Original Research

Behavioural Study of Sanan and Jamnapari Cross Bred Goats Kept in a Stilted House

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Abstract

A sound understanding of the normal behaviour of an animal is important to assess its welfare standards. Behaviour of confined animals is useful in order to design proper housing systems. Objective of this study was to understand the behaviour of goats kept in a stilted house. Behaviour of 14 Sanan and Jamnapari goats (14Kg-37Kg) kept in stilted house was observed using an ethograme for six one hour sessions in two days (rainy and hot). Each session lasted for five minutes. Frequency and times spent on seventeen mutually exhaustive behaviours were recorded. Goats spent significantly ($P<0.05$) more time on eating (31%) than any of the other behaviours. Other important behaviours were resting (11%), licking (10%), ruminating (10%) and walking (9.5%). Goats spent a substantial time on behaviours such as lying (7.3%), running (6.3%), freezing (6%) and animal interaction (5.7%). The time budget on behaviours such as saltate (0.5%), sniffing (0.59%), chattering (0.59%) and importantly on drinking (0.6%) were very low. Behaviors such as freezing, head movement, animal interaction, saltate, running, rumination, chattering and chirping were affected by the climatic condition of the day. It was concluded that goats kept in stilted houses spend one third of their time budget on eating and but very little time on drinking.

Keywords: Behaviours; Goats; Welfare

Introduction

The goat (*Capra hircus*) is thought to have been the first animal to be domesticated for economic purposes. Immediately after domestication, physical differentiation in to breeds and types began. Goats have shown themselves to be extremely adaptable animals and vast majority of goats are found in the developing countries of Asia, Africa and South America. Goats provide their owners with a vast range of useful products; milk, meat, skin and hair and services (Peacock, 1996)

For the past half century, animal husbandry research has mainly encompassed nutrition, animal breeding and diseases control. In contrast animal behaviour and its effects on the production and animal welfare have received little attention. Reasons as to why animal behaviour is important in animal production are numerous. Firstly, there are economic reasons. A proper understanding of the behaviour is of paramount importance to determine management practices particularly housing systems that optimize the economic returns of the livestock farming. Intensification of animal husbandry has reduced the animal welfare standards. The effect of restricted animals is the development of stereotypies, some of which can become pathological and many may cause drops in production. Stereotypies involve repeated actions such as crib biting, fleece chewing, self licking, weaving and inter suckling. In the future it is likely that further intensification of animal husbandry will develop. It is therefore necessary to examine the causes and effects of such

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changes in order to be able to help with present and future housing design and production. Welfare standards of animals are evaluated by behavior assessments. (Broom and Fraser, 2007). Therefore, a sound understanding of behaviour, normal and abnormal, and the limits of adaptability of behaviour in different species, age groups and individuals is a must for achieving optimal production and at minimum welfare cost.

A definition of "intensive husbandry" could well be the husbandry of animals under crowded and confined conditions. Thus the behavioual effects of crowding and confinement are central to our theme. Under confinement condition, some behaviours are restricted and it may merely result in changes in the social organization and the development and maintenance of bonds between individuals.

The study of goat behavior, like so many aspects of the recorded knowledge of the genus Capra, is limited. Many inferences to the behavioral patterns of goats have been drawn from the more abundant and detailed information available on the closely related species such as cattle and sheep. Therefore the objective of this study was to understand the behaviour of goats kept in a stilted/ slated houses.

Materials and methods

This experiment was carried out to investigate the behavior of goats under confined condition that were housed in the Faculty farm belongs to the Faculty of Agriculture of University of Ruhuna in Mapalana in Matara District. Behaviour was recorded between 1000-1300h by direct live focal observations on 17 mutually exclusive behaviours by using an ethogram (Table 1). Fourteen Sanan and Jamnapari cross bred goats (14Kg-37Kg) kept in stilted house were subjected to the behaviour study. The observations were made for six one hour sessions in two days (rainy and hot). Each hour consisted of five minute sessions and the behaviour was recorded at 15 second intervals for consecutive 3 hrs. Frequency and times spent on these seventeen mutually exhaustive behaviours (resting, freezing, walking, lying, eating, head movement, animal interaction, saltating, body shaking, drinking, running, rumination, licking, chattering, chirping, wagging the tail and sniffing) were recorded by three trained observers.The data gathered were then processed to determine the proportion of time spent engaged in individual behaviours or postures, along with frequencies of each behaviour or posture. Data were analyzed by GLM option of ANOVA using the statistical package Minitab 14.1.

Results

Percentages of time spent on particular behavioral components in six hours in two days were shown in Table 2.
Frequencies of the considered behavioral compo-

Table 1. Ethogram of the behavioural study

Activity	Description
St	Standing (Standing with no apparent movement of legs)
Re	Resting (No movement with closed eyes performing lying)
Fr	Freeze (No movement with open eyes performing erect eyes)
Wk	Walking (taking one or more steps)
Ly	Lying (Lay down on the ground performing no perceptible behavior)
Et	Eating (Head extended towards available feed resources and appears to be manipulating or ingesting feed)
Hm	Head movement (Immobile body apart from rapid head movements in any direction or rotations of the head around its vertical or horizontal axis)
AI	Animal interaction (attacking the other animals in a normal or aggressive manner)
Sl	Saltate (Jumping locomotion, not running)
Bs	Body shaking
Dr	Drinking (mouth contact with the water and appears to be ingested water)
Rn	Running (Speedily taking one or more steps)
Ru	Rumination
Li	Licking (mouth behavior that lick body or others body)
Ct	Chattering (Continuous vocalization with long duration, minimum 15seconds)
Cp	Chirp (Vocalization with short duration, quiet between pulses, below 15seconds)
Wg	Wagging the tail
Sf	Sniffing

nents in six hours in two days were shown in Table 3.

Discussion

Based on the time budget on various behaviours, four groups of behavioural activities could be identified. The first group of activity includes feeding behaviour on which goats spent highest proportion of their time budget. Goats spent significantly more time on eating (31%) than the other behaviours. Haenlein (1992) has also revealed that goats spend as long as 11 hours for feeding. The second group of activities includes resting (11%), licking (10%), ruminating (10%) and walking (9.5%). Goats spent a substantial time on behaviours such as lying (7.3%), running (6.3%), freezing (6%) and animal interaction (5.7%) and identified as the third group of behavioural activities. Behaviours such as wagging tail (2.2%), head movement (1.7%), chirp (1.4%), body shaking (0.8%), drinking (0.6%), chattering (0.59%) saltate (0.5%), sniffing (0.5%) were identified as the fourth group of behavioural activities. It is interesting to note that behaviour activity of drinking also among the least prominent behaviours.

Table 2. Percentages of time spent on behavioral components

Behaviour	Percent of time budget
Eating	$30.89^a \pm 11.23$
Resting	$10.89^b \pm 8.19$
Licking	$10.06^{bc} \pm 4.13$
Rumination	$10^{bc} \pm 6.91$
Walking	$9.58^{bc} \pm 2.955$
Lying	$7.32^{bc} \pm 8.07$
Running	$6.37^c \pm 3.707$
Freeze	$6.07^{cd} \pm 7$
Animal interaction	$5.77^{cd} \pm 3.388$
Wagging the tail	$2.26^{de} \pm 1.861$
Head movement	$1.73^e \pm 2.053$
Chirp	$1.43^e \pm 3.074$
Body shaking	$0.83^e \pm 0.865$
Drinking	$0.65^e \pm 0.744$
Chattering	$0.59^e \pm 1.004$
Sniffing	$0.59^e \pm 0.605$
Saltate	$0.54^e \pm 1.161$

The most frequent behaviours were walking, head movement, licking and animal interactions. Less frequently seen behaviours were sniffing, drinking and chattering.

Time budgets on resting, walking, lying, eating,

body shaking, licking, wagging the tail, sniffing were not significantly different between rainy and hot day. Behaviors such as freezing, head movement, animal interaction, saltate, running, rumination, chattering and chirping were affected by the climatic condition of the day.

Table 3. Frequencies of behaviours

Behaviour	Frequency of 6 hours in 2 days
Walking	$8.0714^a \pm 2.464$
Head movement	$6.8571^{ab} \pm 1.103$
Licking	$6.7143^{ab} \pm 2.785$
Animal interaction	$6.0714^b \pm 2.2$
Resting	$3.9286^c \pm 2.235$
Eating	$3.0714^{cd} \pm 1.207$
Wagging the tail	$2.7143^{cde} \pm 1.729$
Rumination	$2.4286^{def} \pm 1.284$
Freeze	$2.1429^{defg} \pm 2.107$
Body shaking	$2.0000^{defg} \pm 1.840$
Lying	$1.5000^{efg} \pm 1.16$
Running	$1.2857^{efg} \pm 1.204$
Chirp	$1.1429^{fg} \pm 1.834$
Saltate	$1.0000^{fg} \pm 1.710$
Sniffing	$0.9286^{fg} \pm 0.829$
Drinking	$0.7857^g \pm 0.893$
Chattering	$0.6429^g \pm 0.842$

Conclusion

The most frequent behaviours were walking, head movement, licking and animal interactions. Less frequently seen behaviours were sniffing, drinking and chattering. Time budgets on resting, walking, lying, eating, body shaking, licking, wagging the tail, sniffing was not significantly different between rainy and hot day. It is concluded that goats kept in stilted houses spend one third of their time budget on eating but very little time on drinking.

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