

LOCALIZATION OF LEPTIN (OB) IN THE ABOMASUM OF THE SHEEP: AN IMMUNOHISTOCHEMICAL STUDY

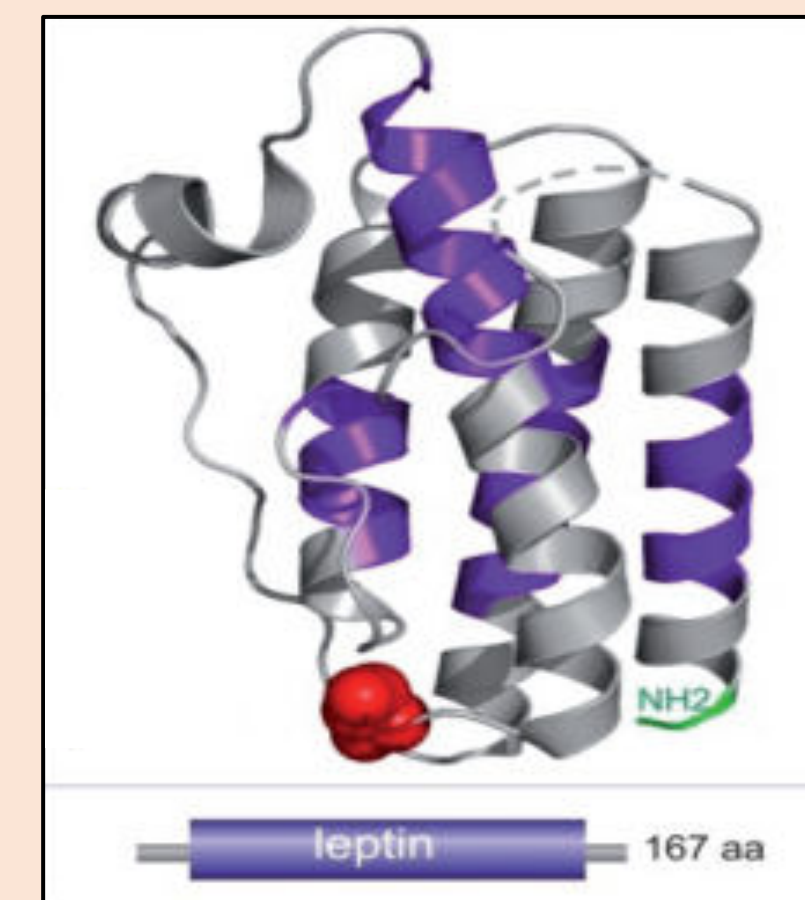
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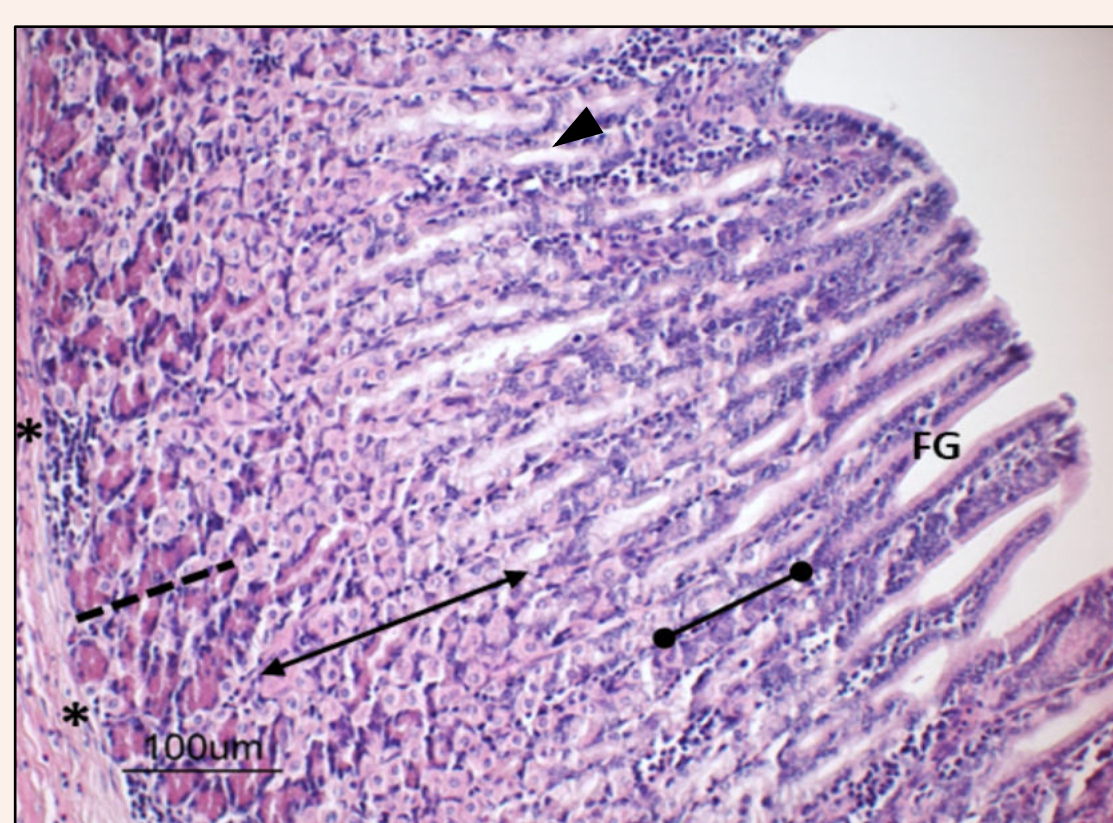
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INTRODUCTION: Adipokines are molecules involved in energy metabolism and represent important links between the nutritional status and neuroendocrine axis [1]. Leptin (Ob) is the first isolated adipokine [2] and it is one of the most important hormones involved in the control of energy homeostasis and feeding behaviour. It serves to signal nutritional status to the central nervous system and peripheral organs and, in physiological condition, it acts to reduce appetite [3]. Ob is primarily secreted by adipocytes of subcutaneous and visceral fat but it is also produced by several peripheral tissues [4]. This work aimed to investigate the presence and localization of Ob in the fundic region of the abomasum of the sheep in an attempt to shed light on those cells and structures that might locally produce this peptide.



Material and methods. Samples of the abomasum fundic region were collected from 15 Comisana x Appenninica adult female sheep reared in a semi-natural pasture of the Italian Central Apennines (No. of approval 95/2018-PR by the Ministry of Health). Samples were fixed in 10% neutral-buffered formalin and processed until paraffin inclusion. Histological sections of 5 μ m were microwaved in 10 mM citric acid (pH 6.0) for antigen retrieval. Sections were incubated with mouse monoclonal anti-Ob antibody (1:150 in PBS, Fitzgerald) for 24 hours. The reaction was detected with a Vectastain ABC kit and visualized with DAB (Vector). A double-label localization of Ob with serotonin was performed incubating sections overnight with 1:100 mouse anti-serotonin antibody (Dako). This reaction was visualized with Vector SG.



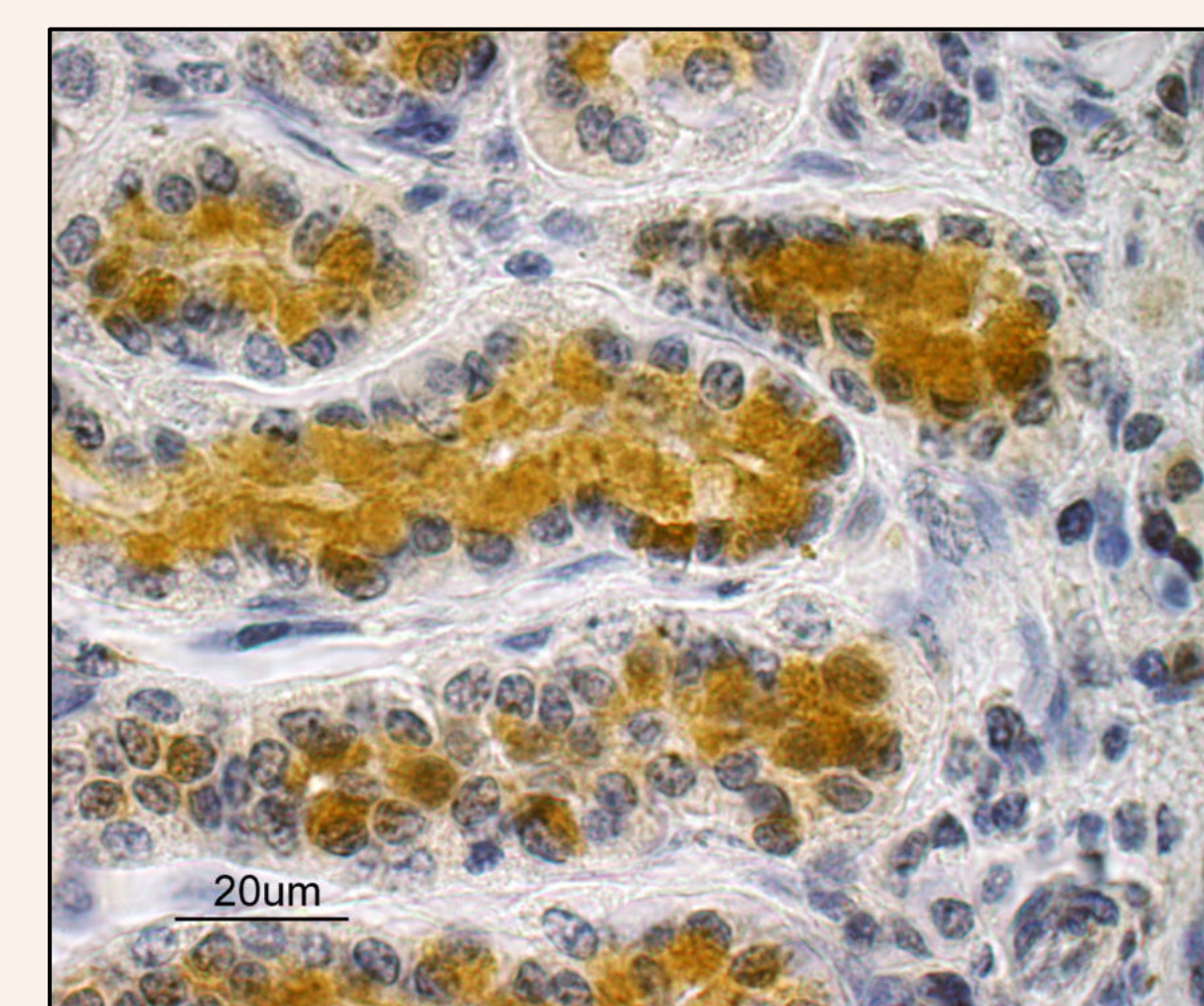
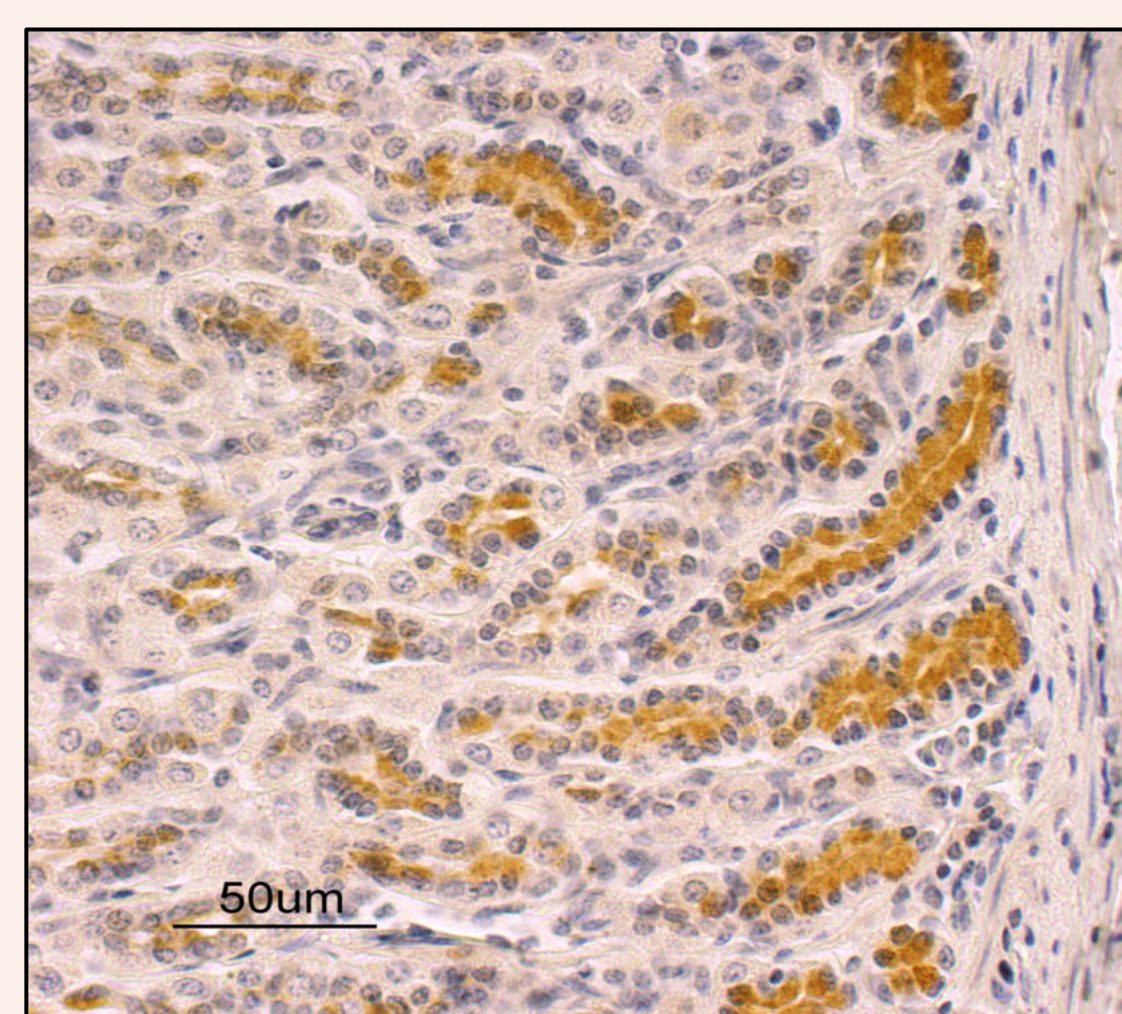
The mucosa of the abomasum fundic region. Tubular glands are shown: base (dotted line), body (double arrow), neck (line with balls). The body represents the intermediate region while the neck opens onto the gastric pits (FG). * = muscularis mucosae. HE.



Two glands at the level of the body region. Main cells (arrowhead) and parietal cells (arrow) are shown. * = gland lumen; C = capillary. He

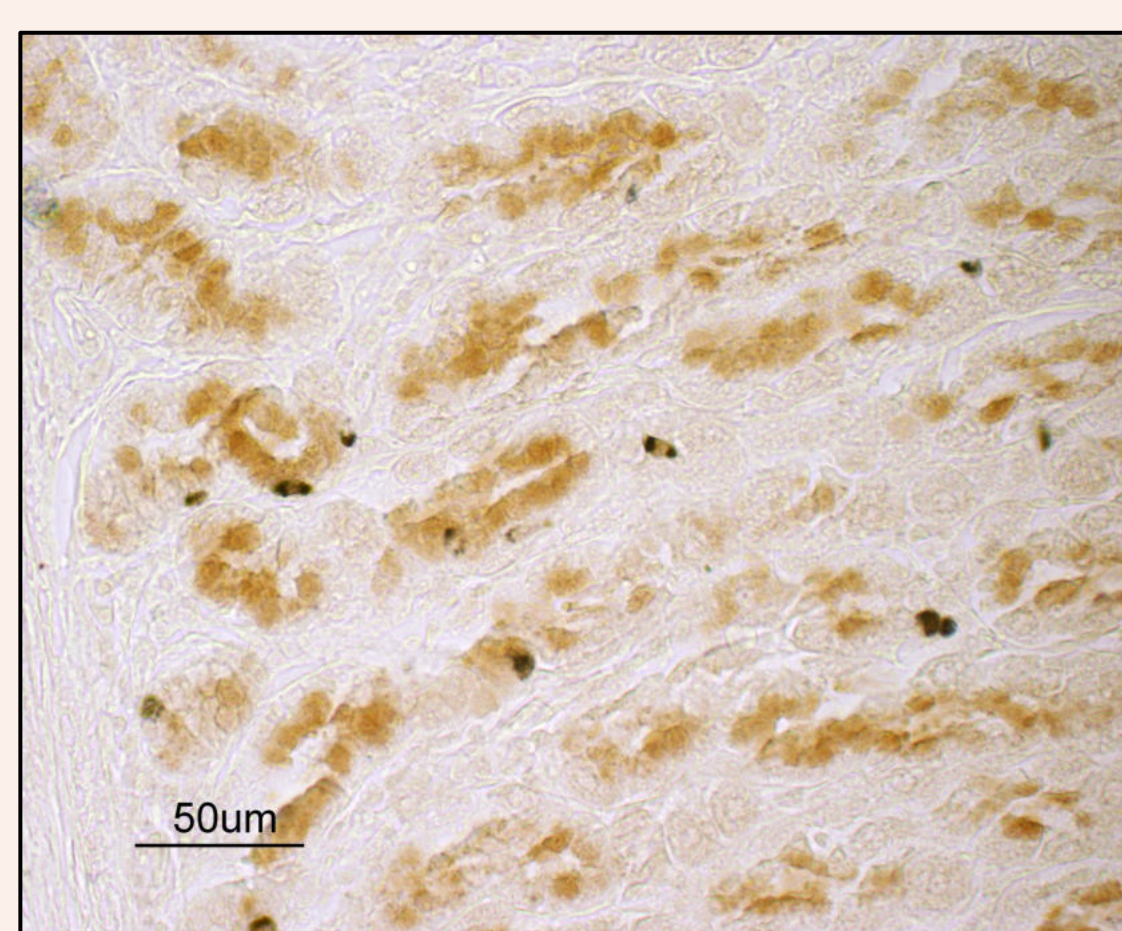


Gland basal region (arrows)

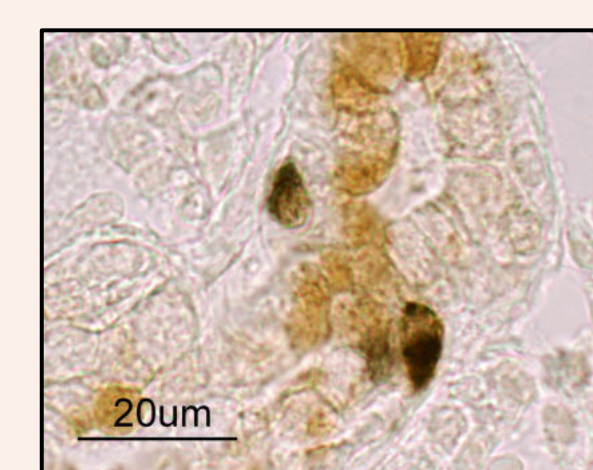


An intense positivity to Ob was evidenced in the gastric glands. Immunostaining was mainly localized in the lower half of the fundic glands.

The staining for Ob was localized in the cytoplasm of the cells.



Positivity to serotonin point out the neuroendocrine cells present in the abomasum. The overlap of colors, visible in most cells, indicates that



leptin is secreted by both neuroendocrine and main cells.

Discussion: To the authors' knowledge, no studies describe leptin localization in the abomasum of the sheep. Its detection in the gastric glands suggests a local activity of this adipokine in the regulation of the digestive function as already attested in other species including humans [3]. This is a preliminary report that introduces leptin investigation in the sheep digestive system and it represents the starting point to carry out further investigations aimed to evaluate the influence of the diet on the molecule expression in sheep reared in the semi-extensive regime, as well as to search the presence of leptin receptor.

REFERENCES

- [1] Trayhurn et al. Adipose tissue and adipokines--energy regulation from the human perspective, *J Nutr*, 136(7):1935S-1939S, 2006. [2] Triantafyllou et al. Leptin and Hormones: Energy Homeostasis, *Endocrinol Metab Clin North Am*, 45(3):633-45, 2016. [3] Sobhani et al. Leptin secretion and leptin receptor in the human stomach, *Gut*, 47(2):178-83, 2000. [4] Ahima RS et al. Leptin regulation of neuroendocrine systems, *Front Neuroendocrinol*, 3: 263-307, 2000.

