

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

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Introduction and Objectives

- In Sub-Saharan Africa, natural pastures constitute the large part of animal feeds. In Benin, the pastoral transhumant system and the sedentary system are the main cattle production systems.
- To maximize production, resources should be efficiently used. 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 compare the digestible nitrogen and energy use efficiency of taurine and zebu breeds of cattle to determine which of the breeds utilize available fodder resources more efficiently.

Sites Location

- The municipality of Coby (located between 10°15' and 10°31' North latitude and between 0°25' and 1°15' East longitude) in the Sudanian Zone (SZ) of Benin, was chosen.
- Four cattle herds with a total of 270 heads including two herds of Sedentary Taurine Farm (STF) and two herds of Sedentary Zebu Farm (SZF) were monitored.

Methodology

- 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).
- Feed conversion efficiency was calculated as the ratio of animal products and the resources consumed by the animals.



Figure 1: Daily milk production weighing.



Figure 2: Sedentary zebu cattle herds on farm (a) and on pasture (b) in Sudanian zone of Benin.

Results

Table 1: Dry matter, energy and digestible nitrogen intakes by cattle - milk production and composition in STF and SZF from the SZ of Benin

		STF	SZF	P
Intake	Dry matter (g/kg ^{0.75})	65.0 ± 1.13	66.4 ± 8.40	NS
	Energy (Kcal /kg ^{0.75} /day)	94.9 ± 1.66	97.1 ± 12.27	NS
	Digestible Nitrogen (g/day)	144.2 ± 12.79	190.2 ± 42.98	NS
Production	Milk (L/day)	1.4 ± 0.11	2.3 ± 0.59	***
	Energy (Kcal /kg ^{0.75} /day)	796.9 ± 21.49	809.6 ± 0.69	NS
	Digestible Nitrogen (g/day)	36.1 ± 1.55	37 ± 0.00	NS

Table 2: Feed conversion efficiency in STF and SZF from the SZ of Benin

Efficiency	STF	SZF	P
Energy	0.08 ± 0.09	0.09 ± 0.04	NS
Protein	0.11 ± 0.04	0.12 ± 0.05	NS



Figure 3: Sedentary taurine cattle herd on pasture in Sudanian zone of Benin.

STF: sedentary taurine farm, SZF: sedentary zebu farm; *** $P \leq 0.001$, NS: not significant (ANOVA test).

- Forage intake quantity and composition in STF and SZF were similar.
- The SZF produced significantly higher amount of milk than the STF, but the milk composition was similar in both farms.
- Both farms were inefficient and their protein and energy conversion efficiencies were similar.

Conclusion

- The extensive system studied is inefficient, regardless of the farm type considered. A ration exclusively based on natural grazing at the end of rainy season then seems insufficient to cover the daily requirements of cattle in the Sudanian zone of Benin.
- 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.

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