

Contemporary and Emerging Issues Symposium: Emerging Animal Welfare Issues

348 Does high production increase the occurrence of health problems in dairy cows? K. D. Vogel*, *Department of Food and Animal Science, University of Wisconsin-River Falls, River Falls.*

Over the past 30 years, individual dairy cow production has increased substantially. The production efficiencies gained through genetic selection, improved nutrition, and changes in management practices has come largely through advances in scientific knowledge of animal breeding, physiology, metabolism, and nutrition. Historically, the primary goal of this research was increased animal productivity through increased milk secretion. Although the goal of maximal production was never malicious, but actually quite the contrary, increasing societal concern has arisen regarding the health and welfare of modern high-producing dairy cows. Some have hypothesized that modern production levels may be taxing the metabolic and physiologic capacities of dairy cows, resulting in increased incidences of lameness, mastitis, infertility, and mortality. However, the underlying factors in cases of lameness, mastitis, infertility and mortality vary widely. Recent studies have consistently identified not one, but multiple, underlying factors that culminated in the one common health problem under investigation. Multiple studies have identified genetic selection, management, nutrition, and environment as influential factors in the incidence of health and welfare issues in modern, high-producing dairy cattle. It appears that an interaction of all of these factors dictates the health and welfare state of the dairy cow. The need exists to integrate the current body of knowledge related to dairy cattle health and welfare to identify common contributors to the incidence of the most prevalent production-related diseases. Data suggest that production diseases are not resultant of milk production level alone, but production level does appear to be a risk factor in the development of health problems in dairy cows. Ultimately, the interaction of genetic predisposition, management, and environment dictate the development of the majority of production related health disorders observed in the modern dairy cow. Remediation of production related health issues requires the consideration of all factors included in the interaction.

Key words: dairy, production, welfare

349 Potential solutions for reducing lameness in dairy cows. N. Cook*, *University of Wisconsin, Madison.*

Lameness control is fundamental to the management of the modern confinement housed dairy herd. It is the most important condition impacting a cow's well-being, and it affects everything she does in her day, from resting, to eating, socializing and milking. Foot lameness is dominated by infectious lesions such as digital dermatitis and foot rot (phlegmon), and by lesions of the claw horn, such as white line disease and ulceration of the sole. Infectious hoof disease can be effectively controlled through good nutrition, improved foot hygiene and by the effective use of hoofbaths to clean and disinfect the foot on a regular basis. Copper sulfate, formalin and zinc compounds are the most commonly used disinfectants and all appear efficacious. However, more attention needs to be paid to the design and location of the hoofbath, to optimize its use within individual farm circumstances. Claw horn lesions may be triggered through poor feeding and poor transitions at calving time. However, white line disease is exacerbated in facilities with poor flooring that creates risk for trauma, wear and concussion. Strategic use of rubberized surfaces and improved concrete finishing

greatly impacts the incidence of this disease. Increased standing time per day on hard surfaces appears to increase the risk for sole ulcer. Dairy facilities need to be designed so that both lame and non-lame cows can achieve at least 12 h of rest per day. This can be achieved with deep loose-bedded stalls with sand bedding, sized to accommodate the resting area of the cow, with freedom to front lunge in the stall without obstruction. Group sizes need to be matched to parlor size and throughput, to minimize time out of the pen to less than one hour per milking, and stocking rates need to be controlled to a maximum of 1.2 cows per stall. Strategic use of fans and soakers, or other cooling methods are essential components of lameness control in the summer. Finally, excellent hoof health requires a dedicated, well-trained hoof-trimmer rebalancing the claws of all the cows at least twice per year, and prompt effective treatment of the lame cow.

Key words: lameness, solutions

350 The national shortage of food animal veterinarians: What's being done to address the issue? D. G. Bristol*, *North Carolina State University, Raleigh.*

When the owner of a sick or injured animal cannot obtain access to prompt veterinary care for that animal, it creates a serious welfare issue. The cause of the shortages in food animal/production veterinarians is multifactorial, and while little can be done to change some of those causes, numerous actions have been taken to address the final result – the veterinary shortage. Survey data collected in 2006 and published by the AVMA indicated that only 10% of all veterinarians practice on food animals. This seminar will review both the causes and potential solutions to a shortage that impacts animal welfare and the safety of the US food supply. A survey by Lenarduzzi et al. (2009) showed that contact with food animal practitioners during vet school was a factor in motivating a career choice in large animal practice. Experience with agriculture may encourage students to consider large animal practice. Some veterinary colleges have 4 or 5 places each year that are reserved for students interested in food animal agriculture. Some of these programs also include financial incentives to practice in rural areas. Other alternatives are developing centers for food animal excellence in several veterinary colleges. There is also a need to expose undergraduate students to food animals so they will develop an interest in them.

Key words: veterinarian, food animal, careers

351 Animal welfare issues: Organic and conventional. W. K. Fulwider*, *Cropp Cooperative, LaFarge, WI.*

The objective of this paper is to acknowledge differences between organic and conventional management regarding animal welfare. Lameness is the most serious welfare issue in dairy herds and leads to milk loss, more days to conception, and increased cull rates. Growth hormone (rBST) may negatively affect body condition, mastitis, and lameness. Parasites are one of the biggest challenges facing the organic industry. Organic management emphasizes prevention of lameness, parasites, displaced abomasums, acidosis, and problems associated with boredom such as tail-biting in swine by providing environments that reduce stress by allowing natural behaviors. Studies show that cattle with access to pasture have reduced lameness. Parasites can be

controlled with rotational and multi-species grazing. Chickens break up manure pats, Muscovy ducks keep fly numbers low, and Runner ducks help eliminate liver fluke problems. When in transition, new challenges make communication with experienced producers and specialists a must. Organic producers often use different breeds or genetic lines to prevent health problems. Hair sheep are resistant to parasites. Dairy cattle with New Zealand genetics may be better suited to grazing. Older genetic lines of Berkshire, Chester White, and Duroc hogs may be less aggressive and better suited to group systems and foraging. The US organic industry is often criticized for not allowing antibiotics. The organic standard states that an organic producer may not withhold medical treatment to preserve an animal's certified organic status. The treated animal must be permanently removed from organic production. Organic animals are housed more extensively to reduce stress and aggression so that procedures such as tail-docking hogs are unnecessary. Use of β -agonists such as ractopamine in swine and zilpaterol in beef may result in lower quality meat and increased welfare problems such as hoof cracking and animals that are difficult to handle. Organic farmers produce food humanely and without chemicals, hormones, or antibiotics. Good management, attention to detail, and continuous improvement are important components of every farm whether organic or conventional.

Key words: welfare, organic, livestock

352 Consequence of changing standards for somatic cell count on US Dairy Herd Improvement herds. H. D. Norman*, J. R. Wright, and R. H. Miller, *Animal Improvement Programs Laboratory, USDA-ARS, Beltsville, MD.*

Consequence of noncompliance with European Union (EU) and current US standards for somatic cell count (SCC) as well as SCC standards proposed by the National Milk Producers Federation was examined for US herds. Somatic cell scores (SCS) from 14,854 Dairy Herd Improvement (DHI) herds were analyzed. Herds had between 15 and 26 DHI tests from Jan. 2009 to Oct. 2010 and ≥ 10 cows. The SCC for individual cows came from their SCS by $SCC = 2^{(SCS - 3)}(100,000)$. As a proxy for bulk tank SCC, herd test-day SCC were derived by weighting each cow's SCC by her test-day milk yield and were the basis for determining herds and milk that were SCC noncompliant. A herd was noncompliant for the EU SCC standard after 4 consecutive rolling 3-test geometric means were $> 400,000$ cells/mL. A herd was noncompliant for US SCC standards after 3 of 5 consecutive SCC tests were $> 750,000$ (current), $> 600,000$ (proposed), $> 500,000$ (proposed), or $> 400,000$ (proposed) cells/mL. Results were examined by month, herd size, and state. For current SCC standards, weighted means for US herd noncompliance from Nov. 2009 through Oct. 2010 was 0.9% for US and 7.8% for EU standards; noncompliance for proposed US SCC standards of 600,000, 500,000, and 400,000 cells/mL were 2.7, 6.2, and 14.1%, respectively. Only a US standard of 400,000 cells/mL was more restrictive than the EU standard. Only 0.2% and 3.1% of US milk failed current US and EU SCC standards, respectively. Compliance for US herds generally increased with herd size. For the current US SCC standard, 1.7% of herds were noncompliant when herd size was < 50 cows, but $\leq 0.1\%$ of each of 4 herd groups with ≥ 200 cows were noncompliant. For the EU standard, noncompliance declined from 10.6% for herds with < 50 cows to 0.5% for herds with $\geq 1,000$ cows. Herd noncompliance ranged from 2 to 15% for 6 states and Puerto Rico for the current US standard and from 20 to 35% for 9 states for the EU standard. If US producers must meet more stringent EU or proposed US standards for SCC, they will need to place more

emphasis on sound milking management practices and do more culling to improve milk quality.

Key words: somatic cell, standards, milk quality

353 Current level of compliance with EU bulk tank SCC standards and proposed US standards based on data from four Federal Milk Marketing Orders. J. E. Lombard¹, H. D. Norman^{*2}, C. A. Kopral¹, J. M. Rodriguez¹, and J. R. Wright², ¹USDA-APHIS-VS, Centers for Epidemiology and Animal Health, Fort Collins, CO, ²USDA-ARS, Animal Improvement Programs Laboratory, Beltsville, MD.

Milk quality in the United States is evaluated annually using bulk-tank somatic cell count (BTSCC) data provided by 4 of the nation's 10 Federal Milk Marketing Orders. The data represents more than 30,000 producers and 50% of milk produced in the US. The reported BTSCC is used for regulatory purposes to determine compliance with the current US limit of 750,000 cells/mL. If 3 of 5 consecutive monthly shipments exceed 750K then regulatory action is taken. The objective of this study was to evaluate compliance of producers with the newly proposed US BTSCC limits. BTSCC data from producers that shipped between 15 and 22 shipments between Jan. 2009 to Oct 2010 were included in the analysis. Four different SCC levels of compliance based on US standards were evaluated: 750K; 600K; 500K; 400K. In addition, the EU standard of 400K based on a 3 mo geometric mean was evaluated. For the 12 mo period ending Oct 2010, 1.0% of producers and 0.2% of milk exceeded the current US limit of 750K; 4.7% of producers and 1.4% of milk exceeded the proposed 600K limit. Although the proposed 400K limit would be the same in the US and the EU, differences in how the limits are calculated and used for regulatory purposes change the percent of producers in compliance in the 2 countries. Although 23.3% of producers exceeded the proposed US 400K limit, only 16.1% of producers would have exceeded the current EU standard. For herds shipping < 907 t of milk in the 12 mo period, 28.0% would have exceeded the proposed 400K US limit and 19.5% would have exceeded the current EU standard. Only 4.1% and 2.2% of herds shipping more than 9,072 t would have exceeded the proposed 400K US limit and current EU limit, respectively. If implemented, the proposed phased in reduction to a 400K BTSCC limit would result in a substantial increase in producers and milk, primarily those with < 100 cows, which would exceed the regulatory limit. Producer education and implementation of programs to lower BTSCC will be critical in minimizing the impact of the proposed reduction in BTSCC.

Key words: somatic cell, standards, milk quality

354 Latinos and animal agriculture. S. Archibeque-Engle* and I. N. Roman-Muniz, *Colorado State University, Fort Collins.*

The hypothesis of this project is that Latinos are critical to the sustainability of animal agriculture in the United States. The intellectual merit of this project is that it quantifies the need for educated animal scientists and identifies potential areas for growth. Since 1903, Colorado State University (CSU) has served as a leader in the Animal Sciences industry. In the early days of the department, undergraduate students had a significant tie to production agriculture, many of those students left family farms to obtain an education and they returned to family farms to put their educations to work once they finished college. Those who did not return to family farms went to work in production agriculture and served as the leaders who shaped the food supply that our country now enjoys. Most undergraduate students who come to CSU to study Animal Sciences in the 21st century no longer have a

tie to production agriculture or agriculture at all. In fact, over 80% of our undergraduates report that they have no agricultural experience (unpublished departmental data). In 2009 the state of Colorado was 20.3% Hispanic (Latino) (www.quickfacts.census.gov) and 90% of farm workers in the west and midwest are Hispanic (Von Essen et al., 1998; Kirkhorn et al., 2002; Mines et al., 1997). In Colorado counties where there is a large livestock industry like Weld and Prowers there is an even larger Hispanic population (27.0% and 32.9% Hispanic, respectively; www.quickfacts.census.gov) However, the Department of Animal Sciences undergraduate population is 5.5% Hispanic (Colorado State University Census Data, Fall 2010). The luxury of excluding any population from an agricultural education, especially given the importance of agriculture to the success of our country, does not exist. We need to educate those who have traditionally come to us (students from family operations), those who are currently coming to us (students from urban and suburban backgrounds), and those who have worked in agriculture in the US for a long time but have been absent from higher education classrooms: Latinos.

Key words: agricultural workers, higher education, animal sciences

355 Effect of live yeast supplementation on milk production and health status of lactating camels (*Camelus dromedarius*). P. Nagy^{*1}, E. Chevaux³, M. Khetrou³, O. Marko², S. Thomas², U. Wernery², and J. Juhasz², ¹*Industries for Camel Milk and Products, Dubai, United Arab Emirates*, ²*Central Veterinary Research Institute, Dubai, United Arab Emirates*, ³*Lallemand SAS, Toulouse, France*.

Dromedaries have not been considered as valuable milk producing animals in the past and limited data are available on their dairy potential and possibilities for improvement. The use of live yeast as a nutritional tool to optimize digestibility of the diet has been extensively documented on ruminants. Though, camels are not true ruminants, their foregut is similar to the rumen, so dairy camels could also benefit from the supplementation of live yeast. The present study aimed at comparing 90 dairy camels (165 d in milk) evenly randomized into 2 dietary treatments (Control (C) vs. Levucell SC (LSC)) during 5 mo. Animals were milked twice daily, sampled for milk composition once a month and for blood parameters every 2 mo. Feed intake was monitored on a daily basis. Data were processed with the mixed model of SPSS 17.0. The average milk production of the camels fed the live yeast (*S. cerevisiae* I-1077) increased ($P < 0.01$) by 10% (7.26 ± 0.14 vs 7.99 ± 0.17 kg/d), without affecting milk fat % (2.46 ± 0.04 vs 2.49 ± 0.04), protein % (2.81 ± 0.02 vs 2.80 ± 0.02), total solids % (10.46 ± 0.06 vs 10.41 ± 0.06) and solids non fat % (8.10 ± 0.04 vs 8.02 ± 0.04) content for C vs LSC, respectively. However, lactose content was higher ($P < 0.01$) for C (4.33 ± 0.02 vs $4.25 \pm 0.02\%$). Protein yield was increased ($P < 0.05$) for LSC over C (213.6 ± 4.7 vs 199.3 ± 4.7 g/day) whereas fat yield was numerically higher for LSC (187.6 ± 4.9 vs 176.8 ± 4.9 g/day). No difference was found on SCC or TVC. Hematology values remained within the normal range. However, some of the

blood nutritional markers indicated some difference in metabolism of C animals as illustrated by higher ($P < 0.01$) levels of creatine kinase (162.7 ± 5.8 vs. 124.3 ± 5.6 U/L) and lactate dehydrogenase (333.7 ± 5.3 vs. 311.9 ± 5.2 U/L). The liver activity was also stimulated for C (79.9 ± 1.3 vs. 71.7 ± 1.3 U/L AST), so did the kidney metabolism ($P < 0.05$) as shown by creatinine (193.9 ± 2.7 vs. 186.3 ± 2.6 μ mol/L) and BUN (11.1 ± 0.2 vs. 10.5 ± 0.2 mmol/L) when compared with LSC. The supply of Levucell SC to lactating dromedary camels supported higher milk production and seemed to have played a role in optimizing protein metabolism.

Key words: dairy camel, live yeast

356 Why people become vegetarian and/or vegan: Results of a survey of US self-identified vegans. S. D. Lukefahr^{*1}, R. A. Cheeke², and P. R. Cheeke³, ¹*Texas A&M University-Kingsville*, ²⁷⁵¹⁰ *NE Todd Dr., Corvallis, OR*, ³*Oregon State University, Corvallis*.

A survey to identify why people choose to become vegan/vegetarian (V/V) was given to people from 14 US states attending V/V trade shows and festivals (e.g., VegFest). Background data included gender, age, education, farm background, animal experience, and dietary habits. Participants were asked the importance of factors in their decision to not consume animal-derived products. The factors were: 1. I am opposed to killing animals; 2. I am concerned with health issues; 3. I am concerned about residues of chemical feed additives and hormones; 4. I am opposed to intensive, confinement systems; 5. I am concerned with food safety issues; 6. I believe that animal production competes with humans for grains; 7. I am concerned about environmental issues; 8. It is "cool" and trendy to be a vegetarian; and 9. I became vegetarian because of peer pressure. The initial scale used in the 2009 survey ranged from extremely important, important, and not important, which was modified in 2010 to a more quantitative scale with 7 classes, ranging from extremely not important to extremely important. Data from 2009 surveys ($n = 121$) were analyzed by Chi-Square to test for relationships between survey scores for each question (Q) and background of the individual. Data from 2010 surveys ($n = 37$) were analyzed by ANOVA involving background factors as sources of variation. Results for 2009 and 2010 showed that most participants surveyed were females over 20 years of age with a college or university education, but had animal experience with only pets and no farm background. For 2009, an association was found ($P < 0.05$) between education level and Q5 that dealt with food safety issues. For 2010, dietary habit influenced ($P < 0.01$ to 0.10) responses to Q1, Q7, Q8, and Q9, whereas education and farm background influenced ($P < 0.05$) responses to Q4 and Q6, respectively. In conclusion, no single issue seems to be the dominant explanation for the selection of a non-animal product lifestyle.

Key words: vegetarianism, dietary choices, contemporary issues