

Prevailing Calf Mortality and its Pattern in Indigenous Cattle in Operational Area of Dairy Vigyan Kendra, Vejalpur, Gujarat

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ABSTRACT

The objective of this study was to assess the prevailing indigenous calf mortality & its pattern in the operational area of Dairy Vigyan Kendra (DVK), Vejalpur, Gujarat, India. Using the simple random sampling method, 300 indigenous cattle owners from 6 villages each from 10 talukas were selected for the study from August to December 2021. The data were collected based on the pre-tested structured interview schedule. Overall indigenous calf mortality was observed 27.90 % in the study area. There was a higher mortality rate in male calves (53.43%) than in female indigenous calves (11.97%) due to limited attention towards the male calf. The mortality rate was recorded higher during the first three months of age (76.42%) and during the summer (50.00%). The major reason of calf mortality was diarrhoea or dysentery. Most indigenous cattle owners had not adopted the recommended calf management practices. Farmers urgently need extension services on scientific calf rearing practices such as cutting navel cord with sterilized object, providing colostrum and milk as per body weight, on-time colostrum feeding, provision of milk replacer, calf starter, salt, mineral mixture, deworming, and HS & FMD vaccination.

Key words: Calf, Dairy Vigyan Kendra, Gujarat, Indigenous cattle, Mortality, Pattern.

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INTRODUCTION

Calf morbidity and mortality are a constant problem for milk producers worldwide (Radostits *et al.*, 2007), especially in the tropics, where high temperatures and humidity promote the multiplication and transmission of infectious agents (Moran, 2011). In India, calf mortality ranges from 12.50 to 30.00 % (Singh *et al.*, 2009), even if it may be as high as 81.00 % (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. Different managerial 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 micro-environment (Shiferaw *et al.*, 2002). There is a vast scope for increased productivity through improved management practices, including calf rearing to get maximum profits (Singh *et al.*, 2012). Calf losses were significantly reduced by introducing new management techniques, including on-time colostrum feeding, housing, feeding and nutrition (Razzaque *et al.*, 2009). The present study was conducted to assess the prevailing indigenous calf mortality & its pattern in the operation area of Dairy Vigyan Kendra (DVK), Vejalpur, Gujarat.

MATERIALS AND METHODS

The study was conducted among the indigenous cattle owners in the operational area of Dairy Vigyan Kendra (DVK), Vejalpur, Gujarat (India) from August to December 2021. The

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government of Gujarat established the first Dairy Vigyan Kendra in India in 2012-13 at Vejalpur to cater training needs of dairy farmers, boost clean milk production and increase animal productivity.

A total of ten talukas of the operational area of DVK were randomly selected for the study. Six villages were selected randomly from each taluka, and five indigenous cattle owners per village. Out of all the owners' indigenous cattle calved within the twelve months were randomly selected from each village, thus making the total sample of

300 indigenous cattle owners from 60 villages selected by adopting the Ex-Post-Facto research design. A standardized, well-structured pre-tested interview schedule was prepared in the line with the objectives in consultation with the experts in Livestock Production Management. The indigenous calf mortality data were categorized according to age and gender. The study period was categorized into three seasons, viz., winter (November to February), summer (March to June), and monsoon (July to October). The data were collected and analyzed with suitable statistical techniques. SPSS 21 (IBM, USA) software was used to analyse the collected data. The mortality rate is the ratio of the number of deaths in the year to the average total population of the year.

RESULTS AND DISCUSSION

The majority of indigenous cattle owners (58.67%) belonged to the middle-age (36-50 years) group having primary to secondary level of education (70.67%) with marginal (83.33%) landholding and possessing Gir (63.67%) cattle with medium herd size (71.67%). Thorat and Wadhvani (2021) reported that most dairy farmers belong to the middle age group and have four to six animals (63.00%) in the Dahod district of Gujarat. More than one-third (37.00%) of them had received training related to animal husbandry from any of the animal husbandry departments of the state and centre.

A perusal of the data shown in Table 1 indicated that most indigenous cattle owners cleaned the calf immediately after birth (78.00%) and did not use disinfectant after cutting the navel cord (90.33%). The present finding was similar to Mahla *et al.* (2015) and Godara *et al.* (2017) that most of the farmers cleaned the calf immediately after birth. It was observed that only 40.67 % of owners cut the navel cord of indigenous calves, and only 2.00 % of them used a sterilized object to cut the navel cord. The present finding was in close conformity with the reports of Mahla *et al.* (2015), Sabapara *et al.* (2015), Sreedhar and Sreenivas (2015), and Godara *et al.* (2017), who reported that very few farmers had followed disinfection of the naval cord. 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 indigenous cattle owners provided colostrum (90.00%), milk (89.33%) and concentrate feed (83.33%) to their calves. 45.00 % of indigenous cattle owners fed colostrum to calf after dropping of placenta, which showed their lack of knowledge about that aspect. The major issue was that only 6.67 % of indigenous cattle owners provided colostrum to the calf within one hour of birth, and only 2.00 % of them provided milk to the calf as per body weight, which reflected the lack of awareness about scientific calf rearing practices among the indigenous cattle owners. A similar result of very few farmers feeding colostrum to the calves within one hour after birth was reported by Mahla *et al.* (2015), and Sreedhar and Sreenivas (2015), whereas contrary findings were reported by Sabapara *et al.* (2015), Divekar and Trivedi (2017) and Kumar *et al.* (2021). This showed the very

Table 1: Prevailing indigenous calf rearing practice (n=300)

Sr. No.	Prevailing practices	Frequency	Per cent
1	Clean the calf immediately after birth	234	78.00
2	Cut the navel cord of calf	122	40.67
3	Cut navel cord with a sterilized sharp object	6	2.00
4	Disinfectant used after cutting of navel cord?		
	No disinfectant use	271	90.33
	Povidone iodine	29	9.67
5	Feeding of colostrum to the calf	270	90.00
6	Time of first colostrum feeding		
	After dropping of placenta	135	45.00
	One to four hours of birth	145	48.33
	Within one hour of birth	20	6.67
7	Provide milk to the calf	268	89.33
8	Quantity of milk provided to calf		
	Only up to let down of milk	19	6.33
	One quarter	243	81.00
	As per body weight	6	2.00
9	Milk feeding up to age		
	One month	6	2.00
	Two months	26	8.67
	Three months	121	40.33
	More than three months	147	49.00
10	Providing milk replacer to calf	46	15.33
11	Providing calf starter to calf	64	21.33
12	Providing concentrate feed to calf	250	83.33
13	Providing mineral mixture to calf	116	38.67
14	Providing salt to calf	88	29.33
15	Bedding facility	159	53.00
16	Deworming at 21 days' age of the calf	179	59.67
17	Deworming at every month up to 6 months of calf	88	29.33
18	Deworming at every six months of calf	218	72.67
19	HS vaccination to calf	93	31.00
20	FMD vaccination to calf	125	41.67
21	Type of treatment		
	Never called a veterinarian	8	2.67
	Used indigenous medicines, then a vet. was called	83	27.67
	Called a vet. or para-vets immediately when calf fell sick	209	69.66

low level of awareness among the indigenous 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). Less than one-third of the indigenous cattle owners provided milk replacer (15.33%), calf starter (21.33%) and salt (29.33%) to their calves. Sabapara *et al.* (2015) reported that only 2.67 % of the dairy farmers provided calf starter in the Surat district of Gujarat, while Yadav *et al.* (2016) reported that more than half of the dairy farmers (57.6%) provided calf starter to their calves in Varanasi district of Uttar Pradesh. Most of the dairy farmers needed to be made aware of the calf starter and milk replacer (Kumar *et al.*, 2021). More than half of indigenous cattle owners had used deworming agents at 21 days of age of calf (59.67%), but only 29.33 % of them provided deworming every month up to the six months of age of calf. These results are in accordance with the study of Sabapara *et al.* (2015), who noted that about 48.76 and 40.67 %, respectively, dairy farmers dewormed their calves regularly and occasionally. The present observations were encouraging than the findings of Sreedhar and Sreenivas (2015); they reported that only 16.67 % of farmers had dewormed their calves at regular intervals. Regular deworming can reduce calf mortality. Pal *et al.* (2016) reported 79-85 % reduction in calf mortality under field conditions when deworming was practiced from 1-2 weeks after birth. 41.67 % of indigenous cattle owners had given FMD vaccine to their calves, while vaccination for *Hemorrhagic Septicemia* (HS) was observed 31.00 % only. Pata *et al.* (2019) recorded 68.67 % of buffalo owners practicing vaccination against FMD disease, followed by 16.00 % against HS in Junagadh and Porbandar districts of Gujarat.

Data in Table 2 indicated that an overall 27.90 % mortality rate was observed in the indigenous calves in the study area. The calf mortality rate was 53.43 % and 11.97 % in male and female indigenous calves, respectively, in the operational area of DVK, Gujarat. There was a higher mortality rate in male calves due to negligence by the owners. There is no economic utility of male calves, even not in agriculture now-a-

Table 2: Indigenous calf mortality rate (year 2021-22)

Sex	No. calf born	No. calf died	Mortality rate (%)
Male	146	78	53.43
Female	234	28	11.97
Total	380	106	27.90

day due to mechanization. Almost similar results in the same study area were obtained by Jadav and Patel (2022), while a study in the Varanasi district of Uttar Pradesh by Yadav *et al.* (2016) 32.00 % mortality was found in female and 62.00 % in male calf within three months of birth. The lower calf mortality rate was observed by Bangar *et al.* (2013) in the Pune district of Maharashtra (16.81%), Mishra *et al.* (2015) in Gir calves kept in organized farms (15.09%), and Patbandha *et al.* (2017) at Saurashtra region of Gujarat (16.03%), while higher calf mortality rate (79.47%) was reported by Sreedhar and Sreenivas (2015) in commercial dairy farms in Guntur and Warangal districts of Andhra Pradesh.

Mortality in indigenous calves (76.42%) was higher during the first three months of age (Table 3). In the present study, only 6.67 % of indigenous cattle owners provided colostrum within one hour to their calves, so overall immunity development may be less, resulting in higher mortality in the age group upto 3 months. The mortality was higher in the summer season (50.00%), followed by the winter (29.25%) and monsoon (20.75%) seasons (Table 3). A similar result was obtained by Mishra *et al.* (2015) due to excessive harsh temperature and scarcity of green fodder in summer. The higher mortality rate in summer may be due to the majority of indigenous cattle (47.37%) that had calved in the winter season (mainly January & February). The majority of indigenous calves died during the first three months of age due to lack of management, especially lack or delayed in the feeding of colostrum depriving overall immunity. Hordofa *et al.* (2021) reported delayed colostrum intake, calving difficulty, and calving season as the three major factors identified that significantly affected calf mortality. According to Moran (2011), the likelihood of a calf getting sick increased by 10.00 % for every hour of delay in colostrum

Table 3: Mortality pattern of indigenous calves in different age groups and seasons

Factor	Criteria	No. of calves died			Per cent of total calf died		
		Male	Female	Total	Male	Female	Total
Age	Birth to 3 months	60	21	81	76.92	75.00	76.42
	3.01 to 6 months	13	6	19	16.67	21.43	17.92
	> 6 months	5	1	6	6.41	3.57	5.66
	Total	78	28	106	100.00	100.00	100.00
Season	Winter	26	4	31	33.33	14.28	29.25
	Summer	41	13	53	52.57	46.43	50.00
	Monsoon	11	11	22	14.10	39.29	20.75
	Total	78	28	106	100.00	100.00	100.00



feeding in the first 12 h of the birth. Since the concentration of IgG in colostrum and its absorption from the small intestine decrease over time, it is advisable to give a sufficient amount of colostrum immediately after birth (within 1-2 h and before 6 h) to ensure the transfer of passive immunity (Arnold, 2014).

Diarrhoea or dysentery (59.43%) was the major reason for indigenous calves' mortality (Table 4). A similar result was reported by Mishra *et al.* (2015), Sreedhar and Sreenivas (2015), Kharkar *et al.* (2017), and Hordofa *et al.* (2021). They stated that diarrhoea or gastroenteritis was the leading cause of calf mortality.

Table 4: Causes of mortality in indigenous calves (n=106)

Reasons	Number	Per cent
Pneumonia	3	2.83
Diarrhoea/ dysentery	63	59.43
Male calf negligence	26	24.53
Bloat	9	8.49
Navel ill/ Joint ill	3	2.83
Parasitic infestation	2	1.89
Total	106	100.00

CONCLUSIONS

The present study revealed that the mortality rate of male indigenous calves (53.43%) was very high compared to female calves (11.97%), and the overall indigenous calf mortality rate was 27.90 % in the operational area of DVK, Vejalpur (Gujarat). Most indigenous calf died during the first three months of age in the summer season, and the main cause was diarrhoea or 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 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 HS & FMD vaccination and cutting navel cord with a sterilized sharp object.

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