what will become their textbook which is centered on a specific aspect of meat science and (or) muscle biology. On the first day of class students are asked to write down a question pertaining to muscle (meat science, muscle biology, or growth and development). This initial assignment provides the instructor with information regarding the level and area of student interest in the broad field of meat science. From this information, the instructor can pick a broad focal point (such as The role of meat in a healthy diet) and assign a more specific topic to the individual students. The students are asked to prepare a literary review of the assigned topic and consider the paper as a textbook chapter. Students are required to research the topic, prepare an outline, write a 5-6-page paper regarding this topic, and present one 20-minute lecture. All papers are compiled by the instructor, edited, arranged in a book format, and distributed to the class prior to initiation of the student lecture section of the course. The instructor and the students of the course evaluate each student lecture. Students are also responsible for preparing 2 exam questions and answers from their respective lecture. The final exam is then developed from these questions. This format of classroom instruction is built upon the idea that individuals learn more when they have to instruct another. Often the University system is criticized for failing to instill job related skills in its students. Preparation, organization, and oral presentation skills as well as the ability to work as a team member are traits that are strongly sought after by potential employers. This style of active learning provides students with valuable job related skills and a better understanding of meat science.

**Key Words:** Meat Science, Teaching, Active Learning

**1310 Experiences with increasing student responsibility for learning in a low enrollment course.** G. E. Shook* and L. Tong, *University of Wisconsin, Madison*.

An innovative teaching approach designed to shift the focus of the classroom toward the students was implemented in a three credit, senior level course in dairy cattle breeding. Goals included both professional and cognitive development of students. This was accomplished by making learning a collaboration between students and instructor and emphasizing long term learning over short-term recall. Students participated in selection of topics. Daily reading assignments of carefully selected scientific journal articles were accompanied by a writing assignment to stimulate thoughtful study and hold students accountable for the reading. Class periods were devoted to discussion of the reading. Content of the discussions was driven by student-generated questions with answers provided by students. The instructor served as facilitator and resource person. As needed, the instructor corrected misconceptions among students and gave impromptu mini-lectures to clarify concepts and fill information gaps. The course was structured to encourage students to take risks, try out their own ideas, and make mistakes without penalty or embarrassment. To this end, grading was based 60% on participation elements and 40% on quizzes and exams. Throughout the semester, the instructor participated in a teaching circle of six faculty in diverse fields convened by a professional in biology education. One member of the teaching circle observed one class and a member of the departmental faculty interviewed the class collectively to evaluate progress. Students completed an extensive written evaluation at the end of the semester. The following quotations are representative: "The discussion format has proven to be much more effective and thought-provoking than the conventional lecture style. More importantly, I also feel like I will actually remember what I have learned." "It was necessary to be at the class always because discussion is where I learned the most." The grading policy " . . . was good because it didnt scare me away from trying." Students embraced this dynamic, interactive learning environment.

**Key Words:** Student-Centered Teaching, Active Learning

## WOMEN AND MINORITY ISSUES IN ANIMAL AGRICULTURE

**1311 How do we fit into ADSA/ASAS: Internationals, minorities, women.** W.A. Samuels*, *Solutia, Inc., St. Louis, MO*.

The need to achieve goes beyond borders, ethnicity and gender. The need to be accepted penetrates deep and is often a need shared by many. Depending on what is driving an individual, one of these needs may be satisfied; if one is left unmet, a void is created. Persistent individuals are driven to fill unmet needs. Whether an Internationalist, a minority or a female, the needs are the same. They have a need to contribute; and when results are accomplished, they have a need to be recognized for their contributions. Our associations can be the vehicle to create the initial launch pad to fill unmet needs. ADSA/ASAS must be an incubator where ideas are shared globally and where individuals, regardless of their accents, ethnicity and gender, can believe that they belong. This presentation will focus on how an Internationalist, like myself (born and grown up in Jamaica), and a minority in my professional organizations, fits into ADSA/ASAS, and lessons learned along the way.

**Key Words:** Minorities, International, Women

## ADDENDUM

The abstracts below were omitted from the following sections but can be found elsewhere in this publication as noted :

## BREEDING AND GENETICS

Abstract number 1012 can be found in the Production and Management Section

## NONRUMINANT NUTRITION

Abstract number 1232 can be found in the Ruminant Nutrition Section

The following abstracts were inadvertently omitted from the program :

## FORAGES AND PASTURES

**1312 An evaluation of the feeding value of bluegrass straw pellets for growing beef and dairy heifers.** J.J. Michal*, J.A. Jewett, K.A. Johnson, R.L. Kincaid, J.D. Cronrath, and S.M. Smith, *Washington State University, Pullman*.

Three studies were conducted to evaluate the feeding value of bluegrass straw pellets (BP). Holstein heifers (n=36; 247 kg) were assigned to one of 3 levels of BP (0, 11, and 22% BP). The BP replaced alfalfa silage in the diet (DM basis). Growing beef heifer calves (n=53; 298 kg) were assigned to diets where BP were included at 0, 15 or 30% of DM. The BP replaced alfalfa hay on a DM basis. Dairy and beef heifers were fed these diets for 60d. The BP contained (DM-basis) 11.8% CP, 51.7%

NDF, 30.8% ADF, 2.16% EE, 9.8% ash, total nonstructural carbohydrates 24.5%, 17% Ca, .16% P, .08% Mg, .52% K, .05% Na, 14 ppm Zn, and 2 ppm Cu. The dairy heifers consumed an average of 6.8 kg/d during the first 30d. During the second 30d, dairy heifers fed 22% BP tended to consume more DM (9.9 vs. 8.5 kg/d). Over the 60d trial, dairy heifers fed the BP had greater ADG (P<.02) than heifers fed 0% BP (.97 ± .11 vs. .82 ± .09 kg/d). There was no difference in ADG of dairy heifers fed 11% or 22% BP. Beef heifers fed 30% BP had higher ADG (1.04 ± .04 kg/d; P<.01) than heifers fed 0% or 15% BP (.82 ± .04 and .77 ± .04 kg/d, respectively). Beef heifers fed 30% BP for 60d tended to have greater feed intake (9.4 kg/d) than heifers fed 0% BP (8.6 kg/d) or 15% BP (9.1 kg/d). Predicted NEm and NEg were 1.63 Mcal/kg and 1.09 Mcal/kg, respectively. Ruminally-fistulated cows (n=3) were used to determine the dry matter disappearance (DMD) of BP, bluegrass straw (BS) and pea hay (PH). The diets consisted of (DM-basis): PH, 100% PH; BP, 46.5% BP, 46.5% PH; BS, 45% BS, 45% PH. Soybean meal was added to the BP and BS diets to equal the CP of PH. Cows were adapted to their diets for 21d. Nylon bags (n=4) of PH, BP and BS were incubated in situ for 0, 4, 8, 16, 24 and 48h. The DMD of PH was 68% at 24h and 75% by 48h. In contrast, the DMD of BP was 42% at 24h and 59% at 48h. The DMD of BS was the lowest, 39% at 24h and 51% at 48h. BP can be used to replace moderate quality forage for growing dairy and beef heifers.

**Key Words:** bluegrass, straw, heifers

## RUMINANT NUTRITION

**1313 Effect of protein level in prepartum diets on the performance of dairy cows during the periparturient period.** A.F. Park, J.E. Shirley, E.C. Titgemeyer, M.J. Meyer, and M.J. VanBaale, *Kansas State University, Manhattan*.

Multiparous Holstein cows (75) were used in a randomized block design to determine the level of dietary protein required to support metabolic functions and enhance body reserves during the periparturient period. Cows were blocked according to expected calving date and assigned to one of five diets: 9.7, 11.7, 13.7, 14.7, or 16.2% CP. Dietary treatments were initiated 28d prior to expected calving date and fed until parturition. Cows were fed a common diet postpartum. Dry matter (DMI) intake and milk yield was recorded daily through 90d postpartum. Full lactation milk yield and components were obtained from DHIA records. Prepartum DMI was 15.6, 15.9, 15.6, 16.3, and 14.6 kg/day for cows fed 9.7, 11.7 13.7, 14.7, and 16.2% CP, respectively. DMI decreased 20, 19, 19, 23, and 29% between week 3 and week 1 prepartum for cows fed 9.7, 11.7, 13.7, 14.7, and 16.2% CP, respectively. Cows fed 16.2% CP were in negative energy balance (NEB) during the last 14d prepartum while cows fed the other diets experienced NEB during the last 7d prepartum. The relationship between prepartum diet and postpartum energy balance was best described as cubic (P=.01) with cows fed 14.7% CP being most negative and remained negative longer than cows fed other diets. Daily milk yield (quartic, P<.05) during the first 90d postpartum was lower for cows fed 13.7% CP but similar among other diets. Response to rbST during the ninth week was influenced (P<.05) by diet. Cows fed 13.7 and 14.7% CP exhibited the strongest response while cows fed 9.7% CP responded with 0.62 kg/d and those fed 16.2respond. Cows fed 16.2 and 9.7% CP produced 1156 and 800 kg less milk, respectively during the subsequent 305d lactation than those fed 14.7% CP. The incidence of sub-clinical ketosis was 6.6, 20, 6.6, 0.0 and 27% for diets 9.7, 11.7, 13.7, 14.7, and 16.2% CP, respectively. These results indicate that using 14.7% crude protein with 35% NSC in the close-up diet for dairy cows produces beneficial outcomes during the subsequent lactation.

**Key Words:** Dairy, Protein, Periparturient

**1314 Meta analysis of multiple responses of dairy cow to diet NDF content.** D. Sauvant*[1] and D. R. Mertens[2], [1] *Institut National Agronomique, Paris, and* [2] *US Dairy Forage Research Center, Madison, WI*.

Dairy cow responses to dietary NDF variations are essential to develop management programs. Therefore a data base was pooled from 100 published experiments (243 observations) where the diet NDF, or concentrate, content was the experimental factor. The following parameters were collected: dry matter intake (DMI = 3.41 ± 0.47 % LW), dietary NDF content (NDF = 34.2 ± 8.0, min = 18.2, max = 59.3 % diet DM), dietary NDF intake (NDFI = 1.15 ± 0.23 % LW), milk yield (MY = 28.6 ± 6.7 kg/d), and milk contents of fat (MFC = 3.63 ± 0.52 %), protein (MPC = 3.20 ± 0.25 %) and lactose (MLC = 4.71 ± 0.16 %). Data were analyzed with the GLM procedure to separate between (BV) and within trial variance. The within trial variance was captured by a curvilinear combination of NDF and NDF2.
Increased dietary NDF systematically decreased DMI in the studied range of NDF (DMI = 3.38 + 0.035 NDF −0.00094 NDF2, n = 230, nexp = 94, R2 = 0.91, rsd = 0.18) but it increased NDFI until NDF = 51.3 %DM and NDFI = 1.38 %LW (NDFI = −0.36 + 0.068 NDF −0.00066 NDF2, n = 230, nexp = 94, R2= 0.96, rsd = 0.06). MY was depressed by increased NDF (MY = 34.2 − 0.0049 NDF2, n = 243, nexp = 100, R2 = 0.99, rsd = 1.8). Dietary NDF was related negatively to MPC (MPC = 3.31 − 0.000091 NDF2, n = 222, nexp = 90, 0.93, rsd = 0.09) and MLC (MLC = 5.36 − 0.0093 NDF, n = 92, nexp = 38, R2 = 0.94, rsd = 0.05) and positively to MFC (MFC = 1.69 + 0.086 NDF - 0.00080 NDF2, n= 219, nexp = 89, R2 = 0.91, rsd = 0.20). The sd values of BV were large for all the items: 0.59, 0.21, 9.1, 0.36, 0.70, 0.23 for DMI, NDFI, MY, MPC, MFC and MLC respectively. These variations were closely related for DMI and RMY (R2 = 0.66). The proposed equations can be used to explore the marginal responses of variables to changes in dietary NDF in a given situation.

## DAIRY FOODS

**1315 Formulation and processing of reduced-fat dairy emulsions on the bench- top scale.** M. T. Dineen* and K. L. Parkin, *University of Wisconsin, Madison*.

Margarine and table spreads composed of vegetable oils or vegetable oil/milkfat blends have become increasingly popular with consumers. Milkfat fractionation and blending enables the manufacturer to produce a tub-margarine like spread that is entirely composed of milkfat. Spread products at the commercial and pilot scale are manufactured in a three phase continuous process, with a minimum batch size requirement of 30 Kg for pilot plant trials. The objective of this research was to develop a bench-top method of making emulsions that emulates the pilot scale process, and to use this system to study the influence of formulation and processing parameters in preparing reduced-fat dairy spreads. Such a scaled-down approach would allow for savings in material and human resources, and accelerate product and process development. Studies have focused on preparing 60% and 40% spreads using a spreadable butter blend. Coarse emulsions (200 g batch size) were first formed using a 50°Cwater bath at 400 rpm with a Servodyne mixer system. A scraped-surface heat exchanger was then simulated using a tempering beaker with controlled agitation and coolant temperature. Monacylglycerols (MAG) levels (0-3% of milkfat phase), and processing parameters of cooling rate (bath temperature 3, 6 and 9°C), end product temperatures (10, 13, 16°C), and extent of working were evaluated. Quality of prepared products was indexed by measurement of emulsion stability (centrifugation), color/appearance (reflectance colorimetry), morphology (photomicroscopy), and textural analysis. Statistical analysis, (ANOVA) of data for 60% lipid spreads indicated that significant differences between sample quality were conferred by variable processing temperatures but not MAG levels. Log transformations of these data correlated processing time with colorimetry values and processing time with textural (spreadability) parameters. Quality of emulsions prepared with a 40% lipid phase were more influenced by MAG level than processing parameters. Ideal conditions for preparing 40% and 60% milkfat spreads using the bench-top system were with a 6°Ccoolant and a 13°Cfinal product temperature.