678 NASA’s Reduced Gravity Student Flight Opportunities Program enhances undergraduate experiences and promotes team-building skills. S. T. Willard*1.

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A proposal was submitted to NASA’s Reduced Gravity Student Flight Opportunities Program (RGSFOP) by 9 undergraduate animal science majors and their advisor. The RGSFOP provides a unique academic experience for students to propose, design, fabricate, fly and evaluate a reduced-gravity experiment of their design. The overall experience includes scientific research, traditional and non-traditional classroom experiences and educational/public outreach activities. Of the 87 applications submitted, 47 proposals were accepted (54%) including the proposal from the Mississippi State Team. The aim of the proposed project entitled “Photonic Emission Kinetics of the Firefly Luciferase Enzyme in Microgravity” was to determine whether enzymatic reactions are altered in microgravity. The students met weekly to design the experiments, and learn about working in microgravity. The team then traveled to the Johnson Space Center (Houston, TX) where for two weeks they participated in astronaut training, learned about NASA programs and tested their experiments. The students then flew aboard the Boeing KC-135A reduced gravity trainer aircraft to conduct their experiments during the 20 or more 25-second Zero-gravity maneuvers on each of two flights. Results indicated that there was a significant increase ($P<.05$) in the area under the enzyme reaction curve; illustrating that microgravity altered luciferase kinetics. Upon returning home, students participated in outreach activities including television, radio and newspaper interviews and presentations at departmental, alumni and other university functions.

The students also constructed a web-site detailing their activities and continued to meet weekly to discuss their experiences. In addition to learning about scientific research and NASA, the students also learned the foundations of NASA Mission Operations: discipline, competence, confidence, responsibility, toughness and teamwork. In terms of lasting outcomes, the participating students commented that this experience was life-changing for many of them. This was re-enforced by comments from many of their professors indicating a positive change in student attitudes and confidence. In summary, the NASA RGSFOP offers both a unique research and personal growth experience for undergraduate students.

679 Engaging students in the learning process in an undergraduate animal breeding course. G. E. Shook* and D. L. Thomas, University of Wisconsin-Madison.

An active learning approach that utilized short lectures, in-class discussions, and written feedback from students was applied to an undergraduate animal breeding course. The approach is based on a textbook that meets course goals in breadth and depth of content. The textbook and special readings, not lectures, define the scope of the course. The course is organized into two-period modules. Each module relates to a specific assignment that students are expected to read before class. Students take a 10-min quiz over the reading assignment at the start of the first period of a module before there is any in-class coverage of the material. The quiz tests for broad understanding rather than mastery of the material and rewards students that have read the assignment. The last question on the quiz is, “What is the most difficult or unclear concept in the chapter?” A 25-min lecture on the important points of the reading follows. For the final 15 min, students are given a discussion question that gives application to the material or reinforces concepts. Groups of 2 to 4 students are formed, and the group writes down their response. Several groups are asked to reveal results of their deliberations, and the instructor comments on the accuracy and applicability of their comments. The second period starts with a 35-min lecture that addresses the concepts that the students indicated on the quiz were most difficult for them and finishes with another 15-min discussion question. Each module has a homework assignment that provides practice with application of concepts presented in the module. With this overall approach, students come to class familiar with the material to be discussed, attend class (something is completed in class and graded every period), have some control in directing the lecture to areas they are less sure about, and learn from the experiences of their classmates during the discussion periods. Students are active participants in their learning, and instructors are well informed by frequent feedback from students. Student comments indicate: “The organization of the class, homework and quizzes made me keep up with the material.” “The discussions are an absolute must.” “Discussion took up too much time in class.” “This class requires self-teaching.”

680 Research Proposal Writing and Student Peer Panel Evaluation as an Instructional Component for a Microbiology Graduate Course in Poultry Science. I.B. Zabala Diaz*, X. Li, and S.C. Riche, Texas A&M University, College Station, Texas/USA.

Proposal writing is a vital experience for Poultry Science graduate students seeking academic careers, but graduate programs provide minimal opportunities to develop successful proposal writing skills. Proposal writing is emphasized in a graduate microbiology course taught in the Poultry Science Department, Texas A&M University. Based on a survey of enrolled students in the year 2000, only 28.5% of the students had previous experience in class proposal writing, but none possessed experience in proposal writing for funding. In addition, 71% of the students had some experience at scientific writing but less than 30% had published scientific papers. The proposals for the course were written on a research problem that utilized information and concepts from the course and included a student peer panel evaluation as part of the course grade. The proposals were judged on the clarity of hypothesis presentation, the appropriateness of the experimental approaches and research relevance in basic and applied science. Overall, students found the experience an important one for developing writing skills in scientific style. However, peer panel evaluation received a mixed response as students found it difficult to understand proposals that fell out of their area of study (21%) and had little preparation in order to offer constructive criticism of other proposals (43%). Based on the responses of students (36%), it is apparent that further improvement in the student peer panel evaluation needs to be made to increase the relevance of this exercise. In conclusion, proposal writing and in-class evaluation as part of a graduate course in Poultry Science provided graduate students with additional writing and communication skills required for future careers in research.

681 Evaluation of student performance in an introductory animal science course by pre-test and post-test scores. T. L. Perkins* and R. J. Andreasen, Southwest Missouri State University, Springfield, Missouri.

AGS 101 is an introductory course emphasizing farm animal industries, breeds, numbers, distribution, nutrition, heredity, reproduction, health, and products. Students enrolling in this introductory course come from a wide range of diverse backgrounds and experiences. In addition, this
Assessment, a key element in accountability and accreditation, is a process that has been widely incorporated into the strategic plans of academic organizations with a goal of improving institutional effectiveness. As education is the primary endeavor of academic institutions, focus of assessment efforts has typically been on the processes of teaching and learning. However, the dilemma faced by many academic units including departments of animal science is the "what" and "how" of assessment. What should our students know when they graduate from our programs? How do we assess what they know? What evidence is available that animal science students have great depth of understanding in their subject area? The key to success of an assessment effort is the clear articulation of what we want students to know. Hence, we must define in broad terms, the objectives of our animal science programs. Equally imperative is the definition of desired, specific academic outcomes. Once objectives and outcomes are established, evidence is then collected to document outcomes. Importantly, a variety of outcome indicators should be used in the assessment of student learning in the animal sciences. Examples of outcome indicators include: capstone experiences (e.g., senior thesis, internships, directed or independent research studies), portfolios (e.g., a compendium of papers written by a student in conjunction with reflections on writing), standardized tests (e.g., GRE), locally developed tests (e.g., a department-generated exit examination), professional licensing or certification (e.g., ARFAS certification), grade point average, graduation rates, job placements, graduate school acceptances, professional school acceptances, employer surveys, etc. For successful completion of the assessment, outcome data is evaluated and, afterward if needed, academic objectives and outcomes are revised. The assessment process should benefit all stakeholders: improved learning by students; shared purpose and focus of faculty and reaccreditation of the institution for administrators are all tangible endpoints. Ultimately, assessment is meant to be a continuous process that leads to improvement of institutional effectiveness.

Key Words: Assessment, Student, Learning