Extension Education

M55 WWW.Foragebeef.ca A new way to promote research. D. McCartney*, *Agriculture and Agri Food Canada*, *Alberta, Canada*.

Forage and cow calf producers in Canada and the Northern United States have a new source for the latest research information covering a wide variety of topics. The web site provides three levels of information. The top level is the most important points or "Knowledge Nuggets" for the respective topic. The next level is for the reader who wants more information about the topic. These are the "Fact sheets" and direct links are provided to the best information available in North America. The objective is to select the most comprehensive and applicable fact sheets in North America. From thousands of fact sheets the best 5 to 10 have been selected by extension agrologists for each specific topic. The third level focuses on relevant scientific review papers that summarize the science behind the fact sheets for the various topics. These review papers originated via the scientific journals. The site features in depth information on forage production, silage management, forage and seed production, beef cow calf management, nutrition, animal health issues, grazing management and range management topics. This is a living web site. Current agricultural news stories from various provincial Departments of Agriculture in Canada are presented along with weather and market reports. In the future, research results and summaries will continually be added to the site. WWW.Foragebeef.ca has attracted over 3000 visitors per month during the first year in operation.

Key Words: Information, Transfer, Web sites

M56 Factors influencing beef producers participation in preconditioned certified calf sales. M. D. Corro*, D. Lalman, R. P. Wettemann, and J. Evans, *Oklahoma State University*, *Stillwater*.

The Oklahoma Quality Beef Network (OQBN) was organized in 2001 with the primary objective of adding value to weaned calves and capturing a portion of this value for both the cattle producer and the cattle buyer. The OQBN provides a process verification system relative to management practices applied to beef calves around the time of weaning. Furthermore, livestock market owners cooperate with producers by assembling OQBN process verified calves and marketing them in certified calf sales. Survey data were collected from OQBN participants on three consecutive years (2001, 2002 and 2003) to determine factors which influencing beef industry stakeholders to participate in certified preconditioned calf sales. The chi-square test was used to evaluate differences between groups of stakeholders and sales. A majority, 66.4% of the Beef industry Stakeholders became aware about preconditioned certified sales through Extension offices, Auction Barn Operators and Cattlemen's Association meetings. Eighty six percent of the producers participating in the program operated a commercial cow/calf enterprise with several producers involved in a combination of commercial cow/calf and purebred cattle or stocker enterprises. A total of 71% of the producers sold less than 50 head of cattle in anyone OQBN auctions. Since 75% of respondents indicated they normally marketed more than 50 calves, this suggests that many participants marketed only a portion of their calf crop through this system. The percentage of producers receiving a premium price of $4 cwt. or more above the regular market, was greater ($p<0.05$) in 2002 than in 2001 and 2003. OQBN Buyers perceived they paid a premium price above the regular market price for preconditioned cattle. No statistical difference ($P>0.05$) was found among the perceived premium price received by producers and the perceived premium price paid by buyers. The premium price, convenience, and other benefits were the main reasons for beef industry stakeholders for participating in certified calf sales.

Key Words: Preconditioning, Calves, Certified sales

M57 Producer experiences in whole farm planning for the production of grass-finished beef. T. M. Johnson*[1], R. E. Morrow[2], C. A. Wells[3], and J. K. Apple[4], [1]*National Center for Appropriate Technology*, *Fayetteville, AR*, [2]*USDA-NRCS*, *Little Rock, AR*, [3]*Springpond Holistic Animal Health*, *Prairie Grove, AR*, [4]*University of Arkansas*, *Fayetteville*.

In Northwest Arkansas, 11 farms participated in a SARE project to evaluate the potential of producing and direct marketing, grass-finished beef. Several key components to success were identified through producer discussion. Producers must strive to put together a program that contains the proper genetics, produces excellent forage availability and quality, and improves soil characteristics. Producers reported the program required more management, time, and attention to detail than their previous program. Some producers were more successful than others at making strides toward this goal depending on individual priorities. The majority found that involvement in the project resulted in improved pasture and forage management, and animal performance. Producers also found that calves with intermediate frame and intermediate maturity were important to produce beef at acceptable rates of economic return on grass. Both forage quantity and quality were important to achieve gains of greater than 0.9kg/d, and daily paddock rotations may be required as animals approach harvest weights. Live weight gains between 453 and 544 kg live weight were worth $1.35/0.45 kg. Total value also increased $1.19 for each day of age. Shear force values declined as ADG increased. The project also developed an economic model to assist producers in making financial decisions for cattle on grass. Other findings included color scores for both lean and fat. Lean L*, a*, and b* were 34.01 ± 0.47, 25.15 ± 0.39, 21.81 ± 0.23 respectively. Fat L*, a*, and b* were 76.35 ± 0.61, 6.00 ± 0.43, 23.71 ± 0.41 respectively. Average Warner Bratzler shear force values were 3.47 ± 0.19 kg. Knowledge of the relationship of primal values to overall values can provide insight into enhancing profitability.

Key Words: Grass-finished Beef, Marketing, Sustainability

M58 Demonstration of organic burial composting of dead cattle. K. W. VanDevender[1], J. A. Pennington*[1], J. L. Gunsaulis[2], and M. R. Gross[2], [1]*University of Arkansas Cooperative Extension Service*, *Little Rock*, [2]*University of Arkansas Cooperative Extension Service*, *Fayetteville*.

A demonstration of organic burial composting (OBC) was conducted to illustrate that OBC could become a legal and effective option for disposal of dead cattle. On 9/23/2002, the carcass of a mature dairy cow was placed on an 45-cm pad of green sawdust and covered with 45 cm of sawdust, exceeding the requirements suggested by the On-Farm Composting Handbook NRAES-54. Then, an existing fence and cattle panels were used to build a fence around the pile. This pile was located outside and exposed to the weather. From 10/24/02 to 12/03, an additional 14 animals were added to the pile as it increased in size from 5 m x 5 m to 5 m x 15 m. Initially, more sawdust was added with each additional mortality. After all available sawdust was used, other on-farm carbon sources such as waste silage and waste hay were used. On 10/02/02, nine days after the first carcass was placed, the pile temperature was 38°C. The temperature climbed to a recorded peak of 40°C on 10/7/02. By 10/24/02, the temperature had dropped to 34°C. On this date the pile was excavated in four separate locations that included the front leg area, the body cavity area, the tail/hip area, and the head area. In the front leg area, only one large leg and hoof bone with some connective tissue was found. In the body cavity area, the only identifiable pieces were a few hairs. In the tail/hip area, only a few large bones were located. In the head area, the skull and some soft tissue were found. While excavating the pile, no excessive odors or flies were observed. In the 31 days since placement of the carcass, the decomposition process had almost completely processed the mortality. Generally, the compost pile temperature increased to about 40 to 47°C after burial. Once this peak temperature was reached, the temperature decreased over a period of several weeks to about 29°C. The most rapid decomposition took place with the first animal being placed in green sawdust. As more mortality was added to the pile and other carbon sources were used, the rate of decomposition decreased. Effective 5/01/04, composting was approved as an option for disposal of dead cattle in Arkansas.

Key Words: Composting, Dairy cattle, Organic burial

M59 Use of coal combustion products (fly ash) for reducing mud problems in heavy use areas for dairy cattle. J. A. Pennington*[1], K. W. VanDevender[1], M. C. Andrews[2], and D. J. Griffin[3], [1]*University of Arkansas Cooperative Extension Service*, *Little Rock*, [2]*University of Arkansas Cooperative Extension Service*, *Clinton*, [3]*University of Arkansas Cooperative Extension Service*, *Marshall*.

Coal ash was applied to heavy use areas of four dairy farms to reduce problems associated with mud. On sites 1 and 2, fly ash was mixed into an equal volume of soil. At site 1, the soil ash mixture was 45 cm deep on an equipment road and was 10 to 15 cm deep on a travel lane and an area in front of a commodity barn. At site 1, fly ash also was pneumatically applied to the muddy area around a waterer to a depth of 45 cm. At site 2, a cattle travel lane was mixed with fly ash to a depth of about 20 cm. At both sites, soil was mixed with a bulldozer, watered, and compacted. On site 3, a lane to the milking parlor was refurbished with 30 cm of a 70:30 volumetric blend of bottom ash and fly ash (BAB). Also at site 3, pads were built with extra BAB at a feeding area for hay and a storage site for hay, but were 15 cm thick. At site 4, BAB was used to build a 25 cm pad for a feeding area and an existing travel lane. Dump trucks and a bulldozer were used to deliver, spread, and partially pack the BAB. Cattle were able to walk on the packed BAB surfaces immediately. After the pads absorbed water from the soil and rainfall, they reacted chemically and became a hard surface. It was best to add moisture and compaction as the pad was built. The soil ash mixtures with at least 20 cm of pad at sites 1 and 2 have supported vehicle and cattle traffic, even under moist conditions. At site 1, the 10 cm pad placed at the entrance to a commodity barn failed when a tractor broke through. This failure occurred when the soil under the 10 cm pad became saturated after heavy rain. Pure fly ash had the consistency of talcum powder, required special pneumatic trailers to haul, and was extremely dusty to handle. In these demonstrations, BAB was preferred to soil mixing with fly ash because it had a soil-like consistency and was easy to transport and handle at the application site. If a premixed material is not available, fly ash and soil can be mixed 50:50 (volumetric basis) to form a supporting pad to reduce mud problems of heavy use areas.

Key Words: Fly ash, Coal combustion products, Heavy use area

M60 HOTCOW - An internet website for heat stress information from the International Dairy Heat Stress Consortium. W. Graves*[1], N. Graves[1], P. Hansen[2], J. Fain[1], and A. DeVries[2], [1]*University of Georgia*, *Athens*, [2]*Univerisity of Florida*, *Gainesville*.

Heat stress is responsible for large declines in pregnancy rates of dairy cattle during hot months throughout much of the United States. Since the summer depression in fertility is greater for high-producing cows than for low-producing cows, the continual improvement in milk yield per cow means that problems of heat stress will be exacerbated in the future. Despite its importance, there are few effective strategies for reducing the effects of heat stress on reproduction. The International Dairy Heat Stress Consortium was formed to bring together the resources of multiple institutions and scientists to address these challenges. One of the objectives of the Consortium is to develop industry-wide and farm-specific recommendations for implementation of strategies for improving fertility on commercial dairies and provide this information to dairy producers through web-based technologies. A website was developed at the link http://hotcow.ads.uga.edu using Microsoft FrontPage software. A Flash introduction was also developed using CoffeeCup Firestarter Shareware. Information on the IFAS grant objectives, consortium directory, publications and resources, meetings and conferences, heat stress links and contact information are provided. Also, easy access to the DairyMAP herd analysis program is available. Hundreds of pages of reference materials and other links dealing with dairy heat stress information are readily accessible. Members of the Consortium can easily be contacted through Microsoft Outlook. Information on various educational opportunities is also included. Over 800 people have visited the web site thus far.

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Key Words: Heat stress, Dairy cattle, Internet

M61 Financial performance of dairies in Florida and Georgia in 2003. A. de Vries[1], R. Giesy[1], L. Ely*[2], B. Broaddus[1], C. Vann[1], and B. Butler[1], [1]*University of Florida*, *Gainesville*, [2]*University of Georgia*, *Athens*.

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-seven dairies submitted financial data in 2003. Twenty-six dairies were included in the summary results. Of these, 17 were located in Florida, and 9 in Georgia. The average herd size was 1,316 cows and 619 heifers with 17971 lbs. milk sold per cow. The average culling rate was 40%. There was an average of 24 FTE workers per farm and 0.96 million lbs milk sold per FTE worker. Total revenue per cwt. was $17.66 / cwt with $15.89 / cwt milk income. The average total expense was $18.27 / cwt. The largest expense items were purchased feed ($7.16 / cwt), labor ($3.22 / cwt), and livestock ($1.95 / cwt). Net farm income from operations was on average $-.61 / cwt and net farm income was $-.51 / cwt. The debt to equity ratio was .62, the rate of return on assets was -0.01, the rate of return on equity was -0.18, the operating profit margin ratio was -0.06. There is no clear association between income, expenses or returns with herd size in 2003. Milk price / cwt was lowest for <500 cows ($15.45) but other income was highest ($1.94 / cwt). Total expenses were highest for the smallest herds ($19.26 / cwt) resulting in the lowest net farm income from operations ($-1.66 / cwt). Milk price and total income decreased with production level. Net farm income was highest for lowest production level.

Key Words: Dairy, Financial, Management

M62 Association between bulk tank milk urea nitrogen and DHI production variables in southern California dairy herds. G. Higginbotham[1], W. VerBoort[2], N. Peterson*[3], and J. Santos[4], [1]*University of California Cooperative Extension*, *Fresno*, [2]*California DHIA*, *Fresno*, [3]*University of California Cooperative Extension*, *San Bernardino*, [4]*University of California, Davis*, *Tulare*.

A retrospective study from January, 2001 to December, 2003 was conducted using data from DHI monthly tests to investigate the relationship between daily bulk tank milk urea nitrogen (MUN) concentration and selected DHI production and reproduction variables. DHI records from selected Holstein herds (N=16) located in San Bernardino and Riverside counties of southern California were analyzed along with their daily bulk tank component information which included MUN. Average herd size and rolling herd average for milk was 1,061 cows with a range of 231 to 1720 cows/herd and 9,771 kg, respectively. Monthly mean MUN was 11.3 mg/dl ranging from 5.5 to 16.8. Season affected concentrations of MUN being significantly ($P < 0.001$) lower (10.3 mg/dl) during the winter and significantly ($P<0.001$) higher (12.1 mg/dl) during months of heat stress. MUN was negatively correlated with true protein ($r^2=0.0182$; $P < 0.002$) and casein ($r^2=0.0249$; $P<0.002$). Test day somatic cell count (TDSCC) as mean SCC and as linear score (L2) showed a negative linear relationship (TDSCC, $P<0.001$; L2, $P<0.001$ with MUN but relationships were weak (TDSCC, $r^2=0.14$; L2, $r^2=0.07$). Services per conception showed a negative linear relationship with MUN ($P<0.001$) but the relationship was not strong ($r^2=0.10$). Test day milk was significantly lower during the fall ($P<0.001$), with test day milk fat and protein percent significantly lower in the summer ($P<0.001$). MUN data from herds studied were not at levels thought to hinder reproductive performance.

Key Words: MUN, DHI, Lactating cows

M63 Survey of drinking water flow rates in tie-stall and stanchion dairy barns. I. Possin*[1], R. Shaver[2], and B. Holmes[3], [1]*University of Wisconsin-Extension*, *Fond du Lac*, [2]*University of Wisconsin*, *Madison*, [3]*University of Wisconsin*, *Madison*.

Water intake influences dry matter intake and milk production in dairy cattle. Lactating dairy cows drink 75 to 150 liters per day depending primarily on

level of milk production, ration moisture content, environmental temperature, and salt intake. Cows typically spend only 5 to 10 minutes per day drinking water at a rate of 10 to 20 liters per minute (lpm), and inadequate water bowl flow rates could limit water consumption. The objective of our study was to survey water bowl flow rates in tie-stall and stanchion barns, and to investigate whether or not water flow rates may be limiting milk production. Fifty-three dairy farms with tie-stall or stanchion barn housing systems were selected for the study. Herd size average and range were 69 and 32 to 96 milking cows, respectively. Bulk tank milk production per cow per day averaged 30.8 kg with a range of 11.2 to 45.3 kg across the herds. Water flow rates were measured 3x at the water entrance to the barn and at three water bowls located the nearest, middle, and farthest from the entrance on each side of the two-row barns. Bulk tank milk weights, dumped milk weights, and number of cows milked were recorded. Only 46% of the 318 water bowls measured delivered 11 or greater lpm. Water entrance flow rates averaged 2.24 times greater at 26.9 lpm than water bowl flow rates at 12.1 lpm. As herd size and distance from water entrance increased, water flow rates declined from 12.6 to 11.0 lpm. No difference ($P > 0.10$) in milk production between high and low water flow rate herds was observed. Most herds had supplemental water available during daily release for cow exercise and barn cleaning which seemed to negate any adverse effects of insufficient water intake on milk production. Thirteen of the 53 dairy farms had variable water bowl flow rates both below 3.8 and higher than 11.3 lpm, suggesting that water bowl maintenance was an issue on about a quarter of the dairy farms surveyed.

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Key Words: Water, Flow rate, Dairy cows

Growth and Development: Growth, Diet and Performance

M64 Performance of Holstein and Jersey calves compared with performance of Jersey × Holstein and Holstein × Jersey crossbred calves. J. V. Ware*[1], S. T. Franklin[1], A. J. McAllister[1], J. A. Jackson[1], and B. G. Cassell[2], [1]*University of Kentucky*, *Lexington*, [2]*Virginia Polytechnic Institute and State University*, *Blacksburg*.

The objective of this study was to compare differences in performance among purebred and crossbred calves. Holstein and Jersey cows were bred using mixed semen, resulting in treatment groups of Holstein × Holstein (HH), Jersey × Jersey (JJ), Holstein × Jersey (HJ), and Jersey × Holstein (JH) calves. Calves (n = 68) were removed from their dams prior to nursing, weighed, and fed pooled colostrum, at approximately 5% of birth weight, within 3 h of birth. Calves received pooled colostrum again 12 h later. Calves were moved to individual hutches and fed milk at approximately 5% of body weight twice daily. Water and a starter ration were provided beginning on d 3. Milk and starter intakes were recorded daily. Body weights were obtained weekly through 8 wk. Hip heights were obtained within 48 h after birth and at 6 wk of age. Calves were weaned after consuming starter at greater than or equal to 1% of their body weight for three consecutive days. Mean weekly dry matter intakes (total of milk and starter) were lowest ($P < 0.05$) for JJ (4.9 ± 0.5 kg) but not differ among HH, HJ, and JH (7.0 ± 0.3, 6.8 ± 0.3, and 6.1 ± 0.3 kg, respectively). Mean weekly body weights were greatest ($P < 0.05$) for HH (57.5 ± 0.9 kg) and lowest for JJ (37.5 ± 1.6 kg) with HJ and JH intermediate (49.3 ± 1.1 and 47.0 ± 1.2 kg, respectively). Gain through 56 d was greater ($P < 0.05$) for HH (35.7 ± 0.8 kg) and HJ (34.5 ± 0.8 kg) compared to JJ (24.9 ± 0.8 kg). Gain for JH (29.8 ± 0.8 kg) was intermediate and did not differ ($P > 0.05$) from HJ or JJ. As a percent of birth weight, gains for HH (96.5 ± 2.2 %) and HJ (95.4 ± 2.2 %) were greater ($P < 0.05$) than for JJ (68.6 ± 2.2 %). Percent gains for JH did not differ ($P > 0.05$) from the other treatments. Hip heights did not differ ($P > 0.05$) among HH, HJ, and JH (mean = 0.82 ± 0.01 m) but were lower ($P < 0.05$) for JJ (0.78 ± 0.01 m). In conclusion, HJ calves had the ability to perform in a comparable manner to HH calves.

Key Words: Calves, Crossbred, Dairy

M65 The effect of feeding three milk replacer regimens preweaning on first lactation performance of Holstein dairy cattle. C. Ballard*[1], H. Wolford[1], T. Sato[2], K. Uchida[2], M. Suekawa[2], Y. Yabuuchi[2], and K. Kobayashi[2], [1]*W.H. Miner Agricultural Research Institute*, *Chazy, NY*, [2]*Zen-Noh National Federation of Agricultural Co-operative Associations*, *Tokyo, Japan*.

As previously reported, sixty Holstein heifer calves at two farms were blocked at birth and randomly assigned to one of three milk replacer (MR) treatments formulated on DM basis: 1) 27% CP/20% Fat fed at 1.5% BW for first week, 2.25% BW from 8 days through 5 weeks, and 1.25% BW from 6 weeks to weaning; 2) 27% CP/20% Fat fed at 200g 2x/day for 2 weeks, 250g 2x/day through weaning; or 3) 27% CP/15% Fat fed at 1.5% BW for first week, 2.25% BW from 8 days through 5 weeks, and 1.25% BW from 6 weeks to weaning. The objective of this study was to measure growth and performance of heifers from 18 months of age through their first lactation. Data was analyzed using Proc GLM with farm and block(farm) in the model. No treatment differences were found for weight and stature of animals at 30 mos of age (n=14, 18, 19). No significant difference in age or weight at calving was realized, although heifers fed milk replacer at a fixed rate tended to be younger and weigh less. Incidence of retained placenta and postpartum metabolic disorders were similar for all treatments. Heifers also had similar calving ease scores with 79, 78 and 68%, respectively having easy calving scores of 1 and 2. No difference in milk yield was realized at 100 dim. Heifers fed the 27/20 MR as a % of body weight yielded nearly 700 kg more milk than treatments 2 or 3 at 200 dim (n=14,18,19). Milkfat and protein yield was similar for all treatments. Although not significant, 3.5%FCM yield at 200 dim tended to be higher for 27/20 MR heifers fed as a % of BW. Implementation of enhanced early nutrition programs may positively impact first lactation milk yield.

	Treatment				
Item	1	2	3	SEM	*P*
Wt, kg Mo 30	653.96	648.68	672.05	18.96	0.511
WH[1], Mo 30	143.10	142.17	142.63	0.75	0.694
S-P[2], Mo 30	176.86	175.25	177.49	1.46	0.494
Age at Calving, d	796	753	783	16	0.264
Wt at Calving, kg	670.60	630.02	666.01	15.52	0.118
Milk-200d					
Yield, kg	6803[a]	6014[b]	6154[b]	206	0.036
Fat, kg	254	229	231	10	0.757
Protein, kg	200	175	184	7	0.530
3.5FCM, kg	7066	6316	6400	249	0.104

[1]Wither height, cm, [2]Shoulder to pin, cm, [a,b]Means within a row differ ($P < 0.05$).

Key Words: Milk Replacer, Heifer Growth, Lactation

M66 Improved prediction of retained energy in a dynamic beef cattle growth and composition model accounting for variable maintenance. L. G. Barioni*[2], J. W. Oltjen[1], and R. D. Sainz[1], [1]*University of California*, *Davis*, [2]*Embrapa Cerrados*, *Planaltina, DF, Brazil*.

Animal growth and composition models base their predictions on estimated retained energy. Therefore, variation in maintenance requirements related to