

STUDY ON FEEDING AND RUMINATION BEHAVIOR IN THREE MONTHS OF AGE ROMANIAN BLACK AND WHITE CALVES

STUDIUL COMPORTAMENTULUI DE HRĂNIRE ȘI RUMEGARE LA TINERETUL DE RASĂ BĂLȚATĂ CU NEGRU ROMÂNEASCĂ ÎN VÂRSTĂ DE 3 LUNI

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The aim of this paper was to measure the main aspects that characterize the feeding and rumination behavior of three months old calves. During the experiments, the following feeding and rumination behavior aspects were determined: number of feeding periods, the length of feeding periods, number of ruminating periods, and the length of rumination periods. Data was computed using ANOVA/MANOVA. Results showed that calves spent feeding, on average, 182 minutes in the morning, representing 38% of that time period, 118 minutes in the afternoon, respectively 25% of the 8-hour time frame and only 69 minutes during the night (14%). Calves ruminate, on average, more during the night (138 minutes) compared with morning and afternoon (104 and 107 minutes, respectively). The length of a rumination period was between 24 minutes in the morning and 30 minutes during the night. Calves ruminated, on average, 331 minutes in the first day of the experiment, respectively 23% of the day length and 367 minutes in the second day (25.5% of the day time).

Key words: calves, feeding behavior, rumination behavior, Romanian Black and White

Introduction

In the last years major progresses in video recording devices, the reduced costs for video cameras and video recorders made possible very precise studies of cattle behavior. Very precise data obtained from those studies were used to develop new and better technologies for cattle.

Feeding behavior is one of the most important behaviors with a big influence on the animal production. A long time spent feeding increases the animal production.

Rumination behavior is also very important especially for young ruminants. Farmers are interested in having calves that ruminate as soon as possible.

This paper presents a study of feeding and rumination behavior of dam-calf couple during the first week after calving.

Materials and Methods

Researches were carried out during the winter season in January 2007 at the university research farm, on a number of 10 three-month old calves from Romanian Black and White breed.

Calves were regrouped after weaning and housed in two 4.1 x 5.0 m pens bedded with straw.

The behavior of calves was video recorded for a period of two days.

To record the behavior of calves a surveillance video system was used. The system consisted in 4 CCTV (CC9622BIR) cameras with a 720 x 480 video resolution connected to a PC unit which had the capacity to store images at 125 frames per second. The video system recorded in a digital format and had software that allowed editing the recordings. The video system permitted to record the date and hours in a mode that included minutes and seconds, which helped the timing process.

Calves were fed with 2 kg of concentrates mixture and 3 kg of alfalfa hay per head.

For a better interpretation, the recorded material was divided in three periods for every 24 hours of surveillance: 07:00 to 15:00 (morning), 15:00 to 23:00 (afternoon) and 23:00 to 07:00 (night).

In the processing of recorded data, the feeding and rumination behavior was observed for calves by counting and timing the periods.

Data obtained from these observations was processed with ANOVA/MANOVA.

Results and Discussions

The length of one feeding period was 23.9 minutes in the afternoon (15:00-23:00), 29 minutes in the morning and during the night (Table 1).

Calves were feeding less times during the night (2.56 feeding periods) and almost double times during the morning and in the afternoon (6.25 and 5.16 feeding periods). There were significant differences between morning and afternoon ($p < 0.05$), between morning and night ($p < 0.001$) and between afternoon and night ($p < 0.001$) for number of feedings.

Figure 1 presents the average value for the time spent feeding by calves. Calves spent feeding, on average, 182 minutes in the morning, representing 38% of that time period, 118 minutes in the afternoon, respectively 25% of the 8-hour frame and only 69 minutes during the night (14 %). The differences between morning and afternoon were significant ($p < 0.01$), also the differences between afternoon and night, and night and morning were significant ($p < 0.001$) for this trait.

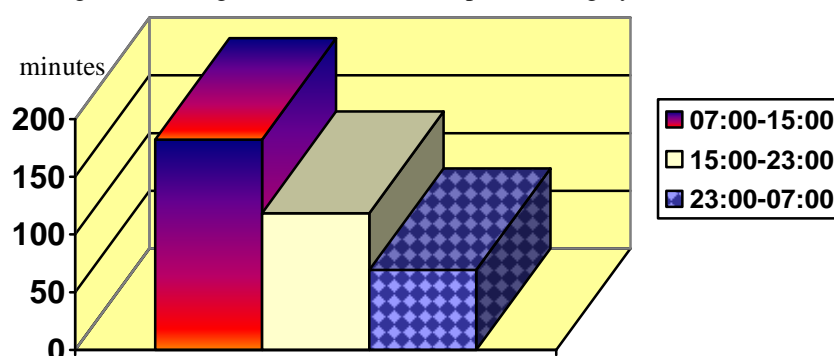
Table 2 presents the daily variation of the rumination behavior. From the table results that calves ruminate, on average, more during the night (138 minutes) compared with morning and afternoon (104 and 107 minutes, respectively).

Table 1

Feeding behavior of three-month old calves (daily variation)

Day period		07:00-15:00	15:00-23:00	23:00-07:00
Feeding periods	X±SEM	6.25±0.33	5.16±0.27	2.56±0.27
	SD	1.48	1.17	1.21
	v%	23.7	22.6	43.5
Total length of feeding periods (min.)	X±SEM	182.3±14.40	118.3±9.78	69.5±6.31
	SD	64.20	42.62	27.49
	v%	35.2	36.0	39.5
Length of a feeding period (min./period)	X±SEM	29.22±1.64	23.90±2.18	29.18±2.59
	SD	7.32	9.49	11.31
	v%	25.04	39.72	38.75

Figure1: Average values for the time spent feeding by calves



The length of one rumination period was between 24 minutes in the morning and 30 minutes during the night.

From Table 2 we can also observe that calves ruminated during 3.63 periods in the afternoon, 4.31 periods during the morning and 4.68 periods during the night.

Table 2

Rumination behavior of three-month old calves (daily variation)

Day period		07:00-15:00	15:00-23:00	23:00-07:00
Rumination periods	X±SEM	4.31±0.28	3.63±0.17	4.68±0.28
	SD	1.25	0.76	1.25
	v%	28.9	20.9	26.7
Total length of rumination periods (min.)	X±SEM	104.68±7.00	107.05±7.31	138.84±9.48
	SD	30.51	31.87	41.34
	v%	29.1	29.8	29.8
Length of a rumination period (min./period)	X±SEM	24.55±0.94	29.31±1.15	29.98±1.54
	SD	4.11	5.00	6.70
	v%	16.8	17.1	22.4

Table 3 presents the rumination behavior of calves during the 2 days of the experiment. Rumination is an important activity for three-month old calves. Calves were ruminating, on average, 331 minutes in the first day of the experiment respectively 23% of day length and 367 minutes in the second day (25.5 % of the day time).

Calves were ruminating almost the same number of periods, respectively 12 periods in the first day and 13 periods in the second day. The length of one rumination period was 27 minutes in day 1 and 28 minutes in day 2 of the experiment.

Table 3

Rumination behavior of three-month old calves			
Day		Day 1	Day 2
Rumination periods	X±SEM	12.22±0.66	13.00±0.47
	SD	1.99	1.49
	v%	16.2	11.5
Total length of rumination (min.)	X±SEM	331.7±22.3	367.6±16.9
	SD	66.9	53.4
	v%	20.2	14.5
Length of a rumination period (min./period)	X±SEM	27.18±1.28	28.48±1.35
	SD	3.83	4.27
	v%	14.1	15.0

Conclusions

Calves spent feeding on average 182 minutes in the morning, representing 38% of that time period, 118 minutes in the afternoon, respectively 25% of the 8-hour frame and only 69 minutes during the night (14 %).

Calves ruminate, on average, more during the night (138 minutes) compared with morning and afternoon (104 and 107 minutes, respectively).

The length of one rumination period was between 24 minutes in the morning and 30 minutes during the night.

Calves were ruminating, on average, 331 minutes in the first day of the experiment, respectively 23% of day length and 367 minutes in the second day (25.5 % of day time).

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