Adaptation of Fleckvieh Cows to Climates and Nutrition Conditions in the Western Part of Romania

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Abstract

Our research sets out to quantify the way in which the nutritional value of the food ratios influences the milk production in Fleckvieh cows which were imported in Agriland ranch in the summer of 2008, from Germany. The different types of fodder existent at the ranch and their supply in the animals' ratios according to the season has been taking into consideration when calculating the nutritional value which has been afterwards compared with the expected values. The main objective was estimating the potential production and then comparing it with the real one obtained in the ranch, under the specific conditions of shelter and feeding. The health of the animals has also been observed. The evolution of the real graphic of lactation is very different from the potential one, in the sense that in the first two or three months of lactation the production decreases, and its peak is somewhere between the fourth month and the fifth month. This proves a feeding which is not proper, because it is not differentiated by production. The ratios should be made proper and this is done relatively easy by including phosphates into the ratio. The energy level can be corrected by individually administering the concentrated fodder which has to be correlated with the milk production.

Keywords: dairy cows, nutrition

1. Introduction

German Fleckvieh, a breed imported at the Agrilact dairy farm in the summer of 2008, is a dual-purpose breed. Initially, they imported 50 pregnant heifers, 45 of which farrowed while 5 aborted. The productive potential of the genitors was between 5,100 and 8,898 litres of milk. Average body weight of the dairy cows was 600 kg.

2. Materials and methods

Milk production from the studied dairy cows was compared to the production potential of their mothers – 5,849.63 litres of milk and to the milk productions and fat percentage of the milk of their grandmothers and of the bulls' mothers. Research was carried out between October 5, 2008, and March 20, 2009. Starting from the milk production of the dairy cows during the research period and from the amounts of milk produced the day of the control and during the entire control period, we could draw the potential lactation curve; we drew the real control curve based on the milk production the day of the control and during the entire control period.

3. Results and discussion

During the fall and the winter, the fodder ratio was calculated depending on the physiological state of the animals given that there were both pregnant heifers and lactating cows. The ratio of the pregnant heifers until the 8th month was made up of 2 kg of alfalfa hay, 25 kg of ensilaged maize harvested during the milk-wax stage, and 5 kg of concentrates, with cows' average weight (650 kg) and planned milk production (5,000-7,000 l a year) as a calculus basis. Table 1 shows the ratio for heifers during the fall-winter stable period.

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Table 1. Heifers' ratio during the fall-winter stable period

Specification	Kg	DM (kg)	UFL (kcal ENL)	DCP (g)	Ca (g)	P (g)	Carotene (mg)	NaCl (g)
Requirements	-	10,4	17869	1140	110	60	475	65
Alfalfa hay	2	1,68	2887	192	20	3,2	40	-
Ensilaged maize	25	6,25	10739	275	30	12,5	452	-
Total fodder	27	7,93	13625	467	50	15,7	492	-
Differences	-	-2,47	-4243	-673	-60	-44,3	17	-
Concentrates	5	3,85	6615	718,75	35,5	19,05	33,75	50
Total ratio	-	11,78	20240	1235,75	81,5	34,75	495,75	-

DSM– dry matter
UFL – in ENL kcal
NE – net energy
DCP – digestible crude protein
Ca – calcium
P – phosphorus

The concentrate mix supplied contains barley, maize, bran, sunflower grits, and PVM (protein-vitamin-mineral) supplements. Due to the fact that heifers were still pregnant, we needed to increase a little the DCP, UFL, DM, and carotene values because it is during this period that the growth process is completed. The Ca: P ratio was 2.34: 1, a good one, though there was a deficiency in both minerals. Heifers in the 8th and 9th months of pregnancy, because we needed to remove the ensilage from the ratio, we had to change it by increasing the alfalfa hay share to 10 kg and concentrates to 8 kg. Table 2 shows fodder ratio for heifers in advanced pregnancy.

Table 2. Ratio for heifers in advanced pregnancy

Specification	Kg	DM (kg)	UF L (kcal ENL)	DCP (g)	Ca (g)	P (g)	Carotene (mg)	NaCl (g)
Requirements	-	10,4	17869	1140	110	60	475	65
Alfalfa hay	10	8,4	14433	960	100	16	200	-
Concentrates	8	6,16	10584	1245	50,4	30,48	568,4	80
Total ratio	18	14,56	25017	2205	150,4	46,48	768,4	80

Analysing the ratio, we can see that during this period of time we ensured more than the necessary nutrients in all parameters. Thus, dry substance was 4.16 kg more, energy was 7148 kcal ENL, protein was 1,065 g more, calcium was 90.8 g more, and carotene was 293 mg more; the only parameter that we did not ensure was phosphorus, in which there was a deficit of 13.52 g, which led to a to high Ca: P ratio (3.22: 1).

Ratio for lactating cows during winter (Table 3) was calculated taking into account average body weight (600 kg) and an average daily production of 22 litres of milk (4% fat).

Table 3. Ratio for lactating cows during winter

Specification	Kg	DM (kg)	UFL (kcal ENL)	DCP (g)	Ca (g)	P (g)	Carotene (mg)	NaCl (g)
Requirements	-	17,3	29552	1970	127	94	790	127
Alfalfa hay	6	5,04	8660	576	60	9,6	120	-
Ensilaged maize	25	6,25	10739	275	30	12,5	452	-
Total fodder	31	11,29	19399	851	90	21,2	572	-
Differences	-	6,01	-10153	1119	37	71,9	218	127
Concentrates	8	6,16	10584	1245	50,4	30,48	568	100
Total ratio	-	17,45	29982	2096	140,4	52,58	1140	100

Analysing the ratio, we can see that there are differences between the requirements of nutrients and the nutrients supplied by the ratio. These differences consist in higher values of dry matter (a surplus of 0.15 kg), of protein (126 g of digestible crude protein), of calcium (13.4 g), of carotene (13.5 mg), and lower values of energy 430 kcal ENL, phosphorus (41 g). The ratio Ca: P was 2.67: 1.

During the summer, the ratio consisted of green fodder (55-60 kg) and concentrates (7 kg). The ratio was calculated starting from an average body weight of 600 kg and from an average daily milk production of 22 litres (45% fats). Table 4 shows the ratio for lactating cows during summer (31.5^0C).

Table 4. Ratio for lactating cows during summer

Specification	Kg	DM (kg)	UFL (kcal ENL)	DCP (g)	Ca (g)	P (g)	Carotene (mg)	NaCl (g)
Requirements	-	17,3	29724	1970	127	94	790	127
Alfalfa	55	12,10	20790	1650	275	38,5	3245	-
Total fodder	55	12,10	20790	1650	275	38,5	3245	-
Differences	-	-5,20	-8934	-320	148	-55,5	2455	127
Concentrates	7	5,72	9828	514,64	5,6	15,05	7,35	70
Total ratio	62	17,82	30618	2164,64	280,6	53,55	3252,55	57

Analysing the ratio for the summer, we can also see differences between nutrient requirements and nutrients supplied. These differences consist in values below the normal level in energy 894 kcal ENL and phosphorus (40.5 g). There are excess values only in dry matter (0.52 kg), protein (194.64 g of digestible crude protein), in calcium (153.67 g), and in carotene (2,465 mg).

4. Conclusions

Correcting fodder ratios along the year can be done relatively easy by including phosphates in the ratio, while energetic level can be corrected by individually supplying concentrates in correlation with milk production.

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