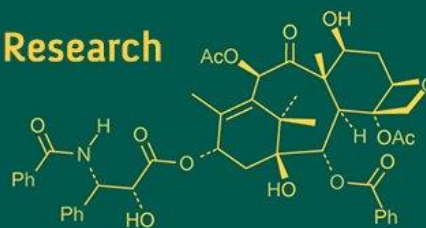


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Effect of polyherbal mixture supplementation on reproductive performance of postpartum dairy cattle

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Abstract

The present study was conducted to find out the effect of supplementation of polyherbal mixture to post-partum Haryana cows on their reproductive attributes. For this purpose the present study was carried out on sixteen cyclic, healthy, post-partum Haryana cows of second and third parity maintained at LFC, DUVASU, Mathura. These experimental cows were quasi randomly divided into two groups (consisting of eight animals both in supplemented and control group) on the basis of their age, parity, body weight and average milk yield per day. Moreover, as estrus synchronization was not practiced at LFC, Mathura, therefore, it was tried best to distribute alternate cows in the same group. All the experimental cows were kept in loose housing system under standard feeding and other management practice as followed at LFC, DUVASU, Mathura. They were kept along with their original herd mates in the same shed. Feeding was done as per the ICAR (2013) standards. A readymade polyherbal mixture (consisting of a total fifteen herbs and black salt) procured from "Essence Natura" Pvt. Ltd. of Panchkula Haryana, India were supplemented to the cows of supplemented group at recommended dose rate of 25gm/day/cow at the time of daily milking along with basal diet from 6th to 96th days postpartum (experimental period 90 days) whereas, only basal diet was fed to the cows of control group. Supplementation of polyherbal mixture revealed a significant decrease in days to first heat (d) ($P=0.047$) in Haryana cows of supplemented group (128.86 ± 16.37) as compared to control group (197.50 ± 16.37). Thus, it may be concluded from the present study that supplementation of polyherbal mixture improved the reproduction status of post-partum Haryana cattle.

Keywords: Polyherbal, Haryana cattle, postpartum, reproductive performance, service period, days to first heat

1. Introduction

India is endowed with the largest livestock population in the world comprised of 536.76 million livestock. As the world's largest milk producer, India has immense resources of livestock which forms an important segment of the economy, livelihood and a steady source of nutrition and also helps in strengthening India's economy (Shetkar *et al.*, 2021a) [3]. Over the period, the contribution of livestock sector in the agriculture sector has been showing steady growth that signifies its growing importance in the Indian economy. Contribution of livestock sector to the Indian Agriculture and Indian Economy is increasing steadily with a share of 30.47% in Agriculture & Allied Sector's GVA and 4.75% in the country's total GVA, respectively (BAHS, 2024).

Total milk production in the country is 239.30 million tonnes during 2023-24. The milk production from exotic/crossbred cattle has increased by 3.75% and indigenous/non-descript cattle have increased by 2.63% as compared to the previous year (BAHS, 2024). Despite being the largest producer of milk in the world, the average annual productivity of cattle in India during 2019-20 was only 1777 kg per animal per year as against the world average of 2699 kg per animal per year (PIB, 2021).

Indigenous cattle are among the most versatile domestic animals that can adapt to different stressful climatic conditions, such as arid, tropical, and desert conditions, have better disease resistance and survive better in local environment conditions. India has an array of indigenous cattle breeds, some of which are considered as potent milch breeds (Singh, 2019) [4].

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Among indigenous cattle breeds, Haryana is the well-known dual-purpose indigenous breed of Haryana state (Shetkar *et al.*, 2021b) [3]. Haryana cattle is known for its remarkable power of endurance under hot climate of tropics, resistance to tropical diseases and has low maintenance cost. Haryana is an important cattle breed with an average standard milk yield of 997 kg per lactation with highest recorded milk yield as 1,745 kg per lactation but high producing animals of Haryana breed may produce over 2300 kg milk in single lactation (Mishra *et al.*, 2009) [7].

In order to restore the animal's productivity and to optimize the milk production in individual animals for better profits, various drugs, herbal preparations, hormones, mineral supplements and feed additives have been tried with variable results (Ramesh *et al.*, 2000) [8]. Various herbs are being used since prevedic era because they are considered to be safe for consumption, cheap to procure and easily available with least or no side effects and no residual effect (Krishna *et al.*, 2005) [9].

Herbs show galactagogue property along with several other pharmacological effects such as antimicrobial and anti-inflammatory (Sathyanarayana *et al.*, 2008) [10], milk composition, metabolic changes in body tissues and the mammary gland (Thakur, 1977) [11]. Herbal preparations may also reduce the heat stress in dairy cows (Zhang *et al.*, 2007) [12]. Supplementation of herbs may be useful even in controlling the incidence and negative effects of subclinical mastitis in lactating dairy cows (Giacinti *et al.*, 2008) [13] by boosting the immune status.

So, for now the effect of supplementation of herbal preparations have been observed mostly on milk production and very few literatures regarding the effect on mastitis and health status of dairy animals are available, whereas these herbs have long been used in feeding of dairy animals for their wellbeing. Further, understanding the effect of polyherbal mixture on reproductive events will advance our knowledge on these herbs and their effect on animal system. Therefore, the present study was undertaken to evaluate the effect of dietary supplementation of a polyherbal mixture on the reproductive performance of postpartum Haryana cows.

2. Materials and methods

The present study was carried out with the objective to evaluate the effect of dietary supplementation of polyherbal mixture on reproductive parameters of postpartum lactating Haryana cattle maintained at Livestock Farm Complex (LFC), DUVASU, Mathura.

Animal care procedures and experimental protocols were approved by Institutional Animal Ethics Committee (IAEC). Experiment was conducted in accordance with CPCSEA guidelines, Government of India.

Sixteen healthy, cyclic Haryana cows of second and third parity just after their parturition were selected for the present experiment. These experimental cows were 'Quasi randomly' assigned into two groups (Eight Haryana cows in each control and supplemented group) on the basis of their parity, body weight and average milk yield per cow per day during previous lactation (2.3, 365 kg, 4.45 kg/cow/day in control group, while 2.5, 370 kg, 4.6 kg/cow/day in supplemented group respectively. Moreover, as estrus synchronization was not practiced at LFC, Mathura, therefore, it was tried best to distribute alternate cows in the same group.

All the experimental cows were kept in loose housing system under standard management practice as followed at LFC, DUVASU, Mathura. They were kept along with their original herd mates in the same shed under loose housing system. The feeding and other management practices for these cows remained same as was normally practiced for other cows of the herd. Feeding was done as per the ICAR (2013) standards. Diets were prepared by taking concentrates and roughage in proportion of 30: 70%. Concentrate mixture prepared at LFC composing of mustard oil cake, gram chunni, wheat bran, cotton seed cake, barley grain, mineral mixture was fed to the animals. Concentrate mixture was fed to the animals only at the time of milking, twice a day. Seasonal green fodder was offered as roughages to the animals. Milking of all the animals was performed manually at regular interval, twice a day.

2.1 Procurement and supplementation of polyherbal mixture

A commercially available polyherbal mixture was procured from Essence Natura Pvt. Ltd., Panchkula, Haryana, India. The experimental polyherbal mixture comprised of a proportioned combination of *Cuminum cyminum*, *Piper nigrum*, *Embelica ribes*, *Leptadenia reticulata*, *Asparagus racemosus*, *Anethum sowa*, *Eclipta alba*, *Solanum nigrum*, *Foeniculum vulgare*, *Trigonella foenum graecum*, *Trachyspermum ammi*, *Swertia chirayita*, *Withania somnifera*, *Boerhavia diffusa*, and *Acacia catechu* in powder form. In addition, Black salt was mixed along with them for palatability.

This polyherbal mixture was stored at a dry place and was supplemented to the experimental cows at recommended dose rate of 25gm/day/cow at the time of daily milking. Cows were fed with Polyherbal mixture powder as per the doses properly mixed in the concentrate mixture provided before afternoon milking. The animals were taken for the experiment just after parturition and were given adaptation period for five days. The duration of experiment was from 06th to 96th days postpartum. Total duration of the experiment was 90 days.

Table 1: Supplementation of polyherbal mixture to experimental cows

Groups	Diet
Control(T ₁)	Basal diet only, with no supplement
Treatment 1 (T ₂)	Basal diet and Polyherbal mixture @ 25gm/day/cow

2.2 Parameters studied

The experimental animals were observed for following reproductive parameters during experimental period of 90 days:

2.3 Days to first heat

The period from the day of calving to the day of first time detection of heat in experimental cows was considered as days to first heat. In all the experimental animals, heat was regularly detected by using teaser bull and observing signs and symptoms of heat.

2.4 Service period

The period from the day of calving to the day of successful artificial insemination (A.I.) or conception was considered as service period.

2.5 A.I. per conception

The number of artificial inseminations required for successful conception in each experimental cow was considered as number of AI per conception.

2.6 Statistical analysis

The data observed were subjected to multivariate analysis of variance using the general linear model (GLM) procedure of the Statistical Software Package (SPSS for window, V19.0; SPSS Inc., Chicago, IL, USA) using following model:

$$Y_{ijk} = \mu + P_i + D_j + e_{ijk}$$

Where, Y_{ijk} is the dependent trait i.e. milk, physiological, hemato-biochemical, immunity, reproductive and ruminal attributes of k th cow on j th days of observation; P_i is the effect of i th Polyherbal mixture; D_j is the effect of j th day of observation and e_{ijk} is the random error, assumed to be normally and independently distributed with mean zero and constant variance i.e. NID (0, σ^2).

3. Result

The present study was conducted to assess the effect of supplementation of polyherbal mixture on reproductive parameters of postpartum dairy cattle. In this experiment, 16 postpartum Hariana cows were selected and quasi-randomly divided into two groups on the basis of age, parity, body weight and average daily milk yield having 8 animals in each group. Animals of control group were fed with basal diet, only whereas, animals of treatment group were supplemented with polyherbal mixture @ 25 gm/cow/day along with basal diet. The observations recorded on different parameters have been analyzed and results for the same have been presented under following heads and subheads:

3.1 Reproductive parameters

The results for the effect of supplementation of polyherbal mixture on various reproductive parameters have been presented under following subheads:

3.1.1 Days to first heat (d)

The results have been presented in table 2 which reflected that mean for days to first heat (d) of the experimental Hariana cows supplemented with polyherbal mixture decreased significantly ($P=0.047$) in supplemented group (128.86 ± 16.37) as compared to the control group (197.50 ± 16.37).

Table 2: Effect of supplementation of polyherbal mixture on days to first heat (d) of postpartum Hariana cows

Attribute	Control	Polyherbal	SEM	P-value
Days to First Heat	197.50 ^b	128.86 ^a	16.37	0.047

Means with different superscript in a row differ significantly.

3.1.2 Service period (d)

The results for the effect of supplementation of polyherbal mixture on the service period (d) of the experimental Hariana cows have been presented in table 3. The mean for service period (d) of experimental Hariana cows differed non-significantly ($P=0.485$) between the supplemented group (211.00 ± 44.75) and the control group (248.50 ± 44.75). Thus, mean service period (d) was found to be non-significantly lesser in supplemented group as compared to control group.

Table 3: Effect of supplementation of polyherbal mixture on service period (d) of postpartum Hariana cows

Attribute	Control	Polyherbal	SEM	P-value
Service Period	248.50	211.00	44.75	0.485

3.1.3 Number of A.I. per conception

The results for the effect of supplementation of polyherbal mixture on the number of artificial inseminations (A.I.) per conception of the experimental Hariana cows have been presented in table 4. The mean for number of A.I. per conception of experimental Hariana cows reflected exceptionally non-significant difference ($P=0.156$) between the supplemented group (2.25 ± 0.24) and the control group (1.50 ± 0.24).

Table 4: Effect of supplementation of polyherbal mixture on number of A.I. per conception of postpartum Hariana cows

Attribute	Control	Polyherbal	SEM	P-value
Number of A.I. per conception	1.5	2.25	0.24	0.156

4. Discussion

The present study was carried out with the hypothesis that the herbs or polyherbal mixtures contain various active ingredients which may be helpful in improving their reproduction. In present investigation post-partum Hariana cows of LFC, DUVASU, Mathura were supplemented with a polyherbal mixture and its effect on reproductive parameters have been interpreted under following subheads:

4.1 Days to first heat (d)

In the present study, the mean for days to first heat (d) of the experimental Hariana cows supplemented with polyherbal mixture decreased significantly ($P=0.047$) in the supplemented group compared to the control group (Figure 1).

Similar findings were observed by Japheth *et al.* (2021) [14], who observed that days to first insemination were earlier in the treatment group compared to the control group, supporting the findings of this study. Similarly, Kuri *et al.* (2019) [15] found a significant reduction ($P<0.05$) in the interval from calving to the first observed estrus in the supplemented group compared to the control. Sharma (2009) [16] noted that polyherbal supplementation resulted in fewer days to postpartum estrus in Karan-Fries cows, aligning with the current results. Muwal *et al.* (2020) [17] also found that the mean duration of the first postpartum estrus was significantly reduced ($P<0.05$) in the treatment group compared to the control group.

These results suggest that the polyherbal mixture effectively reduced the days to first heat in the experimental Hariana cows, indicating a positive impact on their reproductive performance.

4.2 Service period (d)

In the present study, the mean service period (d) of the experimental Hariana cows supplemented with polyherbal mixture did not differ significantly ($P>0.05$) between the supplemented group and the control group. However, the mean service period was shorter in the supplemented group compared to the control group (Figure 2).

In agreement with our findings, Japheth *et al.* (2021) [14] found that the service period was shorter in the treatment group compared to the control group, supporting the trend observed in this study. Similarly, Kuri *et al.* (2019) [15]

found a significant reduction ($P < 0.05$) in the service period in the supplemented group compared to the control. Sharma (2009)^[16] noted that polyherbal supplementation resulted in a lower service period in Karan-Fries cows, aligning with the findings of the present study. Kumar *et al.* (2014)^[18] found that the service period was significantly reduced ($P < 0.05$) in the supplementation group compared to the control group. Muwal *et al.* (2020)^[17] also reported a significantly reduced ($P < 0.05$) service period in the treatment group compared to the control group (Figure 3). These results suggest that while the polyherbal mixture did not significantly impact the service period in this study, there is evidence from other studies indicating potential benefits of similar supplements in reducing the service period.

4.3 Number of A.I. per conception

In the present study, the mean number of artificial inseminations (A.I.) per conception of the experimental Haryana cows reflected a non-significant difference ($P > 0.05$) between the supplemented group and the control group (Figure 3).

Conversely, Japheth *et al.* (2021)^[14] observed that the number of services per conception was lower in the treatment group compared to the control group. Similarly, Kuri *et al.* (2019)^[15] found a significant reduction ($P < 0.05$) in the number of services per conception in the supplemented group compared to the control. Sharma (2009)^[16] noted that polyherbal supplementation resulted in fewer services per conception in Karan-Fries cows. Additionally, Cui *et al.* (2014)^[19] found that the treatment group had significant decreases in the number of services per conception ($P < 0.01$), and Kumar *et al.* (2014)^[18] reported that the number of services per conception was significantly reduced ($P < 0.05$) in the supplementation group compared to the control group.

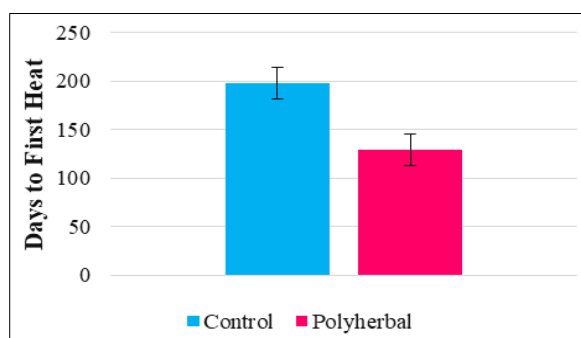


Fig 1: Effect of supplementation of polyherbal mixture on Days of sampling to first heat (d) of postpartum Haryana cows

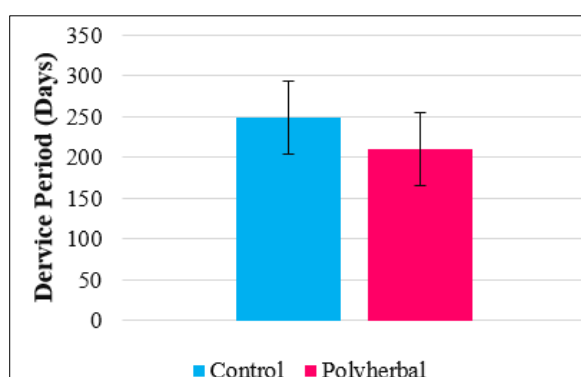


Fig 2: Effect of supplementation of polyherbal mixture on service period (d) of postpartum Haryana cows

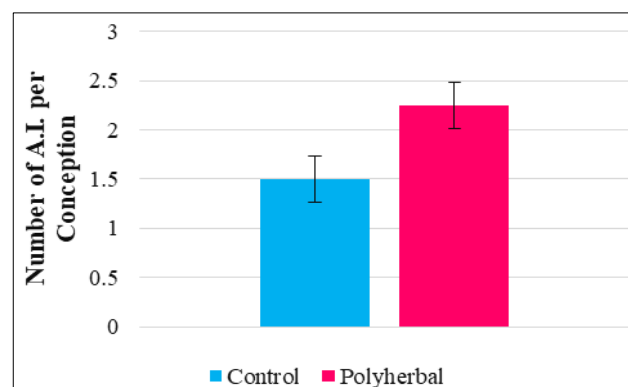


Fig 3: Effect of supplementation of polyherbal mixture on number of A.I. per conception of postpartum Haryana cows

5. Conclusion

Based upon the findings of the present investigation, it may be concluded that the supplementation of polyherbal mixture positively affected the reproductive (decrease in days in first heat) status of dairy animals. Thus, the supplementation of polyherbal mixture improved the production, reproduction and immune status of post-partum Haryana cows.

References

1. Basic Animal Husbandry Statistics (BAHS). New Delhi: Department of Animal Husbandry and Dairying, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India; 2024.
2. 20th Livestock Census. New Delhi: Department of Animal Husbandry and Dairying, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India; 2019.
3. Shetkar M, Kumar V, Singh SP, Singh Y, Kumar M, Nath S. Age at first calving and lifetime performance of Haryana cattle at organized farms. *Indian Journal of Animal Sciences*. 2021;91(12):1106-1108.
4. Press Information Bureau. Productivity of dairy animals. New Delhi: Ministry of Fisheries, Animal Husbandry and Dairying, Government of India; 2021.
5. Singh N. Study on quality and bioactive components in milk of various indigenous cattle breeds in hot-arid region of Rajasthan [doctoral thesis]. Rajasthan, India: Rajasthan University of Veterinary and Animal Sciences; 2019.
6. Shetkar M, Kumar V, Singh SP, Singh Y, Kumar M, Singh K. Genetic analysis of first dry period and lifetime performance in Haryana cattle. *Indian Journal of Animal Sciences*. 2021;91(12):1103-1105.
7. Mishra BP, Mukesh M, Prakash B, Monika S, Kapila R, Kishore A. Status of milk protein, β -casein variants among Indian milch animals. *Indian Journal of Animal Sciences*. 2009;79:72-75.
8. Ramesh PT, Mitra SK, Suryanarayan T, Sachan A. Evaluation of Galactacin, a herbal galactagogue preparation in dairy cows. *The Veterinarian*. 2000;24:1-3.
9. Krishna L, Swarup D, Patra RC. An overview of prospects of ethno-veterinary medicine in India.
10. Sathyanarayana N, Rajesha R, Vikas PB, Kumar TN. Somatic embryogenesis and plant regeneration from stem explants of *Leptadenia reticulata*. *Indian Journal of Biotechnology*. 2008;7:250-254.

11. Thakur SS. Effect of Galog on milk production and feed intake [MVSc thesis]. Karnal, Haryana, India: National Dairy Research Institute; 1977.
12. Zhang Q, Ni Y, Guo H, Wang C. Effects of Chinese herbal formula heat-stress-releasing on antioxidant function in dairy cows. *Frontiers of Agriculture in China*. 2007;1(4):478-480.
13. Giacinti G, Rosati R, Boselli C, Tammaro A, Amatiste S, Ronchi B. Control of bovine sub-clinical mastitis by using herbal extract during lactation. In: *Proceedings of the 2nd Conference of the International Society of Organic Agriculture Research (ISO FAR)*; 2008 Jun 18-20; Modena, Italy. p. 1-4.
14. Japheth KP, Kumaresan A, Patbandha TK, Baithalu RK, Selvan AS, Nag P, *et al*. Supplementation of a combination of herbs improves immunity, uterine cleansing and facilitates early resumption of ovarian cyclicity in postpartum dairy buffaloes. *Journal of Ethnopharmacology*. 2021;272:113931.
15. Kuri P, Kumar P, Kumar N, Aggarwal A, Singh M. Effect of poly-herbal mixture supplementation during postpartum period on feed intake and reproductive performance of Sahiwal cows. *Indian Journal of Animal Nutrition*. 2019;36(1):35-39.
16. Sharma A. Influence of polyherbal immunomodulator supplementation on production performance and milk quality of Karan Fries cows [doctoral thesis]. Karnal, Haryana, India: National Dairy Research Institute; 2009.
17. Muwal H, Rai DC, Bhateshwar V, Meena JP, Lal D. Effect of Shatavari root powder (*Asparagus racemosus*) supplementation on milk composition of Sahiwal crossbred cows. *Journal of Animal Research*. 2020;10(3):411-415.
18. Kumar S, Mehla RK, Singh M. Effect of Shatavari (*Asparagus racemosus*) on milk production and immunomodulation in Karan Fries crossbred cows. *Indian Journal of Traditional Knowledge*. 2014;13(2):404-408.
19. Cui D, Wang X, Wang L, Wang X, Zhang J, Qin Z, *et al*. The administration of Sheng Hua Tang immediately after delivery to reduce the incidence of retained placenta in Holstein dairy cows. *Theriogenology*. 2014; 81(5):645.

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