Supplementation of dietary amino acids in pig diets to enhance immunity and alleviate deoxynivalenol induced impairments

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Deoxynivalenol (DON), a mycotoxin mainly produced by Fusarium graminearum, can inhibit protein synthesis and suppress immunity, resulting in reduced feed intake and poor growth performance. Addition of arginine-family amino acids in feed of piglets may recover immunity of pigs and alleviate the adverse effects of DON on their growth performance. A total of thirty healthy piglets (Landrace×Yorkshire) at 60-d-old were randomly divided into 5 groups. Three of them were assigned amino acid (AA) treatments, and supplemented in their diet with 1.0% Arg (AAa), 1.0% Gln (AAg) and 0.5%Arg+0.5%Gln (AAa+g) respectively. The other groups were set as a toxic control (TC) and a blank control (BC). All piglets had undergone an immune-fortification period of 21 days and then had voluntary feed intake for additional 30 days with final DON concentration at 6 mg/kg. The average daily weight gain (ADWG) in all groups with DON was lower than that in BC group (P<0.0001). However, compared to TC, the average daily feed intakes (ADFI) increased by 6.0, 2.4 and 5.2% in AAa, AAg and AAa+g treatments, respectively (P<0.0001). Liver weights in TC were 13.5% heavier than that in BC (P=0.0215); the increase in liver weights was not observed in AAa, AAg and AAa+g. Pigs in TC had a significantly lower GH (growth hormone) and IGF (insulin growth factor) values than BC (P<0.001), however, the reduction in GH and IGF values was not found in AAa, AAg and AAa+g. The superoxide dismutase (SOD) in AAa was 46.1% higher than that in TC (P<0.001). In addition, IL-2, haptoglobin and MDA (Malondialdehyde) values of AAa, AAg and AAa+g were much lower than TC (P<0.001). All these indicated that dietary supplementation of amino acids can improve immune health and alleviate metabolic impairment induced by DON stress in piglets.

Biography

Wence Wang is Ph.D student at Institute of Subtropical and Agriculture, the Chinese Academy of Sciences. Now she is in Agriculture and Agri-Food Canada for her mycotoxin detoxification investigation. She had published more than 18 papers and abstracts in reputed journals.

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