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SELECTION OF THE DIAMETER OF THE GRANULATOR MATRIX DEPENDING ON THE AGE AND WEIGHT OF THE FISH AND ITS ANALYSIS

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ABSTRACT

The correct and timely balanced feeding of fish according to their age and type, that is, providing them with saturated nutrients with all the necessary ingredients, bringing them to the state of the finished product in short time is an important task. Therefore, now the demand for water-resistant granular products is growing.

KEYWORDS: ***fish, animal husbandry, vitamins and minerals, height and weight, excessive wastefulness, vitamins and minerals.***

1. INTRODUCTION

Currently, fish farming is considered a profitable business. That is why, raising and delivering fish in line with market demands is the main requirement for a fish farming. This makes to pay great attention for feeding fish with the right nutrients. Another important economic aspect of fish farming is that fish farming spends less feed consumption in comparison with animal husbandry. The main task is to choose the right diet and distribution, feeding fish with ready-made food is the easiest and most acceptable choice. Feeding fish with nutrients which contain the necessary vitamins and minerals for well growth and development[1].

2. MATERIALS AND METHODS

There are many types of nutrients, but now the most effective way to gain the rapid growth and weight of fish is to feed them with dry granular nutrients. The advantage of these granular feeds is that they facilitate the feeding process, do not pollute the pond or cage, depending on the type, age and weight of each fish, the size of the pellets is selected and the necessary amount of nutrients is distributed. When choosing a feed, it is taken into account what and how the fish is fed. Fish are divided into meat-eating, herbivorous and omnivorous species[2].

For the above reasons, the composition and size of the pellet is selected. Fish food is divided into two types:

- Plant (stems of various plants and their grains, alfalfa, wheat, oats, crushed legumes and cereals, oilcakes)
- Animal (the remains of fish and other animals are ground to a flour-like state).

Besides that, various minerals are added to the granular feed, which is desirable, since they are highly effective in digesting food and increase the immunity of fish. As a result, it helps to rapid gain of height and weight of fish. The basis of fish food is a plant and animal organism. For example, in order for a Pike to gain weight - 1 kg, it needs to eat 3 kg, and a trout needs to eat 5 kg of young fish. The diet of fish is determined depending on what kind of fish it belongs to. When the fish are small, they all eat the same food, meaning they feed on plankton and larvae. As it gets bigger, so does the diet. Predatory fish are fed on small fish, and herbivores on the remains and veins of various grasses.

At least 30% of the fish diet should correspond to natural food. This is especially important for the growth of young fish. For properly usage of natural feed in the pool, first of all we need to determine what the natural feed base of the pool is. Standing water, which is more exposed to the sun's rays, will be a good condition for increasing the natural food in the pools. For this purpose, hydro biological studies are carried out in the pools. To enrich the natural food of the pool, various nutrients are filled in it.

For fish that feed above water supplied with insects that walk on water and fly above water, for fish

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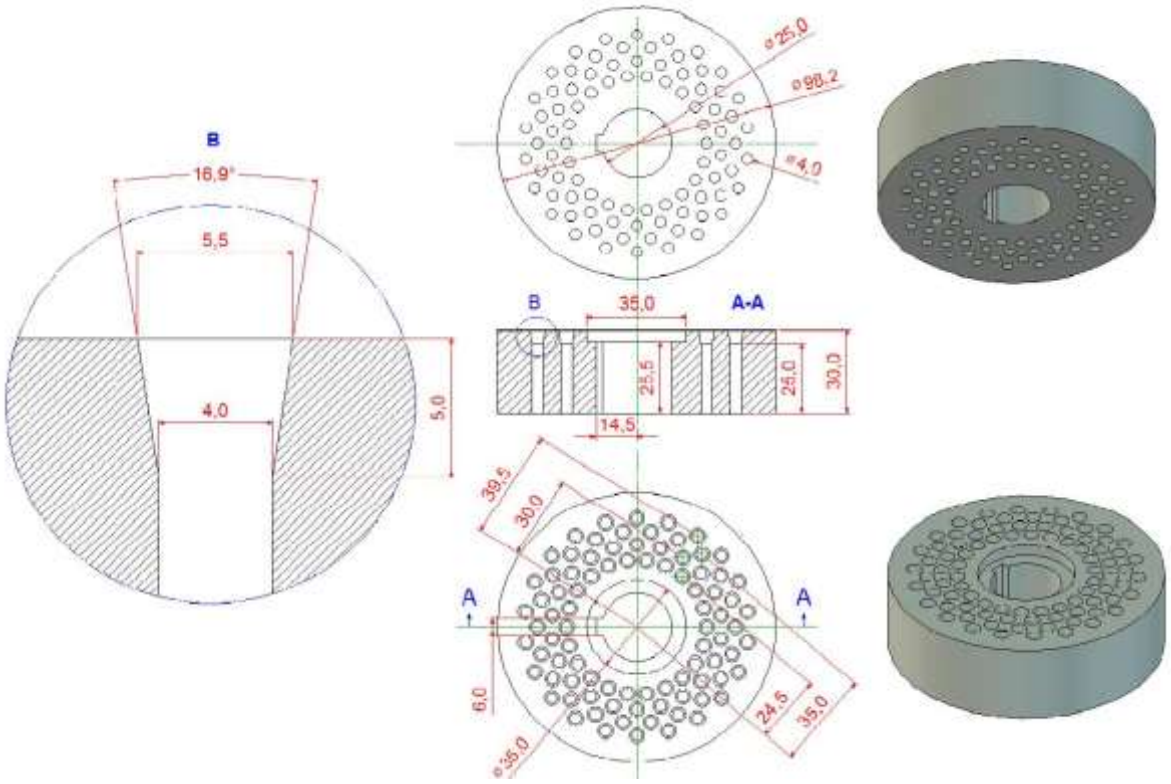
that feed under water supplied with larvae and worms. In addition, during the wake-up season, it is very effective to light low-voltage lamps at night in fish ponds or cages. Because at night different insects come to the light of the lamp, fall into the water and cover 25-30% of the food norm of fish. This leads to an increase in the economic efficiency of feeding fish during the season by 25-30%.

Currently, industrial compound feeds, i.e. feed, are produced depending on the age of the fish. Granulated feed is especially popular. Because these feeds are convenient for storage, transportation, distribution, less crumble and do not pollute the water. The feed contains nutritious proteins and substances. This promotes good growth and proper development of the fish. Properly distributed food, in its turn, prevents excessive wastefulness. Feeding fish with granular feed with automated feed dispensers is very easy and not time-consuming [3].

3. RESULTS AND DISCUSSION

The working process of the granulator is such that the mass of food raw materials, heated to the required temperature, is thrown into the granulator hopper. At the bottom of the hopper the matrix is installed, on top of it rotates the press rolls attached to the center, presses the mass supplied to the matrix. The mass passes through the pressing channels of the matrix, with the help of knives under the matrix, the finished pressed feed is cut to the desired length, brought to the state of pellets and sent to dry.

Depending on the weight of the fish, the size of the feed is determined and the desired matrix is selected, with the diameter of the pressing channel and installed in the granulator. The diameter of the pellet is selected taking into account the weight and age of the fish, that is, depending on the weight of the fish, the diameter of the feed also increases.



1. Picture. View of two matrices of different diameters

The ready pellet has a cylindrical shape, the diameter of which depends on the size of the pressing channels(holes) of the matrix. The most common diameter of the feed is 4,7 mm. The length of the feed is about 10-15 mm, that is, the diameter, the granulation mode can vary depending on the requirements. The surface of the granulated feed is usually glossy, the color and smell of which should correspond to the color and smell of the raw materials from which the feed is made. Some substances and fats that affect the color of food can cause a slight darkening of its color. The moisture content of the granulated feed should not exceed 14.5%. From the point of view of the biological value of the feed, it should correspond to the fish feed recipe.

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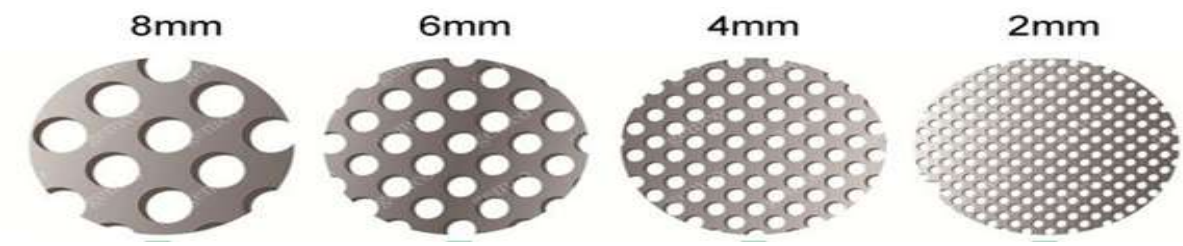
Table 1. The value of the feed index for different types of fish

Measurement	The value of the feed index					
	For carp fish			For sturgeon and salmon fish		
	starting points	production lines		starting points	production lines	for repair and breeding stock
		for fish weighing up to 50 g	for individuals weighing more than 50 g			
Mass fraction of moisture,%, no more:						
In the form of grits and granules	13,5					
In the form of an extrudate	12,0					
Mass fraction of crude protein,%, not less	45,0	35,0	30,0	50	42	50
Mass fraction of crude fat,%, not less	8,0	7,0	5,0	11,0	12,0	10,0
Mass fraction of crude fiber,%, max	2,0	4,5	6,0	1,5	3,0	2,0
Mass fraction of crude ash,%, max	10,0			11	10	12
Mass fraction of phosphorus,%, not less	1,2			0,8		
Mass fraction of lysine,%, not less	2,4	1,7	1,5	3,0	2,1	2,4
Mass fraction of methionine and cysteine (in total),%, not less	1,1	0,8	0,6	1,6	1,2	1,3
Crumbling capacity,%, no more:						
granule	5,0			3,0		
extrudate	3,0			2,0		
Water resistance of granules, min., not less	20,0			30,0		



2. Picture. Matrices of different diameters

The installation of these matrices on the granulator can be used both in cattle breeding, poultry farming, and in rabbit breeding. The granulator is easy to use, changing matrices are also easy, efficient and most importantly economical.

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4. CONCLUSION

Granulated products are enriched with various substances that prevent diseases of the fish, as well as increase its immunity. It is enough to distribute food to the fish in the pond, in the tank once or twice a day. It can be stored in a dry place for up to one and a half to two years. Changing the ingredients can be used in other branches of animal husbandry.

5. REFERENCES

1. *Sidorova V.I., Yanvareva N.I. Development of new technologies and techniques for the production of fish feed// Fisheries. - 2017. № 4 (134). - p.- 168-180*
2. *Zaharov V. Mixed feed for commercial fish farming// Mixed feed. - 2010. - № 6. - p. 34-39.*
3. *Shaari M.F., Aerial Fish Feeding System, Proceedings of the 2011 IEEE, International Conference on Mechatronics and Automation, August 7 - 10, Beijing, China*
4. *Technologyofproductionofcompoundfeedsforvaluablefishbreedshttp://otherreferats.allbest.ru/manufacture/00633515_0.html*
5. *Investigation of the process of press granulation of mixed feeds in press granulators with an end restriction of the wedge-shaped working space https://otherreferats.allbest.ru/manufacture/00883023_0.html*
6. *Calculationofcompoundfeed http://knowledge.allbest.ru/manufacture/3c0a65635b2bd68a4c43a88421206c27_0.html*
7. *Astanakulov K.D., Kurbanov F.K., Isakova F.J. Substantiation of the operating mode of the pendulum feeder// The American journal of applied sciences, volume 2, issue-11, 2020. -p.-110-115.*
8. *Allen Davis. Feed and feeding practices in aquaculture// Woodhead Publishing, 1st edition, 2015.https://www.elsevier.com/books/feed-and-feeding-practices-inaquaculture/davis/978-0-08-100506-4*
9. *Charis Galanakis. Sustainable fish production and processing// Academic Press, 1st edition, 2021.https://www.elsevier.com/books/sustainable-fish-production-and processing/galanakis/978-0-12-824296-4*
10. *S. Schultz, B. Vallant, M.J. Kain, Preferential feeding on high quality diets decreases methyl mercury of farm-raised common carp. http://www.sciencedirect.com/science/article/pii/S0044848612000075*
11. *Sean M. Lucey | Kerim Y. Aydin, Evaluating fishery management strategies using an ecosystem model as an operating model https://www.sciencedirect.com/science/article/pii/S0165783620302976*