

Effects of diseases on milk production and body weight of cattle in Uttar Pradesh

Vijay Bahadur Sharma*¹, Med Ram Verma², Salauddin Qureshi³ and Praveen Bharti⁴

^{1,2}Division of Livestock Economics, Statistics and Information Technology,

³Division of Biological Standardization,

⁴Division of Livestock Production and Management, Indian Veterinary Research Institute, Izatnagar, U.P.

*Corresponding author: drvijaybhardwaj@gmail.com

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Abstract

To analyze the effects of various diseases on productive traits of cattle a study has been undertaken by using data collected from 504 livestock owners in Agra division of Uttar Pradesh, India. The analysis of the data (ANOVA) on milk reduction revealed the significant difference ($p < 0.01$) in milk reduction due to various diseases. Over all milk reduction due to different diseases was 46.56%. Among all the diseases, FMD caused significantly higher milk reduction (63.40%) followed by Milk fever (52.65%) and H.S. (52.22%). But the effect of blot/tympani was lowest (23.61%) as compared to other diseases. The analysis of the data (ANOVA) on weight reduction also revealed the significant difference ($p < 0.05$) in weight reduction due to diseases. Over all weight reduction (%) in cattle due to both diseases diarrhea and pneumonia was (8.70%). Diarrhea had higher effect on weight reduction ((11.78%) as compared to weight reduction due to pneumonia (5.12%).

Highlight

- FMD, milk fever and H.S. caused greater reduction in milk production as compared to other diseases.
- Diarrhea has higher effect on weight reduction (%) in comparison of pneumonia

Keywords: Cattle, milk production, body weight, ANOVA

The livestock system involves various kinds of inputs and produces several kinds of the output. Diseases have different types of biological effects on animals that are exhibited as production losses and also affect the ability of an animal to survive, grow and reproduce. India has the world's largest cattle population and ranks first in milk production (121 MT) in the world. (BAHS 2012). Uttar Pradesh consists of 18.551 million cattle and ranks third in cattle population in India. The milk production in U.P. during 2011 was 21.031 MT and ranks first in milk production in India (BAHS 2012). The livestock production depends on the livestock health and animal diseases. The Infectious and parasitic diseases

are the major constraint to livestock production. Animal diseases have great impact on livestock productivity by altering the rates of reproduction, weight gain, reduced yield and quality of products such as milk. The effects of health disorders like diarrhoea, mastitis, and milk fever are associated with high reduction in milk production (Bareille *et al.* 2003). Mastitis is the most costly disease in dairy production Seegers *et al.* (2003). Parasitic infection is the major cause of apparent enormous economic losses in terms of milk production. (Orellana *et al.* 1999 and Bharti 2000). In Agra division of Uttar Pradesh, in cattle reproductive diseases (35.25%) were more prominent followed by specific diseases



(31.65%). Specific diseases include FMD (11.74%), HS (2.35%) and mastitis (17.56%). The prevalence of other diseases was 10.79 %. The prevalence of respiratory diseases was 7.91%, while morbidity due to parasitic diseases (Surra and others diseases) and digestive diseases was 7.19%. (Sharma *et al.* 2013). The estimation of the effects of these diseases on milk production and survival is of great importance to assess cost-benefits of diagnosis, treatments and prevention efforts.

Materials and Methods

The adopted sampling scheme in study was stratified multistage sampling. The Agra Division of Uttar Pradesh, India consists of four districts Agra, Mathura, Mainpuri and Firozabad. From each district blocks were selected by proportional allocation (5 blocks from Agra and 3 blocks from each Mathura, Mainpuri and Firozabad district). From each selected block, three villages were selected and this constitutes fourteen blocks and forty two villages. From each selected village 12 livestock owners were selected in such way a total of 504 livestock owners were selected. To study the effects of diseases on milk production and body weight, the collected data were compiled and analyzed by using One-way analysis of variance (ANOVA).

Results and Discussion

In study area data on a total of 525 cattle of different age, gender and breeds maintained by 155 livestock owners were collected. Among 525 cattle there were 132 males and 393 females. There were 194 calves, 1115 young stock and 219 adults of both male and female cattle. Out of total 525 cattle, there were 435 non-descript and 90 cross bred cattle (Table 1).

Table 1: Total surveyed cattle population in study area

Species	Calf		Young		Adult		Total
	Male	Female	Male	Female	Male	Female	
Cattle ND	89	79	16	77	8	166	435
Cattle CB	12	14	4	18	3	39	90
Total	101	93	20	95	11	205	525

Reduction in milk yield

The analysis of the data (ANOVA) on milk reduction revealed the significant difference ($p < 0.01$) in milk

reduction due to different disease (Table 3). Results indicated that FMD, milk fever and H.S. were major diseases that caused greater reduction in milk production as compared to other diseases. Singh and Prasad (2008) estimated the losses caused by important diseases, viz. FMD, HS in cattle. In cattle overall milk reduction due to various diseases was 46.56%. Among all the diseases, FMD was a important disease causing significantly higher milk reduction (63.40 %) followed by Milk fever (52.65%) and H.S. (52.22%). Saxena (1994) reported that FMD causes heavy loss in terms of milk production in cattle. Besides above diseases Mastitis also affected the milk production by reducing 40.77% milk yield. Tesfaye *et al.* (2010) and Mweu *et al.* 2012 reported that mastitis is a serious concern for dairy because of decreased milk production, reduced milk quality. Hortet and Seegers (1998) also reported that mastitis had milk reducing effect (23.61%) in affected animals. Diarrhoea also caused 48.16% milk reduction. This result is supported by Bennett (2003) and Smith *et al.* (2009). It was also reported that in cattle parasitic diseases also caused the milk loss (50.00%) in infected animals. Wamae *et al.* (1995) reported that acute fascioliasis caused reduction in milk yield. Blot/Tympany has caused lesser reduction in milk yield (23.61%) as compared to other diseases. Stockdale *et al.* (1980) worked over a period of 184 cases of bloat in cows and founded that milk yield was reduced by 0.14 kg for each hour of bloat ($P < 0.01$). (Table 2).

Table 2: Effect of disease on milk yield (%) in Cattle

Disease	Mean ± S.E.
Mastitis	40.77±1.73
F&MD	63.40±2.97
H.S.	52.22±7.78
Milk fever	52.65±4.14
Diarrhoea	48.16±4.50
Blot/ Tympany	23.61±1.39
Abortion	38.75±1.25
Dydtocia	40.00±0.00
Parasitic	50.00±4.12
Total	46.56±1.68

Reduction in body weight

The analysis of the data on weight reduction (ANOVA) in cattle in Agra division revealed the



significant difference ($p < 0.05$) in weight reduction due to important disease (Table 5). Over all weight reduction (%) in cattle due to both diseases Diarrhea and pneumonia was (8.70%). Diarrhea has higher effect (11.78%) on weight reduction followed by pneumonia (5.12%) (Table 4).

Table 3: ANOVA for milk reduction in cattle

SOV	D.F.	Sum of Squares	Mean Square	F	Sig.
Diseases	8	4430.539	553.817	6.882	<0.001
Error	45	3621.178	80.471		
Total	53	8051.717			

Table 4: Effect of disease on body weight (%) in cattle

Disease	Mean \pm S.E.
Diarrhea	11.78 \pm 9.37
Cold/pneumonia	5.11 \pm 4.20
Total	8.70 \pm 6.31

Table 5: ANOVA for body weight reduction in cattle

SOV	DF	Sum of Squares	Mean Square	F	Sig.
Diseases	1	143.687	143.687	35.647	0.001
Error	11	44.339	4.031		
Total	12	188.026			

Conclusion

It is indicated that in cattle FMD, milk fever and H.S. caused greater reduction in milk production as compared to other diseases while blot or tympani has a lesser effect on milk production. Diarrhea has higher effect on weight reduction (%) in comparison of pneumonia.

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