



RESEARCHES REGARDING DEVELOPMENT BODY AND CUTTING REPORTS AT ONCORHYNCHUS MYKISS SPECIES

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Abstract: From fish are important for human consumption only certain body regions. From trout we are interested by the muscular tissue which has the greatest proportion. The purpose of this research is to analyze the development of body and cutting reports *ONCORHYNCHUS MYKISS* species of different ages (one year, two year and three year). The best efficiency at slaughter yield, respectively 82.15% was recorded at the third batch of rainbow trout, while at the first batch we obtain the lower 78.96%. Setting component parts indicate an increase of the trunk beside total body weight, at a rate of 66.63% for trout aged 1 year to 72.69% at 3 years old trout. Visceral mass accounted for 18.45% of trout with a yearling trout beside 14.25% at 3 years old. Visceral mass accounted for 18.25% at aged 1 year trout beside 14.45% at 3 years old trout.

Keywords: trout, body, cutting, *oncorhynchus mykiss*

1. Introduction

Salmoniculture is the second important branch of pisciculture, and assure the diversification of food products and proteins with a high biological value through trout destined for humans' consumption, very easy digestible products.

Because worked hard to improve the production of salmonids species today are produced trouts throughout the year, in a relatively short time (compared with cyprinids) and increasing density [1].

From the angle of rainbow trout meat chemical composition, must mention mainly the protein content, which at this breed is higher in comparison with meat gathered from other fish breeds [2].

Researches say that fish and fish products, even in low quantities, could have a positive impact in diet improving with proteins, by supplementation with essential amino acids (lysine and methionine, which are in present small quantities of the diets based on vegetable products.

Trout meat have a high nutritive value, offered by the high content in proteins, lipids with a high unsaturated degree, together with lipo and hidrosolubles, content in mineral salts (which include A, D vitamins, B group vitamins, phosphorous, magnesium, selenium, cobalt and iodine) [3, 4].

Fish meat quality, generally, and trout meat, especially, justifies the increased demand of those type of meat on market, face to these breed.

Rainbow trout is one of the most important salmonids species of interest in commercial culture worldwide and trout feed costs account for over 40% of production costs [5].

2. Materials and methods

The current research were realized on three batches of *Oncorhynchus mykiss* (30 individuals/batch), of different ages (one year, two year and three year) growth in the specific environmental conditions from NE area of Romania.

During research trout from the three batches were grown in identical environment conditions, being slaughtered in April 2012, when were determined:

- body length;
- the maximum circumference of the body;
- live weight;
- weight of carcass;
- slaughter yield (%);
- participation of the slaughtered parts in carcass (head, body, fins, skin and bones) and the weight of visceral mass and internal organs (liver, kidneys and heart) for all three age categories (one year, two year and three year).

Biometric data used to determine the increase in length of the fish and to determine general physiological condition are obtained by measurements made using special tools (ihtiometers) or other measuring tools (ruler, caliper) [1, 2]:

Total body length is measured from the tip of the snout to the line joining the tips of the caudal fin lobes;

Maximum body circumference - measured at the maximum thickness and maximum height, before Ridge.

Live weight and weight of carcass were determinate on live individuals, measured by weighting with the help of Kern precision balance.

Determination of rainbow trout live weight was realized at the fishery unit

after maximum one hour from gathering, and for determination of carcasses weight after slaughter and refrigeration after 24 hours at 4⁰C.

The obtained data were used for concretion of slaughter yield, reported as a rate between the weight of carcass and live weight of studied fishes. To determinate slaughter yield were used the following formulas:

$$R (\%) = (\text{Carcass weight} : \text{Live weight}) \times 100$$

In the case of rainbow trout breed (*Oncorhynchus mykiss*) carcass is represented by fish body which was eviscerated and removed the gills.

Evisceration is the process from which are removed the uneatable parts from inside the trout and have the role to prolonged the preservation period of fish and to offer presentation possibilities of the final product in very good conditions. This operation must be effectuated quickly because in fish body starts the proteolysis processes.

Evisceration process implies opening of fish along median ventral line, from gills level up to anal orifice.

Were effectuated gravimetric measurements regarding participation of sliced portions in carcass' structure (head, body, fins, skin). Fish is considered to be more valuable as much as the gravimetric composition is in the favor of eatable parts.

Research involved also the establishment of weight of internal organs and visceral mass. The gathered organs were: liver, kidneys and heart. Kidneys which at *Oncorhynchus mykiss* breed are placed at the level of backbone were removed with the help of a spatula.

The rate of the organs for fish corporal mass have a significant influence on slaughter yield, this one being different

function of corporal dimensions, and also by the development of trout skeleton. The obtained data after gravimetric measurements were statistically processed by calculating the values of some statistical estimators, appreciation of variance, its limits, differences and their signification.

3. Results and discussion

The research began with biometric measurements: total body length, maximum body circumference and live weight. After measurements was calculated an average of 30 trouts in each experimental batch, the results are presented in Table 1.

Table 1. Size and body weight average in *Oncorhynchus mykiss*

Specification	Batch L1			Batch L2			Batch L3		
	\bar{x}	V%	Limits	\bar{x}	V%	Limits	\bar{x}	V%	Limits
Body length (cm)	18.5	12.35	16.4-21.3	27.30	13.10	25.1-32.4	38.73	11.54	28.3 - 46.4
Body circumference (cm)	9.4	8.70	8.2-11.3	15.30	9.20	13.3 – 17.4	23.17	11.21	18.5 - 28.2
Live weight (g)	171.2	11.22	142-184	540.70	14.70	460-590	853.90	17.48	725-1124

From measurements made to rainbow trout specimens analyzed were obtained values close to those presented in the literature consulted [1, 2, 3], which demonstrates that experimental batches had appropriate developments. Coefficients of variation, lower to batches L1 and L2 and higher to batch L3, revealed every time a good

homogeneity of the three groups of trout analyzed.

After making measurements and weighing, trouts from each experimental group were slaughtered and eviscerated being weighed before and after evisceration. Based on live weight and carcass weight was calculated slaughter yield, the results are presented in Table 2.

Table 2. Slaughter yield calculated for *Oncorhynchus mykiss* species

Specification	Batch L1		Batch L2		Batch L3	
	\bar{x}	V%	\bar{x}	V%	\bar{x}	V%
Live weight (g)	171.20	11.22	540.70	14.70	853.90	17.48
Weight of carcass (g)	135.18	12.47	435.25	13.40	701.50	13.71
Slaughter yield (%)	78.96	9.40	80.49	10.20	82.15	11.42

The data presented in Table 2 shows great values of yield slaughter which increases according to the age of the experimental trout. The best values was recorded to the batch L3 (82.15%) followed by batch L2 (80.49%) and batch L1 (78.96%). The coefficient of variation of yield at slaughter had values of 10-11% indicating a good

homogeneity for experimental batches. The calculated values for slaughter yield at all three batches are in the limits cited in the literature, 66.56% – 86.48 % [1, 2, 4, 6].

The main components of body fishes are the head, trunk, visceral organs and internals organs. Results obtained in the experimental batches are presented in Table 3.

Table 3. The weight of internal organs and visceral mass at *Oncorhynchus mykiss* breed

Specification		Batch L1		Batch L2		Batch L3	
		\bar{x}	V%	\bar{x}	V%	\bar{x}	V%
Live weight (g)		171.20	11.22	540.70	14.70	853.90	17.48
Head (g)		21.14	4.87	50.13	5.13	80.78	7.29
%		12.34	5.03	9.27	5.19	9.46	7.09
Trunk (g)	Total, of which:	114.04	10.43	385.12	11.24	620.72	12.53
	%	66.63	11.54	71.23	11.35	72.69	12.62
	Fins	3.12	3.26	6.12	5.82	8.29	7.21
	Tegument	10.47	5.42	27.15	5.61	42.17	8.23
	Bones	8.12	4.67	21.32	5.58	33.14	7.25
Visceral mass (g)		31.25	9.25	88.30	11.42	123.47	12.35
%		18.25	9.28	16.33	11.51	14.45	12.42
Internal organs (g)	Total, of which:	4.77	5.17	17.15	5.45	28.93	6.49
	%	2.78	5.21	3.17	5.52	3.38	6.56
	Liver	2.54	5.21	10.10	5.52	17.31	6.82
	Kidneys	2.02	5.14	6.17	5.64	10.24	6.25
	Heart	0.21	4.26	0.88	5.11	1.38	5.84

The heads which at the studied individuals from *Oncorhynchus mykiss* species presents a percent of 12.34% for the trout of first batch, 9.27% for trout of second batch and 9.46 % for the individuals of third batch. Trunk have the greatest rate with an ascendant evolution at the same time with the age, so the lowest percent of 66.63 % was recorded at rainbow trout individuals of first batch, and the highest rate of 72.69 % was recorded at third batch.

The fins' mass related with the total weight of body represents in the case of rainbow trout, values between 3.12 g and 8.29 g, and tegument represents between 10.47g and 42.17g from the total mass of total body mass.

Analysing the visceral mass of those three batches we notice that its weight increases with age trouts, being 31.25 g for batch L1, 88.30 g for batch L3 and 123.47 g for batch L3.

The percentage of internal organs it was between 2.78% and 3.38% from the total corporal mass of rainbow trout. In descending order of internal organs was liver weighing between 2.54g and 17.31g, followed by kidney weighing between 2.02g

and 10.24g, while the heart was much lower values between 0.21g and 1.38g.

The values at all three experimental batches are in the limits mentioned in the literature for *Oncorhynchus mykiss* species [4-7].

4. Conclusions

An overall analysis of the weight of the specimens of rainbow trout in the 3 experimental groups indicate that the results obtained are slight differences according to age trout.

Measurements on specimens of rainbow trout studied to determine body size trout showed that the groups analyzed had a good development fits within the limits described in the literature for this species.

The rainbow trout specimens studied, the most significant percentage change occurred with increasing age and weight were recorded at the mass of the trunk, where the share increased from 66.63% to trout aged one to 72, 69% to trout by the age of three years.

The data obtained from research conducted showed that rainbow trout as age and weight increases as the percentage of meat from the

carcass has an upward trend, reflected and calculating the yield on the three different slaughter ages.

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