

## Technical Bulletin #12:

# Making Your Own Feed

### Should I make my own feed?

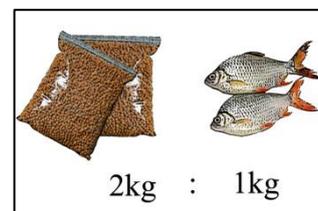
Many farmers want to make their own fish food. If a farmer has all of the ingredients on the farm, the farm-made feed **COULD** be the cheapest and most cost-effective solution. However, there are some important things to consider before deciding to make on-farm feed.

Important limitations of farm-made feed are: First, the feed conversion ratio (FCR) will be higher because it will not hold together in the water as well as factory-made feed. Secondly, the FCR will be higher than for factory-made feed because the nutrients are not balanced (limiting factors). Third, the price to make the same feed will be higher for farm-made feed because the farmer must pay more for ingredients than a large factory does. This is why farmers are often forced to use ingredients that are of lower quality.



### What is the FCR?

The FCR is the number of kilograms of feed required to produce a kilogram of fish. For example, if it takes two kilograms of food to produce one kilogram of fish, the FCR would be 2.



### How do I make farm-made feed?

- Use at least three different ingredients.
- Look for high protein ingredients (protein should be about 30 percent of diet).
- Grind ingredients finely and cook:
  - Especially if using starchy things like ground rice and if using soy.
  - Cooking helps the different ingredients stick together, but it also destroys some vitamins.
  - If using soybean, cook for at least one hour.
- Total fat should be about 6 percent for large fish and 12 percent for very small fish
- Fiber is a problem if it is too high (if more than 10 percent). Keep in mind that rice bran is high in fiber.





### How much do I feed my fish?

How much you feed depends on several things: fish size, feed quality, water temperature, and water quality.

When fish are very young and small, they grow very quickly. Fast-growing fish need a lot of food to sustain that growth. Because the fish are small their stomachs can only hold a little food. This means that a small fish must eat good food that is high in protein many times each day. As fish grow, they can be fed fewer times each day and use feed that is lower in protein. Feed lower percent body weight BUT feed more total feed as fish grow.

If oxygen is low, and fish do not come to eat, DO NOT FEED.

If the stocking density is low, and the water is green, some types of fish like tilapia, gourami, and silver barb can get some nutrition from natural feed. Natural feed is high in protein and low in energy. The farmer can therefore give low-protein feed to supplement.

Powdered feeds are attractive because they are often cheap. However, the various ingredients in a dry powder will either float or sink. This means they separate when placed in water. Typically the fibrous parts of a powdered feed float and are consumed by the fish. The high protein parts of the feed, such as pieces of fish or soybean, will sink quickly to the bottom of the pond where they are not eaten. These are also the good and expensive parts of the feed.

No matter what you feed, keep records of the type, amount of feed given, the cost of the feed, and the amount of fish produced, and you will be able to evaluate for yours the different feeds and formulas you try.

### Sample Recipes

Fish fed with Formula 1 will need to eat much more feed in order to grow. The part they do not use will stay in the pond and make the water poor quality. Fish fed with Formula 2 will grow better, and those fed with Formula 3 will grow even better. Formula 2 and 3 will cost more per kilogram than Formula 1, but the fish will require less feed so the actual cost of growing the fish can be lower.

Ingredient	Formula 1	Formula 2	Formula 3
Rice bran	25 kg	50 kg	25 kg
Maize	25 kg	0	20 kg
Soybean	0	30 kg	30 kg
Greens	50 kg	0	0
Azolla*	0	20 kg	15 kg
Trash Fish	0	0	10 kg
<b>TOTAL</b>	<b>100 kg</b>	<b>100 kg</b>	<b>100 kg</b>

Each of these formulas will give different protein and have different costs. Normally cost is higher for higher protein but so is growth higher and the amount of feed needed to produce a kilogram of fish is lower. These are only approximate values. The actual will depend on the quality of ingredients that are used. They can be highly variable. If you cannot find some of the ingredients you can find a substitute by looking in the table that gives protein values of the different ingredients.

Below are the estimates for the nutrient percentages found in each of the three formulas. It is hard to compare because some formulas have more water than others. On a dry matter basis it is easier to compare the three formulas, but this does not mean you need to dry the feed.



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As Dry	Formula 1	Formula 2	Formula 3
<b>Water</b>	0	0	0
<b>Protein</b>	10%	21%	24%
<b>Fat</b>	7%	14%	12%
<b>Fiber</b>	9%	9%	6%

As Fed	Formula 1	Formula 2	Formula 3
<b>Water</b>	50%	25%	22%
<b>Protein</b>	5%	15.5%	18.7%
<b>Fat</b>	4%	10.2%	9%
<b>Fiber</b>	4%	7.1%	5%

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