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Wild and farmed fish differ in nutritional, sensory, chemical and physical properties, and diet is one of the main factors that influence these properties. A finishing period in farmed rainbow trout (*Oncorhynchus mykiss*) associated with starvation has been carried out in a natural environment with the aim to reduce these differences. 200 kg of trouts (average weight  $307 \pm 2.3$  g) were kept for 64 days in submerged cages, at a depth of 18m in Como lake, in Nobiallo, Menaggio. Measurements of the biomass present in the cages and mortality were recorded at 8, 15, 22, 33, 50 and 64 days and at the same days 6 fish were sampled for laboratory analysis. Biometric parameters were measured from each fish. The fillets of each sample were analysed for proximate and fatty acid composition. The fatty acid profile of livers was also determined. During the trial the trouts progressively lost weight, reaching  $266 \pm 2.5$  g (-13.2%) after 64 days of starvation. Similarly, the lipid content of fillets decreased from 2.7% to 1.1%, while protein content remained constant. Saturated fatty acids of fillets, particularly myristic and palmitic acids, progressively decreased during the experiment, as well as monounsaturated fatty acids. Among the unsaturated fatty acids, linoleic acid, typical of lipids from vegetable sources, decreased from 69 to 17 mg/100g of edible tissue. In contrast, polyunsaturated fatty acids, particularly those belonging to the n-3 series increased during the trial, reaching their maximum after 33 days (349 mg/100g), and decreased during the following weeks. The weight loss during the starvation period and the changes of the compositional characteristics of fillets showed that the optimal finishing period to be considered is between two and three weeks.

**Keywords:** rainbow trout, starvation, fatty acids