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RESEARCH ARTICLE

EFFICACY OF MATERNAL CARE FORMULA AV/MCC/18 ON REPRODUCTION AND PRODUCTION PARAMETERS IN BUFFALAOES

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ABSTRACT

Pregnancy rate is a key determinant of farm productivity and profitability. A High pregnancy rates in animals depend on a rapid return of normal reproductive function after calving. A study was conducted to evaluate the efficacy of maternal care formula AV/MCC/18 (supplied by M/S Ayurvet Limited, Baddi, H.P., India) on successful conception, optimum fetomaternal nourishment and improving milk yield and milk fat%. Twenty four (n=24) post-parturient buffaloes recently parturated and yet to come in estrus were selected for present study. The animals were divided into four equal groups of six (n=6) animals. Group I was untreated control. Group II, III and IV animals were supplemented AV/MCC/18@20gm/animal/day for 2, 3 and 4 months respectively immediately after first A.I. /N.S. The number of services required for successful conception was significantly ($P<0.05$) low in Group IV (1.33) followed by group III (1.50), group II (1.67) and highest in control group I (1.83). Overall conception rate was significantly high in Group IV followed by group III, group II and lowest in control group I. All the AV/MCC/18 supplemented animals had 100% normal parturition while dystokia and retention of placenta was noticed in 16.67% animals in control Group. Overall milk yield (L/day) during treatment and after 15 days post treatment was highest in group IV followed by group III, II and lowest in control group. Similarly overall fat % during treatment and after 15 days post treatment was highest in group III followed by group IV, control and lowest in group II. Overall results of trial suggest that supplementation of herbal maternal care product (AV/MCC/18) has resulted in better reproductive efficiency and productive potential in terms of milk yield and fat percentage in buffaloes during early to mid lactation period in this trial.

INTRODUCTION

Livestock farming is very important in India as a source of livelihood, food and food products, and as a source of income for poor farmers. However, livestock productivity is below their genetic potential because of inadequate and imbalanced feeds and feeding, nutritional imbalance before conception, poor reproductive management and animal diseases. Inadequate nutrition before conception and during pregnancy can result in decreased colostrum yield and quality, diminished milk yield and component concentration, increased incidence of health disorders in dam and calf and impaired fertility. The end result is reduced overall productive efficiency and depleted potential profits (Robert *et al*., 1996). Requirements for pregnancy represent nutrient amounts necessary to support both growth rate and maintenance of fetus, placenta, uterus and mammary gland. Conceptus maintenance expenditure is a substantial portion of the total pregnancy requirement as evidenced by the low efficiencies of utilization for metabolizable energy (12.5%) (Moe and Tyrrell, 1972) and protein (50%) (Ferrell *et al.*,1976). Although requirements for pregnancy are minor compared to lactation, inadequate dry period nutrition can result in a substantial drain of maternal nutrient reserves to sustain the developing conceptus. Prepartum maternal reserve depletion may have detrimental repercussions on subsequent lactational performance and calf viability. All nutrients should be provided daily in sufficient quantities to meet the pregnant animal's needs in order to maintain optimum animal health and calf performance. Nutritional strategies can be used to increase conception rate and prevent metabolic disease in the early days post calving and increase milk production (Patel *et al*., 2013). A wide variety of feed additives are available that have potential for use prepartum as well as post partum. These additives may also improve health status, which implies a decrease of early post-partum diseases and better reproductive performance (Savoini *et al*., 2003, Mishra *et al*., 2006 and Mirzai *et al*., 2011). Keeping in view the preservation of animal health and prevention of excessive stress on its production capacity through hormone and alike, a holistic approach making use of herbal formulations has come up as a desirable approach. Use of herbal plants is a necessity as indiscriminate and prolong use of synthetic compounds and hormones develop adverse effect to animal health (Patel *et al.* 2013). The proposed study was planned to study the efficacy of new herbal formulation AV/MCC/18 in successful conception after first insemination & prevention of delayed conception, optimum fetomaternal nourishment by monitoring conception/conceptus status and improving milk yield and milk fat percentage.

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MATERIALS AND METHODS

The study was conducted in well organized herds at Boriavi (Village) of Dist. Anand, Gujarat.

Experimental design

Twenty four (n=24) post-parturient Jaffrabadi buffaloes recently parturated and yet to come in post partum oestrus were selected for present study. The animals were randomly divided into four equal groups of six (n=6) animals each. Group- I: untreated control, Group-II: animals were administered AV/MCC/18@20gm/animal/day

for two months after first post partum estrus, Group-III: animals were administered AV/MCC/18@20gm/animal/day for three months after first post partum estrus, Group-IV: animals were administered AV/MCC/18@20gm/animal/day for four months after first post partum estrus. The product was administered after first post partum oestrus immediately after first A.I. /N.S. In case of failure to conceive, successive insemination was done and & treatment was continued. AV/MCC/18 (*supplied by M/S Ayurvet Limited, Baddi, H.P., India*) is a herbal maternal care formula comprising of herbs viz. *Glycyrrhiza glabra, Asparagus racemosus, Aegle marmelos, Withania somnifera* & many others in a fixed concentration.

Parameters estimated

1. Total No. of inseminations/services required for successful conception
2. Conception rate
3. Lactation yield and Fat percentage: During treatment and 15 days post-treatment

Recording of Data

All the results were analyzed statistically by using student's `t' test as per Snedecor and Cochran (1967).

RESULTS

The results of the present study are summarized in Table 1.

group I had the lowest daily milk yield during treatment-14.18 L/day. Overall milk yield (L/day) during treatment and after 15 days post treatment was highest in group 1V (15.44, 15.05) followed by group III (14.95, 14.72), group II (14.95, 13.42) and lowest in control group I (14.18, 13.81). Fat % during trial remain constant and bit improved during treatment but statistically not significant shows that the product is good to maintain optimum fat through out of lactation. Overall fat % during treatment and after 15 days post treatment was highest in group III (7.85, 7.80) followed by group IV (7.70, 7.57), control group I (7.52, 7.48) and lowest in group II (7.25, 7.22).

DISCUSSION

The findings of the present study can be attributed to the individual constituent herbs of AV/MCC/18. The plants *Glycyrrhiza glabra, Asparagus racemosus, Aegle marmelos, Withania somnifera* are known to purify blood, increase circulation, provides high quality proteins, vitamins and minerals for increasing fetus weight, regulate hormones and prevent threatened abortion (Chatterjee *et al*. 1995 and Jatav *et al*., 2011, Kumar *et al*., 2008, Patel *et al*., 2012). They are used in pregnancy and lactation for prevention of eclampsia, IUGR (Intra Uterine Growth Restriction), threatened abortion and used as nutritional supplement (Nadkarni *et al*., 1994). *Glycyrrhiza glabra* is also reported to be used in treatment of polycystic ovary syndrome, estrogenic effects (Armanini *et al*., 2007 and Liu *et al*., 2001) and as antioxidant agent (Jatav *et al*., 2011). This may be attributed to active ingredient glycyrrhizin and liquirtin in *Glycyrrhiza glabra*

Table 1. Reproductive and productive indices in control and treated groups

Groups	Reproductive health status			Parturition (%)	Milk production status			
	Post partum status				Milk yield (L/day)		Fat %	
	FPPO	No. of services/conception	Overall conception rate (%)		Av during treatment	Av after 15 days treatment	Av during treatment	Av after 15 days treatment
I	60.17	1.83	69.44	Normal-83.33 Dystokia/retained placenta- 16.67	14.18	13.81	7.52	7.48
II	57.33	1.66*	72.22	Normal	14.95*	13.42	7.25	7.22
III	54.67	1.5*	75.00	Normal	14.95*	14.72*	7.85*	7.80*
IV	59.50	1.33**	83.33	Normal	15.44*	15.05*	7.70*	7.57*

*The values differ significantly at P<0.05 from control

Reproduction Parameters

The no. of services required for successful conception in Group IV (1.33) (administered AV/MCC/18 for a duration of 4 months) was significantly (P<0.05) lowest. This was followed by group III: 1.50 (supplemented with AV/MCC/18) for duration of 3 months), group II: 1.67 (supplemented with AV/MCC/18 for duration of 2 months) as compared to the untreated control group I (1.83). Overall conception rate recorded to be significantly (P<0.05) highest in Group IV (83.33%) (administered AV/MCC/18 for a duration of 4 months) followed by group III: 75% (supplemented with AV/MCC/18 for duration of 3 months, group II: 72.22% (supplemented with AV/MCC/18 for a duration of 2 months) as compared to the untreated control group I (69.40). All of AV/MCC/18 supplemented animals had 100% normal parturition while dystokia and retention of placenta was noticed in 16.67% animals from untreated control Group I. While rest of 83.33% animals from untreated control group parturated normally.

Milk Production Status

Milk production during treatment linearly increased but not statistically significant. The product AV/MCC/18 is found to be significantly efficacious to sustain the peak production. Overall daily milk yield was highest for AV/MCC/18 supplemented group IV- 15.44 L/day (8.16% higher than untreated control group). AV/MCC/18 supplemented groups II (for 2 months duration) and III (for 3 months duration) had non-significantly different daily milk yield of 14.95 L/day (5.43% higher than untreated control group). Untreated control (Jatav *et al*., 2011). *Withania somnif*era is a health restorative to pregnant animals, rejuvenating (Sigh *et al*. 1982), antistress (Archana *et al*., 1999), antioxidant and immune modulating agent (Ziauddin *et al*., 1996). These properties may be attributed to active ingredients such as Withaferins and Withanolides (Rastogi *et al*., 1998). *Asparagus racemosus* is part of various medicinal preparations used to cure various types of diseases, validated as potential antioxidant and anti-stress (Velavan *et al*., 2007), immunomodulator (Kumar *et al*. 2008), appetizer (Vijaya and Vasudevan 1994), hepato-protector (Muruganandan *et al*., 2000), promotes adaptability against adverse condition (Azmathulal *et al*., 2006) and possess anabolic properties viz growth promotion. These properties are effective in enhancing the reproductive and milk yield potential of animals. The findings are in corraboration with those reported by Mallick and Prakash (2011) that supplementation of an herbal immunomodulator improved immunity level in crossbred cow and is therefore, the key to early cyclicity commencement in the supplemented cows. The increased milk production is attributed to galactagogue properties of constituent herbs viz. *Withania somnifera, Asparagus racemosus* and *Glycyrrhiza glabra* (Prakash Behera *et al*., 2013 and Kumar *et al*., 2008). The increased milk production may be due to optimization of rumen microflora function to improve the digestion and better utilization of feed (Phalphale *et al*., 1997). The effect of herbal preparations might have helped in optimizing the ruminal fermentation that ultimately increased the nutrient availability for milk production (Bhatt *et al*., 2009).

Conclusion

Overall results of trial tend to suggest that supplementation of herbal maternal care product (AV/MCC/18) has resulted in better reproductive efficiency in terms of reducing no. of services/ conception, increasing conception rate, normal parturitions, no incidence of dystokia, improvement in milk qualitative & quantitative parameters as well as sustained the productive potential of Jaffrabadi buffaloes of second or third parity during early to mid lactation period in this trial. On the basis of trial results, it is concluded that the product AV/MCC/18 may be recommended for early conception and sustained peak milk yield in animals.

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