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Effect of Jiwanti (Leptadenia reticulata) Supplementation on Fat Percentage and Fat Yield of Milk Produced by Kankrej Cows in Arid Zone of Rajasthan, India

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Research Article

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ABSTRACT

The present study was conducted on 16 lactating Kankrej cows having homogenous parity, milk yield and body weight to investigate the effect of Jiwanti (*Leptadenia reticulate*) supplementation on Fat Percentage and fat yield of Milk produced by Kankrej cows. Cows were grouped in to 4 homogenous treatment groups of 4 each. Out of these, one group served as control wherein no supplementation was given. Cows in treatment groups T1, T2 and T3 respectively, were subjected to Jiwanti supplementation @ 50, 100 and 150 gm. per day. During the supplementation period the Fat percentage was found to be non-significant ($p \leq 0.05$) in all the treatment groups however during post supplementation fat yield was highest in T3 (30.25% higher than control) followed by T2, T1 and then control but the differences were non-significant.

INTRODUCTION

Livestock has a great role in the economy of rural households. Most of the households in rural area possess some kind of livestock and three quarters of these household in the rural area belongs to small and marginal farmers. Livestock has a multidimensional role in achieving national security, employment generation, socio economic development of rural sector especially among the landless, small, marginal farmers and women. Milk production is the enterprise in which the small scale farmers can easily engage themselves in order to improve their livelihood. Regular income from selling of milk moves them from subsistence to a market based income.

Kankrej is one of the heaviest breed of cattle in India and is found in Gujrat and Barmer and Jalore districts of Rajasthan. It is an important dual purpose breed of state which can thrive well in the arid zone of Rajasthan with extreme hot weather, lack of feed and water and management and plays an important role in the milk production of state. Average milk yield of kankrej cattle is around 1,746 kg (range 1,097 to 3,194 kg), Lactation length average is around 294 days (range 275 to 350 days) Calving interval is around 490 days (range 407 to 639 days) and Fat is around 4.8% (range 4.66 to 4.99%).

The use of herbal feed additives in livestock production is as old as the ancient history. Some indigenous plants have been traditionally used to improve feed palatability, utilization and animal productivity. The animal productivity can be increased by using different herbs as a component of animal feed. Now a days, herbal plants are widely used as animal feed additives, having galactogogue properties *viz;* Shatavari, Jiwanti (*Leptadenia reticulata*), Bhringraj (*Eclipta alba*), *Acacia cataehu, Carica papaya* (Papaya) and Methi (*Trigonella foenum*) as reported by Chopra et al [1], Bakshi et al [2].

As the demand of clean milk production increases in the country so there is a need to exploit the use of these herbs as a component of animal feed, which not only improve milk yield but also has beneficial effect on the health of consumers. As in indigenous cattle poor milk production is the main constraint for their animal husbandry. Jiwanti that have anti abortificient activity [3,4] as well as galactogogue activity was used as herbal supplement in the feed to see its effect over production.

Fat Percentage

Average weekly fat percentage data in all treatment groups and control groups has been presented in **Table 1.** The overall mean of weekly fat percentage were found to be 4.18 ± 0.25, 4.29 ± 0.28 and 4.07 ± 0.22 in T1, T2 and T3 groups respectively and 4.17 ± 0.29 in control group. Fat percentage data show that during supplementation period, fatpercentage was not significantly differ between control, T1, T2 and T3; however, during supplementation period average fat percentage was 4.17%, 4.18%, 4.29%, 4.07% in control, T1, T2 and T3 respectively. Fat % in T1 and T2 was 0.28%, 2.82% higher than control whereas in T3 fat % was 2.54% lower than control but it did not reach to the level of significance. During post supplementation period fat percentage was highest in T3 followed by T1, control and then T2 but all these were non-significant. These results suggested that jiwanti herb supplementation did not improved fat percentage. The results were in conformity with the findings of Narasimhamurthy [5]; Dash et al. [6] observed no changes in leptaden supplemented cows, Baig and Bhagwat [7] who reported that galactin vet bolus did not produce any significant change in Fat percentage on crossbred cows; Patel et al. [8] reported that effect of poly herbal biscuits was non-significant on fat percentage. However the results were contradictory with the findings of Shridhar and Bhagwat [9] who reported that Galactin Vet Bolus improved fat percentage in dairy cows. Similar results were also reported by Santosh [10].

Table 1. Mean (± SE) of weekly milk fat percentage in different treatment groups.

week	Milk Fat %			
	Control	T1	T2	T3
1	4.03 ± 0.39	3.8 ± 0.21	3.85 ± 0.73	3.88 ± 0.39
2	4.18 ± 0.33	4.15 ± 0.40	4.05 ± 0.27	4.28 ± 0.32
3	4.18 ± 0.33	4.15 ± 0.40	4.05 ± 0.27	4.28 ± 0.32
4	4.3 ± 0.36	4.58 ± 0.23	4.48 ± 0.39	4.1 ± 0.29
5	3.5 ± 0.41	4.33 ± 0.76	4.89 ± 0.72	3.7 ± 0.13
6	4.35 ± 0.42	3.83 ± 0.28	4.45 ± 0.55	4 ± 0.47
7	4.73 ± 0.41	5.05 ± 0.35	4.8 ± 0.40	4.65 ± 0.40
Mean ± SE	4.17 ± 0.29	4.18 ± 0.25	4.29 ± 0.28	4.07 ± 0.22
P.S.	4.18 ± 0.12	4.33 ± 0.64	4.13 ± 0.35	4.5 ± 0.28

Fat Yield

The fat yield data has been presented in **Table 2** and the overall mean of fat yield was found to be 0.22 ± 0.01, 0.22 ± 0.03, 0.20 ± 0.01 in T1, T2 and T3 groups respectively and 0.19 ± 0.02 in control group. The data indicates that during supplementation period fat yield of T1, T2, and T3 were non-significantly ($p \leq 0.05$) higher than control. T2 had highest fat yield (14.13% higher than control) in supplementation period followed by T1, T3 and then control. During post supplementation fat yield was highest in T3 (30.25% higher than control) followed by T2, T1 and then control but the differences were non-significant.

Table 2. Mean (±SE) of weekly milk fat yield (kg/cow/day) in different treatment groups.

Week	Milk Fat Yield (kg/cow/day)			
	Control	T1	T2	T3
1	0.18 ± 0.03	0.17 ± 0.01	0.17 ± 0.02	0.15 ± 0.02
2	0.19 ± 0.03	0.2 ± 0.02	0.19 ± 0.04	0.18 ± 0.02
3	0.19 ± 0.02	0.22 ± 0.01	0.20 ± 0.01	0.20 ± 0.03
4	0.19 ± 0.02	0.21 ± 0.01	0.23 ± 0.03	0.22 ± 0.02
5	0.16 ± 0.02	0.2 ± 0.01	0.25 ± 0.05	0.2 ± 0.03
6	0.2 ± 0.02	0.22 ± 0.26	0.23 ± 0.04	0.18 ± 0.01
7	0.22 ± 0.02	0.26 ± 0.02	0.25 ± 0.04	0.24 ± 0.01
8	0.2 ± 0.00	0.25 ± 0.02	0.22 ± 0.04	0.21 ± 0.02
Mean ± SE	0.19 ± 0.02	0.22 ± 0.01	0.22 ± 0.03	0.2 ± 0.01
P.S.	0.2 ± 0.01	0.25 ± 0.02	0.22 ± 0.03	0.25 ± 0.02

NS= Non significant ($p \leq 0.05$).
P.S. - Post Supplementation Mean ± SE.

CONCLUSION

From the study it was concluded that during supplementation period, fat percentage was not significantly differ between control, T1, T2 and T3 however fat percentage was highest in T2 followed by T1, control and then T3. During post supplementation period fat percentage was highest in T3 followed by T1, control and then T2. These results suggested that jiwanti herb supplementation did not improved fatpercentage. During supplementation and post supplementation period fat yield of T1, T2, and T3 were non significantly ($p \leq 0.05$) higher than control. T2 had highest fat yield in supplementation period followed by T1, T3 and then control. During post supplementation fat yield was highest in T3 followed by T2, T1 and then control. Thus it can be concluded that Jiwanti can be supplemented @ 50 g/cow/day which is more economic as compare to other treatment groups in the study.

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