

STUDY ON THE RESTING BEHAVIOR IN ROMANIAN BLACK AND WHITE PRIMIPAROUS COWS

STUDIUL ASUPRA COMPORTAMENTULUI DE ODIHNĂ LA VACI PRIMIPARE DIN RASA BĂLȚATĂ CU NEGRU ROMÂNEASCĂ

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The study was carried out on 3 Romanian Black and White cows in their first one hundred days of lactation. The aim of this study was to measure the main aspects that characterized the resting behavior of the cows in 24 hours that were divided into 3 day periods: 07:00-14:00, 14:00-21:00, 21:00-07:00. During the experiments, the following resting behavior aspects were determined: number of periods standing, number of periods lying, the length of the periods. Data was computed by ANOVA/MANOVA. Results showed that the cows spent on average 81.83 minutes standing and 25.33 minutes lying in 07:00-14:00 day period, 80.66 minutes standing and 66.33 minutes lying in 14:00-21:00 day period and 47.83 minutes standing and 137.66 minutes lying in 21:00-07:00 interval. The cows spent on average 75.77% standing and 24.23% lying from a first interval length, 55.49% standing and 44.51% lying from a 14:00-21:00 day period and 26.16% standing and 73.84% lying from a 21:00-07:00 interval.

Key words: resting behavior, cows, Romanian Black and White Cows

Introduction

As early as 1928, researchers were investigating the importance of resting and the implication of adequate lying time for cow comfort, health, and productivity.

Recognized benefits of adequate resting activity include: reduced stress on feet, reduced lameness, increased blood flow to the mammary gland, increased feeding activity, and greater overall cow health. Resting is essential to high production. Blood flow to the mammary gland is 21.6% greater than when standing. Blood plasma growth hormone concentration is decreased when cows are prevented from lying for more than 14 hours per day.

Rumination occurs in 80% of all resting bouts. The advantages of adequate rumination activity are obvious and involve maintenance of ruminal conditions

conducive to efficient microbial fermentation. After a 3 hour period without being allowed to lie down or eat, cows chose to lie down rather than eat. Although dietary physically effective fiber drives rumination activity, social stress, such as overcrowding and excessive competition for feed and stalls, can reduce rumination activity significantly.

Cows attempt to maintain a rather fixed amount of lying time, and their well-being is impaired when lying time is restricted for several hours. Within 10 h, approximately 50% of lost resting activity has been recouped in most cases. When lying and eating are restricted simultaneously, cows choose to rest rather than eat, with an additional 1.5 hours/day standing time associated with a 45 minutes reduction in feeding time.

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

This paper presents a study of resting behavior of cows during the 24 h.

Materials and Methods

Investigations were carried out in the S.D.T. of the U.S.A.M.V.B Timișoara during the winter season. The biological material in the study was 3 Romanian Black and White cows at first freshening, in their first one hundred days of lactation.

In our research we studied some aspects that characterized the resting behavior: number of periods standing, number of periods lying, the length of the periods. The behavior of cows was video recorded for two consecutive days.

For a better interpretation the recorded material was divided in three periods for every 24 hours of surveillance: 07:00 to 14:00, 14:00 to 21:00 and 21:00 to 07:00.

Data obtained from these observations was processed and statistical interpreted with ANOVA-MANOVA.

Results and Discussion

Daily average values and dispersion indices for resting behavior are presented in Table 1.

Cows spent, on average, 81.83 minutes standing, in 3.33 periods representing 75.77% from the total resting time and 25.33 minutes lying, in 2.33 periods, representing 22.4% from the total resting time in 07:00-14:00 day interval. The length of a standing period was 23.59 minutes and the length of a lying period was 8.29 minutes.

In 14:00 – 21:00 interval of a day, cows spent 80.66 minutes standing in 6.3 periods representing 55.49 % from the total resting time and 66.33 minutes lying in 2.5 periods, representing 44.5%.

Table 1

Resting behavior of the cows

Day period		07:00 - 14:00	14:00 - 21:00	21:00 - 07:00
Number of standing periods	X±SEM	3.33±0.33	6.33±0.49	5.00±0.36
	SD	0.81	0.89	1.20
	v%	24.5	17.8	18.9
Total time spent standing (min.)	X±SEM	81.83±14.78	80.66±3.59	47.83±4.79
	SD	36.2	8.79	11.73
	v%	44.2	10.9	24.5
Length of a standing period (min./period)	X±SEM	23.59±2.42	16.67±1.68	7.55±0.52
	SD	5.92	4.1	1.27
	v%	25.1	24.6	16.8
Number of lying periods	X±SEM	2.33±0.66	2.50±0.56	8.16±0.40
	SD	1.61	1.37	0.97
	v%	69.3	54.8	11.9
Total time spent lying (min.)	X±SEM	25.33±11.83	66.33±8.22	137.66±11.64
	SD	28.9	20.1	28.5
	v%	114.38	30.3	20.7
Length of a lying period (min./period)	X±SEM	8.29±2.90	32.83±5.96	17.05±1.62
	SD	7.1	14.4	3.9
	v%	85.6	44.0	23.2
Total time spent resting	X±SEM	107.16±8.54	147.00±6.94	185.50±10.88
	SD	20.9	16.9	26.4
	v%	19.5	11.5	14.2
% of standing time	X±SEM	75.77±10.40	55.49±3.57	26.16±2.83
	SD	25.4	8.7	6.9
	v%	33.6	15.75	26.4
% of lying time	X±SEM	24.22±10.40	44.50±3.57	73.83±2.83
	SD	25.4	8.7	6.93
	v%	10.5	19.6	9.38

In the night interval, the number of periods was 5.00 for standing and 8.16 for lying position. Total time spent standing was only 47.83 minutes representing 26.16% and total time spent lying was 137.66 minutes, representing 73.83 % from total resting time on that interval.

Significance of differences for resting behavior between the three day periods is shown in Table 2.

The significant differences ($p < 0.001$) was observed between 07:00 – 21:00 and 21:00 – 07:00 intervals for: number of standing periods, length of a standing period, for number of lying, for total time spent lying, total resting time, percentage of a standing time and percentage of a lying time from total resting time.

Table 2

Significance differences for resting behavior between three day periods

Day period	07:00 - 14:00 vs 21:00 - 07:00	07:00 - 14:00 vs 14:00 - 21:00	14:00 - 21:00 vs 21:00 - 07:00
Number of standing periods	***	*	*
Total time spent standing (min.)	*	ns (p=0.93)	*
Length of a standing period (min./period)	***	*	**
Number of lying periods	***	ns (p=0.83)	***
Total time spent lying (min.)	***	*	***
Length of a lying period (min./period)	ns (p=0.13)	***	*
Total time spent resting	***	**	**
% of a standing time	***	*	**
% of a lying time	***	*	**

*p < 0.05; **p < 0.01; ***p < 0.001

The differences for the length of a lying periods was non-significant (p=0.13) because the variability coefficient was the highest (v%=85.60%).

Between 7:00-14:00 and 14:00-21:00 intervals, the differences for resting behavior was significant (p<0.001 and p<0.05). Just only for total time spent standing and number of lying periods, the differences was non-significant (p=0.93 and p=0.83, respectively).

Between 14:00-21:00 interval and the night interval the differences for resting behavior was, on average, very significant (p<0.01) and significant (p<0.05). A distinct significant difference was for number of lying periods and total time spent lying.

Conclusions

- In the first day interval, cows spent, on average, 81.83 minutes standing and 25.33 minutes lying.

- In 14:00-21:00 interval the time spent standing and lying was approximately equal.

- In the night interval, the time spent in lying (137.66 minutes) was higher than the time spent standing (47.83 minutes).
- Total time spent resting was, on average, 107.16 minutes from which 75.77% was standing and 24.22% was lying in the first period of a day.
- Total resting time during 14:00-21:00 interval was 147.00 minutes and the percentage for the two positions was close (55.4% for standing and 44.5% for lying).
- In the night interval the cows spent 73.83% in lying and 26.16% in standing position from total resting time.

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Studiul a fost efectuat pe un număr de 3 vaci primipare din rasa Bălțată cu negru românească, aflate în prima sută de zile de lactație. Scopul acestui studiu a fost determinarea principalelor aspecte care caracterizează comportamentul de odihnă al vacilor în 24 de ore împărțite în 3 perioade: 07:00-14:00, 14:00-21:00, 21:00-07:00. În timpul experimentelor au fost urmărite următoarele aspecte ale comportamentului de odihnă: numărul perioadelor de odihnă petrecute în poziție ortostatică, numărul perioadelor petrecute în decubit, durata perioadelor. Datele au fost prelucrate statistic folosind analiza varianței și comparate între ele cu ajutorul testului ANOVA/MANOVA. Datele arată că vacile au petrecut în medie 81,83 minute în poziție ortostatică și 25,33 minute în decubit în primul interval de timp, apoi 80,66 minute în poziție ortostatică și 66,33 minute în decubit în intervalul 14:00-21:00 și 47,83 minute în poziție ortostatică și 137,6 minute în decubit în perioada de noapte. Vacile au stat în medie 75,77% în poziție ortostatică și 24,33% în decubit din primul interval de timp, aproximativ în proporții egale pentru cele două poziții în intervalul 14:00-21:00, iar în timpul nopții au stat în poziție ortostatică doar 26,16% din timp pe când în poziție de decubit au stat în proporție de 73,83%.

Cuvinte cheie: comportament de odihnă, vaci, Bălțată cu negru românească