



Grazing Cows Adapt to Heat in Different Ways

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BOTTOM LINE

Cattle adapt to heat in a variety of ways (including shade-seeking [e.g. Angus], intensifying the grazing effort [e.g. Tuli-Angus] and passing large quantities of material through the digestion tract [e.g. Brahman-Angus]) that possibly influence their ability to be flexible to changes in forage conditions.

Summary

- Angus cows that were selected for heat tolerance avoided grazing during the day but compensated by grazing at night and by increasing grazing intensity.
- Brahman cross cows tolerate the heat by consuming forage in smaller amounts in a large number of meals over long time periods thereby decreasing digesta residence times and the associated heat produced in fermentation and energy required for gut turnover.
- Tuli cross cows minimize grazing time avoiding heat and predator risks but compensate by grazing intensively.

Introduction

Economic success begins by using cattle that are adapted to the production environment. Mis-matches of cattle and environment set the stage for production problems by increasing animal vulnerability and decreasing performance. Sometimes, the main result of these mismatches is low reproduction. It may be possible that there are several types of cattle adapted to hot climates. This could be the case if different kinds of cattle adapt to heat in different ways. The purpose of this project was to determine if local cattle selected for productivity (Angus), those influenced by Indian zebu breeding (Brahman-Angus), and those influenced by African Sanga breeding (Tuli-Angus) adapt to grazing in a hot environment in the same ways.

Experimental Approach

Grazing habits, forage intake, and digestive dynamics were evaluated for 24 females grazing six, 12-acre Kleingrass pastures in a balanced trial. Experimental animals were Angus, Brahman-Angus or Tuli-Angus lactating and dry, 2-yr-old females. These cows had access to abundant amounts of Kleingrass (11 lb DM/lb of body weight) for a 2 wk trial that began on Jul 16, 1994 when the temperature ranged from 68 to 100° F at 21 to 99% relative humidity. The Kleingrass was 67% in organic matter digestibility and 11% in crude protein.

Results

Table 1 presents durations of day and night-time grazing, time spent in shade, digesta residence time in the gastrointestinal tract, and organic matter intake for the breeds of cattle studied. All animals were able to maintain similar afternoon rectal temperature in the face of the summer heat. This provides evidence that the breeds tested were able to adapt to the heat in some way. This is also indicated in that all three breeds were able to consume forage at satisfactory levels (Table 1). Brahman-Angus spent more time grazing and less time in the shade than the other breeds, with the Tuli-Angus being intermediate. Brahman-Angus consumed less forage and had smaller gastrointestinal tracts. Also, the digesta passed through them more rapidly resulting in less residence time in the tract and higher digesta turnover rates. Tuli-Angus and Angus consumed forage at a faster rate than the Brahman-Angus. As indicated Table 1 Tuli-Angus and Angus consumed more OM as percent of body weight in relatively shorter grazing time than the Brahman-Angus.

Also, Tuli-Angus that were lactating were able to increase the rate of eating over those that were dry without increasing the time spent grazing. For other breeds, lactating and dry females responded similarly.

Conclusions and Implications

There is more than one way for cattle to “beat the heat”. Angus selected for heat adaptation need shade to a greater extent than other breeds. Easy access to large quantities of forage may help Brahman crosses control their temperature. Tuli crosses avoid risks involved in grazing by increasing grazing intensity.

Table 1. Forage intake, foraging behavior and digestive dynamics of cattle graze kleingrass in the summer.

Item	Angus	Brahman-Angus	Tuli-Angus
Female Weight, lb	813	950	803
Afternoon Rectal temperature, °C	40.40	40.35	40.45
Day Grazing, min/d	363	506	425
Night Grazing, min/d	172	134	143
Shading, min/d	386	182	336
GIT Residence, hr ^a	46.9	39.9	46.8
O.M. Intake, %BW ^b	3.60	3.45	3.67

^aTime digesta spent residing in the gastrointestinal tract.

^bOrganic matter consumed as a percent of body weight.