THE EFFECT OF DIFFERENT FEEDING SYSTEMS BEFORE AND AFTER WEANING ON AGE AT PUBERTY AND AGE AT FIRST CONCEPTION IN BUFFALO HEIFERS

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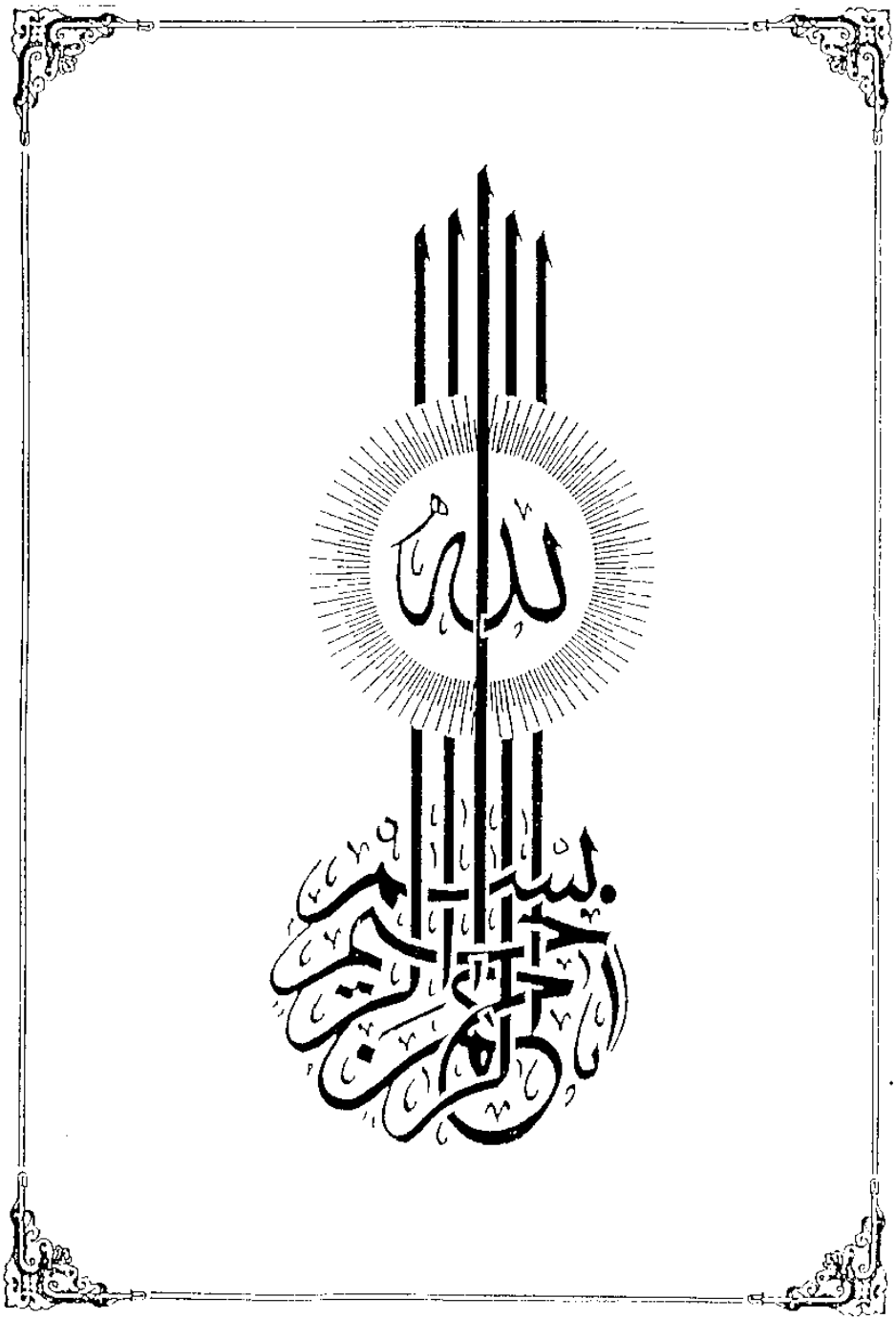

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INTRODUCTION

It is quite well known that the age at first calving in Egyptian buffaloes is, on the average, 40 months (Khishin, 1951; Hilmy, 1954 and El-Sheikh and Mohamed 1967) causes of such noticeable delay or inefficiency in reproductive character in buffaloes has not been elaborated. Work carried out with dairy cattle has shown that raising animals on high levels of nutrition generally leads to obvious improvement in reproductive capabilities. Spicifically, it has been reported, for instance, that the average age at first calving in heifers raised on high planes of feeding is considerably less than that in underfed heifers.

During early life the heifers body is being developed for later milk or beef production and reproduction. In young heifers the development of the reproductive organs is highly dependent on body growth. Since the period to puberty and for a time afterward is nonproductive many husbandmen tend to look on it as unimportant period through which the heifers must be carried. Unfortunately, this attitude frequently leads to heifers being poorly grown, underdeveloped, and delayed in reaching their productive and reproductive age.

Heifers should not be bred until the breeder is

certain that their rate of growth will carry them to a safe calving size by the end of the gestation. Early calving usually results in lower milk production during the first lactation, but gives the early calver an advantage in lifetime milk production that normally is not overcome by the late calvers. Early calving heifers (24 month) usually produce more calves in a lifetime than do heifers first calving at a late age (36 months).

Since buffaloes are still considered the leading dairy cattle in Egypt, it seemed of great importance, therefore, to study the effect of plane of nutrition before and after weaning on age at puberty and age at first conception in buffalo heifers.

REVIEW OF LITERATURE

1- Effect of level of nutrition on growth:

Live body weight and gain:

Early reports have indicated the influence of nutritional status on growth in different species of animals.

Eckles and Swett (1918), observed that nutritional treatment largely affects general growth as measured by body weight, while skeletal growth was less affected.

Eckles and Gullickson (1931), reported little differences in body weight of calves up to 6 to 8 months of age in response to different nutritional treatments. The depression effect of poor nutrition started to show up later on, for several months.

Janet (1957); reported heavier body weights at 3 and 6 months of age for Shorthorn calves reared on more whole milk-90 gallons-as compared with those calves receiving less amount of milk-40 gallons. Earlier, Herman and Ragsdale (1946), reported that heifers on a low level of nutrition were lighter in weight in comparison with controls and were smaller when bred, however, they freshened normally.

Joubert (1954a), studied the influence of seasonal fluctuations in the nutritive value of natural pastures in the Bankenveld region of the Transvaal on the growth of cattle. The growth in the low plane group showed marked seasonal, fluctuations, being greatest at the end of summer and least just prior to the first spring rains. The same author observed that age at first claving had no influence on the cows ultimate size, but growth rate during pregnancy was considerably less on the low than on the high plane, and the birth weight of calves from low plane mothers was 7.5 pounds below that of calves from high plane mothers.

Hansson (1956), found that growth rate per Scandinavian feed unit consumed was lower both at very low and very high levels of feeding in comparison with that of normal moderate level of feed intake.

Winchester and Howe (1955), reported that identical twin Hereford calves raised on low levels of nutrition made efficient weight gains when placed on a higher level of nutrition.

The rate of body development in monozygotic twins was studied as it was affected by the level of nutrition (low & high), Hansson and Bonnier (1951), reported that

only a small difference in body size was noted at the end of the fourth year.

The growth and development of Holstein heifers from birth to the time of first calving was found by Reid (1953), to be highly related to the amount of nutrients consumed. Heifers which were badly stunted (79% of accepted normal weight) as a result of consuming a low level of nutrients prior to the first parturition have recovered to "normal" size by the time of the second parturition when liberal quantities of feed have been provided. However, heifers highly fed prior to the first parturition maintained some advantage in size at the second and third parturitions over those fed a low or a "normal" level of feed during early life.

Sorensen, et al. (1959), studied the effect of three levels of feed intake on the productive and reproductive performances in Holstein heifers, and the average body weights at the end of 80 weeks of age were 566, 919 and 1125 pounds for low, medium and high level, respectively. These differences indicate the extent to which growth, including skeletal size, can be regulated by varying the plane of nutrition. It was also observed that the efficiency of feed utilization expressed

as pounds gained per pound TDN consumed practically identical among the three feeding levels after 32 weeks of age. At earlier ages the heifers on the high level showed slightly more gain for each pound of TDN consumed.

Moreover, Hansson (1956) and Reid, et al. (1957), reported that no permanent impairment of the capacity of dairy heifers to grow appears to result from underfeeding and retardation of growth in early life if additional nutrients are provided after first parturition.

Castle and Waston (1959), reported that the average live weight at 14 weeks of age was 194.0 pounds for calves on the conventional system compared to 183.9 pounds for early weaned calves at the same age.

El-Barbariey (1966), found that the late weaned buffalo male calves had slightly higher average live weight than that of the early weaned calves at the first four months of age, similar results were obtained by Borhami, et al. (1967).

Khoury, et al. (1967) reported that the average final weight at 120 days of age was 82.8 and 67.9 kg. for late and early weaned female buffalo calves compared with 117.5 and 76.7 kg. for late and early weaned

male buffalo calves at the same age. The differences were significant.

Furthermore, Khoury, et al. (1967), showed that early weaned buffalo calves, especially females, had lower gains at weaning and at subsequent ages up to 6 months, as compared to late weaned animals. However, all calves reached nearly similar weights at 12 months.

Using three systems of pail feeding for Friesian calves reared in Tahreer province Ragab and Abdel-Aziz (1961), showed that high levels of nutrients (whole milk and calf meal) resulted in significantly heavier body weights as compared to the poor level of nutrients (whole milk, skim milk and crushed maiz). These authors observed that males were significantly heavier in body weight than females in all ages studied. The rate of growth in the first 4 months of life exceeded that of the following eight months in both males and females.

The quality of feed also affects growth. In a study on Holstein bull calves Flipse and Almquist(1963), concluded that adlibitum feeding of good quality hay and a concentrate mixture containing 10% protein were adequate for normal growth and reproductive development.

Ranjhan and Talapatra (1963), Using Hariana calves fed on different rations consisting of (a) green berseem and wheat straw, (b) green berseem, wheat straw and bone meal and (c) green berseem, wheat straw and wheat bran, showed that the average daily gain of Hariana calves in (a), (b) and (c) groups were 0.73, 0.74 and 0.98 pound, respectively.

On three groups of male Murrah buffalo calves eight months of age fed three levels of DCP and TDN (1.23 and 6.36; 0.56 and 4.57; 0.36 and 2.37 pound/head/day) the average daily gain for the first two groups were 1.4p 0.88 pound. However the third group did not show any growth at all (Sharma and Talapatra (1963).

Using male and female Sahiwal calves Mudgal and Ray (1965a), reported that normal growth can be obtained on considerably less protein than that recommended by Morrison allowances provided that TDN is kept at sufficient level.

Agabawi, et al. (1968), found that average daily gain for late and early weaned calves was 0.47 and 0.42 kg. during 87 days but this difference was not statistically significant. However, El-Naggar (1968), showed that the average daily gains for early and late weaned