ORGANIZATIONAL AND ECONOMIC BASES FOR THE DEVELOPMENT OF THE FEED BASE OF FISHERIES

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This article, based on monographic studies, analyzes the directions of state support for improving the food supply of fisheries, the composition of fish feeds, the requirements for fish feeds, the sources of providing fish farms with feeds, and the problems that exist in the fishing industry today are identified, and the corresponding suggestions and recommendations.

Keywords: fish feeds, natural products, artificial feed, feed composition, fish food requirements, fisheries problems, state support, etc.

Introduction. Since the first days of independence of the republic, in the course of the implementation of socio-economic reforms aimed at developing the skills of a market economy in the fishing industry, various forms of ownership have appeared in the fishing industry, as well as economic, social, organizational and regulatory conditions were created. As a result of the successive reforms carried out, conditions have been created for the operation of fisheries enterprises based on competition in the industry.

The use of 88-90 percent of all water resources used in agriculture shows that the industry has a high weight in assessing the performance of the complex. Because today about 2.4% of water resources are used in industry, 5.4% for household consumption and 2.5% for fish farming.

Today, 47% of the world's food demand is provided by fish products. According to the FAO, over the past 10 years there has been a significant increase in fish farming. Encouragingly, intensive technologies for rearing fish in artificial ponds or open water bodies are being used and rapidly developed thanks to the contribution of developing countries. On the contrary, in developed countries, fish farming is based on the production of products using clean fresh water. This makes the issue of regulating the system for the use of fish feed in freshwater sources relevant.

The objective fact is that a strong competitive environment in fish farming of aquatic resources requires the development of intensive food bases. In such conditions, it is necessary to take into account such aspects as ecology and environmental protection [1, 2, 3, 4, 5].

We consider it expedient to analyze the fish farming and study the composition of fish feed, dividing it into the following 2 groups, based on various literature. In particular, natural and artificial nutrients (Figure 1).

Natural products include products that are found in nature, grown and whose composition has not been altered by additional processing.

Artificial feed - includes artificially prepared products from a mixture of products that consist of elements of different composition.

Natural Nutrients may include the following nutrients. Including: algae - plants growing in natural reservoirs; leguminous products - cereals, barley, soybeans, seeds of wild plants; residual processing - meal, legumes, bran, dry remains of grapes and fruits (in juice production); organisms - food consisting of worms, small, molecular organisms, etc.;

The following nutrients can be included in artificial feeds. Including: granules and tablets - nutrients, consisting of carbohydrates, fats, vitamins in their chemical composition; mineral fertilizers - feed, consisting of fertilizers such as ammophos; artificial feeds such as fishmeal, protein and enzymes, as well as combinations of several of the above.

Materials and Analysis. Types of feed and types of feeding in the fish industry are different. When food types are divided into groups such as natural and artificial, they are used together in feeding. That is, artificial feeding does not only mean the use of artificial nutrients [10].

The need for artificial feeding of fish is used when there are more fish in the feeding area than the availability of natural food to ensure the normal growth of fish. Artificial feeding is usually carried out as a result of human intervention using natural and artificial nutrients.

A significant part of the existing fish farms in our country needs artificial feeding. This can be explained by the absence of large rivers and tributaries and the small number of fish in the existing ones. In particular, although they feed on natural food in the Aral Sea basins, in Aydarkol their weight is small. In addition, although there is natural food in such water bodies as the Amu Darya and Syr Darya, its share in the total demand of the population and production is small. In the main fishery, products are grown on the basis of artificial feeding.

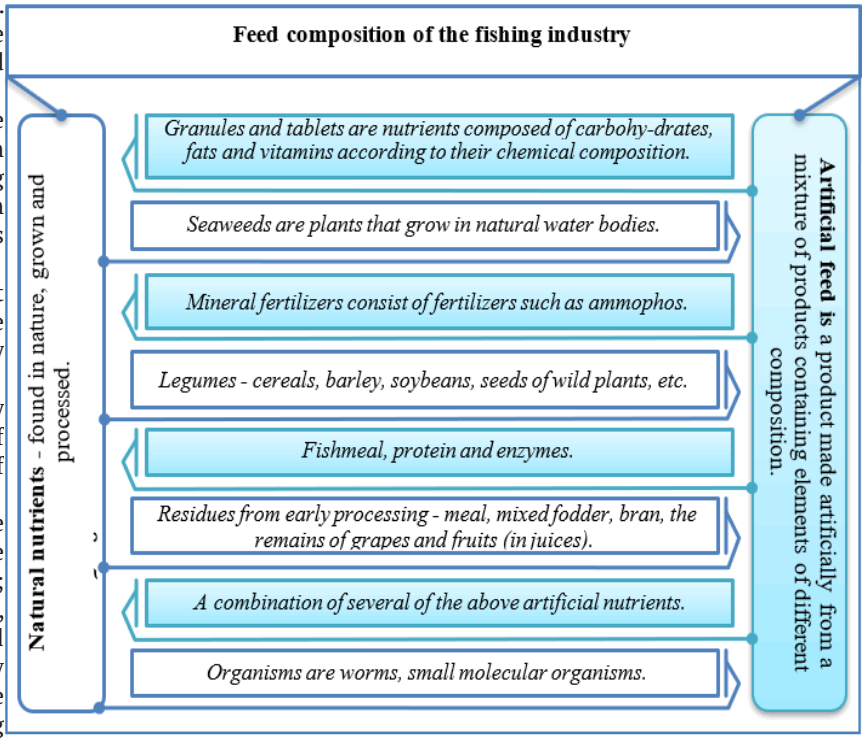


Figure 1. The composition of the feed in the fishing industry.
**Compiled by the author based on research.*

Natural reservoirs are not available in all regions of our republic. In particular, there are no natural reservoirs for fishing in the densely populated Ferghana Valley. This situation determined the need for the development of aquaculture - pond fishing as the main source of fish grown in the republic.

All artificial pond fish farms existing in our republic are built around large cities and densely populated areas, on abandoned and saline lands unsuitable for agriculture. Even today there are such lands, and the construction of artificial fish farms on these lands is economically profitable.

The natural and climatic conditions of Uzbekistan are favorable for growing fish in artificial ponds, and a long growing season makes it possible to achieve high productivity.

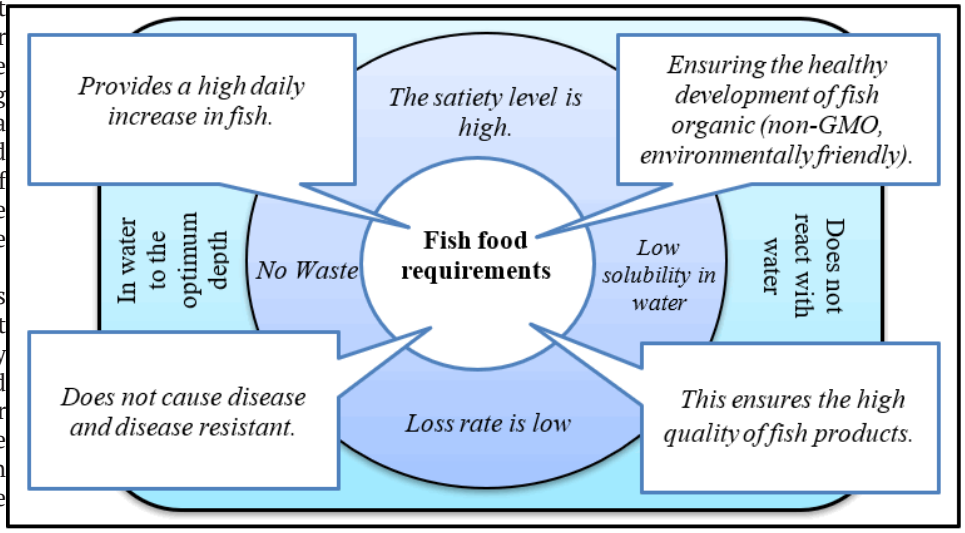


Figure 2. Nutrient requirements for growing quality fish products.

**Compiled by the author based on research.*

The process of rearing fish in artificial ponds is directed and controlled by people. This is the main advantage of growing fish in artificial ponds. The use of these opportunities made it possible to supply fish products in a live form with high quality.

According to experts, artificial feeding creates a different attitude towards the product among consumers. Due to their general (abstract) understanding of feed quality, composition and fish farming technologies, they create fluctuations in demand for products grown in artificial ponds [2, 3, 4, 5].

For this reason, in artificial ponds in developed countries, requirements and norms for fish food have been developed, and it is under strict control. This serves to build confidence among consumers. On the other hand, it is worth noting that such activities are usually open markets where competition is relatively strong and competitors' products are relatively cheap due to the fact that they are grown in rivers and flowing reservoirs, to support and regulate local fish farmers (to control the use of GMOs with in order to reduce costs, in connection with the objective situation) pursues its own goals.

As noted, intensive fish farming and artificial feeding in closed ponds are widespread in our country. In the course of the study, after critically examining opinions and considerations, approaches and proposals regarding the requirements for fish feed in the specialized literature, we found it necessary to group the requirements for fish feed as follows (Figure 2):

- ensuring a high daily increase in fish;
- ensuring the organically healthy development of fish (non-GMO, environmentally friendly);
- do not cause diseases and be protected from diseases;
- fish must provide a high quality product;
- high level of satiety;
- without waste;
- low solubility in water;
- the level of waste is low;
- does not react with water;
- it must be immersed in water to the optimum depth (taking into account 15-20 cm from the water surface).

In general, the development of the fish farming system should not only solve socio-economic issues, but also ensure ecological balance with strict observance of sanitary and hygienic requirements.

In the course of the research, it can be noted that there are the following problematic points in the process of feeding the fishing industry of our country and monitoring the quality of feed. Including:

- inefficient functioning of the fish feed standardization system, the fact that the requirements of GOST for fish feed are not developed based on the conditions of our country, the current standards (GOST 31674-2012, GOST 34109-2017, GOST 2016-2000, Ownership of DSt 3053:2016;
- the technical, technological, organizational and economic foundations of the system for testing fish feed for the presence of GMOs have not been created;
- lack of creation of a system for the production of soft food products for feeding fish based on scientifically based recipes;
- system organizations ("Uzbaliksanoat" Association, Ministry of Agriculture, Research Institute of Fisheries) have not been assigned specific tasks for quality control and monitoring of fish feed;
- lack of methods, techniques and criteria for determining the pollution of water resources and damage to the environment by fish feed products;
- the fact that artificial fish food is produced by fish farms, in connection with which the control system for them has become unusable;
- in the production of fish feed, the focus is on meeting the need in quantitative terms, while the quality indicators of the feed are neglected, etc.

Monographic studies were carried out in Surkhandarya, Kashkadarya and Namangan regions in order to study and conduct research on the state of the fishery and the system of its feed supply. In particular, surveys were conducted with 7 fishing farms in the Sherabad district of the Surkhandarya region, 8 in the Chirakchi district of the Kashkadarya region, 5 in the Mingbulok district of the Namangan region. According to the results of the analysis of the survey conducted with farms specializing in fishing in these regions, the following feeds are used in practice in the process of growing fish (Figure 3). In particular:

- granules, tablets and vitamins;
- meal, leguminous and industrial waste;

- cereals, barley, corn and other legumes;
- ammophos and other mineral fertilizers.

This experience can be observed in the countries of Central Asia, especially in the Republics of Kazakhstan, Tajikistan and Kyrgyzstan [13].

In recent years, experience in the production of granular fish feed has been accumulating in our country, and the following factors hinder its rapid development. Including:

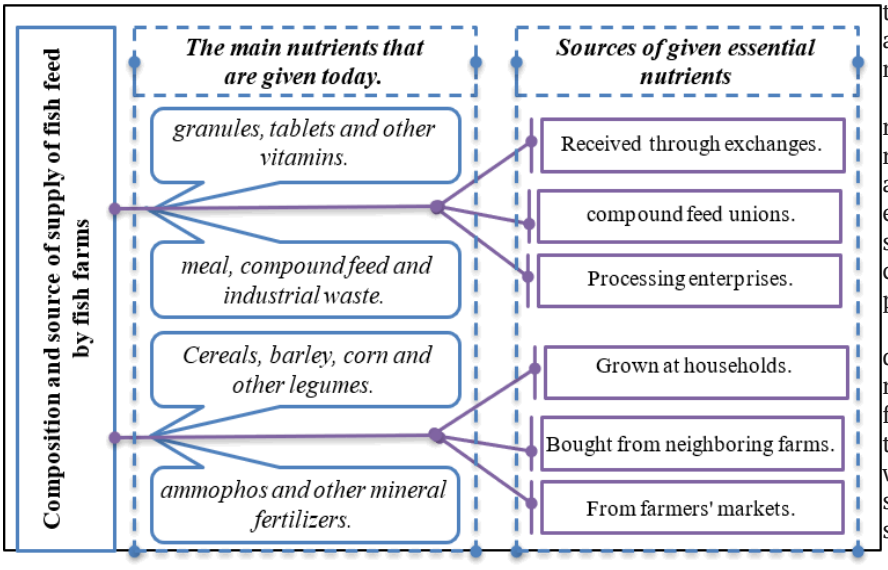


Figure 3. Composition of feed provided by fish farms.
**Compiled by the author on the basis of a monographic study.*

- lack of specialists with experience in the production of pellets;
- its scientific foundations are not adapted to the existing resources and conditions of our republic;
- soybeans and other oilseeds, which have a significant share in the composition of the granules, are imported into our country or cultivation practice is currently being mastered;
- small introduction in the farms of practical skills of feeding fish with pellets due to the lack of molding (usually produced only for use in their own farms);
- the lack of accurate reports on the cost-effectiveness of pelleted fish food and the slowness of promotional work.

Granular fishmeal continues to be in high demand among buyers due to a number of advantages. One of its positive features is that, due to its chemical composition, it cannot be used separately in nature, enters into natural reactions, quickly changes its composition and shape when used alone, but on the other hand, it makes it possible to use it in combination with feed with high levels of nutrients.

In the production of compound feed, some components are specially processed to increase their nutritional value, and the missing biologically active substances are added in the form of preparations of natural origin, special preparations of microbiological or chemical synthesis. Compound feed is produced in a form convenient for mechanization of feeding and cleaning, as well as for eating by animals, birds and fish [14].

If we pay attention to the sources of food supply and their share in fish farms, where monographic studies were carried out, then 21.7% of the total feed consumed in the studied farms falls on commodity exchanges and processing enterprises, 24.8% - on local producers, farmers, dekhkan farms, 20.2 - products grown on their own farms, and 31.3 percent buy at regional and local farmers' markets or retail outlets. This situation is typical for various regions of our republic, including Namangan, Surkhandarya and Kashkadarya regions, and creates the basis for the formation of private conclusions (Figure 4).

Today, the need to use resource-saving and innovative technologies in the production process and their implementation is becoming more and more urgent.

Discussion. It is required to spend the necessary amount of material and labor resources to ensure the quality of each agrotechnical measure. Consumption of each resource at the level of science-based standards is important for the efficient completion of the final production process.

Based on the normative documents developed by industry scientists, the norms for the consumption of feed used in fish farming were developed, which, with the support of state financial resources, were distributed free of charge among system organizations, and training seminars were organized in the regions.

But in practice, the farms do not have skills (even information in some farms) about these norms, they are not observed,

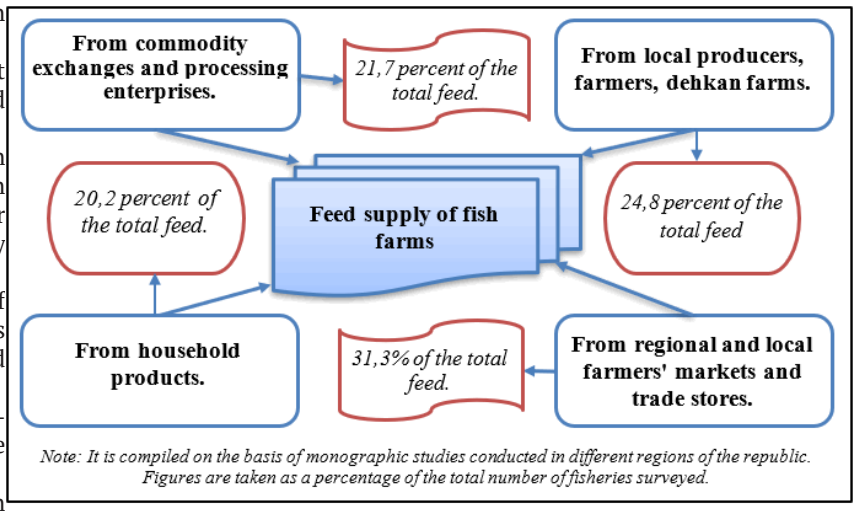


Figure 4. Sources of feed base of fisheries in the conditions of our country [15]
**Compiled by the author on the basis of a monographic study.*

they rely on the experience accumulated over the years regarding feed consumption and norms.

This has a negative impact on product manufacturers in the following aspects:

- failure to ensure daily growth as a result of non-compliance with the norms of feed consumption in fish farming;
- the appearance of waste as a result of the release of excess food from the daily consumption of fish into the water (in the section of fish species, it is assumed that they do not consume products in excess of the daily norm). Firstly, it destroys the ecological state of water, and secondly, it creates excessive costs for feed.
- the fastest (weight) season of fish growth - the beginning of summer (June, July). In turn, this period, according to the natural conditions of our country, coincides with the hottest months, so it is necessary to

observe special scientifically based nutritional standards. Failure to follow this rule will not give the expected weight of the fish, and so on.

In order to study and analyze the practical and urgent problems of the fish industry existing in our republic, ways to eliminate the shortcomings and obstacles encountered in its daily activities, and ensure the integration of science and production based on the results of direct research and scientific research, we conducted monographic studies in several farms . As a result of the research, the identification of current trends based on a generalization of their daily problems serves to determine the aspects that should be addressed within the framework of this practical project.

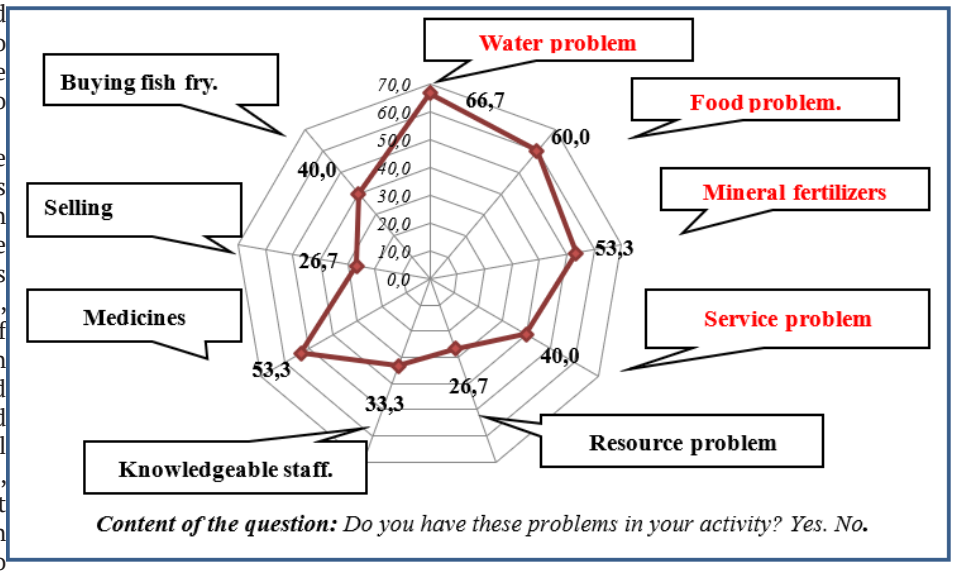


Figure 5. Fisheries problems considered in monographic studies, as a percentage of the total number of respondents [15].
**Compiled by the author on the basis of a monographic study.*

In particular, 66.7 percent of participants who believe that there are water-related problems in the studied fish farms, 60 percent - with feed, 53.3 percent – problems related to fertilizers, 40 percent of the total number of farms who believe that there are problems in the service system (Figure 5).

In addition, 26,7 percent of the surveyed fisheries consider that there are problems associated with the supply of various resources, and 33,3 percent of the farms suffer from problems associated with a lack of educated personnel.

Based on the studies carried out, it is advisable to carry out the organizational and economic foundations of the feed supply system of the fishery network of our republic on the basis of an integrated approach in the following two areas:

- organizational and economic stimulation of the feed production system in fisheries;
- development of a system for providing fish farms with feed from external sources.

The goal of organizational and economic stimulation of the forage production system in the fish industry itself provides for a set of measures to stimulate the availability of a forage base of any size in any season by reducing the impact of external factors on the economy. In our opinion, it is advisable that they consist of the following (Figure 6):

There is an opportunity to establish organizational and financial cooperation (on the basis of practical and innovative project funds) of the Research Institute of Plant Growing, the Research Institute of Botany and Plant Chemistry, and the "Baliqsanoat" Association.

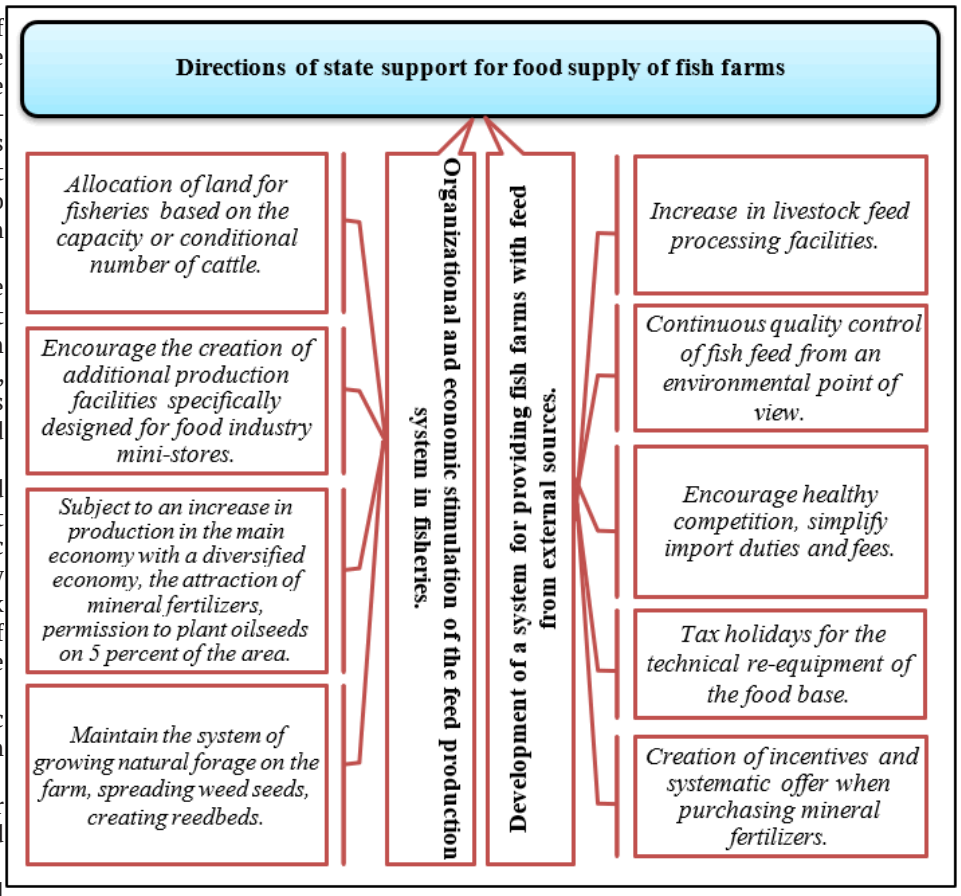


Figure 6. Directions of state support for food supply of fish farms [15].
****Developed by author***

Conclusion. In the direction of developing the system for providing fish farms with feed from external sources, in our opinion, includes a set of measures implemented with the active economic and organizational support of the state. It is desirable that they consist of the following:

- to increase enterprises for the processing of animal feed, focusing on the organization of public-private partnerships;
- constant monitoring of the quality of fish feed from an environmental point of view, in which specific tasks and financial support should be assigned to research

institutions and system organizations;

- it is desirable to promote healthy competition, simplify import duties and payments, eliminate the monopoly position of enterprises producing fish feed, develop various forms of ownership, and create equal conditions in the market for imported fish feed;

- provision of tax holidays for the technical re-equipment of the forage base;

- it is advisable to implement measures such as creating incentives and systematic provision for the purchase of mineral fertilizers.

In general, in the food supply system, which is recognized as the most painful point of the fishing industry of our country, there are many issues that need to be addressed. If the issues that need to be resolved at the initial stage with the help of the above organizational and economic levers find their positive solution, then in the future, taking into account the territorial characteristics of our country, this will create the basis for the development of individual approaches in the region.

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