

# Effects of Lipoic and Ascorbic Acid in Nutrition of South American pacu *Piaractus mesopotamicus* – Muscle and Brain Fatty Acids and Antioxidants

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Effects of dietary  $\alpha$ -lipoic acid (LA) and vitamin C, (ascorbic acid, AA) on fatty acid (FA) composition and vitamin E and C levels in the brain and FA composition in the dorsal muscle were studied in the scurvy prone fish pacu by using a two-factorial design. The diets were casein-gelatin based with addition of both vitamin C and E, only vitamin C, only vitamin E or none of them. Vitamin C was supplemented to the basal diet at 0.5 g kg<sup>-1</sup> (as ascorbyl monophosphate) or LA was provided at 1 g kg<sup>-1</sup>. The diets were fed at 1.9-2.5% body weight for 8 weeks to pacu juveniles of 16.6 $\pm$  0.4 g initial body weight. Fish reached 57 $\pm$  3.5 g (final mean weight). The lipid content was 15 -19% in brains and 1.5 - 2.4% wet weight in muscle. The brain was approximately 0.03% of total body weight. No effect of LA on vitamin E or C levels in brain was detected. AA-deficient diets resulted in significantly lower vitamin C levels but did not influence vitamin E in the brain. The levels of eicosapentaenoic acid (20:5 n-3, EPA) increased in polar lipids (PL) in LA groups. The increase was only significant in muscle PL, but the same trend was also seen in the brain PL (Figure 1 and 2). This trend was also observed in neutral fraction of muscle and brain. No effect of dietary LA on liver or plasma Malondialdehyd or Vitamin E content was found in a previous study on this fish (Park et al., 2006). Therefore it is suggested that LA results in a change in lipid metabolism rather than only protecting against lipid oxidation.

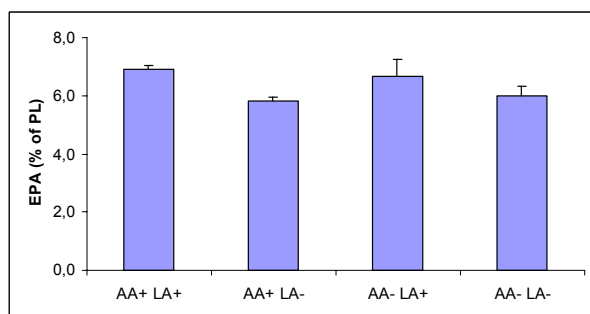


Figure 1. EPA levels in muscle PL

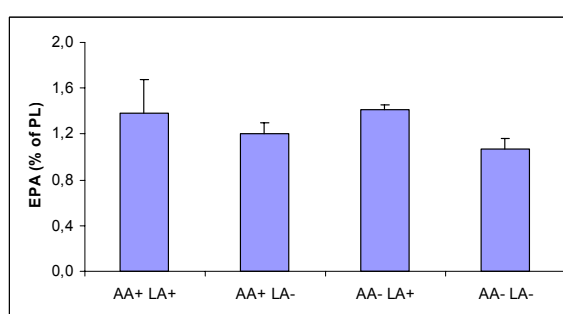


Figure 2. EPA levels in brain PL