

Effect of Feeding Frequency on Body Composition of Rainbow Trout (*Oncorhynchus mykiss* -Walbaum, 1792) Fingerlings

Mirela MOCANU (CREȚU), Victor CRISTEA, Lorena DEDIU, Ștefan M. PETREA

Aquaculture, Environmental Sciences and Cadastre Department,
“Dunărea de Jos” University of Galați, Romania; [cretu mirela2003@yahoo.com](mailto:cretu_mirela2003@yahoo.com)

Abstract. A 21-days experimental trial was conducted to examine the influence of feeding frequency on body composition of rainbow trout fingerlings. A number of 295 trout fingerlings (with mean initial weight \pm SD of 5.53 ± 0.25 g), from Cislau fish farm, Buzau city, were equally stocked in four rearing units. The two experimental variants (feeding frequency 2 meals/day -F1 and 4 meals/day -F2) were each applied for two tanks. At the end of the experiment, fish meat biochemical composition was significantly influenced ($p<0.05$) by feeding frequency.

Keywords: rainbow trout, meat biochemical composition, aquaculture recirculating systems

Introduction. Optimum feeding frequency, for maximum fish growth may vary according to fish species, size and culture conditions, including feed quality, amount of feed administrated and water temperature values throughout the experimental trial (Lee et al., 2000). One of the factors that lead to choose an appropriate feeding frequency consists in determining the time between meals, because feed consumption is closely related to stomach capacity, gastric emptying rate and digestion (Brett, 1971; Riche *et al*, 2004). A feeding frequency between 1-3 meals/day is reported to be proper for rainbow trout.

Aims and Objectives. Knowing the fact that biochemical composition of meat is influenced by several factors such as fish size, age, environmental and feeding conditions, the present study was conducted to determine the influence of feeding frequency on growth and body composition of rainbow trout fingerlings, in conditions of using different feeding frequencies.

Materials and Methods. The experiment was carried out between October 25 and November 16, 2010 at the pilot recirculating system of “Aquaculture, Environmental Science and Cadastre” Department from “Dunarea de Jos” University of Galati. The experimental system consisted of 4 four growing units with a total volume of 0.336 m^3 ($0.35\times 0.80\times 0.120$ m) each and water quality maintenance module, represented by water mechanical and biological filtration units, water sterilization unit (represented by a UV lamp) and water oxygenation unit and 295 trout fingerlings. The two treatments (feeding frequency of 2 meals/day -F1 and 4 meals/day -F2) were each applied for two tanks. On the first six days of experiment, fish were fed with a ratio of 3%/BW/day and then, the ratio increased up to 5% on the eighth day; after that the ratio remained constant till the end of the trial. The rainbow trout meat biochemical determinations were performed on muscle tissue samples and later, from the mixture, homogeneous samples were taken. Proteins were determined with Gerhardt type equipment by using Kjeldahl method, fats were determined by Soxhlet solvent extraction method (petroleum ether) with Raypa extraction equipment, dry matter was determined by heating at temperature of $105\pm 2^\circ\text{C}$ using Sterilizer Esac and ash was evaluated by calcification at temperatures of $550\pm 20^\circ\text{C}$ in a Nabertherm furnace.

Results and Discussions. The results regarding the biochemical composition of rainbow trout meat, fed under different feeding frequencies conditions are presented in *Fig. 1*. After statistical analysis were made, significant differences ($p<0.05$) were registered for all

biochemical compounds analyzed, at mean comparison on experimental variants tested (F1 and F2). The highest percentage of protein was recorded in F1 experimental variant ($17.953 \pm 0.010\%$). In F2 variant, the protein percentage shows a decrease of approximately 10.20% ($16.107 \pm 0.068\%$), the differences between the two experimental variants being significant ($p < 0.05$, $p = 0.0084$). Significant differences were reporting in terms of fat content, that recorded an average of $3.192 \pm 0.052\%$ in case of F1 variant, respectively an average value of 4.832% at F2 version. Also, the water percentage recorded significant differences ($p < 0.05$; $p = 0.0028$). Regarding the water percentage content, a decrease can be observed with increase of muscle tissue protein content, the mean value being $77.514\% \pm 0.050$ in F1 and $78.331\% \pm 0.072\%$ in F2. Ash content shows significant differences ($p < 0.05$; $p = 0.00167$) between F1 and F2 variants, a lower value been observed in F2 case ($1.190 \pm 0.006\%$), in comparison with F1 ($1.374 \pm 0.011\%$).

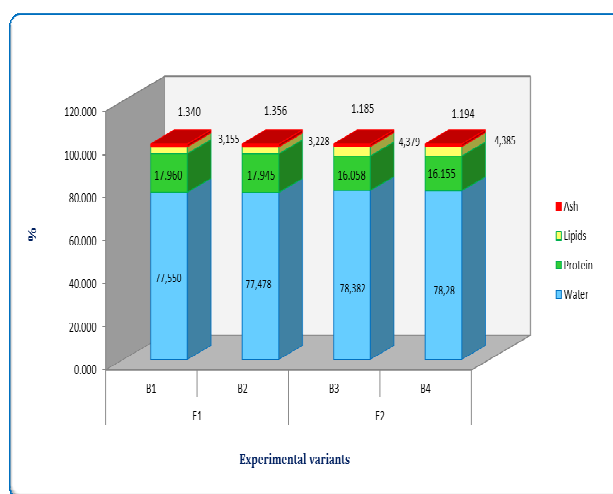


Fig. 1. The body biochemical composition of rainbow trout, fed at different feeding frequencies

Conclusion. After analyzing the body biochemical composition of rainbow trout, fed at two feeding frequencies, an improvement of meat quality was observed among fish from F1 variant (feeding frequency of 2 meals/day), compared with those from F2 variant (feeding frequency of 4 meals/day), reflected by higher protein content and lower fat. Overall, our results on the biochemical composition of rainbow trout meat approach to the results from the literature (Vranic *et al.*, 2011).

Acknowledgements. The work was supported by Project 76822/2010 SOP HRD–TOP ACADEMIC. The author thanks to the management staff of the project for their financial support.

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