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Impact of management practices on reproductive disorders in dairy animals

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ABSTRACT

Reproductive disorders occurring near and after parturition cause lengthening of intercalving interval and huge economic losses to dairy farmers. Adoption of good management practices can reduce the incidence of these reproductive disorders. The present investigation was conducted in six agroclimatic regions of Punjab to work out the relation of reproductive disorders with the management practices. The data were collected by personally interviewing 180 farmers (30 from each agroclimatic region). Incidence of reproductive disorders was studied in 1556 animals (1157 buffaloes and 399 cows). Incidence of uterine infections, prolapse of genitalia, retention of fetal membranes and abortion was 8.55, 7.32, 10.59 and 7.15% respectively. Significant relationship of uterine infections with hygienic housing and prolapse of genitalia with hygienic housing and mineral mixture supplementation was found. Retention of fetal membranes in buffaloes was significantly related with mineral mixture supplementation and colostrums feeding to dam after parturition. Abortion was significantly related with mineral mixture supplementation and hygienic housing.

Key words : Uterine infections, proplapse, retention of fetal membranes, abortion, mineral mixture, hygienic housing

Commercial dairy farmers expect the minimum intercalving interval in their animals so that milk supply is regular and maintained for a longer time. There are many obstacles for achieving that. Major hindrance is reproductive disorders particularly occurring before and after parturition like prolapse of genitalia, retention of fetal membranes, abortion, uterine infections etc. Although India is enjoying no one position in milk production all over the world with 86 million tonnes (Anonymous, 1997). But that is mainly due to large population of cattle and buffaloes which is 19 % of the world ((Malhotra, 1997). The average lactation yield of the animals is less and the cost of milk production is high. Now in the changing scenario and in the light of WTO, the cost of milk production has to be decreased and simultaneously quality is to be improved to compete at international level. Treatment cost of the reproductive disorders is high which ultimately affects the milk price. Additionally these reproductive disorders have effect on the future fertility/calving and also the milk supply from animals is interrupted. The most important factor to counter these problems is good management. Adoption of good management practices like nutrition, hygienic housing etc. are very helpful to reduce the incidence of these diseases. Adequate/hygienic housing can reduce the incidence of uterine infections (Kumar *et al* 1989), adoption of poor management practices lead to higher incidence of prolapse of genitalia (Mishra *et al* 1998). Keeping in view the facts stated above, the study was designed to work out the relation of incidence of reproductive disorders with management practices.

MATERIALS AND METHODS

The present study was conducted in six agroclimatic regions of Punjab (Kingra *et al.*, 2001). These are Sub-mountain undulating region (Region I), Undulating plain region (Rgion II), Central plain region (Region III), Western plain region (Region IV), Western region (Region V) and Flood plain region (Region VI).

The following villages were randomly selected from each agroclimatic region.

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Region	*Villages (Name of District)*
Submountain undulating region (Region I)	Saroa, Mallewal Kandi (Nawanshahar)
Undulating plain region (Region II)	Ghot Poker,Gazikot (Gurdaspur)
Central plain region (Region III)	Roomi Kalan, Agvaar Lopon (Ludhiana)
Western plain region (Region IV)	Takhanwadh, Jhandiana sarki (Moga)
Western region (Region V)	Jassi Baghwali, Jhumha Bhaika (Bathinda)
Flood plain region (Region VI)	Sidhwan Bet, Salempura (Ludhiana)

One hundred and eighty farmers having 6 or more adult dairy animals, i.e. 30 from each agroclimatic region were surveyed. The dairy farmers were questioned about specific reproductive disorders in their animals at the time of investigation on their farms. If any animal had suffered from that reproductive disorder during last one year and treatment given thereof, it was assumed that animals had either suffered from that disease or were suffering from the same. Incidence of reproductive disorders was studied in 1556 animals (1157 buffaloes and 399 cows). Out of 1157 buffaloes 329 were heifers and 828 multiparous and out of 399 cows 122 were heifers and 277 were multiparous. For parturient diseases like retention of fetal membranes, metritis etc. data were collected about the same set of diseases in animals in previous calving.

The farmers were surveyed for the adoption of different management practices followed regularly on their dairy farmers like hygienic housing, concentrate feeding, mineral mixture supplementation etc.

RESULTS AND DISCUSSION

Incidence of reproductive disorders

Incidence of uterine infections including metritis and cervicitis in buffaloes was 7.17 per cent (83 cases out of 1157) and in cows 12.53 per cent (50 cases out of 399). Out of total 1556 animals, 133 (8.55%) were having uterine infections. Incidence of prolapse of genitalia in buffaloes was 9.51 per cent (110 cases out of 1157) and in cows 1.75 per cent (7 cases out of 399). Out of total 1556 animals, 117 (7.32%) were having prolapse of genitalia. Incidence of retention of fetal membranes in buffaloes was 12.12 per cent (101 cases out of 828) and in cows 5.78 per cent (16 cases out of 277). Out of total 1105 animals had undergone parturition and 117 (10.59 %) animals had retention of fetal membranes in previous parturition. Incidence of abortion in buffaloes was 6.64 per cent (55 cases out of 828) and in cows 8.66 per cent (24 cases out of 277).

Reproductive disorder	Total incidence	Incidence in cows	Incidence in buffaloes
Uterine infections	8.55%	12.53%	7.17%
Prolapse of genitalia	19.37%	1.75%	9.51%
Retention of fetal membranes	7.32%	5.78%	12.12%
Abortion	7.15%	8.66%	6.64%

Uterine infections in relation to hygienic housing : On dairy farms with hygienic housing of animals, the incidence of uterine infections in buffaloes, cows and total animals (4.12, 7.29 and 4.96% respectively) was significantly low ($P < 0.01$) than in those without hygienic housing (9.79, 17.39 and 11.69% respectively) as shown in Table 1. Coleman *et al* (1985) reported that management practices significantly affected the incidence of uterine infections.

Uterine infections in relation to bathing of animals : In buffaloes and total animals in which bathing was done on regular basis, the incidence of uterine infections (4.55 and 6.04% respectively) was significantly low ($P < 0.01$) than in those without bathing on regular basis (9.54 and 10.94% respectively). But there was no significant difference in the incidence of uterine infections in cows with regular bathing (9.91%) and without regular bathing (15.51%) as shown in Table1.

Uterine infection in relation to hygienic housing and bathing of animals : In buffaloes, cows and total animals in which hygienic housing + bathing provision was present, the incidence of uterine infections (3.88, 6.78 and 4.62% respectively) was significantly low ($P<0.01$) than in those without all these provisions (9.81, 17.12 and 14.65% respectively) as shown in Table1. Similar to our study, Kaneene and Miller (1995) reported that uterine infection/metritis incidence was higher in larger over populated herds, over and under conditioned animals and problem calvings. However, its incidence can be decreased with good care, nutritional and disease management.

Prolapse of genitalia in relation to hygienic housing : The dairy farms adopting regular hygienic housing, incidence of prolapse in buffaloes and total animals (4.87

Table 1: Uterine infections / metritis / cervicitis in relation to the management practices adopted by dairy farmers in different agroclimatic regions

Table 1: Uterine infections / metritis / cervicitis in relation to the management practices adopted by dairy farmers in different agroclimatic regions of Punjab

Adult Animals	No.	Reproductive Status	No.	Hygienic housing		Bathing		Hygienic housing + Bathing	
				Done	Not done	Done	Not done	Done	Not done
Buffaloes	1157	Uterine infections	83 (7.17)	22 (4.12)	61 (9.79)	25 (4.55)	58 (9.54)	20 (3.88)	63 (9.81)
		Normal	1074 (92.83)	512 (95.88)	562 (90.21)	524 (95.45)	550 (90.46)	495 (96.12)	579 (90.19)
		χ^2 value		13.89***		10.77***		15.09***	
Cows	399	Uterine infections	50 (12.53)	14 (7.29)	36 (17.39)	21 (9.91)	29 (15.51)	12 (6.78)	38 (17.12)
		Normal	349 (87.47)	178 (92.71)	171 (82.61)	191 (90.09)	158 (84.49)	165 (93.22)	184 (82.88)
		χ^2 value		9.27***		2.84^{NS}		9.60***	
Buffaloes + cows	1556	Uterine infections	133 (8.55)	36 (4.96)	97 (11.69)	46 (6.04)	87 (10.94)	32 (4.62)	101 (11.6[illegible])
		Normal	1423 (91.45)	690 (95.04)	733 (88.31)	715 (93.96)	708 (89.06)	660 (95.38)	763 (88.31)
		χ^2 value		22.43***		11.94***		24.54***	

Figures in parenthesis indicate percentage
*** = Significant at 1% level of significance
NS = Non significant

and 3.86% respectively) was significantly low (P<0.01) as compared to incidence on dairy farms without hygienic housing (13.48 and 10.72% respectively). But in cows, there was no significant difference in incidence of prolapse on dairy farms with hygienic housing (1.04%) than in those without hygienic housing (2.42%) as shown in Table 2.

Prolapse of genitalia in relation to bathing of animals : In buffaloes and total animals in which bathing was done on regular basis, the incidence of prolapse of genitalia (5.28 and 4.20% respectively) was significantly low (P<0.01) than in those without regular bathing of buffaloes (13.32 and 10.69% respectively). But incidence was non-significant (P<0.05) in cows with regular bathing (1.42%) and without regular bathing (2.14%) as presented in Table 2.

Prolapse of genitalia in relation to mineral mixture supplementation : Incidence of prolapse of genitalia in mineral mixture supplementation buffaloes (5.99%) was significantly low (P<0.01) than in those without supplementation of mineral mixture (11.25%). But there was no significant difference in the incidence of prolapse in mineral mixture supplemented cows (0.59%) than in those without any mineral mixture supplementation (2.60%). In total animals (buffaloes + cows) incidence of prolapse was significantly low (P<0.01) in mineral mixture supplemented animals (4.35%) than in those without mineral mixture supplementation (9.26%) as shown in Table 2.

Prolapse of genitalia in relation to hygienic housing, bathing and mineral mixture supplementation : Incidence of prolapse of genitalia was significantly low (P<0.01) in buffaloes with all above mentioned provisions (5.55%) than in those without all these provisions (11.43%). But there was no significant difference in the incidence of prolapse in cows with all these provisions (0.62%) and in those without all these provisions (2.51%). In total animals (buffaloes + cows), incidence of prolapse was significantly low (P<0.01) in animals with all these provisions (4.09%) than in those without all these provisions (9.33%) as shown in Table 2. From the above it can be summarized that prolapse of genitalia in animals may be based on mineral mixture supplementation and good housing management although it is multifactorial and hereditary also.

Retention of fetal membranes in relation to mineral mixture supplementation : Incidence of retention of fetal

Table 2: Prolapse of genitalia in relation to the management practices adopted by dairy farmers in different agroclimatic regions of Punjab

Adult animals	No.	Reproductive status	No.	Hygienic Housing		Bathing		Mineral Mixture supplementation		Hygienic Housing + Bathing + Mineral Mixture + Supplement	
				Done	Not done	Done	Not done	Done	Not done	Done	Not done
Buffaloes	1157	Prolapse	110 (9.51)	26 (4.87)	84 (13.48)	29 (5.28)	81 (13.32)	23 (5.99)	87 (11.25)	21 (5.55)	89 (11.42)
	Normal		1047 (90.49)	539 (86.52)	520 (94.72)	527 (86.68)	361 (94.01)	686 (88.75)	357 (94.45)	690 (88.58)	
		χ^2 value		24.80***		21.67***		8.26***		10.19***	
Cows	399	Prolapse	7 (1.75)	2 (1.04)	5 (2.42)	3 (1.42)	4 (2.14)	1 (0.59)	6 (2.60)	1 (0.62)	6 (2.51)
		Normal	392 (98.25)	190 (98.06)	202 (97.58)	209 (98.58)	183 (97.86)	167 (99.41)	225 (97.40)	159 (99.38)	233 (97.49)
		χ^2 value		0.44^{NS}(YC)		0.03^{NS}(YC)		1.24^{NS}(YC)		1.03^{NS}(YC)	
Buffaloes + cows	1556	Prolapse	117 (7.52)	28 (3.86)	89 (10.72)	32 (4.20)	85 (10.69)	24 (4.35)	93 (9.26)	22 (4.09)	95 (9.33)
		Normal	1439 (92.48)	698 (96.14)	741 (89.28)	729 (95.80)	710 (89.31)	528 (95.65)	911 (90.74)	516 (95.91)	923 (90.67)
		χ^2 value		26.25***		23.53***		12.37***		13.91***	

Figures in parenthesis indicate percentage
NS = Non significant
*** = Significant at 1% level of significance
YC = Yates correction

membranes in mineral mixture supplemented buffaloes cows and total animals (7.69, 2.26 and 5.85 % respectively) was significantly low (P<0.01, P < 0.05) than in those without mineral mixture supplementation (14.26, 9.03 and 13.78 % respectively (Table 3). Krupnik (1987) reported that the supplementation of feed with magnesium oxide reduced the frequency of placental retention. Coleman *et al* (1985) also reported the significant association of management practices with retained placenta.

Retention of fetal membranes in relation to colostrum feeding to dam after parturition : Incidence of retention of fetal membranes in buffaloes in which colostrum feeding to the dam was done (5.61%) was significantly low (P<0.01) than in those without colostrum feeding (18.66%). But there was no significant difference in incidence in cows with colostrum feeding (4.39%) and in those without colostrum feeding (6.75%). In total animals (buffaloes + cows), there was significant difference (P<0.01) in the incidence in animals where colostrum feeding was done (5.34%) and in those without colostrum feeding (15.32%) as shown in Table 3. Zebracki *et al* (1988) observed that the placental retention occurred in only 4 out of 61 cows (6.5%) when given 1 litre of their own colostrum within 1-2 hours after calving as compared to 12 out of 41 controls.

Retention of fetal membranes in relation to mineral mixture supplementation and colostrum feeding to dam after parturition: Incidence of retention of fetal membranes in buffaloes, cows and total animals (6.58, 1.77 and 4.99 % respectively) was significantly low (P<0.01, P < 0.05) in which mineral mixture was supplemented and colostrum feeding was done than in those without these provisions (14.33, 8.54 and 13.08% respectively) as presented in Table 3.

Abortion in relation to mineral mixture supplementation : Incidence of abortion in mineral mixture supplemented buffaloes and cows (3.85 and 3.76% respectively) was significantly low (P<0.05, P< 0.01) than in those without mineral mixture supplementation (7.92 and 13.19% respectively). Overall, incidence of abortion was significantly low (P<0.01) in mineral mixture supplemented animals (3.82%) than in animals without mineral mixture supplementation (8.99%) as presented in Table 4. Roberts (1999) mentioned that deficiency of some minerals like iodine and selenium can cause abortion in cattle.

Abortion in relation to hygienic housing : On dairy farms having hygienic housing system for animals, incidence

Table 3. Retention of fetal membranes in relation to the management practices adopted by dairy farmers in different agroclimatic regions of Punjab

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Adult Animals	No.*	Reproductive status	No.	Mineral Mixture Supplementation		Colostrum Feeding		Mineral Mixture Supplementation + Colostrum Feeding	
				Done	Not done	Done	Not done	Done	Not done
Buffaloes	828	Retention	101 (12.12)	20 (7.69)	81 (14.26)	23 (5.61)	78 (18.66)	15 (6.58)	86 (14.33)
		Normal	727 (87.80)	240 (92.31)	487 (85.74)	387 (94.39)	340 (81.34)	213 (93.42)	514 (85.67)
		$\chi 2$ value		7.18***		32.91***		9.28***	
Cows	277	Retention	16 (5.78)	3 (2.26)	13 (9.03)	5 (4.39)	11 (6.75)	2 (1.77)	14 (8.54)
		Normal	261 (94.22)	130 (97.74)	131 (90.97)	109 (95.61)	152 (93.25)	111 (98.23)	150 (91.46)
		$\chi 2$ value		4.65**(YC)		0.69^{NS}		4.45**(YC)	
Buffaloes + cows	1105	Retention	117 (10.59)	23 (5.85)	94 (13.78)	28 (5.34)	89 (15.32)	17 (4.99)	100 (13.08)
		Normal	988 (89.41)	370 (94.15)	618 (86.22)	496 (94.66)	492 (84.68)	324 (95.01)	664 (86.92)
		$\chi 2$ value		14.45***		28.96***		16.35***	

Figures in parenthesis indicate percentage
***Significant at 1% level of significance
YC=Yates correction
*Numbers excluding heifers
**Significant at 5% level of significance
NS = Non significant

Table 4. Abortion in relation to the management practices adopted by dairy farmers in different agroclimatic regions of Punjab

Adult Animals	No.*	Reproductive Status	No.	Mineral Mixture Supplementation		Hygienic Housing		Hygienic Housing+Bathing+Mineral Mixture Supplementation	
				Done	Not done	Done	Not done	Done	Not donc
Buffaloes	828	Aborted	55 (6.64)	10 (3.85)	45 (7.92)	15 (3.62)	40 (9.66)	8 (3.40)	47 (7.93)
		Normal	773 (93.36)	250 (96.15)	523 (92.08)	399 (96.38)	374 (90.34)	227 (96.60)	546 (92.07)
		$\chi 2$ value		4.78**		12.17***		5.55**	
Cows	277	Aborted	24 (8.66)	5 (3.76)	19 (13.19)	7 (5.19)	17 (11.97)	4 (3.70)	20 (11.83)
		Normal	253 (91.34)	128 (96.24)	125 (86.81)	128 (94.81)	125 (88.03)	104 (96.30)	149 (88.17)
		$\chi 2$ value		7.78***		4.03**		4.52**(YC)	
Buffaloes + cows	1105	Aborted	79 (7.15)	15 (3.82)	64 (8.99)	22 (4.00)	57 (10.25)	12 (3.50)	67 (8.79)
		Normal	1026 (92.85)	378 (96.18)	648 (91.01)	527 (96.00)	499 (89.75)	331 (96.50)	695 (91.21)
		$\chi 2$ value		10.20***		16.23***		9.98***	

Figures in parenthesis indicate percentage
***Significant at 1% level of significance
YC=Yates correction
NS = Non significant
**Significant at 5% level of significance
*Number excluding heifers

of abortion in buffaloes and cows (3.62 and 5.19% respectively) was significantly low (P<0.01, P<0.05) than in those without hygienic housing system (9.66 and 11.97% respectively). Overall, incidence of abortion was significantly low (P<0.01) in animals having hygienic housing (4.00%) than in those without hygienic housing (10.25%) as presented in Table 4. Roberts (1999) mentioned that the various infections can cause abortion in cattle and hygiene or sanitation can play an important role in prevention of abortion.

Abortion in relation to hygienic housing, bathing and mineral mixture supplementation : Incidence of abortion in buffaloes and cows with all the above mentioned provisions (3.40 and 3.70% respectively) was significantly low (P<0.05) than in those without all these provisions (7.93 and 11.83% respectively). Overall, incidence of abortion was significantly low (P<0.01) in animals with all these provisions (3.50%) than in those without all these provisions (8.79%) as presented in Table 4. It can be summarized from the above that incidence of abortion can be reduced by hygienic housing, bathing and regular mineral mixture supplementation but other causes like endocrine, infectious and physical causes should be simultaneously controlled.

From the above it can be concluded that adequate management practices including good nutrition are must to control the reproductive disorders.

REFERENCES

Anonymous (1997). *Dairy India.* pp 10-11. Baba Barkha Nath Printers Industrial area, New Delhi.

Coleman,D.A.,Thayne,W.V. and Dailey,R.A. (1985). Factors affecting reproductive performance of dairy cows. J Dairy Sci., **68**: 1793-803.

Kaneene, J.B. and Miller, R. (1995). Risk factors for metritis in Michigan dairy cattle using herd and cow based modelling approaches. Prev. Vety. Med., **23** : 183-200.

Kingra, P.K., Bal, S.K. and Hundal, S.S. (2001). *Practical Manual on Fundamentals of Agroclimatology*. Department of Agricultural Meteorology. pp 43-44. Punjab Agricultural University, Ludhiana.

Krupnik,A. (1987). Effect of magnesium supplementation on the frequency of placental retention and purerperal endometritis in cows. Vet Bull., **57**: 4504.

Kumar, N., Dubay, B.M. and Patil, R.V. (1989). Effect of housing systems on some reproductive parameters of crossbred dairy cows. Paper presented at National Symposium on Applied Reproduction in Farm Animals at VIIIth National Convention of Indian Society for the Studies of Animal Reproduction at G.A.U, Anand.

Malhotra, R. (1997). Significance of dairy in Indian economy. Indian Dairyman, **49**: 33.

Mishra, U.K., Agrawal, R.G. and Pandit, R.K. (1998). Incidence of prolapse of genitalia in Murrah buffaloes in relation to season, pregnancy, parity and management. Indian Vet. J., **75**: 254-55.

Roberts S.J. (1999). *Veterinary Obstetrics and Genital Diseases.* pp. 107-29. CBS Publishers and Distributors, New Delhi.

Zebracki, A., Ras, A. and Podhalicz, D.M. (1988). Unconventional method of preventing placental retention in cows. Vet. Bull., **58**: 2894.

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