



HOMEMADE FORMULATED FEED

for aquarium keeping using household ingredients for use in
COVID -19 lockdown period



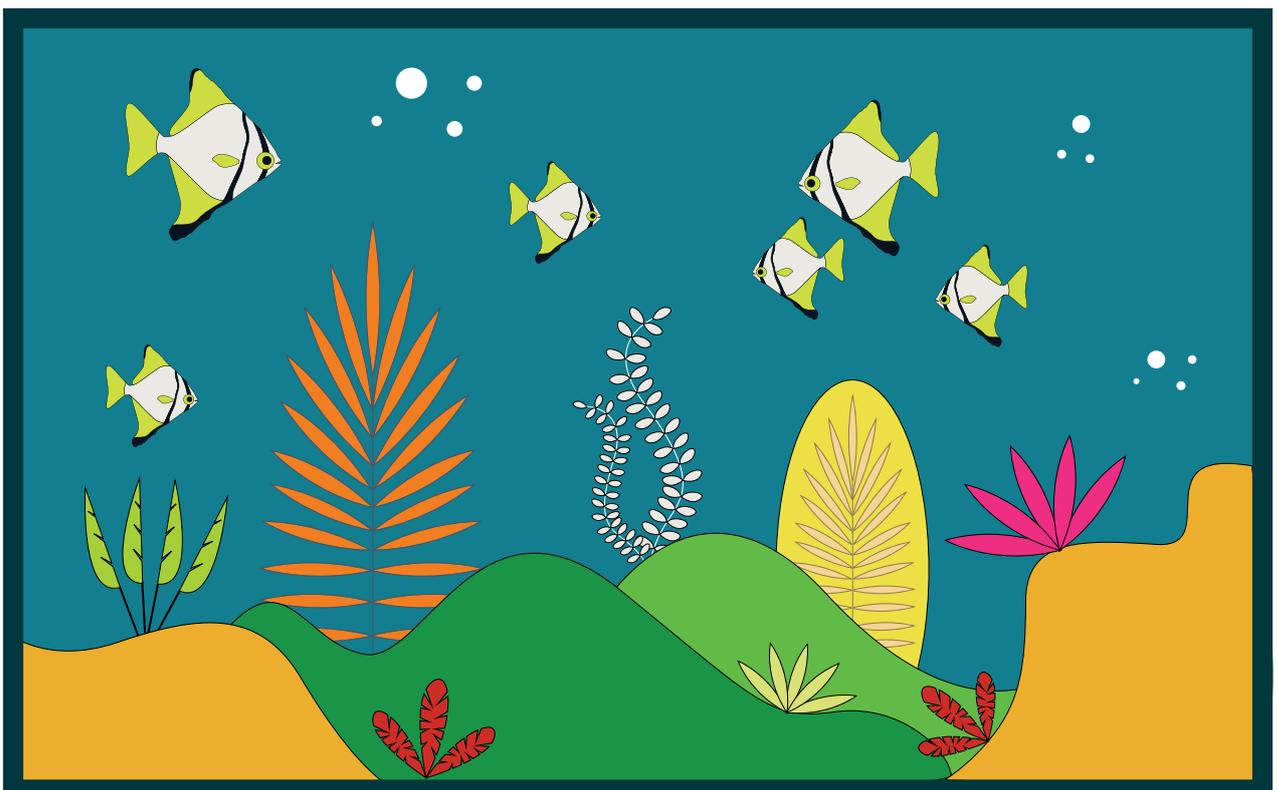
Kolorfish^{plus}:

a popular brand of ornamental fish feed from ICAR-CIBA

Introduction

Aquarium keeping hobby is on the rise across the world including India, and feed assumes paramount importance in the ornamental fish maintenance. Nutrients essential to ornamental fish are the same as those required by most other food fishes, however colour and health is the focus on feeds used in ornamentals, rather than growth. Hence colour enhancing pigments (carotenoids) are commonly added to the diet of ornamental "aquarium" fishes to enhance their coloration. Most of the aquarium hobbyist and ornamental fish farmers procure the feed from commercial manufacturers through the dealers/agents, and household keepers get it from retail shops. The unprecedented lockdown jolted this particular sector and end users due to the non-availability of feeds to feed the fishes. Though the government has included feed for aquaculture under exemption category,

the mechanism could not help the aquarium hobbyist and aquariculturists, there is a severe shortage of feed, as the retail stores of aquarium are also closed, and there was a felt need for the hobbyist to prepare their own feed at home. In this scenario an advisory pamphlet has been prepared to help the hobbyist for preparation of suitable feeds for own use, with resources available within their home. Here it is pertinent to note that, though the aquarium feeds are highly specialized functional feed, a standard maintenance feed for aquarium containing 20 to 25 grams of crude protein and 3 to 5 grams of lipid per 100 gram of feed can be prepared at home and use for feeding, during the period of non-availability of feeds through the normal outlets. In this back drop a detailed know how and methodology for homemade preparation of formulated feeds for aquarium keeping is given.



Nutrients required and their ingredient resources in home

The main objective of homemade ornamental feed preparation during the exigency periods is to maintain and feed the fish with a standard quality feed containing major nutrients like energy, protein and lipids. This can be easily achieved with the common food ingredients normally used in our household and the ingredients required are given below

1) Energy sources

All the cereal grains are rich sources of energy and most of the households will have the following cereals as grains viz., Maize or Corn, Wheat/ Maida, Rice, Ragi and major and minor millets like Sorghum and Bajra. Based on the availability in the particular household, these ingredients can be selected from the above list and it is always advisable to use a minimum of two sources of energy

2) Protein sources:

The commonly used protein sources in the food of human beings are pulses and grams and these can be used to meet the protein requirement in the aquarium feed. The protein sources are further divided into medium and high protein sources. Soya flour or soya chunks/ nuggets / milk powder is the commonly available high protein sources and the medium protein sources are Redgram, Blackgram, Greengram, Bengalgram, Toor dal/Arhar, Peas, Beans, Rajma and Lentils.

The main objective of use of protein sources is to meet the essential amino acid requirement

and hence it will be advisable to include more number of plant proteins in the formulations so that all the essential amino acid requirements are met in the home made feed also. If households are using non vegetarian food items, egg and fish meal/ fish and shrimp waste can be used as a protein source

3) Lipid sources

The commonly used cooking oils can be used as lipid sources in the home made ornamental feeds and the options available are Palm oil, Groundnut oil, Soyabean oil, Gingelly oil, Cod liver oil Mustard oil. Any one of the above oil can be used as per availability. If groundnut seeds/ sesame seeds are available they can be used as both lipid and protein sources

4) Miscellaneous sources

In order to meet the mineral and vitamin requirement, the following items available in the household can be used. To meet the calcium requirement the hydrated lime, commonly used along with paan leaves can be used and the alternate options are calcite/ egg shell/ lime stones or calcium supplements intended for human use. Common salt may be included at 5 to 10 gram per kilogram of feed. For vitamin and colour imparting pigments, the leafy green vegetables like spinach, broccoli, lettuce, carrot, beetroot moringa leaves, coriander leaves marigold petals, China rose and yeast powder can be used. Multivitamin tablets (two tablets per one kilogram feed) and lemon juice (two lemon) can also be used as vitamin supplements.

Formulations of standard homemade ornamental feed:

In India our food habits are diverse and varying from region to region and also striking difference exists in food preference among vegetarian and non-vegetarian and hence to meet the minimum requirement of 20 to 25 grams of protein and

3 to 5 grams lipid in every 100 gram of feed, with other micro nutrients the following sample formulas are suggested for preparation as per the choice and preference of the hobbyist.

Table –1: Formulations for Vegetarian households

Ingredients/Sources	Inclusion Level (gram per kilogram of feed)	
	Option 1	Option 2
Energy sources Rice/ Maize/ Wheat/ Maida/ Ragi/ Sorghum/ Bajra (Minimum of two sources as per availability at 1:1 ratio)	350	350
Medium Protein sources Lentil/ Toor dal/ Arhar/ Green gram/ Black gram/Bengal gram/ Beans/ Rajma/peas (Minimum of three sources as per availability at 1:1 :1ratio)	310	320
Soya flour/ Soya nugget/chunks	170	200
Milk Powder	50	50
Ground nut seeds/ Gingelly seeds	60	-
Palm oil/ground nut oil/soyabean oil/mustard oil/cod liver oil gingelly oil (any one of the oil as per availability)	-	20
Hydrated lime/ Shell grit/ calcite/ lime	10	10
Miscellaneous items: Spinach, Lettuce, Carrot, Beetroot, Moringa leaves, marigold petals, China rose, turmeric, banana, papaya and yeast powder (Combination of available ingredients as per household)	50	50
Total	1000	1000

Table –2: Formulations for Non Vegetarian households

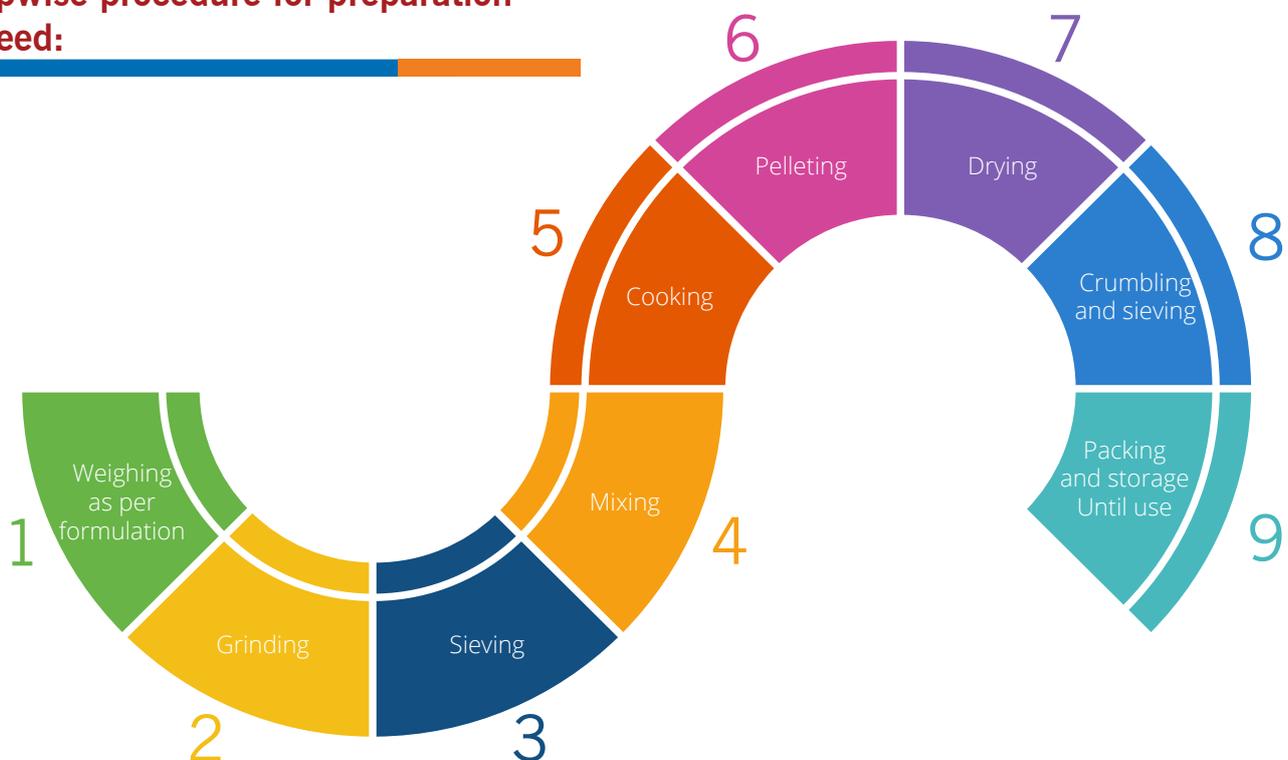
Ingredients/Sources	Inclusion Level (gram per kilogram of feed)	
	Option 1	Option 2
Energy sources Rice/ Maize/ Wheat/ Maida/ Ragi/ Sorghum/ Bajra (Minimum of two sources as per availability at 1:1 ratio)	300	300
Medium Protein sources Lentil/ Toor dal/ Arhar/ Green gram/ Black gram/Bengal gram/ Beans/ Rajma/peas (Minimum of three sources as per availability at 1:1 :1ratio)	340	290
Soya flour/ Soya nugget/chunks	200	230
Egg	100 (2 eggs)	-
Fish / shrimp/ fish and shrimp waste	-	120
Palm oil/ground nut oil/soyabean oil/mustard oil/cod liver oil gingelly oil (any one of the oil as per availability)	20	20
Hydrated lime/ Shell grit/ calcite/ lime	10	10
Comon salt	5	5
Miscellaneous additives	25	25
Total	1000	1000

Thumb rule for homemade ornamental feed formulation:

The formulations given above would be helpful in formulating the home made feed for aquarium fishes. However, for easy understanding the formulation and preparation, the following thumb rule may be considered. Any one of the available energy sources (cereals) and protein sources (any grams or dals) are to be used in the ratio of: 1:1.5, which means to prepare

one kilogram of feed, 400 gram of rice/wheat to be mixed with 600 grams dal/ grams. To this one kilo gram mix, 20 ml of any one of the cooking oil available in the house and 50 gram of miscellaneous additives may be used for preparation. If any one ingredient is not available then a suitable alternates as suggested can be used.

Stepwise procedure for preparation of feed:



1. Weigh all the ingredients as per the formulation using kitchen balance or measure using commonly available measuring utensils at home.
2. Powder all the dry solid ingredients individually using a mixer, if there is any difficulty in individual grinding of protein sources, it may be mixed and powdered
3. Sieve the powdered materials using a sieve available. The commonly used sieve to sieve atta/maida or the tea strainer can be used to sieve the powdered mash.
4. Wet materials like fish waste, green leafy vegetables and egg, are to be homogenized/ emulsified separately in the (mixer) grinder by adding adequate quantity of water.
5. Add oil to the powdered mix and mix well in a big vessel
6. Now add about 100 to 150 ml of water by sprinkling and mix again
7. Cook the mixed mash using a pressure cooker for 5 minutes. Alternatively idli cooker

or any other vessel with provisions for keeping the mash shall be used.

8. If there is clump formation, manually mix again and then add about 400 to 500 ml water and make it like semi moist dough
9. Pelt the dough using a hand press machine, commonly used for noodles /vermicelli / bhujia making. If there was a difficulty in pellet making, additional quantity of water may be added. The hand press machine will

give better pellets at 50 to 60% moisture content and accordingly the water content has to be added and collect it in a tray.

10. Dry the pellets directly under fan/in an oven or by keeping it in the sunlight
11. Hand crumble the dried pellets to the required particle size as per the requirement and sieve it to assorted particle sizes and store in an air tight feed storage container.

Conclusion:

ICAR-CIBA realized the urgent need for formulated feed for homestead aquariums, due to the non-availability of aquarium feed during the lock down situation, a home-made feed for ornamental fishes was conceived and came out

with an advisory to prepare the homemade feed. We hope that this will be of great use for people involved in ornamental aquarium business, aquarium hobbyists and breeders.



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Any clarification in this regard may please be mailed to:

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