

Behavior of Goats Subjected to Different Social Isolation Treatments

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Abstract

Social isolation can be stressful to goats when they are separated from the herd for veterinary care or prior to slaughter. This experiment was conducted to determine the behavior responses in goats during isolation with or without visual contact with conspecifics. Forty-eight uncastrated male Spanish goats (8-mo old) were randomly assigned to one of four isolation (TRT) pens (1.5 x 1.5 m) with metal grill panels: (i) open grill with no visual contact with conspecifics (IO), (ii) covered panels to prevent visual contact (IC), (iii) covered panels with a 30 cm x 30 cm window on one side to allow visual contact with conspecifics (IW), or (iv) open grill to allow visual contact with conspecifics (IV, control), for 90 min (n=12 goats/TRT). Behaviors were recorded by four trained individuals. Frequency of vocalization was recorded continuously, and moving, standing, climbing, lying, and visual contact behaviors, in addition to spatial location, were recorded at 5-min intervals, but grouped into 30-min blocks (TIME). The data were analyzed using Friedman's Two-Way ANOVA by Ranks Test in SAS; however, unranked data means are presented instead of median to show the effect of time within each isolation treatment.

Both TRT and TIME had significant effects ($P < 0.01$) on frequency of vocalization, with mean values of 44.1, 16.6, 4.3, and 2.1 (SEM = 4.58), respectively in IO, IC, IW, and IV groups. Vocalization was highest during the first 30-min period and decreased over time with mean frequencies of 26.9, 12.4, and 11.4 (SEM = 2.43), respectively during 30, 60, and 90 min. Frequencies of climbing and lying behaviors were the highest ($P < 0.01$) in the IC treatment. Goats in IC group also spent more time facing the corner of the pen. The results indicate that goats with no visual contact with conspecifics spend more time vocalizing or trying to escape the pen, which may indicate distress.

Key Words: Behavior, Goats, Social isolation

Introduction

Goats are isolated from their herd or pen-mates to prevent spread of disease, provide veterinary care, or prepare for slaughter when kept in single file races. Isolation of goats from their social group can cause increased distress. When social isolation is combined with other factors such as feed deprivation, the stress level could increase further (Kannan et al., 2002). Stress is also higher when isolated goats cannot maintain visual contact with other animals compared to those that can see other animals. Data on the effects of isolation stress in goats with or without visual contact with conspecifics on behavioral responses are not available in the literature.

Objective

The objective of this experiment was to determine the effects of different short-term social isolation treatments on behavioral responses in goats.

Methods

Animals and Treatments

Forty-eight uncastrated male Spanish goats (8-mo old) were randomly assigned to one of four isolation (TRT) pens (1.5 x 1.5 m) with metal grill panels: (i) open grill with no visual contact with conspecifics (IO), (ii) covered panels to prevent visual contact (IC), (iii) covered panels with a 30 cm x 30 cm window on one side to allow visual contact with conspecifics (IW), or (iv) open grill to allow visual contact with conspecifics (IV, control), for 90 min (n=12 goats/TRT). A separate open grill pen with three goats was placed as shown in Figure 1 such that the IV goats could maintain visual contact (VC).

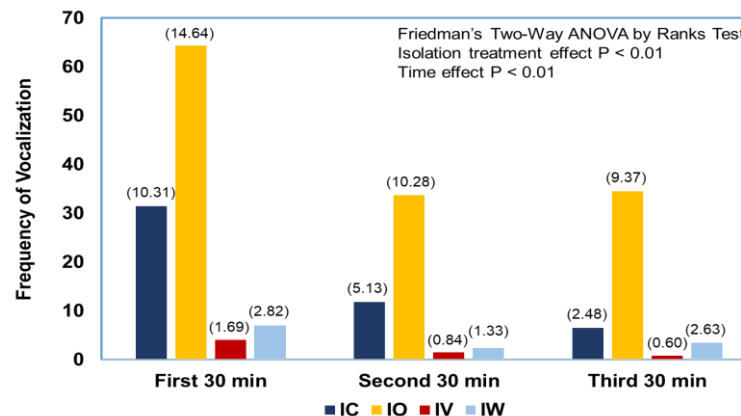
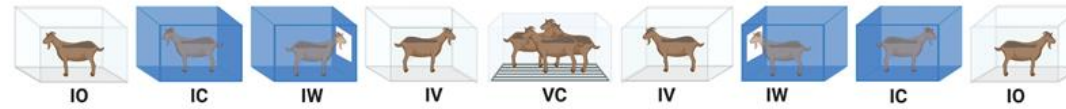


Figure 1. Arrangement of treatment pens.

Figure 2. Mean (±SEM) frequency of vocalization.

Figure 3. Mean (±SEM) frequency of visual contact.

n = 12 goats / treatment
 IC = isolation in covered pen
 IO = isolation in open pen
 IW = isolation with window
 IV = isolation with visual contact
 VC = pen for visual contact

Table 1. Mean frequencies (±SEM) of goat behaviors.

TRT	TIME		
	First 30 min	Second 30 min	Third 30 min
Standing (TRT Effect $P < 0.01$; TIME Effect NS)			
IC	3.6 ± 0.42	3.8 ± 0.39	4.0 ± 0.43
IO	5.1 ± 0.30	5.5 ± 0.25	5.5 ± 0.18
IV	4.5 ± 0.38	4.4 ± 0.42	4.6 ± 0.32
IW	5.0 ± 0.32	5.3 ± 0.32	4.8 ± 0.34
Lying (TRT Effect $P < 0.01$; TIME Effect NS)			
IC	0.8 ± 0.29	1.5 ± 0.39	7.0 ± 5.45
IO	0.0 ± 0.0	0.3 ± 0.23	0.1 ± 0.08
IV	0.7 ± 0.21	1.1 ± 0.32	1.0 ± 0.26
IW	0.4 ± 0.24	0.3 ± 0.18	0.4 ± 0.15
Climbing (TRT Effect $P < 0.01$; TIME Effect NS)			
IC	1.1 ± 0.36	0.6 ± 0.24	0.2 ± 0.10
IO	0.3 ± 0.11	0.1 ± 0.06	0.3 ± 0.12
IV	0.1 ± 0.06	0.0 ± 0.0	0.0 ± 0.0
IW	0.2 ± 0.13	0.1 ± 0.09	0.3 ± 0.16

Table 2. Mean frequencies (±SEM) of goat locations.

TRT	TIME		
	First 30 min	Second 30 min	Third 30 min
Facing Corner, FC (TRT Effect $P < 0.01$; TIME Effect NS)			
IC	2.0 ± 0.34	2.0 ± 0.39	1.9 ± 0.41
IO	1.3 ± 0.31	0.9 ± 0.26	1.2 ± 0.29
IV	1.0 ± 0.25	0.8 ± 0.22	1.2 ± 0.26
IW	0.8 ± 0.21	0.8 ± 0.25	0.6 ± 0.25
Facing Side, FS (TRT Effect $P < 0.01$; TIME Effect NS)			
IC	3.0 ± 0.33	2.5 ± 0.38	3.0 ± 0.41
IO	3.3 ± 0.33	3.3 ± 0.28	3.2 ± 0.39
IV	4.0 ± 0.28	3.7 ± 0.34	3.3 ± 0.36
IW	4.3 ± 0.29	3.9 ± 0.31	4.3 ± 0.36
Middle, MI (TRT Effect $P < 0.01$; TIME Effect NS)			
IC	0.4 ± 0.16	0.5 ± 0.17	0.4 ± 0.13
IO	1.0 ± 0.23	1.3 ± 0.26	1.2 ± 0.31
IV	0.6 ± 0.16	1.1 ± 0.29	0.9 ± 0.20
IW	0.7 ± 0.19	0.8 ± 0.25	0.6 ± 0.17

Behavioral Observations

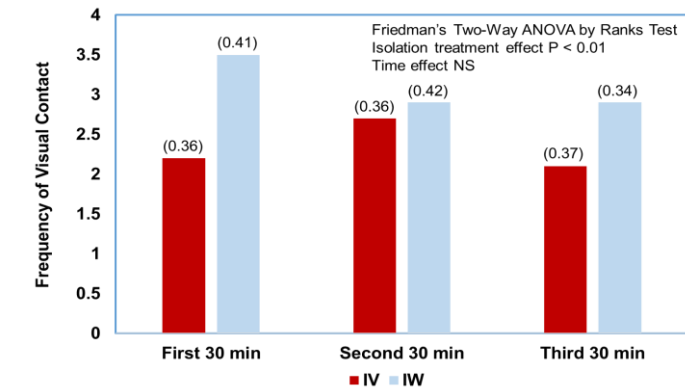
Behaviors were recorded by four trained individuals. Frequency of vocalization was recorded continuously, and moving, standing, climbing, lying, and visual contact behaviors, in addition to spatial location, were recorded at 5-min intervals, but grouped into 30-min blocks (TIME).

Statistical Analysis

The data were analyzed using Friedman's Two-Way ANOVA by Ranks Test (non-parametric) in SAS; however, unranked data means are presented instead of median to show the effect of time within each isolation treatment.

Results

Vocalization was the highest in IO group (Figure 2) and the frequency of visual contact was higher in the IW group than in the IV group (Figure 3). Frequencies of climbing (Table 1) and facing the corner of the pen (Table 2) were the highest in the IC group.



Conclusions

Goats vocalize more when they cannot maintain visual contact with their conspecifics, and vocalization decrease with increasing time in isolation. Goats in an isolation pen with a window spend more time maintaining visual contact even when it requires standing in the same location for extended time. Animals in a covered pen make more attempts to escape the pen. Ability to maintain visual contact with conspecifics when isolated could reduce distress in goats.

Reference

Kannan, G., T. H. Terrill, B. Kouakou, S. Gelaye, and E. A. Amoah. 2002. Simulated pre-slaughter holding and isolation effects on stress responses and live weight shrinkage in meat goats. *J. Anim. Sci.* 80:1771-1780.