



ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2023; SP-12(11): 102-104
© 2023 TPI
www.thepharmajournal.com
Received: 02-09-2023
Accepted: 07-10-2023

Dr. Rachana Sharma
Assistant Professor, Department
of Veterinary Physiology and
Biochemistry, GADVASU,
Rampura Phul, Punjab, India

Dr. Anjali Aggarwal
Principal Scientist, Department
of Animal Physiology, ICAR-
NDRI, Karnal, Haryana, India

Dr. Mahendra Singh
Emeritus Scientist, Department
of Animal Physiology, ICAR-
NDRI, Karnal, Haryana, India

The effect of bypass protein supplementation on the reproductive performance of crossbred dairy cows

Dr. Rachana Sharma, Dr. Anjali Aggarwal and Dr. Mahendra Singh

Abstract

The present investigation was carried out to study the effect of fermented potato protein supplementation on reproductive performance of Karan Fries (KF) cows. Eighteen healthy advanced pregnant crossbred cows of 35 days prepartum were selected from the institute herd. These animals were randomly divided into three groups (6 animals in each) viz. control, SG-1 and SG-2. SG-1 and SG-2 cows were supplemented with fermented potato protein @ 25 and 50 gm/day/animal respectively from 35 days prepartum to 65 days postpartum. The conception rate was higher ($p < 0.05$) in SG-2 in comparison to SG-1 and control. It was concluded that the fermented potato protein supplementation @ 50gm/day significantly increase the reproductive performance of KF cows.

Keywords: Bypass protein supplementation, crossbred dairy cows, Karan Fries

Introduction

The livestock population is expected to grow at the rate of 0.55% in the coming years, and the population is likely to be around 781 million by 2050. The productivity of our animals is 40% lower than the global average due to poor nutritional management, inadequate health-care, and lack of scientific breeding of animals. Half of the total losses in livestock production are contributed by the inadequacy in supply of quality feed and fodders.

At present, the country faces a net deficit of 35.6% of green fodder, 26% of dry-crop residues and 41% of concentrate feed ingredients (Ministry of Agriculture, 2013) [2]. So there is an urgent need to utilize unconventional feedstuffs or their by products from agro-industry for livestock. Potato is a common feedstuff annually occurring throughout India, West China, and other tropics (FAO STAT, 2015) [3]. Postpartum fertility is a vital component of reproductive management in dairy cattle which has a tremendous effect in determining the efficiency and profitability of dairy farm. Infertility can be caused by several and complex genetic and non genetic factors, inter alia follicle development and maturation, successful coitus/insemination, ovulation, fertilization, proper implantation and delivery, uterine involution and cleansing, resumption of ovarian activity and estrus expression.

It has been found that feeding rumen-protected Met improved DMI, milk yield and components and energy balance in periparturient dairy cows by enhancing liver function, increasing antioxidant capacity and ameliorating inflammatory response (Trevisi *et al.*, 2012) [1].

Materials and Methods

The experiment was conducted on apparently healthy and in advanced stage of pregnancy 18 crossbred cows (415 ± 12.56 kg body weight), selected from the Institute herd. The cows were randomly divided into 3 groups of 6 cows in each, viz. control, supplement group-1 (SG-1) and supplement group-2 (SG-2). Cows of all 3 groups were in nearly similar parity (2.6 ± 1.3). Control group cows were fed a control diet as practiced for pregnant cows in NDRI dairy farm. The SG-1 group was supplemented with fermented potato protein @ 25gm/day/cow and SG-2 group was supplemented with fermented potato protein @ 50gm/day/cow with control diet from day 35 prepartum to day 65 postpartum.

The reproductive performance parameters like calving to first service interval, days open, the number of services per conception, Days open, conception rate were recorded during the experiment. All reproductive records of healthy and mastitis cows incidence of mastitis, metritis, retention of fetal membrane and pregnancy were obtained from farm livestock records. The status of pregnancy was confirmed by rectal palpation between 60–65 days post insemination.

Corresponding Author:
Dr. Rachana Sharma
Assistant Professor, Department
of Veterinary Physiology and
Biochemistry, GADVASU,
Rampura Phul, Punjab, India

Data for all measured variables were analyzed as repeated measures using the MIXED procedure of SPSS version 19. The model included the main effects of fermented potato protein on treatment (groups), days around calving and their interactions.

Results and Discussion

The first post-partum heat was significantly lower in SG-2 (61.25±0.48 days) as compared to SG-1 (66.75±0.63 days) and control groups (68.50±1.04 days), but did not differ significantly between SG-1 and control groups.

The service per conception was calculated on the basis of number of services done to animal, divided by number of animals that conceived in that group. Our results indicated AI/conception in control, SG-1 and SG-2 was 3.25±0.25, 2.75±0.25 and 2.00±0.31 respectively. The numbers of AI/conception were significantly lower in SG-2 than other two groups.

The conception rate was (%) significantly higher in SG-2 (58.33±4.43) in comparison to SG-1 (37.50±4.17) and control groups (31.25±2.08), but did not differ significantly between SG-1 and control groups.

The service period was significantly reduced as 22 and 37 days in SG-2 (113.50±7.19) in comparison to SG-1 (135.25±4.21) and control groups (150.75±4.82) respectively, but did not differ significantly between SG-1 and control groups.

It was found that the incidence of mastitis, metritis and retaining fetal membrane in cows of control group was more as compared to fermented potato protein supplemented group. In our results there was improvement in overall reproductive performance in fermented potato protein supplemented group as compared to control group. Ronden and Forier, (2009) [4] reported better overall reproductive performance of fermented potato protein supplemented sows as compared to control

group of sows. Shelke *et al.* (2012) [5] also reported that supplementation of protected fat and protein during early lactation improved the reproductive performance in Murrah buffaloes along with increase in the milk production and its persistency. It is desirable to incorporate the protected protein in the ration of lactating cows in their early lactation period to avoid the NEB and to enhance the milk productivity with desirable composition which may have far reaching positive influence on their reproductive performance.

In our results decreased first post-partum estrus, service per conception, service period and high conception rate in SG-2 as compared to control and SG-1. Ardalan *et al.* (2009) [6] reported that there was significant decrease in days to first estrous, open days, services per conception and increase in pregnancy rate in Holstein dairy cows fed 18 gm rumen protected methionine, from 4 week prepartum to 20 weeks postpartum. The feeding of bypass protein improved the conception rate and reduced the number of days open in crossbred cows (Amrutkar *et al.*, 2015) [7]. Similarly, feeding bypass protein increased the sexual behavior and seminal attributes in Mehsana buffalo bulls and also in crossbred bucks (Walli, 2008) [8]. Thus, the improvement in reproductive efficiency of dairy animals is yet another distinct advantage of feeding fermented potato protein to such animals.

Our result shows that the animals of fermented potato protein supplemented group had shown very low incidence of mastitis, metritis and RFM. This may be attributed to the immunomodulatory action of fermented potato protein. Amrutkar, 2012 [7] reported the overall incidence of health-related disorders were lower (75%, RFM, 66% metritis, 50% premature birth and 50% mastitis) in rumen protected Methionine and lysine supplemented crossbred cows as compared to un-supplemented group.

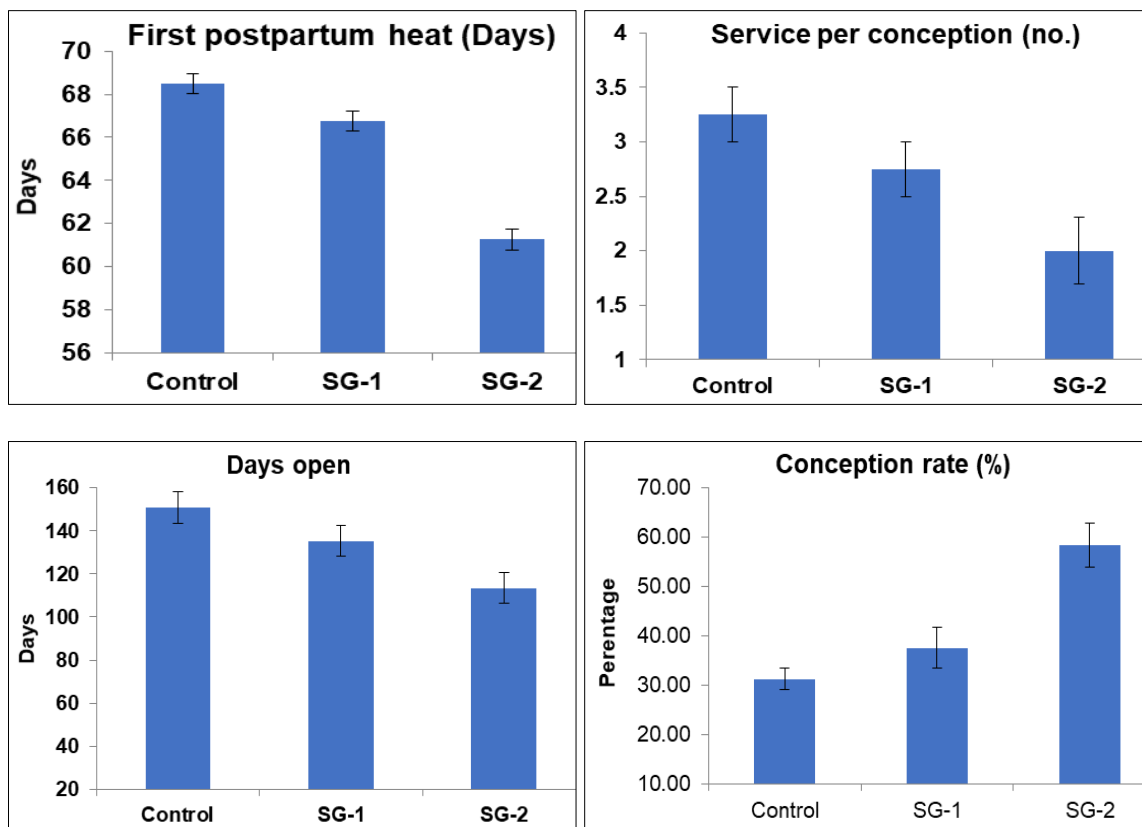


Fig 1: Changes reproductive performances in control and supplemented groups of crossbred cows

Conclusion

It is concluded that fermented potato supplementation @ 50 gm/day significantly improves the reproductive performance of crossbred cows.

References

1. Trevisi E, Amadori M, Cogrossi S, Razzuoli E, Bertoni G. Metabolic stress and inflammatory response in high-yielding, periparturient dairy cows. *Res Vet Sci.* 2012;93:695-704.
2. Ministry of agriculture. Indian Fodder Management towards 2030: A Case of vision or Myopia. *I. J. M. S. S. R.* 2013;2:2.
3. FAO STAT. Department of Agriculture and Cooperation (Horticulture Division); c2015. 2013/Agricultureat%20a%20Glance2013/page128-185.pdf.
4. Ronden T, Forier R. Fermented potato protein for sow diets. *Research & Development.* 2009;17:4.
5. Shelke SK, Thakur SS. Immune response in periparturient Murrah buffaloes supplemented with rumen protected fat and protein. *Ind. Vet. J.* 2012;89(11):131-132.
6. Ardalan M, Dehghan-Banadaky M, Rezayazdi K, Ghavi Hossein-Zadeh N. The effect of rumen-protected methionine and choline on plasma metabolites of Holstein dairy cows. *J Agri. Sci.* 2010;149:639-646.
7. Amrutkar SA. Response of rumen protected methionine and lysine supplementation on lactation and reproductive performance in periparturient dairy cows. Ph. D. Thesis, ICAR-NDRI (Deemed University), Karnal, India; c2012.
8. Walli TK. Bypass protein technology-A success story in feeding of dairy animals for increasing milk production at a cheaper cost. *Indian Dairy man.* 2008;60:53-60.