Study on the Excretion Behaviour in Romanian Black and White Primiparous Cows. Number of Defecations

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Abstract
The study was carried out on 9 Romanian Black and White cows in their first hundred days of lactation. The aim of this study was to measure the main aspects that characterized the excretion behaviour (defecation) of the cows in 24 hours that were divided into 3 day periods: 07:00-14:00 (I_1), 14:00-2:001 (I_2), 21:00-07:00 (I_3). During the experiments, the following defecation behaviour aspects were determined: total number of defecations, number of defecations in the three intervals, number of defecations according to administration order of forages (fibrous-succulents and succulents-fibrous). Data was computed by ANOVA/MANOVA. Results showed that the differences between intervals I_1-I_2 and I_1-I_3 were statistically very significant ($p< 0.01$). In fibrous – succulent order the defecation were 0.69 higher than in succulent- fibrous order ($p< 0.01$). Total number of defecation resulted by summing the defecation from the three intervals, was 14.67 in the first administration order (fibrous-succulent) and 12.61 in the second administration order (succulent-fibrous).

Keywords: behaviour, cows, defecation, Romanian Black and White.

1. Introduction

Elimination in cattle is a spontaneous reflex, and has place while the animal is standing or walking. The quantity of matter eliminated in normal conditions, is estimated to be 6-7% of their body weight, resulting 40-50 kg of faeces per 24 h [1,2] Defecation frequency is on average about 12 times a day. [3,4].
On average, cows defecate between 8 to 16 times during a day's interval [1,5,6]. A decrease in excretion has been observed during resting time, most likely due to the lack of movement. Usually cows defecate or urinate soon after changing lying to standing position.
This paper presents a study of defecation behaviour of cows during 24 h, which is the total number of defecations and number of defecations according to administration order of forages (fibrous-succulents and succulents-fibrous) .

2. Materials and methods

Investigations were carried out in S.D. of the U.S.A.M.V.B Timişoara during the winter season. The biological material in the study was 9 Romanian Black and White cows at first freshening, in their first hundred days of lactation. In our researches we studied some aspects that characterized the excretion behaviour (defecation) of the cows in 24 hours.
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. During the experiments, the following defecation behaviour aspects were determined: total number of defecations, number of defecations in the three intervals, number of defecations according to administration order of

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forages (fibrous-succulents and succulents-fibrous). Data obtained from these observations was processed and statistical interpreted with ANOVA/MANOVA.

3. Results and discussion

Daily average values and dispersion indices for number of defecations are presented in Table 1.

In the first administration order of forages O1 (fibrous-succulents), in the first hour interval (07:00-14:00) the number of defecation was 5.28, in 14:00 – 21:00 interval of a day period was 5.45 and in the night interval (21:00 – 07:00) the number of defecation was 3.94.

In the second administration order of forages O2 (succulents- fibrous), the number of defecations was: 4.67 in the first and second intervals and 3.28 in the night interval.

Irrespective to administration order, the number of defecations observed was: 4.97 in 07:00-14:00 interval (I_1), 5.06 in 14:00 – 21:00 interval (I_2) and 3.61 in 21:00 – 07:00 (I_3). Irrespective to hour's interval the number of defecations was 4.89 in fibrous-succulents order and 4.20 in succulents-fibrous order. Number of defecations, irrespective to administration order and hours interval, was 4.55.

Total number of defecations resulted by summing the defecations from the three intervals, was 14.67 in the first administration order (fibrous-succulent) and 12.61 in the second administration order (succulent-fibrous).

Total number of defecations, irrespective to administration order and hours interval, was 13.64. In the Table 2 are shown significance of differences for the number of defecations between the three day periods.

Hours interval had an influence on the number of defecations, in a way that, both for the fibrous-succulent and succulent-fibrous order, there were statistically very significant differences ($p<0.001$), the number of defecations being higher in I_1 and I_2 intervals compared to the night hour interval. In the first hour interval (07:00-14:00) the number of defecation was 1.34 higher (in O1) and 1.39 higher (in O2) than in the in the night interval (21:00 – 07:00). Between I_2 and I_3 intervals, the differences was very significant ($p<0.001$), in favour of I_2 interval, in both administration order.

Administration order of the forages had an influence on the defecations. In the first interval I_1, the number of defecations was 0.61 higher in O1 order than in order O2 ($p<0.05$). In the second interval (14:00 – 21:00), the number of defecations was 0.78 higher in O1 order than in order O2 ($p<0.01$). An significant difference was in I_3 interval ($p<0.05$), the number of defecations was 0.66 higher in O1 order than in order O2

Irrespective to hour interval, for fibrous-succulent order the number of defecations was 0.69 higher than for the succulent-fibrous order ($p<0.01$).

The total number of defecations in the first administration order (fibrous-succulent) was 2.06 higher than in the second order (succulent-fibrous).

Table 1. Averages and dispersion indices for the number of defecations

	Specification	Average	SEM	SD	v%
O1	I_1 (07°°-14°°)	5.28	0.14	0.44	8.33
	I_2 (14°°-21°°)	5.45	0.26	0.80	14.67
	I_3 (21°°-07°°)	3.94	0.13	0.39	9.89
O2	I_1 (07°°-14°°)	4.67	0.14	0.43	9.20
	I_2 (14°°-21°°)	4.67	0.26	0.79	16.91
	I_3 (21°°-07°°)	3.28	0.14	0.44	13.41
Irrespective to administration order	I_1 (07°°-14°°)	4.97	0.12	0.52	10.46
	I_2 (14°°-21°°)	5.06	0.20	0.87	17.19
	I_3 (21°°-07°°)	3.61	0.12	0.53	14.68
Irrespective to hours interval	O1	4.89	0.16	0.88	17.99
	O2	4.20	0.16	0.86	20.41
Irrespective to administration order and hours interval		4.55	0.12	0.93	20.43
Number of defecation / 24 hours (I_1+ I_2+ I_3)		O1		14.67	
		O2		12.61	
Number of defecation/24 hours (I_1+ I_2+ I_3), *irrespective to administration order*		13.64			

Table 2. Averages and significance of differences for the number of defecations

Specification	Hours intervals			Differences and significance			Differences and significance		
	I_1	I_2	I_3	$I_1 - I_2$	$I_1 - I_3$	$I_2 - I_3$	I_1 O1-O2	I_2 O1-O2	I_3 O1-O2
O1	5.28	5.45	3.94	-0.17^{ns}	1.34^{***}	1.51^{***}	0.61^{*}	0.78^{**}	0.66^{*}
O2	4.67	4.67	3.28	-0.00^{ns}	1.39^{***}	1.39^{***}			
Irrespective to administration order	4.97	5.06	3.61	-0.09^{ns}	1.36^{***}	1.45^{***}	-		
Irrespective to hours interval	O1-O2						0.69^{**}		
Number of urination / 24 hours ($I_1 + I_2 + I_3$)	O1-O2						2.06^{***}		

$p<0.05^{*}$, $p<0.01^{**}$, $p<0.001^{***}$

4. Conclusions

►Hours interval had an influence on the number of defecations, in a way that, both for the fibrous-succulent and succulent-fibrous order, there were statistically significant differences, the number of defecations being higher in I_1 and I_2 intervals compared to the night hour interval.

►Administration order of the forages had an influence on the defecations; for fibrous-succulent order the number of defecations was 0.69 higher than for the succulent-fibrous order ($p<0.01$).

►The total number of defecations in the first administration order (fibrous-succulent) was 14.67, while in the second order (succulent-fibrous) 12.61.

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