

## EXTENSION EDUCATION POSTERS

### 1037 (T077) Potential bull buyers perceive increased value to their operations when purchasing bulls from the Florida Bull Test. D. D. Henry\*,

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The primary purpose of the Florida Bull Test is to serve as an educational aid for the improvement of beef cattle production. The test aims to: 1) provide the commercial cow/calf producer a source of bulls that have been tested for animal performance (i.e., ADG, DMI and feed efficiency), that were thoroughly evaluated at the same location, and that have passed stringent health requirements; 2) provide an opportunity for seed stock producers to advertise their breeding programs through testing and marketing bulls; and 3) promote awareness and understanding of the latest animal breeding concepts and tools while showcasing superior beef cattle genetics in Florida. The test standardizes environmental conditions for evaluating postweaning performance. In doing so, it provides useful records for bull consignors to better evaluate breeding programs and creates a local source of performance-tested bulls. Since the inception of the test, 14 annual bull tests have been completed with 1205 bulls tested from more than 14 different breeds. Mean sale average has ranged from \$1,283 (in 2001) to \$3,274 (in 2013). Before initiation of the 2014 Florida Bull Test sale a survey was conducted among potential buyers on their perception of the value that purchasing a bull may be to their operation. Of the 77 completed surveys, 54% indicated that they had purchased between one and six bulls from previous Florida Bull Test sales. Buyers originated from Alabama ( $n = 21$ ), Florida ( $n = 47$ ), and Georgia ( $n = 9$ ). The primary factors identified by potential buyers when considering to purchase a bull were prioritized as follows: 1) breed, 2) performance and rank in the test, 3) sale price of the bull, 4) phenotype, 5) feed efficiency, and 6) pedigree. The mean perceived increased value per calf sired by bulls purchased from the Florida Bull Test was \$58.05, but ranged from \$0 to \$125 per calf. We concluded that potential buyers value bulls purchased from the Florida Bull Test and these bulls are perceived to increase the value of their offspring at weaning.

**Key Words:** beef cattle, survey, bull test

1038 (T078) 300-d grazing discovery farm. T. R. Troxel<sup>1\*</sup>, M. S. Gadberry<sup>1</sup>, J. A. Jennings<sup>1</sup>, S. M. Jones<sup>1</sup>, K. J. Simon<sup>1</sup>, J. G. Powell<sup>2</sup>, D. S. Hubbell, III<sup>3</sup>, and J. D. Tucker<sup>3</sup>, <sup>1</sup>Dep. of Animal Science, University of Arkansas, Little Rock, <sup>2</sup>Dep. of Animal Science, University of Arkansas Division of Agriculture, Fayetteville, <sup>3</sup>University of Arkansas Livestock and Forestry Research Station, Batesville.

The objectives of the 300d grazing discovery farm were to reduce hay feeding to 60 d or less, 90% net calf crop, average weaning weight of 249 kg and implement management practices common and available to cattle producers. The demonstration pastures consisted of 17.7 ha of common bermudagrass (*Cynodon dactylon*), two 10.6-ha pastures of toxic endophyte-infected Kentucky-31 tall fescue (*Festuca arundinacea*), 10 ha of Ark-Plus novel-endophyte tall fescue, and 10 ha of Ark-Plus fescue/common crabgrass mix. Red (*T. pretense* L.) and white (*T. repens* L.) clovers were interseeded into fescue pastures. Each pasture contained water sources and were subdivided with electric fence. In yr 1 the cow herd was predominately Balancer females (38 multiparous cows) bred to Balancer bulls with a fall calving season. Two horned Hereford bulls were used in yr 2 to 5. The breeding seasons were approximately November 21 to January 26. The grazing protocol for each yr was fescue/clover in spring, bermudagrass for summer and early fall, fescue/clover for late fall and stockpiled fescue in winter. The primary management practices implemented were rotational grazing, strip grazing stockpiled forages during winter and a short defined breeding and calving season. The length of the grazing season for yr 1, 2, 3, 4, and 5 was 337, 311, 330, 323, and 279 d, respectively, and averaged  $316 \pm 20.4$  d (mean  $\pm$  SD). The mean mature cow net calf crop for yr 2, 3, 4, and 5 was  $90 \pm 7.0\%$ ; 24% points improvement compared to yr 1. The overall adj. 205-d BW increased ( $P < 0.05$ ) from yr 1 and 2 (190 and 208 kg, respectively) to yr 3, 4, and 5 (225, 222, and 233 kg, respectively). All calves were weaned during the first 2 wk of May. The weaning weight of yr 1 was  $213 \pm 21.4$  kg. The weaning weight goal (249 kg) was achieved for yr 2, 3, and 5 and was  $255 \pm 39.2$ ,  $273 \pm 40.4$  and  $259 \pm 31.0$  kg, respectively, and was  $241 \pm 35.7$  in yr 4. The average calving season was 59  $\pm$  9.4 d for 5 yr. By incorporating rotational grazing, strip grazing stockpiled forage and a short breeding and calving season a 300 d grazing with acceptable beef cattle performance can be achieved in Arkansas.

**Key Words:** 300 d grazing, beef cattle, rotational grazing, stockpiled forage, weaning weight

**1039 (T079) Case study: Fermentation profile, physical form, and starch digestibility of whole-plant corn silage harvested with novel processing.**

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Samples collected from two self-propelled harvesters (SPFH) at harvest were evaluated for fermentation profile, physical form, and ruminal in situ starch digestibility (StarchD; 12-h incubations on undried, unground samples) in whole-plant corn silage (WPCS). One SPFH was fitted with conventional type rolls with greater roll-speed differential than normal (CRGD). The other SPFH was fitted with intermeshing-disc type rolls (IMDR). The CRGD samples were from three theoretical lengths of cut (TLOC; 1.91, 2.24 and 2.54 cm; 3-mm roll-gap setting) on two hybrid types (leafy [LFY] and dual-purpose [DP]). The IMDR samples were from three TLOC (1.70, 1.91 and 2.54 cm) at two roll-gap settings (1.5 and 2.5 mm) on one hybrid. Unfermented samples were analyzed for processing score (CSPS) and mean particle length (MPL). Fermentation profile and StarchD were measured on fermented samples (30-d; vacuum-sealed bags). Data were analyzed using PROC MIXED of SAS with the Fixed effects of TLOC, hybrids and their interaction or TLOC, roll-gap settings and their interaction for CRGD and IMDR, respectively. For CRGD, CSPS tended ( $P < 0.06$ ) to decrease while MPL increased ( $P < 0.001$ ) with increasing TLOC. Fermentation profile and StarchD were unaffected ( $P > 0.10$ ) by TLOC. Greater CSPS and reduced MPL were observed ( $P < 0.05$ ) for LFY than DP. In addition, LFY had ( $P < 0.01$ ) lower pH and greater total VFA concentrations. Starch digestibility tended ( $P < 0.10$ ) to be greater for LFY than DP (79.9% vs. 71.2%). The difference in DM content between hybrids ( $P < 0.01$ ; 31.2% vs. 35.2% for LFY and DP) may partially explain the differences between hybrid types. For IMDR, CSPS tended ( $P < 0.10$ ) to be greatest for 1.70 cm TLOC. Greatest MPL was observed ( $P < 0.05$ ) at the 2.54 cm TLOC. Measurements of pH were similar ( $P > 0.10$ ) among TLOC, although total VFA concentration was lower ( $P < 0.01$ ) for the 1.91 cm TLOC. A roll-gap set at 1.5 mm increased CSPS and decreased MPL compared to the 2.5 mm setting ( $P < 0.001$ ). Total VFA concentration was similar ( $P > 0.10$ ) and pH lower ( $P < 0.01$ ) for the 2.5 mm treatment. Roll-gap and TLOC setting did not affect ( $P > 0.10$ ) StarchD. Hybrid type and settings for TLOC and roll-gap influenced WPCS physical form and 30-d fermentation profile, while StarchD differed by hybrid type but not TLOC and roll-gap settings.

**Key Words:** corn silage, processing, starch digestibility

**1040 (T080) Initial assessment of producers' experiences, perceptions and attitudes about mastitis and bulk tank somatic cell count management in the Southeast.**

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Impacts of mastitis, including reduced quality milk and productivity, negatively affect the profitability and sustainability of dairies in the Southeast (SE). The Southeast Quality Milk Initiative (SQMI), an integrated research, extension, and education project involving six land grant universities in the SE, aims to reduce mastitis and lower bulk tank somatic cell counts (SCC) through cost-effective control strategies. The first aim of this project was to identify social, psychological, and economic barriers limiting adoption of practices known to effectively control mastitis. To address this aim, a qualitative survey was conducted to identify producers' attitudes, their perceptions of control, the normative factors that influence their behavior towards mastitis control, and their attitudes on the ease of use, utility, and cost of associated control practices. In total, three focus groups (two in Kentucky and one in Virginia) and 18 personal interviews (Producers in Tennessee and Virginia) were conducted. Participants represented a range of farm size (40 to 1200 cows), dairy experience (2 to 55 yr as owner or manager), bulk tank SCC (100,000 to > 600,000/ml; with either decreased or unchanged average SCC in the last 3 yr), and operational types. At each focus group and in personal interviews, a specific set of questions was posed. All content was subsequently reviewed for patterns and similarities. Producer responses were then grouped into key points. Findings summarized here are those that occurred frequently and were emphasized by producers through their input. Main trends are as follows: 1) Shortcomings remain in producer understanding of effects of subclinical mastitis on milk quantity and quality, 2) Producers' long-term objectives drive their investment of time and financial resources into mastitis management, 3) Uncertainty existed on the efficacy and cost-effectiveness of various mastitis control practices, 4) Producers wanted to know the bulk tank SCC that was most cost-effective in terms of the balance among associated costs of labor, management, penalties, and incentives, 5) Culling has been a favored mastitis management practice recently, 6) On-farm demonstrations of effective practices were the preferred means of communication and 7) Frustration resulted when implemented practices failed to control mastitis outbreaks. This information will be utilized to develop strategies for countering non-adoption rationales and form the foundation of a survey subsequently

distributed to approximately 2000 dairy producers in the SE. *This work was supported by a grant award from USDA-NIFA-AFRI (2013–68004–20424).*

**Key Words:** qualitative survey, mastitis, behavior, dairy production

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#### **1041 (T081) The status of milk quality at the start of the Southeast Quality Milk Initiative.**

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The quality of milk produced in the Southeast (SE), based on somatic cell count (SCC) and standard plate count (SPC), is consistently lower than the rest of the United States. Reduced milk quality increases costs while decreasing revenues and efficiency. The combined effect of these factors contributes to the declining dairy industry in the SE. Understanding factors that have the greatest impact on milk quality will provide a background for programs aimed at helping producers improve their operations and was the underlying basis for the establishment of the Southeast Quality Milk Initiative (SQMI). Our overall goal is to enable dairy farmers to move toward production systems compatible with a sustainable industry. To accomplish this, we will integrate outreach, education, and research initiatives focused on improved milk quality, lowered disease costs, and greater revenues on farm. As part of this process, we established the baseline status of milk quality at the start of the project on dairy operations in FL ( $n = 126$ ), GA ( $n = 221$ ), KY ( $n = 753$ ), MS ( $n = 82$ ), TN ( $n = 404$ ), and VA ( $n = 814$ ), which are the partnering states of the SQMI. SCC and SPC bulk tank milk data for 2012 were evaluated from records maintained by state regulatory agencies. At least one SCC and SPC were collected each month from each dairy farm with a Grade A permit and data were summarized using the Timeseries procedure of SAS. Most SPC samples (65%) had  $< 5000$  colony forming units (CFU)/ml and 82% fell within the recommended range ( $< 10,000$  CFU/ml). The SE SCC averaged  $324,204 \pm 174,083$  cells/ml (mean  $\pm$  SD). The annual mean SCC of individual states ranged from  $279,603 \pm 160,665$  to  $417,146 \pm 210,692$ . For herds enrolled in DHIA, which comprised 30–44% of the total herds within a state, annual mean SCC was approximately 50,000 fewer cells/ml. Considerable state-by-state variation occurred in frequency of samples, with SCC  $> 400,000$  cells/ml having the greatest effect evident in the summer months. At this time, 20 to 60% of samples from individual states were  $> 400,000$  cells/

ml. In summary, milk quality in the SE lags behind the US as a whole, and hot, humid summers of the region present one of the major challenges to producing quality milk. Continued evaluation of this information will provide a basis to evaluate the success of the SQMI. *This work was supported by a grant award from USDA-NIFA-AFRI (2013–68004–20424).*

**Key Words:** Mastitis, extension, milk quality

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#### **1042 (T082) Hedonic pricing models for Angus bulls sold at auction following performance testing at Oklahoma Panhandle State University.**

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Selection of a herd sire has always been of paramount importance given the initial financial investment and their contribution and effect on the genetic make-up of a beef herd. Data was collected from the nation's longest consecutively run bull test conducted at the University Farm of Oklahoma Panhandle State University (OPSU). The Bull Test and Bull Sale data utilized were collected from 2008–2013. Performance data were collected over a 112-d test period with data collection occurring at 28-d intervals. The top 70 bulls from each year's test were selected based on a performance index of 1/2 ADG and 1/2 weight per day of age (WDA), and a semen quality and motility score of excellent and sold at auction. Angus bulls were the focus of the study as they represented the vast majority of individuals sold. Three hedonic pricing models were created. The initial hedonic model contained production data that included BW, ADG, WDA, Julian age, final test weight, ultrasound data, and a dummy variable for sale year. The second model utilized production data and added genetic variables in the form of production EPDs (Calving Ease Direct (CED), BW, Weaning Weight, and Yearling Weight) and maternal EPDs (Calving Ease Maternal, Maternal Milk). The third model included the variables from the first and second model with the inclusion of carcass EPDs (Marbling, Ribeye Area [REA] and FAT). Year was significant in all three models however; there was less of an effect on price as more variables were included. In model one, the production factors that were of significance were: ADG ( $P < 0.01$ ), BW ( $P < 0.01$ ) and final test weight ( $P < 0.01$ ). In the second model, ADG, BW, and final test weight retained their significance at the  $P < 0.001$  level. The only production EPD that was significant ( $P < 0.05$ ) was CED. In the third model, years, ADG, and BW were still significant ( $P < 0.01$ ). Final test weight ( $P = 0.070$ ) and CED ( $P = 0.132$ ) had substantial changes. The carcass EPD rib eye area had a  $P$ -value of 0.057. Producers who are placing bulls on test can utilize the given information to assist with their selection. It cannot go unsaid that while single trait selection can be very detrimental; ADG was significant across all models. The study indicates that performance and growth

are of utmost importance to buyers, followed by birth weight consideration because a live calf is the start to a potentially profitable calf crop.

**Key Words:** hedonics, Angus, EPD

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**1043 (T083) Survey of management practices used in the implementation of artificial insemination and estrous synchronization programs in the United States.** S. K. Johnson<sup>\*1</sup>, and G. Dahlke<sup>2</sup>, <sup>1</sup>*Kansas State University, Colby*, <sup>2</sup>*Iowa State University, Ames*.

Artificial insemination (AI) and estrous synchronization (ES) remain underutilized tools by US beef producers. Little information is available on actual management practices used by producers who use these technologies and the value they have within their operation. An online survey tool was developed concerning a variety of production practices, synchronization methods and available tools used with AI and ES. A link to the survey was promoted through electronic extension publications, contact lists and cooperating news media. Producers that participated could enter a drawing for AI supplies at the completion of the survey. The survey was accessed by 546 individuals and 425 completed the survey. Responses came from 42 states. Average number of owned cows that were AI was 67 cows (range 0 to 1750) and 34 owned heifers (range 0 to 1500). Respondents represented commercial herds (56%), seedstock herds (67%), having both commercial and seedstock (44%), commercial heifer development (14%), AI Technicians (18%) and DVMs (18%). A majority of producers used AI for both cows and heifers (87%) with 8% use on heifers only and 5% on cows only. The proportion of respondents that always, usually, sometimes, rarely or never ES was 46%, 26%, 28%, 6%, and 4%, respectively. The frequency of use of AI after observed estrus, estrus AI followed by clean-up timed-AI and strict fixed-time AI was 42%, 25% and 34%, respectively and was similar between cows and heifers. A majority of respondents (97%) were familiar with the recommended protocols for synchronization of estrus and ovulation provided by the Beef Reproduction Task Force. Recommendations from these guidelines were generally used by 65% and sometimes or occasionally used by 20%. The estimated difference in value between AI-sired calves and natural service sired calves was highly variable and averaged \$465 ± 689 per head. The most common ways that AI contributed to profitability were through value of replacement heifers (60%), seedstock production (46%), reduced calving difficulty (42%), and premium of calves sold at weaning (35%). Sex-sorted semen had been used by 27% of respondents for use in heifers to make heifers (43%), cows to make heifers (47%), or cows to make bulls (8%). Pregnancy rates to sex-sorted semen were reported to be about as expected (61%), better than expected (12%) or worse than expected (27%). Despite improvements in fixed-timed AI protocols, many producers still depend on AI after observed estrus.

**Key Words:** artificial insemination, estrous synchronization, management practices

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**1044 (T084) Effect of on-farm dairy Beef Quality Assurance (BQA) training on worker knowledge of BQA and welfare-related practices.** A. E. Adams<sup>\*1</sup>, J. K. Ahola<sup>1</sup>, M. Chahine<sup>2</sup>, A. L. Ohlheiser<sup>1</sup>, and I. N. Roman-Muniz<sup>1</sup>, <sup>1</sup>*Colorado State University, Fort Collins*, <sup>2</sup>*University of Idaho, Twin Falls*.

A training program in Beef Quality Assurance (BQA) practices, which included BQA core components and guidelines, was developed for use on dairy farms. The objective was to determine if on-farm dairy BQA training has an effect on dairy worker knowledge of BQA and welfare-related practices. Twelve dairies in Colorado and Idaho (six per state) participated in this pilot project, with 3 dairies in each state receiving BQA training. Training was provided to all employees (including owners and managers) on the dairies that received it, was conducted by experts in dairy BQA via Spanish-language materials, and was consistent across all dairies. To gauge knowledge of various BQA and welfare-related practices, dairy employees were administered a brief exam before receiving training, and again immediately after. Scores were compared between the pre- and post-exams using the TTEST procedure in SAS, with a significant improvement in overall test score occurring in both states ( $P < 0.0001$ ). Respondents ( $n = 28$ ) scored an average of 53.1 (out of 100) before receiving training, which improved to 76.0 after the training (mean improvement = 22.9). In addition to improvement in worker knowledge, one dairy added a full-time hoof trimmer to their staff after receiving the BQA training, indicating the training made them realize the importance of lame cow identification and management on dairy cow welfare and BQA. The change in producer perception of the importance of lameness on an operation, as well as improvement in dairy worker knowledge, suggests that BQA training programs have the potential of impacting dairy owner and/or employee behavior in a positive manner. Further research, including a larger sample size and follow-up visits to gauge employee knowledge retention, is needed to investigate the long-term effect of on-farm BQA training on dairy worker knowledge and management practices. A training program that benefits both BQA and welfare practices would be an excellent tool for the dairy industry, and would foster continuous improvement in these areas within the industry.

**Key Words:** beef quality assurance, dairy cows, training

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**1045 (T085) Monetary impact of heat stress on dairy and beef industries in the US.**

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Heat stress continues to be a major economic problem for the livestock industry. Over 10 yr ago, St-Pierre et al. (2003) reported annual economic losses totaling \$897 and 369 million for dairy and beef, respectively. Utilizing this publication, economic impact figures were adjusted for 1) inflation using a cumulative rate of 24.78% (US Inflation Calculator), and 2) 2012 USDA figures for the dairy and beef industry inventories by state. For dairy, estimated annual state-by-state financial loss per cow and average farm were calculated. For beef, only estimated loss per cow was found because information on average herd size by state was not available. Annual losses were primarily determined by loss in productivity (i.e., weight gain for beef and milk production for dairy). In terms of economic loss per cow from heat stress, loss to the beef industry is overwhelmed by the dairy industry, with the top 10 dairy states having 25 times greater loss than average loss among the top 10 beef states. Average annual economic losses across all states on a per cow basis for dairy producers was \$89.01, while national annual losses for beef producers was only \$3.05. Texas had the highest beef loss per cow in 2012 (\$19.25), which was nearly double the second highest loss state which occurred in Oklahoma (\$10.59). In comparison, the dairy industry showed an annual per-cow losses of \$366.85 and \$308.03 per animal for Louisiana and Texas, respectively. Of total loss due to heat stress in the contiguous 48 states, the top 10 states account for 85% and 68% of the losses for beef and dairy industries, respectively. Economic losses per farm showed significant variation due to differences both in level of heat strain and average herd size (ranging from 2357 dairy cows per farm in New México to 66 in Missouri). Texas (872 dairy cows per farm), once again had the highest economic losses at \$268,601 per farm while the national average per farm was \$33,245 (national average of 187 dairy cows per farm). When ranked according to a combination of total economic loss due to heat stress, per-cow losses, and severity of heat stress, Texas, Kansas, Nebraska, and Oklahoma are the states where heat abatement systems would have the largest economic impact.

**Key Words:** heat stress, beef, dairy, livestock economics

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**1046 (T086) Phosphorus status of grazing beef cattle in Virginia's Chesapeake Bay watershed.**

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Phosphorus is one of the nutrients identified in EPA's TMDL plan for the Chesapeake Bay watershed. Major research and

extension efforts in Virginia have focused on reducing P losses from concentrated animal feeding operations, however approximately 400,000 beef cows graze pastures in Virginia's Chesapeake Bay watershed. To better characterize farm P status, fecal, forage and soil samples were collected from beef cattle farms in the watershed. One hundred twenty producers from 11 counties cooperated with sample collection ( $N=166$ ). Samples were analyzed for total P (TP) and inorganic P ( $P_i$ ) using the molybdovanadate yellow and blue methods, respectively. Soil test P values were characterized as low (12%), medium (37%), high (35%), and very high (16%) based on Virginia Cooperative Extension Soil Test guidelines. Phosphorus content of pasture forage grab samples (mean = 0.34%; SD = 0.12) was lowly correlated with soil P ( $r = 0.18$ ;  $P < 0.0001$ ) and fecal TP ( $r = 0.15$ ;  $P < 0.0001$ ). Forage TP levels were compared with Beef Cattle NRC (2001) P requirements for a 545-kg cow (Peak milk, 13.6 kg per d). All forage samples were sufficient in P content to meet a dry cow's requirements, while 98% met the requirements for late gestation and 88% met the requirements for peak lactation. Farm mineral supplements were categorized into four levels of P content ( $< 1.0$  [nil], 1.0 to 2.5 [low], 3.0 to 5.0 [medium] and  $> 6.0\%$  [high]). Forage P content did not affect mineral selection by producers. The mean forage P content of the mineral categories was 0.30, 0.36, 0.32, and 0.40%, respectively. The mean fecal TP (0.56%, 0.65%, 0.79%, and 0.97%, respectively) and  $P_i$  levels (0.33%, 0.41%, 0.55%, and 0.68%, respectively) significantly differed between producers that fed a nil and low P mineral, and those that fed mineral in the medium and high categories ( $P = < 0.001$  for TP and  $P_i$ ). Soluble P (defined as  $P_i/TP*100$ ) tended to increase across mineral categories going from nil to high. All farms surveyed required little or no P supplementation in regard to cow P requirements. These results indicate that reducing mineral P may be capable of limiting soluble P losses from supplementation of beef cattle.

**Key Words:** phosphorus, beef cattle, Chesapeake Bay

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**1047 (T087) Assessment of farm nutrient management and phosphorus supplementation practices of beef cattle producers in Virginia's Chesapeake Bay watershed.**

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Concerns over the environmental impact and resource usage of agricultural operations have pressured producers to explore nutrient management as an option to improve sustainability and profitability on the farm. The objective of this study was to determine the level of phosphorus supplementation and nutrient management practices among cow/calf producers in Virginia's Chesapeake Bay watershed. Surveys were collected from 67 producers in 10 counties. Total cattle populations (unweaned calves excluded) of sampled farms ranged

from six to 2810 with a mean of 162 (SD = 359). Seventeen percent of producers had no defined calving season, while 21% practiced fall calving, 31% practiced spring calving, and 31% calved in both spring and fall seasons. Nutrient management plans (NMP) are one of the more prevalent strategies currently employed in the Chesapeake Bay watershed in an attempt to minimize whole farm environmental impact and enhance nutrient conservation on the farm by limiting soil erosion and runoff. Fifty-five percent of participants had implemented NMP at the time of survey completion. In relation, twenty-five percent of all producers sampled forage to determine nutrient content. The majority of producers that sampled forage (94%;  $\chi^2 = 17.1$ ;  $P < 0.0001$ ) currently utilized nutrient management plans. Participants ranked criteria for mineral supplement selection. Responses were weighted based on participant designated ordinal ranking of criteria (three for primary, two for secondary and one for tertiary criteria). Interpretation of response distribution suggests that the primary criterion for mineral supplement selection was price (20.6%), followed by local availability (17.8%) and trace mineral content (17.5%). Sixty-nine percent of producers supplemented a commercial complete mineral mix and 22% used a trace mineral salt block. Eighty percent of producers provided a high magnesium (Mg) mineral (> 10% Mg) at some point during the year for an average of 9.5 mo (SD = 3.5). Eighty-two percent of participants indicated willingness to reduce mineral phosphorus supplementation levels if forage analyses revealed that feed and forage resources were capable of meeting phosphorus requirements, while 15% indicated uncertainty, and 3% indicated unwillingness. Survey results suggest that producers are willing to monitor and reduce farm nutrient losses if research shows that over-supplementation is a problem. A concurrent study is underway to assess the extent of nutrient over-supplementation on beef operations in Virginia's Chesapeake Bay watershed.

**Key Words:** phosphorus, beef cattle, Chesapeake Bay

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**1048 (T088) An economic impact decision support tool for farm specific estimation of not covering horizontal silos storing corn silage.**

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In a horizontal silo (i.e., bunkers and trenches), considerable silage is exposed to environmental elements and, if left uncovered, results in significant feed shrink and economic loss. Depending on the silo dimensions and silage density, 25% of the total volume of corn silage may be within the top 1 m of silage. The objective of this project was to create a producer-friendly dashboard tool (SAP America, Inc. Newtown Square, PA) to highlight the cost of not covering a horizontal silo storing corn silage. Farm-specific inputs of the dashboard tool are adjustable by the end user and include silo dimensions, dry matter of the silage, price of shelled corn/bushel, and total cost to cover si-

lage including price of cover and labor. Bunker silage volume was calculated using silo dimensions including: 1) wall height (height of the silage next to the wall), 2) mean width (width of the silo measured half way up the silo), 3) filling ramp length (length of front filling ramp measured horizontally), 4) dome height (height of the silage above the top of the wall), 5) back ramp length (length of the back silage ramp measured horizontally), and (6) wall length (wall length at the top of the silo). Bunker silage volume calculations were generated from Brian Holmes's Investment and Annual Costs of Forage Storage Calculator ([www.uwex.edu/ces/crops/uwforage/bunkersilovol-ume10-18-08.xls](http://www.uwex.edu/ces/crops/uwforage/bunkersilovol-ume10-18-08.xls)) from the University of Wisconsin-Madison. The dashboard tool outputs lost revenues from not covering a silo. This was calculated by silage price per ton (price of shelled corn/bushel  $\times$  8), multiplied by dry matter lost, and subtracting the cost of covering silage. To demonstrate model utility, total bunker silage amount was set at 1494 metric tons, dry matter density was 6.35 kg/m<sup>3</sup>, price of corn was \$5.00/bushel, total price of plastic was \$485/horizontal silo, and total labor cost was \$100 for covering the silo. With these inputs, the total lost revenues from not covering the silo was \$1,100/year. Dairy producers may use this model as a decision support tool to highlight lost revenue from not covering silos.

**Key Words:** silage covering, economic dashboard, extension tool

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**1049 (T089) A producer assessment of precision dairy farming technology use, usefulness, and pre-purchase considerations.** M. R. Borchers\*, and J. M. Bewley, *University of Kentucky, Lexington.*

A survey to identify producer perception of precision dairy farming technologies was distributed in March 2013 through written publications and email. Responses were collected in May 2013 ( $n = 109$ ) and statistical analysis was performed using SAS (SAS Institute, Inc. Cary, NC). Herd size, producer age, and role on the farm were collected and analyzed but significant differences were not found ( $P > 0.05$ ). Producers were asked to indicate parameters currently monitored on their farm from a predetermined list and producers most often selected daily milk yield (52.3%), cow activity (41.3%), and not applicable (producers not currently implementing technologies; 1.2%). Producers were asked to rank the same list on usefulness using a 5-point Likert Scale (1, not useful to 5, useful). Least-squares means were calculated using the GLM procedure of SAS and producers indicated (mean  $\pm$  SE) mastitis (4.77  $\pm$  0.47), standing heat (4.75  $\pm$  0.55), and daily milk yield (4.72  $\pm$  0.62) to be most useful. Pre-purchase technology selection criteria were ranked using a Likert Scale (1, not important to 5, important) by producers and benefit to cost ratio (4.57  $\pm$  0.66), total investment cost (4.28  $\pm$  0.83), and simplicity and ease of use (4.26  $\pm$  0.75) were found most important. Producers were categorized into United States or an other countries category based on their farm location. Significant differences

( $P < 0.05$ ) were identified between country and the adoption of technologies monitoring: animal position and location, body weight, cow activity, daily milk yield, lying and standing time, mastitis, milk components, rumen activity, and rumination with other countries being higher in all cases. Producers were categorized based on technology use (using technology vs. not using technology) and least-squares means were calculated across technology usefulness with daily milk yield (using technologies:  $4.83 \pm 0.07$ , vs. not using technologies:  $4.50 \pm 0.10$ ) and standing heat (using technologies:  $4.68 \pm 0.06$ , vs. not using technologies:  $4.91 \pm 0.09$ ) differing significantly ( $P < 0.05$ ). Least-squares means were calculated for technology use categories on producer pre-purchase considerations and availability of local support (using technologies:  $4.25 \pm 0.11$ , vs. not using technologies:  $3.82 \pm 0.16$ ) differing significantly ( $P < 0.05$ ). Using this data, technology manufacturers can better design and market technologies for producer needs.

**Key Words:** producer perception, survey, precision dairy farming technologies

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#### 1050 (T090) Sustainable year-round forage production and grazing/browsing management education program.

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Pasture-based goat production is becoming popular among the small-scale livestock farmers in the Southern region. However, most farmers have not adopted sustainable forage programs. As a result, they depend on hay and supplementary feedstuff to sustain their herd during times of reduced forage availability. Moreover, there is not much information available on pasture development/improvement and sustainable grazing/browsing management for goats. The goal of this project was to develop a comprehensive education program to increase the productivity, quality, and production duration of pastures as well as to improve the management of existing pastures for sustainable goat production. Project objectives were: 1) to develop training curricula, and 2) to train field-level extension and technical assistance personnel and goat farmers on sustainable year-round forage production and grazing/browsing management. Tuskegee University and PadmaDal Memorial Foundation were collaborating in this project. Other key partners in the project were Alabama Natural Resources Conservation Service, Auburn University, Mississippi State University, Langston University, and Texas A&M AgriLife Extension Service. The project outputs were 1) ready- to-use training curricula in the form of a handbook- sustainable year-round forage production and grazing/browsing management for goats in the Southern

Region, which is now freely available to the public at Tuskegee University website: [http://www.tuskegee.edu/sites/www/Uploads/files/About%20US/TUCEP/Livestock%20Program/Year-RoundPasture\\_Handbook.pdf](http://www.tuskegee.edu/sites/www/Uploads/files/About%20US/TUCEP/Livestock%20Program/Year-RoundPasture_Handbook.pdf), 2) an educational video to complement the handbook (under review), and 3) trained field-level extension and technical-assistance personnel and extension specialists (22) serving the goat producers in different Southern states and lead goat farmers (4). Short-term impact results showed 29% increase in the knowledge of trainees. The medium-term impact results revealed that majority of the trainees applied the learned skills and knowledge either to educate their clientele more effectively (professionals) or improve their farm operation (farmers).

**Key Words:** curricula, goats, training

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#### 1051 (T091) Assessment of the potential for compost bedded pack barns in sustainable organic dairy farming systems.

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Compost bedded pack barns (CBP) take full advantage of composting and manure management to provide a clean, comfortable environment for cows. Although most CBP research has been conducted on conventional dairy farms, organic dairy farms could also benefit from CBP due to increased cow comfort, natural airflow, and manure storage. To assess the potential for CBP use on organic dairy farms, a survey was distributed to through multiple email lists to organic dairy producers across the United States. Twenty-seven surveys were returned. Mean herd size (mean  $\pm$  SD) was  $95.05 \pm 78.71$  cows. Mean SCC was  $182,250 \pm 61,605$  cells/mL. Twenty-seven percent of producers housed their milking herds in a straw bedded pack, 23% in free stalls, 23% used a year-round pasture based system, 18% used CBP tilled daily, 5% used CBP that were not tilled daily and 5% used tie stall barns. Fifty percent of herds spent 19 to 23 h on pasture/d. Thirty percent spent an average of 12 h/d on pasture. Twenty percent of herds spent 24 h/d on pasture. The number of months that cows spent in a housing system for 24 h/d ranged from  $> 4$  mo (30%), 3 to 4 mo (15%),  $< 2$  mo (15%) or never in a housing system (30%). Organic dairy producers evaluated how effectively CBP, tie stalls, freestalls, straw-based bedded packs and pasture systems meet the needs of organic dairy herds by using a scale of 1 to 5 (1, poorly meets the needs of organic dairy herds to 5, well-suited for meeting the needs of organic dairy herds). Compost bedded pack barns ( $4.06 \pm 0.64$ ) were the highest ranked system, followed by straw bedded packs ( $3.84 \pm 0.90$ ) pasture based systems ( $3.39 \pm 1.20$ ), and tiestalls ( $2.72 \pm 1.23$ ). Using a scale of 1 to 5 (1, strongly disagree to 5, strongly agree), benefits of the CBP were ranked as shelter ( $4.47 \pm 0.51$ ), cow comfort ( $4.42 \pm 0.69$ ), access to fresh air ( $4.17 \pm 0.99$ ), and ventilation ( $4.17 \pm 1.04$ ). Compost bedded pack barns appear to be a viable housing option for organic dairy farms.

**Key Words:** compost bedded pack barns, organic, cow comfort

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**1052 (T092) Development and utilization of the AI Cowculator: A decision-aid application to determine whether to utilize fixed-time artificial insemination (TAI) or purchase herd sires for natural service.** V. R. G. Mercadante\*<sup>1</sup>,

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The development of reliable, efficient and economic TAI protocols has resulted in the opportunity for increased use in commercial cattle production systems. However, producers do not have access to simple decision-aid tools using their own data to determine whether implementing a TAI program or purchasing herd sires is more economically feasible. Therefore, we conducted an experiment to generate an economic model that determined that for every cow exposed to a TAI protocol a cattle producer will gain an additional \$49 per cow after weaning. Utilizing this economic model we developed the AI Cowculator smartphone and tablet application for iOS and Android systems. Since inception, the AI Cowculator has been

downloaded 1025 times in 38 states and four countries. Features of the application include: 1) a simple calculator to assist producers decide whether to utilize AI or purchase a herd sire. The calculator includes 18 entries divided into three categories (natural service sires costs, herd related costs, and artificial insemination related costs). The output includes a partial budget and provides users an opportunity to email the results to a single email account; 2) a push-pin locator that allows users to locate representatives who perform AI services or suppliers of semen and AI suppliers; 3) a resource icon that allows users to access helpful material for reproduction planning including TAI articles by the Beef Reproduction Task Force, a list of extension documents on beef production and future cattle prices; 4) a gallery of pictures and estrus synchronization protocols recommended by experts in the field; 5) a YouTube icon that provides a demonstration on the use of the AI Cowculator; and 6) a social media icon that directs to Facebook and Twitter pages and allow users to share their results. The AI Cowculator Facebook page is updated weekly with relevant reproductive management information and provides technical assistance to users of the application. Information posted on the AI Cowculator Facebook page has reached more than 5000 users of social media and has been liked by more than 310 people.

**Key Words:** smartphone application, decision aid tool; artificial insemination