Performance of Meat Goats Grazing Winter Annual Grasses in the Piedmont of the Southeastern USA

J-M. Luginbuhl
North Carolina State University

J. P. Mueller
North Carolina State University

The XX International Grassland Congress took place in Ireland and the UK in June-July 2005. The main congress took place in Dublin from 26 June to 1 July and was followed by post congress satellite workshops in Aberystwyth, Belfast, Cork, Glasgow and Oxford. The meeting was hosted by the Irish Grassland Association and the British Grassland Society.

Proceedings Editor: D. A. McGilloway

Publisher: Wageningen Academic Publishers, The Netherlands

Performance of meat goats grazing winter annual grasses in the Piedmont of the southeastern USA

J-M. Luginbuhl and J.P. Mueller
Campus Box 7620, North Carolina State University, Raleigh NC 27695-7620, USA,. Email: *jean-marie_luginbuhl@ncsu.edu*

Keywords: goats, grazing, performance

Introduction In the Southeastern United States, meat goats (*Capra hircus hircus*) are becoming increasingly important contributors to the income of many small producers. Meat goats perform well in grazing situations if grazing management practices match their grazing behavior. Nevertheless, little research data are available from the region specifically directed toward forage feeding programs for goats reared for meat production. Hart *et al.* (1993) reported that growing Alpine, Angora and Nubian kids grazed on high quality *Triticum aestivum* forage gained 50 g/d, whereas Kiesling *et al*. (1994) reported gains ranging from 65 to 141 g/d in growing Angora goats grazing *Secale cereale*. This 3-year (YR) grazing study was designed to evaluate the performance of replacement does and wethers grazed on *Secale cereale* (SC, var. Elbon), *Lolium multiflorum* (LM, var. Marshall) and *Triticum secale* (TS, var. Resource Seeds 102).

Materials and methods The experimental area was divided into 9 plots of 0.19 ha each in a randomized complete block design with 3 replications. Forage species were sod-drilled in fall and fertilized with ammonium nitrate (56 kg N/ha) each November and February. Each year, 54 yearling goats (purebred Boer, ¾ Boer and ¼ Landrace, and ½ Boer and ½ Landrace; initial body weight (BW): 29 kg) were stratified by BW, placed in 6 blocks of 9 animals with similar BW, assigned randomly to one of nine plots, and managed using controlled rotational grazing with Premier® electronetting. In YR 1, all 6-tester goats were females, whereas in YR 2 and YR 3, 36 females and 18 castrates were used. Each goat was treated for elimination of gastrointestinal parasites (Ivermectin) at the start of grazing. Goats were moved to a fresh strip of grass 3 to 4 times per week depending on forage availability, and immediately back fenced. Additional goats (2 to 14 goats/plot) were used as put-and-take animals to control forage growth. Goats had free-choice access to a mineral mixture, water and movable shelters and goats were weighed on two consecutive days at the beginning and end of the experiment. In YR 2 and YR 3, two of the 6-tester goats/plot were castrates. In YR 3, blood and ruminal fluid samples were collected from castrates which were then harvested at a commercial facility.

Results YR 1: grazing periods ranged from 25 February – 14 April for SC, 28 February – 19 May for LM, and 28 February – 21 April for TS, with 6-tester goats/plot. YR 2: 3-tester goats/plot were grazed on each forage species from 22 January - 3 March, and then with 6-tester goats/plot until 8 April (SC), 4 May (LM) and 23 April (TS). YR 3: grazing started with 6-tester goats/plot for each forage species from 9 to 28 December. All goats were removed from the experimental plots on 28 December due to lack of forage, with the exception of LM plots, on which 3 goats/plot were left grazing until 18 January. For TS, 3 goats/plot were grazed from 11 to 20 January, at which date 51 cm snow fell in 24 hours. Grazing resumed with 6-tester goats/plot on each plot on 24 February. Grazing ended on 31 March for SC, 10 May for LM, and 20 March for TS. Crude protein values of forage samples hand-plucked periodically from experimental pastures averaged 21.5, 23.3 and 23.0% for LM, SC and TS, respectively. Forage species had no effect on ADG in YR 1, 2 or 3 (avg: 136, 151, 142 g/d, for LM, SC and TS, respectively), but castrates gained more weight than does ($p<0.01$) in YR 2 (139 vs 94 g/d) and YR 3 (201 vs 137 g/d). Gain per ha was greater ($p<0.05$) for LM than SC and TS (YR 1: 504, 235, 293 kg; YR 2: 288, 195, 234 kg; YR 3: 532, 251, 137 kg). In YR 3, the pH of ruminal fluid, ruminal ammonia and carcass yield from castrates grazing LM, SC and TS averaged 6.67, 25.7 mg/dL and 51.3%, respectively. Plasma urea N (16.4, 21.9, 24.1 mg/dL), ruminal acetate (62.0, 60.7, 57.7 mM/100mM), propionate (22.0, 25.2, 27.0 mM/100mM) and acetate:propionate (2.83, 2.43, 2.22) differed between forage species ($p<0.05$).

Conclusions Results indicated that these winter annual grasses were of excellent quality and exceeded the nutritional requirements of growing replacement stock. Growing goats achieved satisfactory weight gains when fed only on these forages under controlled rotational grazing management, but LM resulted in superior per hectare live weight gains.

References

Hart, S.P., T. Sahlu & J.M. Fernandez (1993). Efficiency of utilization of high and low quality forage by three goat breeds. Small Ruminant Research, 10, 293-301.

Kielsing, H.E.,C.E. Barnes, T.T. Ross, J. Libbin, M. Ortiz, R.L. Byford & K.W. Duncan (1994). Grazing alfalfa and winter annual cereals with Angora goats. Agricultural Experimental Station Research Report 684. New Mexico State University Las Cruces, NM.