



FLORIDA INTERNATIONAL  
DAIRY ACADEMY

DEPARTMENT OF ANIMAL SCIENCES

# THERMAL BIOLOGY

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## Instructor

### **Dr. Peter J. Hansen**

Distinguished Professor & L.E. "Red" Larson Professor  
Department of Animal Sciences  
University of Florida  
[pjhansen@ufl.edu](mailto:pjhansen@ufl.edu)

## Course Description

Cattle are classified as homeotherms because they seek to regulate their body temperature at a constant and high level. Conditions such as high air temperature, humidity, and extensive solar radiation cause heat stress that make it difficult for cattle to maintain their body temperature. Cattle exposed to heat stress are at an increased risk for alterations in physiology that compromise productivity and healthy.

After completion of this course, students should understand the scientific basis for management approaches to increase cow comfort during heat stress and reduce the impact of heat stress on the health and function of dairy cattle. This understanding will be gained by 1) learning how heat stress affects economically important traits in dairy cattle, 2) developing a comprehension of heat and temperature and how heat production and exchange is regulated by the cow, and 3) learning about various strategies to minimize the impact of heat stress on the dairy animal.

## Course Layout

This 4-week course consists of approximately three 50-minute lectures and a single 1-hour zoom discussion per week. Each lecture contains imbedded quiz questions to measure understanding of course content. The lectures can be viewed at the student's convenience during the week, but all indicated material should be covered prior to the weekly zoom session.

## Class Expectations, and Make-Up Policy

Lectures can be viewed at the student's convenience during the week, but all material should be covered prior to the weekly one-on-one zoom session. Conflicts that prevent students from attending the weekly zoom session should be addressed with the professor in advance.

## Course Schedule

Week	Module	Lecture
1	Modules 1-2	Stress, Strain, and Adaptation Heat Stress Effects on Cows
2	Modules 3-5	Physics and Chemistry of Heat and Temperature Homeotherms Thermoneutral Zone and Measuring Heat Stress
3	Module 6	Conduction Convection
4	Modules 7-8	Radiation and Evaporation Other Heat Abatement Strategies

## Grading Policy

Pass/Fail – All modules must be viewed and completed to receive a “Pass” for this course.

## University Honesty Policy

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Honor Code (<https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

## Software Use

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.