

## Term Information

Effective Term Autumn 2017  
*Previous Value Autumn 2015*

## Course Change Information

### What change is being proposed? (If more than one, what changes are being proposed?)

Change in course content and removal of quarter system course references from the exclusion.

### What is the rationale for the proposed change(s)?

To better align content with the course description, reduce redundancy across existing foundational courses within the department, and strengthen content that aims to promote an understanding of modern science through an animal systems approach.

### What are the programmatic implications of the proposed change(s)?

(e.g. program requirements to be added or removed, changes to be made in available resources, effect on other programs that use the course)?

None

Is approval of the request contingent upon the approval of other course or curricular program request? Yes

Please identify the pending request and explain its relationship to the proposed changes(s) for this course (e.g. cross listed courses, new or revised program)

Requested changes are contingent upon approval of ANIMSCI 2300H, the honors version of the course, and ANIMSCI 2100. Specifically, content currently covered in ANIMSCI 2200.01 & 2300H (animal industries overview and management practices) will be included in the reinvisioned ANIMSCI 2100. In turn, content of the animal products will be removed from ANIMSCI 2100 and covered in 2200.01 to extend basic scientific principles underlying animal products.

Is this a request to withdraw the course? No

## General Information

Course Bulletin Listing/Subject Area Animal Sciences  
Fiscal Unit/Academic Org Animal Sciences - D1132  
College/Academic Group Food, Agric & Environ Science  
Level/Career Undergraduate  
Course Number/Catalog 2200.01  
Course Title Introductory Animal Sciences  
Transcript Abbreviation Animal Sci Intro  
Course Description A study of the basic principles of genetics, breeding, reproduction, nutrition, behavior, and biotechnology as it applies to the molecular, cellular, and physical underpinnings of domesticated animal form and function. The online course is not open to students with a declared AnimSci major.  
Semester Credit Hours/Units Fixed: 3

## Offering Information

Length Of Course 14 Week, 12 Week  
Flexibly Scheduled Course Never  
Does any section of this course have a distance education component? Yes  
Is any section of the course offered 100% at a distance  
Less than 50% at a distance  
Grading Basis Letter Grade

Repeatable	No
Course Components	Lecture
Grade Roster Component	Lecture
Credit Available by Exam	No
Admission Condition Course	No
Off Campus	Never
Campus of Offering	Columbus

## Prerequisites and Exclusions

### Prerequisites/Corequisites

### Exclusions

### [Previous Value](#)

Not open to students with credit for 2300H.

Not open to students with credit for 2300H (200H) or 200.

## Cross-Listings

### Cross-Listings

## Subject/CIP Code

Subject/CIP Code	01.0901
Subsidy Level	Baccalaureate Course
Intended Rank	Freshman, Sophomore

## Requirement/Elective Designation

Required for this unit's degrees, majors, and/or minors

General Education course:

Biological Science

The course is an elective (for this or other units) or is a service course for other units

## Course Details

### Course goals or learning objectives/outcomes

- A biological systems based approach to equip a broad range of students with the knowledge and critical thinking skills required to address questions concerning the maintenance, reproduction, and performance of domestic animals
- Be familiar with the historical, social, and biological contexts that govern the study of animals
- Understand basic principles of genetics, breeding, reproduction, nutrition, behavior, and biotechnology
- Appreciate the molecular, cellular, and physical underpinnings of animal form and function
- Develop the ability to critically evaluate concepts in science as they are applied to the study of animals
- Construct innovative approaches to, and solutions of, problems encountered when maintaining animals for human benefit
- Appreciate the uses of animals and social attitudes regarding how animals are used
- Have a broad understanding of biotechnology and its uses toward advancing the health and well-being of animals
- Consider positive and negative implications of applying modern technology to animal systems

### Content Topic List

- Evolution of domesticated species and the process of their domestication
- Animal behavior and welfare
- Nutrition: nutrient requirements, physiology, and the importance of different digestive strategies
- Organization of biological systems from molecular structures to physical features
- Genetics & application of genetics for animal breeding: natural versus artificial selection
- Biotechnology: progress, applications, and limitations
- Principles of reproduction and assisted reproductive technologies
- Lactation strategies: nutritional and immunological support of the young
- Food & Fiber: Eggs
- Food & Fiber: Milk
- Food & Fiber: Muscle
- Food and Fiber: Fiber

### Previous Value

- *Process of domestication and a historical perspective of how animals and animal sciences have evolved*
- *Animal behavior and welfare*
- *Nutrition: nutrient requirements, physiology, and the importance of different digestive strategies*
- *Organization of biological systems from molecular structures to physical features*
- *Genetics & application of genetics for animal breeding: natural versus artificial selection*
- *Biotechnology: progress, applications, and limitations*
- *Principles of reproduction and assisted reproductive technologies*
- *Lactation strategies: nutritional and immunological support of the young*
- *Animal form and function: ruminants*
- *Animal form and function: small ruminants*
- *Animal form and function: pseudo-ruminants*
- *Animal form and function: hind-gut fermenters*
- *Animal form and function: simple nonruminants*
- *Animal form and function: avians*
- *Animal form and function: aquatics*
- *Global status of the animal industries*

### Attachments

- 2100\_2200\_CourseChange\_2016.pdf: Rational  
*(Cover Letter. Owner: Lyvers Peffer, Pasha A)*
- ANIMSCI 2200 01 Syllabus\_AU\_17\_Proposed.pdf: Proposed Syllabus  
*(Syllabus. Owner: Lyvers Peffer, Pasha A)*
- ANIMSCI 2200 01 Syllabus\_SP\_16.pdf: Current Syllabus  
*(Syllabus. Owner: Lyvers Peffer, Pasha A)*
- GE ASSESSMENT PLAN 2200.01.pdf: GE Assessment Plan  
*(GEC Course Assessment Plan. Owner: Lyvers Peffer, Pasha A)*

### Comments

- The requested information has been uploaded *(by Lyvers Peffer, Pasha A on 11/10/2016 04:04 PM)*
- Please see email sent 10-11-16 *(by Hogle, Danielle Nicole on 10/11/2016 03:03 PM)*

**COURSE CHANGE REQUEST**  
2200.01 - Status: PENDING

Last Updated: Neal,Steven Michael  
11/10/2016

**Workflow Information**

Status	User(s)	Date/Time	Step
Submitted	Lyvers Peffer,Pasha A	07/11/2016 10:58 AM	Submitted for Approval
Approved	Neal,Steven Michael	09/14/2016 02:22 PM	Unit Approval
Approved	Neal,Steven Michael	09/14/2016 02:22 PM	College Approval
Revision Requested	Hogle,Danielle Nicole	10/11/2016 03:03 PM	ASCCAO Approval
Submitted	Lyvers Peffer,Pasha A	11/10/2016 04:04 PM	Submitted for Approval
Approved	Neal,Steven Michael	11/10/2016 04:54 PM	Unit Approval
Approved	Neal,Steven Michael	11/10/2016 04:54 PM	College Approval
Pending Approval	Nolen,Dawn Vankeerbergen,Bernadette Chantal Hanlin,Deborah Kay Jenkins,Mary Ellen Bigler Hogle,Danielle Nicole	11/10/2016 04:54 PM	ASCCAO Approval

July 6, 2016  
CFAES Academic Affairs  
100 Agricultural Administration  
Columbus, OH 43210

On behalf of the Department of Animal Sciences Academic Affairs Committee, I am submitting course change requests for ANIM SCI 2100 (Appreciation of Production and Companion Animals) and ANIM SCI 2200.01/2300H (Introductory Animal Sciences/Honors Introductory Animal Sciences). Specifically, the request is for a change in lecture content, and changes in course offering length, format, credit hours, and course title for ANIMSCI 2100.

#### Original Content

ANIM SCI 2100 provides a broad overview of the domesticated animals, their related industries, and the products of these systems (food, fiber, milk, eggs, and companionship). In the first seven weeks, the course begins with a review of biological and chemical aspects of animal systems, and then discusses the resulting products that are obtained from animal systems. During the second seven weeks, the focus is on the companion animal industries. The discussion of companion animals includes the care, social and ethical considerations of companion animal use, and industry structure. Students gain a broad foundation of animal husbandry, management systems, and contributions of animals to human society.

Animal Sciences 2200.01 is a study of the basic principles of evolution & domestication, genetics, breeding, reproduction, nutrition, behavior, and biotechnology as it applies to the molecular, cellular, and physical underpinnings of domesticated animal form and function. Students are introduced to the foundations of biological systems and diversity and how knowledge in this area is applicable toward appropriate management of domesticated animals. Animals explored in depth include horses, cattle, pigs, poultry (chickens, ducks, geese, etc.), sheep, goats, and llamas. Students consider how the study of animals has advanced from early scientific discoveries and gain an appreciation of how human intervention has shaped animal form and function. Through the study of animal systems from the local to global arena, students appreciate the use of animals and their contributions across diverse populations and understand the local and global impacts of the application of new technologies to the animal industries. The first 10 weeks of the course focuses on the molecular, cellular, and organismal aspects of aforementioned scientific disciplines. The remaining weeks of the course consider application of these principles within domesticated animal industries, at the organismal level.

#### Proposed Content

Specifically, content of the animal industries and current animal management practices will be removed from ANIMSCI 2200.01 and covered in ANIMSCI 2100. In turn, content of the animal products will be removed from ANIMSCI 2100 and covered in 2200.01 to extend basic scientific principles to animal morphology.

#### Rationale

ANIMSCI 2100 provides an overview of the companion animal industries, comparable discussions of the food production industries are lacking. Reorganization of the content to include this information provides students a context to reflect on the similarities and differences, value, and societal contributions of the collective animal industries as directed by the animal's primary use and fulfills the original goals of the course to consider domesticated animals, their related industries, and their economic impact. Discussions of animal products in ANIMSCI 2200.01 provides a context to focus on the chemical and biological aspects of animal systems from a molecular and cellular context to strengthen the goals of the course, which aim to promote an understanding of

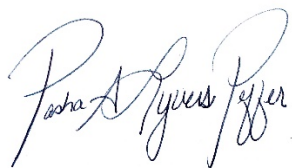
modern science through an animal systems approach.

The requested changes in lecture content aligns with already established course descriptions. Accordingly, including content of production animal industries in ANIMSCI 2100 supports the role of this course in providing an overview of the size and scope of companion animal and production animal systems. Including discussions of animal products in ANIMSCI 2200.01 reinforces an understanding of the principles, theories and methods of modern sciences and the role of scientific discoveries in shaping animal form and function.

In addition, changes in course offering length, format, credit hours, and course title for ANIMSCI 2100 is proposed. The title of the re-envisioned course is proposed as Animal Systems and will be designated as 2200.03. Currently, ANIMSCI 2200.01 is the required introductory course. Re-numbering of the course is requested to facilitate enrollment in 2200.01 prior to enrollment in 2200.03. The course will be offered as a 7 week session course, online, at 2 credit hours. A reduction in credit hours is supported by a reduction in course content that occurs with the removal of topics on biological and chemical aspects of animal systems, which are topics also covered in ANIMSCI 2200.01.

Thank you for your consideration of these course change requests.

Sincerely,

A handwritten signature in black ink, reading "Pasha A. Lyvers Peffer". The signature is written in a cursive style with a large initial "P" and "L".

Pasha A. Lyvers Peffer  
Associate Professor  
Academic Affairs, Chair

**ANIM SCI 2200.01: Introductory Animal Sciences**  
**SPRING Semester, 2016**

**Lecture:** Monday, Wednesday and Friday; 1:50-2:45 am, 103 Kottman Hall

**Instructor:** Pasha A Lyvers Peffer, Department of Animal Sciences  
214 Animal Sciences Building  
[lyvers-peffer.1@osu.edu](mailto:lyvers-peffer.1@osu.edu), 292-3896  
Office hours: Wednesday 11:30-1:00.

**Assistants:** Alex Tebbe  
202 Plumb Hall  
[atebbe2@gmail.com](mailto:atebbe2@gmail.com)  
Office hours: Tuesday & Thursday 10:00-11:00

**Prerequisites:** Not open to students with credit for 2300H. GE Nat Sci Bio course.

**Text:** Required: ANIMAL SCIENCES, Peffer and Day. Kendall Hunt Publishing; Dubuque, IA:2014. ISBN-10: 1465250107; ISBN-13: 978-1465250100

**Goals and Objectives:** Introductory Animal Sciences is a Natural Science (Biological Science), general education, course that promotes an understanding of modern science through a biological systems based approach. Students learn of the relationship between science and technology, consider the implications of scientific discoveries, and acquire the knowledge and critical thinking skills required to evaluate the potential of science and technology to address problems from a global arena as they pertain to domestic animals used for human benefit.

**Learning Objectives:**

1. relate structure, form and function, growth and development of animal systems from the cellular to the organismal level.
2. demonstrate knowledge among anatomy, physiology, genetics, nutrition, and reproduction.
3. discuss practices applicable to animal management systems.
4. assess the practices of respectful management of animals and the environment.

**How students meet objectives through this course:** The course embodies fundamental concepts in areas of genetics, reproduction, nutrition, behavior, and biotechnology. Students are introduced to the molecular and cellular mechanisms that underscore the function of biological systems and how knowledge in this area is applicable toward appropriate management of domesticated animals. Students will consider how the study of animals has advanced from early scientific discoveries. Through the study of animal systems from the local to global arena, students will appreciate the use of animals and their contributions across diverse populations and understand the local and global impacts of the application of new technologies to the animal industries.

**Course Description:** A study of the basic principles of genetics, breeding, reproduction, nutrition, behavior, and biotechnology as it applies to the molecular, cellular, and physical underpinnings of domesticated animal form and function.

**Goals and Objectives of the GE Natural Science Category:** Courses in natural sciences foster an understanding of the principles, theories and methods of modern sciences, the relationship between science and technology, and the effects of science and technology on the environment.

1. Students understand the basic facts, principles, theories and methods of modern science.
2. Students learn key events in the history of science.
3. Students provide examples of the inter-dependence of scientific and technological developments.
4. Students discuss social and philosophical implications of scientific discoveries and understand the potential of science and technology to address problems of the contemporary world

**How students meet the GE Natural Science objectives through this course:** Students will learn how systematic observations of the natural world have helped define current concepts of science and the role of controlled experimentation in support of early scientific theories through discussions of behavior. An understanding of the foundations of modern science will be acquired through discussions of cell theory, heredity, physiological ecology, energy transfer, and evolutionary strategies of today's domesticated species. Students will gain an appreciation of how human intervention has shaped animal form and function throughout history and the role of technology; addressing the implications of biotechnologies current and future applications.

### Lecture and Reading Schedule

Week	Topic	Text	Assignment Due
1	Importance of domesticated animals to humans	Chapter 1	
2	Evolution of domesticated species and the process of their domestication	Chapter 2	JAN 20-JAN 22
3	Animal Behavior and Welfare	Chapter 3 and 16	JAN 27-JAN 29
4	Nutrition: physiology, and the importance of different digestive strategies.	Chapter 4	FEB 3-FEB 5
5	Nutrition: nutrient requirements <b>(FEB 5: Last day to drop the course without receiving a W)</b>	Chapter 4	<b>FEB 10-EXAM I</b>
6	Organization of biological systems from molecular structures to physical features. Genetics & application of genetics for animal breeding: natural versus artificial selection.	Chapter 5	FEB 17-FEB 19
7	Genetics continued Biotechnology: progress, applications and limitations.	Chapter 5	FEB 24-FEB 26
8	Principles of reproduction and assisted reproductive technologies.	Chapter 6	MAR 2-MAR 4
9	Lactation strategies: Nutritional and immunological support of the young.	Chapter 7	<b>MAR 9-EXAM II</b>
10	SPRING BREAK: NO CLASS (MAR 14-MAR 18)		ENJOY YOUR BREAK
11	Animal form and function: Large Ruminants <b>(MAR 25: Last day to drop the course and receive a W)</b>	Chapter 8 and 9	MAR 23-MAR 25
12	Animal form and function: Small Ruminants & Pseudo-ruminants	Chapter 10 and 14	MAR 30-APR 1
13	Animal form and function: Hind-gut fermenters	Chapter 12	APR 6-APR 8
14	Animal form and function: Simple nonruminants & Avians	Chapter 11 and 13	<b>APR 13-EXAM III</b>
15	Animal form and function: Aquatics	Chapter 15	APR 20-APR 22
16	Did we cover everything?		



<b>FINAL EXAM</b>	<b>MAY 3</b>
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**Evaluation** Four exams will be given during the semester. Three lecture midterms worth 100 points each and a lecture final worth 150 points. As the course progresses, concepts learned early will contribute to greater understanding of new concepts, thus this course is **comprehensive**. **Exam will reflect the comprehensive nature of material**. Exams will consist of mixed format questions and **exams will not be returned\***. In addition, 150 points will be earned through course quizzes submitted through Carmen. You will be allowed to drop your lowest two course quiz grades.

<b>Evaluation</b>	<b>POINTS</b>	
Exam I	100	FEBRUARY 10 (1:50-2:45)
Exam II	100	MARCH 09 (1:50-2:45)
Exam III	100	APRIL 13 (1:50-2:45)
Quizzes	150	REFER TO LECTURE SCHEDULE
FINAL EXAM	150	MAY 3 (4:00-5:45)
<b>Total</b>	<b>600</b>	

**\*Exams will not be returned. You may review exams in the instructor's office during office hours. An exam is available for review prior to the succeeding exam.**

Assignments completed online using Carmen may be completed using any computer that allows you to access the Carmen site for ANIM SCI 2200.01. However, **it is not recommended to use wireless internet access** due to the fact that the internet connection may be lost during the course of completing the assignment. **You will be given one attempt to access and complete the Quizzes.**

**Carmen quizzes are available by 5:00 pm on Wednesday and are due by 11:55pm on Friday.** Carmen quizzes are open book and open notes; however, you are to complete the assignment without assistance from others and completion of the quiz is to reflect your own efforts. You will need to study and understand the course material before completing the assignment, just as you would for any other class. **Quizzes are timed at 20 min, similar to what would occur within a class setting.**

**Grade Scale:** Grades will be based on the total points earned as a percentage of total points possible and letter grades assigned as follows:

<u>Percentage</u>		<u>Percentage</u>	
93-100	A	73-76.9	C
90-92.9	A-	70-72.9	C-
87-89.9	B+	67-69.9	D+
83-86.9	B	60-66.9	D
80-82.9	B-	<60	E
77-79.9	C+		

### **SECRETS TO SUCCESS**

- Attend class regularly
- Be an active participant in class activities
- Ask if you need clarification
- Review material after class
- Prepare for exams in advance, do not wait until the last minute to study
- Seek help early in the semester if you are having difficulty
- Get to know other students in the class; they can be your best learning tool

Don't be afraid to venture into what is not familiar.

**Course Management System** This course uses Carmen (<http://carmen.osu.edu>) to manage course content and grades. Students are expected to check this site frequently to receive updates regarding the course. Note, important information delivered during lecture may not be posted to Carmen and Carmen is not a substitute for class attendance.

**Content:** Download and print a copy of the course notes prior to attending class. These notes do not represent a full copy of the lecture notes – but an abridged version to facilitate note taking during lectures. You must attend lectures to obtain the material required to complement these slides.

**Grades:** Mid-term Exams and quiz grades are displayed in Carmen. You should keep record of your course grades and this syllabus to determine your overall course grade and the associated letter grade.

### Course Policies

**Attendance Policy:** You are expected to attend class and be punctual. Attendance is not officially recorded, but you should be prepared to accept the impact of non-attendance on your course performance if you choose not to attend.

***Neither the instructor nor TA will provide material to you in your absence. You will need to request missed notes from a class peer.***

In cases of exams, you must contact the instructor prior to the exam if you will be absent. In case of an illness, you must be seen by and ***receive written documentation from a professional health care provider on the day of the absence.*** Routine specialist appointments (optometrist, dentist, etc.) are not accepted as an excused absence for an exam. In instances of a ***death in the family, documentation in the form of a death certificate, obituary notice, or funeral remembrance card is required. Request for excuse of absence for University sanctioned events must pre-approved by the instructor.*** You are responsible for submitting appropriate documentation for absences within two lecture periods from the absence.

**Exam Policy:** If you miss an exam and have a valid, documented excuse (as noted above in the attendance policy), you will be given an opportunity to attend a make-up exam. ***Make-up exams are available at 4:00 pm on the Friday following the regularly scheduled mid-term (FEB 12, MAR 11, and APR 15 for Exam I, II, and III respectively). There are no alternative make-up exam dates.*** If your absence is not considered valid for missing an exam or if you do not attend the make-up exam date, you will receive a grade of 0. Validity of the excuse is up to the instructor's discretion. Missing an exam due to minor illness, transportation issues, faulty alarm clocks, etc. will result in a grade of zero. If you miss the final exam with no excuse, you will receive an E for the course.

On the day of the exam you should make every effort to be present at the start of the exam. Once exams have been handed-out, and the first exam is turned in by a student, no additional exams will be handed out in class. Any student requesting an exam after the first exam is turned in will not be allowed to take the exam and will receive a 0. ***There are no exceptions to this policy.***

**E-Mail Etiquette:** The use of e-mail has made the classroom professor more approachable and accessible to the student. However, students should realize that e-mail should not always be used as a casual form of communication and professional relationships should be maintained when using e-mail for a class. Below I have included guidelines from Bloomsbury's guide on email etiquette that you should follow when drafting your e-mail. ***I will not respond to e-mails that I consider inappropriate. I will respond to appropriate emails in a timely manner, do not expect an immediate reply. If you require an immediate response consider visiting with me in person.***

#### DO

- Include a descriptive statement in the subject line.
- Use proper salutations when beginning an e-mail.

- Be concise in the body of the e-mail, use complete sentences and proper grammar.
- Use an appropriate closure at the end of each e-mail followed by your first and last name.
- If replying to an e-mail, reference the original e-mail and its content.
- Be selective of your choice of words. Emotions are difficult to convey in text and without the benefit of facial expressions your sentiment can be lost in the words you choose to write.

#### DON'T

- Use all capital letters; this conveys a tone of ANGER.
- Use e-mail as a format to criticize other individuals.
- Ask for your grade via e-mail. **Grades will not be discussed by e-mail.** If you need to discuss a graded item make an appointment to do so in my office.
- E-mail to inquire when grades will be posted. We will work toward submitting grades promptly, however, recognize that grading assignments and exams requires considerable time to ensure uniformity and fairness.
- Send an e-mail out of frustration or anger. Learn to save the e-mail as a draft and review at a later time when emotions are not directing the content.

**Punctuality:** Punctuality is a necessity as tardiness is disruptive to the entire class. Students who are repeatedly tardy are subject to a reduction in total points assessed toward the final grade.

**Technology Devices:** Use of electronic devices can be distracting to learning, not only for those using the devices but also for other students in the class. All portable communication devices must be turned **OFF** or placed in **Etiquette Mode** and stored out of sight during class period. You are permitted to use a tablet or related device to access or take notes during class. You are not permitted to use any electronic device to perform non-class related activities (social networking, instant messaging, checking email, surfing the internet, gaming, etc.). Should the use of accepted electronic devices become a distraction to other students or should it be found that the devices are used for non-class related activities; the further use of such devices will be prohibited. The use of electronic devices is strictly prohibited during exams.

Every student is entitled to full participation of this class without disruption. Please be amicable to your fellow classmates and respect one another's class time. Disruptive behavior will not be tolerated. Students who engage in disruptive conduct will receive a warning. Continuation of disruptive behavior that results in impairment of teaching or learning processes of others will result in disenrollment from the course.

**Respecting Intellectual Property:** Course materials are the property of the instructors. Students may not distribute provided course material without the permission of the instructor. Course material includes, but is not limited to, lecture documents, written or transcribed notes, video or audio recordings, etc. You are not permitted to make video or audio recordings of lectures. **You are not permitted to take and sale notes or sale any course material for commercial purposes or financial gain.** If you would like to share your course notes with your fellow peers enrolled in the course, use the Carmen Drop-box function to post your notes. Student notes, which are posted to Carmen are not reviewed by the course instructor for accuracy.

#### University Policies

**Disability Services:** Students with disabilities that have been certified by the Office for Disability Services will be appropriately accommodated, and should inform the instructor as soon as possible of their needs. The Office for Disability Services is located in 150 Pomerene Hall, 1760 Neil Avenue; telephone 292-3307, TDD 292-0901; <http://www.ods.ohio-state.edu/>.

**Academic Misconduct:** As stated by Ohio State University's Office of Academic Affairs, academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University's *Code of Student Conduct*, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University's *Code of Student Conduct* and this syllabus may constitute "Academic Misconduct." If I suspect that a student has committed academic misconduct in this course, I am obligated by University Rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University's *Code of Student Conduct* (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University. If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me or visit <http://oaa.osu.edu/coam.html> .

As stated by COAM, academic misconduct encompasses, but is not limited to, the following:

1. Violation of course rules;
2. Violation of program regulations;
3. Knowingly providing or receiving information during a course exam or program assignment;
4. Possession and/or use of unauthorized materials during a course exam or program assignment;
5. Knowingly providing or using assistance in the laboratory, on field work, or on a course assignment, unless such assistance has been authorized specifically by the course instructor or, where appropriate, a project/research supervisor;
6. Submission of work not performed in a course: This includes (but is not limited to) instances where a student fabricates and/or falsifies data or information for a laboratory experiment (i.e., a "dry lab") or other academic assignment. It also includes instances where a student submits data or information (such as a lab report or term paper) from one course to satisfy the requirements of another course, unless submission of such work is permitted by the instructor of the course or supervisor of the research for which the work is being submitted;
7. Submitting plagiarized work for a course/program assignment;
8. Falsification, fabrication, or dishonesty in conducting or reporting laboratory (research) results;
9. Serving as or asking another student to serve as a substitute (a "ringer") while taking an exam;
10. Alteration of grades in an effort to change earned credit or a grade;
11. Alteration and/or unauthorized use of university forms or records.

Every effort has been made to provide clear and accurate information within this syllabus. Should events required that information contained herein must be modified, announcements will be made in class. It is your responsibility to acquire any information provided during times of absence.

**ANIM SCI 2200.01: Introductory Animal Sciences**  
**AUTUMN Semester, 2017**

**Lecture:** Monday, Wednesday and Friday; 11:30-12:25 am, 103 Kottman Hall

**Instructor:** Pasha A Lyvers Peffer, Department of Animal Sciences  
214 Animal Sciences Building  
[lyvers-peffer.1@osu.edu](mailto:lyvers-peffer.1@osu.edu), 292-3896  
Office hours: Tuesday 11:30-1:00.

**Assistants:**

**Prerequisites:** Not open to students with credit for 2300H. GE Nat Sci Bio course.

**Text:** Required: ANIMAL SCIENCES, Peffer and Day. Kendall Hunt Publishing; Dubuque, IA:2014. ISBN-10: 1465250107; ISBN-13: 978-1465250100

**Goals and Objectives:** Introductory Animal Sciences is a Natural Science (Biological Science), general education, course that promotes an understanding of modern science through a biological systems based approach. Students learn of the relationship between science and technology, consider the implications of scientific discoveries, and acquire the knowledge and critical thinking skills required to evaluate the potential of science and technology to address problems from a global arena as they pertain to domestic animals used for human benefit.

**Learning Objectives:**

Successful students will

1. appreciate the evolution, domestication, and production of animals
2. relate structure, form and function, growth and development of animal systems from the cellular to the organismal level.
3. demonstrate knowledge of animal well-being, anatomy, physiology, genetics, nutrition, and reproduction.
4. reflect on the chemical and biological underpinnings of animal products

**How students meet objectives through this course:** The course embodies fundamental concepts in areas of genetics, reproduction, nutrition, behavior, and biotechnology. Students are introduced to the molecular and cellular mechanisms that underscore the function of biological systems and how knowledge in this area supports animal use and products. Students will consider how the study of animals has advanced from early scientific discoveries. Through the study of animal systems from the local to global arena, students will appreciate the use of animals and their contributions across diverse populations.

**Course Description:** A study of the basic principles of genetics, breeding, reproduction, nutrition, behavior, and biotechnology as it applies to the molecular, cellular, and physical underpinnings of domesticated animal form and function.

**Goals and Objectives of the GE Natural Science Category:** Courses in natural sciences foster an understanding of the principles, theories and methods of modern sciences, the relationship between science and technology, and the effects of science and technology on the environment.

1. Students understand the basic facts, principles, theories and methods of modern science.
2. Students learn key events in the history of science.
3. Students provide examples of the inter-dependence of scientific and technological developments.
4. Students discuss social and philosophical implications of scientific discoveries and understand the potential of science and technology to address problems of the contemporary world

**How students meet the GE Natural Science objectives through this course:** Students will learn how systematic observations of the natural world have helped define current concepts of science and the role of controlled experimentation in support of early scientific theories through discussions of behavior. An understanding of the foundations of modern science will be acquired through discussions of cell theory, heredity, physiological ecology, energy transfer, and evolutionary strategies of today's domesticated species. Students will gain an appreciation of how human intervention has shaped animal form and function throughout history and the role of technology; addressing the implications of biotechnologies current and future applications.

### Lecture and Reading Schedule

Week	Topic	Text	Assignment Due
1	Importance of domesticated animals to humans	Chapter 1	
2	Evolution of domesticated species and the process of their domestication	Chapter 2	AUG 31-SEPT 2
3	Animal Behavior and Welfare	Chapter 3 and 16	SEPT 7-9
4	Nutrition: Role, function, and requirements of nutrients and an introduction to metabolism and thermoregulation	Chapter 4	SEPT 14-16
5	Nutrition: physiology, and the importance of different digestive strategies. <i>(XXX: Last day to drop the course without receiving a W)</i>	Chapter 4	<b>SEPT 21-EXAM I</b>
6	Organization of biological systems from molecular structures to physical features. The chemical & biological hierarchy of living systems.	Chapter 5	SEPT 28-30
7	Genetics & application of genetics for animal breeding: natural versus artificial selection.	Chapter 5	OCT 5-7
8	Genetics continued Biotechnology: progress, applications and limitations.	Chapter 5	OCT 12-14
9	Principles of reproduction and assisted reproductive technologies.	Chapter 6	<b>OCT 19-EXAM II</b>
10	Lactation strategies: Nutritional and immunological support of the young. <i>(XXX: Last day to drop the course and receive a W)</i>	Chapter 7	OCT 26-28
	Food & Fiber: Eggs		NOV 2-4
11	Food & Fiber: Milk		NOV 9-11
12	Food & Fiber: Muscle to Meat		<b>NOV 16-EXAM III</b>
13	Food & Fiber: Fiber		NOV 30-DEC 2
14	Did we cover everything?		
15	<b>FINAL EXAM</b>		<b>DEC 17-FINAL</b>

**Evaluation** Four exams will be given during the semester. Three lecture midterms worth 100 points each and a lecture final worth 150 points. As the course progresses, concepts learned early will contribute to greater understanding of new concepts, thus this course is *comprehensive*. *Exam will reflect the comprehensive nature of material.* Exams will consist of

mixed format questions and **exams will not be returned\***. In addition, 150 points will be earned through course quizzes submitted through Carmen. You will be allowed to drop your lowest two course quiz grades.

Evaluation	POINTS	
Exam I	100	SEPTEMBER 21 (11:30-12:25)
Exam II	100	OCTOBER 19 (11:30-12:25)
Exam III	100	NOVEMBER 16 (11:30-12:25)
Quizzes	150	REFER TO LECTURE
SCHEDULE		
FINAL EXAM	150	DECEMBER 17 (4:00-5:45)
<b>Total</b>	<b>600</b>	

**\*Exams will not be returned.** You may review exams in the instructor's office during office hours. An exam is available for review prior to the succeeding exam.

Assignments completed online using Carmen may be completed using any computer that allows you to access the Carmen site for ANIM SCI 2200.01. However, **it is not recommended to use wireless internet access** due to the fact that the internet connection may be lost during the course of completing the assignment. **You will be given one attempt to access and complete the Quizzes.**

**Carmen quizzes are available by 5:00 pm on Wednesday and are due by 11:55pm on Friday.** Carmen quizzes are open book and open notes; however, you are to complete the assignment without assistance from others and completion of the quiz is to reflect your own efforts. You will need to study and understand the course material before completing the assignment, just as you would for any other class. **Quizzes are timed at 20 min, similar to what would occur within a class setting.**

**Grade Scale:** Grades will be based on the total points earned as a percentage of total points possible and letter grades assigned as follows:

Percentage	Letter Grade	Percentage	Letter Grade
93-100	A	73-76.9	C
90-92.9	A-	70-72.9	C-
87-89.9	B+	67-69.9	D+
83-86.9	B	60-66.9	D
80-82.9	B-	<60	E
77-79.9	C+		

### SECRETS TO SUCCESS

- Attend class regularly
- Be an active participant in class activities
- Ask if you need clarification
- Review material after class
- Prepare for exams in advance, do not wait until the last minute to study
- Seek help early in the semester if you are having difficulty
- Get to know other students in the class; they can be your best learning tool
- Don't be afraid to venture into what is not familiar.

**Course Management System** This course uses Carmen (<http://carmen.osu.edu>) to manage course content and grades. Students are expected to check this site frequently to receive updates regarding the course. Note, important information delivered during lecture may not be posted to Carmen and Carmen is not a substitute for class attendance.

**Content:** Download and print a copy of the course notes prior to attending class. These notes do not represent a full copy of the lecture notes – but an abridged version to facilitate note taking during lectures. You must attend lectures to obtain the material required to complement these slides.

**Grades:** Mid-term Exams and quiz grades are displayed in Carmen. You should keep record of your course grades and this syllabus to determine your overall course grade and the associated letter grade.

### Course Policies

**Attendance Policy:** You are expected to attend class and be punctual. Attendance is not officially recorded, but you should be prepared to accept the impact of non-attendance on your course performance if you choose not to attend. ***Neither the instructor nor TA will provide material to you in your absence. You will need to request missed notes from a class peer.***

In cases of exams, you must contact the instructor prior to the exam if you will be absent. In case of an illness, you must be seen by and ***receive written documentation from a professional health care provider on the day of the absence.*** Routine specialist appointments (optometrist, dentist, etc.) are not accepted as an excused absence for an exam. In instances of a ***death in the family, documentation in the form of a death certificate, obituary notice, or funeral remembrance card is required. Request for excuse of absence for University sanctioned events must pre-approved by the instructor.*** You are responsible for submitting appropriate documentation for absences within two lecture periods from the absence.

**Exam Policy:** If you miss an exam and have a valid, documented excuse (as noted above in the attendance policy), you will be given an opportunity to attend a make-up exam. ***Make-up exams are available at 4:00 pm on the Friday following the regularly scheduled mid-term (SEPT 23, OCT 21, and NOV 18 for Exam I, II, and III respectively). There are no alternative make-up exam dates.*** If your absence is not considered valid for missing an exam or if you do not attend the make-up exam date, you will receive a grade of 0. Validity of the excuse is up to the instructor's discretion. Missing an exam due to minor illness, transportation issues, faulty alarm clocks, etc. will result in a grade of zero. If you miss the final exam with no excuse, you will receive an E for the course.

On the day of the exam you should make every effort to be present at the start of the exam. Once exams have been handed-out, and the first exam is turned in by a student, no additional exams will be handed out in class. Any student requesting an exam after the first exam is turned in will not be allowed to take the exam and will receive a 0. ***There are no exceptions to this policy.***

**E-Mail Etiquette:** The use of e-mail has made the classroom professor more approachable and accessible to the student. However, students should realize that e-mail should not always be used as a casual form of communication and professional relationships should be maintained when using e-mail for a class. Below I have included guidelines from Bloomsbury's guide on email etiquette that you should follow when drafting your e-mail. ***I will not respond to e-mails that I consider inappropriate. I will respond to appropriate emails in a timely manner, do not expect an immediate reply. If you require an immediate response consider visiting with me in person.***

#### DO

- Include a descriptive statement in the subject line.
- Use proper salutations when beginning an e-mail.
- Be concise in the body of the e-mail, use complete sentences and proper grammar.
- Use an appropriate closure at the end of each e-mail followed by your first and last name.
- If replying to an e-mail, reference the original e-mail and its content.
- Be selective of your choice of words. Emotions are difficult to convey in text and without the benefit of facial expressions your sentiment can be lost in the words you choose to write.

#### DON'T

- Use all capital letters; this conveys a tone of ANGER.
- Use e-mail as a format to criticize other individuals.
- Ask for your grade via e-mail. ***Grades will not be discussed by e-mail.*** If you need to discuss a graded item make an appointment to do so in my office.
- E-mail to inquire when grades will be posted. We will work toward submitting grades promptly, however, recognize that grading assignments and exams requires considerable time to ensure uniformity and fairness.



- Send an e-mail out of frustration or anger. Learn to save the e-mail as a draft and review at a later time when emotions are not directing the content.

**Punctuality:** Punctuality is a necessity as tardiness is disruptive to the entire class. Students who are repeatedly tardy are subject to a reduction in total points assessed toward the final grade.

**Technology Devices:** Use of electronic devices can be distracting to learning, not only for those using the devices but also for other students in the class. All portable communication devices must be turned **OFF** or placed in **Etiquette Mode** and stored out of sight during class period. You are permitted to use a tablet or related device to access or take notes during class. You are not permitted to use any electronic device to perform non-class related activities (social networking, instant messaging, checking email, surfing the internet, gaming, etc.). Should the use of accepted electronic devices become a distraction to other students or should it be found that the devices are used for non-class related activities; the further use of such devices will be prohibited. The use of electronic devices is strictly prohibited during exams.

Every student is entitled to full participation of this class without disruption. Please be amicable to your fellow classmates and respect one another's class time. Disruptive behavior will not be tolerated. Students who engage in disruptive conduct will receive a warning. Continuation of disruptive behavior that results in impairment of teaching or learning processes of others will result in initiation of the process for your disenrollment from the course.

**Respecting Intellectual Property:** Course materials are the property of the instructors. Students may not distribute provided course material without the permission of the instructor. Course material includes, but is not limited to, lecture documents, written or transcribed notes, video or audio recordings, etc. You are not permitted to make video or audio recordings of lectures. ***You are not permitted to take and sale notes or sale any course material for commercial purposes or financial gain.*** If you would like to share your course notes with your fellow peers enrolled in the course, use the Carmen Drop-box function to post your notes. Student notes, which are posted to Carmen are not reviewed by the course instructor for accuracy.

### University Policies

**Disability Services:** Students with disabilities that have been certified by the Office for Disability Services will be appropriately accommodated, and should inform the instructor as soon as possible of their needs. The Office for Disability Services is located in 150 Pomerene Hall, 1760 Neil Avenue; telephone 292-3307, TDD 292-0901; <http://www.ods.ohio-state.edu/>.

**Academic Misconduct:** As stated by Ohio State University's Office of Academic Affairs, academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University's *Code of Student Conduct*, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University's *Code of Student Conduct* and this syllabus may constitute "Academic Misconduct." If I suspect that a student has committed academic misconduct in this course, I am obligated by University Rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University's *Code of Student Conduct* (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University. If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me or visit <http://oaa.osu.edu/coam.html>.

As stated by COAM, academic misconduct encompasses, but is not limited to, the following:

1. Violation of course rules;
2. Violation of program regulations;
3. Knowingly providing or receiving information during a course exam or program assignment;

4. Possession and/or use of unauthorized materials during a course exam or program assignment;
5. Knowingly providing or using assistance in the laboratory, on field work, or on a course assignment, unless such assistance has been authorized specifically by the course instructor or, where appropriate, a project/research supervisor;
6. Submission of work not performed in a course: This includes (but is not limited to) instances where a student fabricates and/or falsifies data or information for a laboratory experiment (i.e., a "dry lab") or other academic assignment. It also includes instances where a student submits data or information (such as a lab report or term paper) from one course to satisfy the requirements of another course, unless submission of such work is permitted by the instructor of the course or supervisor of the research for which the work is being submitted;
7. Submitting plagiarized work for a course/program assignment;
8. Falsification, fabrication, or dishonesty in conducting or reporting laboratory (research) results;
9. Serving as or asking another student to serve as a substitute (a "ringer") while taking an exam;
10. Alteration of grades in an effort to change earned credit or a grade;
11. Alteration and/or unauthorized use of university forms or records.

Every effort has been made to provide clear and accurate information within this syllabus. Should events require that information contained herein must be modified, announcements will be made in class. It is your responsibility to acquire any information provided during times of absence.

### EXPECTED LEARNING OUTCOMES OF ANIMSCI 2200.01: NATURAL SCIENCE: BIOLOGICAL

Introductory Animal Sciences is a Natural Science (Biological Science), general education, course that promotes an understanding of modern science through a biological systems based approach. Students learn of the relationship between science and technology, consider the implications of scientific discoveries, and acquire the knowledge and critical thinking skills required to evaluate the potential of science and technology to address problems from a global arena as they pertain to domestic animals used for human benefit.

**Goals and Objectives of the GE Natural Science Category:** Courses in natural sciences foster an understanding of the principles, theories and methods of modern sciences, the relationship between science and technology, the implications of scientific discoveries and the potential of science and technology to address problems of the contemporary world.

1. Students understand the basic facts, principles, theories and methods of modern science.
2. Students understand key events in the development of science and recognize that science is an evolving body of knowledge.
3. Students describe the inter-dependence of scientific and technological developments.
4. Students recognize social and philosophical implications of scientific discoveries and understand the potential of science and technology to address problems of the contemporary world.

**How students meet the GE Natural Science objectives through this course:** Students will learn how systematic observations of the natural world have helped define current concepts of science and the role of controlled experimentation in support of early scientific theories through discussions of evolution, behavior, reproduction, nutrition, and genetics. An understanding of the foundations of modern science will be acquired through discussions of cell theory, heredity, physiological ecology, energy transfer, and evolutionary strategies of today's domesticated species. Students will gain an appreciation of how human intervention has shaped animal form and function throughout history and the role of technology; addressing the implications of biotechnologies current and future applications.

## Animal Sciences – Introductory Animal Sciences {ANIMSC-2200.01}

### Expected Learning Outcomes Assessment Plan

<i>Course Goals</i>	<b>GE Learning Goals</b>  <i>broad descriptive statements of what students are to be able to do, know, and care about upon the completion of the course</i>	<b>Supporting/Contributing Outcomes</b>  <i>detailed descriptions of what a student must be able to do to reach a goal under the specific conditions</i>	<b>Measures – Means/Methods</b>  <i>the method or means by which the quality of student learning for each goal and associated outcome will be measured and assessed</i>					<b>Criteria</b>  <i>the standards the course will use to evaluate the quality of student learning for each goal and associated outcome</i>
				<i>embedded testing, exercise, or activity to serve as authentic assessment method</i>		<i>relevant topic or reference to course element</i>		
Promote an understanding of modern science through a biological systems based approach  Knowledge	<b>1.0</b> Students understand the principles, theories, and methods of modern science, the relationship between science and technology, the implications of scientific discoveries and the potential of science and technology to address	<b>1.1 understand</b> the basic facts, principles, theories and methods of modern science	1.1.1	Direct	Embedded testing (Appendix A)	Quiz 1 & 2	Key concepts tested: 1) evolutionary theory ; 2) interpretation of science findings	Acceptable criteria is 70% of students scoring 70% or greater
			1.1.2	Direct	Embedded testing	Midterm 1 & Comprehensive Final Exam: Identified question set	Comparison of midterm questions to final exam questions for learning gains for above referenced key concepts	Acceptable criteria is students will demonstrate 25% gain above initial scores obtained for identified problem set
			1.1.3	Indirect	Self-evaluation of learning	Course survey	As a result of this class, how has your understanding of science changed What was the most valuable scientific concept learned from this class	Acceptable criteria is 70% of students perceive increased understanding of modern science concepts

	problems of the contemporary world.	1.2 <b>understand</b> key events in the development of science and recognize that science is an evolving body of knowledge	1.2.1	Direct	Embedded testing	Quiz 5 & 6	Key concepts tested: 1) contributions of early scientist (Aristotle, Hooke, Darwin, Watson & Crick) and current concepts in science	Acceptable criteria is 70% of students scoring 70% or greater	
			1.2.2	Direct	Embedded testing	Midterm 2 & Final Comprehensive Exam: Identified question set	Comparison of midterm questions to final exam questions for learning gains for above referenced key concepts	Acceptable criteria is students will demonstrate 25% gain above initial scores obtained for identified problem set	
			1.2.3	Indirect	Self-evaluation of learning	Course survey	As a result of this class, how has your understanding of science changed What was the most valuable scientific concept learned from this class	Acceptable criteria is 70% of students perceive increased understanding of modern science concepts	
			1.3 <b>describe</b> the interdependence of scientific and technological developments	1.3.1	Direct	Embedded testing	Quiz 4 & 6	<ul style="list-style-type: none"> <li>Key concepts tested: 1) value of technology to understanding and improving animal systems</li> </ul>	Acceptable criteria is 70% of students scoring 70% or greater
				1.3.2	Direct	Embedded testing	Midterm 2 & 3 & Final Comprehensive Exam:	Comparison of midterm questions to final exam questions for learning gains for	Acceptable criteria is students will demonstrate 25% gain above initial

					Identified question set	above referenced key concepts	scores obtained for identified problem set
		1.3.3	Indirect	Self-evaluation of learning	Course survey	What was the most valuable scientific concept learned from this class	Acceptable criteria is 70% of students perceive increased understanding of modern science concepts
						As a result of this class, how has your understanding of science changed	
	1.4 recognize social and philosophical implications of scientific discoveries and understand the potential of science and technology to address problems of the contemporary world	1.4.1	Direct	Embedded testing	Quiz 3, 5, 7	Key concepts tested: 1) Science, application, and controversy of animal welfare, biotechnology, reproductive technology	Acceptable criteria is 70% of students scoring 70% or greater
		1.4.2	Direct	Embedded testing	Midterm 1,2, & 3 & Final Comprehensive Exam: Identified question set	Comparison of midterm questions to final exam questions for learning gains for above referenced key concepts	Acceptable criteria is students will demonstrate 25% gain above initial scores obtained for identified problem set
		1.4.3	Indirect	Self-evaluation of learning	Course survey	As a result of this class, how has your understanding of science changed	Acceptable criteria is 70% of students perceive increased understanding of modern science concepts
						What was the most valuable scientific concept learned from this class	

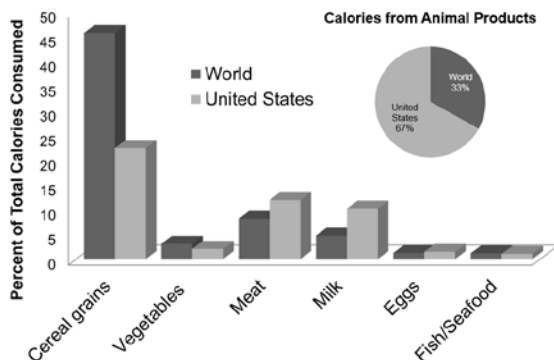
**Use of assessment findings:** Systematic review of course outcomes will occur through data collection and analysis of direct and indirect measures of expected learning outcomes. Data collection for identified direct measures of the associated learning outcomes is conducted each term the course is taught, and annual data of identified measures is summarized and reported as evidence of achievement or need for improvement. With the goal of improving instruction and student learning, indicators of the findings will be used to plan and incorporate strategic adjustments to the course for continuous quality improvement. Emphasis will be placed on goals and associated outcomes for which students failed to meet the minimal acceptable criteria. Teaching and associated assessment measures for which goal achievement is determined will be examined for coherency in enabling the student to achieve learning potential. Assessment data is communicated and shared through an OSU authenticated share site ([box.osu.edu](https://box.osu.edu)).

**APPENDIX A: SAMPLE EMBEDDED QUESTIONS**

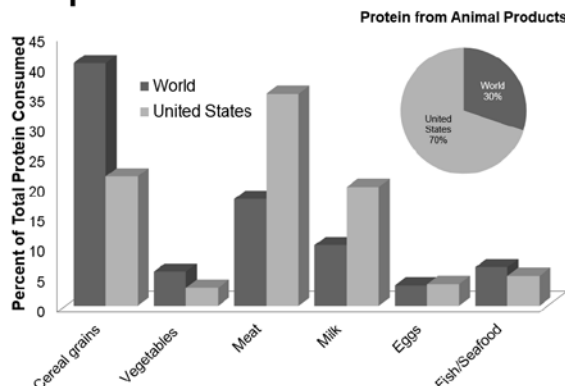
ELO 1: Students understand the basic facts, principles, theories and methods of modern science.

- Key concepts tested: 1) evolutionary theory ; 2) interpretation of science findings
1. The symbiotic relationship between ruminants and the microorganisms that inhabit their digestive system can be viewed as one of \_\_\_\_\_, whereby both systems benefit from one another.
  2. According to the theory of evolution:
    - a. Successful organisms emerge through modifications that increase chances of survival
    - b. Species can be artificially selected for in the creation of new variations
    - c. Species resist change over time and space due to limited ability to vary morphologically
    - d. Species reproduce optimally under limited food and lack of habitat
    - e. To ensure optimal conditions, species reproduce below environmental capacity
  3. Natural selection:
    - a. Introduces variation
    - b. Acts on existing variation
    - c. Increases the likelihood of a genetic modification
    - d. Decreases the likelihood of a genetic modification
  4. Consider the contributions of animal products to world and US food supply and select the response(s) that represent these contributions.

**Total calories consumed**



**Total protein consumed**



- a. Animal products contribute to a greater percentage of total protein than total calories to world food supply.
- b. Animal products contribute a greater percentage of total calories than total protein to world food supply.
- c. Animal products contribute approximately equal percentage of protein and calories to world food supply.
- d. Animal products contribute a lesser percentage of protein to food supply in the US as compared to their contribution to world food supply.



e. Animal products contribute a greater percentage of calories to food supply in the US as compared to their contribution to world food supply.

ELO 2: Students understand key events in the development of science and recognize that science is an evolving body of knowledge.

- Key concepts tested: 1) contributions of early scientist (Aristotle, Hooke, Darwin, Watson & Crick) and current concepts in science

1. The modern cell theory states (select all true):

- a. All living things are composed of cells
- b. All cells come from preexisting cells
- c. The cell is the fundamental unit of structure in living systems
- d. The cell is the fundamental unit of function in living systems

2. The primary phases of the cell cycle:

- a. Interphase                      b. Prophase                      c. Metaphase
- d. Anaphase                      e. Telophase                      f. Mitotic phase

3. According to the complementary base pairing rules of nucleic acids, the following nucleic acid bond pairings would occur (select all that are true):

- a. Adenine:Guanine                      b. Adenine:Uracil
- c. Thymine: Cytosine                      d. Cytosine: Guanine
- e. Uracil:Thymine                      f. Uracil:Guanine

4. Aristotle proposed two theories of embryogenesis. One of the theories later became known as epigenesis. Select the statement that defines or supports the theory.

- a. The embryo is a preformed being that grows during development
- b. A living being arises from the successive differentiation of a formless being
- c. Single cells isolated from the male are capable of developing into an embryo
- d. a and b
- e. b and c
- f. a and c

5. Cellular \_\_\_\_\_ is necessary for embryonic development, postnatal growth, and tissue renewal and occurs through \_\_\_\_\_. \_\_\_\_\_ is the process whereby cells acquire specific function necessary to organismal processes.

- a. Proliferation, Mitosis, Differentiation
- b. Differentiation, Mitosis, Proliferation
- c. Proliferation, Meiosis, Differentiation
- d. Differentiation, Meiosis, Proliferation

ELO 3: Students describe the inter-dependence of scientific and technological developments.

- Key concepts tested: 1) value of technology to understanding and improving animal systems

1. With agriculture, milk availability for human consumption increased and led to milk as a dietary staple for the adults of some cultures. What occurred to account for the ability of early humans to drink milk beyond infancy?
  - a. Loss-of-function mutation contributing to lactase persistence
  - b. Gain-of-function mutation contributing to lactase persistence
  - c. Gain-of-function mutation contributing to lactose persistence
  - d. Loss-of-function mutation contributing to lactose persistence
  
2. In biological systems, the potential energy of transformation is measured by calorimetry. Which of the following describes the relationship between calorimetry and the energy factors of feedstuffs (select all correct)?
  - a. Calorimetry provides a measure of gross energy, or the potential energy available to the organism when chemical bonds of the nutrients are broken
  - b. Calorimetry provides a measure of digestible energy, or the potential energy available to the organism when energy losses through nitrogenous waste compounds are considered
  - c. Calorimetry provides a measure of metabolizable energy, or the potential energy available to the organism when energy losses associated with undigested feeds of the GI tract and nitrogenous waste compounds are considered
  - d. Calorimetry provides a measure of net energy, or the potential energy available to the organism when energy losses associated with undigested feeds of the GI tract and heat of fermentation are considered
  
3. Consider the inheritance of alleles responsible for coat color in cattle. If you bred a red shorthorn female to a white shorthorn male, what coat color/pattern would you predict for the off-spring if the trait was controlled by incomplete dominance:
  - a. The coat color of the progeny would be dilute red
  - b. The progeny would have a roan coat pattern
  - c. The coat color of the progeny would be white
  - d. Male progeny would have a red coat color while females would display the white coat color
  - e. Female progeny would have a red coat color while males would display the white coat color
  
4. Artificial insemination is a widely used reproductive technology. To improve use in beef cattle, estrus synchronization is often employed. Which of the following describes a method used in estrus synchronization:
  - a. Injection of GnRH and regression of the corpus luteum
  - b. Injection of luteinizing hormone and regression of the corpus luteum
  - c. Insertion of a controlled estrogen release device and suppression of estrus
  - d. Insertion of a controlled progesterone release device and suppression of estrus

ELO 4: Students recognize social and philosophical implications of scientific discoveries and understand the potential of science and technology to address problems of the contemporary world.

- Key concepts tested: 1) Science, application, and controversy of animal welfare, biotechnology, and reproductive technology
1. Abnormal behavior in captive animals occurs when behavior of exploration is suppressed. In laying hens, feather pecking is considered an abnormal behavior with the incidence increasing in confined flocks. The incidence of feather pecking is reduced by animal selection and enrichment practices.
    - a. The paragraph contains one incorrect sentence.
    - b. The paragraph contains two incorrect sentences.
    - c. The paragraph contains three incorrect sentences.
    - d. The paragraph is correct.
  2. Why is embryo transfer used in cattle?
    - a. To increase use of superior genetics of elite females
    - b. Increase capacity to use semen of deceased sires
    - c. Safety due to aggressiveness of female cattle
    - d. To reduce costs of pregnancy in each recipient
    - e. To induce lactation in the donor
  3. Gradual involution of the mammary gland follows peak lactation. Involution involves the degeneration and/or loss of secretory epithelial cells and associated alveoli. Administering growth hormone will prevent involution.
    - a. The paragraph contains one incorrect sentence
    - b. The paragraph contains two incorrect sentences
    - c. The paragraph contains three incorrect sentences
    - d. The paragraph is correct
  4. Interbreeding between two animal species yields unique offspring, but these offspring are often sterile, maintaining the genetic distinction of the parents. What process in meiosis is responsible for the sterility observed in these hybrid animals
    - a. Crossing-over of chromosomal DNA
    - b. Mutations of chromosomal DNA
    - c. Homologous chromosome pairing
    - d. DNA replication failure