

MILK SECRETION
ASC 564
Spring, 2007
MWF 12:00
109 Garrigus

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stop by

SYLLABUS

SUGGESTED READING

(Lactation. 1985. B.L. Larson)

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| 1. | Introduction to Physiology of Lactation | Refer to Chapter 1 |
| | a. Importance of Milk | |
| | b. Variation in Composition and Yield | Chapters 3 & 5
(Sec. 3.7-3.9 & 5.1- 5.2-1d) |
| | c. Ontogeny and Phylogeny | |
| 2. | Mammary Gland Structure | |
| | a. Gross Anatomy | Chapter 1 |
| | b. Histology | Chapter 4 (Sec. 4.1-4.2) |
| | c. Cytology | Chapter 4 |
| 3. | Mammary Growth and Development | Chapter 1 |
| | a. From Fetus to Lactation and Involution | |
| 4. | Nutritional and Metabolic Aspects of Lactation | Chapter 3 (Sec. 3.1-3.5) |
| 5. | Biosynthesis and Cellular Secretion of Milk | |
| | a. Energy Metabolism | Chapter 3 (Sec. 3.6) |
| | b. Fat Synthesis | Chapter 4 & 5 |
| | c. Protein Synthesis | Chapter 4 & 5 |
| | d. Lactose, Mineral and Vitamin Secretion | Chapter 4 & 5 |
| 6. | Mastitis | Chapters 6 & 7
UK fact sheet - ASC 140 |
| | a. Economics, Etiology, Milking Management | |
| | b. Prevention & Control of Contagious and Environmental Mastitis | |
| | c. Inflammation & Impact on Milk Quality and Composition | |
| 7. | Endocrine and Neural Control of the Mammary Gland | Chapter 2 |
| | a. Neuroendocrine System | |
| | b. Growth | |
| | c. Lactogenesis | |
| | d. Galactopoiesis & Issues Associated with BST | |

***** FINAL EXAM - Monday, April 30, 2007, 1:00 p.m. *****

TEXT:

There is no required text for the course. However, lecture materials will, in part, be pulled from the reference list below. References 1 and 2 are excellent resources and may be found in the Young Library.

HANDOUTS:

In addition to lecture notes, you will be responsible for material contained in handouts given out in class.

OTHER REFERENCES:

1. Lactation and the Mammary Gland. 2002. R. M. Akers, Iowa State Press.
2. Lactation. 1985 (2nd printing 1995). Ed: B.L. Larson, Iowa State University Press.
3. Biology of Lactation. 1971. G.H. Schmidt, W.H. Freeman & Co.
4. The Physiology of Lactation. 1971. Cowie & Tindal, William & Wilkins Co.
5. Lactation: A Comprehensive Treatise, 1974 & 1978. Vol. I-IV. Eds: B.L. Larson and V.R. Smith, Academic Press.
6. Dairy Cattle: Principles, Practices, Problems, Profits. 1985. Bath, Dickenson, Tucker and Appleman. Lea & Febiger. 3rd Edition.
7. National Mastitis Council web site: <http://www.nmconline.org/home.htm>
8. Biochemistry of Lactation. 1983. T.B. Mepham. Elsevier Sci. Pub.
9. Web site: <http://classes.aces.uiuc.edu/AnSci308/index.html>
10. Large Dairy Herd Management. 1992. H.H. Van Horn and C.J. Wilcox. American Dairy Science Association. Savoy, IL.
11. Journal of Dairy Science; Journal of Animal Science; veterinary journals

GRADING:

	<u>% of Grade</u>
Three one-hour exams (February 9, March 21, April 13)	45%
Quizzes (drop lowest one)	15%
Final Exam (Comprehensive)	25%
Research Summaries (2) (February 16 and April 6)	15%

GRADING SCALE:

Compliance with SACS Criteria regarding expectations in 400G and 500-level courses

In 2001, the consensus of the Graduate Council was that expectations of undergraduate versus graduate students in 400G and 500-level courses should be different, and that these differing expectations should be clearly stated in the course syllabus. This differentiation could be achieved in two ways:

- (i) Graduate students enrolled in a 400G or 500 level course would be required to complete additional assignments consistent with graduate-level scholarship; e.g. an additional term project, literature review, research paper, analysis, etc.
- (ii) Graduate students enrolled in a 400G or 500 level course would be held to a higher grading standard for exams, term projects, and other assignments as appropriate. The grading scale for both under-graduate and graduate students would be clearly stated in the syllabus. While this approach would not necessarily require the graduate student to complete additional assignments, it would provide for a clear differentiation.

To comply with the above requirements, the grading scales for undergraduate and graduate students will be:

<u>Undergraduates</u>		<u>Graduate Students</u>	
90 - 100%	A	92 - 100%	A
80 - 89%	B	82 - 91%	B
70 - 79%	C	72 - 81%	C
60 - 69%	D	< 72%	E

EXTRA CREDIT:

You may earn extra credit by completing 2 additional research summaries on lactation topics of your choice. The average grade on this extra credit opportunity will be substituted for 50% of your lowest hour exam grade. **This extra credit is optional.** These papers will be due the last day of regular classes, **April 27.**

ABSENCES

I do not take attendance in class. However, I expect students to attend class, and it is the student's responsibility to obtain notes or handouts from lectures that are missed. Only reading the suggested reading will not be sufficient! Announced quizzes will be given approximately every 2 weeks. No make-up quizzes will be given. If a quiz is missed with an **excused absence**, the quiz is dropped. Missing a quiz with **no excused absence** results in a 0 grade for that quiz. No hour exam may be missed **without an excused absence**. I must be notified **2 weeks in advance** if there is a legitimate conflict with a scheduled hour exam (you have all the dates). The student and I will make arrangements to have the exam administered at another time. I will make every effort to help students with difficulties in their schedules, within reason. However, I must be kept informed.

RESEARCH SUMMARIES

Two original research articles (not review papers) must be read, reviewed, and a summary prepared for each during the semester. These will be prepared according to the following guidelines:

1. Subject - scientific articles may fall under any of the topics discussed in the course or listed in the course outline. Each article must cover a different subject area. It must be a report of original research, reported in the *last five years* (2000 to present) and not a review article.
2. Centered on the first page, *cover page*, state the author(s), year, title, journal, volume, and pages in the style of reference citations in the **Journal of Dairy Science**; e.g., *Harmon, R.J. and R. Scaletti. 1997. How to cure mastitis without really trying. J. Dairy Sci. 80:123-125*. Put your name, the course, and the date in the upper right hand corner.
3. On the first page of the summary, begin with a statement of the rationale for the study (why it is important) and major objectives. Do not put headings on the paragraphs.
4. A *brief* summary (no more than a paragraph) of the techniques used, numbers of animals, treatments examined, etc. should follow. Use abbreviations to save space, but define first, e.g. ABovine serum albumin (BSA) levels were measured.@ However, provide enough description so I can understand what was done.
5. *Of greatest importance*, discuss the results of the study with the inclusion of **some data**, interpretation of results, and a concluding paragraph stating significance of the results. **Do not include tables or graphs, but do include some data**, e.g., AFeeding lactating cows Wonder Product X resulted in a 20% increase in milk production and a decrease in fat percentage from 3.5% in the control to 3.2% in the treatment group.@
6. Length/style - each report must not exceed *two typewritten* pages (excluding the cover page), *double spaced* with 1 inch margins. Excess will be ignored. (Handwritten reports will *not* be accepted). Use 10 or 12 pt font.
7. One summary is due at the end of class on each of the following dates: **February 16 and April 6. For each class period a paper is late, the grade drops 10%**.
8. Do *not* copy the abstract from the article. Put in your own words. Plagiarism is a serious offense!!
9. **HAVE SOMEONE PROOF YOUR WORK BEFORE IT IS TURNED IN.** Grammar and typos count. All papers must be typed

NOTE: THE SELECTION OF ARTICLES MAY BE AIDED BY CONSULTING *DAIRY ABSTRACTS, JOURNAL OF DAIRY SCIENCE, JOURNAL OF ANIMAL SCIENCE*, OR ONE OF THE LIBRARY'S LITERATURE SEARCHES.

LEARNING OBJECTIVES - ASC 564 MILK SECRETION

Students who have completed this course should be able to:

1. Describe the function of anatomical parts of cow's udder and comparative anatomy of some other species.
2. Describe or diagram the cytological aspects of mammary gland and milk secretion.
3. Explain or discuss endocrine and other factors controlling mammary development, lactogenesis and maintenance of lactation.
4. Logically describe the biochemical aspects of milk secretion, relate them to structure, and list variables that influence milk composition.
5. Explain the impact of the disease process on the mammary gland and what defense mechanisms may aid in protection.
6. Explain the practical methods of mastitis control and their importance in the dairy industry.
7. Effectively reason using knowledge gained in class and coherently express your ideas in writing.
8. Most importantly, enjoy learning!

IMPORTANT DATES - Spring, 2007

Jan 15	M.L. King Day - no class
Jan 22 & 24	Guest lecture – Dr. Amaral-Phillips
Jan 29	No Class - Dr. Harmon out of town
Feb 9	Hour exam #1
Feb 16	1st Research Summary due
Mar 9	Last date to withdraw from a course (Midterm grades due Mar 5)
Mar 12-17	Spring Break - no classes
Mar 21	Hour exam #2
Apr 6	2nd Research Summary due
Apr 13	Hour exam #3
Apr 27	Last day of classes; extra credit due (optional)
Apr 30	Final exam (1:00 p.m.)