

Effect of thermal regime on fatty acid mobilization in male European eels (*Anguilla anguilla*) during hormonally-induced spermatogenesis. Relationship with sperm quality parameters.

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The aim of this work was to study the changes in fat content and to carry out a quantitative analysis of the fatty acid composition of the muscle, liver and gonad of male European eels through hormonally-induced sexual maturation under three different thermal regimes (T10: 10 °C first 6 weeks, 15 °C next 3 weeks and 20 °C last 6 weeks; T15: 15 °C first 6 weeks and 20 °C last 9 weeks; and T20: constant 20 °C) to find the relationship between the fatty acids variations and the sperm quality parameters. The eels reached spermatogenesis earlier and showed best sperm production parameters under treatment T20, suggesting that eel spermatogenesis is closely regulated by water temperature. Males did not show variations of fatty acid content in the muscle. Regarding the liver, the levels of palmitic, eicosapentaenoic (EPA) and docosahexaenoic (DHA) acids increased when eels began to produce sperm, suggesting *de novo* biosynthesis and a probable subsequent mobilization to the testis, due to their important function during steroidogenesis. In the testis, EPA, araquidonic acid (ARA) and DHA remained constant during the maturation process, while the levels of the rest of fatty acids decreased significantly. Maintenance of ARA and EPA levels may have a physiological meaning (as prostaglandins precursors, i.e.), while the maintenance of DHA levels may have a structural one (spermatozoa membranes formation). We found several fatty acids correlated with different sperm quality parameters. In the liver, EPA decreased when the sperm volume increased. Also in liver, the levels of the polyunsaturated fatty acid precursors (α -linolenic and linoleic) decreased when the sperm motility increased. In the testis, ARA levels were negatively correlated with different sperm velocity parameters. All this information could be useful to develop suitable broodstock diets to improve the sperm quality and subsequently, the larval development in this species.