

Bioethics

M37 Measuring and managing for sustainability in dairy production: A stewardship scorecard. G. W. C. Clark*, A. A. Whitman, and J. M. Hagan, *Manomet Center for Conservation Science, Brunswick, ME.*

The dairy industry faces huge challenges as consumer values change, investors concerns extend beyond the financial bottom line, and society's expectations of agriculture are being transformed. We are developing a stewardship scorecard that will provide an objective, numerical, science-based assessment of the condition of social, economic and environmental services on farms. Our goal is to develop a tool that allows producers, processors and consumers to assess farm stewardship of dairy products. The key scorecard components and their science-based indicators are

being selected in consultation with dairy farmers and stakeholders (including consumers). Indicator will be screened and selected to meet five criteria: practicality, utility, scientific merit, efficiency, and social relevance. The scorecard will be tested by applying it to 25 dairy farms in the U.S. After the testing phase, the scorecard will be refined based on (1) the field test results, (2) farmer surveys, (3) stakeholder meetings, and (4) scientific peer review. The final version will be distributed with a user's handbook that describes how to apply the scorecard and ways that farmers can change their scores and communicate their performance to stakeholders and processors. The scorecard will be another tool for fostering an awareness of farm stewardship issues.

Key Words: sustainability, scorecard, stewardship

Breeding and Genetics: Beef Breeding, Poultry Breeding, and Genetics of Disease

M38 Milk production and composition during the first 4 months of lactation of Hereford (HH), Angus (AA) and F1 crosses grazing on native pastures Uruguay. A. Espasandin*¹, A. Casal², A. Graña², V. Gutiérrez², and M. Carriquiry¹, ¹*School of Agronomy, UDELAR, Montevideo, Uruguay,* ²*School of Veterinary, UDELAR, Montevideo, Uruguay.*

The objective of this study was measure milk yield and composition in 24 cows (8 HH, 8 AA, and 8 F1) once a month from 30 to 120 days postpartum (DPP), blocked by calving date and body condition at calving. Cows grazed together on native pasture paddock with an average forage mass available of 2400 kg DM/ha. In the morning, cows were drained and separated from their calves and after 6 hours were milked with a portable machine with previous injection of oxytocin (10 IU/cow). Milk was weighted and sampled for chemical composition analysis (protein, fat and lactose). A mixed model was applied to analyze milk yield and composition including cow and calf breed and calf sex as fixed effects, DPP as a covariate and cow within breed as random effect. Means were considered to differ when $P \leq 0.05$. Milk yield (3.8 ± 0.6 , 5.4 ± 0.8 , 4.4 ± 1.1 kg/d for HH, AA, and F1, respectively), and fat (4.2 ± 0.5 , 2.5 ± 0.6 , and $5.0 \pm 0.9\%$ for HH, AA, and F1, respectively) and lactose (4.9 ± 0.1 , 5.2 ± 0.1 , $4.9 \pm 0.1\%$ for HH, AA, and F1, respectively) contents did not differ among cow breeds but protein percentage was greater from HH and F1 than for AA cows (3.2 ± 0.1 , 2.6 ± 0.2 , and $5 \pm 0.2\%$ for F1, HH, and AA respectively). Milk yield was greater during the first 60 DPP and decreased thereafter (5.4 , 5.2 , 3.9 , and 3.5 kg/d ± 0.4 for 30, 60, 90, 120 DPP, respectively). Protein and lactose contents were affected by month of lactation, as protein was less and lactose content was greater during the first 60 DPP (3.0 , 3.0 , 3.3 , $3.2\% \pm 0.07$ and 5.2 , 5.0 , 4.9 , $4.9\% \pm 0.05$ for 30, 60, 90, 120 DPP, for protein and lactose contents, respectively). Fat percentage was not affected by DPP and averaged $3.8 \pm 0.04\%$ during the first 4 months of lactation. Tendencies observed for milk production and composition along lactation were similar to the reported in literature for beef and dairy cattle. Cow breed did not affect milk production and composition except for protein in which F1 and HH showed superiority.

Key Words: milk yield, beef cattle, lactation

M39 Genetic relationships of monounsaturated fatty acid with image analysis traits in Japanese Black cattle. Y. Nakahashi*¹, T. Kato², M. Nakamachi¹, N. Murasawa¹, Y. Hamasaki¹, S. Hidaka¹, and K. Kuchida¹,

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Monounsaturated fatty acids (MUFA) in beef cattle were investigated in large numbers due to the positive correlation with the flavor of marbling. We have studied MUFA and image analysis traits in order to clarify relations between MUFA and marbling shape in the rib eye. However, there are few studies concerning the genetic parameter of MUFA and no investigations on the correlations of MUFA with image analysis traits. The objective in this study was to analyze the relationships of MUFA with image analysis traits genetically. Carcass data were collected from Japanese Black cattle ($n=1,447$) that shipped to a meat processing plant in Hokkaido, Japan. Fat tissues were sampled from the rib eye of every carcass and the fatty acid compositions were analyzed using gas chromatography. Image analysis was performed to calculate the marbling percent (MP), fineness index of marbling (FIM) in rib eye and so on. Using single/multiple trait animal models, genetic analysis was conducted to estimate the heritabilities of all traits and the genetic correlations of MUFA with the image analysis. The heritability of MUFA was estimated as 0.83, indicating the possibility of improvement of the MUFA of Japanese Black. Genetic correlation of MUFA with MP was 0.20, showing a preferable relationship in which increasing MP causes improvement of MUFA. On the other hand, an undesirable correlation between MUFA and FIM was recognized (-0.09), suggesting that the improvement of MUFA is stifled by the number of small marbling flecks preferred in Japanese Black cattle. Therefore, in order to improve MUFA while keeping the fineness of the marbling in rib eye, planned breeding programs considering sire attributes could be effective by using image analysis.

Key Words: genetic parameter, image analysis, MUFA

M40 Genetic analysis of growth traits considering the average numerator relationship matrix and a hierarchical Bayes model for Nellore cattle. L. Shiotsuki*¹, F. F. Cardoso², J. A. II V. Silva³, and L. G. Albuquerque¹, ¹*Universidade Estadual Paulista, Jaboticabal, Sao Paulo, Brazil,* ²*Embrapa Pecuaria Sul, Bage, Rio Grande do Sul, Brazil,* ³*Alta Genetics, Uberaba, Minas Gerais, Brazil.*

The aim of the present work was to evaluate two statistical models to predict the genetic merit of animals with uncertain paternity, a linear mixed model based on average numerator relationship matrix (ANRM)