Research on the Effect of Utilization CLA and ZLL Nutritional Supplements in Dairy Cows Feeding

Livia Vidu[1], Gianina Costache[2], Oana Ardeleanu[1], Alina Udroiu[1], Monica Marin[1], Dana Popa[1], Ioana Niculae[1]

[1]University of Agricultural Sciences and Veterinary Medicine Bucharest, Faculty of Animal Science, Bucharest,Marasti street 59, Romania
[2]S.C.Vitfoss România, Şoseaua Brăilei- km 7, Buzău, Romania

Abstract
The breeding of dairy cows is an area of great importance to ensure the basic needs of people. Dairy cows are also subjected to the action of various factors of influence due to the feeding peculiarities. This research aims to reveal the influence of the dairy cows feeding use of based on conjugated linoleic acid -CLA and a mixture of plant extracts and micro-ZLL supplements. The study was carried out in Agrimat Matca farm, on a herd of 100 cows at the first lactation. The experiment consisted in the administration of 0.20 kg VILOMIL ZLL and 0.13 kg VILOMIX CLA for a period of 24 days. Observations were made on the quantity of daily milk, the milk quality and hygiene and the health of the dairy cows. We observed that at the beginning of the experiment the somatic cell contents was 800000/ml, and at the end of the experiment it decreased to 400000/ml. The quantity of milk increased between 4 and 12.5%, the fat contents decreased by 0.4 to 0.6% while the protein content was not influenced.

Keywords: CLA, cow, feed, health, milk, ZLL

1. Introduction

Normal alimentation animals involves satisfying their nutritional balance using dietary, digestive and adapted features as economical as possible. Rational feeding dairy cows requires the following stages: assessment of nutrient requirements for maintenance and production (growth or pregnancy termination); establish basic rations, using feed volume ratio which is distributed to all cows in a shelter setting mixture of concentrated and the amount to be distributed each animal (or group of animals), the production function. Over a year dairy cattle through two key phases, namely: stage of lactation, with a median of 305 days and the dry phase, lasting 60 days. Generally in summer and, fall dairy cows are in lactation [1]. This phase begins at calving and lactation superimposed on the real curve, which presents the following: increase in milk production to peak levels within 2-3 months of the lactation, maintaining plateau production of milk (4 months, 5, 6 of lactation) and decreased milk production (lactation 9-10 months). In the actual stage of lactation milk production increases, peaks and is almost 50% of the total lactation milk. Dairy cows have a negative energy balance, achieving training and weakness, body reserves for milk production. Also, cows in this stage have a poor appetite, leading to reduced feed intake.

In the digestive tract microorganisms go through a period of adaptation to new feeding regime (2-3 weeks), different from the dry phase and pregnancy. Ruminal villi recover after involution felt in the previous period of undernourishment. Feeding the poor at this stage, especially in energy, may lead to lower production and the emergence of metabolic diseases and diseases of reproduction. Also, breeding activity is absent in

* Corresponding author: Livia Vidu,
Email: vidulivia@yahoo.com

the first month and a half, genital tract passing through a period of recovery after calving. In order to correct these overstressing of cow body of this very important step is recommended to adopt a specific feeding regime. First, cows with very good milk must have a very balanced diet before calving, so that the shock of this period to be lower. It is given very good fodder (concentrated vitamin hay, fodder beet, corn silage) with high palatability to counter appetite capricious. Switching to this mode of feeding should be gradual so that the rumen microorganisms can be adapted [2].

2. Materials and methods

The research was conducted in a dairy farm Agrimat Matca of Galati, where Holstein dairy cows are breeding. Total number of farm animals is 592, of which 219 dairy cows at different lactation: lactation animals I -111, -79 second lactation animals, lactation and lactation animals III -17 IV and more than 12 animals. The farm has a technology maintenance free, sealed housing with individualized spaces of rest. Modern milking technology is applied with hygiene standards and high labor productivity. Feeding is done based on strict rations drawn, so that the animals to be able to reveal the full genetic potential. This research aims to reveal the influence of the feed use of cow milk-based supplements, conjugated linoleic acid- CLA and a mixture of plant extracts and micro-ZLL. The experiment was conducted on a total of 100 cows at first lactation. The experiment consisted in the administration of 0.20 kg VILOMIL ZLL and 0.13 kg VILOMIX CLA for a period of 24 days. Vilomix CLA contains: 4.20% crude protein, 46.40% crude fat, crude fiber 1.40%, 14.40% crude ash. Vilomil ZLL contains: Saccharomyces cerevisiae (E1702), yeast (Saccharomyces no) including fermentation substrate, Aspergillus oryzae (industr. production of α-Amylases) derivatives with high microbial enzyme contrations, tracer elements (organic), vegetable extracts, vitamins. Chemical composition is: 11.30% crude protein, 2.90% crude fat, crude fiber 3.30%, 19.00% crude ash, 3.00% sodium, 1.00% magnesium. They pursued the following parameters: increase in milk production, increasing the percentage of fat and protein; upgrading breeding fertility, fecundity, reduce the incidence of ketosis, improve fitness, reduce cholesterol, liver and blood by protecting the vessels deposits of fat. The working method was to record daily the proposed parameters. The resulting data were statistically processed and compared with results obtained previously.

3. Results and discussion

Using yeast-based preparations in feeding dairy cows a positive effect on specific consumption, the reduction in digestive problems, improved health and productive performance is better.

Dairy cows fed experimental subject was given a ration composed of alfalfa hay, corn silage, brewers grains, feed concentrates, premixes and two supplements tested (Table 1).

Use of conjugated linoleic acid was carried out in different countries have shown different results over time. Thus, in the table below are shown the results obtained in 2007-2009 on a farm in Germany. In the experiment was observed to increase the amount of milk by 27%. In the same time the milk fat content decreased by 14%.

In the cows at third lactation and above, production increased with about 12% while fat content decreased by 5% (Table 2). Conjugated linoleic acid has a positive effect on milk fat content decreased. It is known that for human food, cow's milk is a source of conjugated linoleic acid (Table 3).

Animals in the experiment organized on the farm Agrimat Matca some noted that the first day of observation the daily amount of milk was 9.93 kg in the middle of the observation period the average amount of milk has grown to 26.65 kg, and at the end reached the amount of 26.94 kg.

In terms of quality milk to a decrease in fat content of 5.7%, slightly increased protein and somatic cell content in milk cows was reduced to half (Table 4).

In terms of first lactation cows, reducing milk fat content has significant effect on decreasing energy effort cow, the mobilization of body reserves.

Table 1. Ration for dairy cows

Feedstuff	Kg feed	Dry matter	MJ	FE	g D.prot	g AAT	g PBV	g F. acid
Alfa alfa hay	4,50	3,83	20,00	2,07	483	228	225	53
Maize silage	24,50	8,13	54,42	7,14	361	692	-564	114
Marc "Heineken"	8,00	2,05	10,35	2,07	431	279	130	162
Barley	0,50	0,44	3,30	0,49	33	43	-23	8
Triticale	0,80	0,68	5,27	0,81	49	72	-36	11
Corn	4,50	3,87	30,69	4,71	172	508	-437	160
Soya meal	2,70	2,36	15,59	2,57	732	376	340	47
Pressed sunflower cake	1,20	1,10	8,98	1,20	226	131	177	175
Calcium carbonate	0,10	0,10	0,00	0,00	0	0	0	0
Lipitec Bovi 85	0,45	0,44	7,87	1,04	-13	0	0	415
CATTLE MIX 6015	0,25	0,25	0,00	0,00	0	0	0	0
Sodium bicarbonate	0,15	0,15	0,00	0,00	0	0	0	0
VILOMIN ZLL	0,20	0,18	0,65	0,36	19	17	0	5
VILOMIX CLA 125	0,13	0,12	1,09	1,10	-4	0	0	51
Total feed	**47,98**	**23,69**	**158,22**	**23,57**	**2488**	**2346**	**-188**	**1201**
Total feed/per kg dry matter:			**6,68**	**0,99**	**105**	**99**	**-8**	**51**
Min. need per kg. dry matter:					135	86	5	19
Max. need per kg. dry matter:					146		50	45

Table 2. Results obtained using CLA 125 VILOMIX

Lactation	**UM**	**2007**	**2008**	**2009**
Lactation 1				
Milk	kg	8413	9465	10713
Fat	%	3,87	3,69	3,32
Protein	%	3,18	3,25	3,20
Lactation 2				
Milk	kg	9828	10701	11056
Fat	%	4,23	3,79	3,53
Protein	%	3,23	3,20	3,28
Lactation ≥ 3				
Milk	kg	10473	10912	11807
Fat	%	3,97	4,00	3,76
Protein	%	3,11	3,19	3,17

Table 3. Sources of conjugated linoleic acid [3]

Source	Fatty acid	Delta	Omega
Linseed oil	linolenic acid	C18:3 (9,12,15)	Omega-3
Rapeseed oil	oleic acid (58%)	C18:1 (9)	Omega-9
	linolenic acid (20,5%)	C18:2 (9,12)	Omega-6
	linoleic acid (9,8%)	C18:3 (9,12,15)	Omega-3
Fish oil	DHA	C22:6 (4,7,10,13,16,19)	Omega-3
	EPA	C20:5 (5,8,11,14,17)	Omega-3
Sunflower oil	linoleic acid (70%)	C18:2 (9,12)	Omega-6
Saffron oil	linoleic acid (74%)	C18:2 (9,12)	Omega-6
	oleic acid (20%)	C18:1(9)	Omega-9
Soybean oil	linoleic acid (51%)	C18:2 (9,12)	Omega-6
	oleic acid (22,8%)	C18:1(9)	Omega-9
	linolenic acid (6,8%)	C18:3 (9,12,15)	Omega-3

Table 4. Evolution of milk in the administration nutritional supplements in the ration

Day of experiment	N	X ± Sx	S	V%
16.08.2010	100	9,93 ± 2,58	26	0,25
24.08.2010	100	26,65 ± 7,87	29,5	0,78
08.09.2010	100	26,94 ± 8,57	31,8	0,85

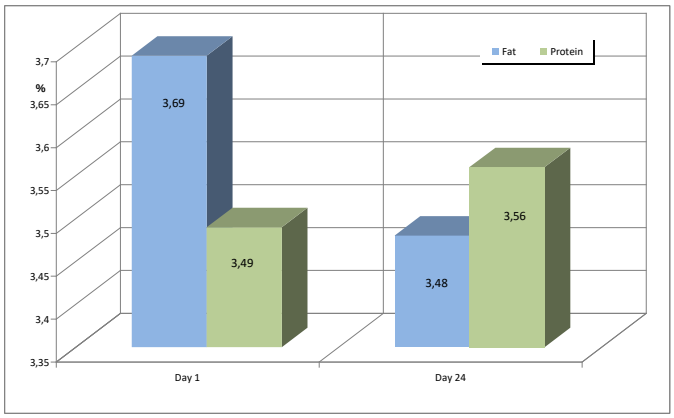

Figure 1. Evolution of fat and protein content in milk cows in experiment

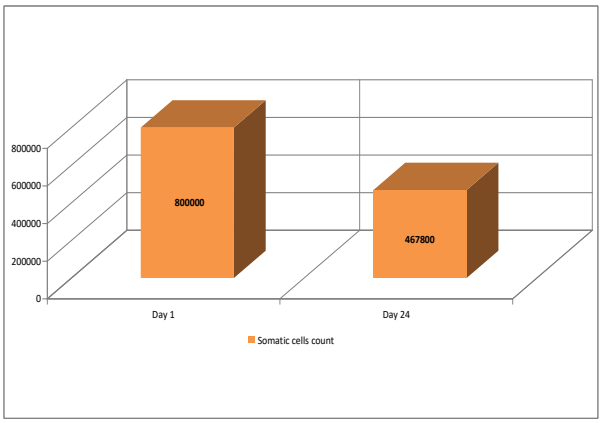

Figure 2. Variation in milk somatic cell count

4. Conclusions

Health has improved; there was a decrease in the number of clinical and subclinical mastitis from 17 cases in the early experiment in 7 cases at the end of administration of the two supplements. After use ZLL and CLA supplementation was observed to increase the amount of milk from 9.93 kg to 26.94 kg. Fat content was reduced by 5.7% (Figure 1) and hygienic quality of milk was significantly improved (Figure 2).

References

1.Georgescu, G., Alimentatia rationala a vacilor de lapte, Ed. Ceres, Bucuresti, 1999, 25-37 pp
2.Vidu, Livia, Hranirea vacilor de lapte in perioada de vara, Revista de Zootehnie, nr. 3 2011.
3.http:/www.Vilomix.com.