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## INTRODUCTION

Steatonecrosis, also called lipomatosis or abdominal fat necrosis (AFN), is frequent in cattle, but is often an accidental finding during transrectal palpation or slaughtering process. Etiology seems to be multifactorial. Excessive fattiness of abdominal tissue in the growing stage, disturbance in lipid metabolism, genetics predispositions, and fescue toxicity have been associated with the occurrence of fat necrosis in cattle, but other causes were suspected in other species, like deficiency of vitamin E or Selenium in foals, or acute pancreatitis in humans. We herein describe an abdominal fat necrosis in a twelve-year old Highland bull.

## A - CASE REPORT

### PATIENT

A 12-year old Highland bull, "Teddy", weighing 550kg (Figure 1).

### HISTORY

He was referred for scant feces since few days and anorexia.

### CLINICAL EXAMINATION

Clinical examination revealed a high rectal temperature. Special abdominal examination highlighted an absence of digestive sound and ruminal contractions and a large firm mass was felt at the abdominal palpation. Rectal palpation revealed a large mass located around the left kidney and some other smaller masses around the intestinal tract.

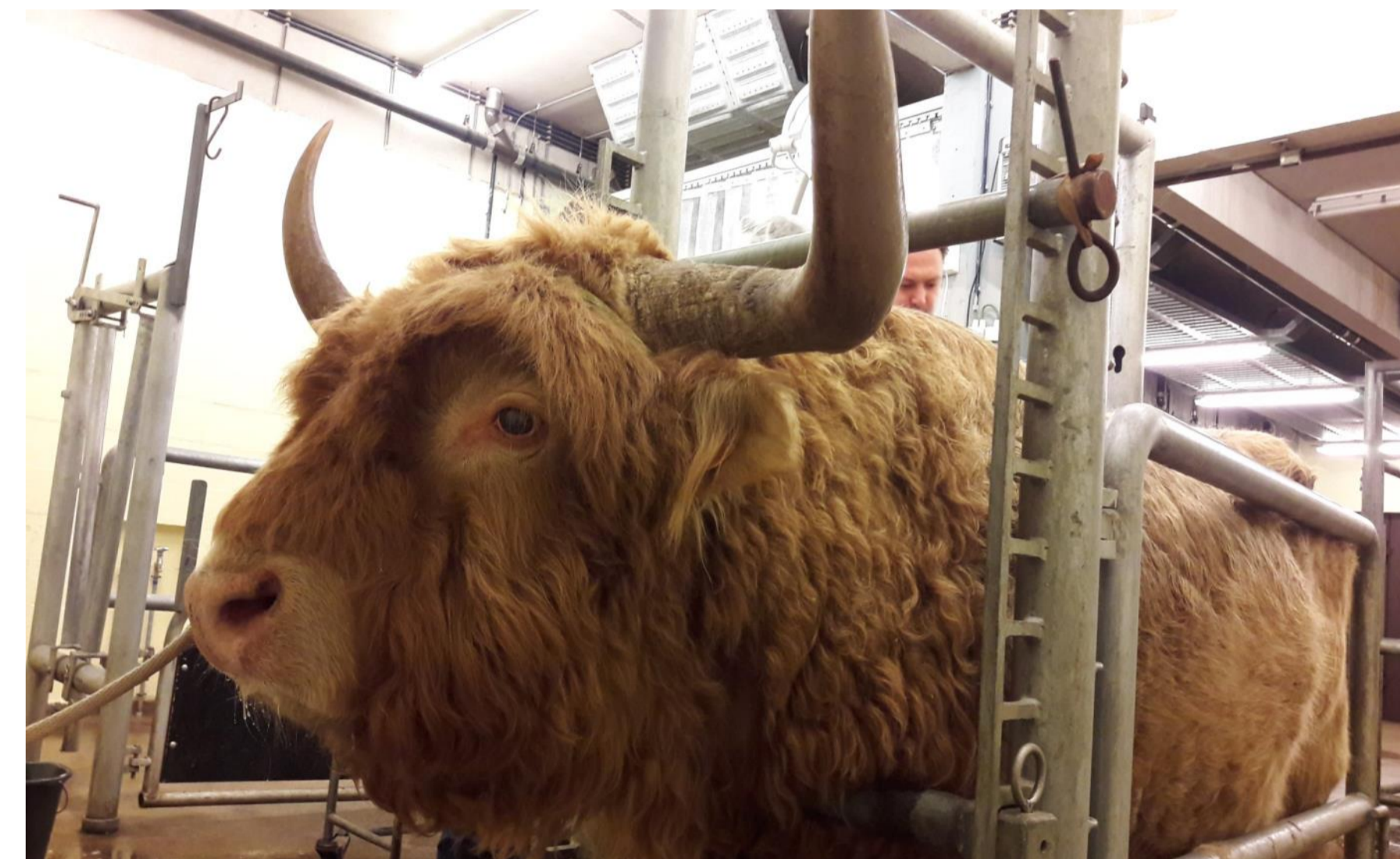


Figure 1: Teddy, a 12-year old highland bull.

### BIOCHEMISTRY & HAEMATOLOGY

Hematology and biochemistry analysis were within normal values.

## B - DIAGNOSTIC IMAGING AND LAPAROTOMY

Transabdominal ultrasonography showed a heterogeneous hyperechoic mass with undefined shape and a hyperechoic omentum. Differential diagnosis must include lymphosarcoma, intestinal adenocarcinoma, and peritoneal tumors such as mesothelioma. The right-flank celiotomy confirmed the AFN with colic obstruction.

## C - TREATMENT

Due to the generalized and severe lesions, the bull was euthanized.

## D - NECROPSY

The necropsy revealed the presence of hard necrotic fat masses surrounding and stenosing spiral and distal colon (Figure 2). The stenosis decreased intestinal transit and caused clinical signs. It has also shown thickened hard great omentum including necrotic fat masses (Figure 3A and 3B). Left and right kidneys were completely included in fat necrotic mass (Figure 4 and 5), but no renal failure has been highlighted.

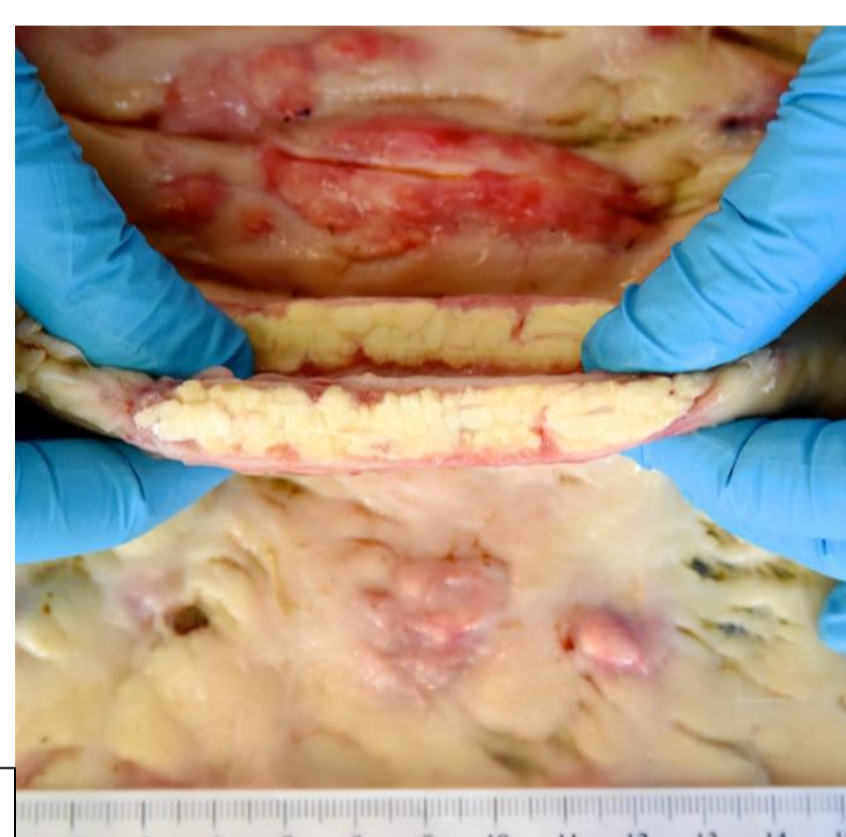


Figure 3B: thickened great omentum.

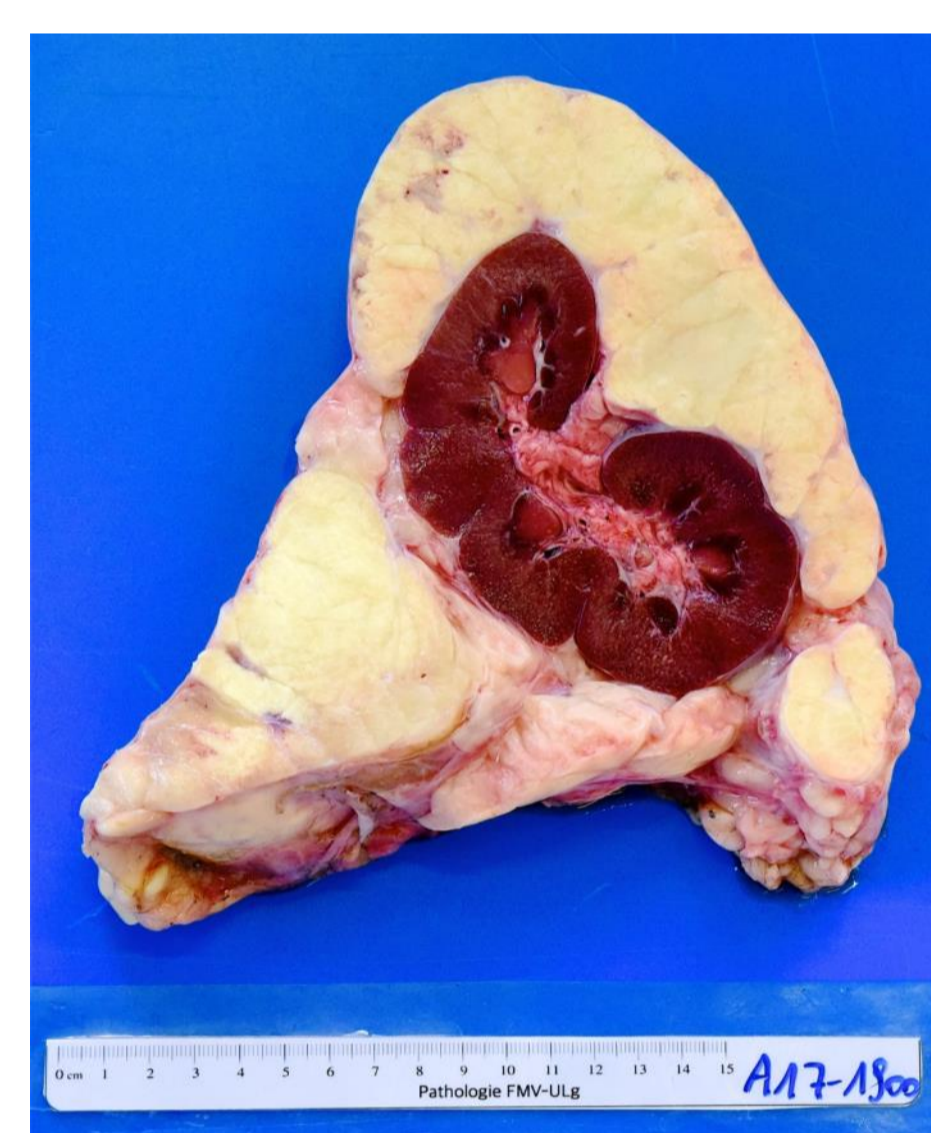


Figure 4: longitudinal section of left kidney surrounding by necrotic fat masses.



Figure 3A: diffusely thickened and chalky white great omentum.

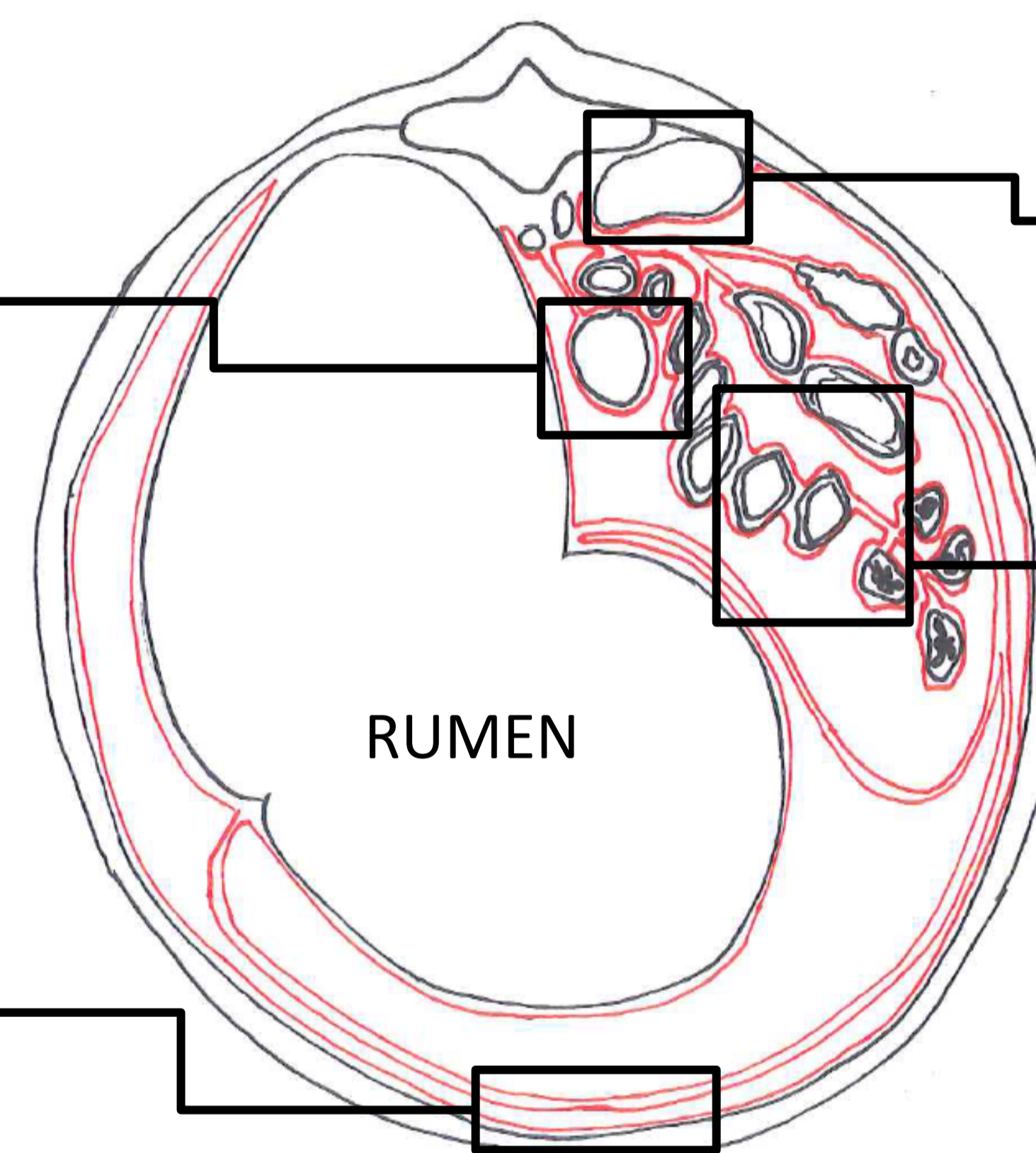


Diagram of the disposition of the peritoneum and the principal viscera in beef (adapted from R. BARONE).



Figure 5: necrotic fat masse surrounding right kidney.



Figure 2: transverse section of spiral and distal colon stenosing by necrotic fat tissue.

## E - HISTOLOGY

Histopathological analysis revealed an aggressive fibrose (Figure 6) with infiltration of inflammatory cells, especially macrophages and multinucleated cells (Figure 7). Those observations are typical of fat necrosis and confirm the diagnosis.

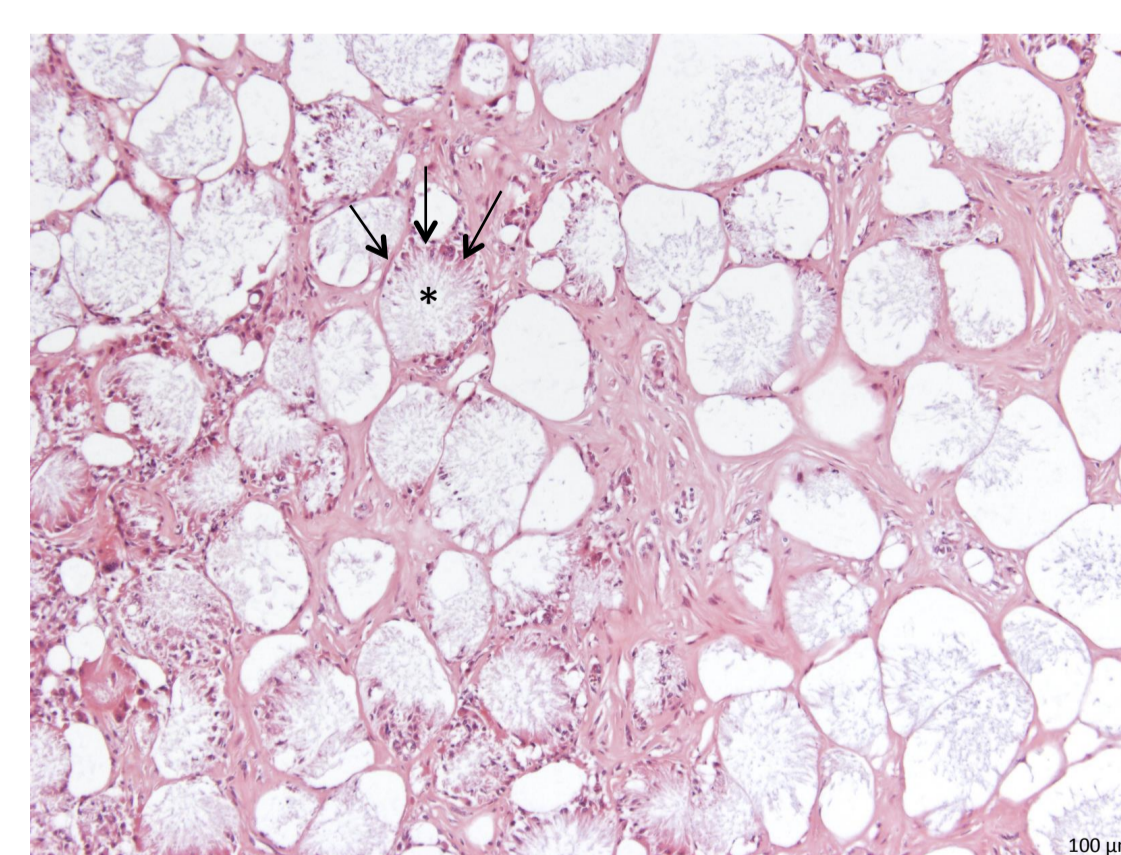


Figure 6: necrotic fat masse histopathological examination : macrophages accumulation in the adipocytes (arrows) and modified/calciated fat (\*) was observed (x100, HE coloration).

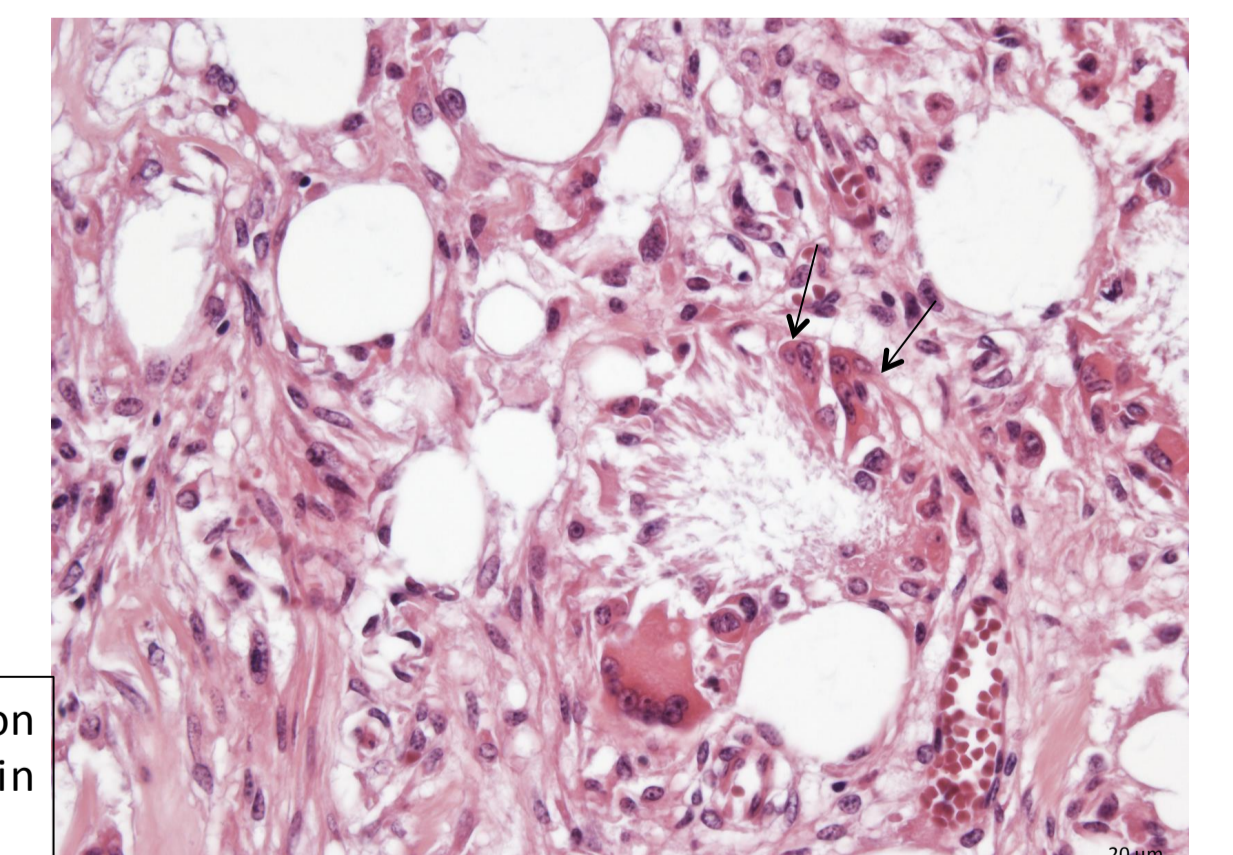


Figure 7: Fat necrosis microscopic evaluation exhibiting inflammatory cells infiltration in adipocytes (arrows) (x 400, HE coloration).

## CONCLUSION

AFN is a common finding in domestic animals and humans. In cattle, etiology seems to be multifactorial. Isoprothiolane, used in agriculture as a fungicide and insecticide, appears to be an effective treatment to AFN in cattle, and it has been tested successfully on horses in UE, but is not authorized in Europe. Clay could prevent the occurrence of AFN and may be used in regularly affected breeding like Japanese Black cattle, without modifying the carcass characteristic. To our knowledge it is the first report of AFN in highland cattle.

## REFERENCES

1. THARWAT M, BUCZINSKI S. Diagnostic ultrasonography in cattle with abdominal fat necrosis. *Can. Vet. J.* 2012; 53: 41-46.
2. AYDIN Y, GÜLBAHAR Y. Massive fat necrosis in a cow. *Ankara Üniv. Vet. Fak Derg.* 1995; 42: 139-141.
3. OKA A, IWAMOTO E, TATSUDA K. Effects of clay on fat necrosis and carcass characteristics in Japanese Black steers. *Animal Science Journal.* 2015; 86: 878-883.