UDK 636.083

Izlaganje sa znanstvenog skupa
Conference paper

THE INFLUENCE OF HOUSING AND FEEDING SYSTEMS ON HEALTH, LONGEVITY AND LIFE-TIME PRODUCTIVITY OF DAIRY COWS

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Abstract

The reasearch was conducted on a herd of Friesian cows born in the years 1975-1980 and culled until the end of 1990.

The course of salubrity (the number of morbidity cases per 100 cows a year was evaluated, the material was divided into 6 groups of diseases) and some production traits of dairy cows in different housing (loose and tied sheds) and feeding (intensive and less intensive) conditions were compared.

The examined cows were mainly fallen ill for a reason of reproductive tract diseases. General morbidity of the cows was the smallest in loose sheds and in case of less intensive feeding. Loose housing system appeared to be better than tied one for the investigated life-time productivity traits. The cows lived and produced longer in loose sheds, their life-time production of milk, fat and protein was higher. In comparison of two feeding systems applied a positive influence of less intensive feeding on life and utilization length of the cows was proved. Life-time yield of milk and its components reached close level in both feeding systems. Milk and fat yield per day of life was higher in cows from loose sheds and fed more intensively.

Material and method

The aim of the research was to determine the influence of different litterless housing technologies (tied and loose) as well as two feeding systems (extensive and intensive) on health of Friesian cattle, its longevity and life-time milk yield.

Rad je priopćen na 48th Annual meeting of the European Association for Animal Production, Vienna, 1997.

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The experiment was conducted on a herd of 400 Friesian cows born in the years 1975-1980 and culled until the end of 1990.

Upon the first calving, all the cows from the experimental herd were disposed at random to four litterless cowsheds sited at one farm. The cowsheds nos. 1 and 2 were the buildings of tied type, and nos. 3 and 4 of loose one. In the cowsheds nos. 2 and 4 the intensive feeding system based on a big rations of concentrates for each kilogram of milk produced, and moreover maize silage, mangels, hay and dried green forage. The animals did not graze at all. In the summer period half of silage ration (in conversion to dry matter) was replaced by meadow grass. The roughages as maize silage, mangels, hay and dried green forages were the base of feeding in the cowsheds nos. 1 and 3. The animals were seasonally (May-October) grazing at the pasture. In this extensive feeding system concentrates constitued 13-15% of dry matter of the ration and the animals were receiving 0,2 kg of the above mentioned feedstuffs for each kilogram of milk over 5 kg of daily yield.

Data concerning morbidity cases, longevity and milk performance was evaluated in cows of fully culled age-groups.

In calculations the analysis of variances by the method of least square means according to Harvey (1987) was applied.

The number of morbidity cases per 100 cows a year was determined. The collected data of diseases was divided into six groups. Moreover so-called general morbidity was estimated. The level of the following productive traits was also calculated: life and productive life lenghts, life-time milk and its basic components yields as well as milk, fat and protein yields per day of life.

Results

The influence of housing and feeding systems on morbitidy of the cows was presented in table 1. In each building the greatest percentage of the cows was fallen ill for a reason of reproductive tract diseases. Type of cowshed had a highly significant influence on the frequency of their occurrence as well as of legs and udder diseases and general morbidity. That morbidity was the least in the cowshed no 3 (loose, extensive feeding with pasture) and the greatest in cows from the shed no 2 (tied, intensive feeding without pasture). The differences in morbidity of the cows form the sheds nos. 2 and 3 were mainly caused by the greater frequency of occurrance of udder, legs and reproductive tract diseases in the cowshed no 2.

Table 1 - INFLUENCE OF HOUSING AND FEEDING SYSTEMS ON MORBIDITY OF COWS (NUMBER OF CASES PER 100 COWS A YEAR)

	Type of cowshed		Feeding		Cowshed			
	tied	loose	E	I	1	2	3	4
Average number of cows	623.8	570.4	610.5	583.7	335.6	288.2	274.3	295.5
Reproductive tract diseases	105.3*	86.1	96.8	95.4	103.7	107.2	88.4	83.9
Udder diseases Mastitis	39.0**	14.9	22.4**	32.7	30.7	48.6	12.4	17.3
Legs diseases	54.0**	30.5	37.7**	48.1	46.8	62.5	26.6	34.2
Digestive tract diseases	80	7.4	6.1	9.4	4.8	11.8	7.6	7.1
Metabolic disorders	2.1	2.5	2.3	2.2	1.8	2.4	2.9	2.0
Other	9.3	5.1	7.0	7.5	9.2	9.4	4.4	5.8
General morbidity	223.5*	148.5	176.6*	199.2	201.7	248.8	145.9	150.9

* - significant differences (p<0,05)

** - highly significant differences (p<0,01)

E - extensive

I - intensive

Feeding system had statistically significant influence only on the frequency of occurrance of legs diseases, mastitis and general morbidity. It was slightly greater in cows kept in the cowsheds without pasture and fed intensiely.

As it is presented in table 2, housing systems significantly influenced the lenght of productive life of the cows. The animals kept in loose system were utilized 140 days longer in comparison with the cows kept in tied sheds. Also their life lenght was about 120 days longer, though in that case there are no statistically significant differences between both housing systems.

Table 2 - INFLUENCE OF HOUSING AND FEEDING SYSTEMS ON LENGHT OF LIFE AND PRODUCTIVE LIFE (DAYS)

Trait	Housing System				Feeding system			
	tied		loose		extensive		intensive	
N=	323		265		266		322	
	LSM	SE	LSM	SE	LSM	SE	LSM	SE
Lenght of life	2229	51.5	2348	58.8	2358*	57.7	2219*	52.6
Lenght of productive life	1335*	51.3	1478*	58.6	1478*	57.5	1335*	52.4

* - significant differences (p<0,05)

Feeding system also appeared to be the factor influencing the period of the animals sojourn in a productive herd. The cows fed with extensive ration lived and produced longer (significant differences). In comparison with that part of the herd, the cows from the intensively fed group lived shorter by 140 days and the same value concerns their dairy use period.

In the cows kept in loose sheds it was observed higher (by about 1500 kg) life-time milk yield as well as its components -fat and protein - yield in comparison with the animals from tied sheds (table 3). In case of milk and fat yield per day of life a slight advantage of the animalas kept in loose sheds also occured.

Table 3 - INFLUENCE OF HOUSING AND FEEDING SYSTEMS ON MILK PERFORMANCE TRAITS (KG)

Trait	Housing system				Feeding system			
	tied		loose		extensive		intensive	
N=	323		265		266		322	
	LSM	SE	LSM	SE	LSM	SE	LSM	SE
Life-time milk yield	14330	646.9	15849	738.7	15103	724.9	15076	660.8
Life-time fat yield	559	25.1	623	28.7	591	28.2	590	25.7
Life-time protein yield	463	19.8	509	22.7	484	22.2	488	20.3
Fat percentage	3.91	0.02	3.94	0.02	3.92	0.02	3.92	0.02
Protein percentage	3.28	0.03	3.27	0.03	3.26	0.03	3.29	0.03
Milk yield per day of life	6.0	0.14	6.3	0.16	6.0	0.15	6.3	0.14
Fat yield per day of life	0.23	0.005	0.25	0.006	0.23	0.006	0.25	0.005
Protein yield per day of life	0.20	0.004	0.20	0.01	0.19*	0.005	0.21*	0.004

* - significant differences ($p<0,05$)

On the other hand the feeding systems applied did not influence life-time milk yield. The difference in its production between the particular feeding systems did not exceed 30 kilograms (i.e. about 0.02% of average yield of the examined herd). In case of fat and protein yields the differences were also little. Lack of differences in life-time yield may be explained by the fact of obtaining higher milk and its components yields per day of life and lactation by the cows fed intensively (shorter utilized). In case of daily protein production the differences appeared to be significant.

Conslusions

The results presented allow to formulate the following conclusions:

1. General morbidity of the cows was higher in tied sheds and in case of intensive feeding system; the cows in the shed no 3 (loose housing system and less intensive feeding) were fallen ill most rarely.
2. The cows lived and produced longer and obtained greater life-time milk and its components yields in loose housing system.
3. Less intensive feeding positively influenced the lenghts of productive life and the life itself, however differences between feeding systems in life-time milk and its components yields were not observed.

UTJECAJ SISTEMA SMJEŠTAJA I HRANJENJA NA ZDRAVLJE, DUGOVJEČNOST I VIJEK PROIZVODNJE MLIJEČNIH KRAVA

Sažetak

Istraživanje je provedeno na frizijskim kravama rođenim od 1975. do 1980. i izlučenim do kraja 1990.

Tijek zdravlja (ocijenjen je broj slučajeva oboljenja na 10 krava godišnje, a materijal je podijeljen u 6 skupina bolesti) i neka proizvodna svojstva mliječnih krava u različitom smještaju (slobodni i vezani stajski), te uspoređeni uvjeti hranjenja (intenzivno i manje intenzivno).

Kod pregledanih krava oboljenja su uglavnom bila bolesti reproduktivnog trakta. Općenito je oboljelost krava bila najmanja u slobodnom držanju i uz manje intenzivno hranjenje. Sistem slobodnog držanja čini se da je bio bolji od vezanog za istraživane osobine proizvodnosti. Krave su dulje živjele i proizvodile u slobodnom držanju, njihov vijek proizvodnje mlijeka, masnoće i bjelančevina bila je veća. U usporedbi dvaju primijenjenih sistema hranjenja dokazan je pozitivni utjecaj manje intenzivnog hranjenja na duljinu života krava i njihovu iskoristivost. Životni prinos mlijeka i njegovi sastojci postigli su sličnu razinu u oba sistema hranjenja. Prinos mlijeka i masnoće po danu života bio je viši u krava u slobodnom držanju i intenzivnije hranjenih.

Primljeno: 10. 9. 1997.