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The effect of dietary whey protein concentrate on adhesion and colonization of enterohemorrhagic *Escherichia coli* O157:H7 in small intestine of Balb/C mice was evaluated. Eight groups containing six females each one were separated and randomly assigned to the following diets (two groups for each diet): standard diet (AIN93G; control group) and three groups with modified diet (AIN93 modified with addition of alpha-lactalbumin fraction; AIN93 modified with addition of beta-lactoglobulin fraction, and AIN93 modified with addition of whey protein concentrate - WPC). The protein fractions were obtained as described in US Patent n.6,900,290. Water was administered ad libitum during the experimental period of seven days. The experimental groups received aliquot of 0.5ml of *Escherichia coli* O157: H7 (ATCC 43895), in the concentration of 7×10^{10} CFU/mL using a gavage cannula. The

animals had been examined clinically and sacrificed in the 8th experimental day, following recommendations of the bioethics committee (CETEA/UFMG). Samples of intestinal portions were submitted to histopathology and morphometry. The statistical analyses was done by the t-Student Test and by ANOVA including analysis of variance and test of multiple comparison according to Tukey (Software GraphPad Prism[®] 3.0.3 - San Diego). The diet containing fractions of beta-lactoglobulin and alpha-lactalbumin resulted in protective effect on the intestinal vilosity, respectively, of the distal part of the jejunum and the ileum ($p \leq 0,05$) in Balb/C mice infected by *Escherichia coli* O157:H7. On the other hand, the WPC did not demonstrate protective effect on the intestinal vilosity. Results showed that whey proteins present great potential for the control of intestinal infections caused by *Escherichia coli* O157:H7. *Acknowledgements: FAPEMIG; CNPq; CAPES.*

Key Words: whey protein, labctalbumin, *Escherichia coli*

Extension Education

W96 Effects of heat mount detectors, season, breed, and lactation on reproductive efficiency in summer and winter of dairy cows marked with chalk. J. A. Pennington*¹ and Z. B. Johnson², ¹University of Arkansas, Little Rock, ²University of Arkansas, Fayetteville.

To determine effects on reproduction, cows (n=410) housed in free stalls and milked in a rotary parlor were assigned on May 26 (S) or January 6 (W) to treatments as cows (C) marked with chalk as an aid to detect estrus or cows (MD) fitted with mount detectors plus marked with a 7-cm wide by 25-cm long chalk along the tail and backbone, beginning at the fifth coccygeal vertebra as the tail curves to form the backbone. Early in the trials, open cows at least 40 days post-partum with no prior breeding or declared open by palpation per rectum were synchronized for estrus and bred at 72 h after PG, unless bred earlier based on detection of estrus. Changes in status of detection aids and estrous activity were recorded at least 2x daily. Holsteins (H; n=134), Jerseys (J; n=189), crossbreds (X; n=38), and other breeds (O; n=49) were assigned 62% to C and 38% to MD. Status of cows following the 96-day spring/summer (S; n=152) and 86-day winter (W; n=258) trials was based on return to estrus and/or results of palpation of reproductive organs. Days from calving to assignment of treatment was not affected ($P > 0.10$) by treatment (T) and lactation number (L) but was affected ($P < 0.01$) by season (S), breed (B), and TxB. Treatment did not affect traits observed but T x L affected days between 1st and 2nd breeding ($P < 0.05$) and days to pregnant ($P < 0.01$). Days from start of trials to 1st breeding were affected ($P < 0.05$) by TxB. Season affected days from start of trials to first detected breeding ($P < 0.05$; S=33.2; W=27.1), days to 2nd breeding ($P < 0.01$; S=61.6; W=48.3), and days to pregnant ($P < 0.01$; S=49.9; W=35.6). Breed affected ($P < 0.05$) days from calving to 1st breeding after treatment (H=113.8; J=102.6; X=90.9; O=98.8) and days from treatment to pregnant (H= 49.9; J= 38.7; X= 38.5; O= 43.8). Pregnancy rates were not affected ($P > 0.10$) by T (C=54.7%; MD=52.6%). Overall, results indicated that heat mount detectors did not improve reproductive performance of dairy cows marked with chalk in the spring/summer and winter. Season, breed, and lactation number affected reproductive efficiency of the dairy cows.

Key Words: dairy, heat detection, estrus detection aid

W97 Improving IPM of house flies at commercial dairy operations through pest monitoring and determination of nuisance threshold. G. E. Higginbotham*¹, L. N. Pereira², and A. C. Gerry³, ¹University of California Cooperative Extension, Fresno, ²California State University-Fresno, Fresno, ³University of California, Riverside, Riverside.

House fly abundance was monitored at three large dairy operations in Fresno County during the summer of 2005. Spot cards, fly tapes, and fly bait traps were simultaneously compared to detect early increases in house fly abundance while still providing manageable information during peak fly activity in mid-summer. Ten spot cards, five fly tapes, and five bait traps were placed to provide full coverage of each dairy. Spot cards and traps were replaced weekly. Fly counts varied significantly by trap location for all monitoring methods ($P < 0.006$). The correlation between fly counts at each trap location also varied considerably for all monitoring methods, with trap locations in near proximity or placed near similar habitats generally having significant correlations ($P < 0.05$). Spot cards and bait traps were similarly effective over a range of fly abundance. Spot card counts ranged from 35 to 5,940 spots per card across all dairies and weeks sampled, with mean spot card counts per dairy of 174 (± 85), 461 (± 221), and 1612 (± 853) spots per card. Mean weekly spot card counts between dairies was significant ($P < 0.001$). Fly bait traps ranged from 41 to 4,545 house flies per trap across all dairies and weeks sampled. Mean bait trap counts per dairy were 600 (± 317), 1473 (± 840), 2040 (± 1275) with significant differences in mean weekly bait trap counts between dairies ($P < 0.001$). Fly tapes were ineffective due to tape failure (18% failure rate) caused by wind, dust, and heat. Spot cards required the least effort and cost to deploy while still providing acceptable resolution of changes in house fly abundance. An automated spot card counting system is needed to improve efficiency of this monitoring tool so that it might be adopted by the industry.

Key Words: fly control, IPM, pest monitoring

W98 Pizza Ranch is an educational tool to teach fourth graders about proper nutrition and where food originates. J. A. Pennington* and J. Buffalo, *University of Arkansas Cooperative Extension Service, Little Rock.*

Pizza Ranch is an educational class for fourth graders which teaches them about the nutritional value of the components of pizza, where the components originate, and the importance of eating properly. Teachers of the youth, primarily from Pulaski County but also some from adjacent counties, are invited to bring their classes to the one-day activity conducted at the Arkansas State Fairgrounds. The 1000-1500 youth attend 20-minute stations for (1) milk, (2) wheat and dough, (3) vegetables and sauce, (4) meat, and (5) cheese before eating pepperoni pizza which is served with milk and ice cream. At each station, the fourth graders are taught about the specific components of the pizza, where the components originate on the farm, how the components are processed into food (wheat into flour or milk into cheese), and the nutritional value of the specific food components. The youth are also told why it is important to eat properly. Extension specialists are the instructors except for the milk and cheese stations where dairy promotion personnel are the instructors. During the breaks between classes, youth are allowed to milk an artificial cow and pet dairy goats. In some years, other animals are also present. Teachers are provided with education materials that they can use in their classroom to further explain the nutritional value of a pizza and the importance of eating according to USDA dietary guidelines. Evaluations for the Pizza Ranch range from 4.3 – 4.8 for the last nine years on a scale of 5.0 and average 4.6 (SD=0.2); comments by teachers are very positive.

Key Words: nutrition education, youth education, dairy

W99 Economic importance of some traits of dairy cattle. F. Szabó* and Z. Fekete, *University of Pannonia, Keszthely, Hungary.*

The economic value of 7 traits was calculated for the dairy cattle population in Hungary in 2008, using a bioeconomic model based on the program package ECOWEIGHT (Wolf et al. 2005). The importance of the study was due to more than 70% of the cattle in the country belonging to the dairy industry. The study was based on the typical dairy farm size of 330 Holstein-Friesian cows, with a production level of 7000 kg annual milk yield. Cows were managed in a loose-housing system with parlour milking, representing current commercial dairy enterprises. A total mixed ration based on maize silage and concentrates, with some alfalfa hay, was offered to 4 groups (first-, second-, third-phase of the lactation and a dry group). Besides the dairy enterprise, calf and replacement rearing were also taken into consideration. Income came from milk, calves, culled cows and manure sale. About 50% of the total costs related to feed, with the remainder due to factors such as management, reproduction and health services, labor, interest and amortization. Annual revenues and costs were used for the economic calculations. Gross margin was taken as a difference between income and variable costs. Marginal economic value of a given trait was defined as the partial derivative of the profit function, which was standardized by multiplying by the genetic standard deviation of the trait. The relative economic values for traits were expressed as a percentage of the standardized economic value of 305-d milk yield. The relative economic importance of the evaluated traits were as follows: 305-d milk yield 100%, length of productive life 51%, conception rate of cows 36%, 305-d protein yield 35%, 305-d fat yield 20%, stillbirth 13%, pregnancy rate of replacements 3%.

Key Words: dairy cattle, functional and production traits, relative economic weight

W100 Financial performance of dairies in Florida and Georgia in 2007. L. O. Ely*¹, A. DeVries², R. Giesy², M. Sowerby², B. Broadus², and C. Vann², ¹*University of Georgia, Athens,* ²*University of Florida, Gainesville.*

The Dairy Business Analysis Project (DBAP) includes an annual survey of the financial performance of dairies primarily located in Florida and Georgia. Its objective is to document the dairies' financial success using standardized, accrual accounting methods in order to calculate benchmarks and provide feedback on the dairies' financial strengths and weaknesses. Twenty-three dairies submitted financial data in 2007. Twenty-one dairies were included in the summary results. Of these, 16 were located in Florida, and 5 in Georgia. The average herd size was 1,399 cows and 708 heifers with 18410 lbs. milk sold per cow. The average culling rate was 35%. There was an average of 22 FTE workers per farm and 1.06 million lbs milk sold per FTE worker. Total revenue per cwt. was \$24.67 / cwt with \$22.59 / cwt milk income. The average total expense was \$21.09 / cwt. The largest expense items were purchased feed (\$9.20 / cwt), labor (\$3.57 / cwt), livestock (\$1.62 / cwt) and milk marketing (\$1.14 / cwt). Net farm income from operations was \$3.58 / cwt and net farm income was \$3.57 / cwt. The debt to asset ratio was 0.29, the rate of return on assets was 0.15, the rate of return on equity was 0.26, and the operating profit margin ratio was 0.13. Total revenue increased and expenses decreased with herd size in 2007 resulting in the largest herds having the largest net farm income (\$4.98/ cwt). The herds with the highest milk production (>20,600 lbs / cow / year) had the highest total revenue (\$25.08 / cwt) and the lowest expenses (\$19.87/ cwt) resulting in the highest net farm income (\$5.20 / cwt).

Key Words: dairy, financial, management

W101 Profitability of milk production considering different prices and yield. F. Szabó*, G. Buzás, and I. Heinrich, *University of Pannonia, Keszthely, Hungary.*

The profitability of milk production was calculated for the dairy cattle population in Hungary using input-output analysis based on budgeting bioeconomic program package. A higher (\$0.35/kg) and a lower (\$0.30/kg) milk prices were taken into consideration. Calculation was done for 6000, 7000 and 8000 kg annual milk yield per cow. Price and cost data were collected on different farms in the country. Cows were managed in a loose-housing system with parlour milking, representing the typical, current commercial dairy enterprises. A total mixed ration based on maize silage and concentrates, with some alfalfa hay, was offered to cows. Besides the dairy enterprise, calf and replacement rearing were also taken into consideration. Income came from milk, calves, culled cows and manure sale. Total variable costs including feed, replacement cow, and other variable costs (such as management, reproduction and health services, interest and amortization) were used for the economic calculations. Feed costs were calculated from the nutrient requirements of cows. Labor costs weren't taken into consideration. Annual revenues and costs were used for the profitability evaluation. Gross margin (GM), in which labor costs and profit of the farmer are included, was taken as a difference between income and total variable costs. Profitability was calculated as a percentage of total variable cost in the income. The ratio of the feed, replacement and other variable costs in case of 6, 7 and 8 thousand kg annual milk yield were: 56:23:21%, 60:21:19% and 62:20:18%, respectively. GM and profitability values, when milk price was high, were: \$789, \$935, \$1025 /cow, 43.5%, 46.1%, and 45.1%, when milk price was low, were: \$488, \$570 and \$625 /cow, 26.9%, 28.1%, and 27.5% in case of 6, 7, and 8 thousand kg milk yield per cow, respectively. However, gross margin per cow increased with increasing

milk production, the profitability from 7 to 8 thousand kg milk yield decreased due to the higher feed costs.

Key Words: dairy cattle, gross margin, profitability

W102 Livestock gross margin insurance for dairy cattle: Analysis of program performance and cost under alternative policy configurations and market conditions. M. Valvekar*, V. E. Cabrera, and B. W. Gould, *University of Wisconsin, Madison*.

Livestock Gross Margin insurance for dairy cattle (LGM-Dairy) is a new risk management tool that can be used to establish a lower bound on a dairy producer's gross margin (defined as milk revenue minus imputed purchased feed costs). A producer's decision of the level of gross margin to insure has a significant impact on the gross margin guarantee (GMG) and resulting premium. An analysis of the relationship between these decision parameters is important to understand how this program could potentially benefit dairy producers. Objectives of these analyses are to (1) review the basic structure of LGM-Dairy (2) examine sensitivity of GMG and premium to changes in insured feed quantity and (3) quantify the impacts of changes in deductible level on important program characteristics. Although this program has been available only since August 2008, we review program performance under a variety of market conditions over the 2000-2008 period for a hypothetical Wisconsin dairy to provide an indication of the usefulness of this program under alternative market conditions. The level of corn and soybean meal equivalent fed are divided into discrete ranges to allow for a sensitivity analysis of GMG and insurance premium to feed quantities. GMG and premium are then calculated for different combinations of feed use and deductible levels, using the University of Wisconsin's LGM-Dairy premium calculator. Correlation coefficients analyze key relationships between different program parameters. Preliminary analysis using 2008 data indicates a negative association between deductible level and premium, a negative association between insured corn equivalents and GMG and a low correlation between insured soybean meal equivalents. Preliminary analyses of the impact of gross margin deductible on payout probability shows that maximum deductible corresponds with lesser payout probabilities.

Key Words: price risk, risk management, revenue insurance

W103 Description of Kentucky dairy management systems and producer demographics. R. A. Russell* and J. M. Bewley, *University of Kentucky, Lexington*.

To characterize the management of Kentucky dairy operations, a survey was distributed to all licensed milk producers in the state. Two hundred and twenty-nine producers responded to the survey. Mean age of responding producers was 50.9 (± 12.9) with a range of 22 to 82. Mean 2008 herd size (milking and dry cows) was 83.0 (± 101.8) with a projected herd size of 102.1 (± 114.4) in 2013. Mean daily milk yield (pounds per cow) was 52.7 (± 11.8) with a range of 15 to 85 pounds. Mean somatic cell count (cells/ml) was 304,524.6 ($\pm 123,306.7$) with a range of 75,000 to 750,000. When asked to describe how much of their income came from farming, 54.9% reported all of their income was from farming, 30.1% said more than half of their income was from farming, 9.3% indicated their income was evenly split between farm and off-farm sources, and 5.8% said most of their income came from off-farm sources. Forty-eight respondents (22.4%) said they intended on staying in the business for more than 20 years, 61 (28.5%) for 10

to 20 years, 71 (33.2%) for 5 to 10 years, and 34 (15.9%) for less than 5 years. One hundred thirty-seven respondents (63.4%) indicated they would improve efficiencies in the next 5 years while 64 (29.6%) said they would expand, 41 (19.0%) would modernize and 36 (16.7%) said they would leave farming in the next 5 years. One hundred and seventy-six (84.6%) producers indicated that Holstein was their primary breed followed by Jersey (8.2%), crossbred (3.4%), mixed (1.9%), Guernsey (1.0%), Brown Swiss (0.5%), and Milking Shorthorn (0.5%). Producers characterized their housing systems as follows: no housing (cows are outside year-round) (40.1%), new (<10 years) or modern freestall barns (22.2%), existing building(s) converted to freestall housing (17.9%), tie-stall or stanchion barns (8.7%), compost bedded pack (sawdust) housing (6.8%), and bedded pack (straw) housing (4.3%). The majority of producers milked cows in a pit parlor (77.7%) with the remaining milking in a stall barn with buckets or pipeline (14.3%) or flat parlor (8.0%). These results provide new insight into the management of Kentucky dairy operations.

Key Words: survey, dairy extension, management systems

W104 Characterization of the decision making behavior of Kentucky dairy producers. R. A. Russell* and J. M. Bewley, *University of Kentucky, Lexington*.

A survey was distributed to all licensed milk producers in Kentucky to gain a better understanding of the factors that influence decisions made by dairy producers. Two hundred and twenty-nine producers responded to the survey. When asked to describe criteria used to evaluate the success of their dairy operation, the criteria selected by the highest percentage of respondents were (1) ability to pay operating expenses without incurring unnecessary debt (91.6%), (2) well-being of animals in the herd (82.8%), (3) producing superior quality milk (75.8%), (4) keeping a balance in the checking account (73.1%) and (5) quality of life (67.0%). The top three sources of influence or information in decision making (with mean response calculated after assigning the following numeric values to producer response categories: not important-1; important-3, very important-5) were (1) advice from consultants, nutritionists, and veterinarians (3.70 ± 1.23), (2) consultation with business partners and family members (3.68 ± 1.29) and (3) intuition and gut feeling (3.10 ± 1.45). When asked about criteria used to evaluate decisions, the criteria selected by the highest percentage of respondents were (1) ability to cash flow (94.7%), (2) availability of funds to pay for investments (80.5%) and (3) impact on the business's long-term financial performance (70.8%). Respondents were asked how frequently they reevaluated their long-term business strategy. The percentage of producers who listed annually was 29.4%, while 16.2% stated never, 14.7% monthly, 13.7% twice a year, 13.2% more than once per month, and 12.7% quarterly. With regard to adoption of automated monitoring technologies, producers indicated that modest adoption rates were a result of (1) not being familiar with technologies that are available (54.9%), (2) undesirable cost to benefit ratios (41.8%) and too much information provided without knowing what to do with it (35.9%). Utilizing this insight into dairy producer decision making should help industry professionals address dairy producer issues and concerns.

Key Words: survey, dairy extension, decision making behavior

W105 A Spanish language artificial insemination school for Idaho dairy employees. J. C. Dalton*¹, K. S. Jensen², M. Chahine³, and M. de

Haro Marti⁴, ¹University of Idaho, Caldwell, ²University of Idaho, Marsing, ³University of Idaho, Twin Falls, ⁴University of Idaho, Gooding.

Idaho is the second largest milk producing state in the western United States, and currently ranks as the third largest in the entire country. The Idaho dairy industry relies on a Spanish-speaking workforce. Coincident with the recent rapid growth of the Idaho dairy industry, the demand from dairy producers for new educational opportunities for dairy employees has increased. To identify critical topic areas, University of Idaho Extension personnel consulted 1) a dairy advisory board, consisting of producers and members of allied industry, and 2) participants in a Spanish language milker's school. Consequently, a Spanish language artificial insemination school for Idaho dairy employees was developed. The program consisted of 10 h of classroom teaching followed by a minimum of 8 h of practical live animal and semen handling experience. The registration fee was \$250 and the program was held in Caldwell and Twin Falls, Idaho. Topics included collection and processing of semen, reproductive anatomy and physiology, semen handling, heat detection, and artificial insemination technique. All material was presented in Spanish. A pre- and post-test (true or false, and fill in the blank) was administered to participants at the beginning and end of each topic area. Twenty-one students completed the pre- and post-tests. The overall mean score for the pre-tests was 76.7%, while the mean score for the post-tests was 90.2%. The mean difference (Post-test – Pre-test) was 13.5%, providing evidence of increased knowledge gained by the participants. At the conclusion of the program, a certificate was awarded to all participants who completed both the classroom and live animal instruction.

Key Words: Spanish, artificial insemination, dairy

W106 Hoof care workshop in English and Spanish. M. Chahine^{*1}, T. S. Hirsch², J. M. DeFrain², T. Fife¹, and M. E. de Haro Marti³, ¹University of Idaho, Twin Falls, ²Zinpro Corporation, Eden Prairie, MN, ³University of Idaho, Gooding.

Milk sales are the number one revenue on a dairy operation. However, there are many different factors that can impair milk production and thereby reduce profits. One of the most significant among these factors is lameness. The University of Idaho and Zinpro Performance Minerals[®] teamed together to address the lameness issue in dairy herds by conducting a Hoof Care Workshop. This workshop was a one day event held in both English and Spanish at a dairy in Jerome, ID. The first half of the workshop was lecture-based and included presentations on the economics of lameness, the overall anatomy of the foot, claw horn lesions, both infectious and non-infectious, hoof and claw care (claw trimming and foot baths), effects of nutrition on hoof health, cow comfort, record keeping, and locomotion scoring. The workshop concluded with a demonstration on locomotion scoring and hoof trimming where the participants received hands-on experience. On the first day 23 people attended the English version of the Hoof Care Workshop. On the second day there were 20 people in attendance for the Spanish presentation of the workshop. Follow-up surveys were conducted in English and Spanish to assess the value of the workshop and what the participants had implemented as a result. Fourteen of the 43 surveys were returned. The overall value of the workshop was 4.2 on a 1 to 5 scale (1 being of little value and 5 being of great value). All the respondents indicated that dairy management practices have been changed or initiated to deal with lameness based upon information they received from the workshop. Several people emphasized the connection they made between cow nutrition and hoof health, such as the amount of fiber in the ration affecting the amount of cud chewing, and ultimately hoof health. Others commented

on the importance of detecting problems early on, diagnosing them, and therefore providing the correct treatment. This educational program has the potential to increase revenues for the dairies through increased milk production, decreased days open, decreased death loss, cows staying on the dairy longer, reducing the number of culls and ultimately improving animal well being.

Key Words: hoof care, lameness

W107 TMR feeder schools in English and Spanish. R. J. Norell^{*1}, M. Chahine², and M. E. de Haro Marti³, ¹University of Idaho, Idaho Falls, ²University of Idaho, Twin Falls, ³University of Idaho, Gooding.

Feed cost is the largest single expenditure on a dairy, accounting for 50 to 60% of the total cost of producing milk. On-farm training programs for feeders are limited in number and scope. Hispanic workers comprise 85% or more of the Idaho dairy workforce, most of them with little or no proficiency in English. Dairies also have English speaking feeders with no knowledge of Spanish. Based on this situation, it was determined that training programs for dairy feeders should be offered in both languages. The University of Idaho Extension developed and pilot tested the TMR/Mixing Feeding School. The school included presentations and written materials on nutrition and metabolic diseases, Total Mixed Ration mixing techniques and Standard Operation Procedures, feed bunk management, dry matter determination, particle size determination, farm safety, and nutrients and the environment. In total, 17 participants attended the Spanish workshop, and 12 participants attended the English workshop. A one page questionnaire was used in the English workshop to assess how often feeders used best management practices before attending the school, and how often they planned to use the practice after attending it. Participants in the Spanish version of the feeder school indicated they preferred to use a pre/post test format for evaluating their knowledge. Based on their input, an 18 question pre/post test was developed in Spanish and covered various aspects of feeding management. Scores improved from 33.3% correct to 71.1% correct, indicating a significant increase in knowledge. Based on the questionnaire responses, significant improvements in planned practice adoption were also observed in the English workshop for eleven out of twelve categories, and for the overall school. To assess learning, we also asked each attendee to indicate how much they may have learned from the workshop. The feeder school received an overall rating of 3.2 on a 1 to 4 scale (1 being nothing new and 4 being a lot). We anticipate that this educational program will increase revenues on dairies through improved feeding management, increased milk production, decreased feed cost and decreased metabolic diseases.

Key Words: feeder school, Spanish education

W108 Educating Oklahoma producers on radio frequency identification. P. K. Camfield^{*}, A. Preator, D. Stephens, and J. Townsend, Oklahoma Panhandle State University, Goodwell.

National Animal Identification (NAID) is a system that will effectively allow animals to be tracked from birth to death in a timely manner. Benefits of NAID include quick response to disease outbreaks, preventing disease outbreaks, and maintaining domestic and foreign consumer confidence in the U.S. beef industry. Objectives for our Radio Frequency Identification (RFID) research were to compare 3 different ear tags and 2 electronic readers over a 2 year period. The working ease, readability, and durability of these RFID materials were tested. Methods of testing

were: tagged cattle (n=5000) in both large and small operations, located within different geographic regions of Oklahoma, were tracked through all stages of production. Two types of RFID readers were used during this trial, one was battery operated and has the capability of storing 5000 data points. The other utilizes Bluetooth technology and sends all data points directly to a spreadsheet. The battery operated reader was the easiest to operate in all production scenarios. It was necessary to have a clear line of site to the computer with the Bluetooth reader. Both readers were very easy to operate and can be utilized in all cattle production phases. There was no difference between the 3 ear tags used, with less than 1% loss and/or damage regardless of operation size, geographic region, or stage of production ($P > 0.05$). No difference ($P > 0.05$) was observed between either reader's ability to identify and read tags. The only operational difference was the capability for one reader to store data in the reader, compared to the Bluetooth reader's ability to only store data directly to the computer. The main concern of producers was the overall cost of implementing, maintaining, and educating users to properly operate this technology. The RFID technology tested was equally effective in working ease, readability, and durability, regardless of size of the business and geographic location.

Key Words: animal identification, electronic tags, tag readers

W109 The integration of beef cattle into a peanut and cotton crop rotation that involves a perennial grass: A farm scale demonstration. R. O. Myer^{*1}, D. Zhao¹, K. S. Balkcom², C. L. Mackowiak¹, J. L. Foster¹, D. L. Wright¹, J. J. Marois¹, J. A. Howe², G. C. Lamb¹, A. R. Blount¹, and M. K. Maddox¹, ¹University of Florida, Marianna, ²Auburn University, Headland, AL.

Use of perennial grasses in row crop rotations can reduce economic risk, enhance crop yields and protect the environment. Integrating beef cattle into the system can make for more efficient use of farm resources, and reduce risk by diversification. Two, irrigated farm-size fields (NW Florida; 61 ha and SE Alabama; 20 ha) have been involved in a sod-based rotation project since 2000, mainly focusing on the agronomic aspects of the system. Results to date indicate that including bahiagrass (*Paspalum notatum*) in the rotation improves cotton and peanut yields, and water quality. The present focus is to demonstrate how best to integrate beef cattle (cow/calf system) into the rotation system, and to evaluate how grazing might impact subsequent yields of cotton and peanut. Each field is divided into four sections and a 4 yr rotation of bahiagrass (bahia1), bahiagrass (bahia2), peanut and cotton has been and is being utilized. The cows are used in the rotation to utilize the bahiagrass as well as the winter cover crops (rye and oat blend) planted after the peanut and cotton harvests. The fields have non-grazed (exclusion) areas to evaluate the impact of grazing. The cattle graze bahia2 starting May, continue grazing until Aug., graze bahia1 until frost (Nov.), and fed hay (oat or bahiagrass) until calving (Jan. thru Mar). After calving, cows and calves graze winter cover crops until May, and cycle repeats. Calves are weaned in Aug. Each site uses a constant number of cows through the summer and winter/spring. Put and take cows are used during the winter/spring to utilize the excess forage. Hay is harvested from Bahia2 in Oct. and this field is planted into Oat (sod-seeded) which is harvested for hay (FL) in April or grazed (AL). After 2 yr at the FL site, 45 calves per yr have been raised, and the winter cover crops provided extra grazing days (mean of 2548 d). No impact ($P < 0.05$) on subsequent peanut or cotton yields were noted.

Key Words: beef cattle, farming systems, forages

W110 Incorporation of Tifton 85 greenchop in least-cost rations for Florida dairy producers. J. Clavijo^{*1}, Y. Newman¹, L. Ortega², C. Staples¹, A. Adesogan¹, and L. Sollenberger¹, ¹University of Florida, Gainesville, ²National Mango Board, Orlando.

Due to the dependence on purchased feeds that is typical of Florida dairies and the declining trend of milk prices, farmers are increasingly interested in analyzing the feasibility of growing forages for their rations. Predictive tools can help the decision making process by providing insight into the potential outcomes of using perennial warm-season forages as feeding alternatives in dairies. To address the need for such tools, a least-cost ration formulation model that assessed the incorporation of Tifton 85 bermudagrass greenchop into dairy rations was developed. The linear program model was based on information from nutrient requirements of dairy cattle (NRC, 2001) feedstuff nutritive value profiles, as well as the nutritional requirements of Holstein cows at different production levels and lactation stages. Yields (DM, Mg ha⁻¹) and nutritive value (crude protein, CP; neutral detergent fiber, NDF; acid detergent fiber, ADF; phosphorus, P) from an on-farm Tifton 85 defoliation management trial were incorporated into the model. Production costs and prices for readily available feedstuffs in the region were obtained from producer interviews and local distributors. On average, rations that incorporated Tifton 85 greenchop harvested at 35 d intervals cost \$4.3 cow⁻¹d⁻¹, resulting in an 18.1 and 28.7% reduction when compared to those formulated with purchased Tifton 85 or alfalfa hay, respectively. These results suggest that Tifton 85 greenchop can replace other high quality forage sources in dairy rations, benefiting producers by lowering production costs and nutrient imports. Least-cost ration models that incorporate on-farm forage cropping alternatives and that simulate Florida dairy farm conditions can serve as predictive tools that facilitate decision making in milk production.

Key Words: Tifton 85 bermudagrass, greenchop, least-cost ration

W111 Master goat producer's training certification program at Tuskegee University. O. U. Bolden-Tiller^{*}, S. Solaiman, and N. K. Gurung, Tuskegee University, Tuskegee, AL.

The Tuskegee University (TU) Master Goat Producer's Training Certification (MGPC) Program was held in August 2008 to provide new and established producers an opportunity to access up-to-date and accurate information on how to raise healthy, productive meat goats. Although much information such as that provided in the MGPC Program is available via the internet, to date more than 50% of Alabamians, particularly those in the more rural areas which boast most of Alabama's farms, do not have access to high speed internet. Program participants took part in a comprehensive three-day intensive course (lecture and hands-on) in meat goat production, covering topics such as marketing, enterprise budgets, record keeping, facilities, livestock evaluation, parasite management, pasture management, nutrition, reproduction, predator management and more. Three levels of certification were offered: One - completion of the three-day MGPC program; Two - completion of level one and a farm inspection; Three - completion of Levels One and Two, an exam evaluating the ability to apply the newly learned information, and a second farm inspection. Producers completed surveys to assess the likeability of the events and to ascertain demographic information. Twenty-four participants took part in the program, representing 20 farms and three states (AL-20; GA-1; FL-2). Based on survey results, participants found the presentations to be of quality and value and the presenters knowledgeable with adequate materials (3.6±4.0); and they would recommend the program to others. An increase in post-test scores compared to pre-test scores, indicated that producers acquired knowledge that could result in

improved herd management. To date, five of the 20 farms have received Level Two Certification. In conclusion, the TU MGPC program provided producers with valuable information necessary for meat goat producers to become competitive in this global economy.

Key Words: goats, extension, producer education

W112 Influence of citronella and geranium essence treatment on milk aroma. S. Carpino¹, G. Belvedere¹, T. Rapisarda*¹, G. Azzaro¹, and G. Licitra^{1,2}, ¹CoRFiLaC, Regione Siciliana, Ragusa, Italy, ²D.A.C.P.A. University of Catania, Italy.

A commercial mix containing geranium and citronella essence was used in a farm against flies. Several authors report volatile compounds can be transferred by breath and skin to blood and consequently to milk. This study was performed in a dairy cow farm located in the South of Sicily. The aim of this study was to detect the influence of geranium and citronella essence treatment on milk aroma profile at different times. Geranium and citronella mix was spread on lactating cows through the farm cooling system. Milk samples were collected at 0 (M0), 12 (M12), 24 (M24) and 36 (M36) hours from mix spreading and then analyzed.

SMart Nose system (LDZ, Switzerland) allowed the direct analysis by MS of volatile organic compounds (VOCs). Dynamic headspace extraction (Purge&Trap) (Tekmar 8900) in combination with a gas chromatograph olfactometry/mass selective detector (GC/MSD/O) were also used to analyze the odour active compounds of milk samples. Sensory analysis, using triangle test technique, was also performed on M0 and M12 milk samples, by CoRFiLaC staff in Ragusa, Italy. Principal Component Analysis (PCA) applied to SMart Nose results had a good separation (PC1 55.96%; PC2 12.04%) among the four groups of milk samples. This result clearly indicated that, at different times of treatment, samples showed different volatile compounds. Moreover, GCO results demonstrated that M0 milk samples had the richest profile among the M12, M24 and M36 respectively. Triangle test confirmed ($p < 0.001$) all the instrumental results and clearly indicated a difference between treated and no treated milk. The different aroma profiles in milk samples are strongly correlated to the volatile components of the mix treatment. Further, studies are needed to better understand if different concentrations of these mixes might be used without interfering with milk and eventually cheese flavour. This would be a good practical application for farmers in order to improve cow comfort, health and safety in their farm.

Key Words: milk, volatile compounds, geranium citronella essence

Forages and Pastures: Silages

W113 Relationship of corn silage dry matter content to density in bunker silos. K. E. Griswold*¹, P. H. Craig², and S. K. Dinh¹, ¹Penn State Cooperative Extension, Lancaster, ²Penn State Cooperative Extension, Dauphin.

Dry matter (DM) content and density of corn silage (CS) was investigated in 103 bunker silos and piles over a 5-year period. For each silo/pile, 12 samples were collected using a 5.08 cm diameter stainless-steel coring tube driven by a gas-powered drill. Core depth was recorded to the nearest 0.64 cm, and wet weight was determined on a digital scale. Sample DM was determined with a Koster Crop Tester. Density was calculated by dividing core dry weight by core volume. Cores were collected at three vertical levels, bottom \approx 1 m from silo floor, top \approx 1 m from top edge, and middle \approx equidistant between bottom and top. At each level, cores were collected horizontally at four locations, I and IV within 2.4 m of the outside edges, and II and III equidistant between I and IV. Data were analyzed using PROC REG and RSREG within SAS. When individual core density and DM content were regressed, there was a significant quadratic relationship ($P < 0.0001$, $R^2 = 0.13$). However, when level and location were included in the model as covariates, the strength of the relationship increased ($R^2 = 0.43$). Location was not significant in the model. These results suggest that DM content of corn silage is weakly related to density within bunker silos/piles and that level at which density is measured has a greater impact on density than DM content. Regression of the silo/pile average density and DM content showed a significant quadratic relationship ($P < 0.0001$, $R^2 = 0.28$), which suggested that DM content of corn silage may have greater impact on overall density of corn silage in silo/pile than density at specific positions within a silo/pile.

Key Words: corn silage, dry matter, density

W114 Biomass yield and nutritive value of three forages for silage. R. L. Holness*, N. C. Whitley, and K. Baldwin, North Carolina A&T State University, Greensboro.

A two yr study was conducted to measure the biomass yield and nutrient content of three forages for potential silage use. Forages used were conventional (Round-Up Ready®; CC) and organic (OC) corn (*Zea mays*) and pearl millet (*Pennisetum americanum*; PM). Plots measuring 18x18 m were used in a completely randomized design with four replications. Fertilization considered organic status as well as soil test recommendations. Forages were seeded at recommended rates and harvested at the same time both years. Four weeks after planting, CC was treated with glyphosate. Areas of 3.05 x 3.05 m were manually sampled to a 10-cm stubble height. Samples were weighed to determine fresh biomass accumulation, fed into a silage flail-type mower conditioner and sub-sampled for nutritional content analysis by near infrared reflectance spectroscopy (Dairy One, Ithaca, NY). Biomass yield was influenced by a forage x yr interaction ($P < 0.01$). Corn forages had greater ($P < 0.05$) yields than PM for both years, however, CC and OC yield were similar in yr 1 but CC was greater than OC for yr 2 (a year with less rainfall). Both forage type and year influenced CP, TDN and NSC ($P < 0.05$) with values higher for yr 1 than yr 2 and higher for CC and OC (which were similar) than for PM. Values for ADF, NDF and Ca were influenced by treatment ($P < 0.001$) with CC and OC values being similar but lower than that for PM. Variety and year both influenced levels of P, K, and Mg ($P < 0.05$). Corn forages had similar levels for both years but P was higher than PM in yr 1, lower in yr 2; K was lower in PM for yr 1 than yr 2 and PM Mg was similar to CC but lower than OC in yr 1 and lower than both CC and OC in yr 2. Overall, corn produced silage with greater biomass and better nutritional values than PM with organic and conventional corn silage forages having similar nutrient profiles.

Key Words: organic corn, pearl millet, silage