Effect of Dietary Plant Extracts on Splenic Cytokine Response in Pigs after Weaning

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SUMMARY

Plant extracts are being considered as possible alternatives to in-feed antibiotic growth promoters in pig nutrition. It is known that diets supplemented with plant extracts can modulate the innate and acquired immune response (Ilsley et al., 2005). The effects of several dietary plant extracts consisting of chlorella, inulin, sodium alginate and an essential oils mixture (25 g limonene, 5 g eugenol and 12 g pinene per kg product), encapsulated (mixture 2) or not (mixture 1) on the cellular immune response assessed by cytokines synthesis in spleen were studied in piglets after weaning, a critical period associated with very severe stress (Pie et al., 2004; Janczyk et al., 2009). A feeding trial was conducted on piglets weaned at 28 days of age, when they received either a control diet or a control diet with plant extracts (1.0, 1.5, 0.5 and 0.04%, respectively) for 11 consecutive days. Four piglets were sacrificed in each group on day 39 and organ samples (spleen) were collected and cytokine synthesis was determined. Samples of spleen were weighed, homogenized in phosphate buffer protease inhibitor cocktail tablets and kept 30 min on ice; after centrifugation at 10,000g at 4°C for 10 min, pro-inflammatory (IL-8, TNF-α, IL-1β) and IFN-γ concentration were determined in the supernatants by ELISA, using the commercially available kits (R&D Systems) according to the manufacturer’s instructions. With the exception of TNF-α a synthesis of IL-1β and IL-8 was revealed by ELISA measurement in spleen of weaned pigs fed diets containing plant extract supplements. The results showed a very slight increase of the production of IL-1β and IFN-γ produced by the dietary chlorella and essential oils. All investigated extracts had a decreasing effect on the level of spleen IL-8 synthesis at 39 days of age which suggest that the dietary plant extract supplementation might provide protection against the inflammatory process often occurred during the weaning period in pig.

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REFERENCES