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THE DRIVING FORCE OF SCIENCE AND TRENDS IN ITS DEVELOPMENT

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CONTENT

SECTION 1.
ENTREPRENEURSHIP, TRADE AND SERVICE SECTOR

SECTION 2.
MARKETING AND LOGISTICS ACTIVITIES

SECTION 3.
MANAGEMENT, PUBLIC MANAGEMENT AND ADMINISTRATION

SECTION 4.
LAW AND INTERNATIONAL LAW

SECTION 5.
FIRE AND CIVIL SAFETY

SECTION 6.
BIOLOGY AND BIOTECHNOLOGY

SECTION 7.
AGRICULTURAL SCIENCES AND FOODSTUFFS

SECTION 8.
ELECTRONICS AND TELECOMMUNICATIONS

SECTION 9.
ECOLOGY AND ENVIRONMENTAL PROTECTION TECHNOLOGIES

SECTION 10.
COMPUTER AND SOFTWARE ENGINEERING

SECTION 11.
SYSTEM ANALYSIS, MODELING AND OPTIMIZATION

SECTION 12.
INFORMATION TECHNOLOGIES AND SYSTEMS

SECTION 13.
PHILOLOGY AND JOURNALISM

SECTION 14.
PHILOSOPHY AND POLITICAL SCIENCE

SECTION 15.
PEDAGOGY AND EDUCATION

SECTION 16.
PSYCHOLOGY AND PSYCHIATRY

SECTION 17.
MEDICAL SCIENCES AND PUBLIC HEALTH

SECTION 18.
PHARMACY AND PHARMACOTHERAPY

SECTION 19.
ARCHITECTURE AND CONSTRUCTION

SECTION 20.
CULTURE AND ART

SECTION 7.
AGRICULTURAL SCIENCES AND FOODSTUFFS

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BIOLOGICAL-PRODUCTIVE PARAMETERS OF TILAPIA DURING CULTIVATION IN RAS

Aquaculture is an integral industry, the vectors of which have many forms and scales of production. Today, the rational management of aquaculture plays an important role in stimulating production at global levels of fish production and meeting the gradually growing demand of the population for fish products. Therefore, it is urgent to search for and develop ways to stimulate productivity and improve the quality characteristics of biological fish products. Taking into account the demand for the use of recirculation system pools among entrepreneurs engaged in the production of aquaculture products in a short period of time, it is impossible not to pay attention to warm water fish – tilapia. This cichlid fish inhabits freshwater tropical reservoirs, rivers and lakes, rarely brackish in natural conditions [1, 2].

Under the conditions of industrial cultivation, it provides positive, effective results when breeding in basin farms of the RAS system, also with the use of waste heated water from thermal power plants or geothermal waters, and less often in Ukrainian farms [1, 3].

Today, tilapia, a warm-water fish that is considered an invasive species, is taking up more and more space and gaining importance in most countries. Ukraine is not the exception. Tilapia is the second most cultivated fish in the world, the volume of global production has increased fourfold on average. Its biological and economic qualities create all the prerequisites for the effective production of commercial products [3].

As a result of cultivating two species of tilapia in RAS basin systems, fish productivity indicators were obtained. This made it possible to make a comparison between the cultivation of *O. Mossambicus* (group 1) and *Florida Red* (group 2). From the beginning of development in early ontogenesis, group I is formed (average body weight of tilapia O. Mossambicus): 1.5-13.5; group II - from 13.5 to 30 g; group III - 30 g - 60 g; group IV - from 60 to 120 g; group V - 120 g - 140 g; VI - 140 - 230 g (Fig.1).

When sorting young tilapia of all species, the main diameters are measured. Under the conditions of further use of tilapia for the nest / family, it is mandatory to carry out all measurements, calculate body structure indices and determine the exterior profile of tilapia. In the groups, the results of the study of morphometric parameters showed that with an average body weight of 15 g - 20 g, tilapia of group 1 had the following values after calculating the indices: according to the index of short body length - 64%, index of total length - 75% with an index of head length of 24.5% respectively; body height index was equal to 31.2%, while trunk girth (compactness index) was 64.8%.

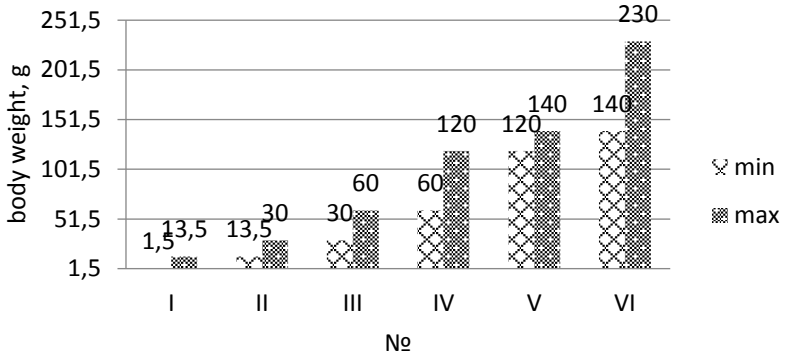

Fig.1. **Analysis of distribution by body weight of tilapia *Oreochromis Mossambicus* in industrial groups**

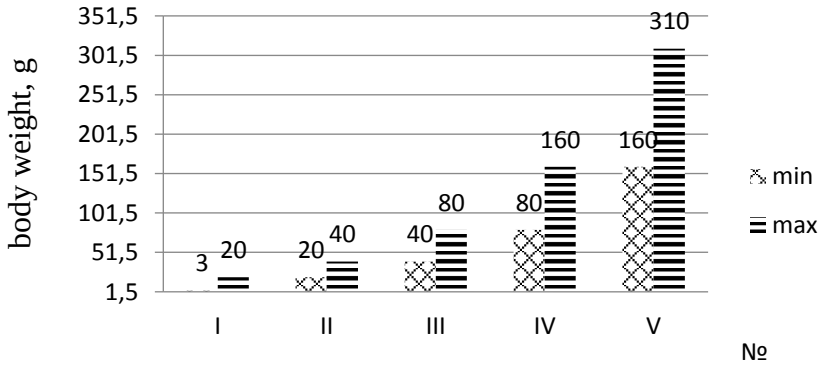

Fig.2. **Analysis of distribution by body weight of tilapia *Florida Red* in industrial groups**

Index studies in *Florida Red* tilapia showed the highest values, which were explained by individual variation. Thus, tilapia with a body weight of 35-40 g had a small body length index of 81.9 and a large body length index of 87.2%. Indexes: the body girth was 71.2 and the progonist index was 4.2. All obtained results corresponded to the regulations in fish farming regarding the speed of development of fish of each species. The coefficient of obesity had limits of 2.7-3.9 units, which reflected the dynamics of mass accumulation on the positive side.

During each of the stages of group formation, the chief fish breeder at the enterprise enters the results of weighing and measurements into the electronic database, records them on special information sheets placed in the tilapia breeding shop. The concept of "youth, early youth, larva, commercial fish, breeder, mother herd, family" is used.

Therefore, at each stage of tilapia development, the average value of the growth rate is calculated, which provides an opportunity to compare and obtain reliable data on the growth rate of fish for all species.

The farm grows several types of tilapia according to the scheme of full-cycle and full-system functioning. That is, from obtaining eggs to growing and obtaining marketable products. In addition, the formation of a family (maternal nest) with the subsequent obtaining of one's own offspring is envisaged. All tilapia *(Oreochromis Mossambicus* and *Florida Red)* have a continuous cycle of reproduction, so the chief technologist - fish breeder coordinates all conditions for breeding fish in such a way that water temperature, oxygen content, water exchange and feeding with supplements have an effect on the stimulation of development and spawning.

On average, spawning takes place more with an interval of a little more than a month - two months. The common parameters of tilapia females of the two species are: early puberty, cyclicity in spawning, high rates of development and high productivity make it possible to obtain offspring all year round when cultivated in recirculation system (RAS) basins. As the age and weight of tilapia

females increases, as in most other fish species, their working fertility increases. The maximum relative fertility is mostly observed in females aged one to two years. This period is characterized by higher quality indicators of caviar and larvae that are in the transition to active nutrition.

Studies of productive parameters of tilapia *O. Mossambicus* have shown that fish in industrial conditions have early puberty (from 3 months), relatively low body weight and fairly positive indicators of the efficiency of the spawning company. For tilapia, the process of incubation of eggs in the oral cavity is characteristic. The duration of the incubation of the eggs and the survival of the larvae is up to 10 days, and after the dissolution of the yolk sac (a source of nutrients), the transition of the larvae to active swimming, the females release them from the oral cavity. In the first 2-3 days, the larvae are under her protection. And in less than a week, the body of females is ready for the next spawning.

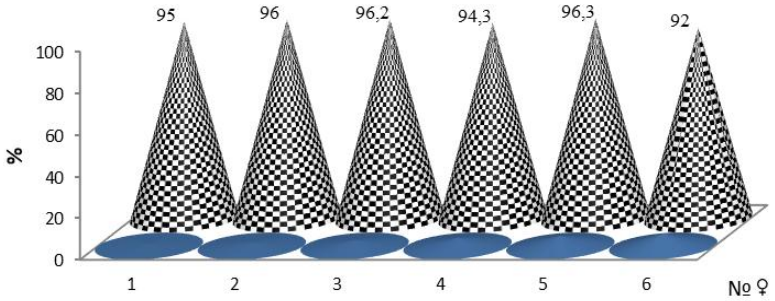

Fig.3. **Study of fertilization percentage in tilapia *O. Mossambicus***

Analyzing the obtained results, it is important to note that tilapia productivity parameters can vary significantly. The determining factor is biological features and technological parameters (Fig. 1 – 4).

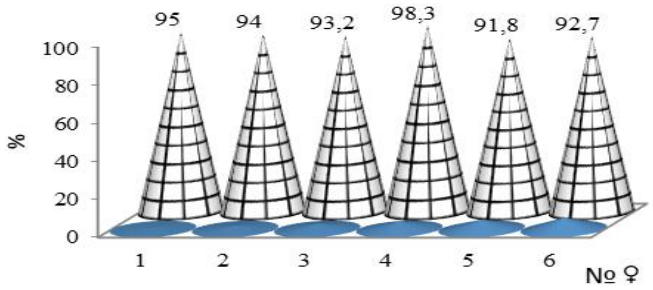

Fig.4. **Study of fertilization percentage in tilapia *Florida Red***

Therefore, the rate of fertilization, as well as the parameters of development, depend on many factors, in particular, the hydrochemical state, biological features of tilapia, genetic characteristics. However, in all groups, all parameters corresponded to the well-known standards in aquaculture for tilapia. The use of RAS provides an opportunity to control all technological processes and not depend on seasonality and other factors. Thereby providing aquaculture products to the population annually.

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