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Reproductive and Productive Performance of Murrah Buffaloes on Post-Partum Poly-Herbal Supplementation



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ABSTRACT

The present experiment was conducted to evaluate the effect of poly-herbal mixture supplementation on production and reproductive performance in freshly calved buffaloes. Twenty Murrah buffaloes were divided into two groups viz.; T0 control (n=10, parity P=3.3±0.55, avg. milk yield (kg)=2659±204) without any supplementation and T1 (n=10, parity P=3.5±0.56, avg. milk yield (kg)=2620±112) poly-herbal mixture was supplemented for ten days postpartum. 1st heat in days (T0- 103.6a±12.40, T1- 71.9b±9.55), no of AI done (T0- 2.3±0.48, T1- 2.2±0.49), service period (days) (T0-108.4±22.47, T1- 89.67±8.51), time of the expulsion of the fetus (hours) (T0- 15.7a±2.15, T1- 9.3b±1.84), conception rate (%) (T0- 41.7%, T1- 46.14%), RFM (%) (T0- 20%, T1- NIL), and yield per day (kg) (FCM6%) (T0- 12.81±0.67, T1- 13.50±0.37), peak yield (kg) (FCM6%) (T0- 16.53±0.85, T1- 17.23±0.47), milk yield of 4 months (kg) (FCM6%) (T0- 1537±80.92, T1- 1620±44.11). 1st heat in days and expulsion of the fetal membrane were significantly higher (P<0.05) in the supplemented group as compared to the control group (T0). Feeding of the poly-herbal mixture could lower the number of days to first insemination and service period due to early uterine involution. It can be concluded that the supplementation with the polyherbal mixture in the postpartum diet enhances the postpartum productive and reproductive performance of Murrah buffaloes.

Keywords: Poly-herbal mixture, Reproductive performance, postpartum period, Murrah

INTRODUCTION

The transition period is the most crucial phase in bovine life when various physiological, gynecological, and metabolic changes occur that leads to disrupt the homeostatic mechanisms of the buffaloes. It happens together with the high nutrient requirement for calf growth and milk synthesis and secretion along with that there is a gradual decline in dry matter intake (DMI) that starts 2–3 weeks prepartum. This leads to a negative energy balance (NEB) in early lactation [5, 11]. Although reproductive performance is compromised, primarily through delayed ovarian activity and reduced conception rates due to demands to maintain high milk yield [21,4]. Buffalo is exposed to a high risk of infection to the uterus after postpartum due to anatomical barriers which are breached and genitalia remains open for various days [10], resulting in gynecological disorders like anoestrus, endometritis, metritis, pyometra, etc. in buffalo. It is estimated that around 18-40% of cattle and buffaloes were culled mainly due to infertility [18]. However, there is scanty scientific information available on the effect of “poly-herbal mixture” feeding on reproduction performance in Murrah buffaloes.

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MATERIALS AND METHODS

Descriptive study of the area

This study was conducted at Buffalo Farm, Department of Livestock Production Management, Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar, India. The LUVAS, Hisar is located at 29.09°N 75.43°E in western Haryana. It has an average elevation of 215 m (705 ft) above mean sea level. The region is part of the alluvial Ghaggar-Yamuna plain and its southern and western portions mark a gradual transition to the desert. The minimum ambient temperature falls to near freezing point in winter and the maximum goes approximately up to 47°C in the May/June months of summer.

Experimental animals and feeding management

The present study was conducted from Feb 2021 to June 2021 on twenty Murrah buffaloes. Animals were selected 30 days before the expected date of calving and randomly allotted on the basis of their Body weight and parity to the control group (T0) and treatment group with polyherbal mixture supplementation (T1) of 10 buffaloes each under randomized complete block design. Control group i.e. T0 control (n=10, parity P=3.3±0.55, avg. milk yield (kg)=2659±204) without any supplementation was offered standard ration as per requirements (NRC, 2001). In T1 (n=10, parity P=3.5±0.56, avg. milk yield (kg)=2620±112) poly-herbal mixture was supplemented for ten days postpartum. The buffaloes were managed as per the standard

rearing practices throughout the experimental period. Animals for the present experiment were duly approved by Institute Animal Ethics Committee.

Poly-herbal preparation

The Poly-herbal mixture in this study was composed of four herbs, *Foeniculum vulgare* (Saunf), 20g; *Trachyspermum ammi* (Ajwain), 30g; *Trigonella foenum-graecum* (Methi), 50g; *Curcuma longa* (Haldi), 30 g; along with that 20-gram black salt (Kala Namak) was also added and finally that was administered as a single dose. 150g of the poly-herbal mixture along with 25g black salt was mixed in 1 litre of water. This mixture was boiled for about 20-30 minutes till half of the water remains, and then 250 grams of Jaggery (Gur) were added and heated for 5-10 minutes and cool it add 150 gm GULKAND. The poly-herbal mixture, thus, is prepared to be mixed with 1 kg of concentrate mixture and fed to the buffaloes after parturition for ten days in the morning hours.

Name of Herbs	Amount (500gm)	Properties
Methi	50 g	Antioxidation, laxation, fungicide, appetite stimulation, anti-inflammatory and antipyretic.
Ajwain	30 g	Anthelmintic, carminative, laxative, and stomachic. strong germicide, anti-spasmodic, and fungicide activity.
Sanuf	20 g	Helps normalize the appetite, liver cleanser, promoter of menstruation. It has emmenagogue and galactagogue properties.
Haldi	30 g	Anti-inflammatory and antioxidant properties, antibacterial and antiparasitic, antipyretic
Black salt	20 g	Helps in reducing gas and heartburn, is used as a digestive help and a laxative
Gulkand	100 g	Laxative, antibacterial, antioxidant, demulcent
Gur	250 g	Gathers ferrous salts, very good as a cleansing agent. it cleanses the lungs, stomach, intestines, esophagus, and respiratory tracts.

Reproductive parameters

All experimental animals were observed for the time of the expulsion of the fetal membrane after parturition. Different reproductive parameters of buffaloes were recorded which include days to first insemination, service period, service per conception, conception rate, and pregnancy rate.

Production parameters

These parameters include FCM 6% Yield/day (kg), FCM 6% Peal yield (kg), and FCM 6% 4-month Milkyield (kg).

Statistical analysis

All data were subjected to ANOVA for randomized complete block design using the general linear model (GLM) of SAS (SAS Institute, 2002), and group comparison was done by Tukey test.

Cervical and uterine diameter, time of the expulsion of fetal membrane, days to first insemination, service period, and service per conception data were analyzed by descriptive statistics for experimental groups.

RESULTS AND DISCUSSION

The effect of poly-herbal supplementation on productive and reproductive performance parameters is shown in Table 1. The results depicted those buffaloes in the supplemented groups took less time ($P < 0.05$) for the expulsion of fetal membranes as compared to the control group (T0). Buffaloes supplemented with a polyherbal mixture had a lower service period than the control group. There was an improvement in the conception rate of the group fed polyherbal mixture as compared to the control

group. The less time taken for the expulsion of fetal membranes by the buffaloes in ($P < 0.05$) supplemented groups as compared to that of control ones also hinted at the advantage of poly-herbal mixture feeding just after post-partum. It is very important to note that the poly-herbal mixture reduced the time required for expulsion of the fetal membrane through the anti-inflammatory action and immunomodulator action [27], which was later proved from the buffaloes included in the supplemented group which showed complete involution and started cycling earlier than the control buffaloes. Also, there were no incidences of retained fetal membranes in the treatment group with polyherbal mixture supplementation as compared to the control group.

The average daily milk yield (6% FCM) per animal per day during the post-partum period in supplemented group (T1) and control group (T0) were 13.50 ± 0.37 kg and 12.81 ± 0.67 kg respectively. Peak milk yield (6% FCM) per animal was 16.53 ± 0.85 kg and 17.23 ± 0.47 kg in T0 and T1 respectively. Similarly, the 4-month milk yield (6% FCM) per animal was 1537 ± 80.92 in the control group and 1620 ± 44.11 in the treatment group.

In the present study, feeding of the poly-herbal mixture could lower the service period due to early uterine involution and recovery, resulting in better resumption of cyclicity after calving. In a similar line, [13] and [7] reported that herbal therapy is beneficial for the uterine recovery process following delivery. It is possible that the poly-herbal mixture facilitated the uterine recovery process in Murrah buffaloes by improving the uterine environment along with earlier placental detachment and a balanced uterine condition.

Therefore, the results depicted that the poly-herbal mixture and butyric acid improved the overall fertility in Murrah buffaloes may be due to the synergistic effect of *Foeniculum vulgare* to improve uterus conditions [22]; and *Trachyspermum ammi* and *Trigonella foenum-graecum* having immunomodulatory, anti-inflammatory and antithrombotic properties [6,2]; *Zingiber*

officinale and *Elettaria cardamomum* having analgesic and anti-inflammatory properties [3,24,13]; *Anethum graveolens* having anti-inflammatory [12]. Higher milk production in poly-herbal and combination of poly-herbal with butyrate supplemented group may be due to galactopoietic activity of some of the herbs like *Anethum graveolens* (Sowa), *Foeniculum vulgare* (saunf) and *Trachyspermum ammi* (ajwain). It is well known that *Anethum graveolens* (sowa) acts as a galactagogue [14], whereas *Foeniculum vulgare* (saunf) plays an important role in promoting milk ejection, stimulating milk flow, and increasing milk production [1] and *Trachyspermum ammi* (ajwain) acts as galactagogue, hypo-tensive, oxytocic, stimulate milk ducts of mammary gland tissue as well as promote milk ejection [1,9].

In the present study, supplementation of poly-herbal during the transition period improved productive and reproductive performance, which indicates the effectiveness of the poly-herbal mixture.

CONCLUSIONS

The results clearly validate the age-old practice of dairy farmers of India regarding karrah supplementation just after partition for seven days. Further, the encouraging result of the poly-herbal mixture supplementation during the transition period improves the reproductive performance of the Murrah buffaloes. Therefore, the poly-herbal mixture just after parturition is incorporated into the transition diet of dairy animals for better productive and reproductive health.

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Conflict of Interests

The authors declare that they have no interests' conflicts of interest.

Table 1: Production and Reproduction parameters of Murrah buffaloes supplemented with poly-herbal mixture in transition period.

	Control (T ₀)	Poly-herbal (T ₁)
1 st heat in days	103.6±12.40 ^a	71.9±9.55 ^b
No. of AI done	2.3±0.48	2.2±0.49
Service period (days)	108.4±22.47	89.67±8.51
Time of expulsion of fetal membrane (hrs)	15.7±2.15 ^a	9.30±1.84 ^b
Conception rate (%)	41.7	46.14
Retention of Fetal Membranes (%)	20	00
FCM 6% Yield/day (kg)	12.81±0.67	13.50±0.37
FCM 6% Peak yield (kg)	16.53±0.85	17.23±0.47
FCM 6% 4-month Milk yield (kg)	1537±80.92	1620±44.11
Means bearing superscript differ significantly ($p < 0.05$)		

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