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Appraisement of supplementation of concentrate and specific mineral mixture on milk yield and live weight gain of milking cows

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Abstract
The possible efforts are done to use the dairy cows body weight and its variations for different diagnostic and management purpose were studied BW data were received dairy the day from visiting controlled feeding situations.

Body weight data were analyzed on a daily and weekly basis in relation to other performance data that were also recorded on a daily basis. The analysis showed that BW, being sensitive to dry matter intake (DMI), response to reproductive clinical events by detectable changes. Analyzing BW data in relation to those on milk yield (MY), allow to characterize physiological stat ages during milking stage that can be of help in making management decisions. Possibility to build models that use daily BW and MY data to estimate DMI, and significant physiological stages are represented and illustrated.

Keywords: Dairy cow, body weight, management, dry matter intake

Introduction
In India, agricultural prosperity is intimately associated with the livestock development, because, this sector not only contributes to the principal motive power for agricultural operations and transport in rural areas, but also supplies nutritionally rich food for human being such as milk and milk products. Animal productivity is a major part of agricultural productivity and plays important role in the national economy. Indeed, the socio- economic aspects of livestock development may have a larger impact on marginal farmers and landless labour since livestock forms a movable asset especially in stress situation and is more easily convertible than land. In 2003, Saghar [8] worked on the effect of supplementation of mineral mixture in the feed of lactating buffaloes and concluded that mineral supplemented animals have significant increase in milk production and onset of estrous. Farmers maintain their animals on community lands and vicinity of forest land and supplementation of concentrate mixture or any other cereal grains or pulse by products or cakes at stall is almost negligible. Some of the farmers in the region supplement stover and cereal straws to animals. However, these resources are know to be poor in essential minerals. Inadequate nutrition is one of the factors that frequently limit the full utilization of the productive and reproductive potential of livestock in the region. Presently, day by day deterioration of grazing land adversely affect growth, production as well as reproduction of farm animals because of insufficient intake of nutrients.

Keeping in view the above facts, the present study was taken up with the following objectives:

1. To study the feeding regime of on farm trial of dairy cows.
2. Analysis of body weight of milking cows for different dairy managemental practices.

Review of Literature
In the present study, Review of different researches of workers are as, Singh *et al.* (2008) [9] conducted a survey to study the trace mineral status in feeds, which were commonly grazed by the goats. Malawi Kids were divided into two groups Group I was supplemented mineral mixture containing those trace minerals which is deficient in feed samples. While group II was not supplemented with minerals. Body weight was higher in minerals supplemented group (14.5) than in unsupplemented group (13.18 kg). The daily DM intake in G-I and G-II was 507.50 and 430.98 gm respectively. When expressed as percentage of body weight the corresponding value was 3.5 and 3.27. The minerals supplementation showed significant ($P < 0.05$) improvement in the digestibility of DM, OM, CP, CF, EE and NFE.

Mudgal *et al.* (2007) [4] determine the effect of supplementation of Zn, Cu and Selenium together on growth rate and nutrient utilization in the male buffalo calves. The growth rate of the buffalo calves was numerically higher in all the three mineral supplemented group. (T_2, 607; T_3, 611 and T_4, 626) as compared to the control group (577). It may be concluded that supplementation of all these minerals together may not bring the desirable effects and these minerals should be supplemented based on specific deficiency.

Material and Methods

The materials used for conducting the research and various Methodologies used for the completion of research work are described.

Location and place of work

The research work was conducted on lactating cows at villages of district Sagar, Madhya Pradesh.

Selection of the Animals and Experimental Design

For the present study, 40 lactating Tharparkar cows of the II nd to III[rd] lactation were selected and divided randomly into 4 dietary treatments of 10 animals each considering their body weight, milk yield, parity and stage of lactation. The experiment was conducted for the period of 180 days.

Body weight

Body measurements of all the forty cows were taken in the beginning and at the end of the experiment. The weight of animals was taken before feeding and watering in the morning by the Shaffer's formulae:

$$\text{Live weight (in pounds)} = \frac{\text{length x (Girth)}^2}{300}$$

Selection of animals

All the selected cows showed poor body condition. Anoestrous was the major problem as 91.66% of the selected cows had not shown estrous for the last over 6 months. The health condition of the selected cows suggested that the malnutrition might have been the cause of anestrous.

Feeding schedule

The concentrate mixture was offered at 3.30am. and 3.00pm whereas the chaffed mixed roughage was offered at 3.00am. The water was provided to each animal twice a day.

Dietary Treatment

The four dietary treatment used are as under –

Group I (T_1)

Group I will be control. The animals were be fed diet regularly used in the farmer's field. It will consist of wheat straw adlib and in addition to that green berseem is provided daily in the evening while concentrate mixture will be provided at the time of milking daily in the morning and evening.

Group II (T_2)

The animals of this group were be fed similar diet to control but it will be supplemented with mineral mixture @ 2% of the diet.

Statistical analysis

The data obtained were analyzed using general statistics *viz.*, computation of percentage, mean, standard deviation and correlation coefficient. Two sample test for mean and proportion on normal distribution and one way ANOVA was used to find significant differences among groups

Result and Discussion

Body weight of the animals

The body weight of all the animals was recorded before and after the experiment to observe the effect of strategic supplementation on change in their body weight. The average body weight of cows in group I at the start of the experiment was 355.18±5.79 kg while, after the termination, it was recorded as 358.74±6.04 kg. The average body weight recorded in group II was 367.43±5.39 kg before the experiment, while at the end of the experiment it was 370.86± 5.56 kg. In group III, the average body weight of the animals before the start of experiment was 369.43 ±4.21 kg while, that at the end of experiment was 362±4.58 kg. In the last group i.e. group IV the average body weight of the animals before the start of experiment was 365.90±5.24kg that at the end of the experiment was 369.35±5.04kg. The range of the body weight of group I animals before experiment were 334.9 to 385.2 kg and after the experiment were 338.8 to 390.3 kg. The range of the body weight recorded in group II animal before experiment were 332.9 to 389.0 and after the experiment were 334.7 to 389.5 kg. In group III, the range of the body weight before the start of experiment were 352.9 to 389.0 kg while, that at the end of experiment were 350.2 to 383.7 kg. In the last group i.e. group IV the range of the body weight before the start of the experiment were 339.3 to 397.2 kg while, that at the end of the experiment were 342.1 to 399.6 kg.

Studies revealed that there was no significant effect of strategic supplementation on the body weight of animals. Individual and group wise averages of initial body weight of cows are presented in Table.

Gain and loss in the body weight of the animals was calculated after recording the initial and final body weight of the animals which is presented in the text. In group I, the gain in the body weight of the animals was 3.84 kg. The average gain in the body weight of the animals of group II was 3.42 kg. But in group III, there was loss in the body weight of animals and the average loss in the body weight of animals of this group was 2.97 kg. In group IV, the gain in the body weight of the animals was 3.45 kg. The gain or loss in the body weight of animals of all the group along with their group average is presented in Table.

Table 1: Individual as well as mean body weight of animals before the start of experiment

S. No	Group I		Group II	
	Animal No.	Body Weight(Kg)	Animal No.	Body Weight(Kg)
1	A1	370.2	B1	332.9
2	A2	355.2	B2	388.1
3	A3	334.9	B3	352.9
4	A4	337.7	B4	371.3
5	A5	353.6	B5	363.7
6	A6	371.3	B6	355.5
7	A7	335.7	B7	369.5
8	A8	370.3	B8	377.7
9	A9	337.7	B9	373.7
10	A10	385.2	B10	389.0
Mean	-	355.18	-	367.43
SE	-	5.79	-	5.39
SD	-	18.31	-	17.04

Table 2: Individual as well as mean body weight of animals after the termination of experiment

S. No	Group I		Group II	
	Animal No.	Body Weight(Kg)	Animal No.	Body Weight(Kg)
1	A1	372.3	B1	334.7
2	A2	363.9	B2	395.7
3	A3	336.3	B3	356.3
4	A4	341.3	B4	373.2
5	A5	356.4	B5	368.8
6	A6	375.0	B6	360.6
7	A7	345.1	B7	370.3
8	A8	373.0	B8	383.9
9	A9	333.8	B9	375.6
10	A10	390.3	B10	389.5
Mean	-	358.74	-	370.86
SE	-	6.05	-	5.56
SD	-	19.13	-	17.61

Table 3: Change in Body Weight (gain/ loss) of animals during experimental period

S. No	Group I		Group II	
	Animal No.	Body Weight (Kg)	Animal No.	Body Weight (Kg)
1	A1	2.10	B1	1.80
2	A2	8.70	B2	7.60
3	A3	1.40	B3	3.40
4	A4	3.60	B4	1.90
5	A5	2.80	B5	5.10
6	A6	3.70	B6	5.10
7	A7	9.40	B7	0.80
8	A8	2.70	B8	6.20
9	A9	−3.90	B9	1.90
10	A10	5.10	B10	0.50
Mean	-	3.56	-	3.43

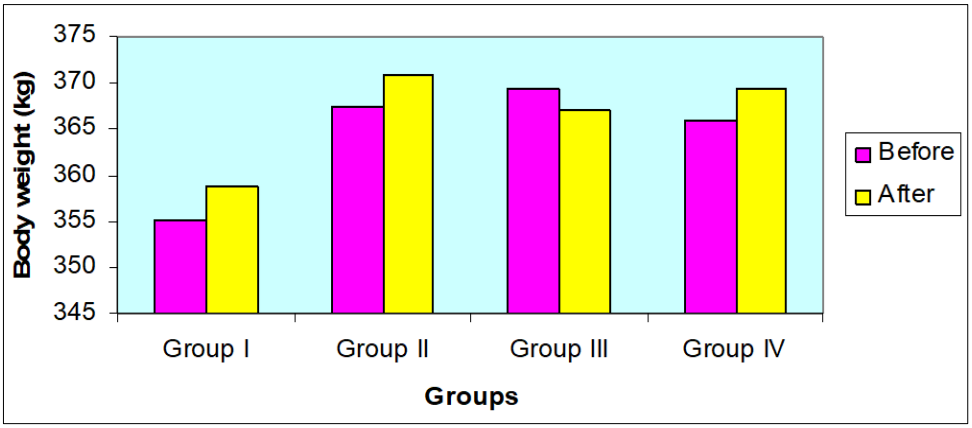

Fig 1: Body weight of animals before and after termination of experiment

Discussion

In the present study average change in body weight in animals of group I, II, respectively during the entire period of 180 days was 3.84 and 3.42. Body weight among cows from different groups did not differ significantly variation per day body weight was only in grams. As the weight was measured using formulae this variation can not be accounted for any dietary effect. Further, in such large animals such small variation in body weight is meaning less. However, supplementation of mineral mixture to conventional feeding method in the dairy led to increase in the weight gain.

This result was comparable with the findings of Mc Beth *et al.* (2003) [3], *Salyer et al.* (2004) and Saha *et al.* (1997b) [7]. They concluded that body weight of the cows and buffaloes were not affected when animals were supplemented strategically as per their nutrient requirement. Plumlee *et al.* (1958) [5], Renquist *et al.* (2005) [6] also came across similar type of inferences. They reported that body weight of cattles was not affected significantly on strategic supplementation. Mburu *et al.* (1993) [2] and Tola *et al.* (2003) [10] in goats and Bedi and Sawhney (1979) [1] in cows reported no significant effect of mineral supplementation on weight gain.

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