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Feed Resource Use Efficiency in Taurine and Zebu Cattle Raised on Natural Pastures in Benin

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Abstract

In sub-Saharan Africa, optimising cattle production is key for the ecological and economic profitability of farms. However, there is a controversy about whether cattle breeds consume more energy and plant protein than they produce for human consumption. To test this claim, we determined feed conversion efficiencies for energy and protein (Digestible nitrogen: DN) of four farms comprising 270 cattle in the Sudanian zone of Benin. Two taurine and two zebu herds were compared to determine which of the herds utilise available fodder resources more efficiently.

In each herd, six animals (two cows, two heifers and two bulls) were monitored during three consecutive days for pasture dry matter (DM) intake. Milk production from all milking cows in the herd was monitored at bi-weekly intervals for three months and the milk composition determined using a Milkotester device (Milkotester Ltd., Bulgaria). Calves were weighed using an electronic scale and the weights of adult animals (heavier than 100 kg) were estimated from body measurements at monthly intervals.

Feed and nutrient intakes were similar in both herds. Per day, Taurine herds consumed on average 65.0 ± 1.13 g DM $kg^{-0.75}$; 94.9 ± 1.66 kcal $kg^{-0.75}$ day^{-1} and 144.2 ± 12.79 g DN day^{-1} while for zebu it amounted to 66.4 ± 8.40 g DM $kg^{-0.75}$; 97.1 ± 12.27 kcal $kg^{-0.75}$ day^{-1} and 190.2 ± 42.98 g DN day^{-1}. Milk production was significantly higher for zebu (2.4 ± 0.60L day^{-1}) than for taurine cows (1.4 ± 0.11 L day^{-1}; $p < 0.001$). However, its composition per kg was similar ($p > 0.05$) irrespective of breed and amounted to 36.1 ± 1.55 g DN and 796.9 ± 21.49 kcal for taurine and 37 ± 0.00 g DN and 809.6 ± 0.69 kcal for zebu cows. Protein (0.1 ± 0.05) and energy (0.1 ± 0.04) feed conversion efficiencies were similar across breeds.

The results indicate that the extensive system studied is more inefficient, regardless of the herd type considered. However, a ration exclusively based on natural grazing at the end of rainy season seems insufficient to cover the daily requirements of cattle in the Sudanian zone of Benin. Our study confirms that taurine and zebu breeds consume more energy and plant protein than they produce for human consumption and therefore supplementation of the animals is necessary to improve production efficiency.

Keywords: *Bos indicus*, *Bos taurus*, energy and protein efficiencies, rangelands, West Africa

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