



# The presence and localization of apelin in the sheep abomasum: impact of diets characterized by different chemical composition.

## Die Präsenz und Lokalisation von apelin im Abomasum des Schafes: Auswirkung von Diäten mit unterschiedlicher chemischer Zusammensetzung

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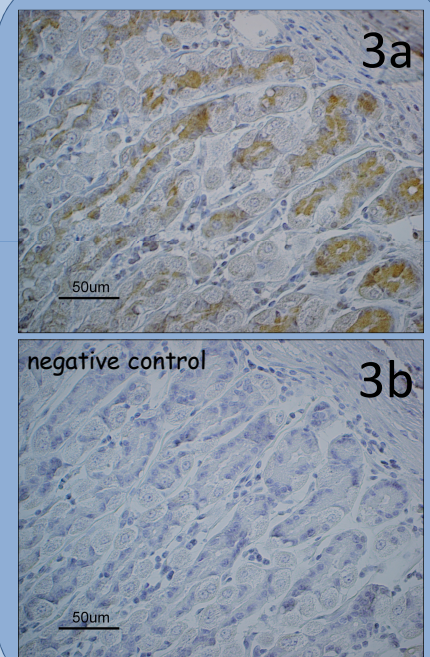
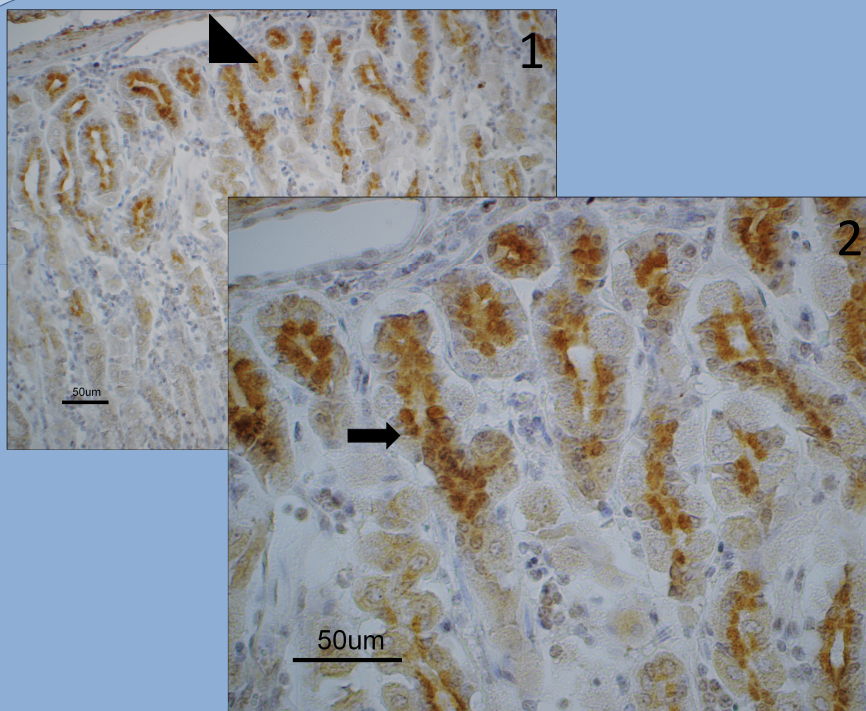
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**Question:** The apelinergic system is a complex system including the apelin peptide (AP) and its receptor, named APJ receptor. The apelin peptide is extensively expressed in several human and laboratory animal organs (heart, lung, brain, mammary gland). Recently, its expression was also evidenced in the basal glandular portion of the stomach in laboratory animals, making it possible to hypothesize its intervention in the control of acid secretion<sup>1,2</sup>. No data concerning its presence and distribution in the abomasum of the sheep are available at the moment. So, we decided to test the presence and distribution of apelin in the abomasum of the sheep and the possible existence of a variability as a consequence of the different chemical composition of the diet.

**Method:** We used 50 "Comisana" sheep fed on Apennine semi-natural pasture for two experimental periods: in the first period the animals were fed for 45 days on pasture at the height of its flowering and this was the first group named group A; in the second period the animals, homogeneous for age, body condition score and milk yield at previous lactation, were fed on the same pasture until it was completely dry while they were equally allocated into two groups (B and C). The group B received a diet supplement of cereals daily (400 g/d/each of maize grain). At the end of each experimental period, the animals were regularly slaughtered at the local abattoir, the abomasum specimens were immediately removed and some of them processed for routine tissue-embedding preparation. They were fixed in 10% neutral-buffered formalin and embedded in paraffin wax. The immunohistochemical reaction was visualized on 5  $\mu$ m serial sections, using a primary rabbit polyclonal antibody (anti-AP), a secondary biotinylated goat anti-IgG antibody, the avidin-biotin-complex and DAB as chromogen.

**Results:** The immunohistochemical study showed a peculiar immunoreaction for AP in the abomasums of the animals examined. In particular, an immunopositive reaction for AP was evident in the cells of the basal third of the tubular glands (Fig 1, arrow-head) localized particularly in the cytoplasm of the epithelial cells, between the nucleus and the apical portion of the plasma membrane (Fig 2, arrow). The immunopositive reactions did not evidence any statistically significant difference in either the localization or in the number of the positive cells, among the different experimental groups. Immunopositivity for AP was not observed in any other histological structure or in the sections utilized as negative controls (Fig 3b)



**Conclusions:** These results allow us to conclude that AP is present in the glandular tissue of the abomasums of the sheep, as observed in laboratory animals, with a peculiar cytoplasmatic localization. We hypothesize that AP is involved in the control of gastric secretion, probably via APJ receptor. The AP expression in the stomach does not seem to be influenced by the different chemical composition of the diets.

1. Wang G. et al., Regul Pept. 158: 32-39, 2009; 2. Susaki E. et al., Regul Pept. 129: 37-41, 2005.