



ISSN: 2456-2912

VET 2023; 8(6): 139-141

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Received: 11-08-2023

Accepted: 20-09-2023

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Evaluation of a poly: Herbal Galactagogue on milk production in buffaloes

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Abstract

Present study was plan to evaluate the effect of a poly-herbal Galactagogue on milk production in buffaloes. Total 45 buffaloes were selected from Commercial Dairy farm, Nagpur. On the basis of lactation stages buffaloes were divided in to three groups comprising of 15 animals i.e. early lactating, mid lactating and late lactating. All the buffaloes were supplemented with herbal Galactagogue containing *Lepidium sativum* (50%) and *Dioscorea bulbifera* (50%) at the dose of 100 gm per day along with concentrate mixture orally for fifteen consecutive days. Haematobiochemical parameters were recorded on 0th, 15th and 30th day of study. Milk yield was recorded 15 day before initiation of experiment, 15 days during and 15 days after supplementation of polyherbal Galactagogue. Significant improvement in milk yield, serum calcium were documented and no significant alteration in hemoglobin, serum phosphorus, total protein and glucose were observed due to supplementation of poly herbal Galactagogue.

Keywords: Polyherbal galactagogue, milk yield, buffaloes, Haematobiochemical parameter

Introduction

The low milk production of dairy animals due to various factors like under feeding, mal-nutrition, various diseases, stress, seasons etc. which hamper the economy of dairy industry Herbal medicine is mainstay of 75-80% of the world population mainly in the developing countries for primary health care because of easy availability at cheaper cost, better compatibility with the human / animal body and negligible side effects.

Galactagogues are medications or substances believed to assist initiation, maintenance and augmentation of maternal milk production. A number of herbal plants have been emphasized in Ayurveda, which contain large number of chemical active principles including alkaloids, have galactogenic properties and can be used as herbal medicine for the purpose of milk let-down in dairy animals. The use of herbal galactagogues are known to have beneficial effect on milk production (Bharti *et al.*, 2012) [6]. Therefore, it is envisaged in the present study to evaluate a polyherbal Galactagogue (*Dioscorea bulbifera* 50% and *Lepidium sativum* 50%) which are low cost, safe, free from side effect and easily available.

Materials and Methods

In the present study total 45 buffaloes were selected from Commercial Dairy farm, Nagpur On the basis of lactation stages buffaloes were divided into three groups comprising of 15 animals i.e. early lactating, mid lactating and late lactating. All the buffaloes were supplemented with herbal Galactagogue containing *Lepidium sativum* (50%) and *Dioscorea bulbifera* (50%) at the dose of 100 gm per day along with concentrate mixture orally for fifteen consecutive days. All animals were maintaining on same ration. Milk production were recorded 15 days before initiation of study, 15 days during feeding of herbal Galactagogue and 15 days post supplementation. Haematobiochemical parameters were recorded on 0th, 15th and 30th day of study (Haemoglobin, serum calcium, phosphorus, total protein and glucose). Data was analyzed statistically analyzed by using one-way classification method and technique as outlined by Snedecor and Cochran (1994) [17].

Results

It is evident from the data presented in Table 1 that there is slight improvement on 15th day in mid and late lactating animals but decline in early lactating. Further, decrease in haemoglobin concentration at 30th day values when compared to 0th day observation in early and late lactating buffaloes and slight improvement in mid lactating buffalo. There was no significant difference observed between the observations. The serum calcium level has increased on 15th and 30th day as compared with 0th day of experiment. However, level was reduced on 30th day as compared to 15th day observation. These improvements in calcium levels are significant. In buffaloes slight improvement in serum phosphorus was recorded on 15th day in early and late lactating groups and

slight decrease in mid lactating groups. However, in all the groups at all stages serum phosphorus concentration declined on 30th day as compared to 0th day observation. These observations are nonsignificant. The serum total protein slightly increased on 15th day and decreased on 30th day when compared to 0th day readings of experiment. In early and late lactating buffaloes these improvements were nonsignificant where as significant in late lactating buffaloes. In all lactating buffaloes the serum glucose concentration declined on 15th day of experiment which further reduced on 30th day of study. This reduction in glucose levels were nonsignificant at statistical level. In case of milk yield significant improvement was recorded on 15th and maintained up to 30th day of the study (Table 1).

Table 1: Mean \pm S. E. of Haematobiochemical parameter and Milk yield in buffaloes at early, mid and late lactation period and its significance

Parameter	Lactation Status	Days			Significance
		0	15	30	
Hemoglobin	Early	9.32 \pm 0.18	9.15 \pm 0.19	9.25 \pm 0.19	NS
	Mid	9.29 \pm 0.14	9.32 \pm 0.15	9.40 \pm 0.11	NS
	Late	9.31 \pm 0.19	9.32 \pm 0.13	9.21 \pm 0.13	NS
Serum Calcium	Early	8.58 ^a \pm 0.23	9.57 ^b \pm 0.32	8.94 ^a \pm 0.28	*
	Mid	9.00 ^a \pm 0.16	9.79 ^b \pm 0.21	9.00 ^a \pm 0.34	*
	Late	8.58 ^a \pm 0.13	9.41 ^c \pm 0.16	9.03 ^b \pm 0.16	**
Serum Phosphorus	Early	6.01 \pm 0.34	6.02 \pm 0.29	5.81 \pm 0.28	NS
	Mid	4.89 \pm 0.25	4.73 \pm 0.21	4.67 \pm 0.34	NS
	Late	5.07 \pm 0.20	5.16 \pm 0.31	5.09 \pm 0.32	NS
Serum Total Protein	Early	7.18 \pm 0.37	7.32 \pm 0.25	7.04 \pm 0.29	NS
	Mid	7.97 \pm 0.29	7.98 \pm 0.29	7.80 \pm 0.19	NS
	Late	8.43 ^a \pm 0.23	9.28 ^b \pm 0.27	8.52 ^a \pm 0.27	*
Serum Glucose	Early	59.50 \pm 4.18	53.57 \pm 2.58	53.53 \pm 2.09	NS
	Mid	52.38 \pm 3.69	48.07 \pm 3.47	46.59 \pm 1.44	NS
	Late	51.47 \pm 3.18	46.56 \pm 2.92	45.81 \pm 1.38	NS
Milk Yield	Early	9.07 ^a \pm 0.26	9.97 ^b \pm 0.23	9.87 ^b \pm 0.23	*
	Mid	9.23 ^a \pm 0.23	10.00 ^b \pm 0.25	10.20 ^b \pm 0.25	*
	Late	6.20 ^a \pm 0.28	6.93 ^b \pm 0.20	7.13 ^b \pm 0.29	*

* = Significant at 5% level

** = Significant at 1% level

Row – wise different superscript indicates significance

Discussion

In early lactating buffaloes haemoglobin concentration in blood was declined on 15th day and slightly improved on 30th day. Marginal decline in concentration was observed in late lactation; however, slight improvement in mid lactating buffaloes. The variation was non-significant. Similar observation was reported by Tomar *et al.* (1996) [19] and Adam (1999) [2] who observed that non-significant alteration in haemoglobin after feeding *Lepidium sativum* 100g to cows and 2% of feed in rats, respectively. In the present study it is clearly observed that haemoglobin concentration was decreased as milk production increases. The observation is supported by findings of Chaudhari (2000) [7]. Payne *et al.* (1974) [13] also reported that the haemoglobin concentration lower in lactating animals than non-lactating.

In the present study serum calcium significantly improved in all the treatment groups. This indicates that herbal Galactagogue has significant and positive effect on serum calcium level. Rowlands *et al.* (1975) [15] and Quayam *et al.* (1987) [14] reported that as compare to prepartum blood calcium level was increased in post partum period might be due to increased dietary absorption or increased mobilization of calcium from bone to meet the demand for increased milk production estimated the mineral content in *Dioscorea bulbifera* and reported that the tubers of *Dioscorea bulbifera* are rich source of calcium.

Fluctuating level of serum phosphorus was observed in all the groups. The values are within the normal range as reported in literature. This fluctuation in level of serum phosphorus with increased milk production may be due to increased absorption of this mineral and appears to be due to feed supplementation i.e. poly-herbal Galactagogue. The observation of present study is in general agreement with the observation of Khalil *et al.* (2012) [9] who reported that *Lepidium sativum* contain high content of phosphorus i.e. 96.3 mg/100g.

Perusal of data revealed that serum total protein was increased in late lactating buffaloes. However, non-significant improvement observed in early and mid lactating buffaloes. The findings of the present study are in general agreement with that of Tomar *et al.* (1996) [19] and Abo El - Nor (2007) [1]. Abo El - Nor (2007) [1] reported that supplementation of medicinal plant (*Lepidium sativum*) increased serum total protein significantly. The increase in total serum protein may be due to nourishing effect and improved digestion effect of *Lepidium sativum* seeds. The increase in serum total protein level in the present study clearly indicated that poly-herbal Galactagogue has significant and positive effect on serum total protein and this increase in level might be due to high protein availability and increase digestibility in rumen due to feeding poly-herbal Galactagogue.

In the present study declining trend in serum glucose level was observed in all the groups after feeding poly-herbal

Galactagogue. Similar observations were reported by Ahmed *et al.* (2009)^[20], Amawi and Aljamal (2012)^[5] and Manohar *et al.* (2012)^[11]. Rowlands *et al.* (1975)^[15] and Gupta and Rai (1987)^[8] reported that glucose concentration decreases after calving in early lactation may be due to energy intake at this stage was barely adequate for production requirements. The decreased in blood glucose may be due to the aqueous extract of *Dioscorea bulbifera* either potentiated insulin secretion or acted like insulin in quick glucose metabolism. In permanent diabetic rats it might have been due to the stimulation of insulin secretion from remnant β – cells.

Significant improvement in milk production was observed in all groups. This results are in general agreement with Thakur *et al.* (2006)^[18], Abo El – Nor *et al.* (2007)^[1], Kumar *et al.* (2011)^[10] and Patel *et al.* (2013)^[12]. In India and abroad *Lepidium sativum* was commonly used to enhance milk production in buffaloes by Kumar *et al.* (2011)^[10] and Patel *et al.* (2013)^[12], in rats Al – Yawar *et al.* (2006)^[4]. significant increased milk production in murrh buffaloes due to supplementation of *Lepidium sativum* recorded by Kumar *et al.* (2011)^[10]. They explained that the increase in milk yield of buffaloes due to chandrasoor (*Lepidium sativum*) supplementation was related to higher amount of nutrient utilization and its availability for milk synthesis.

Conclusion

It is observed from the present study that the supplementation of poly-herbal Galactagogue in the feed increases the milk production, serum calcium significantly; however, haemoglobin, serum phosphorus, serum total protein and serum glucose level decreases in response to increase in milk production.

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