

*Original Research***A Survey on the Occurrence of Livestock Diseases and Constrains in Controlling those Diseases in Maharashtra****S. K. Das*, H. P. Aithal and K. N. Bhilegaonkar**

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Rec. Date:	Sep 13, 2019 05:04
Accept Date:	Feb 07, 2020 07:26
DOI	10.5455/ijlr.20190913050411

Abstract

Feedback of 344 veterinary officers of Maharashtra state was taken regarding the occurrence of infectious disease, systemic disease, reproductive disorders and constrains faced by them in controlling those diseases in different regions of Maharashtra in pre constructed format. It was revealed that PPR (2.30 ± 0.08), Mastitis (1.81 ± 0.06) and repeat breeding (1.73 ± 0.05) were most important infectious disease, systemic disease and reproductive disease respectively. Most important difficulty in controlling infectious diseases, difficulty in treatment of diseases and most important causes for reproductive problems at field level were found to be “Non cooperation from animal owners (2.16 ± 0.07)”, “high cost of treatment (2.53 ± 0.07)” and “nutritional deficiencies (1.66 ± 0.06)” respectively. Region wise analysis of data revealed that PPR was the most prevalent infectious disease in all the six regions of Maharashtra except in Pune. Mastitis was the most prevalent systemic disease in five regions i.e. Mumbai, Pune, Aurangabad, Latur and Amaravati. Repeat breeding was the predominant reproductive problem in all the seven regions of the state. Nutritional deficiency was found to be the main cause of reproductive problems.

Key words: Control, Livestock Diseases, Maharashtra, Occurrence, Problem

How to cite: Das, S. K., Aithal, H. P., & Bhilegaonkar, K. N. (2020). A Survey on the Occurrence of Livestock Diseases and Constrains in Controlling those Diseases in Maharashtra. International Journal of Livestock Research, 10(2), 89-96. doi: 10.5455/ijlr.20190913050411

Introduction

Livestock sector plays an important role in socio economic development of our country. The success of livestock industry depends on good health of the livestock. Maharashtra is rich source of livestock population. As per 19th Livestock Census (2012) the bovine livestock population of Maharashtra is 21.07 million out of which cattle population is 15.48 million (7.59 % of national population and stands fourth position) and buffalo's population is 5.59 million (5.14 % of national population and stands eighth position). In Maharashtra goat population is 8.44 million, which is 6.24 % of National population. Maharashtra ranks

sixth position in goat population. Livestock thus is an important integral part to the sustainability of economy of this state. So, information on the incidence of different types of diseases in livestock in different regions of the state of Maharashtra and associated problem in controlling those diseases will definitely help the State Animal Husbandry Department to plan properly to monitor and undertake prevention and control measures of livestock diseases well in advance. Moreover, all that information was lacking. Therefore, this survey work was conducted as a part of extension work in the year 2016 - 17.

Materials and Methods

A questionnaire was developed for collecting data from veterinary officers of Maharashtra on occurrence of livestock diseases and constraints faced by them in treatment and control of those diseases. Feedback of 344 veterinary officers of Maharashtra state was taken in supplied format in 1-5 scale, where score 1 was given to most important disease and difficulty, score 5 was assigned for least important disease and difficulty. Afterwards score mentioned by them were analyzed statistically as per Snedecor and Cochran (1994). One-way analysis of variance and critical difference test was done using SPSS 10.1 version software.

Results and Discussion

Information on infectious diseases was collected for five groups i.e. Foot and Mouth Disease (FMD), Peste des Petits Ruminants (PPR), Haemorrhagic Septicaemia (HS), Black Quarter (BQ) and Blood Protozoan Diseases (BPD). It was revealed (Table 1) that PPR (2.25 ± 0.08) was most important infectious disease in Maharashtra followed by FMD (2.56 ± 0.09) and BPD (2.63 ± 0.08), however non - significant ($P > 0.05$) difference of score was observed between the three diseases.

Table 1: Occurrence of different infectious diseases in different regions (Mean $\pm$ SE of score)

Region	Infectious Diseases				
	FMD	PPR	HS	BQ	BPD
Mumbai	$2.43^{bc} \pm 0.25$ (35)	$2.09^c \pm 0.21$ (35)	$3.23^a \pm 0.25$ (35)	$3.20^a \pm 0.27$ (35)	$2.83^{ab} \pm 0.27$ (35)
Pune	$2.72^b \pm 0.22$ (54)	$2.30^b \pm 0.19$ (53)	$3.66^a \pm 0.18$ (53)	$3.82^a \pm 0.17$ (50)	$2.22^b \pm 0.18$ (54)
Nashik	$2.56^b \pm 0.27$ (36)	$2.31^b \pm 0.26$ (35)	$3.20^a \pm 0.23$ (35)	$3.47^a \pm 0.25$ (36)	$2.56^b \pm 0.26$ (36)
Aurangabad	$2.44^b \pm 0.29$ (27)	$1.93^b \pm 0.21$ (27)	$3.32^a \pm 0.29$ (25)	$3.24^a \pm 0.28$ (25)	$2.28^b \pm 0.26$ (25)
Latur	$2.29^b \pm 0.25$ (31)	$2.18^b \pm 0.21$ (34)	$3.07^a \pm 0.25$ (30)	$2.81^a \pm 0.23$ (31)	$3.03^a \pm 0.27$ (30)
Amaravati	$2.75^b \pm 0.24$ (40)	$2.26^b \pm 0.20$ (39)	$3.74^a \pm 0.21$ (38)	$3.38^a \pm 0.23$ (40)	$2.64^b \pm 0.23$ (42)
Nagpur	$2.75^a \pm 0.19$ (64)	$2.67^a \pm 0.18$ (60)	$2.92^a \pm 0.18$ (62)	$3.10^a \pm 0.18$ (62)	$2.83^a \pm 0.17$ (64)
Overall	$2.56^b \pm 0.09$ (287)	$2.25^b \pm 0.08$ (283)	$3.31^a \pm 0.08$ (278)	$3.29^a \pm 0.08$ (279)	$2.63^b \pm 0.08$ (289)

Bold value in a row indicates lowest value. Parenthesis indicates number of observations; Figures having different superscripts in a row differ significantly ($P < 0.05$).

Krishnamoorthy *et al.* (2018) reported that the cumulative diagnosed cases reported were highest in PPR (25,200), followed by HS (1,794), FMD (1,193), BQ (1,006). The cumulative death cases reported were highest in PPR (6,204), followed by HS (857), BQ (632), and FMD (44). However, number of outbreaks was highest in black quarter (203) followed by Haemorrhagic septicaemia (176), Peste des Petits Ruminants (137) and Foot and mouth disease (6). Region wise analysis of data revealed that PPR was the most prevalent infectious disease in all the six regions of Maharashtra except in Pune. Blood protozoan disease was recorded to be most prevalent in Pune region followed by PPR and FMD. The reason might be high population of cross bred cattle in this region. However, non - significant ($P > 0.05$) difference of score was observed between the three diseases. In Nagpur region only non - significant difference ($P > 0.05$) of score was observed among the all infectious diseases. Krishnamoorthy *et al.* (2018) reported that the disease outbreaks were reported high in Central Maharashtra Plateau, Western Maharashtra Plain and Western Ghat Zones etc.

Information on systemic disorders was collected in five groups i.e. mastitis, ketosis, tympanitis, enteritis and pneumonia. Most important systemic disorder (Table 2) was reported to be mastitis (1.83 ± 0.06) followed by enteritis (1.95 ± 0.07) and tympanitis (2.53 ± 0.07), however non - significant ($P > 0.05$) difference of score was observed between the mastitis & enteritis and significant ($P < 0.05$) difference of score was observed between the mastitis & tympani.

Table 2: Occurrence of different systemic disorders in different regions (Mean $\pm$ SE of score)

Region	Systemic disorders				
	Mastitis	Ketosis	Tympanitis	Enteritis	Pneumonia
Mumbai	1.81^c ± 0.16 (37)	2.78 ^{ab} ± 0.23 (36)	2.39 ^b ± 0.18 (36)	2.22 ^{bc} ± 0.23 (37)	3.14 ^a ± 0.23 (36)
Pune	1.56^c ± 0.13 (57)	2.67 ^a ± 0.15 (55)	2.57 ^a ± 0.17 (56)	2.02 ^b ± 0.16 (57)	2.81 ^a ± 0.16 (53)
Nashik	1.72 ^b ± 0.18 (39)	2.95 ^a ± 0.22 (38)	2.79 ^a ± 0.24 (38)	1.46^b ± 0.15 (39)	2.68 ^a ± 0.20 (38)
Aurangabad	1.74^b ± 0.22 (27)	2.92 ^a ± 0.23 (24)	2.19 ^b ± 0.22 (26)	1.81 ^b ± 0.24 (27)	2.22 ^b ± 0.20 (27)
Latur	1.97^b ± 0.25 (31)	3.12 ^a ± 0.21 (33)	2.47 ^a ± 0.22 (34)	2.06 ^b ± 0.23 (32)	2.84 ^a ± 0.18 (31)
Amaravati	1.83^b ± 0.15 (42)	2.85 ^a ± 0.21 (41)	2.61 ^a ± 0.20 (41)	2.02 ^b ± 0.20 (41)	2.60 ^a ± 0.21 (42)
Nagpur	2.17 ^b ± 0.16 (64)	3.19 ^a ± 0.17 (63)	2.67 ^a ± 0.17 (64)	2.07^b ± 0.17 (61)	2.82 ^a ± 0.15 (62)
Overall	1.83^c ± 0.06 (297)	2.93 ^a ± 0.07 (290)	2.53 ^b ± 0.07 (295)	1.95 ^c ± 0.07 (294)	2.73 ^{ab} ± 0.07 (289)

Bold value in a row indicates lowest value. Parenthesis indicates number of observations; Figures having different superscripts in a row differ significantly ($P < 0.05$).

Region wise analysis of data revealed that mastitis was the most prevalent systemic disorder in five regions i.e. Mumbai, Pune, Aurangabad, Latur and Amaravati, followed by enteritis. However, enteritis was most common in Nashik and Nagpur region, followed by mastitis. But there was non - significant ($P > 0.05$) difference of score between the two diseases in Nashik and Nagpur region. However, in contrast to present findings Bangar *et al.* (2013) reported that major cause of morbidity and mortality in cattle in Pune region was digestive diseases.

Reproductive disorders was classified in six groups i.e. Repeat Breeding (RB), Anoestrus, Metritis, Dystocia, Abortion and Delayed Puberty (DP). Most prevalent reproductive disorder (Table 3) was found to be RB (1.75 ± 0.05), followed by Anoestrus (2.07 ± 0.06) and Metritis (2.70 ± 0.06), however non - significant ($P > 0.05$) difference of score was observed between the RB & Anoestrus and significant ($P < 0.05$) difference of score was observed between the RB & metritis and between the anoestrus & metritis. Region wise analysis of data revealed that RB was the predominant reproductive problem in all the seven regions of Maharashtra. Kumaresen *et al.*, 2013 reported in this context that incidence of repeat breeding in India ranges from 5.5 - 33 % in cattle and 6 – 30 % in buffaloes respectively. So, present findings corroborate with the findings of Kumaresen *et al.*, 2013. Second most important reproductive disease was Anoestrus in all the regions. However, only in Amaravati district significant ($P < 0.05$) difference of score was observed between RB and Anoestrus.

Table 3: Occurrence of different reproductive disorders in different regions (Mean $\pm$ SE of score)

Region	Reproductive Disorders					
	RB	Anoestrus	Metritis	Abortion	DP	Dystocia
Mumbai	1.95^b ± 0.16 (37)	2.00 ^b ± 0.16 (34)	2.71 ^{ab} ± 0.19 (34)	3.14 ^a ± 0.25 (36)	3.12 ^a ± 0.23 (34)	2.58 ^b ± 0.23 (33)
Pune	1.60^c ± 0.12 (57)	1.93 ^{bc} ± 0.14 (56)	2.48 ^b ± 0.13 (56)	3.59 ^a ± 0.16 (51)	2.60 ^b ± 0.16 (55)	3.26 ^a ± 0.15 (53)
Nashik	1.44^c ± 0.13 (39)	1.77 ^c ± 0.14 (39)	2.50 ^b ± 0.20 (38)	3.28 ^a ± 0.20 (36)	2.40 ^b ± 0.24 (35)	3.11 ^a ± 0.18 (38)
Aurangabad	1.74^d ± 0.20 (27)	2.26 ^{cd} ± 0.19 (27)	2.67 ^{bc} ± 0.22 (27)	3.22 ^a ± 0.21 (27)	2.93 ^{ab} ± 0.22 (27)	2.78 ^{abc} ± 0.19 (27)
Latur	1.88^c ± 0.17 (33)	2.22 ^c ± 0.20 (32)	2.78 ^b ± 0.20 (32)	3.34 ^a ± 0.25 (32)	3.24 ^{ab} ± 0.25 (29)	3.06 ^{ab} ± 0.21 (32)
Amaravati	1.67^c ± 0.13 (42)	2.17 ^b ± 0.18 (42)	2.80 ^a ± 0.21 (41)	2.90 ^a ± 0.20 (39)	2.46 ^{ab} ± 0.24 (37)	2.85 ^a ± 0.23 (40)
Nagpur	1.98^c ± 0.13 (64)	2.14 ^c ± 0.16 (63)	2.97 ^b ± 0.15 (62)	3.56 ^a ± 0.15 (61)	2.95 ^b ± 0.18 (63)	3.16 ^{ab} ± 0.15 (61)
Overall	1.75^c ± 0.05 (299)	2.07 ^c ± 0.06 (293)	2.70 ^b ± 0.06 (290)	3.29 ^a ± 0.08 (282)	2.81 ^b ± 0.08 (280)	2.97 ^{ab} ± 0.06 (284)

B: Bold value in a row indicates lowest value. Parenthesis indicates number of observations; Figures having different superscripts in a row differ significantly ($P < 0.05$).

Most important constrains faced by the field veterinarians in controlling infectious diseases (Table 4) was reported to be “Non - cooperation from animal owners” (2.22 ± 0.07) followed by “Difficulty in early

diagnosis” (2.45 ± 0.08) and “Difficulty in vaccination coverage” (2.49 ± 0.07). However, non - significant ($P > 0.05$) difference of score was observed between the three reasons in controlling infectious diseases. Krishnamoorthy *et al.* (2018) reported that despite of vaccination programmes, the disease outbreaks were reported high due to low vaccination coverage, low vaccine efficacy and unrestricted movement of animals, etc. So, present results was in agreement with the findings of Krishnamoorthy *et al* (2018) on one point ie low vaccination coverage. Region wise data analysis indicated that “non - cooperation from animal owners” was the main difficulty in controlling infectious diseases in Mumbai, Pune, Aurangabad, Amaravati and Nagpur regions followed by “Difficulty in vaccination coverage” in Mumbai, Pune, Aurangabad and “difficulty in early diagnosis” in Amaravati and Nagpur regions. However, in Nashik and Latur region “difficulty in early diagnosis” was the main problem in controlling infectious diseases followed by “non - cooperation from animal owners” with non - significant ($P > 0.05$) difference of score between the two difficulties.

Table 4: Difficulties in controlling infectious diseases in different regions (Mean $\pm$ SE of score)

Region	Particular			
	Difficulty in early diagnosis	Non availability of suitable vaccine	Difficulty in vaccination coverage	Non - cooperation from animal owners
Mumbai	$2.51^b \pm 0.21$ (35)	$3.75^a \pm 0.23$ (36)	$2.49^b \pm 0.23$ (37)	$2.31^b \pm 0.22$ (36)
Pune	$2.50^b \pm 0.17$ (54)	$3.64^a \pm 0.19$ (53)	$2.27^b \pm 0.16$ (55)	$2.00^b \pm 0.16$ (56)
Nashik	$2.11^b \pm 0.20$ (37)	$3.86^a \pm 0.22$ (36)	$2.46^b \pm 0.21$ (37)	$2.31^b \pm 0.21$ (36)
Aurangabad	$2.33^{ab} \pm 0.22$ (27)	$3.13^a \pm 0.26$ (24)	$2.15^b \pm 0.25$ (26)	$2.11^b \pm 0.22$ (27)
Latur	$2.58^b \pm 0.26$ (33)	$3.61^a \pm 0.28$ (31)	$2.70^b \pm 0.26$ (33)	$2.69^b \pm 0.23$ (32)
Amaravati	$2.54^b \pm 0.19$ (41)	$3.71^a \pm 0.21$ (41)	$2.62^b \pm 0.23$ (42)	$1.98^b \pm 0.18$ (42)
Nagpur	$2.56^b \pm 0.16$ (63)	$3.51^a \pm 0.17$ (63)	$2.73^{ab} \pm 0.18$ (63)	$2.17^b \pm 0.14$ (63)
Overall	$2.45^b \pm 0.08$ (290)	$3.60^a \pm 0.08$ (284)	$2.49^b \pm 0.07$ (35) (293)	$2.22^b \pm 0.07$ (292)

NB: Bold value in a row indicates lowest value. Parenthesis indicates number of observations. Figures having different superscripts in a row differ significantly ($P < 0.05$).

The important constrains faced by the veterinary officers in management / treatment of diseases (Table 5) was observed to be “High cost of treatment” (2.54 ± 0.07) followed by “Owner’s non - compliance” (2.75 ± 0.07) and “Non availability of medicine” (3.11 ± 0.08). However, non - significant ($P > 0.05$) difference of score was observed between “High cost of treatment” and “Owner’s non - compliance” and significant ($P < 0.05$) difference of score was observed between the “High cost of treatment” & “Non availability of medicine” in management / treatment of diseases. Region wise data analysis also indicated that “Owner’s non – compliance” and “High cost of treatment” was the main difficulty in the management of systemic diseases in Mumbai, Pune, Nashik, Aurangabad and Amaravati. However, in Latur and Nagpur region “non - availability of medicine” was the main difficulty of management / treatment of diseases followed by “High cost of treatment” with non - significant ($P > 0.05$) difference of score between the two reasons.

Table 5: Difficulties in management / treatment of diseases in different regions (Mean $\pm$ SE of score)

Region	Particular			
	Non availability of medicine	Lack of technical know how	Owner's non compliance	High cost of treatment
Mumbai	3.30 ^a $\pm$ 0.25 (37)	3.31 ^a $\pm$ 0.23 (36)	2.37^b $\pm$ 0.22 (35)	2.73 ^b $\pm$ 0.22 (37)
Pune	3.57 ^a $\pm$ 0.24 (54)	3.68 ^a $\pm$ 0.18 (53)	2.85 ^b $\pm$ 0.16 (52)	2.69^b $\pm$ 0.17 (55)
Nashik	3.51 ^a $\pm$ 0.24 (37)	3.79 ^a $\pm$ 0.22 (38)	2.67 ^b $\pm$ 0.21 (36)	2.42^b $\pm$ 0.24 (38)
Aurangabad	3.19 ^b $\pm$ 0.24 (27)	3.76 ^a $\pm$ 0.23 (25)	2.84 ^b $\pm$ 0.18 (25)	2.42^c $\pm$ 0.24 (26)
Latur	2.76^b $\pm$ 0.26 (34)	3.79 ^a $\pm$ 0.24 (33)	3.09 ^b $\pm$ 0.26 (33)	2.79 ^b $\pm$ 0.26 (34)
Amaravati	2.98 ^b $\pm$ 0.22 (42)	3.73 ^a $\pm$ 0.18 (41)	2.69 ^b $\pm$ 0.21 (42)	2.24^c $\pm$ 0.19 (41)
Nagpur	2.48^b $\pm$ 0.16 (62)	3.44 ^a $\pm$ 0.17 (62)	2.75 ^b $\pm$ 0.13 (60)	2.51 ^b $\pm$ 0.17 (63)
Overall	3.11 ^b $\pm$ 0.08 (293)	3.64 ^a $\pm$ 0.07 (288)	2.75 ^{bc} $\pm$ 0.07 (283)	2.54^c $\pm$ 0.07 (294)

NB: Bold value in a row indicates lowest value. Parenthesis indicates number of observations. Figures having different superscripts in a row differ significantly ($P < 0.05$).

Most important cause for reproductive problems reported by veterinary officers at field level (Table 6) was “Nutritional deficiencies” (1.72 ± 0.06) followed by “Improper timing / technique of AI” (3.08 ± 0.07) and “Difficulty in heat detection” (3.15 ± 0.07). Significant ($P < 0.05$) difference of score was observed between the scores of first and second cause and non significant difference was there between second and third cause for reproductive problems at field level.

Region wise data analysis indicated that in all the seven regions “Nutritional deficiencies” were the main cause of reproductive problems. The second most important reason was “Improper timing / technique of AI” in Mumbai, Nashik, Aurangabad, Amaravati and Nagpur region with significant differences ($P < 0.05$) of score between the two causes for reproductive problems. In Pune and Latur region “Difficulty in heat detection” was the second most important reason for reproductive problems with significant differences ($P < 0.05$) of score between the two causes.

Table 6: Causes for reproductive problems at field level in different regions (Mean $\pm$ SE of score)

Region	Particular			
	Difficulty in heat detection	Improper timing / technique of AI	Poor semen quality	Nutritional deficiencies
Mumbai	3.22 ^b $\pm$ 0.22 (36)	3.03 ^b $\pm$ 0.22 (36)	3.89 ^a $\pm$ 0.18 (36)	1.97^c $\pm$ 0.22 (34)
Pune	3.00 ^b $\pm$ 0.17 (55)	3.02 ^b $\pm$ 0.18 (54)	4.04 ^a $\pm$ 0.18 (50)	1.79^c $\pm$ 0.15 (57)
Nashik	2.84 ^b $\pm$ 0.21 (37)	2.67 ^b $\pm$ 0.21 (36)	3.92 ^a $\pm$ 0.20 (38)	1.64^c $\pm$ 0.22 (37)
Aurangabad	3.04 ^b $\pm$ 0.24 (25)	3.00 ^b $\pm$ 0.23 (26)	4.08 ^a $\pm$ 0.21 (25)	1.63^c $\pm$ 0.13 (27)
Latur	3.26 ^a $\pm$ 0.23 (34)	3.56 ^a $\pm$ 0.22 (34)	3.94 ^a $\pm$ 0.24 (32)	2.00^b $\pm$ 0.19 (33)
Amaravati	3.14 ^b $\pm$ 0.22 (42)	3.10 ^b $\pm$ 0.21 (41)	4.13 ^a $\pm$ 0.16 (40)	1.33^c $\pm$ 0.12 (43)
Nagpur	3.56 ^a $\pm$ 0.15 (64)	3.19 ^a $\pm$ 0.13 (63)	3.97 ^a $\pm$ 0.16 (61)	1.66^b $\pm$ 0.12 (64)
Overall	3.15 ^b $\pm$ 0.07 (293)	3.08 ^b $\pm$ 0.07 (290)	4.00 ^a $\pm$ 0.07 (282)	1.72^c $\pm$ 0.06 (295)



NB: Bold value in a row indicates lowest value. Parenthesis indicates number of observations; Figures having different superscripts in a row differ significantly ($P < 0.05$).

Conclusion

Special attention is needed for veterinary services to keep the animals healthy and productive. Regular deworming and vaccination could reduce morbidity and mortality of the animals due to infectious diseases. Any animals suffering from contagious and infectious disease such as FMD, PPR quarantine measures is to be taken to prevent dissemination of disease to other healthy animals as PPR and FMD was found to be most important diseases in Maharashtra. There is also need for laboratory (serological and molecular) confirmation of clinically diagnosed cases for various livestock diseases to have better confirmation of livestock diseases. The state animal husbandry departments should ensure availability of most of the important medicines and vaccine to the livestock owners for reducing the cost of treatment as well as maintaining health and production of livestock as it was observed that high cost of treatment and non-availability of medicine were major constraints faced by the field veterinarians. As “nutritional deficiencies” is the major cause of reproductive disorder, so livestock owners should be well aware of the formulation of balanced nutrition at low cost for their livestock. Farmers should produce green fodder for feeding animals to reduce the reproductive diseases as far as possible. Moreover, timely artificial insemination with qualified doctor is very essential to reduce different reproductive diseases as “improper timing of AI” was second most important cause of reproductive disorder.

Acknowledgement

Authors are thankful to Mr. D Bhashkara Rao, Technical Officer, TEC, IVRI for providing necessary help as and when required. Authors acknowledge all the veterinary officers and team of respective Veterinary Dispensary, Department of AH & Veterinary Services, Govt. of Maharashtra for providing necessary facilities. Authors also duly acknowledge Director, ICAR – Indian Veterinary Research Institute, Izatnagar, Bareilly, UP for necessary cooperation and guidance.

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