ience to heat and diseases but has lower milk productivity, whereas the high-yielding Jersey breed struggles with environmental stressors. Cross breeding the local and exotic cattle aims to combine the adaptability of White Fulani with the productivity of Jersey to improve dairy cattle performance. Understanding physiological and morphological variations among these breeds and their crossbred progeny is essential for optimizing breeding strategies, enhancing milk production, and ensuring sustainable dairy farming in Nigeria. This study evaluated physiological and morphological variations among White Fulani, Jersey, and their F_1 crossbred calves at Shonga Dairy Farm, Nigeria. Growth traits were recorded from 21 calves, and blood samples were collected over 6 mo to assess biochemical and hematological parameters. Results indicated no significant differences ($P > 0.05$) in most biochemical parameters among breeds, except for lower urea levels in Jersey compared with F_1 crossbreds. The F_1 crossbreds displayed intermediate linear body measurements but had a significantly higher heart girth ($P < 0.05$) than Jersey calves. Strong positive correlations were observed between heart girth and traits such as wither height, hip width, top line, and head length, suggesting their usefulness in estimating live weight. The alanine aminotransferase/aspartate aminotransferase ratios varied significantly ($P < 0.05$) across months. In contrast, hematological parameters were broadly similar, except for lower erythrocytic indices (MCV, MCH, and MCHC) in White Fulani and Jersey compared with F_1 crossbreds in some months. These variations were influenced by genetics and could be modulated by environment, management, and nutrition. Findings from this study provide valuable insights for trait selection in crossbreeding programs, supporting efforts to enhance dairy cattle productivity and adaptability in Nigeria.

Key Words: dairy, crossbreeding, productivity

2434 Production cost and number of lactations for the repayment period of dairy heifers. L. H. R. Silva[1], K. R. Oliveira*[1], A. L. Silva[1], J. V. C. Rodrigues[1], W. P. F. Amorim[1], M. I. Marcondes[2], T. E. da Silva[3], J. H. C. Costa[3], and P. P. Rotta[1], *[1]Universidade Federal de Viçosa, Viçosa, Minas Gerais, Brazil, [2]William H. Miner Agricultural Research Institute, Chazy, NY, [3]University of Vermont, Burlington, VT.*

The objective of this study was to estimate the average number of lactations required to achieve the rearing repayment period. This study used a database containing financial and zootechnical information from 2021. The data were generously provided by the EDUCAMPO/SEBRAE group and included 311 farms in Brazil. Dairy farms were categorized into 3 milk production tiers based on average milk yield: low production tier (LOW; n = 78) with an average of 12.0 L/cow per day (range: 7.4–14.5 L); intermediate production tier (INT; n = 155) with an average of 18.0 L/cow per day (range: 14.6–22.5 L); and high production tier (UPP; n = 78) with an average of 26.7 L/cow per day (range: 22.6–32.0 L). A Monte Carlo simulation was employed to estimate the repayment period for each production tier, considering the following parameters: (1) rearing cost from birth to calving: US$2,006.4 ± 62.52 (range: 874.6–6,048.6) for LOW, US$1,821.4 ± 44.35 (range: 962.9–3,163.7) for INT, and US$ 1,884.6 ± 62.52 (range: 1,205.4–2,872.9) for UPP; (2) milk net margin of 25%, 30%, and 35% ± 0.03% for LOW, INT, and UPP, respectively; (3) milk price received: US$0.50 ± 0.001 for LOW and INT, and US$0.51 ± 0.001 for UPP; (4) culling rate of 15%, 20%, and 25% for LOW, INT, and UPP, respectively; (5) price per 100 kg (arroba, live cattle weight unit for 30 kg) of culled cows: US$30.49 across all tiers; (6) market price of male calves at birth: US$20.32 for LOW and INT, and US$10.16 for UPP; and (7) market price of female calves at birth: US$30.49, $40.65, and $60.98 for LOW, INT, and UPP, respectively. The Monte Carlo simulation was conducted with 5,000 iterations using Latin Hypercube Sampling in ModelRisk. On average, the number of lactations required to achieve the repayment period was 3.98 (range: 1.33–9.33) for LOW, 2.64 (range: 1.33–6.33) for INT, and 1.64 (range: 0.66–3.66) for UPP. In conclusion, rather than solely evaluating the rearing cost of a heifer from birth to calving, it is essential to determine the number of lactations required to reach the breakeven point. This analysis should be conducted based on the specific production system and productivity level of each dairy farm.

Key Words: heifer, cost of production, repayment period

2435 Individual and combined associations of metritis and clinical endometritis with dairy cow profitability. O. A. Ojeda-Rojas*[1], J. Pérez-Báez[2], S. Casaro[1], F. Cunha[1], R. C. Chebel[1], A. De Vries[3], J. E. P. Santos[3,4], F. S. Lima[5], P. Pinedo[6], G. M. Schuenemann[7], R. C. Bicalho[8], R. Gilbert[9], W. W. Thatcher[3,4], and K. N. Galvão[1,4], *[1]Department of Large Animal Clinical Sciences, University of Florida, Gainesville, FL, [2]Escuela Medicina Veterinaria, Universidad Autónoma de Santo Domingo, Santo Domingo, Republica Dominicana, [3]Department of Animal Sciences, University of Florida, Gainesville, FL, [4]D. H. Barron Reproductive and Perinatal Biology Research Program, University of Florida, Gainesville, FL, [5]Department of Population Health and Reproduction, University of California, Davis, CA, [6]Department of Animal Sciences, Colorado State University, Fort Collins, CO, [7]Department of Veterinary Preventive Medicine, The Ohio State University, Columbus, OH, [8]FERA Diagnostics and Biologicals Corp., College Station, TX, [9]School of Veterinary Medicine, Ross University, Basseterre, St. Kitts, West Indies, [10]Department of Animal Sciences, University of Illinois, Urbana-Champaign, IL, [11]College of Veterinary Medicine, Texas A&M University, College Station, TX, [12]Department of Animal Sciences, University of Wisconsin, Madison, WI.*

The objective was to evaluate the individual and combined associations of metritis (MET) and clinical endometritis (CE) with dairy cow profitability. Cows (n = 11,051) from 16 dairy herds located in 4 regions of the US were classified as having no uterine disease (NUD), only MET, only CE, or both MET and CE (METCE). Incomes were calculated from milk yield, cow sales, and residual cow value at 305 DIM. Expenses were calculated from feed, reproductive, and replacement costs. Gross profit was calculated as the difference between incomes and expenses. Continuous and dichotomous outcomes were analyzed using mixed effects models. The additive association of MET and CE was evaluated using a nonorthogonal contrast. Cows with METCE produced less ($P < 0.05$) milk than cows with MET, CE, and NUD (9,514 vs. 9,969 vs. 9,919 vs. 10,109 kg/cow, respectively), which led to lesser ($P < 0.05$) milk sales for METCE than MET, CE and NUD (4,629 vs. 4,850 vs. 4,825 vs. 4,918 $/cow, respectively). The proportion of pregnant cows at 305 DIM was lesser ($P < 0.05$) in cows with METCE (67%) than in cows with MET (76%) and CE (75%), which were lesser ($P < 0.05$) than in cows with NUD (82%). No difference ($P > 0.05$) was observed between cows with MET and CE. The proportion of cows leaving the herd by 305 DIM was greater ($P < 0.05$) in cows with METCE (38%) than in cows with MET (30%) and CE (31%), which were greater ($P < 0.05$) than in cows with NUD (25%). No difference ($P > 0.05$) was observed between cows with MET and CE. Overall, cows with METCE had lesser ($P < 0.05$) gross profit per cow ($3,628) than cows with MET ($3,905) and CE ($3,921), which were lesser ($P < 0.05$) than NUD cows ($4,085). No difference ($P > 0.05$) was observed between cows with MET and CE. Uterine diseases negatively affected the profitability of dairy cows by being associated with decreased milk yield, reproductive efficiency, and herd survival. The combination of MET and CE led to