Evaluation of the degree of pancreas activity in piglets from sows fed enzymatic stimulating complex

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Abstract

One of the possibilities for estimating pancreas activity is the estimation of zymogene granule content in pancreatic follicular cells. In the present study, the degree of pancreatic activity was measured in piglets from sows receiving enzymatic stimulating complex throughout pregnancy and during the lactation period. The pancreas was collected for ultrastructural examination from 1-day-old and 21-day-old piglets. The enzyme preparation influenced the ultrastructural structure of the piglet pancreas, but the secretory cells in these animals did not confirm a more intensive course of creation and maturation processes. The accumulation of granules in extra-secretory pancreatic cells was observed, with a large volume of these granules and granular crinophagy observed in older piglets. The findings indicate a slow process of granule release, which may be the result of overproduction, lower requirements for enzymes contained in the granules, or both.

Key words: piglet, enzymatic stimulating complex, pancreas, ultra structural, zymogene

Introduction

Over the last few years, the attitude of both the scientific world and animal breeders has markedly changed towards hormonal or antibiotic growth stimulators (Yamamoto et al. 2000). In many countries, the use of hormonal substances is banned in animal production, especially steroid hormones and their analogues. Since January 1, 2006, a ban has been in place for antibiotic growth promoters in European Union countries, and even earlier in Scandinavian countries. Widespread usage of antibiotic growth promoters caused lower efficiency as it is a kind of tachyphylaxis (Posnyiak et al. 1994). Accumulation in the body of animals fed this kind of additive in the feed is also a possibility (Szprenger-Juszkiewicz 2002), but the main problem is drug resistance among pathogenic microorganisms. Also, the accumulation of the toxic activity of growth promoters towards different organs in animals and humans is very well known (Akhtar et al. 2009).

Theoretically, coordination in the regulation of digestive enzyme excretion by animal feed compounds could optimize digestion and compound utility (Lizardo et al. 1997), but the pancreas synthesizes and secretes 10 times more digestive enzymes than needed. Until now, the physiological importance of pancreas adaptation has not been described (Soriani et al. 1995). From previous studies, it can be concluded that the kinetics of adaptation processes with diet change is similar in different animal species. Changes after the introduction of a new...