

RESEARCHES REGARDING CONSUMPTION SPEED OF FORAGES IN MULTIPAROUS ROMANIAN BLACK AND WHITE COWS DURING COLD SEASON.

2. ADMINISTRATION OF RATION IN THREE PORTIONS

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

2. ADMINISTRAREA RAȚIEI ÎN TREI TAINURI

GAVOJDIAN D., STANCIU G., CZISZTER L.T., TRIPON I., ACATINCĂI S.,
ERINA SILVIA

Faculty of Animal Sciences and Biotechnologies, Timișoara, România

Two experiments were conducted to examine the effect that the order of administering forages into the portion has on the consumption speed of the forages. Experiments A (order corn silage-pasture hay) and B (order pasture hay-corn silage) involved 10 multiparous Romanian Black and White cows. Cows were in their first 100 days of lactation and were housed in a tied stanchion barn 24 hours per day. Ration offered comprised corn silage (20 kg), pasture hay (8 kg), concentrates (3 kg) and brewer's yeast (2 kg). Cows were fed three times per day, at 7:00, 13:00 and 19:00. Consumption speed was calculated in minutes per kilograms of raw feed. Average consumption speed values were calculated as follows: concentrates 3.04 min/kg, pasture hay 25.45 min/kg, corn silage 4.96 min/kg and brewer's yeast 2.34 min/kg.

Key words: intake rate, forages, portion, Romanian Black and White, cows

Introduction

Recent literature was surveyed to determine the importance of eating time and rate and rumination time. In cattle, eating time ranges from 2.4 to 7.2 hours per day with an average of 4.8 hours.

It is common known that early lactating cows do not eat as much feed as they do at three to four months into lactation even though the level of milk production may be the same. Feed intake lags behind peak milk production by about two to four weeks. These results in a negative energy balance, as such, body reserves mobilized to overcome the energy deficit, which results in some body weight loss. In early lactation, the energy and especially the protein, available from body stores can supply only a limited amount of cow's needs. To maximize the forage intake in lactating cows, we have administrated the ration in three portions, knowing that the

consumption speed is correlated with the total intake of the forages. Some authors suggest that in dairy cattle are three main intake bouts during a day (dawn, afternoon and dusk).

This experiment's objectives were to study the main features regarding consumption speed of forages in multiparous Romanian Black and White cows, during cold season, with the administration of the feed in three portions per day.

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.

Cows monitored 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 three times per day at 07:00, 13:00 and 19:00. Corn silage was administrated in three portions of 7 kg each during meals 1 and 3, and 6 kg during meal 2. Pasture hay was administrated also in three portions of 3 kg in meals 1 and 3, and 2 kg during meal 2. Concentrates were fed to 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 the following 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 cow monitored.

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 corn silage – pasture hay (Table 1) and pasture hay - corn silage (Table 2). In Table 3 the average indices for both experimental variants are offered.

Pasture hay was consumed by the cows during morning portions with an average intake rate of 27.00 min/kg in variant A, and 22.93 min/kg in variant B. During portion number two, average consumption speed was 26.70 min/kg for variant A and 23.99 min/kg for variant B.

Portion number 3, was consumed by the cows with an average consumption speed of 25.16 min/kg in variant A, and 33.36 min/kg for variant B of the experiment.

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	3.28 ± 0.10	0.33	10.17	2.80	3.85
	Field hay	10	27.00 ± 1.89	6.00	22.22	18.18	37.92
	Corn silage	10	5.30 ± 0.32	1.03	19.57	3.77	6.86
Portion 2	Field hay	10	26.70 ± 2.27	7.19	26.93	16.06	39.29
	Corn silage	10	7.81 ± 0.67	2.12	27.16	4.92	12.22
Portion 3	Field hay	10	25.16 ± 0.92	2.93	11.65	20.18	29.58
	Corn silage	10	4.37 ± 0.19	0.62	14.33	3.38	5.25
	Brewer's yeast	10	2.16 ± 0.11	0.37	17.16	1.40	2.63

Intake rate for the consumption of corn silage, during variant A of the experiment was, on average, 5.30 min/kg during first meal, 7.81 min/kg during portion 2 and 4.37 min/kg during the evening portion.

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	2.79 ± 0.14	0.45	16.38	2.22	3.85
	Field hay	10	22.93 ± 0.68	2.17	9.47	18.02	26.14
	Corn silage	10	2.84 ± 0.25	0.79	27.85	2.04	4.59
Portion 2	Field hay	10	23.99 ± 1.38	4.39	18.31	17.58	29.70
	Corn silage	10	4.36 ± 0.25	0.81	18.73	3.61	6.36
Portion 3	Field hay	10	33.36 ± 3.51	11.10	33.28	18.55	49.50
	Corn silage	10	3.43 ± 0.26	0.82	23.96	2.46	4.75
	Brewer's yeast	10	2.51 ± 0.18	0.57	22.92	1.53	3.36

For variant B, average intake rate for corn silage was 2.84 min/kg during the consumption of first portion, 4.36 min/kg during the second portion and 3.43 min/kg during the evening meal.

For concentrates, average consumption speed was registered in variant A to be 3.28 min/kg (with limits ranging between 2.80 and 3.85), and in variant B on average 2.79 min/kg (with limits ranging between 2.22 and 3.85).

Table 3

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

Forage type	n	X±SEM	SD	V (%)	Min	Max
Concentrates	10	3.04 ± 0.14	0.46	15.24	2.22	3.85
Field hay	10	25.45 ± 1.61	5.09	20.02	16.06	39.29
Corn silage	10	4.96 ± 0.68	2.15	43.46	2.04	12.22
Brewer's yeast	10	2.34 ± 0.16	0.50	21.61	1.40	3.36

Brewer's yeast registered an average intake rate of 2.6 min/kg (with limits ranging between 1.40 and 2.63) during variant A of the experiment, and during variant B consumption speed was on average 2.51 min/kg (with limits ranging between 1.53 and 3.36). The highest consumption speed was observed in variant A, with the order of forages corn silage-pasture hay, higher with 0.35 min/kg.

Conclusions

Consumption speed for corn silage was 4.96 min/kg, the highest intake rate was observed during evening portions (meal 3).

Pasture hay was consumed by the cows with an average consumption speed of 25.45 min/kg.

For concentrates, intake rate was on average 3.04 min/kg, with the highest consumption speed registered during variant B of the experiment.

Average consumption speed for brewer's yeast was 2.10 min/kg (2.16 min/kg for variant A and 2.51 min/kg in variant B).

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~~Facultatea de Zootehnie și Biotehnologii, Timișoara, România~~

~~Două variante experimentale au fost efectuate pentru a stabili modul în care ordinea administrării furajelor afectează viteza de consum a acestora. Varianta experimentală A (cu ordinea de administrare siloz de porumb – fân de câmpie) și varianta experimentală B (cu ordinea de administrare a furajelor fân de câmpie – siloz de porumb) au fost efectuate pe 10 vaci multipare din rasa Bălțată cu negru românească. Vacile incluse în acest experiment se aflau în primele 100 de zile de lactație și au fost întreținute în sistem legat 24 de ore pe zi. Rația zilnică a vacilor a fost compusă din 20 kg siloz de porumb, 8 kg fân de câmpie, 3 kg concentrate și 2 kg borhot de bere. Furajele au fost administrate zilnic pe parcursul derulării experimentului în 3 tainuri, la orele 7:00, 13:00 și 19:00. Viteza de consum a furajelor a fost calculată în minute per kilogram furaj brut. Vitezele medii de consum înregistrate au fost următoarele: concentrate 3,04 min/kg, fân de câmpie 25,45 min/kg, siloz de porumb 4,96 min/kg și 2,34 min/kg la borhotul de bere.~~

~~**Cuvinte cheie:** rată de consum, furaje, tain, Bălțată cu negru românească, vaci~~