

## STUDY OF PHYSICAL PROFILE AND BODY CONDITION SCORE OF *MYCOBACTERIUM AVIUM* SUBSP. *PARATUBERCULOSIS* INFECTED SLAUGHTERED BUFFALOES OF MALWA REGION OF MADHYA PRADESH

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### SUMMARY

*Mycobacterium avium* subsp. *paratuberculosis*, an etiological agent of paratuberculosis (JD), causing chronic persistent diarrhoea in small and large ruminants. Paratuberculosis or Johne's disease is a chronic granulomatous gastroenteritis caused by *M. avium* subsp. *paratuberculosis*. Several reports are available regarding prevalence of paratuberculosis in animals, however, reports pertaining to physical profile and body condition score of *M. avium* subsp. *paratuberculosis* infected animals is lacking. Therefore, in the present study, 150 (120 females and 30 males) buffaloes slaughtered at Cantonment Board slaughter house, Mhow and Nagar Nigam Indore were examined. The presence of gross lesions, fat in the organs, fat around the visceral organs, gelatinization of visceral fat around the visceral organs, quantity of visceral fluid and quality of visceral fluid or protein content. On the basis of physical profile and body condition, the current study recorded the status of paratuberculosis (JD) as 0% (advanced clinical JD), 0% (clinical JD), 6% (subclinical JD), 66% (apparently normal, status of JD not known) and 28% (healthy with no symptoms like diarrhoea, cachexia, etc.)

**Keywords:** Body condition score, Buffaloes, MAP, Paratuberculosis, Physical profile

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Paratuberculosis or Johne's disease is a chronic granulomatous gastroenteritis caused by *Mycobacterium avium* subsp. *paratuberculosis*. The disease occurs worldwide and is primarily a disease of domesticated ruminants, including cattle (both beef and dairy), sheep, goats and farmed deer. Johne's disease is a deadly intestinal ailment which results into weight loss, diarrhoea (intermittent or continuous) and emaciation. The disease has significant impact on the global economy (Sweeney, 1996). The animals may get infected through horizontal transmission (fecal-oral route) and vertical transmission (placenta and semen), during the first week of life/pregnancy which is followed by long and variable incubation period (2-10 years) depending on different stress factors (Whittington and Windsor, 2007). Johne's disease is one of the most challenging infectious diseases that slowly progresses to hypoproteinemia, malabsorption, oedema and progressive thickening of gut which may be the main cause of weight loss (Patterson and Berrett, 1969).

Prevalence of MAP infection in buffaloes were reported by examining gross pathological lesions, impression smears, indigenous ELISA and modified Zeihl-Neelsen (ZN) staining in Malwa region of Madhya Pradesh (Jatav *et al.*, 2017). But reports are lacking pertaining to physical profile and body condition score in MAP infected animals. Therefore, the present study was

carried out to study the physical profile and body condition score of MAP infected slaughtered buffaloes in Malwa region of Madhya Pradesh.

The present study was conducted on a total of 150 buffaloes which were brought at slaughter houses located in Cantonment Board, Mhow and at Nagar Nigam Indore. The detailed studies were performed before and after slaughter of buffaloes. Buffaloes were physically examined before slaughter, for their geographical location (source), breed, age, sex, productive/non-productive and body condition score on the scale of 0 to +5 (physical profile). On the basis of physical profile and body condition score, buffaloes were categorized, *viz.* extremely healthy (+5), healthy (+4), normal (+3), weak (+2), extremely weak (+1) and emaciated (0). On the basis of clinical examination, buffaloes with respect to Johne's disease were grouped as cases of: 1. Advance clinical Johne's disease; 2. Clinical cases of Johne's disease; 3. Sub-clinical cases of Johne's disease (suspected for Johne's disease); 4. Apparently normal (status of Johne's disease not known); 5. Healthy with no symptoms of Johne's disease.

In the present study, 150 (120 females and 30 males) buffaloes slaughtered at Cantonment Board slaughter house, Mhow and Nagar Nigam Indore were examined for *Mycobacterium avium* subsp. *paratuberculosis*. These buffaloes were belonging to different locations of Malwa

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tract, viz. Depalpur, Dewas, Mhow, Dhar (Sundrel), Indore and Maheshwar. Age of these buffaloes was ranged between 1 to 10 years. As all 150 buffaloes were non-productive, hence they were slaughtered.

In the present study, the animals which were critically examined for the presence of fat in the organs (Table 1 & Fig. 1), fat around the visceral organs (Table 2 & Fig. 1), gelatinization of visceral fat around the visceral organs (Table 3 & Fig. 2), quantity of visceral fluid (Table 4 & Fig. 3) and quality of visceral fluid or protein content in gm/dl, (Table 5 & Fig. 4).

**Table 1**  
**Presence of visceral fat in the organs**

S.No.	Status	No. of animals	Incidence (%)
1.	Positive	150	100
2.	Negative for Johne's Disease	00	00

**Table 2**  
**Presence of fat around visceral organs**

S.No.	Status	No. of animals	Incidence (%)
1.	Positive	150	100
2.	Negative	00	00

**Table 3**  
**Gelatinization of visceral fat around visceral organs (Total no. of animals examined =150)**

S.No.	Status	No. of animals	Incidence (%)
1.	Gelatinized	01	00.66
2.	Slightly gelatinized	116	77.33
3.	Very less gelatinized	19	12.66
4.	Non-gelatinized	14	09.33

**Table 4**  
**Quantity of visceral fluid (n=150)**

S.No.	Status	No. of animals	Incidence (%)
1.	Excess	01	0.66
2.	Less	91	60.66
3.	Very less	51	34.00
4.	Normal	07	04.66

**Table 5**  
**Protein content (gm/dl) in visceral fluid(n=150)**

S.No.	Protein in gm/dl	No. of animals	Incidence (%)
1.	0 to >2	78	52.00
2.	2 to >4	59	39.33
3.	4 to >6	09	06.00
4.	6 to >8	02	01.33
5.	8 to >10	01	00.66
6.	10 to >12	01	00.66

**Table 6**  
**Status of Johne's Disease based on physical profile and body condition**

S.No.	Status	Physical profile	No. of animals	Overall % incidence
1.	Advance clinical JD	Emaciated	00	00.00
2.	Clinical JD	Extremely weak (+1)	00	00.00
3.	Subclinical JD	Weak (+2)	09	06.00
4.	Apparently normal	Normal (+3)	99	66.00
5.	Healthy with no symptoms of JD	Healthy and extremely healthy (+4 to +5)	42	28.00

On the basis of recorded result of the physical profile and body condition the slaughtered buffaloes were categorized as extremely healthy (+5), healthy (+4), normal (+3), weak (+2), extremely weak (+1) and emaciated (0). On the basis of clinical examination like diarrhoea, cachexia, etc., physical profile and body condition, the status of Johne's Disease in slaughtered buffaloes were recorded as advanced clinical JD (00%), clinical JD (00%), subclinical JD (06%), apparently normal, status of JD not known (66%) and healthy with no symptoms (28%). The findings of physical profile and body condition are shown in Table 6 and Fig. 5.

*Mycobacterium avium* subsp. *paratuberculosis* infection is a chronic wasting disease where the animal affected often presented with poor body condition score, however, often with a good appetite. It affects the small intestine of all ruminants, causing persistent diarrhoea which is not responsive to treatment as described by Harris and Barletta (2001) and clinical symptoms like diarrhoea, cachexia, etc. of MAP infection in cattle are easily recognized, they have pipe stream diarrhoea, chronic weight loss and oedema due to hypoproteinemia caused by protein-losing enteropathy as described by Sweeny *et al.* (2012). The present study also described the incidence of Johne's Disease based on physical profile and body condition score of buffaloes slaughtered at Cantonment Board Slaughter House, Mhow and Nagar Nigam, Indore from Malwa region of Madhya Pradesh. In the present investigation, it was found that out of 150 buffaloes, irrespective of age, sex and breeds, 06% (9/150), 66% (99/150) and 28% (42/150) were found under the body condition score (BCS) of weak (+2), normal (+3) and healthy (+4) & extremely healthy (+5), respectively. The body condition score followed in the present investigation was in accordance with the body condition score described by the Anitha *et al.* (2011) in Murrah buffaloes. The findings of present investigation are in contrast with the observations of Sweeny *et al.* (2012) pertaining to the incidence according to the body condition score with 66%

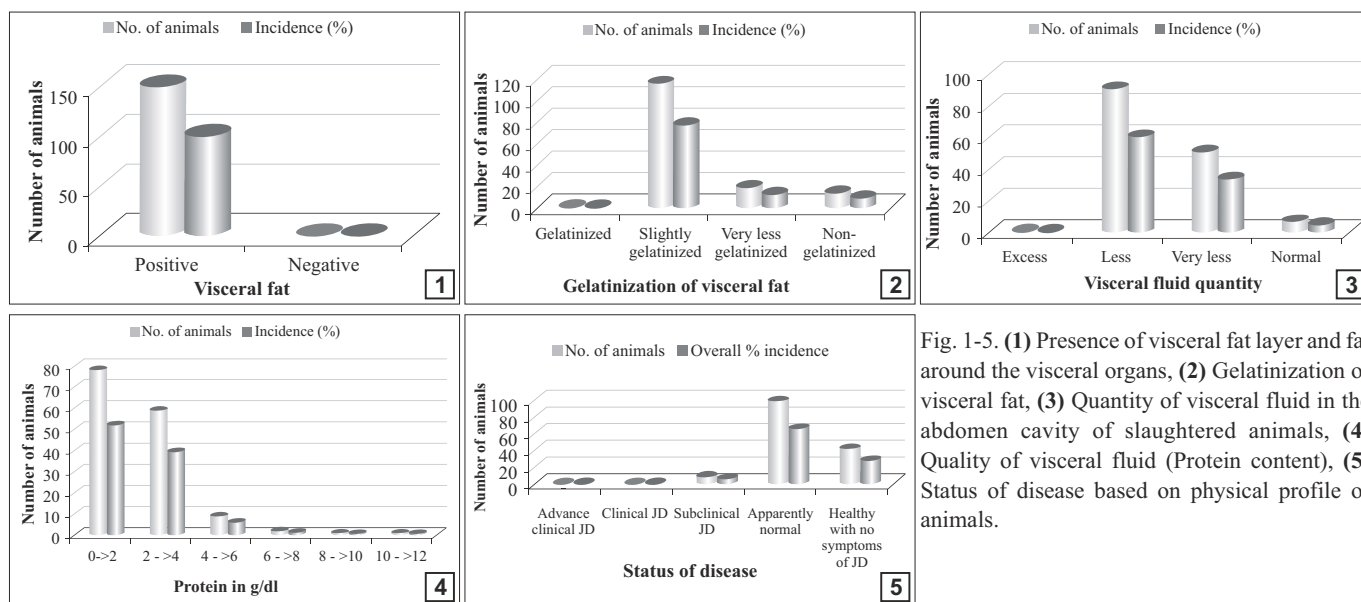


Fig. 1-5. (1) Presence of visceral fat layer and fat around the visceral organs, (2) Gelatinization of visceral fat, (3) Quantity of visceral fluid in the abdomen cavity of slaughtered animals, (4) Quality of visceral fluid (Protein content), (5) Status of disease based on physical profile of animals.

and 28% animal score normal and healthy to extremely healthy condition, respectively.

Examination of 150 (120 females and 30 males) buffaloes revealed 87.33% MAP infection. Out of which, 18.32 and 81.68% were suffered from sub clinical and clinical type of Johne's Disease, respectively, on the basis of gross lesions, whereas on the basis of physical profile the percentage of subclinical type of Johne's Disease was found to be 6%. As the causative agent produces chronic granulomatous enteritis which is responsible for persistent diarrhea which was recorded in the present study. Further, persistent diarrhea results in dehydration and cachexia, the cachexia was also recorded in the current study. However, the current study could detect Johne's Diseases on the basis of body condition score only in 6% animals and rest of the animals which were detected by different laboratory examinations were having good body condition score. This study concludes that, mere poor body condition score does not indicate that animal is infected with Johne's Disease, as the present study recorded the infection in animals having good body condition score as well.

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