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Effects of dietary astaxanthin (AX) supplementation on pigmentation, antioxidant capacity and nutritional value of swimming crab, *Portunus trituberculatus*

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Abstract

The swimming crab, *Portunus trituberculatus*, is one of the most popular marine crustaceans in China, and there is a significant potential to expand their aquaculture and improve nutritional value. This study was designed to evaluate the effect of dietary astaxanthin (AX) levels on the growth, shell pigmentation, antioxidant function and fatty acid composition of juvenile swimming crab. Five diets were formulated to supply five levels of AX (0, 30, 60, 90 and 120 mg kg^{-1}). Juvenile crabs (31.65 ± 0.06 g) were fed these experimental diets for 56 days. The growth performance and feed efficiency were not significantly affected by dietary AX supplementation. Dietary AX supplementation enhanced the redness (a*) of cooked crabs, whereas the lightness (L*) and yellowness (b*) were less affected. The AX concentrations of the whole body, shell and hepatopancreas showed a linear increase with increasing dietary AX levels. The redness (a*) of the shell generally correlated with whole body and shell AX concentrations. AX supplementation reduced oxidative stress and increased whole body n-3 highly unsaturated fatty acid (HUFA) concentrations, thus improving the nutritional value of the product and animal health.