
0273 Modeling body condition score at calving by past body condition and forage allowance in grazing beef cow on rangelands. M. Claramunt*¹ and P. Soca², ¹*Centro Universitario de la Región Este, Universidad de la República, Treinta y Tres, Uruguay*, ²*Facultad de Agronomía, Universidad de la República, Paysandu, Uruguay*.

Body condition score at calving affects the length of postpartum anoestrus, probability of pregnancy and the response of temporary suckling restriction and flushing on reproductive performance. Body condition score could be manipulated by forage allowance (FA). Therefore, modeling the effect of FA on BCS could provide valuable information for beef cow managers. The objective was to study the relationships between FA and BCS at middle gestation (BCSm) and calving (BCSc) of primiparous beef cow grazing located in native pastures. We used data from an experiment that evaluated the effect of 2 levels of FA on productivity of primiparous beef cows grazing rangelands. The experiment took place in Facultad de Agronomía, Uruguay. Eighty cows were assigned to a completely randomized experiment of 2 FA in spatial replication on 2 blocks during 2 yr. The annual FA averaged 2.5 and 4 kg DM/kg BW for low (L) and high (H) FA, respectively. Cow BW and forage mass were measured monthly and used to adjust FA using the “put and take” method. The experiment started in autumn –150 d postpartum (dpp) and finished 190 dpp. The BCS at –150 dpp (early gestation [BCSe]) was recorded. The BCS was recorded by a visual scale (1–9 points). We used a seasonal value FA before BCS was recorded (FAM and FAc), calving date in Julian days (CD) and the previous BCS and FA to explain BCSm and BCSc. Models were obtained by multiple regressions and variables were selected by Stepwise. An increase in BCSe and FAM improved BCSm ($BCSm = 0.16 + (0.66*BCSe) + (0.43*FAM) + (-0.07*(FAM-2.89)^2$); $r^2 = 0.63$; $P < 0.01$; Mean = 5; RMSE = 0.43) and BCSc was increased as a result of the increase in BCSe and BCSm ($BCSc = 0.28 + (0.18*BCSe) + (0.62*BCSm) + (0.008*CD$; $r^2 = 0.57$; $P < 0.01$; Mean = 4.4; RMSE = 0.2). Models have a good explanation capacity and highlight the effect of prepartum BCS and FA on BCSc. Forage allowance indirectly affected BCSc by its positive effect on BCSm. These models could be employed by beef herd managers to control or predict the BCSc and reproductive performance.

Key Words: body condition score, forage allowance, modeling

0274 Growth Potential of Dhanni cattle under rain-fed conditions of Punjab, Pakistan. G. Bilal*¹, M. Moaen-ud-Din¹, and A. Zurwan², ¹*PMAS-Arid Agriculture University, Rawalpindi, Pakistan*, ²*PMAS-Arid Agriculture University, Rawalpindi, Pakistan*.

The objective of the present study was to investigate growth potential of Dhanni cattle (a local humped cattle used for light draft) for possible utilization as potential beef cattle in arid or rain fed region of Attock, Punjab, Pakistan. Data on live weight of cattle ($N = 185$: 105 male, 80 females; age ranged from 1 to 375 d) were recorded in the field from 30 registered farmers raising purebred Dhanni cattle. The overall production system consisting of grazing (from 0800 to 1700 daily) with little or no supplementation. Mostly farmers weaned the calves between 6 and 8 mo of lactation probably due to low milk yield of Dhanni cows. Age of cattle was divided into 11 monthly classes with the last class having d 301 to 375. Data were analyzed using PROC MIXED of SAS (University Edition). The model included fixed effects of age at of cattle on test-day and sex; random effects of herd and residual. Males had slight higher weights (73.94 ± 1.81) than females (71.77 ± 1.97), but overall effect of sex was statistically nonsignificant ($P = 0.33$). Estimates of herd and residual variances were 18.15 and 206.35, respectively. Live weight of cattle varied with age ($P < 0.0001$). The least squares estimates of means of live body weight (kg) for monthly age classes 1 (1–30 d), 2 (31 to 60 d) and so on to 11 (301–375 d) were 24.86 ± 2.60 , 39.31 ± 3.18 , 51.68 ± 4.62 , 61.86 ± 2.90 , 72.27 ± 3.67 , 75.49 ± 3.65 , 80.19 ± 3.93 , 81.97 ± 5.04 , 97.45 ± 4.25 , 98.80 ± 6.12 and 117.49 ± 5.41 , respectively. Overall, cattle showed a daily growth rate of 268.50g from 1 mo to approximately 12 mo of age. The data shows potential of Dhanni cattle for raising as a beef cattle using current genetic and genomic selection tools.

Key Words: Dhanni cattle, growth potential, field condition

BEEF SPECIES SYMPOSIUM: IMPROVING WELFARE OF BEEF CATTLE

0275 Assessing and improving welfare in cow calf systems. C. B. Tucker*, *University of California, Davis*.

To date, animal welfare assessment, particularly independent audits, have focused on intensive animal agriculture. As public and corporate interest in farm-to-plate animal welfare assurance grows, extensive animal agriculture, such as cow-calf operations, may begin to be audited as well. The extensive nature of cow-calf systems presents both opportunities and challenges from an auditing perspective. Cow-calf operations lend

themselves toward animal welfare auditing from two perspectives: direct inspection of animals (animal-based measures) and evaluation of practices or records (management-based measures). Looking at the animals directly during a ranch visit allows assessment of several key welfare concerns, namely stockmanship, animal behavior during handling, long-term effects of forage availability (e.g., body condition), and some health conditions like lameness, pinkeye and injury. An investigative approach to assessing management practices provides information about welfare concerns, including pain management during common procedures, weaning practices, and antibiotic use (a proxy for incidence of health problems such as bovine respiratory disease). When available, direct inspection of ranch records can also provide information about frequency and causes of mortality. The more challenging aspects of animal welfare assessment on cow-calf operations are related to how cattle are kept, or facility-based measures, including: water access and quality, access to dry, protected lying areas, shade and shelter. Assessing the animal welfare implications of transport are also a challenge. These environmental factors are known to be important, yet change on a regular basis, thus are difficult to audit. In addition, there are other logistical challenges including the size of the cow-calf sector (757,000 U.S. ranches) and, in some cases, limited availability of days/year and facilities to directly observe cattle. Despite these challenges, there is tremendous potential to provide valuable feedback to ranchers and their customers and ultimately improve animal welfare in the cow-calf sector.

Key Words: cow-calf, welfare, assessment

0276 Best management practices for weaned calves for improved health and well-being. C. R. Krehbiel*,

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Morbidity and mortality from Bovine Respiratory Disease (BRD) in newly weaned calves continues to be the most significant health problem facing the beef cattle industry. BRD accounts for over 50% of all cattle treated for sickness, and several studies have documented the economic impacts of BRD on profit outcomes of calves. Direct costs attributable to BRD include death loss, treatment and labor costs, and prevention costs. BRD has been shown to impact growth performance and feed efficiency, days on feed, carcass merit and market value, and can decrease the returns of individual cattle from \$50 to \$250. Best management practices for weaned calves vary depending on factors such as season of year calves are purchased, calf genetics, length of time in the marketing/transport process, previous management/vaccination, among other factors. Calves purchased directly from a ranch have fewer health problems. In general, the longer an animal is in the marketing chain, the more health problems will be encountered. Calves that have spent several days in the marketing channel may develop clinical BRD before or very soon after

arrival at the feedlot; whereas, cattle with less time in the marketing chain may get sick later (2 to 4 wk), due to the length of time it takes for BRD to develop. On or before arrival, calves should be given a risk score (High, Medium, Low) that relates to the quantity of stress they have encountered and the probability they will develop BRD. High-risk calves normally will have been recently weaned, have received no vaccinations, have not been castrated or dehorned, have been commingled and have moved through at least one auction market. Low-risk calves will come from a single source and will have gone through a value added/preconditioning program that includes vaccination, castration, dehorning, weaning, and adaptation to a feed bunk. Variation exists within risk category, and groups of calves from auction markets can have few health problems, while some groups of preconditioned calves have high incidence of BRD. Cattle managers must be willing and able to make changes in management to meet the needs of the individual loads of cattle. To improve health and well-being, the beef cattle industry should move toward lowering the risk of receiving calves. This presentation will review the best management practices for weaned calves based on risk category for improved health and well-being.

Key Words: bovine respiratory disease, health and well-being, weaned calves

277 Dairy cow culling: Best practices and industry trends. J. Walker*, *Dean Foods, Dallas, TX*

We all know that the best time to find a new career is while you still have your current one. And every dairy farmer should know that every dairy cow should have two careers, a MILK cow and a BEEF cow. While the proportion of animals sent to slaughter unfit for transport is extremely low, considering the number of cows slaughtered every year, the number of cows shipped that are unfit for transport becomes a significant welfare concern. There have been significant efforts on the part of the beef industry in the form of the Beef Quality Assurance programs to address the issue, yet there seems to remain a gap in performance in the dairy sector when it comes to dairy cattle condition at slaughter. The underlying cause of this gap is multifactorial, and the key to the solution is understanding the fundamental disconnect between dairy farmers and the beef supply chain. If progress is going to be made, we must first understand the drivers at the farm level. Milk price, milk production, feed cost and cull cow prices appear to be the primary drivers. Additional drivers include an apparent disconnect between the processor and the supplier and language barriers. Stakeholder engagement from farm to plant is essential to bridge the gap and improve the welfare of cattle sent to slaughter. Once the bridge is built, education, training and accountability will be the necessary drivers to secure change needed to demonstrate to consumers and customers alike that the welfare of cattle continues to be an industry priority.

Key Words: dairy, cull, welfare

0278 Welfare assessments of low stress handling in finishing feedlot cattle. K. S. Schwartzkopf-Genswein*, *Agriculture and Agri-Food Canada, Lethbridge, AB.*

Over the past 10–15 yr low stress handling for beef cattle and the techniques used to achieve it have gradually increased in use and understanding. The goal of low stress handling is to facilitate ease of animal movement as well as improve animal and handler safety. Its use is particularly important when handling finishing feedlot cattle that are heavy (> 300 kg) and more prone to injury, exhaustion, heat stress and lameness particularly at marketing when cattle are sorted, loaded/unloaded. Much excellent information is written and available on websites regarding specific techniques. The goal of this talk is to provide a brief overview of relevant low stress handling techniques for finishing cattle with a main focus on how and if these techniques reduce stress both physiologically and behaviorally. Studies assessing the effects of noise, light, visibility of the handler, facility design and prod use on indicators of cattle stress, as well as performance and meat quality have shown significant relationships between these variables. Overall, these studies help to validate the use of low stress techniques. Continued research is required to document the effects that low stress handling has on animal health, welfare and economics in the feedlot industry.

Key Words: low stress, handling, feedlot, finishing cattle

279 Evolution of animal welfare at packing plants.

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Animal welfare and humane handling have become integral components of slaughter plant operations over the past several decades. In the early nineties, Dr. Temple Grandin, a world-renowned animal scientist who revolutionized animal handling within the livestock industry, worked with the North American Meat Institute (NAMI) to publish the *Recommended Animal Handling Guidelines for the Meat Packing Industry*, which since its inception has served as the gold standard for animal handling at packing plants. Many commercial slaughter facilities address the proper treatment of animals through standard operating procedures, verification and monitoring programs, founded on the NAMI guidelines, in addition to applicable federal regulations. In the mid-1990s, Dr. Grandin was commissioned by the USDA to develop an objective system to evaluate the critical control points of animal handling at packing facilities. A HACCP-type (Hazard Analysis Critical Control Point) approach to evaluating animal handling was developed and adopted by NAMI and ultimately the meat industry as the voluntary standards for proper humane handling at slaughter facilities. By the end of the '90s, major corporations such as McDonald's began requiring animal handling audits at beef and pork supplier slaughter plants. With

their purchasing power, these major food companies were able to drive improvement in animal handling performance at the packing facilities that supplied them. Within the past several years, many federally inspected plants have implemented a "systematic approach" to humane handling, which is a voluntary HACCP-based program described by the USDA Food Safety Inspection Service (FSIS) as a program that assesses critical control points of animal handling, develops appropriate programs and facilities to minimize stress and discomfort to animals and monitors performance continually. The meat industry has professionalized animal handling by supporting additional training and certifications specific to working with and processing animals, building a strong culture of animal care with the animal handlers at their facilities. As the number of plants reaching "excellent" levels on animal handling audits have continued to increase, the meat industry looks for novel ways to continually make progress (e.g., implementing the use of remote video auditing to monitor and train employees). There has been more focus in recent years on the condition of animals arriving at facilities and the impacts that has on how they must subsequently be handled. Animal handling continues to be a priority for all segments of the value chain.

Key Words: animal handling, auditing, slaughter

BIOETHICS SYMPOSIUM

0280 How was that chicken raised? Ethics and deliberating conscientiously about animal welfare standards. R. X. Anthony*, *University of Alaska, Anchorage.*

How was that chicken raised? Ethics and deliberating conscientiously about animal welfare standards

Whose or which animal welfare standards should be framing and guiding deliberations and practices so that they actually contribute to higher level of animal welfare? Animal welfare standards should first and foremost produce positive outcomes for the health and welfare of farm animals. However, the development and implementation of these standards do not always meet this mark. Global trade and commercial factors and the lack of governance structures and local science can result in less than desirable outcomes for animals. Farmers must contend with governmental regulations that are legally binding and a variety of private standards ranging from assurance and certification schemes and programs, voluntary codes of practice and standards of excellence from advocacy organizations. The plethora of standards can lead to "psychic numbing" and the moral psychology of denial among both farmers and consumers and can impede the discharge of good animal husbandry practices. Here, I explore the promise and shortcomings of employing wide reflective equilibrium (WRE, Daniels, 1996) to address these conditions. WRE can