YOU ARE WHAT YOU EAT – USE OF FATTY ACID SIGNATURES TO DECIPHER DIET COMPOSITION

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Fatty acid signature (FAS) analysis is an important component in determining the interrelationship between predator and prey. Analyzing FAS of a predator species can provide clues about their long term feeding habits based on the degree of similarity between their prey's FAS and the predators. Lake trout (120) were separated into two tanks and fed 5% of their total body weight of thawed rainbow smelt. Approximately seven fish were sacrificed for sampling at 0, 31, 54, 80, and 109 day intervals. The lipid content and FAS of the lake trout, rainbow smelt diet, and dry diet was analyzed using fatty acid analysis techniques. The results indicated that there were five influential fatty acids present in all the lake trout (18:2n-6, 16:1n-7, 22:6n-3, 18:6n-3, and 16:0). It is also conclusive that over time, the FAS of the lake trout became more similar to that of the rainbow smelt diet that they were fed. From day 54 on, there were no significant shifts in FAS similarity according to the cluster analysis. This research helps to determine how the predators are metabolizing the prey species in aquatic food webs. Further research will aid in determining the best prey species lake trout should be fed in order to have the most beneficial fatty acid content.

Keywords: fatty acid, lake trout, lipid content, predator, aquatic food webs