



Tropentag, October 6-8, 2009, Hamburg

“Biophysical and Socio-economic Frame Conditions
for the Sustainable Management
of Natural Resources”

Shall the Animals Graze? - Analysing the Efficiency of Traditional Goat Husbandry in the Al Jabal Al Akhdar Mountains of Oman

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Abstract

Pastoral goat husbandry supplies meat and income to farm households in villages of Al Jabal al Akhdar, Oman. The pasture vegetation significantly contributes to goats' feed intake, but its low nutritive value appears to limit the animals' growth and production.

To quantify goats' daily weight gain, animals of twelve farmers were weighed every five weeks during November 2006 — October 2007 and progeny history interviews were conducted on does ($n=114$) of 14 households to determine age at first parturition (AFP, months), kidding interval (KI, months) and litter size (LS, n /parturition). Data was analysed using the herd model PRY to estimate annual output (€/animal) and feed use efficiency (€/kg dry matter intake) of goats under traditional management (TR). To evaluate the potential of an improved supplement feeding of goats or the introduction of a zero-grazing system, output and feed use efficiency were also simulated, assuming AFP, KI and LS to be 18 months, 10 months and 1.2 kids for a semi-intensive (SI) and 14 months, 8 months and 1.3 kids for a zero-grazing (ZG) management. Metabolizable energy concentrations in the SI and ZG diets were set to 10 MJ and 11 MJ kg^{-1} organic matter.

While AFP (22 ± 9.7), KI (12 ± 4.3) and LS (1.0 ± 0.26) and post-weaning weight gain of TR bucks ($73\pm 34.6\text{g d}^{-1}$) and does ($48\pm 25.7\text{g d}^{-1}$) resulted in a low annual output (38€) and feed use efficiency (0.05€), both increased for SI goats (54€, 0.08€) and ZG goats (61€, 0.14€). However, considering feed intake of goats on pasture to be 50 % (SI), 60 % (TR) and 0 % (ZG) of their daily feed intake, feed use efficiency was higher in SI goats (0.16€) than in TR (0.11€) and ZG (0.14€) goats.

The pasture vegetation is an important source of fodder in Oman's pastoral livestock systems, increasing the benefits derived from the traditional goat husbandry and rendering livestock keepers more independent from the purchase of expensive, often imported feed stuffs. Nevertheless, improved homestead feeding of goats in addition to grazing can increase reproduction performance, feed use efficiency and overall herd productivity.

Keywords: Feed use efficiency, Grazing, Growth rates, reproductive performance, Small ruminants