

ABSTRACT

Performance of Dairy Calves on Diets of Poultry by-product Meal, Broken Rice and Sugarcane

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The dairy industry of Trinidad and Tobago relies on imported feed ingredients for calf rearing. This thesis, therefore, examines the effects of feeding locally available by-products on calf performance. Two randomized block design experiments, consisting of 36 crossbred Holstein calves each, were conducted to measure the performance of calves to three displacement levels of the imported feed ingredients, soyabean meal (SBM) and maize, with the locally available by-product feeds poultry by-product meal (PBPM) and broken rice, respectively. The experiments simultaneously noted the effects of feeding a non-traditional forage source, chopped whole sugarcane (*Saccharum officinarum*) to early-weaned calves.

In the first experiment, calves on the PBPM diets up to 50 kg liveweight did not achieve the levels of growth obtained by those on the all SBM diets. At 0, 33 and 66 per cent crude protein displacement levels of SBM with PBPM preweaning gains were 98 g d^{-1} , 44 g d^{-1} , and -20 g d^{-1} ($P > .05$), respectively. This trend continued post-weaning with gains of 500 g d^{-1} , 381 g d^{-1} and 340 g d^{-1} ($P < .05$) for the respective diets. In the 50 to 100 kg liveweight range, however, utilization of PBPM by calves improved, and gains of 805 g d^{-1} , 766 g d^{-1} and 798 g d^{-1} ($P > .05$) were obtained, respectively.

In the second experiment, calves performed similarly on diets when broken rice displaced 0, 50, or 100 per cent of the digestible energy contributed by maize in the concentrate formulation. Preweaning gains averaged 124 g d^{-1} , 120 g d^{-1} and 157 g d^{-1} ($P > .05$) for the respective diets. Post-weaning gains of 440 g d^{-1} , 461 g d^{-1} and 440 g d^{-1} ($P > .05$), were later almost doubled to 870 g d^{-1} , 822 g d^{-1} , and 883 g d^{-1} ($P > .05$) for the respective diets of calves in the 50 to 100 kg liveweight range.

Liveweight gains on sugarcane supplemented and non-supplemented diets averaged 447 g d^{-1} and 428 g d^{-1} ($P > .05$), respectively in the PBPM experiment, and 469 g d^{-1} and 428 g d^{-1} ($P > .05$), respectively in the broken rice experiment.

It is concluded that PBPM in excess of 10 per cent of the concentrate formulation is not well utilized by the young calf but is a good protein supplement for the older weaned calf above 50 kg liveweight. Broken rice is recommended for complete substitution of maize in calf concentrates. Finally, whole plant sugarcane may be incorporated into the diets of early-weaned calves without producing any deleterious effects.