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629 Evaluating varying dietary energy levels for optimum growth and early puberty in Sahiwal heifers under sub tropical environment. M. Abdullah^{*1}, M. Fiaz^{2,1}, M. Nasir¹, M. E. Babar¹, J. A. Bhatti¹, T. N. Pasha¹, and M. A. Jabbar¹, ¹University of Veterinary & Animal Sciences, Lahore, Punjab, Pakistan, ²Buffalo Research Institute, Pattoki, Pattoki, Punjab, Pakistan.

To study the effects of different energy levels for optimum growth and early puberty, 20 Sahiwal heifers (Age = 12 ± 2 mo and wt = 120 ± 10 kg) were assigned to 4 dietary treatments having 5 animals on each treatment. Iso-nitrogenous (CP = 13.7%) diets having varying energy, viz; ME 100% (Control), ME 88%, ME 112% and ME 124% of NRC recommended level for small breed non bred heifers were fed to the respective groups until onset of puberty. The collected data was analyzed through ANOVA techniques using SAS 9.1.3 portable software. Average daily gain (ADG) during the time phase from 13 to 18 mo of age was found optimum. The overall ADG was higher (571 ± 15 g/d) in ME 124% than of ME 100, 88 and 112%, whereas ADG was lowest in ME 88% (397 ± 07 g/d). Similar trend was observed in feed efficiency for different treatment groups. Heifers fed dietary level of ME 124% of NRC acquired higher body length, height and heart girth as compared with those fed other dietary energy levels. The digestibility of nutrients, age at puberty, age at 1st conception and serum progesterone were not influenced by dietary treatments ($P > 0.05$). It is concluded that higher dietary energy level (ME 124% of NRC) enhanced growth parameters and feed efficiency but reproductive performance of Sahiwal heifers in terms of age at puberty and age at 1st conception was optimum even at lower dietary energy level (ME 88% of NRC recommended level) under sub tropical regions.

Key words: dietary energy, Sahiwal heifers, puberty

630 Performance of Sahiwal calves raised on whole milk, blend or milk replacer with or without calf starter supplementation. M. Abdullah^{*1}, J. A. Bhatti¹, Z. Iqbal¹, and K. Hayat², ¹University of Veterinary and Animal Sciences, Lahore, Pakistan, ²Livestock Experiment Station, Jahangirabad, Khanewal, Pakistan.

Young dairy calves are severely deprived of the milk allowance during pre-weaning period for obvious monetary reasons. This leads to stunted growth, high mortality and ultimately late age at puberty. The objective of the present study was to compare the performance of Sahiwal calves fed whole milk, blend or milk replacer with or without calf starter. The study was conducted using 40 8 newly born Sahiwal calves, maintained at Livestock Experiment Station Jahangirabad, having mean birth weight of 20.40 ± 0.18 kg to determine the affect of feeding whole milk, milk replacer or blend of whole milk and milk replacer with or without calf starter supplementation on their performance. At 14 d age the calves were randomly allotted to whole milk (W), WM+ calf starter (WC), W+ Milk replacer (WR), WM+MR+CS (WRC), Milk Replacer (R) and MR+CS (RC) diets up to 120 d of age. Data thus obtained were analyzed using ANOVA technique under completely randomized design (CRD) and differences among treatment means were compared through least significant difference (LSD) test. Mean daily intake was highest ($P < 0.05$) in calves on treatment WC (2.33 ± 0.21 kg) followed by W, R, WR, WRC and RC, respectively. Highest daily weight gain ($P < 0.05$) was observed in the calves on treatment WRC (0.38 ± 0.02 kg). Fortnightly mean body height increase in calves on W, WC, WR, WRC, R and RC was 0.70 ± 0.07, 1.08 ± 0.10, 0.75 ± 0.09, 1.14 ± 0.09, 0.74 ± 0.09 and 1.13 ± 0.10

inches, higher ($P < 0.05$) in the groups fed either whole milk, milk replacer or blend but supplemented with calf starter. Similar trend was observed in body length and heart girth increase at fortnightly intervals. Differences in mean WBCs, RBCs values and hemoglobin level varied ($P < 0.05$) between treatments and differences among total protein and albumin contents were non-significant. Cholesterol and triglyceride levels were highest ($P < 0.05$) in calves fed R. Cost to gain ratio was lowest on treatment RC. It was concluded that early introduction of calf starter during pre-weaning period improved the growth performance of Sahiwal calves

Key words: milk replacer, calf starter, weight gain

631 Withdrawn

632 Financial and energy analysis spanning the first decade of the pioneer organic beef enterprise in the Mexican tropics. P. Fajersson^{*1} and P. Parada², ¹EcoAgroPec, Hueytamalco, Puebla, Mexico, ²Carnes La Rumorosa, Poza Rica, Veracruz, Mexico.

Ten years ago a strategic alliance was formed between academia, a certification agency and a rancher to establish the first organic beef enterprise in the Mexican tropics. The sustainability and rentability of a 761 ha pasture based 550 head traditional beef cattle system (TBCS) converted to an organic beef cattle foodchain (OBF), with 685 head of cattle and marketing beef in 8 states in 2010, was evaluated using a financial and energy analysis. Continuous collaboration and interviews with the rancher and a questionnaire were used to obtain production costs, quantify inputs and collect data from yrs 2000, 2006 and 2010. In the energy analysis, the inputs used were identified, quantified, each assigned a value and transformed into energy units, compared and also used to determine critical points of the foodchain to identify opportunities to improve resource use. An analysis of 6 future economic scenarios identified strengths and weaknesses in a dynamic environment. The fixed costs were similar, USD 460933–466603 over time, while variable costs were less in the TBCS than in the OBF, USD 25123, 59608 and 75778 respectively. The marginal gain of the fixed costs remained negative, while the difference between return on investment, 16.6% in the TBCS and 36.6% and 31.2% in the OBF, represents the real gain from the conversion. Using only the variable costs, the marginal gain was USD 43912 for the TBCS and USD 132725 and 93339 for the OBF over time. The OBF remained profitable in all future scenarios, USD 37139–144074. The organic certification and integration of the foodchain increased production and commercialization costs, but guarantee the product quality and access to value added markets. The energy flow reflected the use of natural resources and their direct and indirect use in generating beef for society. The OBF was more energy efficient, 37.9% and 49.6% in yrs 2006 and 2010, than the TBCS with 18.3%. The efficiency and stability, indicating improved sustainability of the OBF, have increased as external inputs have declined. Increased beef production is possible without deterioration of natural resources in this low input organic agroforestry system, but economic gain depends more on the value added, 25% in 2010, to the organic beef.

Key words: organic beef, profit margin, energy efficiency

633 Expansion of meat rabbit projects in disaster-stricken Haiti. S. D. Lukefahr^{*1}, M. Kaplan-Pasternak², J. I. McNitt³, and B.

Migny Jasmin⁴, ¹Texas A&M University, Kingsville, ²PO Box 587, Nicasio, CA, ³Southern University Agricultural Research and Extension Center, Baton Rouge, LA, ⁴PO Box 80, Cap Haitian, Haiti.

Following the recent devastating earthquake in Haiti in January of 2010, humanitarian efforts have been made to expand small-scale rabbit farming enterprises to over 1,000 resettled rural families. The rabbit program was initiated in the mid-90s. The study objective was to evaluate rabbit program status, based on a USAID consultancy visit in July–August, 2010. In the townships of Cap Haitian and Grand Bou-lage, several farms were visited to determine production status. In general, farmer enthusiasm toward the project was perceived to be high. Shed and cage designs as promoted by the host organization (Makouti Agro-Enterprises; MAE) were sound. Rabbit health problems associated with pathogens were minor. Contrary to the objective of farmer's achieving low-cost, on-farm feed security, only one feed species was typically fed each day, rather than a broad variety of grass and legume forages and garden and kitchen "wastes." With one exception, poor feeding practices were observed on all farms visited. In response,

reproductive performance on farms was low and body condition of does was poor to fair. Average litter size was 3.71 kits, well short ($P < 0.05$) of the target standard of 5.5 fryers at market age per litter. Also, fryer body weights were light considering age. A frequency distribution of does on farms that were present with litter revealed a mode of 0%, a mean of 23.3%, and a median of 22.2%. Further, the distribution was sharply skewed to the right with one-third of farmers having no does with litters. Over one-half of farmers fell short of the 50% target (based on 6 litters per doe per annum). During the visit, rabbit training that emphasized proper feeding practices was conducted in both townships involving a total of 63 students, professionals, and farmers from many project locations. Several recommendations were made including that MAE make more frequent routine visits to farmers and also explore rabbit meat market opportunities. In conclusion, despite the discouraging present status, good progress has been made since project initiation, and people have accepted the practice of rabbit farming and the consumption of rabbit meat in their diets.

Key words: rabbits, development, international