Tropentag 2010
ETH Zurich, September 14 - 16, 2010
Conference on International Research on Food Security, Natural Resource Management and Rural Development

Effect of feed supplementation on the performance of nomadic dairy cows in rangeland of Kordofan, Sudan

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Abstract
Tow experiments were carried out with Dar El-Reih cows of northern Kordofan (Sudan). Records were kept for daily milk production and body weight, body condition score and progesterone profile. The cows that recently calved were monitored for the first and sustained progesterone (P4) rise to assess the interval from calving to ovulation and conception.

In the first experiment 36 cows were selected from the nomadic herd and divided into three groups. Group A was supplemented with a high energy high protein concentrate mixture (ration A) and group B received a medium energy medium protein concentrate mixture (ration B), while group C received a low energy low proteins concentrate mixture (ration C). The cows were at their early lactation and were for six weeks at the rate 2 kg/cow/day after grazing. The results indicated that group A cows had a significantly higher milk yield ($P<0.05$) than group B or group C cows, and group C cows had lowest milk yield of all the all groups, Group A had also attained the highest body weight and body condition .

In the second experiment, three trials were conducted to study the effect of molasses supplementation on milk yield in comparison with the conventional concentrate feed ingredients used in the region. In each trial 12 cows were selected and were divided into two experimental groups. One group designed as a test group and the other as a control group. In each trial the test ration contained molasses, replacing grain sorghum, or sorghum brewery residue, the results revealed significant differences in milk yield between the test and control groups.

Keywords: supplementation, performance, nomadic dairy cows; Kordofan, Sudan

Introduction

Nomadic dairy herds are raised within pastoral system in the western Sudan. They spend the rainy season in home territories (in North) and move to the South in the dry season. Nomadic system is involving extensive seasonal migratory movements for search of water and pasture, the stock of thus subjected of combination of stress such as long journeys, extensive of heat, insufficient water supply, and scarcity and low nutritive quality of pasture particularly during the long dry season. Nutritional limitation constitutes one of the most important productivity constrain for nomadic herd, the grazing cattle are apt to suffer from nutritional deficiency, loss of body weight and body condition during the dry season, when the pasture is scarce, fibrous and low of a low nutritive value. This generally reflected in slower growth rate, reduced maturity and low productive and reproductive performance. This work has been has been under take in Western Sudan to develop feed supplementation strategies for improving milk production of nomadic herds.

Material and Methods

Study area

This study was carried out in Sheikan Province, North Kordofan State (Sudan), which is located in aid semi-desert zone.

The experimental work:

The first experiment was conducted to study the effect of supplementary concentrate feeding during the late dry season on body condition, body weight, milk production and reproduction performance (by the assay of progesterone profile in milk). Thirty six cows were divided at random into three groups, group A (high energy high protein) group B (medium energy medium protein) and group C (low energy low protein). Animals were supplemented after grazing with experimental ration composed from local ingredients (ground nut cake, wheat bran and sorghum). Animals were fed with 2 kg/cow/day.

The second experiment was done in the dry season to assess the effect of feeding molasses cane in supplementation to natural grazing of milking cows. The experiment consisted of three feeding trails, in each trails a different experimental rations containing 50 % molasses was tested against a control ration (Sorghum grain, Ground nut cake and Sorghum grain brewery). The same experimental procedure adopted in the first experiment was followed.

Results and Discussion

The result of dietary supplementation on daily and total milk yield is shown in Figure 1, there were significantly different ($P < 0.05$) among the three treatments (A, B and C. The molasses fed groups of grazing cows, produced significantly higher daily milk yield compared to their respective control groups (Figure 2). These findings are in general agreement with those obtained by John and Garnsworthly (1988).

Changes in live weight was assessed for the three experimental groups of animal, live weight decreased for all experimental groups of animal , the cows in group C had significantly higher live weight than the cows in group B and A (Figure 3). The results of the study indicated that, the body condition score of the cows at calving was generally low and it was further reduced as the milk was increased (Figure 4).). The effect of post-partum supplementation on body condition, milk yield and reproductive performance in the present study is affected by the low level of nutrition during lactation period. These findings are in line with the results obtained by Hoogendroon and Greiver (1970), Ali (1991) and El Taher (2000).

Progesterone values revealed some differences in the interval (days) from calving to first progesterone rise (ovulation) among the three groups (table 1). Percentages of cows ovulating and conceived were shown in table 2 and table 3 respectively. The progesterone values revealed some differences in the interval (days) from calving to the first progesterone rise (ovulation) among the three groups of cows. However, these differences were an indication that the cows supplemented with high energy high protein concentrate mixture (group A) ovulated at a shorter interval from calving compared to the other two groups. This explanation is in line with the findings of Richards et al. (1989) and Gosh et al, (1993) .

Table 1 : Mean ± SD (days) from calving to first progesterone (P4) rise and conception in the cows.

Group	Interval (days) from calving to first (P4) rise	Interval (days) from calving to conception
A	57.17±38.2	100.09 ±35.6a
B	73.33±31.3	100.09 ±35.6a
C	74.58±44.0	139.25±24.5b

a, b= Means in the same coloum with different letters are significantly different ($P < 0.05$).

Table 2: Percentage of cows ovulating within difference ranges (days) in all experimental groups.

Range in days	Group A %	Group B %	Group C %	All groups %
15-45	41.7	25	33.3	33.3
46-60	8.3	8.4	33.3	16.7
61-90	33.3	33.3	25.0	30.5
91-120	16.7	33.3	8.4	19.5
120	0	0	0	0

Table3: Percentage of cows conceived within difference ranges (days) in all experimental groups.

Range in days	Group A %	Group B %	Group C %	All groups %
30-60	16.7	8.3	0	8.3
61-90	33.3	8.3	8.3	16.7
91-120	16.7	58.4	8.3	27.8
121	25.0	16.7	83.4	41.7
NC	8.3	8.3	0	5.5

NC = Animals not conceived

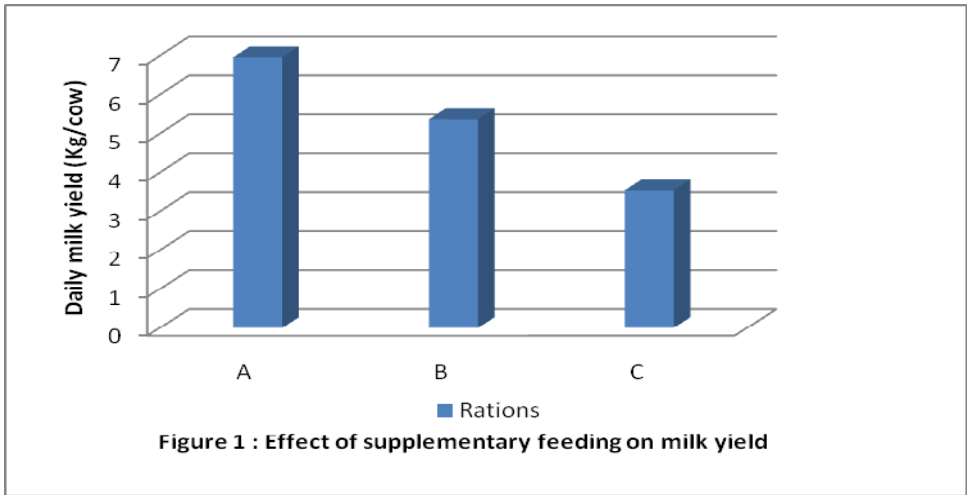

Figure 1 : Effect of supplementary feeding on milk yield

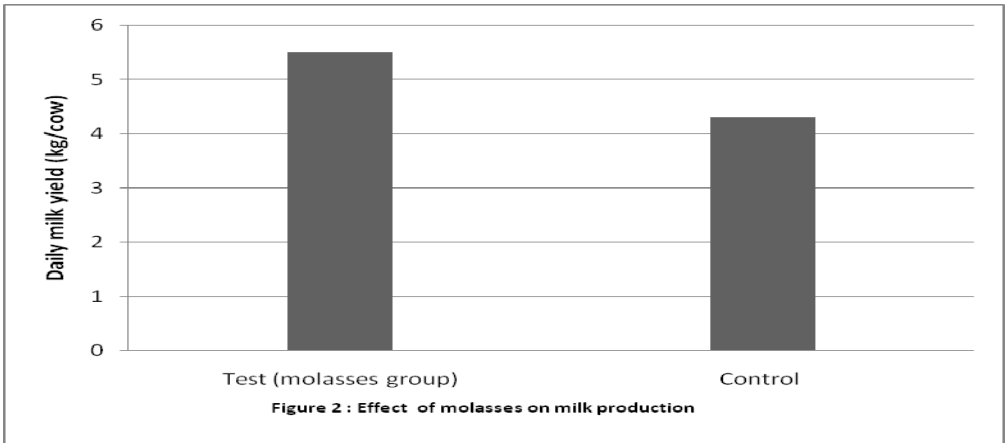

Figure 2 : Effect of molasses on milk production

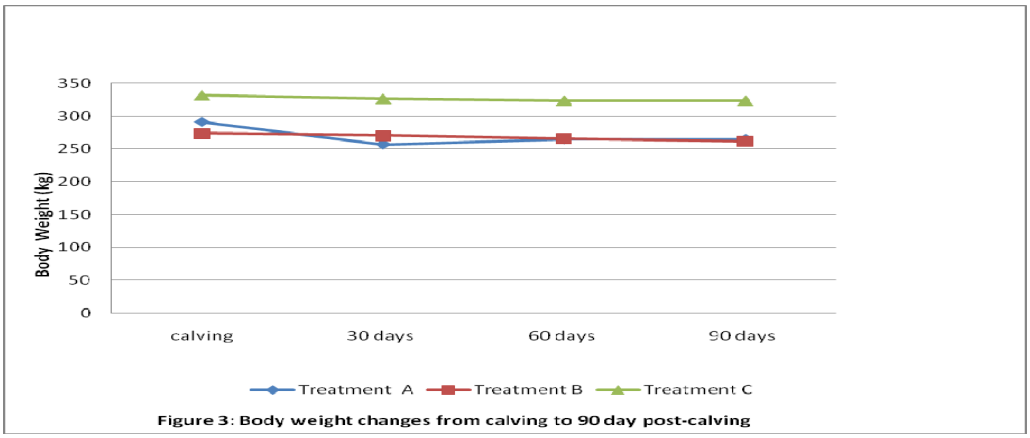

Figure 3: Body weight changes from calving to 90 day post-calving

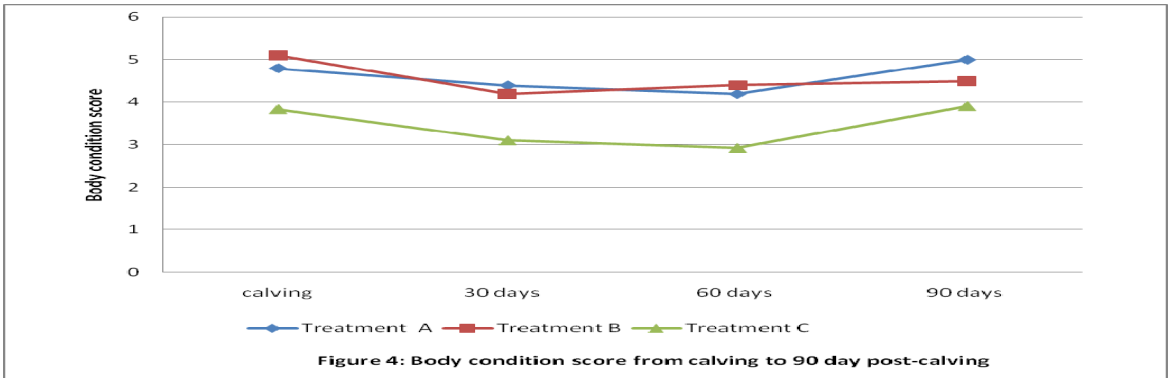

Figure 4: Body condition score from calving to 90 day post-calving

Conclusions and Outlook

The result of the present study indicated that, post-partum supplementation of nomadic milking cows during the dry season improved milk yield. The study indicated the importance of the nutritional status of the nomadic cows at calving and early post-partum on the production and reproduction performance of the animals.

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