Year-round foraging for sustainable goat production in Southeastern U.S.

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Project Title: A Sustainable Year-round Forage System for Goat Production in the Southern USA
Project No. LS02-141
Project Type: SSARE Research and Education

Abstract

Series of experiments were conducted to develop and demonstrate a profitable and sustainable year-round forage based production system—mimosa, bahaiagrass pasture or feedlot system in the summer-fall, and annual ryegrass pasture in the winter— for goat production for the Southeastern U.S. Summer pasture, browse and feedlot system were compared using 16 wether kids for each; however, winter pasture system used buck kids and was conducted at a different time period inherited by the nature of the system.

A comparison of production systems indicated that animals on feedlot or Marshall ryegrass grew faster and reached expected slaughter weight in less time when compared to bahiagrass pasture and mimosa browse. Marshall ryegrass system was most economical production system in our study. Although intact male goats used, for winter grass system, produced heavier carcasses, wether goats with less gain capacity could have reached market weigh in the same timing. Raising wethers on mimosa browse was associated with lowest input to the system and seems profitable; however, it took 4 more weeks for these goats to reach market weight than those on feedlot system or improved winter pasture, respectively. Bahaigrass pastures could not sustain a profitable meat goat production because of high system input in terms of supplemental feeds and anthelmintics used in this system.

Introduction

The sharp increase in the Hispanic and Muslim populations in the United States has resulted in a substantial increase in the demand for goat meat (Figure 1). Hispanic population will be more than 25% by year 2050. Local production of goats is unable to meet current demand. Consequently, more than 11,000 metric tons of goat meat, equivalent to about 750,000 goat carcasses were imported from Australia and New Zealand to meet the demand in 2006 (Figure 2). This creates profitable opportunities for limited resource farmers in the Southeast to maximize economic return from small farms and to maximize return per acre. On the other hand, the southern U.S. is well suited to forage production. Goats are more efficient from a reproductive perspective and can easily raised on these forages or browse. However, the humid environment of the southeastern U.S. results in gastro-intestinal parasites posing a major challenge for goat producers. Compared to perennial pastures, annual pastures are expected to reduce the need for de-worming because parasite larvae are destroyed and diluted during tillage operations and browsing reduces exposure to larvae. Consequently, forages such as annual ryegrass or mimosa would appear to have promise for goat production.

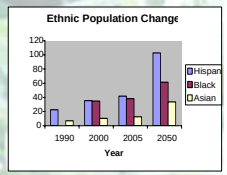


Figure 1. Ethnic Population Changes

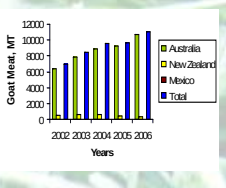


Figure 2. Goat Meat Imports

Objectives

- **Develop a profitable year-round forage based production system for goats using annual ryegrass and mimosa**
- **Compare goat performance in different production systems**
- **Compare economics of different production systems**

Methods

Experiment 1

Animals: 24 High percentage (75%) and 24 low percentage (50%) Boer cross wether kids

Treatments: 1) Feedlot (CONC) containing 40% protein pellets, 40% soybean hulls, and 20% bermudagrass hay

2) Warm season bahiagrass pasture (BG) supplemented with 150 g (0.33 lb.)/head/day protein pellets, continuously grazed 2 acre bahaiagrass pasture

3) Mimosa browse (MB) supplemented with 100 g (0.22 lb.)/head/day of cracked corn, rotated every 2-wks on 4, 1 acre mimosa plots

Duration: 98-134 days (when BW reached 70 lb.)

Mimosa Browse

Feedlot System

Improved Pasture

Experiment 2

Animals: 22 Boer cross buck kids

Treatment: Continuously grazing 2 acre Marshall ryegrass pasture planted in September, seeding rate @ 30 lb/acre, Nitrogen fertilization @ 100 lb./acre at planting and in 60 lb./acre in February

Duration: 105 days

Data Collected: Initial BW, final BW, total feed consumed, total hay consumed, fertilizer used and total other inputs to the systems

Results

Performance:

Goats receiving the BG treatment had the lowest ADG, 47.5 g (0.1 lb.) over 134 days followed by goats receiving the MB treatment, 82.4g (0.18 lb.) and required more days on feed to reach harvest end points. Goats on feedlot style treatment exhibited the highest ADG of 125 g (0.27 lb.) over the 98 days of growth period and reached harvest end point two to five weeks earlier than BG or MB treatments. Average over two years of performance on ryegrass pastures resulted in 138 g (0.3 lb.) ADG for 105 days. There was no different in performance between Boer crosses or claimed 75% purebreds.

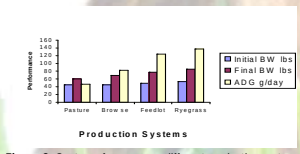


Figure 3. Goats performance on different production systems.

Production Economics

Profit and losses of feedlot system, summer pasture system, mimosa browse and winter pasture are presented in Tables 1, 2, 3 and 4 with the summary presented in figure 4. Prices are based on 2005 data.

Table 1. Economic Analysis of Feedlot System

Animals	16 Castrated Goats
Initial BW	50 lb.
Final BW	77 lb.
Age	4-5 months
Breed	Boer/Spanish
Feed	40% Dairy pellets, 40% Soybean hulls, 20% BG hay
Period	98 days
PURCHASES	
Goats, Boer crosses	$720.0
Total Feed Costs	$352.8
Grain mix,Soy hulls, Bermudarass hay, Medicated feeds	
Medications	$17.3
Cydectin, Co-Ral dust, Clostridium C & D with Tetanus	
TOTAL	$1090
INCOME If sold live 80lb. @ $1.10/lb.	$1408
Profit/goat	$20
INCOME If sold live 80 lb. @ $1.00/lb.	$1280
Profit/goat	$12
INCOME if slaughtered @ 50% dressing	
Total meat & bone	640 lb.
Costs of processing @ $1/lb.	$640
If sold @ $3.00/lb.	$1,920
Profit-loss/goat	$12
If sold @$3.50/lb.	$2,240
Profit/goat	$32
If sold @ $4.00/lb.	$2,560
Profit/goat	$52
SUMMARY	
Feed Cost/goat	$22
Medication Cost/goat	$1.1

As indicated above, goats raised on a feedlot style system if sold for at least $1.1/lb. for an 80-lb. carcass, will not produce extra revenue if retail cuts are sold less than 3.5/lb. Prices are based on 2005 data.

Results Cont.

Table 2. Economic Analysis of Grazing System (Summer)

Animals	16 Castrated Goats
Initial BW	46 lb.
Final BW	60 lb.
Age	4-5 months
Breed	Boer/Spanish
Feed	2 acres Bahaiagrass Pasture + Suppl.
Period	134 days
PURCHASES	
Goats, Boer crosses	$720
Lime, Fertilizer 16-16-16	$200
Total Feed Costs	$146.8
Medicated feeds, Grain mix, Bermudagrass hay	
Medications	$36.0
Cydectin, Permeceprin, Clostridium C &D with Tetanus Ivermectin, Valbazin, Panacur	
TOTAL expenses	$1103
INCOME if sold live 60 lb. @ $1.25/lb.	$1200
Profit/goat	$7.0
INCOME If sold live 60 lb. @ $1.00/lb.	$960
Profit-loss /goat	$-8.9
INCOME if slaughtered @ 50% dressing	
Total meat and bone	480 lb.
Costs of processing @ $1/lb.	$ 480
If sold @ $3.00/lb.	$1.440
Profit-loss/goat	$-8.9
If sold @$3.50/lb.	$1,680
Profit/goat	$6.0
If sold @ $4.00/lb.	$1920
Profit/goat	$21.0
Feed Cost Including Lime, Fertilizer	$347
Feed Cost/goat	$21.6
Medication Cost/goat	$2.25

Goats raised on bahiagrass pasture required more grain and anthelmintic treatments and took longer to reach saleable weight. Prices are based on 2005, when data was collected.

Table 3. Economic Analysis of Browse System

Animals	16 Castrated Goats
Initial BW	46 lbs.
Final BW	70 lbs.
Age	4-5 months
Breed	Boer/Spanish
Feed	Mimosa, Corn 100 g/h/d
Period	134 days
PURCHASES	
Goats Boer crosses	$720.0
Feed Costs, Medicated Feed and corn	$58.7
Medication	$20.3
Cydectin, Co-Ral Dust, Clostridium C &D/Tetanus, Valbazin	
TOTAL Expenses	$799.0
INCOME If sold live 70lb. @ $1.00/lb.	$1120
Profit/goat	$20
INCOME If sold live 70lb. @ $1.15/lb.	$1288
Profit/goat	$30.5
INCOME if slaughtered @ 50% dressing	
Total meat	560 lbs.
Processing cost @ $1.00/lb.	$560
If sold @ $3.0/lb.	$1,680
Profit/goat	$20
If sold @$3.50/lb.	$1,960
Profit/goat	$37.5
If sold @$4.0/lb.	$2,240
Profit/goat	$55
SUMMARY	
Feed Cost/goat	$3.7
Medication Cost	$20.3
Medication Cost/goat	$1.3

This system was most profitable system considering the lowest manual and financial input to the system.

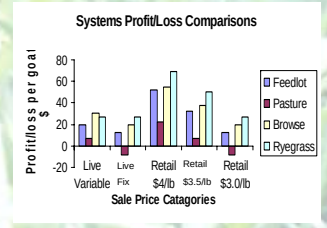
Results Cont.

Table 4. Economic Analysis of Grazing System (winter)

Animals	22 bucks
Initial BW	53 lb.
Final BW	85 lb.
Age	4-5 Months
Breed	Boer/Spanish
Feed	Marshall Ryegrass 2 acres
Period	105 days
PURCHASES	
Goats Boer cross	$990.0
Medicated Feed	$30.0
Medications	$23.6
Cydectin, Co-Ral Dust, Clostridium C &D with Tetanus	
Marshall Ryegrass	$28.8
Fertilizers,	$210
NPK, 16-16-16, 2% S, Ammonium Nitrate	
TOTAL Expenses	$1282.4
INCOME if sold live 85 lb. @ $1/lb.	$1870
Profit/goat	$26.7
INCOME if slaughtered @ 50% dressing	
Total meat	935 lb.
Processing cost @ $1.00/lb.	$ 935
If sold @ $3.0/lb.	$2,805
Profit/goat	$26.7
If sold @$3.50/lb.	$3,272.5
Profit/goat	$48
If sold @$4.0/lb.	$3,740
Profit/goat	$69
SUMMARY	
Feed Cost Including Fertilizer	$269
Feed Cost/goat	$12.2
Medication Cost/goat	$1.1

This system produces heavier carcasses that are sold with lower price per lb. However, this system is one of the most profitable production systems. Prices are based on 2005, when data was collected.

Conclusions



- Commonly used practices for raising goats in Southeastern U.S. such as bahaiagrass pastures are not profitable. Improved pastures, although have higher input, are profitable.
- Selling goats live is not profitable, and based on this data, goat meat should sell for more than$3.0 per lb. for a profitable system.