

Optimization of Fatty Acid Composition in the Diet for Female Broodstock Eels

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Farmed European eel (*Anguilla anguilla*) are fed a diet optimized for high growth rate and high feed conversion rate in freshwater recirculation systems. There is ample evidence in the literature that on-growing diets are nutritionally inadequate for broodstock, and therefore a specific diet was developed for farmed broodstock eel. This diet contains specific fatty acids in well-defined ratios promoting normal oocyte development and maturation, which in turn will improve egg and larval viability. Important fatty acids in this context are the two long chain polyunsaturated omega-3 fatty acids EPA (20:5 n-3) and DHA (22:6 n-3) and the long chain omega-6 polyunsaturated fatty acid ARA (20:4 n-6). These fatty acids have been shown to have an impact on the egg quality.

Optimized diets for farmed broodstock eels are to date not yet available, and mature eels, or fertilized eggs have never been caught in the wild. Therefore, to develop an eel broodstock diet with an optimal composition of these three fatty acids, the fatty acid composition in farmed eel was compared to that in wild eel about to embark on the marine journey to the spawning grounds. The results showed that farmed eel had an entirely different composition of these three fatty acids than wild silver eels. On the basis of these results the fatty acid composition of the broodstock eel diet was optimized with respect to its content of ARA, EPA and DHA. Feeding experiments with the optimized diet showed that it was possible to change the fatty acid composition in the female broodstock eel so that it became similar to that in wild silver eel.