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THE IMPORTANCE OF NATURAL NUTRIENTS IN THE DIET OF CATFISH

Pardayev Sh.
Shamsiyev N.A.
Shokirova Sh. Sh.
Farmonova M. Q.
Savriyeva M.S.
Pulatova N. X.
Buxoro State University

Abstract
This article provides information on the categories of fish feeds, predatory fish, non-predatory Fish, benthic Fish, Fish that feed on plankton, Fish that feed on plants, the digestive system of predatory fish, the obesity rate, and rapidly digestible feeds.

Keywords: predator, benthos, plankton, phytoplankton, casual food, mandatory food, non-food fish, zooplankton, zoobenthos, obesity rate.

Introduction

Fish farming - reproduction and improvement of the quality of fish stocks in the water bodies of the national economy-study of the biological foundations of fish farming activities (artificial fish breeding and training in new conditions, breeding new fish species, improving the reclamation condition of reservoirs) and the main processes of fish farming (catching adult fish, release of artificial spawning grounds of caviar, commercial fish). fish farming, etc.) is a science engaged in the development of biotechnology. Fish farming is divided into natural pond fish farming and artificial pond fish farming. In fish farming, the reclamation condition of artificial reservoirs is improved, artificial fish mating is performed, appropriate reclamation conditions are created in places where fish lay eggs (caviar) and juveniles grow; fish spawning sites are cleared, a fish path to river dams is laid, equipment made of special reeds is installed in spawning sites.

In natural reservoirs, work is underway to artificially interbreed fish, increase the number of fish caught or replace them with new fish species. Special fish factories are being built for this purpose. The use of reservoirs for fish farming, acclimatization of other fish species is also the main task of fishing. Reservoirs are cleared of shrubs and special grass, and a fishing nursery is being built for breeding juveniles. Fish are grown in special ponds. In such reservoirs, processes are carried out, starting from mating fish, feeding with larvae, gills and ending with bringing it to the level of consumption. 76 species of fish live in the waters of Uzbekistan, of which Cyprinus carpio, Hypophthalmichthys molitrix, Aristichthys nobilis, Sander lucioperca, Abramis brama orientalis, Carassius gibelio, Silurus glanis, Channa argus Rutilus aralensis of great hunting importance.

The industrial development of fishing in Uzbekistan began in 1957.

The habitat of fish is water. The aquatic environment for Fish demonstrates several features of adaptation to life. Fish are mainly characterized by specific biological morphological features. He adapts to the characters mainly through jabra. To date, more than 36 thousand species of fish have been identified in the waters of the world. Fish occupy the 1st place among vertebrates in terms of

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diversity and abundance. For this reason, his body shape is also extremely diverse.

External signs occupy the main systematic place and are of practical importance in determining the type of fish. The main parts of the body are considered to be the head, trunk, tail and fins. The fins are quite diverse and differ from fish to fish in shape and large size. The shape of the fish's head is extremely variable, and also depends on the structure of the oral apparatus. The location of the mouth in fish varies depending on the nutrition titer. The mouths of the Fish will be as follows:

1) the mouth is located above or called the upper mouth (planktonic mammals) - Hypophthalmichthys molitrix, Aristichthys nobilis, Alburnus chalcoides aralensis,

2) the last mouth (predatory fish) - Sander lucioperca, Esox lucius, aspius aspius iblioides,

3) oral bottom (benthic) - Cyprinus carpio, Carassius gibelio,

4) passable, half high, half low (omnivorous fish) an example is Luciobarbus conocephalus.

The diversity of the ichthyofauna of the reservoir and the productivity of fish are directly related to the quantity, composition and quality of feed in the reservoir. If the physiological composition of the feed stock in the reservoir is not at the level of demand, the growth rate, fat content and fertility of fish decrease, and fish productivity decreases sharply.

For extensive feeding of fish in growing ponds, first of all rotifers must have a high biomass of infusoria, euglena. To do this, in ponds where herons feed, first of all they should be prepared from black cow and horse manure in order to develop microscopic algae: chlorella, scenedesmus and bacteria. Because there will be a lot of bacteria and infusoria in the manure of these animals. According to B.V. Verigen (1963), 1 g of fresh manure contains millions of infusoria, as well as billions of bacteria. That is why fresh, clean manure should always be used in pond fish farming. If you give a clean manure mixture and water with zooplankton, the number of microorganisms will increase 20 times in 2-3 days.

According to G.G. Vinberg (1970), bacteria exposed to fresh manure begin to multiply after 3 days if old manure is put in the pool water, while bacteria exposed to fresh manure They begin to multiply after a few hours. Horse manure is preferred for fertilizing reservoirs.

Horse manure if mixed with black cow manure, bacteria and naive animals will quickly develop in the pond water. Old or dried manure pollutes the pool water. Such recommendations are made only in ponds where Seagulls and larvae feed. Zooplankton representatives can be grown in special pools or in ponds measuring 2x2 m, 1.5x1.5 m wide. Such pools and ponds should be prepared before germination, that is, in early April, and mixed with 1.5-2 kg of fresh manure per 1 m3 of water.

Zooplankton increases in number and biomass after 10 days, then 0.75-1 kg of fresh manure is dumped every 10 days. The increased zooplankton is removed by 75% to the pond where the heron feeds, and the rest is filled with water again. During the growing period of herons, the main part of their diet should be made up of living organisms.

During the cultivation of thyme, the hydrochemical and hydrobiological condition of reservoirs is constantly monitored.

When feeding herons with artificial feeds, it is more effective if they are fed with feeds specially designed for herons (fish meal, bone meal, silkworm flour, blood meal, wheat flour). When feeding chickens for the first 10 days, 50% of body weight is given for every 1 ml of chickens or 5 kg of flour is mixed daily with 100-200 liters of water. In the second 10 days, 25-30% of body weight

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or 7.5-8.0 kg of flour mixed with 250-300 liters of water is given. They are fed 8 times during the specified day or 1 time every 3 hours. Then, at the end of the breeding period, transplanting is carried out into ponds for cultivation. Before transportation, preventive maintenance is carried out in a 0.5% solution of diamond-shaped greens or 5-10% solution of table salt.

Ponds in which sedges are grown are divided into 0.1-2 hectares. The depth is 1.5-1.9 meters. Typical annual fish ponds can range from 40 to 50 acres. But such large pools do not justify themselves. Annual herbivorous fish are fed from June, from October to November, until the water temperature reaches 12-14 ° C. Basically, annual Cyprinus carpio, Ctenopharyngodon idella and Hypophthalmichthys molitrix fish are fed semi-intensively in multicultural conditions.

The pond must be dry until, in accordance with the requirements of fishing, the ponds are filled in, the pond will be completely cleared of various vegetation and its remnants. In order to disentify ponds, 300-400 kg / ha of quicklime is sown in 5-7 days, then 3-4 tons of fresh manure are methodically processed. As soon as the cutlets are ready, the water is sent to the ponds. A nylon protective bag No. 12 is installed at the entrances to the ponds, which prevents foreign fish from entering the ponds. The food is served in specially prepared places.

It is important to properly regulate the flow and outflow of water into ponds, that is, water exchange, in order to avoid the negative effects of residual substances on the gas exchange of water in the pond and other environments caused by the consumption of not all feeds supplied to herons by Fish.

In the 70s and 90s of the last century, an equal amount of 5-6 thousand/ha was thrown out of Cyprinus carpio, Ctenopharyngodon idella and Hypophthalmichthys molitrix fish. However, South-East Asian countries are currently considered as the main or dominant species according to fishing experience, while the rest are considered as an additional species (Table 1).

Table 1. Catch rates of commercial fish ponds. Thousand eqs/ha

version	Hypophthalmichthys molitrix	Aristichthys nobilis	Ctenopharyngodon idella	Cyprinus carpio	Total
I	50	2,5	15	2,5	70
II	10	-	20	10	40
III	20	-	80	10	110
IV	10	30	10	50	100
V	-	40	15	5	60

The nitrogen content in water of 2 mg/l of phosphorus should have an indicator of 0.5 mg/l. When fertilizing a pond, 45 kg of nitrogen and 15 kg of superphosphate are considered the annual norm. The amount of manure per 1 ha is defined as the norm of 2 tons. They are sown per 0.3 hectares of pond. 3-5 days after fertilizing the pond during one growing season, it is necessary to conduct a hydrobiological and hydrochemical analysis, while determining the natural nutrients of the pond-phytoplankton and zooplankton. The amount of phytoplankton is 250-500 thousand huj / l,

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biomass is 2-3 g / m3, zooplankton is 35-40 thousand ex / m3, and the biomass will be equal to 3-5 g / m3. For this, constant monitoring of water transparency is carried out, with a transparency of 20-30 cm, top dressing is stopped, with a transparency of more than 60-65 cm, top dressing is carried out.

To bring Hypophthalmichthys molitrix and Aristichthys nobilis to 30-35 grams, in the 1st month after the fish is transferred to the pond, 1.5 tons of fresh manure dissolved in water are introduced according to the planned rate every 10 days, in the 2nd month they are fertilized every 7-10 days. In the following months, when the water temperature decreases, the feeding period is carried out once every 20-30 days. At the same time, the amount of dissolved oxygen in the water is also controlled, which does not fall below 4-5 mg / l, while always being controlled.

Ctenopharyngodon idella herons switch to eating zooplankton and daily food when they reach 0.9-1.0 g (Table 2).

Table 2 Ctenopharyngodon idella composition of soft feed of chicks

Food ingridients	As a % of the amount	Replacement rate
soy mixture	9	Pea 1:1,5
Sunflower mixture	20	soy mixture 1:0,75
Pea	10	soy mixture 1:0,75
Wheat, barley, oats mixture	40	-
Wheat bran	3	Wheat waste 1:1
Paparin (BVK)	16	Eprin 1:1
Chalk	1	Trisodium phosphate 1:1
Mikroelements	1	-
protein	26	-

According to their nutrition, fish are divided into the following groups.

Of predatory fish such as Sander lucioperca (Linnaeus, 1758) and aspius aspius iblioides (Kessler, 1872), the mouth is motionless, the teeth on the jaws are numerous, and the shape is conical. The teeth serve to capture and capture prey. The Jabra plates are short and partially small. These teeth protect the jabra leaves from bits of food. Predatory fish are quite mobile, taking prey one at a time, as the jaws are powerful. The diet of peaceful or non-poisonous fish is conventionally divided into benthic, planktonic and herbivorous fish species.

Benthic fish belong to a group of fish that adapt differently depending on their diet. This group includes true benthic fish (Cyprinus carpio (Linnaeus, 1758), Carassius gibelio (Bloch, 1783), Abramis brama orientalis (Berg, 1949)), whose teeth are developed to varying degrees, mobile and adapted to catching food. Their mouth is half turned downwards, mobile, and resembles a not very large flute. The teeth are located in the pharyngeal cavity, on the bones of the larynx and have the property of crushing food. The Jabra cover is much bigger. This feature indicates the development of the grasping nature of the oral cavity. The number and size of their larvae is much larger than that of predatory fish.

In fish that feed on plankton, the mouth is inactive, teeth are poorly developed or absent altogether. Characteristic of the morphological features of fish in this group is a long and numerous number of gill plates used for extracting food.

The White dungpeshana, which feeds on algae, has plates intertwined like a ribbon. Aristichthys nobilis (Richardson, 1845) and mollusks of all fish also feed on zooplankton. Jabra plates have different structures.

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There are much fewer herbivorous fish. These include fish species such as Ctenopharyngodon idella (Valencinnes, 1844). Some of them have a mouth facing downwards, in the form of a transverse slit, the lower lip has a sharp cutting edge. The jaws, often covered with a cornea, do not have teeth. Fish that live in murky water, or fish that live in a relatively fairly deep place, will have whiskers around their mouths. Whiskers provide the ability to feel a limb and find food. For example, Pseudoscaphirhynchus kaufmanni, nemachilus malapterurus logicauda, silurus glanis, etc. are well developed.

Most cyprinids, for example, species such as Carpio carpio, cyprinus carpio, alburnus chalcoides aralensis, dig bottom mud for 10-15 cm in search of food. The lips of these are adapted to this.

The digestive system of predatory and peaceful fish is not the same, predatory fish have a large stomach, and peaceful fish have intestines. In fish belonging to the cyprinid family, food comes from the esophagus directly into the small intestine. Some fish have pointed outgrowths in their intestines - salmon have up to 200 of them, planktonic ones have up to 40. The intestines (stomach) of predatory fish are quite short. In herbivorous fish (hypophthalmichthys molitrix, ctenopharyngodon idella), the intestine is up to 13 times long, in capoeta capoeta steindachneri it is 7-10 times long relative to the body. Aquarium fish have short intestines. The reason is that they feed mainly on animals (gammarids, artemisia).

The digestive process of predatory and peaceful fish differs chemically and mechanically. While predatory fish are dominated by an enzyme that breaks down protein, peaceful fish are dominated by an enzyme that breaks down carbohydrates. In predatory fish, the crushing of food occurs mainly under the action of hydrochloric acid in the stomach. In peaceful fish, the splitting of feed occurs in the intestine, occurs without the participation of hydrochloric acid. Protein absorption is carried out in the last part of the intestine. It is possible to observe a strong change at different stages of individual development of fish. The intestinal system also changes morphologically. Larvae and larvae of fish feed mainly on zooplankton, and adult fish feed on zoobenthos, benthos. All fish, whether carnivorous or peaceful, feed mainly on zooplankton and partially on phytoplankton at the spawning stage. The mouth of catfish is large in relation to the body, and the mouth is motionless forward. One by one, he takes a large food item. They resemble predators in their way of feeding, but in terms of the size of the food item, peaceful fish stay close to the food item.

Abramis brama orientalis, rutilus aralensis and cyprinus carpio require the study of nutrition, growth and development of fish in 4 stages.

1) the stage of nutrition for jaundice;
2) the stage of nutrition of the simplest animals;
3) feeding stage of representatives of zooplankton cladosera, copepoda;
4) zobenthos, the stage of nutrition of benthic plants.

All the studied species have a specific food item in adulthood, and this feature is related to the method of forage coverage. The replacement of each fish food item occurs with a change in the length of the intestine. For example: in a river, fish feed on various invertebrates, and the nature of their diet changes dramatically to lake conditions. Some species of Sander lucioperca switch to temporary prey (5-8 cm), previously feeding on invertebrates. Benthic fish feed first on zooplankton and then on benthos. For planktonic fish, age does not greatly affect, since from the first day of feeding until the end of life they feed on zooplankton and phytoplankton (Aristichthys

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nobilis, hypophthalmichthys molitrix), (Pardaev et al. 1977) in winter they feed on zoobenthos, and in summer on zooplankton.

For proper management of pond fish farming, it is necessary not only to know the composition and quality of fish feeds at different stages of development, but also to know their feed ration. Currently, the feed rations for most fish have been determined, the feed ration is designed in such a way as to replenish the energy consumed by the fish during the day. The feed ration is the amount of nutrients needed during the day. The feed ration is determined by the age and growth of the fish. A properly formulated feed ration must meet the following requirements. Fast-digesting protein, minerals, vitamins, trace elements and carbohydrates with sufficient protein content should be 23-28%. The protein ratio is 1: 2. When the water temperature decreases, the protein content in the feed increases to 1:3. For example: a one-year-old Pike perch receives 16-17% of the feed per day from body weight - zooplankton 15-33%, chironomide 15-25%, mysid 11-12% and fish 3-5%. The feed ration of catfish is 2.9% of body weight. The main part of the feed is made up of soft algae. The daily diet is 1 \ 32 of body weight during the period of active nutrition and 1 \ 50 at other times. Fish Cyprinus carpio, Carpio carpio, are well absorbed by zoobenthos (Chironomid, Oligochaete). They make up 2.5-3.0% of body weight. The most quickly digestible food is considered to be the larva of chironomid, mysid, Springer larva. The speed of passage of the feed object through the digestive tract depends on the age of the fish, the water temperature, the type of feed and the frequency of feeding. Carpiform fingerlings digest chironomid larvae with an interval of 3-3. 5 hours. On the other hand, three-year-old fish spend more than 10 hours. The intensity of fish nutrition depends primarily on the physiological state of the fish organism. Most fish, especially carp-like ones, stop feeding during spawning. Fish obesity (the ratio of fish body weight to fish body length) affects the intensity of feeding. The index of intestinal fullness (the ratio of the weight of food in the intestine to the weight of fish) decreases in most carp in autumn, but the obesity rate increases. Fish stop eating when the obesity rate reaches 3.0-3.5. Each fish species will have its own optimal temperature for intensive feeding. Out of habit, with a decrease in water temperature, the intensity of feeding also decreases. With a sufficient obesity rate, the fish moves on to wintering migrations, when the fat set is 4-5 points. It accumulates in deep places of rivers, lakes or reservoirs (4-6 m) and is at rest. If there are not enough fat reserves or the obesity rate, the fish will not go to winter. The optimal temperature for carp is considered to be 23-26 °C, for walleye -16 -18°C. Heating of the reservoir (30-35°C) has a negative effect on fish. Because of this, divers get very hot during the day, so they feed at night. However, during the daytime they do not feed sedulously and remain motionless among aquatic plants. Another factor affecting the intensity of the feed is the quality and quantity of the feed. The more colorful the food, the less it is consumed. The intensity of feeding decreases if there are also few nutritional resources.

In the diet of an adult heron, there are various aquatic animals characteristic of predators, including herons of other fish species. Goiter fish catches prey and bites it with sharp teeth in the jaw. After swallowing, the food passes through the larynx and the red right stomach. A goiter fish swallows its prey whole. Therefore, his stomach will stretch. Very small glands in the stomach wall secrete gastric juice, and under its influence, food begins to digest. The partially modified food then enters the small intestine, where it is exposed to the digestive juice of the pancreas and bile fluid from the liver. The supply of bile fluid accumulates in the gallbladder. Nutrients are absorbed into the blood through the intestinal walls, and the undigested part enters the posterior intestine and is

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excreted through the anus.

Summing up, we can say that the process of fish mating in natural reservoirs and the reclamation state of reservoirs have been fully analyzed, and the advantages of installing artificial howling installations have been revealed.

The growth development of catfish was briefly studied and their feed ration at these stages was analyzed.

The technology of creating a natural food supply in pond fish farms has been studied, experiments have been conducted on the cultivation of zooplankton and benthos representatives. Based on the results, recommendations were developed for implementation in Balinese farms.

References:

1. Husenov S.Q., Niyazov D.S. Baliqchilik. “O‘zbekiston faylasuflari milliy jamiyati” nashriyoti. Toshkent 2013.
2. Ahmedov. X.Y, Turg`unova U, Saidov Z. Baliq chavoqlarini yetishtirish. ChF «KARRLO». - Toshkent, 2006.
3. Kornilov G.K. O‘zbekiston kolxoz va sovxoz baliq xo‘jaliklarida baliq o‘stirish va semirtirish bo‘yicha metodik tavsiyalar. ToshDU. - Toshkent, 1984.
4. Xolmirzayev D., Haqberdiyev P.S., Shohimardonov D.R., Shaptaq E.S. Baliqchilik asoslari. Toshkent. «ILM ZIYO» - 2016.
5. Kamilov B.G., Qurbonov R.B. Baliqchilik. (O‘zbekistonda karp baliqlarini ko‘paytirish) - Toshkent 2009.
6. Буриев С.Б., Хайитов Ё.К., Рашидов Н.Э., Мустафоева М.И. Использование водных растений в водоросной биотехнологии Бухарской области. Экологический проблемы растительного и животного мира Бухарского региона. Бухара. 1997. С. 17-20.
7. Буриев С.Б., Рашидов Н.Э., Каландарова Д.С., Кенжаева Ж. Балиқчилик ҳовузларидаги микроскопик ва юксак сув ўсимликлари, улардан балиқчиликда фойдаланиш. Самарқанд. 2014.
8. Занозина Н.А. Количественные закономерности летней динамики макрозообентоса озера Яркулы. Изд-во Томского Госуниверситета. Томск. 1984. С. 95-104
9. Веригин Б.В. и др. Материалы по изберательности в пище и суточным рационам белого амура. В сб: Проблемы рыбохозяйственного использования растительноядных рыб в водоёмах СССР. Изд-во «Илим» Ашхабад.1963. С. 191-208
10. Камилов Г.К. Рекомендации по использованного растительноядных рыб в качестве биомелиораторов ирригационной системе Узбекистана. 1985. С. 22-26.
11. Мирзаахмедов У.О., Ниёзов Д.С. Вычисление веса доминирующих видов зоопланктона водоёмов низовьев реки Зарафшан. “В экологические проблемы растительного и животного мира Бухарского региона”. Бухара. “Илм” 1997 г. С. 133-145.
12. Shamsiyev N.A. et al. Phytoplankton of lake Ayakagimta//Central Asian Journal of Medical and Natural Science. - 2021. - Т. 2. - №. 3. - С. 140-149.
13. Shamsiyev N.A. va boshqalar Qumsulton ko’li gidrobiologiyasi va ixtiologiyasiga oid ma’lumotlar//центр научных публикаций (buxdu.uz). - 2023. - Т. 38. - №. 38.
14. Shamsiyev N.A. et al. Information on hydrobiology and ichthyology of lake Kumsultan //Science and Innovation. - 2022. - Т. 1. - №. 8. - С. 245-256.

Web of Agriculture: Journal of Agriculture and Biological Sciences
webofjournals.com/index.php/8

Volume 2, Issue 5, May - 2024
ISSN (E): 2938-3781

15. Shamsiyev N.A. High Vegetation of Lake Ayakagitma in Bukhara Region and Their Distribution //центр научных публикаций (buxdu. uz). - 2023. - Т. 38. - №. 38.
16. Shamsiyev N.A., KuzmetovA. R., Toshov H.M., Abdinazarov H.H. Hydrobionts of Devhona and Ayakagitma Lakes in Bukhara region //International Journal of Sciense and Research (IJSR). - 2019. - Т. 8. - №. 11. - С. 1763-1769.
17. Пардаев Ш., Ахроров Ф.А. Питание личинок и мальков рыб на различных этапов развития в Нурекском водохранилище. Изд.АН.ТажССР. №6, 1977, стр 91-96
18. Niyozov D.S. va boshqalar. Buxoro viloyati tabiiy suvliklarini bioekologik xususiyatlari va ulardan baliqchilik uchun foydalanish yo`llari. Ekologiya xabarnomasi. №3 2013 y. 16-19 bet.

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