A student who accepts an associateship appointment in this Department is expected to complete a degree program. This includes publication of the thesis or dissertation research results.

**Stipend and Tuition Waiver**

The stipend paid to Graduate Associates is based on a tiered system. The first-year student working toward a Master's Degree is awarded the first tier. Associates beginning their doctoral studies are awarded the second tier. Students who have passed their Ph.D. candidacy exam are awarded the third tier. A student meeting the criteria for a University Fellowship and having an identified professor may be offered a Doctoral Recruitment award at the UF Fellowship (fourth tier).

Tuition and fees will be waived for all students with 50% (or greater) appointments.

**Percent Time**

Graduate associate appointments can begin coincident with any semester. Start dates are January 1 or September 1 and are typically half-time associateships. The student is expected to report to the Department of Animal Sciences by the first day of his or her initial appointment. Some short term appointments of one and/or two semesters or appointments for 25% time may be made if circumstances warrant. Students appointed for short term or 25% will be considered along with all others for 50% appointments. Please see the separate section regarding 25% appointments. Minimum course loads (credit hours) for international students, Graduate Associates, and Graduate Fellows are stipulated by the Graduate School.

**Expectations**

Graduate associates are expected to devote 20 hours per week to duties and responsibilities in the Department. The advisor and Department Chair will strive to ensure that these responsibilities are met. This work shall include, but not necessarily be limited to: research responsibilities assigned by the student's major professor, assistance in courses taught in the Department (e.g., preparation and presentation of class lectures, work in the class laboratory, counseling of students, and grading papers), and help with various tasks as needed by the Department.

It is expected that students that receive an associateship will not have other employment unless it directly relates to their work and must be approved by the student’s advisor and the GSC. Time consumed by responsibilities of 50% graduate research associate appointments and at least 16 hours of graduate course requirements is deemed to be a reasonable commitment. Note that full time graduate student hours vary from 3 to 16 and that no student is permitted to take over 16 credit hours (8 hours is the maximum for summer semester). Doctoral Candidates can register for only 3 credit hours per semester (see earlier section).

**Fringe Benefits**

Graduate Research Associates at 50% time on yearly appointments will receive 20 working days of vacation per year. An absence form must be completed for all away-from-duty time (illness, professional meetings, vacation, etc.). This absence and the associated form must be approved by the major professor who then
submits it to the Department Graduate Program Coordinator. GRA students are required to report for work every day that the University is open even if no classes are scheduled. This vacation must be taken during the period of their contract. Graduate Research Associates and Fellows may also participate in the University-sponsored insurance programs; 85% of the premiums are paid by the Department with the remainder being deducted from the GRA's paycheck (along with bus, activity, recreation & student union fees). Graduate Research Associates are eligible for staff I.D.s and may purchase staff parking permits. Payroll checks are direct deposited into the student’s bank account.

Graduate Associates/Fellows have two choices in health insurance: University Prime Care and Student Health Insurance. Additional information is available at: http://hr.osu.edu/benefits/gahealth.html.

Graduate associates, fellows and most graduate students in the Department will be provided with office space, a mail box, and an e-mail address; they will have access to office duplicating equipment, a telephone, and file space.

25% Appointments

Graduate Research Associate appointments for 25% time will be given only in exceptional cases and with the approval of the GSC and the Dean of the Graduate School. The information regarding 50% appointments applies to 25% appointments with the following exceptions:

1. 10 hours per week are to be committed to the Department,
2. the stipend will be for half of the amount listed for each tier, and
3. only one-half of the tuition and general fees will be waived.

ADDITIONAL INFORMATION

Special Programs

The Department of Animal Sciences participates in the joint graduate-undergraduate program of the College of Food, Agricultural and Environmental Sciences. The program is called the AGR7 and results in awarding a B.S. and M.S. degree to successful students. The Department of Animal Sciences also participates in the joint graduate-professional degree programs. Participation with the College of Medicine results in the M.D./Ph.D. (MED7). Participation with the College of Veterinary Medicine results in the D.V.M./Ph.D. (VME7). See Section VIII of the Graduate School Handbook for a program description and admission requirements. The Department also participates in the Ohio State University Nutrition (OSUN) program and the OSU Interdisciplinary Environmental Sciences Graduate Program (ESPG). In these programs, graduate students advised by Faculty in our Department are administered through the specific interdisciplinary graduate program. The Department of Animal Sciences has no specific restrictions against other special programs listed in the Graduate School Handbook; however, participation is subject to approval by the GSC.

GRIEVANCE PROCEDURE

A student should make every effort to resolve disputes with the party(ies) involved. If this is not possible, a written appeal can be submitted to the GSC through the grievance procedure described in this document.

Please review the grievance procedure before the need arises. Cooperation and communication are required on all sides to avoid unnecessary misunderstandings. The grievance procedure starts with a student’s discussion with the appropriate faculty advisor. At each level of appeal, there are at least two possible results. The first, and most desirable result, is a faculty-student understanding, leading to a solution and thereby resolving the grievance. The second result always provides a mechanism for the student to appeal to another
party of higher authority who is further removed from the situation.

Levels of Appeal

1. Discussion with faculty advisor
2. Discussion between student and GSC chair
3. Presentation of grievance to entire GSC (either in person or in writing). A majority vote in the student's absence will determine a decision.
4. Appeal to the Department Chair (either in person or in writing)
5. Written appeal to the Department Chair's Advisory Committee
6. Department Chair and Student approach the Graduate School Dean

It is the Department’s sincere hope that all grievances can be resolved at the first step. When further steps are required, everyone involved should understand the steps to be taken so personal conflicts do not develop and decrease our ability to work together towards a solution. Conflicts, which persist, hurt everyone. Grievances must be worked out rapidly and to the satisfaction of all concerned. If some policy of procedure is causing low morale, we all suffer. Graduate student/faculty relations are very important for the overall productivity of the Department. We encourage constant communication between students and faculty. If there is free and open communication, many misunderstandings can be corrected before they become grievances. Refer to the Graduate School Handbook (http://gradsch.osu.edu/appendix-d.html) regarding grievance procedures.

THE GRADUATE SCHOOL AND THE DEPARTMENT OF ANIMAL SCIENCES

The Graduate School

See Section I of the Graduate School Handbook for information on the structure of the Graduate School and the Council on Research and Graduate Studies. The Department of Animal Sciences graduate faculty has a commitment to maintain an outstanding program of graduate study operated through the GSC.

Graduate Studies Committee

The GSC Chair is a Category P graduate faculty member elected by the faculty to serve a 3-year term. The GSC Chair is eligible for re-election. Three additional graduate faculty members are elected by the faculty to serve 3-year staggered terms. One member is re-elected or replaced each year. If a member of the GSC is elected as chair, a replacement will be elected to serve the remainder of his/her term. The Department Chair will serve as a member of the Graduate Studies Committee. One graduate student will be elected by the graduate students to serve a one-year term as a non-voting member of the GSC. Responsibilities of the GSC are spelled out in Section XIV of the Graduate School Handbook. A Departmental support staff individual will be assigned to coordinate graduate studies activities.

In addition to other duties mentioned in this document, the GSC will review course proposals or other curriculum issues related to the graduate program. Course proposals and other reviews will be forwarded to the Academic Affairs Committee and should include an assessment of how the proposal enhances the Animal Sciences graduate program. The Academic Affairs Committee will be responsible for the administrative aspects of the documentation and approval of these graduate courses.

Graduate Faculty Membership

The Graduate School at OSU determines requirements for Graduate Faculty status; Category M is necessary to mentor M.S. students; and Category P to mentor M.S. and Ph.D. students (see Section XV of the Graduate School Handbook). The Graduate Faculty members of the Department of Animal Sciences believe
that the desire to counsel students as a mentor is an integral part of graduate faculty membership. All faculty members with an appointment in the Department of Animal Sciences are eligible to be members of the Animal Sciences Graduate Faculty.

The qualifications for Category M status are that an individual holds a faculty appointment and an M.S. degree or equivalent or higher. The qualifications for Category P status are that an individual holds a faculty appointment, has an earned Ph.D. or equivalent, is engaged in an active program of research, or demonstrates significant promise of establishing such a program. The GSC confers Category M status and notifies the Graduate School of its actions.

Faculty members desiring Category P status are required to submit evidence of eligibility to the GSC. It is suggested that new faculty with a Category M status co-advice Ph.D. students prior to submitting this request. The candidate’s nomination materials will be made available to the entire Graduate Faculty of the Department for perusal and comment. The GSC will assess the materials submitted and consider faculty comments. If warranted, the GSC will make a nomination for Category P status to the Graduate School.

Faculty members with a courtesy appointment in the Department of Animal Sciences are eligible to be members of the Animal Sciences Graduate Faculty. To be granted Category M or P status in the Department of Animal Sciences, faculty with a courtesy appointment must have credentials consistent with those of regular faculty holding such appointments. The GSC appoints faculty with courtesy appointments to Category M graduate faculty status and notifies the Graduate school of its actions. Nomination materials for courtesy faculty that desire Category P status will be made available for review by the entire Animal Sciences Graduate Faculty. The GSC will assess the materials submitted and consider faculty comments. If approved, a nomination for Category P status will be forwarded by the GSC to the Graduate School. Students advised by courtesy faculty with graduate faculty status in the Department of Animal sciences are not eligible for Departmental associateships or fellowships, nor are they eligible for Departmental funds in support of travel to scientific meetings.

**GRADUATE FACULTY OF THE DEPARTMENT OF ANIMAL SCIENCES**

Graduate faculty members with regular appointments in the Department of Animal Sciences are listed alphabetically. Following the faculty member's name are Graduate Faculty Category, the degree, institution, year of degree, research interest, location and rank (P for those authorized to advise Ph.D. students and M for those who may advise M.S students and serve on Ph.D. committees.

**Chair**

- Kensinger, Ronald S., Ph.D., University of Florida, 1982 (Columbus) P.

**Associate Chair**

- Hogan, Joseph S., Ph.D., University of Vermont, 1986. Dairy Mastitis (Wooster) P.

**Graduate Studies Committee Chair**

- Day, Michael L., Ph.D., University of Nebraska, 1985. Cattle Reproduction (Columbus) P.
Graduate Faculty

- Boyles, Stephen L., Ph.D., Kansas State University, 1985. Beef Nutrition (Columbus) M.
- Cole, Kimberly, Ph.D., University of Arkansas, 2005. Equine (Columbus) P.
- Dabrowski, Konrad, Ph.D., courtesy from Natural Resources (Columbus) P.
- Daniels, Kristy, Ph.D., Virginia Tech, 2008. Mammary Development (Wooster) P.
- Davis, Michael E., Ph.D., Colorado State University, 1980. Beef Cattle Genetics (Columbus) P.
- Eastridge, Maurice L., Ph.D., Purdue University, 1986. Dairy Nutrition (Columbus) P.
- Ezeji, Thaddeus, Ph.D., (MCL) University of Rostock, Germany, 2001. Microbiology (Wooster) P.
- Firkins, Jeffrey L., Ph.D., University of Illinois, 1987. Dairy Nutrition (Columbus) P.
- Fluharty, Francis L., Ph.D., The Ohio State University, 1993. Beef and Sheep Nutrition (Wooster) P.
- Jackwood, Daral, Ph.D., courtesy from Food Animal Health (Wooster) P.
- Kinder, James E., Ph.D., Washington State University, 1975. Reproductive Physiology (Columbus) P.
- Knipe, Lynn C., Ph.D., Iowa State University, 1982. Meat Science (Columbus) M.
- Kuber, Paul S., Ph.D., Washington State University, 2001. Meat Science (Columbus) M.
- Lee, Kichoon, Ph.D. University of Georgia, 1997. Molecular Biology (Columbus) P.
- Lilburn, Michael S., Ph.D., Pennsylvania State University, 1980. Poultry Science (Wooster) P.
- Loerch, Steven C., Ph.D., University of Illinois, 1982. Beef Cattle Nutrition (Wooster) P.
- Moeller, Steven J., Ph.D., Iowa State University, 1994. Swine Genetics (Columbus) P.
- Morrison, Mark, Ph.D., University of Illinois, 1991. Anaerobic Microbiology (Columbus) P.
- Neal, Steven, Ph.D., courtesy from Agricultural Technical Institute (Wooster) M.
- Ockerman, Herbert W., Ph.D., North Carolina State University, 1962 (Columbus) P.
- Ottobre, Joseph S., Ph.D., West Virginia University, 1981. Reproductive Physiology (Columbus) P.
- Peiffer, Pasha, Ph.D., North Carolina State University, 2004. Nutrition (Columbus) M.
- Pope, William F., Ph.D., Oregon State University, 1981. Reproduction (Columbus) P.
- St-Pierre, Normand R., Ph.D., The Ohio State University, 1985. Dairy Management (Columbus) P.
- Saif, Y. Mo, Ph.D., courtesy from Food Animal Health (Wooster) P.
- Selvaraj, Ramesh, Ph.D., University of California, Davis, 2005. Immunology (Wooster) P.
- Slemons, Richard, Ph.D., courtesy from Veterinary Preventive Medicine (Columbus) P.
- Weiss, William P., Ph.D., The Ohio State University, 1985. Dairy Nutrition (Wooster) P.
- Yu, Zhongtang, Ph.D., New Mexico State University, 1996. Molecular Microbiology (Columbus) P.
- Zerby, Henry N., Ph.D., Colorado State University, 1999. Meat Science (Columbus) P.
Appendix A: Department of Animal Sciences Graduate Program Learning Goals

The Graduate Program of the Department of Animal Sciences is structured to facilitate training both M.S. and Ph.D. students in one of a wide range of disciplines, including reproductive physiology, nutrition, mammary health and physiology, meat science, tissue (muscle, lipid, extracellular matrix, etc.) biology, genetics, microbiology, production systems management, immunology and animal welfare and behavior. This document describes the general expectations relative to program learning goals in the Department of Animal Sciences (Table 1). Expectations vary between the M.S. and Ph.D. degrees. Also, each discipline has specific program learning goals unique to that program (Table 2).
<table>
<thead>
<tr>
<th>M.S.</th>
<th>Description</th>
<th>Ph.D.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge and comprehension of cell structure and function and</td>
<td>Sense of relevancy of information related to cell structure and metabolism in</td>
<td>Analyze, synthesize, and evaluate information related to cell structure and function and understand molecular technology necessary to assess cell function</td>
<td>Ability to clarify relationships of component parts of living cells, make linkages among component parts and integrate new information</td>
</tr>
<tr>
<td>application of knowledge to animal tissues, systems and function.</td>
<td>animals and microbes.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge and comprehension of statistics and experimental design</td>
<td>Understand and articulate relevancy of descriptive statistics and concepts of variance, statistical inference and analysis of variance. Understanding of experimental design.</td>
<td>Develop experimental hypotheses, apply experimental designs to test hypotheses, conduct appropriate data analyses and interpret data</td>
<td>Skillfully develop experimental hypotheses, make use of experimental designs in conducting research, and evaluate statistical results to ascertain knowledge gained from research</td>
</tr>
<tr>
<td>Depth in specific sciences of the discipline of study*.</td>
<td>See attached Table 2</td>
<td>Expertise in specific science within discipline</td>
<td>See attached Table 2</td>
</tr>
<tr>
<td>Knowledge and application of communication skills for teaching and/or outreach, and communication with peers within the scientific community</td>
<td>Improve oral presentation skills through enhancing knowledge for effective oral communication and skillfully using this knowledge in developing and making presentations to faculty mentors and graduate student peers. Publish research findings</td>
<td>Interpret and evaluate research findings and communicate knowledge to peers and the scientific community. Develop and effectively deliver course material in teaching and/or outreach communications.</td>
<td>Use lateral thinking to make new linkages among concepts and through oral communication apply new findings with background information in oral and poster communications at scientific meetings. Publish research findings in peer-reviewed journals.</td>
</tr>
<tr>
<td>Knowledge and comprehension of the literature in area of study and in scientific writing.</td>
<td>Sense of what literature is relevant, and ability to articulate what is understood both orally and in writing, and what needs to be addressed with further study.</td>
<td>Analyze, synthesize and evaluate literature to enhance knowledge base in area of study and for proposal development</td>
<td>Integrate existing knowledge and assess skill base in developing dissertation problem, conducting research and processing new information for communication of results</td>
</tr>
<tr>
<td>Scientific method and ethics</td>
<td>Sense the importance of use of the scientific method and recognize situations where ethical issues often exist in science</td>
<td>Use the scientific method to enhance analysis, synthesis, and evaluation of results of scientific endeavor; Utilize ethical values in all aspects of graduate program</td>
<td>Divide a problem into component parts, develop knowledge to a new level of understanding, and accept or reject hypotheses through use of the scientific method and apply ethical values throughout the scientific process</td>
</tr>
<tr>
<td>Comprehension, and application of knowledge as it relates to the use of animals for the well being of animal- and human-kind</td>
<td>Articulate and understand the use of animals for the well being of animal- and human-kind in research.</td>
<td>Analyze, synthesize, and evaluate knowledge base as to how respective area of research relates to the use of animals for the well being of animal- and human-kind</td>
<td>Integrate knowledge to produce a generalized concept, gain a new level of understanding, and relate the contribution of new information to the use of animals for the well being of animal- and human-kind</td>
</tr>
</tbody>
</table>

*Disciplines include reproductive physiology, nutrition, mammary health and physiology, meat science (muscle, lipid, extracellular matrix, etc.) biology, genetics, microbiology, production systems management, immunology and animal welfare and behavior. There is a unique knowledge base for each discipline that each student shall master before being awarded a degree. Hence, the learning objective for this program goal varies by discipline and is presented in Table 2.
<table>
<thead>
<tr>
<th>Discipline</th>
<th>Fields of depth relative to discipline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reproductive Physiology</td>
<td>Reproductive physiology and endocrinology, Molecular biology techniques</td>
</tr>
<tr>
<td></td>
<td><strong>M.S.</strong>: Knowledge, comprehension, and application of understanding of physiology, anatomy and endocrinology of reproduction and appreciation of wide array of molecular techniques available for study. <strong>Ph.D.</strong>: Analysis, synthesis, and evaluation of knowledge related to cell function and its impact on function of reproductive systems, depth in other physiological functions (e.g. immunology, cell biology, developmental biology, etc.) pertinent to the dissertation focus, experience and expertise in some molecular techniques to study reproductive function.</td>
</tr>
<tr>
<td>Mammary Health and Physiology</td>
<td>Mammary biology and immunology</td>
</tr>
<tr>
<td></td>
<td><strong>M.S.</strong>: Knowledge, comprehension, and application of understanding of mammary development and mastitis control to optimize production potential and milk quality in dairy cows. <strong>Ph.D.</strong>: Analysis, synthesis, and evaluation of knowledge related to biological factors influencing mammary cell regulation, mammary development and milk production in dairy cows, characterizing mammary host defenses, manipulating virulence factors of mammary pathogens, and applying new technologies to advance milk quality and safety.</td>
</tr>
<tr>
<td>Meat Science</td>
<td>Skeletal tissue anatomy, properties and function</td>
</tr>
<tr>
<td></td>
<td><strong>M.S.</strong>: Knowledge, comprehension, and application of understanding of factors influencing variation in fresh and processed meat and fat quality, palatability, wholesomeness, and food safety. <strong>Ph.D.</strong>: Understanding of pre-harvest factors such as genetics, nutrition, growth and development and animal handling factors that influence food animal products. Analysis, synthesis, and evaluation of knowledge of the pre-harvest factors to improve the quality, palatability, wholesomeness, and safety of food animal products.</td>
</tr>
<tr>
<td>Tissue Biology</td>
<td>Muscle and adipose tissue physiology</td>
</tr>
<tr>
<td></td>
<td><strong>M.S.</strong>: Knowledge, comprehension, and application of understanding of growth and development of adipose and muscle and interplay of nutrition, genetic, and hormones in tissue growth. <strong>Ph.D.</strong>: Analysis, synthesis, and evaluation of knowledge related to cellular and molecular events of tissue growth and development and their impact on production of food animals. Experiencing general cellular, molecular, and genetic technologies for the research goals during the M.S and Ph.D program.</td>
</tr>
<tr>
<td>Field</td>
<td>Specialization</td>
</tr>
<tr>
<td>------------------------------------</td>
<td>------------------------------------------</td>
</tr>
<tr>
<td>Microbiology</td>
<td>Microbiology and rumen function</td>
</tr>
<tr>
<td>Production Systems Management</td>
<td>Advanced statistical analyses and modeling</td>
</tr>
<tr>
<td>Immunology</td>
<td>Molecular basis of immune cell regulation and interaction</td>
</tr>
<tr>
<td>Animal Welfare and Behavior</td>
<td>Behavioral analyses and endocrinology</td>
</tr>
<tr>
<td>Nutrition</td>
<td>Gastrointestinal tract function and nutrient metabolism</td>
</tr>
</tbody>
</table>
Appendix B

Department of Animal Sciences
Advisory Committee
Approval Form

Name of Student: __________________________________________

Enrollment Start Date: __________________________

Name of Advisor: __________________________________________

Degree: M.S.  Ph.D.

Brief Statement of Research Problem:

Advisory Committee Members:

________________________________________ (Advisor)

________________________________________

________________________________________

________________________________________

________________________________________

Approved by Graduate Studies Committee: ____________________

The advisor must complete this form for submission to the Graduate Studies Committee during the second term (semester or summer session) of enrollment for both M.S. and Ph.D. students for evaluation by the GSC. The composition of the committee must include the advisor plus 2 faculty members for the M.S. and the advisor plus 3 faculty members for the Ph.D. Further detail on committee composition is provided in the Department Graduate Student Handbook.
Appendix C

Department of Animal Sciences
Graduate Research Proposal
Cover Page

TITLE

Name of Student

Degree (circle one): M.S. Ph.D.

Advisory Committee Member Approval (signatures required):

______________________________ (Advisor) __________ (Date)

______________________________ __________ (Date)

______________________________ __________ (Date)

______________________________ __________ (Date)

______________________________ __________ (Date)

Submitted to Graduate Studies Committee: ____________ (Date)

The research proposal is to be submitted to the Advisory Committee during the second term (semester or summer session) of enrollment for M.S. students and the third term (semester or summer session) of enrollment for Ph.D. students. A copy of the research proposal along with a signed cover page (Appendix C) indicating approval by all committee members of the research and coursework plan of the student, must be submitted to the Departmental GSC by the end of the second or third semester of enrollment for M.S. and Ph.D. students, respectively.
Appendix D

Annual Graduate Student Review
OSU Department of Animal Sciences

Graduate Student Name: ________________________________
Advisor/Mentor: ___________________________ Academic Year: ______________
Degree sought: ______ Program start date: _______ Projected completion date _______
Advisory Committee Approved: Yes____ No_____ Advisory Committee:
____________________________________________________________________________
____________________________________________________________________________

1. Has your Advisory Committee approved your coursework plan? _____ Yes _____ No
   If yes, date approved __________ If no, date of next committee meeting __________

2. Has your research proposal been approved by your Advisory Committee? ____ Yes ____ No
   If yes, date approved __________________________
   If no, date of next committee meeting _______________

3. If a Ph.D. student, have you successfully completed the candidacy exam? ____ Yes ____ No____
   If yes, date completed __________________________
   If no, date scheduled __________________________

4. Have you met with your Advisory Committee in the past 12 mo.? Yes____ No____ Date____
   Briefly summarize the purpose and outcome of this meeting (use attached sheet if necessary).

5. Have you served as a TA in the past 12 months? List course(s) below.

6. Indicate date and location of all presentations, departmental and at professional meetings,
   below or on attached sheet. For presentations at professional meetings, include the reference
   for the presentation, the meeting at which it was made, whether it was a poster or oral
   presentation, and the length of the oral presentation(s).

7. List all publications in the past 12 months on the attached sheet and indicate any honors/awards
   below.

____________________________________________________________________________
Student Signature ___________________________ Date ______

____________________________________________________________________________
Advisor Signature ___________________________ Date ______