

# Animal, Dairy and Veterinary Sciences

**Department Head:** Mark C. Healey

**Location:** Agricultural Science 230

**Phone:** (435) 797-2162

**FAX:** (435) 797-2118

**E-mail:** advsdept@adv.susu.edu

**WWW:** <http://www.advs.susu.edu>

**Associate Head:** Thomas D. Bunch, Agricultural Science 220,  
(435) 797-2148, [tombunch@cc.susu.edu](mailto:tombunch@cc.susu.edu)

## Undergraduate Advisor for Animal Science and

**Dairy Science majors:** Tami Spackman,  
Agricultural Science 242, (435) 797-2150,  
[tami.spackman@susu.edu](mailto:tami.spackman@susu.edu)

## Undergraduate Advisor for Bioveterinary Science majors:

Stanley D. Allen, Veterinary Science 211, (435) 797-1900,  
[sallen@cc.susu.edu](mailto:sallen@cc.susu.edu)

## Graduate Programs Coordinator:

Jeffrey L. Walters,  
Agricultural Science 246, (435) 797-2161,  
[jeffrey.walters@susu.edu](mailto:jeffrey.walters@susu.edu)

**Degrees offered:** Bachelor of Science (BS) and Bachelor of Arts (BA) in Animal Science, Dairy Science, Bioveterinary Science; Master of Science (MS) in Animal Science, Bioveterinary Science, Dairy Science; Doctor of Philosophy (PhD) in Animal Science and Bioveterinary Science; MS and PhD degrees in Toxicology are available through the Interdepartmental Toxicology program

**Undergraduate Emphases:** *Animal Science*—Animal Industries, Biotechnology, Science; *Dairy Science*—Dairy Industries, Science; *Bioveterinary Science*—Biotechnology

**Graduate Specializations:** *Animal/Dairy Science*—Animal Nutrition, Breeding and Genetics, Molecular Biology, Reproductive Biology, Animal or Dairy Management (MS only); *Bioveterinary Science (PhD only)*—Parasitology, Toxicology, Virology

**Certificate Program:** Dairy Herdsman

## Undergraduate Programs

### Objectives

Bachelor's degree students majoring in animal or dairy sciences may choose a program from two career emphasis areas: **Science** or **Animal (Dairy) Industries**. The curricula in the animal and dairy sciences are designed to prepare students for a broad base of rewarding careers in the dynamic disciplines of animal agriculture. Teaching and research facilities, flocks, and herds are available for "hands-on" practical laboratory experiences, along with faculty-mentored research projects. An assigned faculty advisor helps students develop, arrange, and expedite their personal undergraduate program.

Preveterinary bachelor's degree programs are intended to prepare students for admission to professional veterinary medical schools and/or graduate study in the biomedical sciences. A preveterinary bachelor's degree is considered a nonterminal degree. Prevetinary students may earn a bachelor's degree in bioveterinary science, or in the science emphasis of animal science or dairy science with a preveterinary option.

Instruction in the ADVS Department also encompasses a diversified co-curricular program including allied clubs, intercollegiate livestock judging and rodeo teams, and involvement with their respective professional societies.

### Animal and Dairy Sciences

**Science Emphasis.** Designed for students desiring education beyond the bachelor's degree, this emphasis is a preparatory course of study for students who have a career interest in the following areas: animal research in genetics; reproductive biology, nutrition (public or private sector); biotechnology; teaching; and advanced degrees (MS, PhD, and veterinary school). The science emphasis requires an especially close student-advisor relationship, as post-graduate training is considered essential for professional success in these disciplines.

**Animal (Dairy) Industries Emphasis.** This emphasis is designed to prepare students who earn a bachelor's degree for the broadest range of career opportunities in animal agriculture. The Animal Industries Emphasis stresses both traditional skills in the areas of basic and applied animal sciences and related learning experiences in the other agricultural sciences, as well as in the areas of business administration, economics, and management. Students can select either an advanced research project or an internship experience in the animal industries as an integral component of their program of study during the junior or senior year. Graduates from this emphasis may seek career opportunities in production animal agriculture in farm or ranch management, in state or federal government agricultural agencies, and in fields that support or interact with animal agriculture, such as corporate agribusiness, wholesale and retail marketing and sales, economics, accounting, agricultural real estate sales and appraisal, financing and credit operations, public policy, agricultural media and communications, insurance, commodity trading, animal product processing, agricultural cooperatives, and producer/commodity associations.

### Animal and Bioveterinary Sciences

**Biotechnology Emphasis.** This emphasis is designed to prepare students who earn a bachelor's degree for careers in the expanding biotechnology industry or for graduate study in related fields. Nationwide there are more than 1,200 biotechnology/biopharmaceutical companies, with additional start-ups developing every year. Recent increases in federal funding for research in animal biotechnology, along with heightened private sector activity, have led to unprecedented career prospects in molecular biology, genomics, bioinformatics, developmental biology, and associated areas. USU has made a major commitment to biotechnology since 1986. The ADVS Department is heavily involved in biotechnology research and teaching, and the resources of the Center for Integrated BioSystems are also available to support this emphasis.

Those students who enjoy lab work and would like to have a BS degree with good job opportunities, and still qualify to apply to veterinary school, may elect to add the Biotechnology Emphasis in Bioveterinary Science to their degree.

### Preveterinary Program

Preveterinary students take courses required by veterinary schools. Classes should be planned to assure meeting the current requirements for the veterinary schools to which the student plans to apply for admission. In most cases, preveterinary preparation requires a major portion of three academic years. Students accepted into veterinary school prior to completion of their BS degree may transfer credits back to USU for completion of their BS degree in bioveterinary science.

Utah participates in WICHE (Western Interstate Commission for Higher Education) which provides state subsidization of Utah resident (5 years or longer at the time of application) students entering any veterinary school that is a WICHE-participating school. At present this includes Colorado State University, Washington State University, Oregon State University, and University of California at Davis. Students may also apply to other veterinary schools as out-of-state applicants.

### Vocational Subbaccalaureate Program

**Dairy Herdsman Certificate.** Students completing the required courses and experience in the Dairy Herdsman's curriculum usually find employment with a commercial or family dairy. Some enter dairy-related businesses. Students desiring to continue their dairy education may complete a BS degree in three additional years with proper planning and suitable academic performance.

### Requirements

**Departmental Admission Requirements.** Undergraduate admission requirements for the animal science and dairy science programs are the same as those described for the University. Students in good standing may apply for admission to the department. New freshmen admitted to USU in good standing qualify for admission to the bioveterinary science major. Students with less than 60 semester credits transferring from other institutions need a 2.2 transfer GPA, and students with less than 60 semester credits transferring from other USU majors need a 2.0 GPA for admission to the bioveterinary science major. All students with 60 or more semester credits need a 2.75 total GPA to be admitted to advanced standing in bioveterinary science.

**Departmental Standards.** The following minimum requirements apply to all students working toward any bachelor's degree offered by the ADVS department. Bachelor's degree candidates must comply with these requirements in order to graduate: (1) courses required for the major may be repeated only once to improve a grade, and (2) courses required for the major may not be taken for pass-fail credit. In addition to these requirements, animal science and dairy science bachelor's degree candidates must attain a grade point average of at least 2.50 in the ADVS courses specified as requirements in their respective emphasis curricula to graduate. Animal science and dairy science degree candidates must attain an overall GPA of at least 2.25 to graduate. Bioveterinary science degree candidates must attain an overall GPA of at least 3.0 to graduate, *except* for students with a biotechnology emphasis, who must attain an overall GPA of at least 2.50 to graduate.

### Graduation Requirements

Courses required and recommended for meeting BS degree graduation requirements in the various options available in the department are as follows.

#### Animal/Dairy Science: Science Emphasis

The following courses are required for students pursuing a bachelor's degree in the animal science or dairy science Science Emphasis. Courses followed by (A) are required for Animal Science majors. Courses followed by (D) are required for Dairy Science majors. ADVS 1110, 1910, 2200, two 2000-level species production practices courses (A), 2130 (D), 3000, 3500, 3510, 4200, 4250 or 4800, 4560, 4910, 4920, two 5000-level species management courses (A), 5130 (D); ASTE 3090 (D); BIOL 1210, 1220, 3200, 3300; CHEM 1210, 1220, 1230, 1240, 2310, 2320, 2330, 3700; MATH 1050; MATH 1100 or 1210; STAT 2000.

#### Animal/Dairy Science: Industries Emphasis

The following courses are required for students pursuing a bachelor's degree in the animal science or dairy science Animal (Dairy) Industries Emphasis. Courses followed by (A) are required for Animal Science majors. Courses followed by (D) are required for Dairy Science majors. ADVS 1110, 1250, 1910, 2200, three 2000-level species production practices courses (A), 2130 (D), 3000, 3500, 3510, 3650 (A), 4200, 4250 or 4800, 4560, 4910, 4920, two 5000-level species management courses (A), 5030 (A), 5130 (D), 5520 (A); ASTE 3050; BIOL 1010; CHEM 1110, 1120; ECON 1500; MATH 1050; NFS 5030 (D); SOIL 2000 or 3000 (D); STAT 1040 or 2000 or 2300. In addition, students majoring in this emphasis must choose three directed elective courses in animal management from the following: ADVS 3300, 5030 (D), one 5000-level species management course in addition to the two courses required for the major (A), 5520 (D), 5530, 5860 (A); ASTE 3090 (D), 3600 (D), 4100 (D); NFS 5020 (A); PLSC 4320; FRWS 4000 (A); SOIL 2000 or 3000 (A). Furthermore, students majoring in this emphasis must choose four directed elective courses in industry from the following: ACCT 2010; ASTE 3090 (A); BA 3400, 3500, 3700; ECON 2010, 3030, 3050, 4010, 4030, 5030; MHR 2990, 3110.

#### Animal/Bioveterinary Science: Biotechnology Emphasis

The following courses are required for students pursuing a bachelor's degree in the animal science or bioveterinary science Biotechnology Emphasis. Courses followed by (A) are required for Animal Science majors. Courses followed by (B) are required for Bioveterinary Science majors. ADVS 1110, 1910 (A), 1920 (B), 2040, 2200, 3200, 4260, 4910 (A), 4920 (A), 5160 (B), 5240 (B), 5260 (B), two 5000-level Methods in Biotechnology courses (A); BIOL 1210, 1220, 3200, 3300; CHEM 1210, 1220, 1230, 1240, 2310, 2320, 2330, 3700; MATH 1050 (A), 1100; STAT 1040 or 2000. In addition, students majoring in this emphasis must complete 12 credits in directed elective courses from the following: ADVS 3000, 3500, 3510, 4200, 4560, 5490, 5700 (B), 5820, one additional 5000-level Methods in Biotechnology course (A); BIOL 4200, 5150; PHYX 2110, 2120.

#### Bioveterinary Science

This curriculum includes those courses required for application to WICHE veterinary schools after three years of study. Requirements are as follows:

**Freshman year:** ADVS 1110, 1920, 2200; CHEM 1210, 1220, 1230, 1240; ENGL 1010; MATH 1050; one University Studies Breadth course.

**Sophomore year:** ADVS 2920; BIOL 1210, 1220; CHEM 2310, 2320, 2330; MATH 1100; STAT 1040; one University Studies Breadth course; electives.

**Junior year:** ADVS 3000; BIOL 3200; CHEM 3700, ENGL 2010; PHYX 2110, 2120; one University Studies Breadth course; one University Studies Depth course; electives.

**Senior year:** Choose from among the following courses to complete the University requirements for the bachelor's degree: ADVS 3500, 3510, 4200, 4560, 5160, 5240, 5260, 5490, 5700; BIOL 3300, 4200, 5150, 5330, 5340, 5600, 5620.

### BA Degree in Animal/Dairy/Bioveterinary Science

Students must complete requirements for the BS degree in these respective programs (see above), plus two years of a foreign language (see page 50 of this catalog).

### Honors

There is also an Honors Plan for students desiring a BA or BS degree "with Honors" in Animal/Dairy/Bioveterinary Science. For details, students should contact their academic advisor.

### ADVS Minors

A minor can be valuable when associated with a major in agricultural education, agricultural economics, plant science, nutrition and food science, business, economics, computer science, rangeland resources, and in other disciplines where the animal industry has direct or indirect involvement.

Requirements for specialty or emphasis area minors are listed below. The same departmental standards applying to animal science and dairy science majors also apply to all minors (see page 129).

### Requirements for Minors

The following is a listing of courses for the various minor emphasis areas. A specific course may **not** be used to fulfill the requirements of more than one ADVS minor.

**General Animal Science:** ADVS 1110; choose one or more courses from ADVS 2080, 2090, 2120, 2190; 10 elective ADVS credits with approval of an animal science advisor.

**General Dairy Science:** ADVS 1110, 2130; 10 elective ADVS credits with approval of a dairy science advisor.

**Bioveterinary Science:** ADVS 2200, 3000, 4200; 3 elective ADVS credits with approval of a bioveterinary science advisor.

**Horse Production:** ADVS 1110, 2190, 2250; 6 or more elective ADVS credits with approval of an animal science advisor.

**Horse Training:** ADVS 1110, 1600, 2190, 2600; 2 or more elective ADVS credits with approval of an animal science advisor.

**Dairy Herdsman:** ADVS 1020, 1030, 1040, 1050, 1060. (*Not available to Dairy Science Majors.*)

Transfer students must have a minimum of one 3-credit upper-division course in residency with the approval of an ADVS advisor.

### Additional Information and Updates

For more information about Bachelor of Science requirements and the sequence in which courses should be taken, see major requirement sheets. For more information on ADVS Department minors, see minor requirement sheet. These are available from the ADVS Department advisor's office (AG S 242).

Successful completion of a bachelor's degree program in the ADVS Department requires that a very close student-academic advisor relationship be established and continued through each student's bachelor's degree program. Each student must take the responsibility of establishing this close working relationship with his or her advisor. Doing this soon after the student's entry into the department can keep academic problems to a minimum.

For updated information on ADVS programs and course offerings, check the departmental home page at:  
<http://www.advs.usu.edu>.

### Safety and Liability in Classes and Laboratories

Certain classes and laboratories involve a risk of bodily injury or of damage to clothing. Students should take appropriate precautions and wear suitable protective clothing. Some of the risks include handling or being near animals, slick floors or corrals, use of toxic or corrosive substances, and the use of sharp or breakable instruments and equipment. Students should take precautions to avoid fainting during demonstrations or work with animal tissues or operative procedures. Students must assume their own liability protection for travel to and from classes, laboratories, and field trips. The University and its employees assume no liability in the performance of classroom or laboratory instruction or on scheduled field trips, or for other dangerous activities. The student, by voluntarily participating in these classes and activities, agrees to assume the risk and not hold USU or its staff liable.

### Financial Support

In addition to the scholarships and other financial aid available through the University, the department awards designated scholarships to qualified students. The department employs students on a part-time basis to assist with its research and operate its animal facilities. The department also coordinates cooperative education and internship employment opportunities for students. For more information, contact the department.

## Graduate Programs

### Admission Requirements

In addition to the general admission requirements (see pages 90-91), applicants should have satisfactory (3.0 GPA or better) grades in completion of previous degree programs. GRE exam, verbal, quantitative, and analytical scores at or above the 40th percentile are required.

The applicant for a graduate program in animal or dairy science should have completed a BS undergraduate program similar to the USU animal science or dairy science Science Emphasis BS degree. This background would include the following courses and their prerequisites: BIOL 1210 and 1220 or their equivalents; CHEM 2310 and 2320 or their equivalents; MATH 1050 and STAT 1040 or their equivalents. Applicants with deficiencies in these areas may be admitted to the graduate program subject to the completion of remedial coursework specified by the department. Other preparatory courses may be specified by the student's supervisory committee.

Applicants to the bioveterinary science graduate program should have a degree in bioveterinary science, biology, microbiology, chemistry, or one of the animal sciences. Pre-veterinary students oriented towards graduate research studies are strongly encouraged to apply.

### ***Degree Programs***

**Master of Science.** The MS is available to qualified students with bachelor's degrees. MS degrees are offered by the department in animal science and dairy science, with five specializations in each, and in bioveterinary science.

**Doctor of Philosophy.** The PhD degree in animal science is offered with four specializations. It is available to qualified students with master's degrees in related disciplines. Exceptionally well-qualified applicants may be considered for admission to a postbaccalaureate PhD program. The PhD degree in bioveterinary science has three specializations and is available to qualified students holding a DVM or a master's degree in a related discipline, or exceptionally well-qualified postbaccalaureate applicants. The PhD is a terminal research degree that is awarded upon successful completion of a comprehensive program of coursework and original research in an approved area of specialization.

### ***Specializations in Animal/Dairy Science***

**Animal Nutrition.** This specialization involves studies in biochemistry, principles of nutrition, animal management, nutritional physiology, and animal feedstuffs. Cooperation with producers, feed industry groups, other departments of the University, and USDA collaborators, along with research funding from private industry, strengthens the graduate program in this area.

*Course requirements:* Students in the MS program are required to complete the following courses: ADVS 6800, any four ADVS graduate nutrition courses at the discretion of the supervisory committee; one 5000-level Statistics course. Students in the MS program are required to complete or to have completed CHEM 3700 or its equivalent, but will not receive graduate credit for it. Students in the PhD program are required to meet or have met all MS program requirements, as well as to complete the following coursework: ADVS 6800 (additional to the MS requirement), ADVS graduate nutrition courses as directed by the supervisory committee; CHEM 5700, 5710; one 5000-level Statistics course (additional to the MS requirement); additional coursework at the discretion of the supervisory committee to a total of at least 30 credits.

**Breeding and Genetics.** This specialization involves studies in quantitative genetics, applied animal genetics, statistics, and animal management. Cooperation with other departments, particularly the Department of Biology and the Department of Mathematics and Statistics, and collaboration with other research institutions, livestock producers, and commercial animal breeding companies broadens the resources of this graduate program.

*Course requirements:* Students in the MS program are required to complete the following courses: ADVS 6300, 6800; BIOL 6170, 6280; STAT 5110; and a minimum of 6 credits in the student's area of study. Students in the PhD program are required to complete the following courses in addition to those required for the MS degree: ADVS 6800, 6820; MATH 5710, 5720; STAT 6710, 6720.

**Molecular Biology.** This specialization involves studies in molecular genetics, biochemistry of nucleic acids, cell biology, reproductive physiology, and bioveterinary science. Cooperation with other departments, particularly the Department of Biology and the Department of Chemistry and Biochemistry, the Biotechnology Center, and collaborators at other research institutions allows for a strong graduate program in this area.

*Course requirements:* Students in the MS program are required to complete the following courses: ADVS 5160 or 5240 or 5260; ADVS 6800; BIOL 4200 or 6210; BIOL 5190; STAT 5200; and a minimum of 6 credits in the student's area of study. Students in the PhD program are required to complete the following courses in addition to those required for the MS degree: ADVS 6800; CHEM 5700, 5710.

**Reproductive Biology.** This specialization involves studies in physiology and endocrinology of reproduction; embryo technology, including collection, culture, manipulation, storage, and transfer of embryos; disease transmission, cytogenetics and molecular genetics; and environmental and toxicological influences on reproductive processes and fetal development. Cooperation with other departments and research centers of the University and with USDA collaborators allows for a strong graduate program in this area.

*Course requirements:* Students in the MS program are required to complete the following courses: ADVS 6200, 6800; BIOL 4200; STAT 5200. Students in the PhD program are required to complete the following coursework additional to the MS requirements: ADVS 6800; BIOL 5150, 6210; CHEM 5700, 5710. Additional coursework for the MS and PhD degree may be required at the discretion of the supervisory committee.

**Animal or Dairy Management (MS only).** This specialization involves studies in the applications of the principles of genetics, reproductive biology, and nutrition to animal or dairy management at an advanced level. Appropriate emphasis is also placed on statistics, economics and business administration, and range management. The management specialization offers the option of degree programs with or without thesis (Plan A or Plan B). Graduates in management from a program including thesis (Plan A) may pursue advanced studies in more specialized fields. The MS in management without a thesis (Plan B) is considered a terminal degree.

*Course requirements:* Students choosing either the option with thesis (Plan A) or the option without thesis (Plan B) are required to complete the following courses: ADVS 6200, 6300, 6520 or 6530, 6800; plus one of the following (if comparable course not previously completed at the undergraduate level): ADVS 6080, 6090, 6120, 6130, 6190; one 5000-level Statistics course. Additional courses in related areas will be required as directed by the supervisory committee.

### ***Bioveterinary Science***

This degree program involves studies in biochemistry, statistics, pathology, toxicology, virology, parasitology, pharmacology, microbiology, and laboratory animal management. Advanced

techniques in laboratory procedures and animal health research are emphasized. Cooperation with other departments and research centers of the University and with federal collaborators and agencies allows for a strong graduate program in bioveterinary science.

**Course requirements:** Students in the MS program are required to complete the following courses: ADVS 6700, 6800; CHEM 5700; STAT 3000. Students in the PhD program are required to complete the following courses: ADVS 6700, 6800; CHEM 5700, 5710; STAT 5200. Additional coursework will be determined by the supervisory committee.

### Research

The ADVS department conducts a broad range of basic and applied research in the areas of animal reproduction, animal nutrition, livestock and dairy management, animal health, virology, parasitology, toxicology, animal behavior, cytogenetics, and molecular genetics. Department facilities include over 30 research laboratories on campus and at local and regional animal research facilities. There are research herds and flocks of beef and dairy cattle, sheep, and swine housed close to the University. There are additional research units housing beef cattle, sheep, and turkeys located throughout the state. Research in the department is funded by a multimillion dollar budget derived from support by the Utah Agricultural Experiment Station and by substantial outside contracts and grants. Cooperation with other departments and research centers of the University and with federal collaborators enhances the ADVS research and graduate programs. Significant in this regard are the University Center for Integrated BioSystems, the Utah State Animal Disease Diagnostic Laboratories, the Laboratory Animal Research Center, the Center for Environmental Toxicology, the Center for the Genetic Improvement of Livestock, and the on-campus USDA Poisonous Plant Laboratory.

### Financial Assistance

Both departmental and research grant support are available to matriculated graduate students on a competitive basis. The department funds a number of graduate assistantships, which are available on a competitive basis to matriculated graduate students who are U.S. citizens, nationals, or residents. Students interested in departmental assistantships may request an application form from the department. Applications for assistantships for the following academic year must be submitted by March 15.

Acceptance to graduate study in the ADVS Department does not constitute a guarantee of financial assistance.

### Career Opportunities

Career opportunities are available for students who have earned graduate degrees in the MS and PhD programs offered by the ADVS Department as described below.

#### Animal and Dairy Science Graduate Degree Programs

**Animal Nutrition.** Career opportunities exist in extension, university and private research, the commercial animal feedstuffs industry, private consulting firms, and international programs.

**Breeding and Genetics.** Career opportunities exist in extension university and private research, commercial animal breeding and genetic engineering enterprises, and international programs.

**Molecular Biology.** Career opportunities exist in university, federal, and private research organizations, and in commercial applications in the rapidly growing area of biotechnology.

**Reproductive Biology.** Career opportunities exist in extension; university and private research; the pharmaceutical, embryo transfer, and artificial insemination industries; private consultation; and international programs.

**Animal or Dairy Management.** Career opportunities include extension, private consultation firms, farm and ranch management, sales and service to agricultural producers, agricultural finance, and international programs.

#### Bioveterinary Science Graduate Degree Programs

Career opportunities in this area exist in research, management, and submanagement positions in public and private health research and testing organizations, and in commercial industries in the health field. Graduates from the MS program may seek admission to advanced degree programs in the biological sciences or veterinary medicine.

## Animal, Dairy and Veterinary Sciences Faculty

#### Trustee Professor

*Robert W. Sidwell, virology*

#### Professors

*Stanley D. Allen, veterinary diagnostics, laboratory animal management*

*Clell V. Bagley, veterinary medicine*

*Thomas D. Bunch, cytogenetics, embryo biology*

*Noelle E. Cockett, molecular genetics, identification of genetic markers*

*Roger A. Coulombe, Jr., veterinary toxicology, molecular biology*

*Howard M. Deer, pesticides, environmental toxicology*

*Mark C. Healey, parasitology*

*Lyle G. McNeal, sheep production, wool science*

*Kenneth L. White, reproductive physiology, developmental biology*

#### Research Professors

*John D. Morrey, virology, transgenic animals*

*Kamal A. Rashid, in vitro mutagenesis and DNA repair*

*Donald F. Snee, viral chemotherapy*

#### Adjunct Professors

*J. Talmage Huber, dairy nutrition*

*Lynn F. James, animal physiology*

*Michael R. Marshall, veterinary medicine*

*Kanok Pavasuthipaisit, medical science, anatomy*

*R. Dean Plowman, dairy genetics, management*

*Rex S. Spendlove, microbiology*

#### Professors Emeriti

*Clive W. Arave, behavior, dairy genetics*

*John E. Butcher, ruminant nutrition*

*Jay W. Call, veterinary medicine*

Warren C. Foote, reproductive physiology  
James LeGrande Shupe, veterinary science, comparative clinical medicine  
Ross A. Smart, veterinary diagnostic pathology  
Norris J. Stenquist, livestock production, nutrition  
Wallace R. Taylor, dairy breeding, dairy herd improvement  
Don W. Thomas, veterinary medicine

**Associate Professors**

Thomas J. Baldwin, veterinary diagnostic pathology  
Tilak R. Dhiman, dairy nutrition  
David D. Frame, poultry production and management  
Jeffery O. Hall, veterinary pathology, toxicology  
Kenneth C. Olson, range livestock nutrition, management  
Lee S. Rickords, molecular genetics, developmental biology  
Randall D. Wiedmeier, beef cattle nutrition, management  
Allen J. Young, dairy management, reproduction  
Dale R. ZoBell, beef cattle production, management

**Adjunct Associate Professors**

Dale R. Gardner, chemistry/toxicology  
Kip E. Panter, animal science/toxicology  
Roy W. Silcox, physiology, nutrition  
Bryan L. Stegelmeier, pathology  
John T. Stellflug, reproductive physiology, biochemistry, statistics  
J. Christopher Wilson, veterinary medicine, fisheries

**Associate Professor Emeritus**

Larry M. Slade, equine nutrition, management

**Research Associate Professors**

Dale L. Barnard, virology  
Ronald L. Boman, dairy nutrition, management

**Adjunct Research Associate Professor**

Shiquan Wang, cytogenetics, reproductive physiology

**Assistant Professors**

Ramona T. Skirpstunas, bacterial diseases of fish, veterinary pathology, veterinary laboratory diagnostic medicine  
Quinton A. Winger, reproductive physiology, molecular biology

**Adjunct Assistant Professors**

William E. Day, equine management, reproductive biology  
Breck D. Hunsaker, veterinary immunology  
Stephen T. Lee, analytical chemistry  
Timothy A. McAllister, ruminant nutrition, microbiology

**Research Assistant Professor**

Jeffrey L. Walters, dairy cattle breeding, statistics

**Clinical Assistant Professors**

Douglas S. Hammon, clinical veterinarian, dairy reproduction, nutrition  
Eleanor P. Jenson, clinical veterinarian, extension veterinarian

**Research Assistant Professor Emeritus**

Robert E. Warnick, turkey nutrition

**Lecturers**

Brett R. Bowman, animal science/nutrition  
Parl Galloway, animal science, manager of Animal Science Farm  
Justin A. Jenson, dairy herdsman coordinator, dairy youth specialist

## Course Descriptions

Animal, Dairy and Veterinary Sciences (ADVS), pages 330-333