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PREVAILING CALF MORTALITY AND ITS PATTERNS IN CROSSBRED CATTLE

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ABSTRACT

The study aimed to know the prevailing crossbred calf rearing practices and crossbred calf mortality and its patterns in the Anand district of Gujarat, India. Using simple random sampling methods, 200 crossbred cattle owners from 20 villages of 4 talukas from the Anand district were selected. The data were collected based on the interview schedule. The majority of crossbred cattle owners had not adopted the different calf management practices viz., cutting the navel cord with sterilized sharp object, provision of milk replacer, calf starter, salt, bedding facility, deworming agent at every month up to six months and vaccine. An overall crossbred calf mortality was observed 51.68% in the study area. There was a higher mortality rate in male calves (71.64%) than female calves (31.57%) because of negligence towards the male calf. The mortality rate observed was higher during the first three months of age (73.18%) and during monsoon (44.93%). A major reason for death of calf said by crossbred cattle owner was diarrhoea/ dysentery (35.51%). A negative and significant relationship was observed between providing milk to the calf, providing calf starter with crossbred calf mortality. A negative and significant relationship was observed between experience in dairy farming of crossbred cattle owner, training in animal husbandry and crossbred calf mortality. Participation in various animal husbandry training programs and adoption of scientific management practices will be helpful to reduce crossbred calf mortality rate at the field level.

Keywords: *dairy farmers, mortality rate, crossbred cattle*

INTRODUCTION

Calf rearing is an important component and the future progeny of the dairy farm, which the farmers commonly neglect. Calf morbidity and mortality are a constant problem for milk producers worldwide, especially in the tropics where high temperatures and humidity promote the multiplication and transmission of infectious agents. In India, calf mortality ranges from 12.50 to 30 per cent (Singh *et al.*, 2009), even if it may be as high as 81 per cent (Tiwari *et al.,* 2007). Due to the high mortality of calves in India because of mismanagement, calf rearing should be taken on scientific lines with economically sound footing (Banerjee, 1998). Different managemental and environmental factors were reported to affect calf morbidity and mortality significantly. These include colostrum feeding, housing, calving assistance, production system, herd size, season and hygiene of the micro-environment. There is a vast scope for increased productivity through improved management practices including calf rearing to get maximum profits. The present study was conducted to investigate the crossbred calf mortality & managemental practices in the Anand district of Gujarat state.

OBJECTIVE

To know crossbred calf mortality and prevailing calf rearing practices in crossbred cattle

METHODOLOGY

The present study was undertaken in Anand district of middle Gujarat. Anand district possess eight talukas namely – Anand, Umreth, Sojitra, Petlad, Borsad, Anklav, Tarapur and Khambhat. Out of eight talukas in the district, four talukas were randomly selected. From each selected taluka, five villages having functional milk producer's co-operative societies and ten dairy farmers from each village were selected randomly. Thus, total 200 dairy farmers were selected as sample for present study. "Ex-post facto design" was employed in the present investigation as the events have already occurred and design was considered appropriate (Kerlinger, 1976). The data were collected through direct personal investigation with help of well-defined interview schedule. The crossbred calf mortality data were categorized according to age and gender. Herd size meant the number of dairy animals owned by the family of respondents at the time of investigation. These dairy animals were converted into Standard Animal Units (S.A.U.) as per the methodology suggested by Patel *et al.*(1983). During the study, the months were categorized into three seasons, viz. winter (November to February), summer (March to June) and monsoon (July to October). The data were collected and analysed with suitable statistical techniques. The mortality rate was calculated by ratio of the number of deaths in the year to the average total population of the year.

$$\text{Calf mortality rate} = \frac{\text{Number of died calf in the study area}}{\text{Total calf population in the study area}} \times 100$$

The statistical parameters included were frequency, percentage, rank, mean, standard deviation and co-efficient of correlation.

RESULTS AND DISCUSSION

Table 1: Profile of crossbred cattle owners

(n=200)

Sr. No.	Profile of crossbred cattle owners	Frequency	Per Cent
1	**Age**		
i	Young Age (Up to 35 years)	88	44.00
ii	Middle Age (36 to 5o years)	59	29.50
iii	Old Age (Above 50 years)	53	26.50
2	**Education**		
i	Illiterate	20	10.00
ii	Primary education (Up to 8th std.)	51	25.50
iii	Secondary education (9th std. to 10th std.)	76	38.00
iv	Higher secondary education (11th std. to 12th std.)	36	18.00
v	Graduate	15	07.50
vi	Post- Graduate	02	01.00
3	**Experience in dairy farming**		
i	Low (Up to 11 years)	74	37.00
ii	Medium (12 to 22 years)	73	36.50
iii	High (More than 22 years)	53	26.50
4	**Land holding**		
i	Landless	38	19.00
ii	Marginal (Up to 1.00 ha)	134	67.00
iii	Small (1.01 ha to 2.00 ha)	18	09.00
iv	Medium (2.01 to 4.00 ha)	10	05.00
v	Large (Above 4.00ha)	00	0.00
5	**Herd size**		
i	Small (Up to 5.17 SAU)	61	30.50
ii	Medium (5.18 to 10.34 SAU)	95	47.50
iii	Large (More than 10.34 SAU)	44	22.00
6	**Training in Animal Husbandry**		
i	Training received	83	41.50
ii	Training not received	117	58.50

The data presented in table 1 indicate that majority of crossbred cattle owners belonged to the young age group (44.00%) having primary to secondary level of education (63.50%) with low to medium level of experience in dairy farming (73.50%), with marginal (67.00%) land holding and medium (47.50%) herd size, not received (58.50%) professional training. similar result found by Chinchmalatpure, (2022) and Mahammad et al. (2022). Less than one-third (23.33%) of them had received training related to animal husbandry from any of the animal husbandry departments of the state and centre. Similar result was found by Dabhi *et al.* (2018).

Table 2: Prevailing crossbred calf rearing practices

(n=200)

Sr. No.	Prevailing practices	Frequ-ency	Per Cent
1	Clean the calf immediately after birth	198	99.0
2	Cut the navel cord of calf	37	18.5
3	Cut navel cord with a sterilized sharp object	16	08.0
4	Which disinfectant is used after cutting of navel cord?		
	A. No disinfectant use	183	91.5
	B. Povidone iodine	17	08.5
5	Feeding of colostrum to the calf	196	98.0
6	Time of first colostrum feeding		
	A. After dropping of placenta	109	54.5
	B. One to four hours of birth	62	31.0
	C. Within one hour of birth	29	14.5
7	Provide milk to the calf	195	97.5
8	Quantity of milk provides to calf		
	A. Only up to let down of milk	95	47.5
	B. One quarter	56	28.0
	C. As per body weight	49	24.5
9	Milk feeding up to age		
	A. One month	50	25.0
	B. Two months	26	13.0
	C. Three months	89	44.5
	D. More than three months	35	17.5
10	Providing milk replacer to calf	10	05.0
11	Providing calf starter to calf	72	36.0
12	Providing concentrate feed to calf	176	88.0
13	Providing mineral mixture to calf	158	79.0
14	Providing salt to calf	60	30.0
15	Bedding facility	43	21.5
16	Deworming at 21 days age of the calf	166	83.0
17	Deworming at every month up to 6 months of calf	22	11.0
18	Deworming at every six months of calf	135	67.5
19	HS vaccination to calf	36	18.0
20	FMD vaccination to calf	172	86.0
21	Type of treatment		
	A. Never called a veterinarian	00	0.0
	B. Used indigenous medicines, then a vet. was called	28	14.0
	C. Called a vet. or para-vets immediately when calf fell sick	172	86.0

The data presented in table 2 indicate that most crossbred cattle owners had cleaned the calf immediately

after birth (99.00%) and had not used disinfectant after cutting the navel cord (91.50%). The present finding was similar with the findings of Mahla *et al.* (2015) and Godara *et al.* (2017). It was observed that only 26.50 per cent of owners had cut the navel cord of crossbred calves and only 8.00 per cent of them used a sterilized object to cut the navel cord. The present finding was similar with the reports of Mahla *et al.* (2015), Sabapara *et al.* (2015), Sreedhar and Sreenivas (2015) and Godara *et al.* (2017). Such a result is due to a lack of awareness and monetary issues of dairy farmers. There is a need to motivate dairy farmers to cut the navel cord with a sterilized object. The majority of crossbred cattle owners had provided milk (97.50%), colostrum (98.00%), and concentrate feed (88.00%) to their calf. The major issue was that only 14.50 per cent of crossbred cattle owners provided colostrum to the calf within one hour of birth and only 24.50 per cent of them provided milk to the calf as per body weight which reflected the lack of awareness about scientific calf rearing practices among the crossbred cattle owners. A similar result Mahla *et al.* (2015) and Sreedhar and Sreenivas, (2015). This showed the very low awareness among the crossbred cattle owners about the importance of first colostrum feeding and its timing. It is a well-established fact that delays in the feeding of colostrum lead to the lower effectiveness of colostrum in providing immunity to calves (Sharma and Mishra, 1987). Crossbred cattle owners had provided calf starter (36.00%), mineral mixture (79.00%), milk replacer (5.00 per cent) and salt (30.00 per cent) to their calves. These findings are in line with the findings of Jadav & Patel (2023) and contradictory with the result found by Sabapara *et al.* (2015). Most dairy farmers were unaware of the calf starter and milk replacer reported by Kumar *et al.* (2021). The majority of crossbred cattle owners had used deworming agents at 21 days of age of calf (83.00%), but only 11.00 per cent of them provided deworming every month up to the six months of age of calf. A similar result was found by Jadav & Patel (2023). Regular deworming can reduce calf mortality which was supported by Pal *et al.* (2016) reported that 79-85 percent reduction in calf mortality under field conditions when deworming was practiced from 1-2 weeks after birth. There were 86.00 and 18.00 per cent of crossbred cattle owners who had given vaccination for Foot and Mouth Disease (FMD) and Hemorrhagic Septicemia (HS) vaccine to their calves, respectively. A similar result found by Pata *et al.* (2019).

Table 3: Crossbred calf mortality rate (2023-24)

Sr. No.	Sex	No. of calf born in the last year	No. of calf died in the last year	Mortality rate (Per cent)
1	Male	268	192	71.64
2	Female	266	84	31.57
	Total	**534**	**276**	**51.68**

Data in table 3 indicated an overall 51.68 per cent mortality rate was observed in the crossbred calves in the study area. The crossbred calf mortality rate was 71.64 per cent and 31.57 per cent in male and female crossbred calves, respectively. There was a higher mortality rate in male calves due to negligence by the owners. There is no economic utility of male calves. Similar results were obtained by Selvan *et al.* (2019).

Table 4: Mortality Pattern of crossbred calves in different age groups and seasons

Sr. No.	Age/ Season	No. of calves died			Per cent of calves died		
		Male	Female	Total	Male	Female	Total
1	Birth to 3 months	146	56	202	76.05	66.66	73.18
2	3.01 to 6 months	36	19	55	18.75	22.62	19.92
3	More than 6 months	10	09	19	5.20	10.72	6.88
	Total	**192**	**84**	**276**	**100**	**100**	**100**
1	Winter	76	30	106	39.59	35.72	38.41
2	Summer	32	14	46	16.66	16.66	16.66
3	Monsoon	84	40	124	43.75	47.62	44.93
	Total	**192**	**84**	**276**	**100**	**100**	**100**

The data presented in table 4 indicate that mortality in crossbred calves (73.18%) was higher during the first three months of age. Similar result was found by Selvan *et al.* (2019). In the present study, only 14.50 per cent of crossbred cattle owners had provided colostrum within one hour to their calves, so overall immunity development may be less, resulting in higher mortality in the age group up to 3 months. The mortality was higher in the monsoon season (44.93%), followed by the winter (38.41%) and summer (16.66%) seasons. A similar result was obtained by Kharkar *et al.* (2017). Monsoon was the most susceptible season to calf disease and mortality. Moist and humid conditions, along with rainfall may be suitable for the growth and proliferation of disease causal agents. The majority of crossbred calves died during the first three months of age due to lack of management, especially in the feeding of colostrum within one hour of their calves' birth, which is reflected in their overall immunity.

Table 5: Reasons of crossbred cattle owners for crossbred calves' death (n=152)

Sr. No.	Reasons	Frequency	Per cent
1	Diarrhoea/dysentery	98	35.51
2	Male calf negligence	45	16.31
3	Navel ill / Joint ill	33	11.96
4	Malnutrition	27	9.78
5	Parasitic infestation	25	9.05
6	Pneumonia	22	7.97
7	Bloat	17	6.16
8	FMD	03	1.09
9	Dog Bite	03	1.09
10	Babesiosis	02	0.72
11	Theileriosis	01	0.36
	Total	**276**	**100**

The data presented in table 5 indicate that diarrhea/ dysentery (35.51%) was the major reason for crossbred calves' mortality, followed by male calf negligence (16.31%), navel ill/ joint ill (11.96%) and mal nutrition (9.78%). A similar result was reported by Kharkar *et al.* (2017) and Hordofa *et al.* (2021).

Table 6: Relationship between the profile of crossbred cattle owners and crossbred calf mortality

(n=200)

Sr. No.	The profile of crossbred cattle owners	'r' Value
X_1	Age	-0.124^{NS}
X_2	Education	0.058^{NS}
X_3	Experience in dairy farming	-0.140*
X_4	Landholding	0.108^{NS}
X_5	Herd size	0.247**
X_6	Training in animal husbandry	-0.173*

The data presented in table 6 indicate that the correlation of experience in dairy farming and training in animal husbandry of dairy farmer with crossbred calves' mortality was found negative and significant at 5 per cent of level of confidence, which means providing training to dairy farmers reduces crossbred calf mortality. Similarly, with increase the experience of dairy farmers reduces crossbred calf mortality.

The data presented in table 7 indicate that the correlation between providing milk to the calf with crossbred calves' mortality was found negative and significant at 5 per cent of level of confidence, which means providing milk to the calf reduces crossbred calf mortality. the correlation between providing calf starter to the calf with crossbred calves' mortality was found negative and significant at 1 per cent of level of confidence, which means providing calf starter to the calf reduces crossbred calf mortality. The remaining practices did not find any significant effect on crossbred calf mortality in field conditions, which may be due to the homozygous group of respondents.

Table 7: Relationship between common management practices and crossbred calf mortality

(n=200)

Sr. No.	The profile of crossbred cattle owners	'r' Value
X_1	Clean the calf immediately after birth	0.077^{NS}
X_2	Cut the navel cord of calf	-0.028^{NS}
X_3	Disinfectant used after cutting of navel cord	0.040^{NS}
X_4	Feeding of colostrum	-0.046^{NS}
X_5	Time of first colostrum feeding	-0.034^{NS}
X_6	Provide milk to the calf	-0.144*
X_7	Quantity of milk provides	0.099^{NS}
X_8	Milk feeding up to age	0.090^{NS}
X_9	Providing milk replacer to calf	0.084^{NS}
X_{10}	Providing calf starter	-0.346**
X_{11}	Providing concentrate feed to calf	0.096^{NS}
X_{12}	Providing mineral mixture	0.074^{NS}
X_{13}	Providing salt	-0.055^{NS}
X_{14}	Bedding facility	0.071^{NS}
X_{15}	Deworming	0.094^{NS}
X_{16}	Vaccination	0.079^{NS}

CONCLUSION

The mortality rate of male crossbred calves (71.64%) was very high than female calves (31.57%), and the overall crossbred calf mortality rate was 51.68 per cent in the study area. The majority of crossbred calves died during the first three months of age in the monsoon season and the major causes of calf mortality were diarrhoea/dysentery. There is an urgent need to educate and motivate dairy farmers about scientific calf rearing practices by conducting training programmes special in the field of providing concentrate feed, milk to calf as per their body weight, first colostrum feeding within one hour of birth, milk replacer, calf starter, salt, mineral mixture, deworming agent at every month up to six months, and vaccinations. There is an urgent need to make a state-level concrete policy to prevent heavy male crossbred calf mortality, along with the introduction of sex-sorted semen in bovine with a nominal price.

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CONFLICT OF INTEREST

This is to declare that there is "No conflict of interest" among researcher.

REFERENCES

Banerjee, G. C. (1998). A textbook of animal husbandry (8th Eds.), Oxford & IBH Publishing Company Private Limited. New Delhi, India.

Chinchmalatpure, U. R. (2022). Socio-economic status of dairy farmers and their constraints in adoption of improved dairy management practices. *Gujarat Journal of Extension Education*, special issue, 22-25.

Dabhi, A. M., Durgga Rani, V., & Ghasura, R. S. (2018). Personal, socio-economic and psychological characteristics of crossbred cattle owners of Surat district in south Gujarat. *Gujarat Journal of Extension Education*, Special Issue on National Seminar, 173–178.

Godara, V., Singh, N., Kumar, S. and Robin. (2017). Calf rearing management practices followed in rural areas of Western Haryana, India. *Int. J. Curr. Microbiol. Appl. Sci.,* 6(12): 2996-3000.

Hordofa, D., Abunna, F., Megersa, B., & Abebe, R. (2021). Incidence of morbidity and mortality in calves from birth to six months of age and associated risk factors on dairy farms in Hawassa city, southern Ethiopia. *Heliyon*, *7*(12).

Jadav, S. J. and Patel, Y. G. (2023) Crossbred calf mortality and managemental practices in operational area of dairy vigyan kendra. Gujarat Journal of Extension Education, 35(1):4-11. https://doi.org/10.56572/gjoee.2023.35.1.0002.

Jadav, S. J., & Patel, Y. G. (2023). Crossbred calf mortality and managemental practices in operational area of dairy Vigyan Kendra. *Gujarat Journal of Extension Education Vol.* 35(1): 4-11.

Kerlinger, F.N. (1976). Foundation of Behavioural Research. Surjeet Publications, Delhi, India.

Kharkar, K. P., Raghuwanshi, D. S., Lende, S. and Khati, B. M. (2017). Mortality Pattern in Crossbred Calves of Dairy Cattle. *J. Krishi Vigyan,* 5(2): 116-121. https://doi.org/10.5958/2349-4433.2017.00026.5

Kumar, S., Dahiya, S. P., Kumar, M. and Kumar, N. (2021). Appraisal of calf rearing practices followed by farmers in Hisar district of Haryana. *Haryana Vet*., 60(2): 179-182.

Mahammad Shafi R. Sk, Chauhan N. B. and Vinaya Kumar H. M. (2022). Participation of young generation of practising dairy farmers in family dairy farming. Guj. J. Ext. Edu. 33 (2): 73-76. https://doi.org/10.56572/gjoee.2022.33.2.0014

Mahla, V., Choudhary, V. K., Saharan, J. S., Yadav, M. L., Kumar, S. and Choudhary, S. (2015). Study about socio-economic status and calf rearing management practices adopted by cattle keepers of Western Rajasthan, India. *Indian J. Agri. Res*.,49(2): 189-192.

Pal, S. S., Sharma, I. and Fareeda. (2016). Clinical importance of scheduled deworming in buffalo calves. *Intas Polivet*,17(1): 85-87.

Pata, B. A., Odedra, M. D., Savsani, H. H., Ahlawat, A. R., Patbandha, T. K. and Odedara, A. B. (2019). Breeding, calf and health management practices opted by buffalo owners in Junagadh and Porbandar districts of Gujarat: A Comparative Study. *Int. J. Curr. Microbiol. Appl. Sci.*,8(3): 2426-2435.

Patel, R.K., Kumbhare, S.L. and Sharma, K. N. S. (1983). Standardization of Bovine Units. *Indian J. Anim. Hlth*., 93(2): 457-550.

Sabapara, G. P., Fulsoundar, A.B. and Kharadi, V. B. (2015). Survey of calf rearing practices followed at rural dairy farms in Surat district. *J. Anim. Res*.,5(2): 257-261.

Selvan, A. S., Tantia, M. S., Kumar, D. R., Karuthadurai, T., Upadhyay, A., Lathwal S. S. and Kumaresan, A. (2019). Factors influencing calf mortality in zebu and crossbred cattle reared under subtropical agroclimatic conditions. *Indian J. Ani. Sci*., 89(3): 304-309.

Sharma, M. C. and Mishra, R. R. (1987). Livestock health and management. Khanna Publishers, New Delhi, India.

Singh, D. D., Kumar, M., Choudhary, P. K., & Singh, H. N. (2009). Neonatal calf mortality-an overview. *Intas Polivet*, 10(2), 165-169.

Sreedhar, S., and Sreenivas, D. (2015). A study on calf mortality and managemental practices in commercial socio-economic status and calf rearing management practices adopted by cattle keepers of Western Rajasthan, India. *Indian J. Agri. Res*.,49(2): 189- 192.

Tiwari, R., Sharma, M., & Singh, B. (2007). Buffalo calf health care in commercial dairy farms: a field study in Uttar Pradesh (India). *Livestock research for rural development*, 19(3), 8.

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