

### 399 Integrating experiential learning into animal science curriculum through a hands-on Beef cattle management and marketing contest.

C. J. Malone\*, J. W. Rickard, K. W. Tudor, *Illinois State University, Normal.*

According to Illinois Agricultural Education's 2014 annual report, nearly 61% of students beginning their undergraduate studies in Agriculture at a 2-yr college in Illinois came from non-farm backgrounds. Yet, knowledge of and experience in livestock operations is still a requirement for many careers in the animal science industry. In response to this, the Department of Agriculture at Illinois State University has implemented a course that provides students an opportunity to gain hands-on experience with beef cattle management and marketing. The course was designed to enhance learning by requiring students to develop and execute a management and marketing plan for a pen of steers at the University Farm, which encouraged practical application of classroom instruction. The objective of this study was to determine if participation in the course enhanced student learning and knowledge retention. Eight student teams, composed of 3–4 students each, executed their own management and marketing strategies with the goal of obtaining the highest return on production, measured by subtracting expenses from revenue. Quantitative data was derived from gain scores on a pre-test at the beginning of the course and a post-test at the conclusion of the course. Qualitative data was obtained by having the students reflect on what they had learned. This reflection occurred at the end of each unit using Likert-scale and open-ended questions. Results obtained demonstrated that the contest enhanced learning and knowledge retention. Post-test means improved significantly ( $P = 0.000$ ) over pre-test means with gain scores being the highest in the unit topic areas of meat science, marketing and health. In addition, student reflection indicated the students believed that the contest enhanced learning, noting that it increased their beef cattle knowledge by making them aware of all of the factors that go into raising and marketing feedlot cattle.

**Key Words:** Feedlot, Teaching, Curriculum

doi: 10.2527/msasas2016-399

### UNDERGRADUATE STUDENT COMPETITION: ORAL

#### 400 Spinning straw into milk: Can a 95% byproduct diet support milk production? M. Hulett\*<sup>1</sup>,

C. M. Ylioja<sup>1</sup>, T. A. Wickersham<sup>2</sup>, B. J. Bradford<sup>1</sup>,

<sup>1</sup>*Department of Animal Sciences and Industry, Kansas State University, Manhattan* <sup>2</sup>*Texas A&M University, College Station.*

Agriculture is challenged with the need to support increasing human populations without additional land. One way the livestock industry has addressed this is by using human inedible feedstuffs, including industrial byproducts. Many dairy and feedlot diets incorporate 20–40% byproduct feeds, but few studies have evaluated responses of lactating dairy cattle to diets composed almost entirely of byproducts. Our objective was to evaluate such a diet in comparison to a more traditional lactation diet. The control diet was primarily composed of alfalfa hay, corn silage, corn gluten feed, and corn grain. The by-product diet included wheat straw, corn hominy, post-extraction algae residue, and corn gluten feed; in addition, 4% molasses was included to improve palatability. The control and by-product diets had similar concentrations of DM (50.6%) and CP (17.2%), whereas the byproduct diet included slightly more NDF (32.9 vs. 30.5%) and less fat (4.7 vs. 5.2%). Twelve Holstein cows ( $154 \pm 20$  DIM) were blocked by parity (primiparous vs. multiparous) and randomly assigned to treatment sequence in a crossover design. Diets were fed for 20 d, with data and sample collections over the final 3 d of each period. One cow was removed from byproduct diet after refusing to consume it, and data from this period were not included in the analysis. Data were analyzed with mixed models to assess fixed effects of diet, parity, and their interaction as well as the random effects of cow and period, and significance was declared at  $P < 0.05$ . The one selective cow notwithstanding, DMI was not affected by treatment. Milk yield of multiparous cows was decreased by the byproduct diet ( $38.7$  vs.  $42.3 \pm 2.2$  kg/d) but there was no treatment effect in primiparous cows ( $39.3$  vs.  $39.4 \pm 2.2$  kg/d). The byproduct diet decreased milk fat content ( $3.3$  vs.  $3.6 \pm 0.12\%$ ) and tended to decrease protein content ( $2.94$  vs.  $2.99 \pm 0.05\%$ ), and energy-corrected milk yield was decreased by 5.4 kg/d in multiparous cows and 1.5 kg/d in primiparous cows. No effects on BW or BCS were detected. Despite negative productivity responses, calculated recoveries of human-edible protein and energy in the diet were increased by approximately 50% with the byproduct diet, changing from a net loss to a net gain in human-edible energy and protein. A diet composed of 95% byproduct feeds supported milk yield of 39 kg/d and increased the efficiency of production from a human-edible input perspective.

**Key Words:** sustainability, byproduct feeds, lactation, dairy

doi: 10.2527/msasas2016-400