Growth and development of young sterlet under bioresonance exposure

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The best investments known to mankind are investments in their own health and active longevity. It is known that according to this indicator, those people, in whose diet fish predominates, compare favorably. Most fish and other seafood are consumed by the inhabitants of Japan, where for each person there are 60 or more kilograms per year. In Russia, per capita fish consumption is now about 17–18 kg per year. The fish farmers are faced with the task of increasing the production of competitive products, incl. sturgeon fish species. Artificial production of caviar, its incubation, rearing of fry for subsequent release into natural reservoirs, today is the most effective method of reproduction of sturgeon fish species. Technologies are used at each stage of reproduction,

The purpose of this work: to study the influence of bioresonance effects on the growth and development of juvenile sturgeon fish. The fish organism is exposed to a weak field in the spectrum of electromagnetic frequencies (EFS) of biologically active substances.

The work was carried out at FSUE "Temryuk sturgeon fish hatchery" in 2011. Two identical groups of sterlet fry were formed, experimental and control, each of the groups was presented in duplicate. The fish were housed in identical pools, 20 thousand pieces in each, the average initial weight of fish was 80 mg. The area of the pools, temperature regime, water quality, feed and feeding conditions in the experiment and control were the same. The impact was started on the fry, which switched to active feeding - 80 mg and carried out to a weight of 1 g. For this purpose, the device "IMEDIS-BRT-A" was used. Control weighing was carried out every 10 days.

The difference in the weight of fish between the experimental and control groups was manifested already at the first control reweighing and remained at the second, table 1.

Table 1

Sterlet weight, mg

Indicators	The control	An experience	+ / - experience / control,%
Initial	80	80	0
1 decade	399	520	+ 30.3
2 decade	1060	1380	+ 30.1
Average daily gain	49	65	+ 32.6

As can be seen from the table, the growth rate is very intensive, for 20 days the fish in the control exceeded the weight by more than 13 times from the initial 80 mg, in the experiment - more than 17 times. The difference in live weight between the experimental and control fish exceeded 30% after the first decade of exposure. At the end of the observations, the fish in the experimental group weighed 1.38 g, while in the control only 1.06 g

table 2

Sterlet survival,%

Indicators	The control	An experience	+ / - experience / control,%
Initial	20,000	20,000	0
Waste, pcs. 1 decade 2 decade	1018 322	768 98	32.5 330
Total for the period,	1340	866	
pcs. Waste,%	6,7	4.3	
Safety,%	93.3	95.7	

Advantages of the experimental group of sterlet are observed in safety, if in the first decade in both groups the deviation is high, but in the control it is 32.5% lower, then in the second decade it is lower by 3.3 times.

Table 3

The efficiency of growing sterlet

Indicators	The control	An experience
Average weight, g Number	1.06	1.38
of fish at the end of cultivation, pcs.	18660	19134
Fish received in live weight, kg	19.78	26.40
B% to control	100	133.5

The advantage of this method is the receipt of additional products from a unit of production area per unit of time by increasing the average daily fish gain by 32% and increasing the safety of fish from 93.3 to 95.9%, which together increases the efficiency of growing sterlet fry, when using bioresonance effects , - by 33.5%.

The environmental friendliness of this method is due to the absence of chemical components that affect the fish. Efficient use of compound feed reduces the retention of nitrogen and other organic substances into the water. The method is technologically advanced, quickly pays for itself, is applicable to the existing system of growing sterlet.

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