

Evolution of fatty acid profile of gilthead sea breams during the decade 2005-2014

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The aquafeed industry is facing the progressive lack of availability and high price of fish meal and oil, in the formulation of feeds. Nowadays the increasing use of plant derived oils and oils obtained from by-products of farmed fish have modified the fatty acid (FA) composition of sea bass and sea breams feeds. To investigate how this process is changing the lipid profile of farmed fish we compared the FA composition of sea breams collected on the Italian market during last year with a similar carried out in 2005. The sampling covered sea breams of different origin, mirroring the presence of different country products in the Italian market. In 2005 we sampled 46 fish, 18 farmed in Greece, 15 from Italy, 10 from Croatia and 3 from Turkey. In 2014 we sampled a total of 44 sea breams, 18 farmed in Italy, 14 from Greece, 6 from Turkey, 3 from Croatia and 3 from Malta. In addition to we sampled also 21 wild sea breams: 19 during the 2005 and 2 during 2014. Lipid content of fillets was determined by chloroform/methanol extraction, FA methyl esters were analyzed by gas-chromatography. In order to compare different samples and to detect the most important fatty acids affecting the distribution of fish samples, data were processed by principal component analysis using FA. Lipid content of farmed sea breams has proven quite stable in the period of the trial, 2.8% in 2014 and 2.6% in 2005. Farmed sea breams, showed a higher lipid content respect of wild ones, where the lipid of muscle were found at 0.7%. Concerning FA, sea breams appeared well separated according of their year of farming and type of production. The 2014 sea bream were more characterized by linoleic and oleic acids, and they showed a smaller spatial dispersion compared with the 2005 sea breams, which were placed in the intermediate position between wild fish and 2014-farmed ones and resulted less homogeneous concerning their spatial distribution. Wild fish were characterized by the presence of a higher amount of n-3 polyunsaturated fatty acid and arachidonic acid without differences between 2005 and 2014. Our study confirms that the increase of plant derived oils and fish by-products oils is modifying the FA profile of sea breams. The 2014 fish present the higher difference from wild ones. The small spatial dispersion of 2014 fish suggests a tendency to a standardization of the fish feeds, which was lower in 2005, when probably there was more variation of the lipid sources used in feed formulation.