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Comparison of balanced and routine diets on the economic performance of semi-industrial dairy farms ((Hybrid) in Markazi Province of Iran

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Abstract

This study was conducted to investigate the effect of using balanced diets and optimal nutrition on the amount of consumed feed, the amount and composition of produced milk and conversion coefficient of food to milk in semi-industrial dairy farms continuing and completing the project to study the nutritional management of industrial dairy farms in Markazi province. In this project were selected 10 farms interested in cooperation that had the necessary conditions and facilities to implement the project. So that these farms were an index of the total of available farms; five farms as a control and five farms as a test group. Firstly, the current situation of the farms was examined in terms of food items used, methods of balancing diets, the status of the used diets in terms of the types of required nutrients for the production or physiological groups in the farm, feeding type, and the amount of produced milk and its ingredients. Then the cows were examined and tested during a lactation period. In the selected five farms as control, the farmer's usual nutrition and feeding method was implemented and in five experimental units, balanced diets and optimal nutrition were used and balanced and optimal rations were adjusted based on the nutritional needs presented in the NRC, 1989 tables of dairy cattles depending on the weight, cow's distance from calving and the level of milk production of the cows and the nutritional needs of the different production groups, and according to the appropriate and available nutrients in each unit. And based on the optimal feeding (Total mixed ration or TMR) and after a 14-day food adaptation period, given to the cows. Daily feed intake recorded in all farms. Daily milk production of cows of all farms (control and experimental) was recorded on the day and cow's milk samples were sent to the laboratory every two weeks to determine the amount of fat and protein using a MilkoScan machine. Then the coefficient of food to milk conversion was measured for cattles of each farm. Also were recorded calving rate and calfs birth weight. Comparisons between control farms (common nutrition) and balanced feeding farms performed by SPSS statistical software through the independent t test at different stages of a milking period. The results showed that the average daily milk production of high- yielding cows of the balanced and control feeding group was 27.02 and 24 liters per day, and the average daily milk production of the medium- yielding cows produced by the two groups was 21.35

and 18.4 liters per day, respectively which were significantly different (P≤ 0/001). Also, the amount of milk fat and protein of high- yielding cows of the balanced and control feeding group were (3.43, 3.29%) and (3.18 and 3.04%) respectively, which were significantly different (P≤ 0/001). The amount of milk fat and protein of medium - yielding cows of the balanced and control feeding group were (3.64, 3.55%) and (3.22 and 3.17%) respectively, which were significantly different (P≤ 0/002).

A survey of the milk fat and protein percentage in high- yielding and medium- yielding cows of two treatment groups examined also showed a significant difference between these values. The average birth weight of calves in the two groups of balanced and control nutrition was 39.68 and 38.93 kg, respectively, which did not differ significantly. Also, the number of open days in the cows of these two groups was 81.63 and 91.53 days, respectively, which were not significantly different. However, using a balanced diet, reduced the number of open days in dairy cows. The conversion coefficients of asfed feed to raw milk in high- yielding dairy cows in two balanced and control feeding groups, were 1.13 and 1.17, respectively. And the conversion coefficients of dry matter to raw milk in these two groups were 0.74 and 0.83, respectively (P≤ 0/05). The feed cost for the production of each kilogram of raw milk in two balanced and control feeding groups was 14625 and 15038 Rials, respectively (P≤ 0/03). Also, raw milk production yield in the two groups was 1.35 and 1.2 kg, respectively. The conversion coefficients of asfed feed to raw milk in medium- yielding dairy cows in two balanced and control feeding groups were 1.24 and 1.38, respectively (P≤ 0/03). And the conversion coefficients of dry matter to raw milk in these two groups were 0.78 and 0.92, respectively (P≤ 0/02). The feed cost for the production of each kilogram of raw milk in two balanced and control feeding groups was 14683 and 15102 Rials, respectively (P≤ 0/05). Also, raw milk production yield in the two groups was 1.28 and 1.08 kg, respectively (P≤ 0/05). In summary, using of balanced diets based on production and physiological conditions of livestock, improved feed intake, increased milk production, increased durability of lactation and increased feed efficiency in lactating cows.

Keywords: Markazi Province, Dairy Cattle, Nutrition, Balanced Diet