Lucrări ştiinţifice **Zootehnie şi Biotehnologii**, vol. **41 (2)** (**2008**), Timişoara

RESEARCHES REGARDING CONSUMPTION SPEED OF FORAGES IN MULTIPAROUS ROMANIAN BLACK AND WHITE COWS DURING COLD SEASON. 1. ADMINISTRATION OF RATION IN TWO PORTIONS

CERCETĂRI PRIVIND VITEZA DE CONSUM A FURAJELOR LA VACILE MULTIPARE DIN RASA BĂLȚATĂ CU NEGRU ROMÂNEASCĂ ÎN SEZONUL RECE. 1. ADMINISTRAREA RAȚIEI ÎN DOUĂ TAINURI

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The aim of this research was to describe some aspects regarding the intake behavior, during cold-season in Romanian Black and White cows. Researches were carried out on 10 multiparous cows (in their first 100 days of lactation), housed in a tied stanchion barn 24 hours per day. During current study the consumption speed for varied forages type, specific during cold season (corn silage, pasture hay, concentrates and brewer's yeast) was pursued. Forages were offered in two equal portions each day. Portions were provided to cows in different orders, corn silage – pasture hay (variant A) or pasture hay – corn silage (variant B). Intake rate (consumption speed) was calculated in minutes per kilograms of raw feed. Average consumption speed values were calculated as follows: concentrates 3.32 min/kg, pasture hay 22.27 min/kg, corn silage 4.41 min/kg and brewer's yeast an average of 2.10 min/kg.

Key words: consumption speed, multiparous cows, Romanian Black and White

Introduction

The transition period from the non-lactating to lactating status imposes enormous stress on the dairy cow.

Little research has focused specifically on the intake behavior in transition cows. Total intake of forages in cows is correlated with the consumption speed of forages. Dairy cows that are in the beginning of the lactation period achieve greater intake by increasing meal size and spending less time eating and ruminating per unit of intake (2), feed intake and meal patterns in cattle differ by parity.

Factors that may influence feed intake during this stage of lactation are housing, environment, age, breed, feeding strategy and systems, competition for feed, milk yields of the cows, social dominance and physiological status (1, 2, 4).

These factors which modulate feeding behavior can be optimized to promote intense feeding and maximum dry matter intake following parturition.

In the literature are different opinions on the subject of the recommended order in administrating forages to cows during meals. Knowing that consumption speed of forages is great influenced by the appetite of the animal, and this diminishes once the animal is starting to eat.

Objectives of this experiment were to study the main features regarding consumption speed of forages in multiparous Romanian Black and White cows during the cold-season, cow that are in their first 100 day of lactation.

Materials and Methods

In the current study 10 Romanian Black and White multiparous cows (parity = 3.1) were used. Cows were housed in a tied stanchion barn at the Didactical Farm of the Banat University of Agricultural Sciences and Veterinary Medicine Timișoara. The experiment was carried out during the cold-season, in February 2007.

Monitored cows were in their first hundred days of lactation, and had an average daily yield of 15.7 liters of milk, with an average body weight of the cows of 617 kg.

During the experimental period, cows were fed a diet consisted in 20 kg corn silage, 8 kg of pasture hay, 3 kg of concentrates and 2 kg of brewer's yeast. Fresh feed was provided twice daily at 06:30 and 16:30. Corn silage was administrated in two portions of 10 kg each. Pasture hay was administrated also in two portions of 4 kg each. Concentrates were fed to the cows only during morning portion after the consumption of the corn silage and pasture hay. Brewer's yeast was offered during evening portion. The experimental period was divided in two variants, during first three days cows were given the forages in the order corn silage – pasture hay (variant A), and after that next three days in the order pasture hay – corn silage (variant B). Cows were milked twice a day at approximately 05:00 and 17:00.

During the experiment, portions and leftovers were measured using an electronically scale. Consumption speed of the forages was calculated in minutes per kilograms raw forage.

Data regarding environmental temperature was recorded three times a day, at 07:00, 13:00 and 01:00. Average air temperature during the experiment was 5.5°C outside the barn and 8.1°C inside, with a minimum outside temperature of -1.2°C.

The barn was under continuous natural and/or artificial lightning. All the cows were treated as a single group and had free access to water.

Consumption speed behavior was monitored using 4 video cameras (CC9622BIR) connected to a video capture device of 125 fps with four channels. Video recordings were analyzed by continuous observation for each monitored cow.

Results and Discussions

Averages and dispersion indices for the calculated parameters are presented in Tables 1, 2 and 3. In the first two tables, averages for consumption speed of the forages are presented in administrating order of the meals pasture hay - corn silage (Table 1) and corn silage – pasture hay (Table 2). In Table 3 the average indices for both experimental variants are offered.

Analyzing data from Tables 1 and 2, it can be observed that when the pasture hay is administrated before the corn silage, consumption speed diminishes with 5 minutes/kg raw forage.

During morning meals, for variant A, average consumption speed was 28.32 min/kg (with limits ranging 24.6 and 31.35) and for variant B a mean intake rate of 23.32 min/kg (with limits ranging 18.97 and 25.93).

Speed consumption of the pasture hay, during evening meals was less influenced by the administrating order of the forages. For variant A of the experiment, mean intake rate for the pasture hay was 18.44 min/kg (with limits ranging from 16.02 to 20.90) and for variant B an average consumption rate of 19.01 min/kg (with limits ranging from 17.51 to 21.65). In this case consumption speed of the pasture hay was higher for variant A, with an average of 0.66 min/kg.

Table 1

Averages and dispersion indices for consumption speed in variant A, minutes per kg raw feed

Portion	Forage type	n	X±SEM	SD	V (%)	Min	Max
Portion 1	Concentrates	10	3.73 ± 0.23	0.73	19.75	2.44	4.80
	Pasture hay	10	28.32 ± 0.68	2.15	7.60	24.60	31.35
	Corn silage	10	5.07 ± 0.26	0.84	16.71	3.30	5.76
Portion 2	Pasture hay	10	18.44 ± 0.48	1.52	8.25	16.02	20.90
	Corn silage	10	3.85 ± 0.07	0.25	6.51	3.45	4.29
	Brewer's yeast	10	1.95 ± 0.11	0.37	19.33	1.35	2.59

Intake rate for corn silage is less influenced by the order of administrating in the portion, fact observed by others researchers, too. Average consumption speed for this forage sort was 4.41 min/kg (with limits between 3.05 and 5.83). Between the two experimental variants, during the first meal administrated, were differences only by 0.5 min/kg.

Table 2

Averages and dispersion indices for consumption speed in variant B, minutes per kg raw feed

Portion	Forage type	n	X±SEM	SD	V (%)	Min	Max
Portion 1	Concentrates	10	2.91 ± 0.17	0.53	18.52	2.29	3.81
	Pasture hay	10	23.32 ± 0.63	2.01	8.63	18.97	25.93
	Corn silage	10	5.12 ± 0.13	0.43	8.41	4.61	5.83
Portion 2	Pasture hay	10	19.01 ± 0.42	1.35	7.11	17.51	21.65
	Corn silage	10	3.61 ± 0.19	0.61	17.02	3.05	5.02
	Brewer's yeast	10	2.26 ± 0.20	0.70	31.18	1.32	3.29

Consumption speed for concentrates was influenced by the order of administrating the forages during meals. Intake rate was, on average, 3.74 min/kg (with limits ranging between 2.44 and 4.80) during variant A, and an average consumption speed of the concentrates of 2.91 min/kg (with limits ranging between 2.29 and 3.81) for variant B of the experiment. Difference between the two variants was 0.37 min/kg higher intake rate for variant B.

Table 3

Averages and dispersion indices for speed consumption of forages in administrating of the ration in two meals, minutes per kg raw feed

Forage type	n	X±SEM	SD	V (%)	Min	Max
Concentrates	10	3.32 ± 0.24	0.75	22.83	2.29	4.80
Pasture hay	10	22.27 ± 1.38	4.37	19.63	16.02	31.35
Corn silage	10	4.41 ± 0.28	0.89	20.29	3.05	5.83
Brewer's yeast	10	2.10 ± 0.18	0.57	27.12	1.32	3.29

Intake rate for the brewer's yeast was influenced by the order of administrating of forages into the meals. Mean consumption speed for this sort was 1.95 min/kg (with limits from 1.35 to 2.59) during variant A, and a mean of 2.26 min/kg (ranging from 1.32 to 3.29) registered in variant B. For brewer's yeast, the highest intake rate was in variant A, difference between the A and B variants was 0.31 min/kg.

Conclusions

Consumption speed for corn silage varied very little between the two types of administrating order, highest intake rate was registered during evening portion (3.61; 3.85 min/kg) with an average consumption speed of 4.41 min/kg.

For pasture hay the average consumption speed was 22.27 min/kg, and the peak intake rate was registered during the second portion of the day (evening meal).

During concentrates consumption, the average consumption speed registered was 3.32 min/kg. Between the two experimental variants, the highest intake rate was observed when the portion was administrated in the order pasture hay – corn silage.

Intake rate for brewer's yeast was 2.10 min/kg, with the maximum consumption speed (1.95 min/kg) in administrating order corn silage – field hay.

Average consumption speed calculated for all studied forage sorts during the experiment are comparable with data from the literature.

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