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تأثير التغيرات في نظام غذاء الأبقار الفريزيان
خلال فترة الجفاف وبعد الولادة على انتاجية الأبقار

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أجريت هذه الدراسة على عدد ٣٢ من أبقار الفريزيان بمزرعة الشهداء بمحافظة المنوفية بمصر ، حيث قسمت الحيوانات الى مجموعتين خلال فترة الجفاف . وقد أعطيت المجموعة الأولى عليقة توازى ١١٥٪ العليقة اللازمة للحيوان كي يعيش والمجموعة الثانية أعطيت ١٦٠٪ خلال فترة الجفاف ، وبعد الولادة قسمت كل مجموعته الى مجموعتين فرعيتين تناولت مجموعة فرعية منهم عليقة منخفضة المستوى الغذائي والمجموعة الأولى عليقة عالية المستوى الغذائي ، وقد اثبتت الدراسة حدوث زيادة ملحوظة في انتاجية الأبقار التي تناولت عليقة عالية المستوى الغذائي خاصة بعد الولادة وبصفة خاصة في كمية اللبن ووزن الحيوان .

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**THE EFFECT OF THE CHANGES IN FEEDING PROGRAMS DURING
DRY AND EARLY LACTATION PERIODS ON THE PRODUCTIVITY
OF FREISIAN COWS**

(with 3 tables)

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SUMMARY

A total number of 32 Freisian cows in El-Shohada farm (Mnofia governorate, Egypt) were divided into 2 groups. The first was fed a ration equals 115% that of the maintainance requirements while the second was fed 160% that of the maintainance during the dry period. After parturition each group was further subdivided into two subgroups in such a way that one subgroup was fed on low energy ration while the second on high energy ration for 10 weeks. Studies were carried on to test the effect of these programs on the animal productivity. The cows kept under high plane of nutrition showed an increase in both milk yield and calves body weight.

INTRODUCTION

Progress has been considerable in the field of dairy cattle feeding especially during the periods before and after parturition. In this aspect the feeding requirements has been identified to be from 100% up to 15% that of the maintainance requirements (MORRISON, 1954) and up to 120% of the maintainance requirements (MAYNARD, 1979). (Progressively experimentation has described on physiological and biochemical bases for an increasing part by variation in the ration). The work of BLAXTER (1950 & 1956); REID (1950) and KLEIBER (1961) summarized much of the work on the changes in metabolism of dairy cattle and presented the most comprehensive description of energetics of dairy cattle available in their time. Earlier studies showed that lactation was more efficient than fattening. REID (1950) concluded that metabolizable energy, consumed in excess of maintainance, was used to the extent of 69.3% for milk production and 58.0% for body increase and that both were relatively constant.

Considerable disagreement, existed the relationship between energy intake and energy balance RAFFLER, *et al.* 1978; VANHERN, *et al.* (1979); GREESMAN, *et al.* (1980) and LUNDQUIST, *et al.* (1983). Workers generally accepted that this relationship was curvilinear when both data above and below maintainance were included.

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MOE, et al. (1971) demonstrated that cows in later stage of lactation are more efficient in converting feed metabolizable energy into body tissue than nonlactating cows. Some primary objectives in developing a dry cow feeding program are to reestablish the cows nutrient reserves lost from the previous lactation and to provide for both maintenance and fetal development, (COPPOCK, et al. 1972; CHASE, 1977; WILDMAN, 1979; JOHNSON and OTTERY, 1981 and NOCEK, et al. 1983). The adequacy with which these needs are met will influence performance in the subsequent lactation, which is ultimate measure of successful program JOHNSON and OTTERY, 1981 and NOCEK, et al. 1983.

The aim of the present investigation is to study the effect of the change of feeding program on the productivity of animals.

MATERIAL and METHODS

A total number of 32 adult Freisian cows of 4 years old and medium body weight about 450 kilograms were used in this experiment. The work was carried out in El-Shohada farm (Mnofia governorate Egypt). Animals were fed hay and concentrate mixture of yellow corn 22%, wheat bran 33%, cotton seed cakes 35%, Molasses 3%, rice polishing 4%, lime stone 2% and 1% NaCl. The animals were divided during the dry period into two main groups where the first was fed a diet equals to 115% that of the maintenance requirements, while the second was fed a ration of 160% that of the maintenance requirements. Diets were adjusted according to the NRC standards (1978). After parturition each group was further subdivided into two subgroups A and B in such a way that subgroup (A) was fed low energy ration (2% of the live body weight, hay, plus 250 gram concentrate mixture for/liter milk, while the other subgroup B was fed high energy ration (2% of the live body weight hay, plus 500 gram concentrate mixture for 1 liter milk) for 10 weeks after parturition. All cows were scored for milk yield production and for the weights of the newly born calves.

RESULTS

The mean values of the data concerning the efficiency of productivity are represented in table (1). It is evident that the time from calving to the first estrous was somewhat earlier in the first subgroup of cows where they were fed low energy level after parturition (34 days) while in the subgroups a ranged between 43 - 46 days. The ratio of calving to conception were somewhat higher in the subgroups which were fed ration of high energy level (110-111) while they were lowered in the other two subgroups (100-102). It is worthy to say that the better service- conception rates were in the subgroups fed high energy level which ranged from 1.8-2. The weight of calves just after parturition was nearly identical in all subgroups and ranged from 42.4-43.6 kg. The involution of uteri showed slight insignificant changes at the first days after parturition till the day 60 where these involutions were equals in all groups.

Losses in body weight during lactation were scored in table 2, using the weight of 3 days post partum as the initial weight, and it was recorded in each animal every other weeks during the experiment and for 100 days. It was clear from these data that cows of group I.B. (115% level prepartum and high level after parturition) returned to the initial weight at 75 days post partum while subgroup II B (receiving 160% level prepartum and high level postpartum) at 90 days after calving. At the same time the other groups continued losing weight

FEEDING PROGRAMS DRY AND EARLY LACTATION PERIODS

till the end of the experiment. Results for milk yield and milk fat percents are presented in table (3). It was clearly evident that the higher milk yield was in those fed ration of high energy level where it reached its peak, in the subgroup of animals fed ration of high energy level post partum and especially in the subgroup which was fed ration 115% that of the maintenance in the dry period. Data concerning fat percents in the milk pointed to insignificant changes in the different subgroups of animals whether those fed ration of high energy level after parturition or those fed low level and these data ranged between 2.95% and 3.28%.

DISCUSSION

The experiments described in this paper were carried out to study the effect of plane of nutrition in the dry period and in the early lactation period. In fact difference in level of feeding between group one and two showed that increasing energy level of the diet is to a great extent more beneficial than lowering it whether during the dry period or after parturition. This was clearly seen in the data concerning productivity of the animal. The ratio between service to conception was higher in those fed high energy level (1.8-2) this agreed with WOLDMAN, 1979; JOHNSON and OTTERY, 1979 and NOCEK, *et al.* 1983. Uterine involution was without any significant changes among the different subgroups. This may attributed to the genetic characteristics of these animals. It is also a matter of inherited characters that no significant variation was obtained in the weight of the newly born calves which ranged between 42,4-43,6 kg. These data agreed with findings of REID 1956; KLEIBER, 1961; COPPOCK, 1942; WILDMAN, 1979 and Others.

As far as the mean values of body weight changes, it was clearly evident that it was higher in the subgroups which were given low energy level ration before and high level after parturition while those weights changes were lowered in the subgroup that was given low level of energy. This may be attributed to the fact that the body weight is eventually increased by increasing plane of nutrition (BLAXTER, 1961; COPPOCK, 1972; VANHORN, *et al.* 1979 and LUNDQUEST, 1983).

In the view of the obtained results of milk yield production and its fat percent, one can say that increasing plane of nutrition especially after parturition greatly increased the milk yield and favoured the fat percent in the milk. Furthermore, the results showed the economical importance of using high energy level of nutrition in increasing the milk yield with improving the fat percent. These agreed with RAFFLER, *et al.* 1978; VAN HORN, *et al.* 1979; WILDMAN, 1979; GRESSMAN, *et al.* 1980 and NOCEK, *et al.* 1983.

Finally it could be concluded that the present results pointed to an optimum responses to increasing plane of nutrition only till 115% of maintenance ration during the dry period and give high level of energy after parturition. In addition, in the feature of major practical importance from the present result, is to find the optimum plane of nutrition which gives the best results in increasing the productivity of dairy cows under our Egyptian climatic conditions.

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FEEDING PROGRAMS DRY AND EARLY LACTATION PERIODS

Table (1)
Effect of feeding levels on the reproductivity of animals in the two experimental groups

Parameter	Group I		Group II	
	Subgroup A	Subgroup B	Subgroup A	Subgroup B
Time from calving to 1 st estrous (days)	34	45	46	43
Time from calving to conception (days)	110	102	111	100
Service conception ratio	2	1.5	1.8	1.5
Weight of newly-born calf (Kg)	43.6	43.1	42.4	42.1
<u>Involvement of uterus (in cm)</u>				
. At 30 days	5	4	4	6
. At 45 days	7	6	6	7
. At 60 days	8	8	8	8

A = low energy feeding program.

B = high energy feeding program.

Table (2)
Body weight changes in the first 100 days after parturition

Days	Group I		Group II	
	Subgroup A	Subgroup B	Subgroup A	Subgroup B
15	-15	-9	-30	-15
30	-11	-7	-30	-13
45	-13	-3	-28	-4
60	-7	-1	-40	-3
75	-8	0	-38	-3
90	-9	+7	-31	0
100	-7	+10	-28	+2

A = Low energy feeding program.

B = High energy feeding program.

Table (3)
Milk yield and fat percent at different levels of feeding

	Group I		Group II	
	Subgroup A	Subgroup B	Subgroup A	Subgroup B
Milk yield in Kilograms (100 days)	2278	2322	2172	2102
Fat %	3.02	2.95	3.01	2.95

A = Low energy feeding program.

B = High energy feeding program.