

## JUSTIFICATION OF FEED AND FEED ADDITIVES FOR GROWING FISH

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### Annotation

Combined feed, these are concentrates that contain increased levels of protein, minerals, microadditions and they are a set of feed products in ratios determined on the basis of modern data on the nutrient requirements of fish.

**Key words:** reservoir, cages, medical and preventive feeds, components, feed base, zooplankton, algae.

### Introduction

Currently, industrial fisheries are developing faster than commercial fisheries as the demand for fish is growing among the population. This type of fisheries, that is, industrial, allows you to get less expensive products, besides, an increasing number of consumers prefer fish as a healthier food compared to other types of meat.

To draw up a program for feeding fish, the nutritional needs of various fish species are taken into account, as well as according to the method of their cultivation, that is, in ponds, open reservoirs or special pens, cages. The program covers the entire range of feeds for a full growing cycle, from starter feeds, juvenile feeds, production feeds, feed for producers and up to therapeutic and preventive feeds.



1. Picture. Pond and cage fish farming



Therefore, the food supply, consisting of natural food such as zooplankton, algae and feed, is of great importance. In addition, the use of grain, juicy and coarse feed products is biologically complete feeding. Since it fully meets the fish's need for nutrients, minerals and biologically active substances.

All this is a valuable, nutrient-rich and vitamin-rich food, so it must necessarily make up at least 20-25% of the daily diet of fish with compacted plantings. The rest of the diet falls on specially prepared compound feeds, which are based on various cakes and grain processing products. These feeds have different nutritional values, which is determined by the feed coefficient - an indicator of the feed consumed per unit of fish growth.

The calculation of the feed demand from the planting density and the average daily increase is made according to the formula:

$$D = \frac{(B \times A \times (N-1))}{N}$$

where D is the daily feed rate per fish, g; B is the average daily increase in fish, g; A is the feed coefficient; N is the multiplicity of fish planting.

Usually, when feeding pond fish, compound feed is used, which includes wheat, crushed corn, and peas. Such feeds contain a lot of carbohydrates and vitamin B, but are poor in protein and basic amino acids, so protein components such as soy meal and premixes containing amino acids, in particular methionine and lysine, are necessarily introduced into them. Also, in mixed feeds for fish, peeled barley is used no more than 40%, toasted soy up to 70%, wheat bran up to 70%, sunflower cake or meal no more than 50%, soy cake or meal up to 40%, molasses beet molasses – up to 3%.

Other components necessary to create a complete feed are feed phosphates that enrich the feed with essential linolenic and arachidic acids; protein raw materials – fish, meat and bone meal, blood meal, milk processing products, feed yeast, etc. Animal proteins can be easily combined with other feed additives that complement each other in amino acid composition, which allows you to bring the feed into compliance with the nutritional needs of various types of farmed fish.



Table No. 1. Composition and nutritional value of vegetable feed, g/kg of feed

indicators	Corn		soft wheat	oats	rye	barley	soy	wheat bran	Meal		
	white	yellow							flax	soy	Sunflowe
organic substances											
protein	92	103	133	108	120	113	319	151	340	439	429
fat	43	42	20	40	19	22	146	41	17	27	38
fiber	43	38	17	97	21	49	70	83	96	62	144
mineral elements											
calcium	3.7	5.2	3.4	4.4	4.8	5.0	21.7	10.9	12.5	19.5	8.0
phosphorus	2.7	5.2	3.6	3.4	2.8	3.9	7.1	9.6	8.3	6.6	12.2
magnesium	1.5	1.4	1.0	1.2	1.1	1.0	2.9	4.3	5.3	3.5	5.1
kalium	0.4	0.5	0.8	1.5	0.9	2.0	4.8	3.0	2.8	2.7	3.6
natrium	0.1	1.3	0.1	1.8	0.1	0.8	3.4	0.9	0.8	0.4	0.4

The composition of amino acids and their availability are primary factors in determining the nutritional value of a feed additive used as a protein source. Despite the fairly good amino acid composition, proteins obtained during animal processing may be deficient in one or more essential amino acids.

According to the nutritional properties of the feed components and their digestibility, you can choose the "ideal" amino acid and vitamin-mineral composition of the premix, based on the needs of fish for essential amino acids, vitamins and trace elements.

Depending on the composition of the main nutrients, vegetable products are divided into three groups — rich in starch, protein or fat. The content of nutrients and mineral elements in some components of plant origin used in the manufacture of fish feed.

### Conclusion

It is very important to use specially developed premixes in mixed feeds for fish, balancing feeds in terms of the content of essential amino acids, as well as vitamins and trace elements. Vitamins of group B are especially important for the normal growth and development of fish. Productivity in the fishing industry can be achieved through timely feeding, proper distribution of fish in the reservoir, care and continuous monitoring.



## **Literature**

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