

## BOVINE FAT NECROSIS FINDING AROUND THE STOMACH WITH PERSISTENT VOMITING IN JAPANESE BLACK CATTLE

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### ABSTRACT.

A 7-years old Japanese Black (JB) cow showed persistent vomiting, anorexia, diarrhea, and also 3-month pregnancy. Laboratory tests revealed anemia, hypoalbumenia, hypoproteinemia, elevated serum liver enzyme, and ketonuria. Due to poor condition, she was euthanised and necropsy was performed. Grossly, the stomach was surround and adhered by thick hard fat masses which were suggestive of necrotic fat masses. The fat masses were mainly found around abomasum and also found around reticulum, omasum and omentum. Histopathological examination revealed the fat tissue consisted of calcified and necrotic adipocyte with fibrosis and leukocyte infiltration. According to these findings the lesions were diagnosed as bovine fat necrosis (BFN) and rarely found around the stomach with persistent vomiting symptom.

**Ket Words :** bovine fat necrosis, fat masses, Japanese Black cattle, stomach

Fat necrosis commonly occurs in cattle and characterized by the formation of necrotic fat masses in the abdominal cavity. This disease is very complex and causes intestinal obstruction and some clinical symptoms, such as sclerous feces, constipation, and chronic anorexia [4,10,13]. In a 2015 Japanese study, among 5,788 fat Japanese Black cattle, 23% of the animals developed BFN. The pathogenesis of BFN is still unknown, it may be related to ingestion of endophyte-infected fescue and rye grasses, obesity, lack of exercise, high intake of energy diet, and genetics [4, 11].

A cow at Yamaguchi University farm showed clinical signs of persistent vomiting, anorexia and diarrhea. Auscultation and percussion test revealed decreased gastrointestinal movement and ping sound at upper stomach and right dorso-caudal abdomen. During that condition, 3 times blood haematology and biochemistry test revealed Hb, PCV, total protein, and albumin level were lower than normal values and AST, ALP and GGT level were higher (Tab. 1). Urine test kit revealed high urine ketone bodies. She was treated for ketosis, gastrointestinal hypoactivity and vomiting by hypertonic saline, 50% sugar, physiological saline, Tollamine<sup>R</sup>, ursodeoxycolic acid, vitamin B/A/E/D3, Propylene glycol and moxibustion were given to trigger gastrointestinal and jaw stiffness treatment. Although the signs got well by increased of appetite, decreased of ketone bodies and vomiting frequency after treatment, anorexia, ketonuria and vomiting recurred after 10 days and she was unable to stand. Due to poor condition, she was euthanised by general anesthesia and necropsy was performed.

Necropsy revealed the stomach was surrounded by thick hardened fat masses and multiple adhesion of the fat mass to the stomach wall (Fig. 1 and

2) and the characteristic of fat masses is similar to necrotic fat masses which is yellowish-white or white patches and nodule. The fat lesions being the only grossly recognizable abnormality and were found mainly around the abomasum and also formed around the reticulum, omasum and omentum (Fig 3). On the other hand, the lesion was not found around rumen but adhesion to the wall occurred (Fig.3 & 4). Commonly necrotic fat masses are multifocally found in various sites, including intestines, omentum, mesentery of the spiral colon, mesorectum and retroperitoneal area [1,3,5-9] but rarely found at stomach. Generally, cases of abdominal fat necrosis are often seen as incidental findings at slaughterhouse or necropsy examination and difficult to confirm by rectal palpation [3, 14]. In this case, pregnant condition and fat masses location also make this case difficult to confirm by rectal palpation and also was seen as incidental finding at necropsy examination.

Histopathologically, The fat tissue appearance was abnormal. Necrosis and calcification of adipocyte, fibrosis, and infiltration of inflammatory cell were observed (Fig. 5) and the lesions were consistent and confirmed as bovine fat necrosis [1,3,5,8,12,15].

The condition of persistent vomiting condition in this case is considered BFN wasn't an option for diagnosis at the time because usually cows with BFN have clinical symptoms such as sclerous feces, constipation and chronic anorexia but vomiting never been reported in BFN cases. Necropsy finding revealed that the vomiting caused by obstruction and gastric constipation and was thought to be caused by compression of large hardened fat masses to the stomach especially abomasum and blockages in the gastric tract by dry and hardened rumen fill due to gastrointestinal dysfunction (Fig.6).

Generally cattle with proximal duodenal obstruction (PDO) and persistent vomiting caused severe hyponatremia, hypochloremia and hypokalemia [2]. On the other hand, this cow have a normal values of natrium, kalium and chloride which indicates that this cow has incomplete obstruction or partial obstruction (Tab. 1). Meanwhile the condition of hypoproteinemia, hypoalbuminemia, ketonemia and hypoglycemia were consequences of combination BFN, gastrointestinal dysfunction and pregnancy due to lack of energy intake.

Fat necrotic masses usually formed around intestines and mesentery in BFN cases and lesions around the stomach and vomiting consequence is rarely found. This report provide suggestion that BFN also been found at stomach and persistent vomiting could be shown as clinical symptom. Furthermore, genetic is considered to be the main cause of BFN to this cow.

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Figure 1. Pathology and Histopathology finding. 1. stomach surround by fat masses (a). omasum, (b). abomasum. 2. Fat masses at abomasum. 3. Omentum with fat necrosis, (c) omentum, (d) Liver, (e) Rumen. 4. adhesion of stomach wall (f). Rumen, (g). Liver, (h). adhesion . 5. Histopathology finding of fat masses (i) calcification, (j) fibrin tissue and inflammatory cell, (k). adipocyte necrosis . 6. Rumen with dry rumen fill and compact

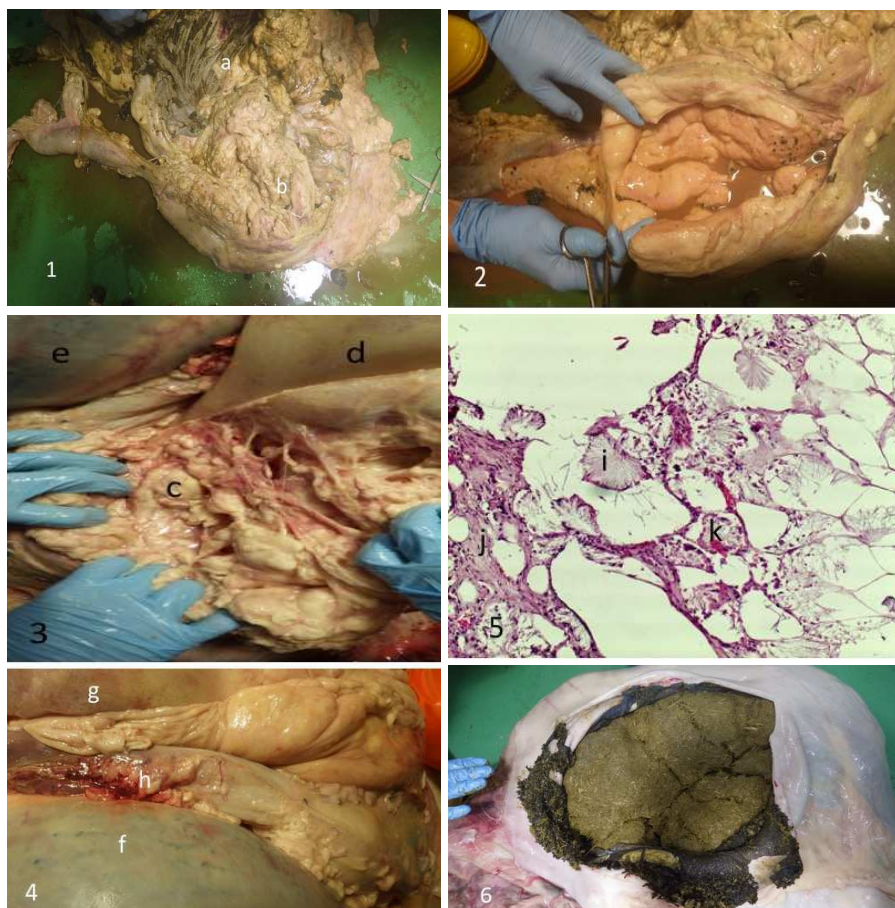


Table 1. Haematology and biochemistry test result from several parameter

Parameter	Normal	5/18/2018	5/29/2018	6/20/2018	Unit
RBC	5-10	5.06	4.87	4.83	10 <sup>6</sup> /μL
HB	9-15	7.8	7.5	7.2	g/dL
PCV	24-46	24.3	23.1	21.7	%
P. Prot	6.5-7.5	5.7	5.4	5.0	g/dL
WBC	4-12	10	10	13	10 <sup>3</sup> /μL
BUN	10-25	12.3	10	12.2	mg/dL
CRE	0.5-1.8	1.2	1.0	0.7	mg/dL
AST	43-127	381	170	79	U/L
ALP	27-107	191	209	209	U/L
GGT	15-39	158	145	92	U/L
ALB	3.0-3.6	2.0	2.2	1.8	g/dL
T.BIL	0.1-0.8	NT	0.1	0.3	mg/dL
GLU	45-75	NT	30	66	mg/dL
Na	132-152	143	142	141	mEq/L
K	3.9-5.8	3.8	4.5	4.1	mEq/L
Cl	97-111	105	106	105	mEq/L