Evaluation of Warm Season Annuals for Forage Finishing in the Piedmont Region on Animal Performance and Meat Quality

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Background

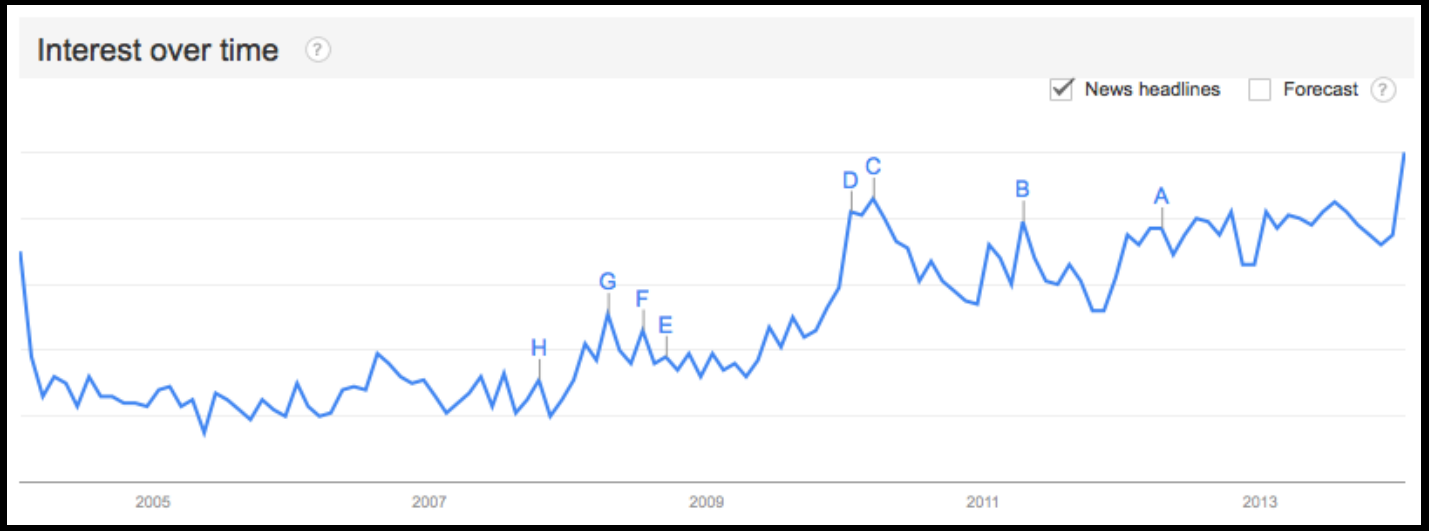
- Challenges to producers
  - Corn and soybean cost
  - Unpredictable climate of the Southeastern U.S.
- Grass-finished market
  - Health claims
  - Environmentalists
  - Animal activist friendly
  - Community/local attitudes

– Optimize resources at hand (forages)

Grass-Fed Trend

- Importance of grass fed beef:
  - 29% somewhat
  - 26% Important
  - 10% Very important
  - 3% Extremely
- Willingness to pay:
  - 10% above typical retail: 24.5%
  - 25% above typical retail: 3.37%
  - +25% above typical retail: 2.4% (Lacy et al.)

- Estimated 2,000+ forage finishing producers
  - $2.5B retail market



Google trends; 2004-Jan 2014

Objectives

- Evaluate the effects of specific forages on finishing cattle
- Live Animal Production:
  - Determine the effects of forage type on ADG and carcass characteristics obtained by steers when finished to a common endpoint
- Meat Quality:
  - Determine the effects of specific forage on meat quality attributes. Meat quality attributes of tenderness, lipid oxidation, color profile, shelf life, fatty acid profiles and sensory appeal will be evaluated

Experimental Design and Treatments

- J. Phil Campbell Research and Education Center
  - Watkinsville, Georgia
- 16- 0.73 ha pastures
  - 83 days
  - June-September 2013
- 2 steers per pasture as experimental animals (n=30)
- Put and take steers utilized to manage available forage

Experimental Design and Treatments

- 4 treatments; 4 pastures per treatment
  - Pearl Millet
  - Pearl millet + crabgrass
  - Sorghum sudangrass
  - Brown midrib sorghum sudangrass

Barn

SxS F2	SxS 6C	PM 6B	PM 6A	BMR SxS 4C	BMR SxS 4B	4A	Put & Take 2C	Put & Take 2B	PM 2A
PM + CG F1	BMR SxS 5C	PM + CG 5B	PM 5A	PM + CG 3C	SxS 3B	SxS 3A	Put & Take 1C	BMR SxS 1B	PM + CG 1A

Forages

- Pearl millet
  - Drought and heat tolerant

    (Jain and Bal, 1997)

- Crabgrass
  - High palatability
  - Tolerant of defoliation

    (Blount et al., 2003)

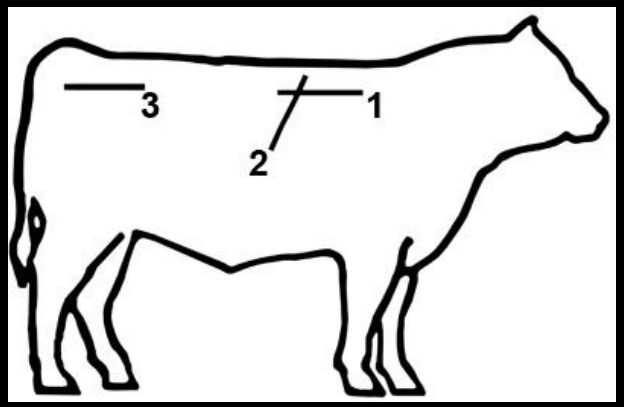
- Brown midrib (BMR) sorghum sudangrass
  - Drought tolerant
  - Lower lignin content → increase in digestibility

    (Ledgerwood et al)

- Sorghum sudangrass
  - Drought tolerant

Animal Data Collected

- Weight
  - Day 0, 83
- Ultrasound data
  - Day 0, 28, 53, 88
  - Measure REA, 12th rib fat, percent IMF, rump fat



Forage Data Collected

- Every 2 weeks, beginning with Day 0
- Forage mass
- Proximate analysis
- TDN

Carcass Data

- Steers were harvested at White Oak Pastures
  - Bluffton, GA
- The following data was collected:
  - Live weight, hot carcass weight, dressing percent, KPH %, fat thickness, adjusted fat thickness
  - Ribeye tracings
  - Calculated yield grades
  - Quality grade attributes
  - Color of fat and lean
    - Subjective and Objective

Sampling & Analysis

- Boneless short-loin was collected 24 hours post-mortem, vacuum packed and aged 17 days
  - Following aging, short-loins were sliced into 1” steaks for further analysis

- Proximate analysis
  - % of ether-extractable fat, protein and moisture
- Fatty acid analysis
  - Focus on CLAs and n-6: n-3
- Slice shear force
  - Measuring tenderness
- Shelf-life
- Color

Initial Findings

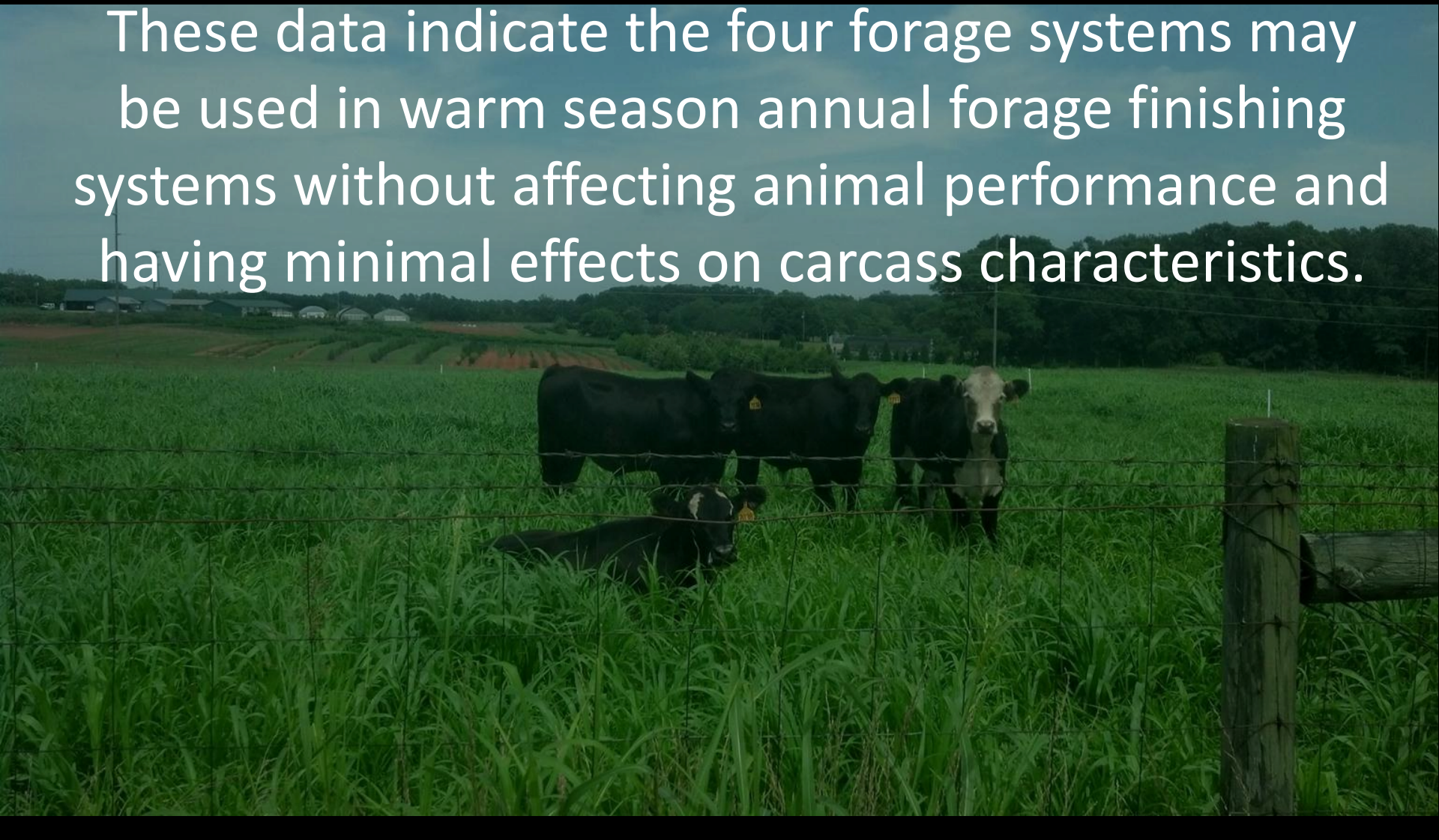
- No differences in marbling scores ($P > 0.12$)
- No differences in ultrasound data of predicted carcass traits ($P \geq 0.34$)
- No differences in HCW, % KPH, REA, 12th rib fat thickness, and yield grade ($P > 0.17$)
- No differences in ADG ($P = 0.42$)

Treatment ADG	Kg
BMR SxS	0.71
SxS	0.43
PM	0.49
PM + CG	0.46

Initial Findings

- No differences observed for objective lean color scores ($P > 0.50$) and fat ($P > 0.26$) or subjective lean color scores ($P > 0.34$)
- Carcasses from pearl millet + crabgrass had greater overall maturity (A^{80}) than sorghum sudangrass ($P < 0.01$; A^{60}) and pearl millet ($P = 0.03$; A^{70}), due to pearl millet + crabgrass having great lean maturity ($P < 0.01$) than other treatments
- Subjective fat color of sorghum sudangrass carcasses were more yellow in color than carcasses from all other treatments ($P \leq 0.03$)

Implications



These data indicate the four forage systems may be used in warm season annual forage finishing systems without affecting animal performance and having minimal effects on carcass characteristics.

Questions?