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Niharika Thakur
Ph.D. Scholar, Department of Veterinary and Animal Husbandry Extension Education (VAHEE), Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana, Punjab, India

Parminder Singh
Professor, Directorate of Extension Education, Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana, Punjab, India

Corresponding Author
Niharika Thakur
Ph.D. Scholar, Department of Veterinary and Animal Husbandry Extension Education (VAHEE), Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana, Punjab, India

Effect of special feed supplementation on various transitional diseases

Niharika Thakur and Parminder Singh

Abstract
The present study was undertaken to assess the effect of special feed supplementation (SFS) on incidence of various transitional diseases. A total of 250 dairy farmers were randomly selected and were interviewed personally from various parts of Punjab through a structured interview schedule. The effect of special feed supplementation was found to be significant ($p<0.05$) with various supplements given before calving, after calving and during dry period in case of dystokia, ROP (Retention of Placenta), anoestrus and metritis. Effect of feed supplementation varied significantly ($p<0.01$) with the whole model of ROP. But ROP also had significant effect ($p<0.05$) individually with SFS after calving. Nishadhar had a significant impact ($p<0.05$) on incidence of ROP and anoestrus and helped in reducing the incidence of ROP and anoestrus. DCAD (Dietary Cation Anion difference) also varied significantly with anoestrus. Hence, it was concluded that farmers who were using special feed supplements did not encounter any transitional problems. Majority of dairy farmers were not very much aware regarding special feed supplements that are to be offered during transitional diseases. Hence, extension awareness regarding this concept is a need of an hour so as to prevent animals from future production losses.

Keywords: Special feed supplementation, incidence, transitional disease

1. Introduction
Nutritional aspect plays an indispensable role in rearing of animals for profitable dairy farming. It also has a significant influence on many of the production diseases that result in financial losses to the dairy farmers. Nutrition and management during the transition period (period 3 weeks pre parturition to three weeks post parturition) is very important, but its success is set several months earlier. High DCAD, low magnesium, calcium levels in the diet, negative energy balance, low protein, vitamins and minerals are major factors contributing to transitional diseases. Nearly all transition cows experience at least 3 weeks of negative energy balance, a situation in which they require more energy for maintenance and milk production than is consumed from the diet. One factor responsible to this nutrient imbalance is rapid mobilization of adipose tissue triglyceride, resulting in elevation of plasma NEFA leading to ketosis.

Another nutrition-related issue is the subclinical hypocalcemia that occurs in most transition cows. Cows with hypocalcaemia are more likely to contract peripartal problems such as retained placenta, metritis, endometritis, mastitis, ketosis, milk fever and displaced abomasums. Dietary cationic anionic balance rather than dietary calcium seems to be a major risk for developing hypocalcemia.

The chances of occurrence of ketosis are high in cows which have either a retained placenta, or milk fever. Manipulating the DCAD of the transition diet of dry cows has been shown to prevent hypocalcaemia and its associated diseases in dairy cows. Dry period should be regarded as a preparatory period for investment of optimal health and performance in subsequent lactation. The close-up diet should be formulated as accurately as possible to provide the required nutrients and have a DCAD of approximately (-15 mEq/100 g) dietary dry matter intake (Roche, 2015) [1].

Dairy farmers do not take care of the balanced diet of their animals which further leads to various metabolic, production and transitional diseases. The knowledge of farmers regarding nutrition is almost poor. Hence, proper extension machineries should be constructed in such a way that farmers understand the importance of nutrition in curbing the incidence of transitional diseases.

2. Materials and Methods

To determine the effect of special feed supplementation on various transitional diseases a total of 250 dairy farmers were selected randomly from all parts of Punjab. A structured interview schedule was also developed which was earlier pre-tested. The data was put to tabulation and further was subjected to suitable statistical analysis with the help of SAS 9.3 system Carry N C, USA.

3. Results and Discussion

3.1 Effect of special feed supplementation on dystokia

Table 1 illustrated that the effect of special feed supplementation was found to be significant (p<0.05) with whole model i.e SFS before calving, after calving and during dry period. Table 2 described the effect of feed supplementation on dystokia before calving. Category 3 was found to be significantly different with category 5 and category 6. If farmers were feeding category 6 feed i.e. feed along with more than 2 anabolites like choline, bypass fat, biotin, nishadhar etc., followed by category 5 i.e. feed along with two anabolites; incidence of dystokia will be less. Civelek *et al.*, 2013 [2] in their study reported that dietary additives in the ration of dairy cattle that were fed with adequate and nutritionally well balanced rations not only increase their milk production but also protect dairy animals against the development of various transitional diseases like dystokia. However, SFS after calving and SFS during dry period individually had no significant effect on dystokia.

Table 1: Effect of special feed supplementation on dystokia

Category	Degree of Freedom	Sum of Square	Mean Square	F value
Dystokia	14	677.25	48.37	1.79*
SFS Before calving	5	202.30	40.46	1.50
SFS After calving	5	125.05	25.01	0.92
SFS Dry Period	4	191.38	47.84	1.77

*=Significant at 5%

Table 2: Effect of SFS after calving on Dystokia

Disease	No. of observations	SFS After Calving	Mean±S.E
Dystokia	11	1 (Feed only)	1.91±1.811[a]
	8	2 (Feed+ M.M)	2.25±1.29[a]
	84	3 (Feed+M.M+ghee+calcium etc)	3.10±0.83[a]
	50	4 (Branded feed)	0.78±0.43[a]
	70	5 (Feed +2 anabolites Feed +anabolites like biotin, choline, niacin, bypass fat, vitamins, minerals)	0.93±0.46[a]
	27	6 (Feed + more than 2 anabolites)	0.24±0.21[a]

*=Significant at 5%

3.2 Effect of special feed supplementation on ROP

Table 3 illustrated that effect of feed supplementation had a significant effect (p<0.01) on whole model of ROP. But ROP also had significant effect (p<0.05) individually with SFS after calving. Table 4 indicated that second category was found to be significantly different from third, fourth, fifth and sixth category. It meant incidences of ROP were less if 6th category followed by 5th category, 4th category and third category were fed to animals before calving. Table 5 depicted the effect of SFS after calving on incidence of retained placenta was also found to be significant. First category was significantly different with third category, fifth category and sixth category. Incidences of ROP were less if feed supplements of category 6 followed by category 5 were given. Grewal *et al.*, (2013) [3] in their study discussed that the effect of various anabolites particularly niacin and bypass fat not only improved the production performance of animals but also improved the milk yield, conception rate and helped to reduce the incidence of transitional diseases. SFS during dry period had no significant difference with each other. Table 6 depicted that nishadhar had a significant impact (p<0.05) on incidence of ROP. It meant use of nishadhar reduced the incidences of ROP. Nishadhar is a negative DCAD and thus a week before parturition helps to maintain the calcium homeostasis (Oetzel, 2012) [6] and balance of other minerals in the diet further preventing incidence of transitional diseases.

Table 3: Effect of special feed supplementation on ROP

Category	Degree of Freedom	Sum of Square	Mean Square	F value
ROP	14	3774.02	269.57	2.64**
SFS Before calving	5	821.27	164.25	1.61
SFS After calving	5	1073.48	214.69	2.10*
SFS Dry Period	4	152.45	38.11	0.37

**=Significant at 1%, *=Significant at 5%

Table 4: Effect of SFS after calving on ROP

Disease	No. of observations	SFS after calving	Mean±S.E
ROP	11	1 (Feed only)	0.55±0.45[b]
	8	2 (Feed + M.M)	5.56±1.70[ab]
	84	3 ((Feed + M. M + ghee + calcium + turmeric + fennel + ginger, garlic etc)	9.09±1.76[a]
	50	4 (Branded feed)	3.38±0.79[ab]
	70	5 (Feed + 2 anabolites anabolites like biotin, choline, niacin, bypass fat, vitamins, minerals etc)	1.96±0.52[b]
	27	6 (Feed + more than 2 anabolites)	1.56±0.76[b]

*=Significant at 5%

Table 5: Effect of nishadhar on ROP

Disease	No. of observations	Use of Nishadhar	Mean±S.E
ROP	63	No	3.83±0.78[a]
	37	Yes	1.38±0.57[b]

*=Significant at 5%

3.3 Effect of special feed supplementation on anoestrous

Table 6 depicted that whole model of feed supplementation was significant (p<0.05). Table 7 illustrated that first, second, third and fourth category was significant with sixth category. It meant incidence of anoestrous were low if feed supplements of sixth category were given before calving. It was also assessed from Table 8 that second and third category was significantly different from sixth category. If feed supplementation of sixth category was given after calving incidence of anoestrous was low. As supplementation of various anabolites like biotin, choline, niacin, bypass fat etc. not only helped in reducing the stress but also maintained energy balance, reduced the service period and improved the fertility of animals by further preventing other transitional diseases. These findings were similar to Mudgal *et al.*, 2012 [5]. However, SFS during dry period individually had no significant effect on anoestrous. Table 9 illustrated that DCAD had a significant impact (p<0.05) on anoestrous and incidence of anoestrous were low if DCAD was given. Table 10 illustrated that nishadhar also had significant effect (p<0.05) on anoestrous and leads to reduced incidence of anoestrous as they were significantly different from each other. Hence, it meant that nishadhar and DCAD helped to maintain the mineral balance preventing further incidences of other transitional diseases. These findings were in line with Tewari *et al.*, 2010 [7].

Table 6: Effect of special feed supplementation on anoestrous

Category	Degree of Freedom	Sum of Square	Mean Square	F value
Anoestrous	14	7710.93	550.78	2.19*
Before calving	5	715.71	143.14	0.57
SFS After calving	5	931.13	186.22	0.74
SFS Dry Period	4	1617.07	404.26	1.61

*=Significant at 5%

Table 7: SFS before calving on anoestrous

Disease	No. of observations	SFS Before Calving	Mean±S.E
Anoestrous	31	1 (Feed only)	16.56±3.75[a]
	29	2 (Feed + M.M)	18.10±3.22[a]
	48	3 (Feed + M. M + ghee + calcium + turmeric + fennel + ginger, garlic etc)	17.97±2.63[a]
	37	4 (Branded feed)	11.83±2.76[a]
	74	5 (Feed + 2 anabolites anabolites like biotin, choline, niacin, bypass fat, vitamins, minerals etc)	10.61±1.53[ab]
	31	6 (Feed + more than 2 anabolites)	3.98±1.18[b]

*=Significant at 5%

Table 8: SFS after calving on anoestrous

Disease	No. of observations	SFS After Calving	Mean±S.E
Anoestrous	11	1 (Feed only)	11.14±4.69[ab]
	8	2 (Feed+ M.M)	15.00±5.26[a]
	84	3 (Feed + M. M + ghee + calcium + turmeric + fennel + ginger, garlic etc)	17.76±1.97[a]
	50	4 (Branded feed)	11.50±2.17[ab]
	70	5 (Feed + 2 anabolites like biotin, choline, niacin, bypass fat, vitamins, minerals etc)	12.02±1.96[ab]
	27	6 (Feed + more than 2 anabolites)	3.58±1.09[b]

*=Significant at 5%

Table 9: Effect of DCAD on Anoestrous

Disease	No. of observations	Awareness about DCAD	Mean±S.E
Anoestrous	86	No	13.24±1.72[a]
	14	Yes	2.50 ± 1.25[b]

*=Significant at 5%

Table 10: Effect of Nishadhar on Anoestrous

Disease	No. of observations	Use of Nishadhar	Mean±S.E
Anoestrous	63	No	14.74±2.21[a]
	37	Yes	6.62±1.40[b]

*=Significant at 5%

3.4 Effect of special feed supplementation on Metritis

The effect of feed supplementation was found to be significant (p<0.05) with whole model of metritis (Table 11). However, Table 12 demonstrated that second category was significantly different from fourth, fifth and sixth category. Incidences of metritis were less if category 6 feed followed by category 5 feed were given before calving. It meant that supplementation of various dietary components such as choline, biotin, bypass fat, niacin etc helped to maintain the dietary balance and helped to reduce the transitional stress. Choline helps to decrease the ammonia production and also helps to maintain a balanced pH, (Jayprakash *et al.*, 2013) [4]. Immune mechanism get rejuvenated due to these feeding strategies and further helps to eliminate pathogens responsible for causing metritis and other transitional diseases like mastitis. It was also found that SFS after calving and SFS during dry period had no significant effect on incidence of metritis. Also, there was no effect of feeding of DCAD and nishadhar on incidence of metritis as they were not significantly different.

Table 11: Effect of special feed supplementation on Metritis

Category	Degree of Freedom	Sum of Square	Mean Square	F value
Metritis	14	998.79	71.34	2.07*
Before calving	5	256.56	51.31	1.49
SFS After calving	5	209.46	41.89	1.22
SFS Dry Period	4	47.77	11.94	0.35

*=Significant at 5%

Table 12: Effect of SFS before calving on metritis

Disease	No. of observations	SFS Before Calving	Mean±S.E
Metritis	31	1 (Feed only)	3.38 ± 1.47^{ab}
	29	2 (Feed + M.M)	5.48 ± 2.06^{a}
	48	3 (Feed + M. M + ghee + calcium + turmeric + fennel + ginger, garlic etc)	3.79 ± 0.92^{ab}
	37	4 (Branded feed)	1.47 ± 0.53^{bcd}
	74	5 (Feed + 2 anabolites like biotin, choline, niacin, bypass fat, vitamins, minerals etc)	0.86 ± 0.32^{cd}
	31	6 (Feed + more than 2 anabolites)	0.23 ± 0.16^{d}

*=Significant at 5%

4. Conclusion

Farmers don't have the basic knowledge of special feed supplementation during transitional period. They even lack the basic information regarding transitional diseases. They do not take care of their animals during transitional feeding and do not provide them with the balanced diet that is important for the animals during transitional period which predispose them to various transitional diseases. Hence, proper diffusion of the information regarding this concept is very important for the farmers in order to avoid unnecessary financial and economic losses in the near future.

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