Meat Quality of Rainbow Trout (*Oncorhynchus Mykiss*) from the Bistrișorii Valley Trout Farm, Alba County

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Bulletin UASVM Animal Science and Biotechnologies 75(1)/ 2018

Print ISSN 1843-5262; Electronic ISSN 1843-536X

DOI:10.15835/buasvmcn-asb: 003617

Abstract

Fish meat represents a great energy source in human nutrition, due to its content in high biological value protein, lipids which contain omega acids and minerals. The chemical composition of fish meat can be influenced by several factors such as: species, administered feed, environment, age and spawning period. The aim of this research was to analyse the chemical composition of the rainbow trout meat reared in the fishery Valea Bistrișorii, in a classical system. The determination of water (W %), minerals (M %) and dry matter (DM %) content was performed by calcination. The crude fat (CF %) was determined by Soxhlet method and crude protein (CP %) by the Kjeldahl method. Analysing the chemical composition of the rainbow trout meat, the following values were obtained: W = 73.60 ± 0.23%; DM = 26.40 ± 0.14%; CP = 18.21 ± 0.14%; CF = 6.87%; M = 1.32%. The obtained data offers useful information of meat chemical composition for selection of future breeders and improving the rainbow trout raised in the Bistrișorii Valley.

Keywords: *chemical composition, crude fat, minerals, crude protein*

INTRODUCTION

Fish meat has always been an important food source in human nutrition. Over time, due to climate change, pollution and overfishing, a major decline in global fish stocks has occurred. For these reasons, as well as many others, the specialists have reoriented on the development of continental fish farming. In fact, statistical data show an increase in aquaculture production compared to marine and oceanic capture. Fish species from the Salmonidae family have always shown an increased interest for consumers, due to their organoleptic characteristics and increased biological value of fish meat (Coroian *et al.*, 2015), respectively the balanced content in amino acids and polyunsaturated fatty acids (Celik *et al.*, 2008). The quality of fish meat from aquaculture depends on several factors, among which: the

quality of feed and the feeding program, physico-chemical parameters of the water and rearing technology (population density) (Cocan *et al.*, 2015; Nistor *et al.*, 2014). Rainbow trout meat chemical composition can be improved by selection of the breeders to satisfy the highest requirements of the consumer.

MATERIALS AND METHODS

This study was conducted during June-July 2015, in the research laboratories of UASVM Cluj-Napoca, Faculty of Animal Science and Biotechnologies. The chemical composition of fish meat was determined for 15 specimens of rainbow trout (*Oncorhynchus mykiss*) weighing between 250-300 g, reared in the Valea Bistrișorii trout farm, Alba County. Determination of the water content (W%) was made by drying in

Table 1. Meat chemical composition in rainbow trout (*Oncorhynchus mykiss*)

SPECIFICATION	n	VARIABLES		
		X±sx	s	V%
Water %	15	73.60 ± 0.14	0.54	0.73
Dry matter %		26.40 ± 0.14	0.54	2.05
Crude protein %		18.21 ± 0.14	0.54	2.97
Crude fat %		6.87 ± 0.13	0.51	7.36
Minerals %		1.32 ± 0.01	0.03	2.41

oven samples at 100°C - 105°C for 2-4 hours (mandatory in case of litigation) (Iurca, 2006). The dry matter content (DM %) was determined by the percentage difference of the analysed mass sample and total water content which was determined by dry in oven. The determination of crude fat (CF %) was done by extraction with organic solvent (petroleum ether) using the Soxhlet apparatus (Șara, 2006).

Crude protein (CP %) was determined by Kjeldahl method (Șara, 2006) and mineral substances (M %) was done by calcining the analysed samples at 600°C for 5 hours. The statistical data was analysed with the GraphPad Prism 6 program.

RESULTS AND DISCUSSION

The fish meat water composition (W%) was between 72.10% - 74.20% with an average of 73.60±0.14%. The dry matter (DM%) was 26.40±0.14%. The content of protein from fish meat is superior to pork, beef or mutton. In our research crude protein (CP%) content was between 17.39% - 18.88% with an average of 18.21 ± 0.14% (Tab.1). The values obtained are higher than the quoted values by Cocan (2011), 17.10 ± 0.07 CP% and González *et al.*, (2004), 16.04 CP% and a little lower than the limits quoted by Banu (2010) for *Salmo trutta fario*, 18.8-19.1 CP%. The crude fat CF% was 6.87±0.13% higher than the quoted values by Celik *et al.*, (2008) of 4.43%. Due to the fact that rainbow trout is an ameliorated species, suitable for captivity rearing, less active than wild specimens, leads to more fat deposits in the meat instead of muscle fibers. The rainbow trout meat minerals values were between 1.27%-1.37% with an average of

1.32±0.01%, the values are higher than the quoted by Coroian *et al.*, (2015) 1.27% and lower than the limits quoted by Celik *et al.*, (2008) of 1.36 %. The fish meat minerals values can be influenced and because of the food fodder composition.

CONCLUSIONS

The rainbow trout population reared in the Bistrișorii Valley trout farm has higher meat quality. Depending on the consumer's requirement (fish meat with higher or lower fat) the fish meat composition can be improved with a good fodder (feeding density) and rearing conditions (population density). The rainbow trout specimens (*Oncorhynchus mykiss*) reared in the Bistrișorii Valley trout farm have adequate organoleptic characteristics due to the feed (Aqua Garant), the water quality (free from upstream pollution) and the rearing conditions.

Acknowledgments. This paper was published under the frame of European Social Fund, Human Resources Development Operational Programme 2007-2013, project no. POSDRU/159/1.5/S/132765.

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