Biotechnology in Animal Husbandry 20 (3 - 4), p 1 - , 2004
Publisher: Institute for Animal Husbandry, Belgrade-Zemun

ISSN 1450-9156
UDC: 636.234

BEHAVIOR OF HIGH PRODUCING HOLSTEIN-FRIESIAN COWS DURING THE THREE MONTHS OF LACTATION[1]

I. Bencsik, N. Pacala, T.Theilen, Jana Stanculet, Alena Bencsik[2]

Abstract: In our study the behavior of dairy cows was studied during the first three months of lactation. The experiments were done on 25 cows raised in free-stalls on slatted floor in 25.5-31.5 m ^{2} boxes. In the experimental period the cows were fed grass, silage and hay. The concentrates were used for feeding during the milking time and the quantity depended on milk production of each cow. The dairy cows were monitored every 10 minutes in 24 hours period for several days. We have observed that the primiparous and secundiparous cows are resting 1-2 hours less than the older cows. The time needed to ingest the forages is longer at primiparous and secundiparous. During 24 hours, cows are spending 12-14 hours on rest, so it is necessary to build comfortable and spacious pens. Cows are spending 5-6 hours on feeding, so we must provide a larger feeding area for each cow.

Keywords: behavior, free-stall, feeding, resting, walking, standing.

Introduction

The right breeding of Holstein-Friesian cows in the first three months of lactation is essential in obtaining high milk productions. The study on cows behavior during 24 hours offers us information about the time spent on forage ingesting, resting, walking and standing. When we have this data we can adapt and modify the technology of breeding to physiological needs of each animal.

Wakeful state and standing period are alternating 10-15 times. The cows are standing 9 hours and 50 minutes, and lying 14 hours 10 minutes (*Ruckebusch, 1972*) quoted by *Erick Kolb(1981)*.

The ingesting of forages can be influenced by factors depending on the animal, breed, age, physiological state, individuality, productive natural disposition (cows in lactation consume till 30% more then the cows in mammary repose), body condition, and/or health. Ingestion duration is 8-9 hours per day and the consuming periods are alternating between milking time and rest time, *Dan Drinceanu et al.(2002)*

---

[1] Original scientific paper – Originalni naučni rad. Presented as poster on 7th International symposium "Modern Trends in Livestock production", Belgrade, September 30th – October 3rd, 2003.

[2] conf. Dr.I.Bencsik, prof. Dr.N.Pacala, ing. Drd.Jana Stanculet, student Alena Bencsik from Banats University of Agricol Science and Veterinary Medicine, Timisoara, Faculty of animal Science, Romania; student T.Theilen, from University of Trier, Faculty of Economy and Social Science, Germany

Materials and Methods

The experiments were done on a private farm, on 25 dairy cows, where the cows were raised in free-stalls, in 25.5-31.5 m^2 boxes on slated floor. To each animal correspond 5-6 m^2, including the pens. The feeding area was 65 cm for each cow. In the barn the water wass distributed in drinking cups with constant level. The cows were fed during the experiment silage, hay and grass. The concentrates were administrated during the milking time and the quantity depended on milk production of each cow.

For our experiment we have used Holstein –Friesian cows with 7000-8000 l per lactation, with a content of 4.45% fat and 3.46% protein. Cows were milked two times a day on five places milking platform and all of them were in the first three-months of lactation. Dairies were divided in two groups: in the first one we placed primiparous and secundiparous cows, and in the second one the multiparous.

Behavior monitoring was done using a micro camera and a computer. The cows were filmed 24 hours per day each 10 minutes for one minute. In this minute was taken one image every second. In 24 hours we have obtained 8640 images which were analyzed and evaluated later.

Result and Discussion

The studied dairies were divided into two groups. The first group (10 cows) was formed with primiparous and secundiparous cows and the second group (15 cows) with multiparous cows. Behavior dynamics, that includes the succesion of feeding, resting walking and standing period, are presented in tables 1 and 2. The succesion of periods of time needed to feed, rest, walk and stand wasn't made suddely. For exemple the passage from feeding period to resting period was done very slowly. The cows were going one after another in laying boxes but before they laied down to rest, they were standing a shorter or longer period on their pens. In our feeding conditions, ad libidum, the passage from resting period to feeding period was also done gradually. The cows stood up and started to feed just after a period of standing.

The observation period have been divided in four periods (I-IV), each of 6 hours: 13-18, 19-24, 1-6 and 7-12. The time spent with milking is included in standing and walking period.

Table 1. Primiparous and secundiparous cows behavior
Tabela 1. Ponašanje krava prvotelki i drugotelki

Interval/ Interval	Period of time (hour)/ Period dana	Feeding/Ishrana	Walking and standing/Stajanje i hodanje	Resting/ Odmaranje
I	13-18	1h 25min	1h 25min	3h 10min
II	19-24	2h 30 min	0h 45min	2h 45min
III	1-6	0h 40min	1h 05min	4h 15min
IV	7-12	2h 20min	1h 20min	2h 20min
Total		6h 55min	4h 35min	12h 30min

Table 2. Multiparous cows behavior
Tabela 2. Ponašanje krava koje su se telile više puta

Interval/ Interval	Period of time (hour)/period dana	Feeding/Ishrana	Walking and standing/ Hodanje i stajanje	Resting/ Odmaranje
I	13-18	1h 40min	1h 35min	2h 45min
II	19-24	1h 15 min	1h 40min	3h 05min
III	1-6	1h 00min	1h 20min	3h 40min
IV	7-12	1h 00min	1h 15min	3h 45min
Total		4h 55min	5h 50min	13h 15min

In tables 1 and 2 we can observe that the multiparous cows were resting almoust one hour more than the cows from the first group. Also the cows from group II were walking and standing one hour more than group I. The cows from the first group were spending one hour more on forage ingestion than the second group. In the behavior of first group cows, coulds be distinguished two periods of time: one between 19-24 hour and the other between 7-12 hour were they were spending more time on feeding then the cows from the second group. For the second group we can observe a longer period for feeding in the first interval (13-18 hour).

Conclusion

1. The time needed for forage ingesta in the first three month of lactation is influenced by age and the number of lactation.

2. The primiparous and secundiparous cows need one hour more for forage ingesta than the multiparous cows.

3. In free stalsls breeding is necessary ad libidum administration of forages.

PONAŠANJE VISOKO PRODUKTIVNIH KRAVA HOLŠTAJN-FRIZIJSKE RASE TOKOM PRVA TRI MESECA LAKTACIJE

I. Bencsik, N. Pacala, T. Theilen, Jana Stanculet, Alena Bencsik

Rezime

Pravilan odgoj krava holštajn-frizijske rase tokom prva tri meseca laktacije je od velike važnosti za ostvarivanje visoke mlečnosti. Ispitivanje ponašanja krava tokom 24 sata nam daje informacije o vremenu provedenom u uzimanju hrane, odmaranju, hodanju i stajanju. Uz ovakve podatke možemo adaptirati i modifikovati tehnologiju odgoja u skladu sa fiziološkim potrebama svake životinje.

Eksperimenti su izvedeni na 25 krava na privatnoj farmi gde se krave drže u slobodnim štalama, sa boksevima površine 25.5-31.5 m^2 na rešetkastom podu. Deo štale koji služi za ishranu iznosi 65 cm za svaku kravu. U objektu voda se distriburia preko pojilica sa konstantnim nivoom vode. Tokom ogleda životinje su hranjene silažom, senom i travom. Koncentrati su davani tokom perioda muže a količina je zavisila od mlečnosti svake pojedinačne krave.

U ogledu su bile uključene krave holštajn-frizijske rase sa 7000-8000 l mleka po laktaciji, I sadržajem mlečne masti od 4.45% i 3.46% proteina. Krave su mužene dva puta dnevno na platformi za mužu od pet mesta, i sve krave su bile u prva tri meseca laktacije. Muzare su podeljene u dve grupe: u prvoj su se nalazile krave prvotelke i drugotelke, a u drugoj krave koje su se telile više puta.

Ponašanje krava je praćeno pomoću mikro-kamera i kompjutera. Krave su snimane 24 sata dnevno – svakih 10 minuta u trajanju od 1 minuta. Tokom 1 minuta snimana je po jedna slika svake sekunde. Za period od 24 sata dobili smo 8640 slika koje su kasnije analizirane i ocenjivane. Opservacioni period smo podelili u 4 perioda (I-IV) od po 6 sati.: 13-18, 19-24, 1-6 i 7-12. Vreme provedeno u muži je uključeno u period stajanja ili hodanja.

Muzare su podeljene u dve grupe: u prvoj su se nalazile krave prvotelke i drugotelke, a u drugoj krave koje su se telile više puta. Krave koje su se telile više puta su se odmarale skoro za 1 sat više od krava iz prve grupe. Takođe, krave iz druge grupe su stajale i hodale za 1 sat duže od krava iz prve grupe. Krave iz prve grupe su više vremena provodila u unošenju hrane. Postoje dva perioda između 19-24 časa i 7-12 časova kada su krave iz prve grupe provodile više vremena u hranjenju nego krave iz druge grupe. Kod druge grupe možemo primetiti duži period za uzimanje hrane u prvom intervalu (13-18 hour).

Kao zaključak, na vreme provedeno u unošenju hrane tokom prva tri meseca laktacije utiču uzrast i broj laktacije. Kravama prvotelkama i drugotelkama je potrebno za 1 sat više vremena za unošenje hrane u poređenju sa kravama koje su se telile više puta. Takođe, preporučujemo u slobodnim štalama odgoj sa hranom ad libitum.

References

1. DRINCEANU, D.;LUCA, I; STEF, LAVINIA(2002)"Dairy cows alimentation in familial farms", Waldpress Edition,Timisoara, pp14.
2. KOLB,E.(1981):About the life and behavior of domestic animals, Ceres Edition, pp.57.