Applied Animal Behaviour Science 193 (2017) 1–6

Contents lists available at ScienceDirect

Applied Animal Behaviour Science

journal homepage: www.elsevier.com/locate/applanim

Behaviour of White Fulani calves grazing panicum/stylo pasture in Southwest Nigeria

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ARTICLE INFO

Keywords:
Grazing behaviour
White Fulani
Panicum maximum
Stylosanthes guianensis
Dense biomass
Sparse biomass

ABSTRACT

The objective of this study was to investigate the behaviour of White Fulani (WF) yearling calves grazing a *Panicum maximum/Stylosanthes guianensis* mixture under traditional management system in south western Nigeria. The effects of two biomass spatial distribution (dense and sparse) were evaluated in association with three pasture heights (10, 15 and 20 cm), with calves allowed access to the pasture for 2:00 h. The experiment was laid out in a split plot design with the two biomass spatial distribution assigned to the main plot and sward height assigned to the sub plot to give six treatments; this was replicated three times. The experiment took place from November to December, 2015. Grazing behaviour was recorded with the aid of a Chloride UK 8 channel, H.264 digital video recorder and Chloride UK IR waterproof camera fitted with 3.6 mm lens. Data on grazing time, walking time, idling/resting/rumination time and time spent by the animals exhibiting self-licking behavior were collected from the recorded CCTV video player. There was a significant difference in the time spent grazing by the calves with those grazing the pasture with dense biomass at 15 cm height recording more grazing time (87.33 min). Animals on the pasture with sparse biomass at 10 cm height recorded more ($p < 0.05$) idling/resting/rumination time (18.33 min). The time spent by the calves walking was similar for the pasture with dense biomass at 10 cm and 15 cm above the ground. Self-licking behaviour was generally exhibited by the calves across the treatments. However, calves grazing in the plot with sparse biomass at 20 cm height engaged in more self-licking behaviour than those in the dense biomass pasture. The differences observed in the behavioural parameters examined clearly indicated the capability of WF yearling calves to increase grazing time, reduce the time spent walking, idling/resting/rumination and self-licking time, thereby improving their efficiency of grazing. From management perspective, plots with dense pasture biomass cut to 15cm height is suggested for optimal production of grazing calves on sown *Panicum/Stylosanthes* mixture under the present production systems in south western Nigeria.

1. Introduction

White Fulani (WF) cattle are the most prevalent of the cattle breeds in Nigeria. They are mainly traditionally managed by the nomadic Fulani people who occupy the Sahara and Sub-saharan Africa including the northern Nigeria (Kano, Zaria, Borno and Bauchi States) and Cameroon (White Fulani, 2009). They are generally managed for milk, meat and draught. However, the traditional Fulani agro-pastoralists keep the breeds mainly for milk production.

In Nigeria, information on the growth and lactation performances of WF cattle over the decades are available in literature (Olaloku and Oyenuga, 1977; Mrode, 1988; Campbell et al., 1996; Ige et al., 2015), but there is dearth of such information on the grazing behavior of the animals. Knowledge about grazing behaviour in terms of the time spent grazing, standing or ruminating, or grooming has been reported to be useful in extensive systems of cattle management (Reinhard et al., 2007). Adequate understanding of grazing behaviour will help farmers to devise techniques for improving pasture utilization and possibly extend the grazing season. Another merit of this knowledge is identification of areas that offer higher potential for defoliation of forages. The abundance and maturity of forages also play a prominent role in the behaviour exhibited by cattle on pasture. It is therefore, pertinent to understand the behaviour of cattle at pasture for improved livestock management, reduction of environmental effect and sustenance of a

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http://dx.doi.org/10.1016/j.applanim.2017.03.007
Received 20 September 2016; Received in revised form 9 March 2017; Accepted 19 March 2017
Available online 24 March 2017
0168-1591/

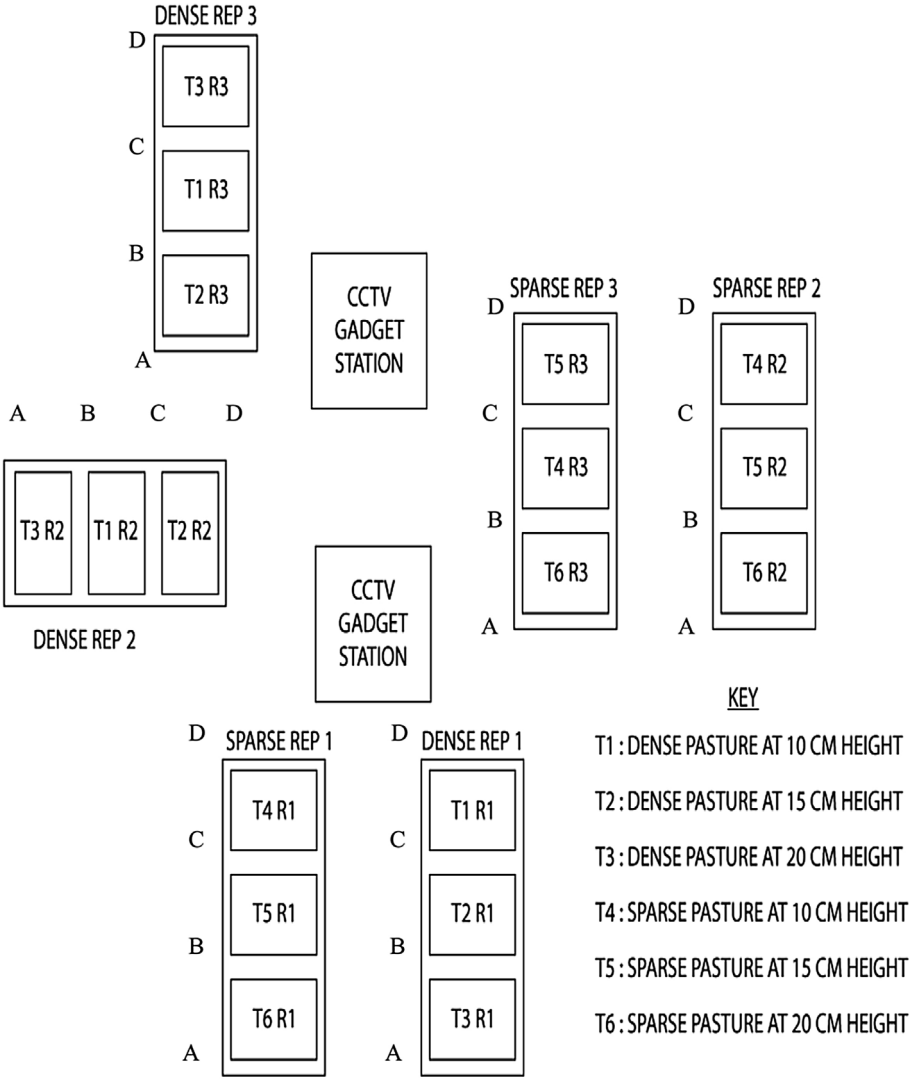

Fig. 1. Field layout of the experimental site.

healthy livestock-pasture interrelationship (Taweel et al., 2006; Gibb, 2007; Clapham et al., 2011; Yong et al., 2013).

Grazing behaviour of adult cattle is generally influenced by environmental factors and type of plant species present, but on the contrary, the behaviour of calves at pasture depends on climate, age, state of the teeth and type of supplemental diet offered to the calves (i.e. milk, concentrates or forages). Determining the grazing behaviour of cattle in relation to the plant species available in pasture is a challenge and of great importance. The variation in the grazing behaviour of cattle due to breed, stage of growth and level of production poses management challenges to stock managers as they strive to meet the nutritional needs of varying classes of cattle (Jennifer, 2014).

The most important dilemma faced by herbivores in the acquisition of food is drawing a scale of preference between quantity and quality especially when feeds are scarce (Laca and Demment, 1991). The potential feeding location of ruminants is influenced by the spatial distribution of the animals themselves within the grazing environment (Dumont and Boissy, 1999). Thus, animals are constantly faced with a sequence of short-term decisions about what forage to select and where to forage. This is influenced by organization of herbage in space which varies in the quantity of herbage and in physical and chemical attributes of the plant material (Ungar et al., 1992; Wendy, 1999). The structural characteristics of the sward, i.e sward height, herbage density and maturity as well as leaf: stem ratios and green: dead material ratios may influence selection of plant materials by grazing animals' vis-à-vis the time spent grazing, ruminating, and the vertical distance animals insert their muzzle into the sward (Laca et al., 1994; Hodgson et al., 1994). Ruminants are therefore capable of changing their effectiveness in the search for and capture of forage by recognizing the quality of the grazing environment (Mezzalira et al., 2013).

In southwest Nigeria, where human population density is increasing with an attendant decrease in available land for animal husbandry, livestock owners result to grazing their animals on natural pasture with