Review

Supplementation of pigs diet with zinc and copper as alternative to conventional antimicrobials

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Abstract

Modern commercial pig farming systems inflict increased stress in animals, which often leads to various negative changes in the gastro-intestinal tract, especially in the case of piglets. Ban of antibiotics, used as growth promoters, has caused a need for alternatives to conventional antimicrobials in swine diets. Use of pre-/or probiotics, organic acids and plant extracts is often recommended, but it seems that zinc oxide and cooper salts, which were traditionally included in high doses to piglets diet, possess the highest efficacy. In commercial conditions feeding piglets with high doses of Zn and/or Cu stimulates piglets daily gain and decreases feed conversion factor. However, as heavy metals Zn and Cu tend to accumulate in soil and cause serious environmental pollution of soil and tap-water. Furthermore, high zinc concentrations (2500-3000 mg/kg feed) in feed may have an impact on development of antimicrobial resistance, and may regulate the expression of genes that modify piglets’ immune response. Therefore, the use of high doses of ZnO and/or Cu salts, as growth promoter, has always been a subject of discussion, and caused different legal status of such treatment in various EU countries. This short review describes current European Food Safety Authority (EFSA) point of view on the use of ZnO in medicated feed. The higher bioavailability of recently introduced new sources or forms of these metals allows for substantial reduction of dietary inclusion rate, which should have a positive outcome for pigs health and the environment.

Key words: ZnO, pig, dietary supplement, alternative antimicrobials, growth promoters

Conditions of modern commercial pig farming inflict different type of stress which is associated with significant negative impact (physiological, microbiological and immunological) on the gastro-intestinal tract in housed animals. These stress-related changes lead to sub-optimal growth, decrease feed efficiency and increase incidences of intestinal disturbances, including diarrhoea. Post-weaning diarrhea is one of the most frequent causes of economic losses dealing with pigs. To minimize all these negative changes antibiotics were extensively used in pig farming, which, in turn, caused a development of increased antibiotic resistance in numerous bacterial strains. As a consequence, in 2003 the use of in-feed antibiotics in livestock diets was banned in the EU (Regulation No. 1831/2003).

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