International Journal of Veterinary Sciences and Animal Husbandry

ISSN: 2456-2912
NAAS Rating: 4.61
VET 2025; 10(7): 01-07

www.veterinarypaper.com
Received: 09-05-2025
Accepted: 12-06-2025

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Factors affecting mortality and morbidity in Gir cattle herd in south saurashtra agro-climatic region of Gujarat

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DOI: https://www.doi.org/10.22271/veterinary.2025.v10.i7a.2368

Abstract
The present investigation aimed to study the factors affecting mortality and morbidity during a period of 20 years (2001 to 2020), in an organized large century-old Gir cattle herd in its home tract. Average strength of the herd was 115 Gir cows with 100 birth per year and around 390 total heads with overall mortality of 6.2%. Based on strength of animals at risk, maximum mortality occurred in from birth to 1 month age group (7.3%) and significantly (p<0.05) higher deaths were recorded during Nov-Dec. months (8.5%) as compared to rest of the periods of the year. Colibacillosis and pneumonia were the major reasons accounting for 46±8.3 and 20.5±5.1% of death in calves below 6 months of age. Mastitis, colibacillosis, bovine ephemeral fever and pneumonia were observed major health disorders in cattle herd and their incidences were 23.2±2.2, 18.8±1.7, 14.3±1.6 and 9.8±1.8%, respectively. The results indicated that for successful dairy farming, all possible care and precautions during the concerned age group and periods are utmost needed to keep incidences of these ailments minimum possible in the herd to reduce mortality and have the optimum replacement rate in the dairy herd.

Keywords: Gir Cattle, mortality, morbidity, age, season, birth weight

Introduction
Mortality in calves is a serious concern affecting replacement rate and thereby genetic improvement in dairy cattle. Morbidity in the herd affects growth, production and reproductive performance of animals and also leads to economic loss to the dairy farm. In a recent study, Rasmussen *et al.* (2024) [11] estimated that total annual global losses due to dairy cattle diseases was US$65 billion and the loss was greatest in India (US$12 billion). Calf mortality acts as one of the major obstacles and 20% calf mortality reduces net profit to approximately 40% (Singh *et al.*, 2009) [13]. Calf mortality in India ranges from 12.5 to 30% (Singh *et al.*, 2009) [13], even it may be as high as 81% (Tiwari *et al.*, 2007) [15]. Mortality pattern of any organized dairy farm indicates the herd health status and efficiency of routine animal management. Moreover, climatic variations round the year, age and sex of animals, and kind of diseases are also important factors in animal mortality (Upadhyay *et al.* 2017; Selvan *et al.*, 2019) [16, 12]. In order to reduce the overall mortality of the herd, a number of management steps like proper feeding, housing, vaccination etc. are generally undertaken well in advance. Often, there is considerable loss due to the seasonal and routine changes in management, which could be avoided by adopting standard management practices and avoiding unnecessary as well as abrupt changes in the routine management activities (Prasad, 2004; Das *et al.*, 2012) [10, 2]. Cattle Breeding Farm (CBF), Junagadh has a very large and century-old herd of Gir cattle in South Saurashtra Agro-climatic region of Gujarat. Therefore, pattern of mortality and morbidity, and factors affecting these traits in Gir cattle herd was studied in detail in order to suggest strategies to minimize mortality and have desired replacement in the herd.

Materials and Methods

Records on 2068 Gir cattle (103.4±8.49 births/year) born and maintained during 20 years (2001 to 2020) at CBF Junagadh were utilized. Different age groups considered were Birth-30d, 31-60d, 61-90d, 91-180d, 181-365d, 1-2 year & above 2 year. Mortality rate in different age groups was calculated using the formula suggested by Parekh and Singh (1981) [8]. Effect of sex, age, season and birth weight was studied. Three seasons and 11 birth weight groups (based on 0.5 SD, Gir calves: 21.6±0.10 Kg., SD=3.24, 0.5SD=1.62 i.e., 1.6, 11 groups) were considered for the study. Causes of death were analysed. Incidence of different ailments was studied with reference to season and age group.

Information relevant to morbidity and mortality collected was subjected to standard statistical procedures. Effect of various factors *viz.*, sex, age, and season and birth weight was tested using Chi-square test as per standard statistical procedure. The effect was considered as significant if $p \leq 0.05$.

Results and Discussion

Mortality in the Gir cattle herd

During the period of 20 years under the study, total number of calves born and animals at risk per day in the Gir herd were 2068 (103.4±8.49 per year) and 388.37±6.09, respectively. A total of 484 animals died in 20 years with average annual death of 24.2±2.49. Thus, based on number of animals at risk/day, overall mortality in Gir herd was 6.23 percent (Table 1).

Calf mortality observed under in this study is lower than the previous reports on mortality rate (9.8-32.9%) in dairy herds in India (Singh *et al.*, 2009; Mishra *et al.*, 2015; Kalam *et al.*, 2016; Upadhyay *et al.* 2017; Patbandha *et al.*, 2017; Selvan *et al.*, 2019) [13, 5, 4, 16, 9, 12]. The overall mortality rate in Nili-Ravi herd (as per yearly herd strength) was noted to be 4.67 per cent (Das *et al.*, 2012) [2]. Patbandha *et al.* (2017) [9] reported that incidence of calf mortality was 16.03% which differed significantly with herd size ($p<0.001$) being significantly higher (25%) in small size herd followed by 15.09% in medium and 6.51% in large size herd ($p<0.001$). However, higher calf mortality (up to 80%) has been reported by Tiwari *et al.* (2007) [15] and Sreedhar and Sreenivas (2015) [14] in India. Further, calf mortality in tropical climate has been reported to be as high as 50% (Moran, 2011) [6].

Effect of sex on mortality

Of the total Gir animals died, 42.98% were of male sex. Data of Table-1 showed that based on no. of animals at risk, mortality among males (9.40%) was higher than that in female counterparts (4.97%), however the difference was statistically non-significant ($p>0.05$). This may be attributed to chance factor as animals of both the sexes were given equal attention and reared in similar/identical management conditions. Death rate of male and female Gir cattle in different age groups (Table-2a) indicated that the effect of sex on mortality was significant only in the age group of above 2 years. High death rate in male sex compare to female sex (5.75 vs. 2.94%) could be attributed to comparatively very less no of male animals at risk than the female counterparts.

Similar to present findings, Jadav *et al.* (2023) [3] also noted that the male calf mortality was significantly higher than in female calves (53.43 vs. 11.97%), and attributed to limited attention towards the male calf and preference of females for let-down and suckling. In a similar line, Selvan *et al.* (2019) [12] reported higher mortality in male calves compared to female calves in Sahiwal (21.78 vs. 19.48%) and crossbred (29.03 vs. 26.37%) cattle only, but it was reverse in Tharparkar cattle (9.43 vs. 14.2%). Contrary to this, Das *et al.* (2012) [2] reported that overall female mortality was higher (61%) as compared to male (39%). Moreover, Mishra *et al.* (2015) [5] observed almost similar mortality between male and female Gir calves (15.86 and 14.28% in male and female, respectively).

Effect of age on mortality

Details on mortality pattern in the Gir herd with reference to age group are presented in Table-2. Effect of age on mortality was non-significant ($p>0.05$). Maximum (7.25%) mortality was recorded in birth to 1 month age group. Death rates declined with advancement in age of the calves up to 3 months of age. Mortality in 1 to 2 months, 2 to 3 months and 3 to 6 months age groups were at almost same rates i.e., 1.4 to 1.8%. Calf mortality from birth to 3 months and birth to 6 months was 10.40% and 12.23% respectively. Calf mortality up to the age of 1-year was 14.53%.

Similar reports of high mortality rate of calves in first month were also documented by previous studies in indigenous cattle (Mishra *et al.*, 2015; Selvan *et al.*, 2019) [5, 12]. Mortality rate of Gir calves during 0-1 month, 2-3 months and 4-6 months reported by Mishra *et al.* (2015) [5] were 5.44, 3.61 and 2.41%, respectively. Selvan *et al.* (2019) [12] reported that mortality rates during 0-1 month, 2-3 months and 4-6 months, respectively were 15.08, 4.09 and 2.60%, in Sahiwal cattle and 7.01, 3.93 and 1.37% in Tharparkar cattle. According to Das *et al.* (2012) [2], about 68 per cent mortality occurred within one year of age. Out of which about 16, 15, 11, 16 and 10 per cent animals died between birth-30, 31-60, 61-90, 91-180, 181-365 days of age, respectively, maximum death being in 0-30 days age group.

Effect of season on mortality

Season of the year influenced ($p<0.05$) the mortality rate (Table-3). Maximum mortality in relation to strength at risk was observed during winter season (6.78%). Mortality rate was almost same in summer and monsoon seasons (4.7 to 4.8%). Months of a year also exerted significant ($p<0.05$) effect on mortality in the Gir herd. Of the total animals died in the herd, more proportion of animals, 27.69% animals died in the November-December months as compared to those in other periods of a year. Based on number of animals at risk, total deaths in November-December months was 8.54, which was significantly ($p<0.05$) higher as compared to rest of the periods (4.3 to 5.4%) of a year (Table-3a). The high death rate during these periods could be attributed to more proportion of calves born/ at risk and high density of calves which might be resulting in higher incidence of calf ailments and also due to uncongenial environmental conditions.

Previous studies also reported significant influence of season of birth on calf mortality in indigenous zebu cattle (Mishra *et al.*, 2015; Selvan *et al.*, 2019) [5, 12] as well as crossbred dairy cattle (Atrey *et al.*, 2005; Pandey *et al.*, 2012) [1, 7]. While, Upadhyay *et al.* (2017) [16] did not observe any significant effect of season on calf mortality in crossbred cattle. Mishra *et al.* (2015) [5] observed significantly higher mortality of Gir calves during winter followed by summer, rainy and spring (5.69, 4.98, 2.68 and 2.55%, respectively). In an organised herd, Selvan *et al.* (2019) [12] observed wide seasonal variation on calf mortality; calves that born in winter, summer and rainy seasons showed higher mortality in Sahiwal, crossbred and Tharparkar, respectively. Atrey *et al.* (2005) [1] reported significantly higher cases of female calf mortality during the

summer season (15.89%) and rainy season (18.22%) than in winter (11.7%) and autumn (8.7%) in Frieswal cattle. However, Upadhyay *et al.* (2017) [16] found maximum mortality in rainy season (23.3%). Moreover, Pandey *et al.* (2012) [7] also observed maximum mortality of female calves in summer (52.27%) and minimum mortality in winter (36.04%) in crossbreds. The higher mortality in the summer season might be attributed to exposure of calves to adverse hot and humid weather conditions of summer, whereas better care and protection of calves from inclement cold weather conditions might have reduced calf mortality in winter season.

Effect of birth weight on calf mortality

Birth weight of calves did not significantly influence calf mortality. However, death rates were more in the calves with birth weight below average. The calves with <16.0 and 16 to 17.6 kg birth weight had 16 to 19% death rate whereas, mortality in calves with 22.4 to 25.6 kg birth weight was 7.0 to 7.5% only (Table 4).

In consonance with the result of the current study, Selvan *et al.* (2019) [12] reported non-significant effect of birth weight on calf mortality in Zebu cattle like Sahiwal and Tharparkar. However, they observed significant effect of birth weight on calf mortality in crossbred cattle which contradict the current result. The calves with birth weight less than 23 kg had higher risk of mortality. Contrary to present finding, Upadhyay *et al.*, (2017) [16] reported significant effect ($p \leq 0.05$) of birth weight of calf on the mortality rate of calves. They observed that the calves born with lower birth weight showed the higher mortality. This was attributed to higher risk of their immune deficiency and more vulnerable to disease.

Causes of mortality in the Gir herd

Information on causes of mortality is presented in Table-5. In the herd with 103.4±8.49 number of calves born each year, total calves died up to 6 month of age/year was 12.2±1.96 of these, annual 6.3±1.45 and 3.2±0.92 calves died on account of Colibacillosis and Pneumonia, respectively. These major reasons accounted for 45.69±8.32 and 20.51±5.12% of death in calves below 6 months of age. In the above 6 month age group, old age/senility generalized debility, tympany/ intestinal obstruction and respiratory/heart failure each accounted for 8 to 16% deaths.

In an earlier study, Mishra *et al.* (2015) [5] observed higher mortality in Gir calves due to gastroenteritis followed by pneumonia (6.18 and 3.16%, respectively) which is supported by the current study. However, Upadhyay *et al.* (2017) [16] reported that maximum (28.24%) mortality in calves occurred due to the pneumonia which might be attributed to inclement weather in winter followed by enteritis and gastro-enteritis (23.61%) due to higher worm load in rainy season. Selvan *et al.* (2019) [12] reported that major reason for calf mortality was respiratory problems (33.34%), followed by general debility (29.36%) and digestive problems (21.36%) in Sahiwal cattle. While, in Tharparkar cattle, general debility was major reason of calf mortality (46.16%) followed by respiratory problem and digestive problem (23.07 and 17.96%, respectively).

Morbidity in Gir cattle herd

The incidence of different health disorders in Gir herd is depicted in Table 6. In the herd of 111.34±1.47 Gir cows and 388.38±6.09 total heads, 119.9±9.25 health disorders were recorded each year of the total ailments, mastitis, colibacillosis, bovine ephemeral fever and pneumonia were major ones and their incidences were, respectively, 23.18±2.19, 18.83±1.74, 14.34±1.64, 9.78±1.78%. Incidence of Colibacillosis, pneumonia and gastroenteritis were higher in Sept-Oct. and Nov-Dec. periods (18-25%) as compared to other periods (9-17%) and in the age group of birth to 1 month (44-47%), (Table-7). Bovine ephemeral fever was recorded during monsoon only, incidence being higher in Sept. and Oct. months and in adult animals above 2 years (Table-8). Incidence of mastitis was lesser in Jan. to April (9-12%) and in cows with more than 6 months post calving. Incidence of metritis was more in March-April and cases of genital prolapse was more in late summer and early monsoon (Table 9). Thus, it is necessary to take all possible care and precautions during the concerned age group and periods to keep incidences of these ailments minimum possible in the herd.

Table 1: Effect of Sex on mortality in the herd of Gir cattle (Yr. 2001-20)

Sex	Deaths		No of Animals at risk	% Death	Chi-square value	Test
	Total (%)	Mean±SE				
Male	208 (42.98%)	10.4±1.48	110.63±2.49	9.40	2.66	NS
Female	276 (57.02%)	13.8±1.70	277.74±3.81*	4.97		
Total	484	24.2±2.49	388.37±6.09	6.23		
Table value at 5%, 1, D.F. =3.841, * av No of cows: 111.34±1.47						

Table 2: Effect of age on mortality in the herd of Gir cattle (Yr. 2001-20)

Age group	Deaths		Av. No of Animals at risk	% Death	Chi-square value	Test
	Total (%)	Mean±SE				
Birth to 30 days	150 (30.99%)	7.5±1.31	103.4±8.49	7.25	8.27	NS
31-60 days	34 (7.02%)	1.7±0.42	95.9	1.77		
61-90 days	26 (5.37%)	1.3±0.37	94.2	1.38		
91-180 days	34 (7.02%)	1.7±0.37	92.9	1.83		
	244 (50.41%)					
181-365 days	42 (8.68%)	2.1±0.31	91.2	2.30		
1-2 years	38 (7.85%)	1.9±0.55	64.67	2.94		
Above 2 years	160 (33.06%)	8.0±1.17	235.33	3.40		
Pooled	484	24.2				
Table value at 5%, 6, D.F. = 12.59						

Table 2(a): Death rate of male and female Gir animals in different age groups (Yr. 2001-20)

Age group and sex	Total No	Died	% Death	Chi-square value	Test
Birth to 30 days					
Male	1004	78	7.77	0.39	NS
Female	1064	72	6.77		
Total	2068	150	7.25		
31-60 days					
Male	926	7	1.51	1.17	NS
Female	992	10	2.02		
Total	1918	17	1.77		
61-90 days					
Male	914	12	1.31	0.53	NS
Female	970	14	1.44		
Total	1884	26	1.38		
91-180 days					
Male	904	18	1.99	0.13	NS
Female	954	16	1.68		
Total	1858	34	1.83		
181-365 days					
Male	886	22	2.48	0.12	NS
Female	938	20	2.13		
Total	1824	42	2.30		
1-2 years					
Male	530	20	3.78	1.10	NS
Female	764	18	2.36		
Total	1294	38	2.94		
Above 2 years *					
Male	766 (16.3%)	44 (27.5%)	5.75	7.68	*
Female	3942 (83.7%)	116(72.5%)	2.94		
Total	4708	160	3.40		
Table value at 5%, 1, D.F. =3.841, * Over all Male: Female in the herd =28.18: 72.18					

Table 3: Effect of season on mortality in the herd of Gir cattle (Yr. 2001-20)

Season	No of calves born (%)	Total Animals at risk	Total Animals died (%)	Death%	Chi-square value	Test
Winter	788 (38.10%)	3068	208 (42.97%)	6.78	8.28	*
Summer	596 (28.82%)	2876	134 (27.69%)	4.66		
Monsoon	684 (33.08%)	2964	142 (29.34%)	4.79		
Pooled	2068	--	484			
Table value at 5%, 2, D.F.= 5.991						

Table 3(a): Effect of period on mortality in the herd of Gir cattle (Yr. 2001-20)

Period	No of calves born (%)	Total Animals at risk	Total Animals died (%)	Death%	Chi-s square value	Test
Nov-Dec	430 (20.79%)	1570	134 (27.69%)	8.54	22.57	*
Jan-Feb	358 (17.31%)	1498	74 (15.29%)	4.94		
Mar-Apr	376 (18.18%)	1516	80 (16.53%)	5.28		
May-Jun	220 (10.64%)	1360	54 (11.16%)	3.97		
Jul-Aug	244 (11.80%)	1384	74 (15.29%)	5.35		
Sep-Oct	440 (21.28%)	1580	68 (14.04%)	4.30		
Pooled	2068	--	484			
Table value at 5%, 5, D.F. = 11.070						

Table 4: Effect of birth weight on mortality in the herd of Gir cattle (Yr. 2001-2020)

Birth wt. (Kg.) group	Animals at risk	Animals died	% Death	Chi-square value	Test
< 16.0	90	14	15.56	10.90	NS
16.0-17.6	84	16	19.05		
17.6-19.2	228	34	14.91		
19.2-20.8	422	60	14.22		
20.8-22.4*	540	62	11.48		
22.4-24.0	238	18	7.56		
24.0-25.6	252	18	7.14		
25.6-27.2	104	14	13.46		
> 27.2	110	8	7.27		
Pooled	2068	244			
Table value 5%, 8, D.F.=15.507 * Mean±SE 21.6±0.10 Kg. SD=3.24, 0.5SD=1.62,i.e., 1.6 Kg					

Table 5: Causes of mortality in the Gir herd (Yr. 2001-2020)

		Pooled, N				Pooled,%	
	Below 6 month	**Mean**	**SE**	**TOT**	**%**	**Mean**	**SE**
1	Pneumonia	3.20	0.92	32	26.23	20.51	5.12
2	Collibacillosis	6.30	1.45	63	51.64	45.69	8.32
3	Snakebite	0.70	0.21	7	5.74	11.43	6.42
4	Tympany/ Intestinal obstruction	0.30	0.15	3	2.46	3.02	1.66
5	Accidental death	0.40	0.22	4	3.28	6.82	4.09
6	Gastroenteritis	0.60	0.40	6	4.92	6.05	4.45
7	Weak & Debility	0.10	0.10	1	0.82	1.43	1.43
8	Others / Paralysis	0.60	0.27	6	4.92	5.06	2.86
	Total	12.20	1.96	122	100.00	100.00	
	Above 6 month						
1	Pneumonia	0.80	0.25	8	6.67	6.47	2.01
2	Collibacillosis	1.10	0.35	11	9.17	8.87	2.87
3	Snakebite	1.80	0.42	18	15.00	14.42	3.23
4	Tympany/ Intestinal obstruction	1.10	0.31	11	9.17	8.88	2.36
5	Accidental death	0.70	0.21	7	5.83	6.09	1.88
6	Respiratory/ heart failure	1.10	0.35	11	9.17	9.07	2.83
7	TRP / Peritonitis	0.90	0.43	9	7.50	6.93	3.26
8	Surra	0.60	0.40	6	5.00	5.69	3.44
9	Gastroenteritis	0.70	0.33	7	5.83	5.59	2.73
10	Toxaemia/Prolapse	0.20	0.13	2	1.67	1.62	1.09
11	Old age/Senility	1.00	0.37	10	8.33	9.60	3.43
12	Others/Generalized Debility	2.00	0.58	20	16.67	16.77	4.42
	Total	12.00	0.67	120	100.00	100.00	
	Grand Total	24.2	2.63	242			

Table 6: Incidence of various health disorders in Gir herd (2001-2020)

S. No.	Disease	Total in 20 yrs.	Animals affected / Health disorders No/year				Av. pop. at Risk	% based on affected pop	
			Mean	SE	Mean	SE		Mean	SE
1	Colibacillosis	462	23.10	3.50	18.83	1.74	113.69	20.32	2.06
2	Pneumonia	212	10.60	1.93	9.78	1.78	105.58	10.04	1.97
3	Gastro-enteritis	198	9.90	1.02	8.45	0.80	129.39	7.65	1.63
4	Worm infestation	204	10.20	2.12	8.71	1.84	133.60	7.64	2.30
5	Snakebite	46	2.30	0.42	2.16	0.44	397.24	0.58	0.11
6	Bovine Ephemeral ever	234	17.10	2.74	14.34	1.64	341.52	5.01	0.48
7	Gen. prolapse	58	2.90	0.38	2.53	0.33	107.61	2.70	0.52
8	Metritis	56	5.60	1.14	4.83	0.94	106.52	5.26	1.17
9	TRP / Peritonitis	26	1.30	0.37	1.24	0.37	325.00	0.40	0.09
10	Mastitis	590	28.50	4.06	23.18	2.19	113.47	25.12	3.63
11	Surra	60	3.00	1.49	2.49	1.14	307.69	0.98	0.50
12	Ketosis	26	1.30	0.58	0.99	0.35	105.95	1.23	0.61
13	Others	82	4.10	2.99	2.47	1.69	338.00	0.72	0.44
	Total	2358	119.90	9.25	100.00				

Table 7: Incidence of health disorders in Gir calves (< 6 mon.) during different periods of a year and age groups (Year: 2001 to 2020)

Period	Births		Colibacillosis		Pneumonia		G. enteritis	
	N	%	N	%	N	%	N	%
Nov-Dec	430	20.79	102	22.08	58	27.36	50	25.25
Jan-Feb	358	17.31	74	16.02	38	17.92	30	15.15
Mar-Apr	376	18.18	82	17.75	24	11.32	24	12.12
May June	220	10.64	56	12.12	22	10.38	18	9.09
Jul-Aug	244	11.80	60	12.99	30	14.15	26	13.13
Sept-Oct.	440	21.28	88	19.05	40	18.87	50	25.25
Age-group	2068	100						
0-1 mon.			208	45.02	94	44.34	92	46.46
1 to 2 mon.			100	21.65	52	24.53	36	18.18
2 to 3 mon.			78	16.88	46	21.70	28	14.14
3 to 6 mon.			76	16.45	20	9.434	42	21.21
Total			462	100	212	100	198	100

Table 8: Incidence of bovine ephemeral fever in Gir cattle during different months and age groups (Year: 2001 to 2020)

Month	N	%
July	52	15.20
August	66	19.30
Sept.	118	34.50
Oct.	106	30.99
Age group		
6 to 12	22	6.43
1 to 2 yr.	50	14.62
Males > 2 yr.	70	20.47
Heif. > 2 yr. + Dry cows	82	23.98
Milch	118	34.50
Total	234	100

Table 9: Incidence of health disorders in Gir females (Year: 2001 to 2020)

Period	Av. No of Total cows	Av. No. of Milch cows	No of Calvings	Mastitis		Metritis		Genital prolapse	
				N	%	N	%	N	%
Nov-Dec	226.40	131.70	430	128	22.46	18	16.07	10	17.24
Jan-Feb	223.00	121.75	358	52	9.12	20	17.86	6	10.34
Mar-Apr	216.60	125.08	376	68	11.93	26	23.21	8	13.79
May June	223.10	131.00	220	112	19.65	20	17.86	12	20.69
Jul-Aug	223.40	124.04	244	92	16.14	14	12.5	14	24.14
Sept-Oct	223.60	123.88	440	118	20.70	14	12.5	8	13.79
Post-calving									
0-2 mon.				132	23.16	10	8.93	6	10.34
2 to 4 mon.				230	40.35	18	16.07	14	24.14
4 to 6 mon.				104	18.25	30	26.79	18	31.03
6 to 8 mon.				56	9.82	34	30.36	12	20.69
> 8 mon.				48	8.42	20	17.86	8	13.79
Total				570	100	112	100	58	100

Conclusion

In South Saurashtra region, an established large cattle herd has overall mortality of 6.2%. Based on strength of animals at risk, maximum mortality (7.3%) occurs in birth to 1 month age group and significantly (p<0.05) higher deaths were observed during Nov-Dec. months (8.5%) as compared to rest of the periods of the year. Colibacillosis and pneumonia were the major reasons accounting for 46 and 21% of deaths in calves below 6 months of age. Mastitis, colibacillosis, bovine ephemeral fever and pneumonia were major health disorders in cattle herd and their incidences are respectively, 23, 19, 14 and 10%. Hence, dairy farmers are advised to take all possible care and precautions during the concerned age group and periods to keep incidences of these ailments minimum possible in the herd to reduce mortality in the herd.

Acknowledgement

We are grateful to authorities *i.e.*, Director of Research and Dean, PG studies of both, Junagadh Agricultural University and Kamdhenu University and also the then Research Scientists for kind permission for utilizing the data for the present study.

Conflict of Interest: All authors declare no conflict of interest.

Financial Support

Not available

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How to Cite This Article
Gadariya MR, Gadariya GM, Patbandha TK, Gamit VV, Chaudhari PN, Savsani HH, *et al*. Factors affecting mortality and morbidity in Gir cattle herd in south saurashtra agro-climatic region of Gujarat. International Journal of Veterinary Sciences and Animal Husbandry. 2025;10(7):01-07.