1427 Using children's toys to enhance youth learning. M. J. Wylie*, *University of Maryland, College Park*.

All things being equal, a person will remember only 10% of what they hear, 20% of what they see, and 50% of what they read. But a person will remember 90% of what they do. It is only natural that children are attracted to animals. Live animals are not always available and/or feasible to use in certain teaching environments. The use of children's toys offers an alternative way to effectively teach concepts, whether the learning goals are oriented toward agricultural literacy, science literacy, or animal management/subject matter. This active-learning station will allow meeting attendees the opportunity to be an age between 5 and 18 years old for a few minutes. Participants will learn an age-appropriate concept facilitated by the use of children's toys. Examples of learning activities which appeal to all learning styles (visual, auditory, and kinetic) will be presented. Concepts taught will be based on research and practice from a variety of educational settings. Some concept examples include sorting, sequencing, categorizing, and recognizing patterns. Participants will hear, see, read, and do as children's toys are incorporated in the teaching to enhance youth learning.

Key Words: Youth, Learning, Children's Toys

1428 Students interacting across universities: a mock congressional hearing project. J. C. Swanson*[1] and M. Beck[2], [1]*Kansas State University, Manhattan,* [2] *University of Nebraska, Lincoln*.

There are several examples of animal science departments in the United States that reside in close proximity; for example, Washington State University and the University of Idaho are within a two hour drive of each other. In recent years electronic teaching methods have promoted the possibility of extending class boundaries beyond the home campus. Last spring, 44 students enrolled in similar courses taught at the University of Nebraska, Lincoln (UNL)(n=24) and Kansas State University (KSU)(n=20) cooperated to conduct a mock congressional hearing on a federal bill related to animal use. The project commenced one month before the formal hearing date of May 3,1997. In both courses students were divided in half and assigned to be proponents or opponents of the proposed legislation. The proponents and opponents from UNL joined forces with their respective counterparts at KSU to research, develop information, write and give testimony and lobby their position. A list serve was developed by UNL for each side to be used as the primary communication tool between the students. Students made strategic decisions involving the roles for each student, information development and assimilation, and lobbying efforts. The KSU students traveled to UNL to join their counterparts and present testimony to a congressional subcommittee composed of five animal science faculty from both universities (two KSU, three UNL). Six students (three UNL, three KSU) delivered testimony for each side. Students were evaluated by a combination of peer and group evaluation methods. In addition to the unique experience of participating in this inter-university project, students became proficient in the use of electronic tools (e-mail, list serves, and Internet information acquisition). A post project survey of UNL and KSU students indicated unanimous support for the inter-university project and offered constructive suggestions for the future.

Key Words: Active Learning, Group Project, Contemporary Issues

1429 Class lectures and help sessions presented over website at low cost. J. H. Hesby*, C. L. Skaggs, W. S. Ramsey, T. R. Greathouse, and B. A. Miller, *Texas A&M University, College Station*.

For the past 27 years, lectures, help sessions and seminars at TAMU were videotaped and placed on reserve in the library allowing students that were absent to view the missed material. However, with classes growing to be as large as 750 students, accessibility of these videotapes has become difficult. The new audio-video card for desk top computers now enables one to transfer lecture videotape, including recorded PowerPoint presentations, to a hard drive. This process involves a computer program that compresses the lecture on the hard drive. This is done in order to save space. The program takes five hours to run, but the computer is fully functional during this time. When the process is complete, the compressed version is then sent to the server, thus becoming available for viewing on the website. A modem is necessary in order to access lectures. Students may view lectures at home with the proper equipment or from computer access labs on campus. Presentations may be reversed, frozen or fast forwarded exactly as a normal videotaped progam. This system allows many students access to the same material simultaneously. It also permits students from another campus to view the lectures, providing a low cost form of distance education. At the end of the semester, all of the lectures may be saved onto a CD to preserve them for future use.

Key Words: Distance Education, Audio-Video Presentations, Internet/Website

1430 Interactive livestock breed identification on the Internet. S. P. Schmidt* and R. A. Dean, *Auburn University, AL*.

Students enrolled in an introductory animal science course are required to identify selected prominent breeds of cattle, horses, sheep and swine. A web-based breed identification viewer application was developed. (http://www.ag.auburn.edu/~sschmidt/breed_id/index.html) Objectives were to build a program that was intuitive to use, fast across the Internet, and interactive. The breed identification viewer uses Javascript, HTML and images in a standardized page layout. Content and program files are distributed from an Internet server to run locally on the student's machine with minimal server interaction. The application uses cache memory and hidden framesets which are downloaded to the student's computer to record, tabulate and re-display their identification responses. It also allows students to re-answer incorrect responses—a form of formative testing. A student survey was conducted following use of the breed identification slide show for one quarter term in a class of 88 students; 72 surveys were completed and returned. Eight respondents did not use the breed identification viewer to study; two of those did not use any other course materials posted on the author's homepage. Of the 64 who did use the viewer, 73% thought it helped them learn the breeds faster; 14% thought it made little difference in their learning speed; and only one student said learning speed was slower. Negative comments included the issues of older versions of browsers, "slow" computers and problems with commercial Internet providers. Most comments about the viewer were positive, with convenience being cited most frequently as the major benefit.

Key Words: Livestock, Breeds, Internet

1431 Collaborative teaching & learning meat-animal growth, development, & evaluation via distance education. A. L. Grant*[1], D. E. Gerrard[1], J. C. Forrest[1], T.R. Carr[2], D. F. Parrett[2], B. R. Skaar[3], F. C. Parrish[3], J. E. Williams[4], M. C. Lucy[4], A. J. Maurer[5], R. L. Russell[5], D. L. Thomas[5], C. C. Gibson[5], K. A. Reilly[5], and R. G. Kauffman[5], [1]*Purdue Univ., W. Lafayette, IN,* [2]*Univ. of Illinois, Urbana,* [3]*Iowa State Univ., Ames,* [4]*Univ. of Missouri, Columbia, and* [5]*Univ. of Wisconsin, Madison.*

An animal growth and development course was taught during the fall of 1997 and was a collaborative effort by thirteen faculty members at five universities. The objective was to coordinate and concentrate expertise and effort by the distance learning approach. Twenty 2-hour sessions were scheduled from September 16 through November 20. Live synchronous presentation and interaction were conducted via 9 satellite sessions and 11 audioteleconference sessions. Asynchronous support was provided via a website, videos, and print materials. In addition, an all-class "subscriber" listserv was available for students to raise questions or participate in discussions. Twenty-five project groups were collaborating across institutions on topics of their choice via preconfigured listservs. A total of 182 students representing eleven institutions enrolled; one site withdrew due to inadequate prerequisites of its students. Packets of course syllabi, handouts, instructions and texts were distributed to each site coordinator. Site coordinators were responsible for course assistance, discussion, and issuing course credit. Midterm and final examinations and grading keys were prepared by the course presenters and distributed to site coordinators for administering and grading. Students have indicated preference for satellite over audio-only sessions. They recommend more continuity among faculty, congruence between lectures and materials, greater clarity of key points and more production-oriented application of content. Collaborative teaching allowed students to be exposed to some topics in more detail than traditional methods would have allowed. Faculty note that the incorporation of technology challenged both teachers and learners.

Key Words: Distance Education, Teaching, Growth

1432 Teaching animal health management in the undergraduate curriculum. J. N. Nielsen* and T. Luba, *Purdue University, West Lafayette, IN.*

This course was designed to teach basic principles of health maintenance/disease prevention, rather than detailing diagnosis and treatment of specific diseases. The course has general appeal to Animal Sciences majors, since an understanding of health management is advantageous not only for careers in veterinary medicine and production agriculture, but also nutrition, agribusiness and other allied professions.
The first section of the course introduced students to interactions of agent, host and environment and their role in animal health. An overview of animal immune function, agent virulence factors and environmental influences on this interplay were presented. Host-determined genetic diseases and environmental diseases were also covered. The second section covered health concerns specific to ruminant, swine, poultry, and aquatic animal species and featured guest speakers in each area. The final section examined the role and purpose of government regulations relating to animal disease, zoonotic diseases and food safety issues.
A website was created to aid in teaching/learning; no single textbook covered all topics. In addition to general information and course syllabus, the website included lecture notes containing hyperlinks to other websites where applicable. Additional web-based information was provided as a listing of websites by topic. Lecture photos and illustrations were placed on the site when available. An e-mail based web discussion group was initiated to exchange information among classmates and instructor. On-line interactive quizzes allowed students to self test themselves for understanding of topics. The final exam was also administered in an on-line format.
Student response to the course was measured with a questionnaire at the end of the semester. The website was viewed as a helpful adjunct, with 28 of 30 strongly agreeing and 2 of 30 agreeing to the statement "Overall, I feel that the website was a beneficial learning tool in helping me understand concepts and materials covered in this course". The majority of students expressed a desire to expand the course to include canine (24/30), equine (23/30) and feline (22/30) species.

Key Words: Health, Teaching, Internet

1433 Development of an instructional delivery system to teach dairy health management using simulation modeling. C. Haferkamp*[1], H. G. Allore[2], Y. T. Grohn[2], and L. D. Warnick[2], [1]*Free University, Berlin, Germany, and* [2]*Cornell University, Ithaca, NY.*

We have developed simulation software "Dairy Herd Dynamics - Simulation Laboratory" to teach dairy production medicine to veterinary students. We have added to our existing research simulation models - SIMHEALTH and SIMMAST - an interactive user interface and output analysis system. The current program allows a veterinary student to learn dairy production medicine without requiring a deeper cognition of the underlying research software. A student is able to test and compare different herd management and herd healthcare strategies by running simulated experiments and performing basic statistical analyses. The underlying research tools have different functions: SIMHEALTH is a simulation model of reproductive and metabolic disorders that allows modifying input variables, such as disease incidence and detection rates, disease treatment, breeding and culling policies. SIMMAST is a mastitis and milk production model that can be used to study the effects of risk factors on the occurrence of mastitis and the relationships between mastitis and production of milk, fat, and protein. Both are stochastic models, hence students run replicate simulations representing multiple herds in a trial. This allows for statistical comparisons of different herd management strategies, disease incidence rates, treatments, or methods of prevention. Targeted learning outcomes are for students to identify opportunity areas to improve productivity by recognizing and solving complex and interdependent milk production, reproduction, and health issues.

Key Words: Education, Simulation, Diseases

1434 Multimedia approach to teaching reproductive physiology in the classroom. R. D. Geisert*, L. G. Burditt, and R. G. Bradley, *Oklahoma State University, Stillwater.*

Advancement of computer and CD-ROM technology has provided an opportunity for a revolution in classroom instruction and student learning. Multimedia approaches to teaching have provided the instructor with a means to not only give lectures with clearly written PowerPoint slides and animation, but also incorporate colored illustrations, pictures and videos to enhance the students understanding of the course material. The necessity to show illustrations and actual pictures in our undergraduate reproductive physiology course made it ideally suited for multimedia technology. We have developed a CD-ROM that provides classroom lecture notes in a student friendly format through animated PowerPoint slides. Lecture notes contain colored illustrations and actual pictures to assist in student visualization of anatomy and physiological concepts presented in the course. In addition, our CD contains over 1000 slides that are utilized in laboratory presentations for student learning of many topics. Over 20 videos provide clear examples of events such as ovulation, egg transport, heat detection, semen collection, artificial insemination, ultrasonograhy and palpation of all domestic farm species. Response of undergraduates to the multimedia presentations was largely positive, the only negative comments pertained to seating problems in seeing the screen clearly and small typing of some illustrations. Student access to laboratory slide presentations and videos through our web-site following the laboratory provides the students with a source to review material and utilize for future reference in their remaining animal science courses. Development of our CD will provide a good source of information for instructors who lack facilities and animals to provide hands on laboratories. We also feel that the CD could be a useful source of illustrations and slide sets for teaching theriogenology in veterinary medicine and highly applicable for producer presentations by extension personnel.

Key Words: Reproduction, Multimedia, Teaching

1435 Experiences and opportunities of moving course material to the World Wide Web and using the web as a teaching tool. S. P. Miller*, *University of Guelph, Canada*.

Objectives were to describe experiences and identify opportunities when moving course material to the World Wide Web. The course, Beef Production, through the Ontario Agricultural College at the University of Guelph was made available on the web. A home page was built which allowed contact to the instructor and teaching assistant. Lectures were given using the computer projector taking advantage of visual material. A course outline was linked from the home page, each item of the outline was hot-linked to the material as presented in lecture. An email discussion group was established to maintain a free exchange of ideas outside of lecture which the entire class could participate in. Discussion could have been directly related to course content or generally related to beef production through additional reading by students. The discussion group was also meant to speed efficiency in answering students questions and concerns. The discussion group, despite its potential, was poorly utilized by students. However, the computer generated presentations with visual aids were well received. The web pages with the lecture material were well visited, not only by students enrolled in the course, but equally well by visitors from outside, although the address was never globally advertised. This world wide interest indicates the tremendous opportunity to make courses available globally, building on strengths at individual institutions. One of the laboratory assignments was made available at two sister campuses through the use of video. Experiences gained indicated that the web was an excellent teaching tool giving students instant access to course material and an excellent forum for discussion. Although this course was local in nature, the global interest in the site makes the opportunities of collaboration between institutions to provide an improved course on a more global format apparent.

Key Words: Teaching, Beef, World Wide Web

1436 Development of a World Wide Web page for a senior level beef production course. A. D. Herring* and B. L. Barham, *Texas Tech University, Lubbock*.

Undergraduate students are becoming more familiar with the internet and use of electronic mail. A survey was distributed at the beginning of the Spring 1998 semester to students in a senior level beef production course at Texas Tech University. Of the 47 students enrolled, the average number of e-mail messages sent/received per week was 3.85, and the average number of internet accesses per week was 2.38. However, these varied widely among these students. Although only 19% of the students did not use the internet, 55% did not use e-mail. A World Wide Web page was developed to supplement lecture and laboratory topics, and was made available to the students after the third week of the semester. Several aspects of the web page appealed to the students; specifically, the access to previous exams was popular. An increasing number of animal science majors now come from non-agricultural backgrounds, and use of a web page can help to provide supplemental materials to these students. Moreover, this type of resource allows students to spend more time on topics they are unfamiliar with, or are more interested in. Links to a wide variety of beef cattle related web pages were utilized. These links included pages of beef cattle research, employment opportunities, market information, breed associations, and various industry groups. A student comment section was included. Students were given access to all grades and class average grades through a unique, random number code. The concept of "on-line" office hours was proposed and tested because students interact with university professors in such varied fashions and emotions. It is recommended that students be given access to both passive and active segments of an undergraduate course web page. Lecture notes were not made available through this web page. It is the opinion of the instructor that utilization of the world wide web for undergraduate courses should supplement the traditional lecture approach, not substitute for it.

Key Words: Internet, Teaching, Beef production

1437 Format for a four-credit senior-level beef cattle science course. F. A. Thrift, *University of Kentucky, Lexington*.

A four-credit (three hours of lecture, one three hour laboratory) senior-level beef cattle science course has been developed within the Animal Sciences Department at the University of Kentucky. This course has junior-level prerequisite courses of 1) live animal and carcass evaluation, 2) animal breeding, 3) feeds and feeding and 4) reproductive physiology, and is composed of three basic components. The first component of the course deals with the following topics: 1) equipment, 2) identification, 3) beef cattle industry, 4) breed evaluation, 5) nutrition, 6) genetics, 7) reproduction, 8) health and 9) marketing. The second component of the course integrates most of the first component topics into management practices that are applicable during the following time periods of a typical yearly Kentucky cow-calf production cycle: 1) calving to breeding, 2) breeding to weaning and 3) weaning to calving. The third component of the course addresses the following issues: 1) taxation, 2) beef cattle organizations, 3) feedlot, packer and consumer and 4) industry problems and possibilities; the latter issue primarily addresses results generated from the National Fed and Non-Fed Beef Quality Audits. Most of the course has been developed on a microcomputer which greatly facilitates updating of material. All course material is duplicated and made available to the students on a section by section basis as the semester progresses. Student response to the course format has been very good. Most of the Animal Science majors, many of which desire to be veterinarians, that enroll in this course lack experience working with large animals, so experiences gained from the hands on labs, most of which involve various aspects of routine herd work, have been especially well received.

Key Words: Teaching, Cattle

1438 Teaching a general education course on history and attitudes of animal use. M. E. Dikeman, *Kansas State University, Manhattan*.

"History and Attitudes of Animal Use" is taught as a General Education course at Kansas State University. It includes the historical aspects of humans as hunters, animal domestication, the beginning of human cultures, early animal agriculture, and American history of animal agriculture and animal use. The therapeutic and psychological benefits of the symbiotic bonds between humans and animals are discussed. Students are asked to identify themselves with one or more of the nine basic attitudes people have towards animals. Students are introduced to ethics and ethical issues related to slaughtering animals for food, eating meat, factory farming, and animal experimentation. Factual and objective information is presented about food, fiber, and other products obtained from animals. However, issues of healthfulness and safety of animal product consumption are used to engage students in discussion. Both philosophical and scientific positions on animal well-being and animal rights are presented as well as characterization of animal-focused organizations. Introductory media training and mock interviews are used to discuss media coverage of animal use and the environment. Students are assigned to small groups and given two decision cases on "Unwanted Newborn Calves in Feedlots" and "County Voting on Corporate Hog Farming in Kansas." Groups are given information to analyze outside of class and required to present their decision on each case. Although this class averages 70 students, this approach to active learning works well. Students are given several reading assignments and are required to write short reports. Lectures are broken into 20 min segments followed by questions or a short assignment that they discuss briefly before I ask for responses. A major question on the final exam requires them to view a video entitled "Man versus Animals: To Kill or Not to Kill" and then to write a review of the video using 30 definitions they have learned during the semester. Students are challenged to integrate history, ethics, attitudes towards animals, and scientific information about animals and their products into a professional, objective philosophy about animal agriculture and animal use.

Key Words: Animals, Ethics, Active Learning

1439 Chemistry study groups for Animal Science students: four years later. C. M. Wood*, W. E. Beal, D. M. Denbow, J. W. Knight, and E. A. Wong, *Virginia Polytechnic Institute and State University, Blacksburg*.

Students entering Virginia Tech as Animal Science (AnSc) freshmen in 1992 (n=71) and 1993 (n=79) were assigned at random to faculty-led study groups that focused on introductory chemistry. In 1991, 55% of AnSc majors (n=60) earned D's or F's in the same course; the results were 19% in 1992 and 25% in 1993. High school (HS) demographic data (HSrank, SAT score, residency, gender and ethnic background) for freshmen entering in 1992 and 1993 were analyzed for correlations with chemistry grade (CHEM), first semester grade point average (GPA1) and cumulative grade point average (GPAF). Almost 31% of the students were from out-of-state and 75% were women.

Statistic	HS Rank	SAT	CHEM	GPA1	GPAF
Mean	84	1061	C+	2.79	2.66
Minimum	41	820	F	0.22	0.40
Maximum	99	1360	A	4.00	4.00

Analysis of variance indicated that participation in a study group favorably impacted ($P<.05$) CHEM, GPA1 and GPAF. Regression of HSrank and SAT on grade variables indicated that demographic information could be used to help predict first semester grades ($r^2 = .15 - .20$). The University now generates profiles on incoming students as an aid to advisors placing students in freshman classes. In general, correlations of math SAT scores with college grades were stronger than for verbal or total SAT scores, and HSrank was also favorably correlated to grades. On average, students not assigned (n=9) to study groups were stronger academically (SAT=1110; GPA1=2.94) than those who participated in the groups (SAT=1064; GPA1=2.86). Students who were assigned to a group but chose not to participate (n=11) were the weakest (SAT=1064; GPA1=1.69). Comparison of the correlations between CHEM and GPAF for AnSc students who stayed in school at least three years (n=75; r=.7) and those who transferred out of AnSc but stayed in school (n=42; r=.5) indicated that students who did well in chemistry also tended to stay in the major and posted better grades (GPAF=2.92 and 2.73, respectively).

Key Words: Teaching, Study Groups, Academic Success

1440 Increasing the use of artificial insemination: an undergraduate internship program using variations of the Select Synch estrous synchronization protocol. D. R. Doherty*, J. C. Whittier, D. G. LeFever, R. G. Mortimer, and T. W. Geary, *Colorado State University, Fort Collins*.

The objectives of this study were to increase student and producer interest and expertise in estrous synchronization and AI. Students often enroll in an AI class while in college, but very rarely get many practical, hands on experiences. Eleven undergraduate students were chosen to participate in this internship based on AI experience and knowledge of beef cattle reproduction. Producers were selected based on willingness to work with students, herd size, and handling facilities. Variations of the Select Synch protocol, using mass mating at either 72 or 84-h and with or without 48-h calf removal, were used. Two to three students met with each producer to set up an estrous synchronization program, and assign responsibilities. Students were responsible for the administration of the synchronization protocol, as well as the heat detection and insemination. An experienced AI technician was present at each of the cooperating herds to assist students if any help was needed. The conception rates of cows bred 12 h after being detected in estrus for students and experienced technicians did not differ ($P > .1$) in the cooperating herds, 51 and 56% respectively. There was also no difference ($P > .1$) in conception rates between 72 versus 84-h timed insemination, 18 and 23% respectively. Through the continuation of this project we hope to both increase the use of AI in the beef industry and to develop a more experienced graduating class of AI technicians. This internship also proved to be a good way for students to meet prospective employers, and develop skills that will make them more valuable to operations they may work with in the future.

Key Words: AI, Internship, Reproduction

1441 Working with animals: A one credit laboratory for first year animal/dairy science and pre-veterinary medicine college/university students. P. O. Brackelsberg* and W. W. Wunder, *Iowa State University*.

More undergraduate students who have not had opportunity for hands on contact with animals are entering animal/dairy science and pre-veterinary medicine programs. This introductory course deals with skills for proper care and management of domestic animals such as: health observation, animal movement, identification, management procedures and environmental assessment. Active and collaborative teaching techniques are used so students learn to: 1) characterize normal animal function and determine general health status of domestic animals, 2) compare methods of identifying the individual domesticated animals, 3) safely, humanely, and efficiently handle, restrain, and move domesticated animals, 4) describe, and classify animals in terminology commonly accepted for each species (including sex, color, breed, markings, structure, type, composition and others), 5) demonstrate basic procedures such as castration, implantation, docking, clipping of needle teeth, injection, drawing of blood, sampling of feces, 6) identify basic feed ingredients according to category, 7) identify behaviors and conditions that typify phases of the reproductive cycle, (estrus, flocking, nesting, parturition, etc.) and 8) assess environmental conditions that affect the well-being of domesticated animals. A total of 315 students were enrolled in the first semester. The students (and percentage) ranked the class as first (30%), second (40%), middle (16%), next to last (13) and last (1%) among their courses for the semester. Herdspersons demonstrated and/or gave opportunity for students to participate when animals and facilities allowed.

Key Words: Animal, Handling, Laboratory

1442 Effect of student seat location on instructor evaluation. W. Ellis, *Southeast Missouri State University*.

Three years of instructor/course evaluations were analyzed to determine if the students seat location within the class room had an influence on their evaluation of the instructor. The evaluations were conducted in a freshman Animal Science course offering. This is a five hour course taught every fall semester. The course was taught in the same room, using the same text and mode of instruction for three fall semesters. In addition, the same instrument was used to assess instructor effectiveness. Students were allowed to select the row they wished to occupy for the semester. The room has five rows of students desks. The instrument accessed the instructors communication skills, classroom environment, course content, student's laboratory experience, student's recommendation of the instructor and course. There were 149 instructor evaluations. Instructor evaluations were analyzed based on the row a student chose to sit. Analysis of variance for these data indicated that row is a significant source of variation upon instructor evaluation. Additionally, row was a significant source of variation for course final grade. Students in the first two rows ranked the instructor higher for communication skills and classroom environment as compared to students in the last three rows. Students in the last two rows ranked the laboratory experience higher than students in the front three rows. Significant positive correlations were discovered between row and course final grade, course recommendation and instructor recommendations. The data displayed that 90% would recommend the instructor and 91% recommend the course. Year was not a significant source of variation. The row in which a student chooses to sit in a class may have some influence on their perception of the instructor effectiveness.

Key Words: Instructor, Course, Evaluation

1443 The relationship between students' learning styles and teaching performance in an introductory animal science course. B. L. Garton, J. N. Spain, W. E. Trout, D. E. Spiers, and W. R. Lamberson*, *University of Missouri, Columbia*.

Learning styles have been shown to have an influence on students' academic achievement, how students learn, and student/teacher interaction. The objectives of this study were to determine the learning styles of students enrolled in an introductory animal science course and to describe the relationship between students' learning styles and their evaluations of teaching performance. The Group Embedded Figures Test (GEFT) was used to assess student (n=187) preferred learning styles. The maximum score on the GEFT is 18, with a nationally normed mean of 11.4. Students scoring 0–10 (field-dependent), perceive globally, have more difficulty in solving problems, and learn better when motivation, organization and structure are provided by the instructor. Those scoring 14–18 (field-independent), find it easier to solve problems, and prefer to develop their own structure and organization for learning. Students scoring 11–13 (neutral), tend to possess some of the characteristics of both field-independent and field-dependent learning styles. Four instructors with GEFT scores ranging from 6–18 were involved in teaching the course. Students rated each instructor's teaching performance at the conclusion of the instructor's unit using a standard university evaluation. Product Moment correlation coefficients were calculated between GEFT scores and each of the questions on the teaching performance evaluation. Learning style classifications of students were: fields independent, 56%; neutral, 22%; and field dependent, 22%. The mean GEFT score (13.4 $\pm$ .28) was significantly higher than the national mean. Negligible to low correlation coefficients were found between students' GEFT scores and teaching evaluation scores for all four instructors regardless of the instructor's GEFT score. Therefore, the diversity in learning styles was found to have little to no influence on students' perceptions of the instructors' teaching performance. Consequently, the instructors' teaching styles were viewed by students in a positive manner.

Key Words: Learning Styles, Instructor Evaluation

1444 International dimensions course taught at Oklahoma State University. W. S. Damron, *Oklahoma State University, Stillwater*.

Agricultural Animals of the World, a course taught at Oklahoma State University, explores how the major domestic species provide for man's needs and how they fit into agricultural systems throughout the world. Contributions by animals to humankind in diverse circumstances in both traditional and newly developing systems are discussed. This course meets the university's requirement as a general education course for the International Dimension. This course category " . . . helps students explore a culture or several cultures which are different from their own." Cultural exploration must comprise at least 51% of such courses. This requirement is met easily because cultural need often is the primary reason for keeping animals. Cultural implications provide a unifying them and a means of integrating and discussing other prescribed issues necessary for students to become aware of international and multicultural issues. Such issues include discussion of language and its limitations, geography, climate, political systems, economic development and religion. Animal care and production serves as an excellent vehicle for illustrating these topics and the influence that these topics have on the world, its people and their cultures. Relationships between humans and their animals are placed in a cultural context by comparing "their" ways with "our" ways. Topics of current general interest including sustainability, grain feeding to animals, world hunger, desertification and pollution have close links to agriculture, agriculturists, and society in general. The physical environment, economic factors, and socio-cultural factors dictate animal numbers, species, distribution and utilization of agricultural animals and the system of agriculture in which animals are found. Thus, through discussion of the role of animals in the major agricultural systems of the world, international awareness is heightened and students become enlightened about the human condition.

Key Words: International, Culture, Course

1445 Internationalizing Animal Science programs. D. M. Kinsman, *University of Connecticut, Storrs*.

Animal Science Departments should consider internationalizing their educational programs. With increasing foreign trade of animal agriculture products, especially U.S. exports, more opportunities exist for Animal Science graduates. Several ways to incorporate international facets in most courses can be employed at minimal cost. One major approach is to encourage faculty to spend some time abroad, such as on sabbatic leaves or other opportunities, to expand their global outlook, and make new contacts in the country or countries where they work or study. Exchange of scientists can be developed from faculty contacts and travels, which in turn expose students to foreign agriculture. Other programs such as the Peace Corps, IFYE, study abroad and student exchanges can augment this goal. Additionally, cooperative research programs with overseas partners can provide international experiences for both faculty and students. An initial means of heightening awareness of international animal agriculture interests and experience is to survey the faculty to determine who has already served overseas and their interest in developing greater involvement in that direction, including incorporating more in their courses, encouraging their students to participate in international internships and inviting foreign scientists to their departments. International internships, arranged by faculty members through their counterparts abroad, are an excellent, minimal cost means of providing meaningful global experiences for students and bring an exciting, progressive dimension to Animal Science programs thereby providing new opportunities and knowledgeable faculty and students well prepared to take leadership in the future of Animal Science on a global basis. During the past 20 years, the University of Connecticut, Department of Animal Science has placed 90 students in 20 countries on four continents at no cost to the department other than correspondence. These students have found ready admission to graduate or veterinary schools or employment with animal oriented organizations involving international business or contacts. Think globally, act locally.

Key Words: International, Internships

1446 Where did they come from & how did they get here? K. Bump and T. Williams*, *Cazenovia College, Cazenovia, NY*.

Recent declines in student enrollments at four-year colleges and universities have resulted in an increasing need for college wide involvement in student recruitment. Regardless, faculty often feel that they should not be asked, or required, to participate in the recruitment process. However, the involvement of faculty in the enrollment process allows them to provide input into the students who eventually arrive in their classroom. In addition, a clearer understanding of who their students are, where they came from, and how they arrived will often translate into higher rates of student retention and student satisfaction. Integral involvement of the Equine Studies Department in student recruitment over the past two years has resulted in stable and increasing enrollment during times of decreasing enrollment in other academic programs. Recruitment efforts have included a variety of paths including a career day for juniors and seniors in high school interested in pursuing careers in this aspect of the animal industry. This presentation will focus on the student recruitment process and how a joint effort between and academic program, specifically equine studies, and an Admission Office translates into success for all involved. The Recruitment Funnel and its application in departmental recruitment efforts will be discussed at length.

Key Words: Equine, Recruitment, Careers

1447 Trends observed for Livestock Management majors in the Associate Degree program at North Carolina State University. J. A. Moore* and M. J. Yoder, *North Carolina State University, Raleigh*.

Enrollment in the Livestock Management curricula (sum of LMG = Livestock Management General; LMS = Swine; LMD = Dairy, which was discontinued in 1995) in our Associate Degree program has fluctuated over the past 20 years, peaking in 1980 at 105 students. Enrollment then dropped off to 39 in 1986, stabilized, and began climbing again in 1992 to peak a second time in 1994 with 68 students. Statistical analysis revealed a quadratic relationship between enrollment and unemployment in the state as follows: $U = 8.40 - 0.156y + 0.00154y^2$ where U = unemployment (2 years later) and y = enrollment; $R^2 = 0.78$. Because unemployment lagged behind enrollment, unemployment could not be considered a useful predictor of enrollment. Changes have also been observed in species interests of students in the Livestock Management curricula (including LMP = Poultry) as surveyed in the required Animal Feeds and Nutrition course over the past six years; numbers presented are the averages for two years (1992/93 and 1996/97, respectively) and are presented as percentage of the class (students could choose as many species as they wished). Student numbers did not change (31, 32); interest in swine (67%, 52%) and beef (80%, 65%) declined but remained high; dairy (35%, 38%) and sheep (10%, 13%) interest remained unchanged; and interest in poultry (13%, 58%), horses (38%, 44%) and goats (2%, 24%) increased. The increase in poultry interest is most likely due to the introduction of the poultry option (LMP) into the curriculum in 1993. An expanded meat goat industry and introduction of Boer goats into the state (1994) is most likely responsible for the increase in interest in goats. In summary, enrollment fluctuates and is related to unemployment, and species interest of students appears to be changing.

Key Words: Enrollment, Livestock, Associate Degree

1448 Evaluation of academic advising for Animal Sciences majors. M. A. Diekman, *Purdue University, West Lafayette, IN*.

An opinion survey was mailed to 50 universities that are members of the National Association of State Universities and Land-Grant Colleges (NASULGC). After a follow-up letter and telephone call, responses were obtained from 48 departments (96%) that were Animal Science or Animal and Dairy Science. Number of departments have <100 undergraduates was 1, 100–199 was 30, 300–499 was 8 and ≥500 was 9. Percentage of advisees that are male are 41.2±2.1%. Assistant, associate and full professors are doing the majority (97%) of the advising with an average load of 17, 23 and 34 advisees, respectively. Teachers (92%), researchers (84%) and extensionists (46%) are advising. Methods used to train advisors include seminars (28%), and meetings with advisor coordinator (64%), but most receive training on-the-job (76%). Functions of advisors include registration of classes, career opportunities, job placement, club advisors and audits for graduation (>90%). Assignments to advisors are random (42%, especially freshmen), by species interest (66%), by discipline interests (52%) or by request of student (68%) via department head (50%) or undergraduate coordinator (30%). Approximately 54% of students enter as freshmen, 17% transfer from pre-veterinary programs, 12% transfer from other majors within the university and 17% transfer from other institutions especially two-year community colleges. Only 10% of animal science majors transfer out of the department. Considerable variation exists on the amount of time an advisor interacts with an advisee during the semester, ranging from 1 to 10 hours, averaging 3 hours. Respondents strongly agree that faculty, rather then professional counselors, are best suited to advise students, and provide an important service to the department, but their time and effort are not necessarily financially rewarded or considered in promotion process. In general, survey respondents stated advising of undergraduate students is taken very seriously in their department and advisors aspire to be accessible.

Key Words: Undergraduates, Animal Science, Advisors

1449 Major and GPR differences in satisfaction with the Department of Animal Science at Texas A&M University. J. R. Noska*, B. A. Miller, J. J. Cleere, G. E. Briers, J. H. Hesby, P. S. Murano, C. L. Skaggs, W. S. Ramsey, and T. R. Greathouse, *Texas A&M University, College Station*.

A scantron opinion survey was distributed by the Department of Animal Science at Texas A&M University in the Fall of 1996 to all individuals graduating from the department between 1986 and May 1996 (n=2,200). Responses of all BS students (n=397) were analyzed based on major and GPR. The survey addressed demographics, employment information, satisfaction with the department, personal growth, activities and satisfaction with major. Most students received a BS in ANSC (n=313). Thirty-nine students received a BS in FSTC, seventeen in NUTR and fifteen in DASC. The average GPR was 3.03±0.47. Pearson correlation was used to determine significance of GPR with Likert-scored responses. A one-way ANOVA was used to determine significance of major. GPR was significant ($p<.05$) with respect to overall personal growth, time seeking employment, first salary, current salary, overall satisfaction with the department and overall satisfaction with major. As GPR increased, students were more satisfied with their overall personal growth and departmental experience. In addition, students with a higher GPR had a shorter time seeking employment, received higher salaries in their first and current jobs and felt their college preparation was important in their present job. ANSC, DASC and FSTC majors felt field trips were more important in contributing to personal growth than NUTR majors. ANSC and NUTR majors felt course content taught was more up-to-date than FSTC majors. DASC majors felt teaching assistants made more positive contributions than FSTC or NUTR majors. ANSC majors felt their major challenged them more than FSTC majors. NUTR and ANSC majors felt the contribution of Texas A&M University on their speaking ability was greater than FSTC majors.

Key Words: Education, Major, GPR

1450 Alumni opinion survey regarding BS graduate satisfaction for the Department of Animal Science at Texas A&M University. J. J. Cleere*, B. A. Miller, J. R. Noska, G. E. Briers, J. H. Hesby, P. S. Murano, C. L. Skaggs, W. S. Ramsey, and T. R. Greathouse, *Texas A&M University, College Station*.

Graduates with a BS or graduate degree from the Department of Animal Science (1986–1996) were surveyed by mail (return envelope provided) to access opinions on the curriculum and satisfaction with their degrees. The survey contained five Likert-type questions (1=excellent, 4=poor) regarding satisfaction with major, educational results, personal growth, professional development, and skills important for employment. Multiple-choice questions (n=9) addressed education, background, job status, and gender. Surveys (n=2200) were sent to students and 470 responded, with 397 of the respondents having received a BS degree. Students found that courses within the Department of Animal Science were valuable, well taught, up to date, non-redundant, and recommendable (means 1.42±0.70 to 1.81±0.76). In evaluating individual majors within the Department of Animal Science, students found that majors were challenging, flexible, well arranged, and could be progressed through in a timely manner (means 1.54±0.70 to 1.81±0.79). Students rated personal growth and achievement through their degrees as excellent to good. Upon graduation 88.7% of the students obtained a full time job within six months. Students reported first job salaries from <$25,000 (68.2%) to >$60,000 (0.8%) (weighted average $27,215) and current salaries ranged from <$25,000 (28.1%) to >$100,000 (1.6%) (weighted average $38,512). College preparation was rated extremely to moderately important in the respondents present jobs (mean 1.76±0.96).

Key Words: Animal Science, Survey, Curriculum

1451 Gender differences in employment opportunity and satisfaction with the Department of Animal Science at Texas A&M University. B. A. Miller*, J. R. Noska, J. J. Cleere, G. E. Briers, and T. R. Greathouse, *Texas A&M University, College Station*.

A scantron form survey was mailed to all individuals who graduated from the Department of Animal Science from 1986 to 1996 (n=2,200). Of these, 470 surveys were returned, with 397 indicating receiving an undergraduate degree in the Department of Animal Science. The survey addressed satisfaction with the department, major field, available activities, and personal growth. It also included demographics and employment information. Most students completed a BS in ANSC, 151 females and 162 males. Seventy-one students majored in FSTC, NUTR, or DASC in decreasing numbers respectively. Gender was a significant factor ($p<0.05$) with respect to satisfaction with major field, starting salary, current salary, time seeking employment, and current employment, with females showing lower salaries, longer time in finding first job, more tendency to be unemployed, and less tendency to be employed in a field related to their major. Chi-square analyses were employed to detect gender differences in responses to individual questions. Concerning GPR, overall satisfaction with the Department of Animal Science, overall personal growth, and overall importance of gained skills in employment, no significant differences were found between males and females. Significant differences in specific personal growth responses revealed that females felt like they received less contribution from TAMU in leadership ability, mathematical ability, creativity, and technical expertise in their field. In skills needed for present employment, sex differences were significant in computer skills, critical thinking skills, problem solving skills, and advancement potential. Females felt that computer skills were more important, while males felt critical thinking, problem solving, and advancement potential were more important.

Key Words: Education, Employment, Gender