

# RESEARCH ON THE GROWTH OF THE RUTHENUS ACIPENSER SPECIES - CEGA AT A 13°C WATER TEMPERATURE IN A RECIRCULATING SYSTEM

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## Abstract

This study followed the growth rate of the species *Acipenser ruthenus*, at a water temperature between 13.2° C and 13.6° C. The water supply from the farm under study was pumped from a depth of 130 meters with a temperature of about 13°C. The study was conducted over a period of 100 days starting with September 28, 2018 and ending on January 6, 2019. The pools populated with the *Acipenser ruthenus* species had a volume of water of 10.8 m<sup>3</sup> with a filling degree of 10 m<sup>3</sup> / water. The population with biological material was realized with a number of 1611 copies totaling a total weight of 104 kg. In addition to the growth rate of the species studied, the consumption of extruded fodder and the minimum and maximum lengths of the biological material were also tracked.

Starting from a weight per unit of about 64 g at the end of the research period, we reached a weight per unit of about 147.5 g of blind. The fish were fed throughout the period with extruded feed from Biomar company having a crude protein of 46% and a granulation of 3 mm. The control fishing was carried out bi-monthly and the feed was administered 4 times a day starting from an amount of 2.3 kg / day. The oxygen dissolved in water had values between 8.08 and 9.01 mg / l.

**Key words:** recirculating system, growth rate, extruded feed

## INTRODUCTION

In recent years, the production of aquatic organisms, mainly of fish, is oriented towards breeding systems that allow obtaining high densities, to make good use of water and land resources, given the current climate changes, materialized in the absence of precipitation for long periods of time. time and predisposition of many areas to desertification (1.2.7).

In the very near future, the Romanian fisheries sector will have to adapt its activity by diversifying its production with economically valuable native species (3.4).

Regardless of the ecological type of the population, sturgeon breeding always takes place in the freshwater environment, generally in the spring at an average water temperature of 15 degrees Celsius. The substrate is preferably gravel, rocks, the water depth being on average 4-5 m at a water current of 1 m / s.

The time interval between two successive reproductions is highly variable but is generally shorter in males than females.

Intraspecific variations are very important and depend on the usual conditions (geographical areas).

As endemic fish, sturgeons withstand a broad spectrum of water temperature compared to other fish species, but to achieve growth performance, certain limits must be respected.

The temperature limits in which sturgeons survive are between 0°C and 32°C, but generally feed between 6°C and 26°C (5.6.)

In the blind the optimum temperature values are between 15°C and 19°C, so when choosing the crop species, check the temperature limits of the water to be used on the farm (8.9.10).

## MATERIAL AND METHOD

The study was carried out at a fish farm in the Moldovan region, the breeding system used being a super-intensive one.

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The biological material studied consisted of a number of 1611 specimens of blind which was monitored for 100 days. The body weight at popular was about 64 g / pieces.

Specimens of fish fed with feed throughout the extrusion from the company Biomar having a crude protein of 46% and a grain size of 3 mm.

The pools populated with the *Acipenser Rututenus* species had a volume of water of 10.8 m<sup>3</sup> with a filling degree of 10 m<sup>3</sup> / water.

The control fishing was carried out bi-monthly and the feed was administered 4 times a day starting from an amount of 2.3 kg

/ day. The oxygen dissolved in water had values between 8.08 and 9.01mg / l.

The water supply from the farm under study was pumped from a depth of 130 meters with a temperature of about 13°C.

## RESULTS AND DISCUSSIONS

The study was carried out over a period of 100 days starting with September 28, 2018 and ending on January 6, 2019. In addition to the growth rate of the species studied, the consumption of extruded fodder and the minimum and maximum lengths were also monitored. of biological material.

Table 1 Biotechnological indicators (28.09- 24.10.2018)

| The calendar period of growth | Nr. pieces | The evolution of body mass (g) | Total biomass at the time of entry (kg) | Total biomass at the end of the period (kg) | Kg increase in growth period | Kg fodder | Minimum and maximum lengths (cm) |
|-------------------------------|------------|--------------------------------|---|---|------------------------------|-----------|----------------------------------|
| 28.09 -10.10                  | 1611       | 64.00                          | 104.00                                  | 115.18                                      | 11.18                        | 25.3      | 20-30 cm                         |
| 11.10–24.10                   | 1611       | 79.5                           | 115.18                                  | 127.99                                      | 12.81                        | 32.2      | 22-32 cm                         |

In the first month of growth of the fish material there was an evolution of the body mass of 64 g to about 79.5 g / copy. There was an increase of 11.18 kg of fish and fish lengths between 22 and 32 cm. Granulated

feed was administered, in the first period an amount of 25.3 kg was administered and in the second period an amount of 32.2 kg was administered.

Table 2 Biotechnological indicators ( 25.10- 22.11.2018)

| The calendar period of growth | Nr. pieces | The evolution of body mass (g) | Total biomass at the time of entry (kg) | Total biomass at the end of the period (kg) | Kg increase in growth period | Kg fodder | Minimum and maximum lengths (cm) |
|-------------------------------|------------|--------------------------------|---|---|------------------------------|-----------|----------------------------------|
| 25.10 -08.11                  | 1611       | 87.5                           | 127.99                                  | 154.23                                      | 26.24                        | 49.4      | 23-34 cm                         |
| 09.11–22.11                   | 1611       | 112.9                          | 154.23                                  | 181.76                                      | 27.53                        | 37.8      | 23-37 cm                         |

In the second represented period we observe an evolution of the body mass of about 112.9 g / fish specimen. There were no mortalities and the body lengths of the fish were between 23 and 37 cm / specimen.

The oxygen dissolved in water had values ranging from 8.08 mg / l to 9.01 mg / l and

the water temperature in the fish basins studied was about 13.4°C.

Table 3 Biotechnological indicators ( 23.11- 21.12.2018)

| The calendar period of growth | Nr. pieces | The evolution of body mass (g) | Total biomass at the time of entry (kg) | Total biomass at the end of the period (kg) | Kg increase in growth period | Kg fodder | Minimum and maximum lengths (cm) |
|-------------------------------|------------|--------------------------------|---|---|------------------------------|-----------|----------------------------------|
| 23.11 -14.12                  | 1611       | 122.00                         | 181.76                                  | 209.30                                      | 27.54                        | 52.1      | 25-39 cm                         |
| 15.12-21.12                   | 1611       | 138.0                          | 209.30                                  | 230.23                                      | 20.93                        | 13.3      | 26-39 cm                         |

Feeding of the fish material was done 4 times daily during the entire research period. We can see that the initial body weight was 64 g / copy and on 21.12 it reached an average body weight of 138 g / pieces. The maximum body lengths reached 39 cm for some specimens and the minimum lengths were about 25-26 cm / pieces.

Considering that the optimum breeding water temperature of the species *Acipenser ruthenus* is 14-17° C, we can conclude that at a temperature of about 13.4°C there are no major variations in body evolution or body lengths.

Table 4 Biotechnological indicators (22.12- 06.01.2019)

| The calendar period of growth | Nr. pieces | The evolution of body mass (g) | Total biomass at the time of entry (kg) | Total biomass at the end of the period (kg) | Kg increase in growth period | Kg fodder | Minimum and maximum lengths (cm) |
|-------------------------------|------------|--------------------------------|---|---|------------------------------|-----------|----------------------------------|
| 22.12 -28.12                  | 1611       | 143.00                         | 230.23                                  | 237.47                                      | 7.24                         | 14        | 26-40 cm                         |
| 29.12-06.01                   | 1611       | 150.0                          | 237.47                                  | 241.50                                      | 4.03                         | 10.8      | 27-40 cm                         |

During the entire research period there were no mortalities, and the evolution of the body mass was quite good, reaching the end of the study period at about 150 g / pieces.

The granulated feeds administered throughout the research period had a granulation of 3 mm and totaled 234.9 kg.

The maximum length of the specimens reached 40 cm and the minimum was 27 cm.

During the entire research period, the water was not heated but was pumped into basins directly from the supply well.

## CONCLUSIONS

The study showed that the temperature of 13.4°C did not influence the growth rate of the species *Acipenser ruthenus*.

Within a period of 100 days, we managed to reach an average weight of 150g / pieces, starting from a weight of 64g / pieces when

the populations in the fish farms were completed.

The water extracted from the wells did not pass through a heater, which results in an economy made on the farm.

Water and feed were of good quality, this being seen in the survival rate of the fish material (100%)

During the research I had a total increase in body mass of about 86g / pieces.

The feed was administered 4 times daily with 3mm granules from Biomar, this feed is especially for acipenseridae and has a 46% PB.

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