

EFFECTS OF DIETARY INCLUSION OF ASTAXANTHIN ON GROWTH, MUSCLE PIGMENTATION AND ANTIOXIDANT ACTIVITY OF JUVENILE RAINBOW TROUT (*ONCORHYNCHUS MYKISS*)

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EFEKTI KORIŠĆENJA ASTAKSANTINA U ISHRANI NA RAST, PIGMENTACIJU MIŠIĆA I ANTIOKSIDANTNE AKTIVNOSTI MLAĐI KALIFORNIJSKE PASTRMKE (*ONCORHYNCHUS MYKISS*)

Apstrakt

Cilj ovog istraživanja bio je da testira efekte korišćenja astaksantina u ishrani na rast, pigmentaciju mišića i antioksidantnu aktivnost i biohemijski sastav mlađi kalifornijske pastrmke (*Oncorhynchus mykiss*). Eksperimentalna hrana formulaisana je tako da sadrži 50, 70 i 100 ppm astaksantina (označen kao AS50, AS75 and AS100). Hrana koja nije bila obogaćena astaksantinom smatrana je kontrolnom hranom. U periodu od deset nedelja, ribe su hranjene svakom eksperimentalnom hranom (18.5 grama / ribi) do vidljivog zasićenja, dva puta dnevno. Eksperiment je rađen u triplikatu. AS nivo u hrani ($P > 0.05$) nije uticao na performansu rasta i hemijski sastav mišića ribe. Ukupna koncentracija karotenoida u mišiću ribe koja je hranjena AS50 hranom bila je viša nego kod riba hranjenih kontrolnom hranom, ali nije bila drugačija od riba hranjenih AS75 i AS100 hranom. Koncentracija astaksantina u mišiću riba hranjenih AS50, AS75 i AS100 hranom bila je viša nego kod riba hranjenih kontrolnom hranom. Crvena boja (a^*) mišića ribe koja je hranjena AS50, AS75 i AS100 hranom bila je jača nego kod ribe hranjene kontrolnom hranom ($P < 0.05$). Antioksidantna aktivnost DPPH, radikala hidroksila i alkila u plazmi i jetri riba nisu zavisili od nivoa astaksantina osim kod plazme koja je imala antioksidantnu aktivnost alkilnih radikala. Rezultati ove studije nagoveštavaju da se hrana koja sadrži 50 ppm astaksantina može koristiti da bi se poboljšala crvena boja mišićne pigmentacije kod mlađi kalifornijske pastrmke.

Abstract

This study was designed to test the effects of dietary astaxanthin on growth, muscle pigmentation, antioxidant activity and biochemical composition of juvenile rainbow trout (*Oncorhynchus mykiss*). Experimental diets were formulated to contain 50, 75 and 100 ppm astaxanthin (designed as AS50, AS75 and AS100). The diet without supplementation of astaxanthin was considered as the control diet. Each experimental diet was fed to three replicate groups of fish (18.5 g/fish) to visual satiation two times a day for 10 weeks. Growth performance and proximate composition of muscle of fish were not affected by dietary AS levels ($P > 0.05$). Total carotenoid concentration in the muscle of fish fed the AS50 diet was higher than that of fish fed the control diet, but no different to that of fish fed the AS75 and AS100 diets. The astaxanthin concentration in the muscle of fish fed AS50, AS75 and AS100 diets were higher than that of control diet. The redness (a^*) of the muscle of fish fed AS50, AS75 and AS100 diets were higher than that of fish fed the control diet ($P < 0.05$). DPPH, hydroxyl and alkyl radical scavenging activities in the plasma and liver of fish were not affected by dietary astaxanthin level except for the plasma of alkyl radical scavenging activity. The results of this study suggest that a diet contained 50 ppm astaxanthin could be used for improve red color of muscle pigmentation of juvenile rainbow trout.