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Status of disease prevalence in dairy bovines of Sabarkantha district of Gujarat

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Abstract
The livestock health plays a significant role in economy of livestock owner. The major factors responsible for different diseases among livestock are poor hygienic condition, lack of awareness towards vaccination and deworming, lack of scientific knowledge for feeding, watering and outbreaks of diseases etc. Majority of livestock owners are facing great economics losses due to such diseases. The disease surveillance of major viral, bacterial infections and parasitic infestation of cattle and buffaloes was carried out in total 184 livestock owner of 07 Taluka of Sabarkantha district of Gujarat are subjected to the disease surveillance in cattle and buffaloes. A questionnaire was device to record the information on prevalence of different diseases. The data were analysed and results were compared with the reports of Sabar Dairy and Animal Diseases Investigation Office (ADIO), Himmatnagar. Prevalence of diseases was postulated on the basis of history, signs and symptoms provided by farmers. Present finding indicated that mastitis (29.68%) and infertility (22.58%) were major disease conditions observed in the cattle and buffaloes during survey followed by Babesiosis (9.03%), Brucellosis (8.39%), Foot and mouth disease (FMD) (8.39%) and Uterine Infection (7.10%). The mastitis and infertility were major disease conditions observed during early and mid lactation in the cattle and buffaloes as compare to late lactation period. The present findings are close agreement with finding reported by Sabar Dairy and ADIO, Himmatnagar. The economic losses to the owner due to different diseases were calculated and presented.

Keywords: Livestock, diseases, prevalence, infection, sabarkantha

Introduction
Globally livestock production is growing faster than any other sector, and by 2025 the livestock sector is predicted to become the most important agricultural sector in terms of added value, referred to as the 'livestock revolution'. Animal diseases are a major and increasingly important factor reducing livestock productivity in developing countries in particular. These diseases have numerous impacts, including productivity losses for the livestock sector (production losses, cost of treatment, market disturbances), loss of income from activities using animal resources (energy, transportation, tourism), prevention or control costs (production costs, public expenditure) and suboptimal use of production potential (animal species, genetics, livestock practices) [1].

Highly contagious livestock diseases such as foot and mouth disease (FMD), hemorrhagic septicemia (HS), mastitis, peste des petits ruminant (PPR) and surra in cloven footed domestic animals cause irreparable economic losses to the farming community.

In the above context, a comprehensive economic assessment of animal diseases is of utmost importance before formulating the various livestock health intervention efforts. Several studies in the Indian context are available on the prevalence of major livestock diseases and the economic loss due these diseases [2, 3].

The present study was undertaken to assess the status of important diseases on production parameters in bovines in India with the following specific objective: To carry out the disease surveillance of major viral, bacterial infections and parasitic infestation of cattle and buffaloes in Milk Shed Area of Sabarkantha District.

Materials & Methods
The surveillance of major diseases on production loss in cattle and buffaloes of Sabarkantha District. Total 184 livestock owners in 07 Taluka i.e., Himatnagar, Idar, Prantij, Talod, Khedbrahma, Vadali and Vijaynagar of Sabarkantha district were subjected for the diseases surveillance study. A questionnaire was prepared and each livestock owner was contacted

personally to record the data. The data were grouped, analysed & tabulated. Prevalence of diseases was postulated on the basis of history, signs and symptoms provided by farmers. However, no reports were provided by them regarding confirmative diagnosis.

For retrospective analysis of epidemiological data on various diseases in the Operational area, the reports from Sabar Dairy (2014) and Animal Diseases Investigation Office (ADIO), Himmatnagar (2013-14 & 2014-15) were collected and compared with present finding.

Chi square test (x^2)

Chi-square test (Test of Independence) was being applied to determine the association of different diseases surveillance with different categories.

The value of chi-square test (X^2) was calculated by using following formula.

$$X^2 = \Sigma \left[(O_i - E_i)^2 / E_i \right]$$

Where, X^2 = Chi- Square test value
Σ = Summation.
O_i = Observed frequency
E_i = Expected frequency
The calculated x^2 value was compared with table x^2 value at 5 % & 1 % level and given degree of freedom for its test of significance [4].

Results and Discussion

Table 1: Effect of species on prevalence of diseases in Sabarkantha district of Gujarat

Diseases observed	Cattle		Buffaloes		Total		P (χ^2)
	n	%	n	%	n	%	
Mastitis	30	28.57	16	32.00	46	29.68	
Infertility	24	22.86	11	22.00	35	22.58	
Uterine Infection	6	5.71	5	10.00	11	7.10	
Brucellosis	9	8.57	4	8.00	13	8.39	
Babesiosis	11	10.48	3	6.00	14	9.03	
Theileriosis	4	3.81	0	0.00	4	2.58	
FMD	9	8.57	4	8.00	13	8.39	
Milk Fever	4	3.81	1	2.00	5	3.23	0.452
Pica	2	1.90	0	0.00	2	1.29	
Parasitic infestation	3	2.86	1	2.00	4	2.58	
Ketosis	1	0.95	2	4.00	3	1.94	
Fascioliasis	0	0.00	2	4.00	2	1.29	
Coccidiosis	1	0.95	0	0.00	1	0.65	
Abscess	0	0.00	1	2.00	1	0.65	
HS	1	0.95	0	0.00	1	0.65	
Total	105	100.00	50	100.00	155	100.00	

From table 1 it was observed that the mastitis (29.68%) and infertility (22.58%) were major disease conditions observed in the cattle and buffalo followed by Babesiosis (9.03%), Brucellosis (8.39%), FMD (8.39%) and Uterine Infection (7.10%) etc. As compare to cattle, the incidences of mastitis, Uterine Infection, Ketosis and Fascioliasis were more in buffalo. Likewise, the incidences of Babesiosis, Theileriosis, Milk Fever, Pica and HS in cattle were more as compare to buffalo. The incidences like Infertility, Brucellosis, FMD and Parasitic infestation were almost similar in cattle and buffaloes.

The present finding was well supported by the result of earlier workers (Vahora *et al.,* 2012) [5] revealed that overall incidences of Babesiosis was 10.41 and 3.66 % in cattle and

buffalo respectively in Kheda and Anand District. (Binod Kumar *et al.,* 2016) [6] found higher rate of hemoprotozoan by testing 366 samples from cattle (n = 175) and buffaloes (n = 191) and exhibited that 58.6 % of cattle and 41.2 % of buffaloes were infected with haemoparasites comprising *Babesia bigemina*, *Theileria annulata*, and *Anaplasma marginale* @ of 54.0, 3.4 and 1.1 in cattle and 38.8, 1.2 and 1.2 percent in buffaloes, respectively from South Western Gujarat.

(Patel *et al.,* 2012) [7] tested 10539 milk samples from healthy cows, 4932 cows (46.80%) were found positive for sub-clinical mastitis in Anand district and (Patel *et al.,* 2014) [8] analysed 582 milk samples among them 69 (11.90 %) samples found positive for bovine brucellosis under intensive system of production in Anand, Ahmedabad, Navsari, Surat, Valsad and Vapi districts of Gujarat. Further Kathiriya *et al.,* (2014) [9] reported overall prevalence of subclinical mastitis (SCM) in lactating dairy cows found in this study was 29% in Rajkot district of Gujarat.

The present findings are close agreement with finding reported by Sabar Dairy and ADIO, Himmatnagar.

Table 2: Effect of lactation stages on prevalence of diseases in Sabarkantha district of Gujarat

Diseases observed	Early lactation		Mid lactation		Late lactation		Total		P (χ^2)
	n	%	n	%	n	%	n	%	
Mastitis	25	25.51	21	39.62	0	0.00	46	29.68	
Infertility	23	23.47	10	18.87	2	50.00	35	22.58	
Uterine Infection	6	6.12	5	9.43	0	0.00	11	7.10	
Brucellosis	6	6.12	5	9.43	2	50.00	13	8.39	
Babesiosis	11	11.22	3	5.66	0	0.00	14	9.03	
Theileriosis	3	3.06	1	1.89	0	0.00	4	2.58	
FMD	9	9.18	4	7.55	0	0.00	13	8.39	
Milk Fever	4	4.08	1	1.89	0	0.00	5	3.23	0.514
Pica	2	2.04	0	0.00	0	0.00	2	1.29	
Parasitic infestation	4	4.08	0	0.00	0	0.00	4	2.58	
Ketosis	1	1.02	2	3.77	0	0.00	3	1.94	
Fascioliasis	2	2.04	0	0.00	0	0.00	2	1.29	
Coccidiosis	0	0.00	1	1.89	0	0.00	1	0.65	
Abscess	1	1.02	0	0.00	0	0.00	1	0.65	
HS	1	1.02	0	0.00	0	0.00	1	0.65	
Total	98	100.00	53	100.00	4	100.00	155	100.00	

From table 2 it was revealed that the lactation period is most crucial time for the milk production. During lactation period the animal reaches maximum milk yield per day within 2-4 weeks. For high level of lactation yield, the peak yield should be maintained for longer period as far as possible. The maintenance of peak yield for long period is known as persistency, slow decrease in dairy milk yield after reaching peak yield in necessary. High persistency is necessary to maintain high level of milk production. Generally all the disease condition effect more to early and mid lactation as compare to late lactation. The mastitis and infertility were major disease conditions effect the early and mid lactation observed in the cattle and buffalo as compare to late lactation period. In early lactation period, the incidence of mastitis (25.51%) and infertility (2.47%) were observed more in animals followed by Babesiosis (11.22%), FMD (9.18%), Uterine Infection (6.12%), Brucellosis (6.12%) and milk fever (4.08%). Likewise, the incidence of mastitis (39.62%) and infertility (18.87%) were more affect the animals in mid

lactation period followed by Uterine Infection (9.43%), Brucellosis (9.43%), FMD (7.55%), Babesiosis (5.66%) and ketosis (3.66%).

The present finding was well supported by the result of Biswal *et al.*, (2016) [10] reported in milk shed areas of Odisha state, India where the prevalence of ketosis was observed to be the highest at 56.7% on the first stage of lactation at the 1st month after 2 weeks. The present findings are close agreement with finding reported by Sabar Dairy and ADIO, Himmatnagar.

This was contrary to the findings of Joshi and Gokhale, (2006) [11] who concluded that the prevalence increased with higher lactation number and animals in 4th & 5th month of lactation were found more susceptible (59.49%) followed by 1st to 3rd month (42.22%), 6th to 7th month (40.29%), and 8th month of lactation stage and above (21.42%) in India.

Conclusion
Mastitis is a major infectious disease of dairy cattle that causes significant economic losses. Infertility causes prevent conception, create problems in the delivery of healthy calves, lead to postpartum complications, reduce milk yield and lower overall lifetime productivity. The mastitis and infertility were major disease conditions observed in sabarkantha district.

Acknowledgements

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