



Aquatic Animal Nutrition: Make a Fish Food



Grade Level:

9-12

Subject Area:

Aquaculture, Nutrition

Time:

60 minutes

+ introduction/discussion time

Student Performance Standards (Sunshine State Standards):

03.01 Employ scientific measurement skills (SC.912.E.7.8; SC.912.L.14.4; SC.912.S.3.1, 9; MA.912.A.1.5; MA.912.S.4.2; MA.912.S.5.1, 3; MA.912.S.5.2, 3, 4, 5).

06.01 Explain the economic importance of animals the products obtained from animals (SC.912.L.14.11, 12, 13, 14, 15, 16, 17, 18, 19, 21, 22, 28, 29, 31, 32, 33, 34, 36, 40, 41, 42, 43, 45, 46, 47, 48, 51; SC.912.L.15.4, 5, 6, 7; SC.912.L.16.3, 4; SC.912.L.17.11, 12, 13, 15, 16, 17, 18.19).

11.07 Determine why aquatic crops may be more productive than terrestrial crops (LA.910.1.6.1, 2, 3, 4, 5; SC.7.L.10.2, 3; SC.7.L.11.2, SC.912.L.14.7).

11.10 List and describe the major factors in the growth of aquatic fauna and flora (LA.910.1.6.1, 2, 3, 4, 5; SC.7.L.17.1, 2, 3)

15.05 Determine feeding methods and feed aquaculture species (LA.910.1.6.1, 2, 3, 4, 5; MA.912.A.1.4).

Objectives: Students will be able to

1. Formulate fish food (measure, mix, roll, dry).
2. Classify types of fish food as live or commercial.
3. Describe types of fish food.
4. Analyze fish food based on appropriateness for larval or adult fish.
5. Compare and contrast live foods for common and commercial use.

Abstract:

Ever wonder what goes into the food animals eat? This activity will allow your students to appreciate fish foods from the inside out by constructing a fish diet from locally available ingredients. This activity will gain skill at measuring accurately by using a scale and calculating percentages. This activity will also provide them with an idea of what a diet smells and tastes like (If they want to eat it!) Students

will gain skills in manipulating the feedstuffs and subsequently feeding their diet to fish.

Interest Approach:

Show various food items to class, processes vs. fresh. Ask them which they prefer to eat and why? Answers will likely vary but may center on the following: color, flavor, texture, and smell. This will often be the same reasons, which you could site for fish. Display several types of fish food, or show slides of live vs. commercial feeds and ask them to speculate if this applies to fish, or would have importance in a fish farming operation.

Student Materials:

1. Pencil
2. Paper
3. Calculator
4. Clothes that may get dirty

Teacher Materials:

<i>Material</i>	<i>Store</i>	<i>Estimated Cost</i>
Pencil/pen	NA	NA
Paper	Office Depot, WalMart	\$1.99 and up
Calculator	Office Depot, WalMart	\$4.99 and up
Wax paper	Local grocery store	\$2 and up
Wooden/metal spoons	WalMart, Target	\$5 and up
Bowls	WalMart, Target	\$3 and up
PowerPoint Handout	NA	NA
Pictures/samples of feed from each animal (pellets, flakes, etc.)	NA	NA
Examples/pictures of larval and adult fish foods (algae, daphnia, feeds)	NA	NA
Scale	WalMart, Carolina Biological	\$20 and up
Weighing boats	Carolina Biological	\$16 and up
Ice trays	Local grocery store	\$3 and up
Fish food recipe	Support materials	NA
Fish meal (or canned sardines), Corn meal, Wheat flour, Soybean	NA	NA

meal

IFAS publication VM 114 <http://edis.ifas.ufl.edu/FA096>
(Fish Nutrition)

NA

Student Instructions:

1. See attached handouts for students (FEED COMPARISON).

Teacher Instructions:

Preparations:

1. Provide students with samples of fish food for comparative purposes.
2. If making fish feed, assemble ingredients mixing equipment and “recipe” for diet feed (FISH DIET OBJ 3). (Depending on the type of fish food you are making the recipe can be modified in many ways.)

Activity:

| During the diet making process, make certain you ask students:

1. If they understand what they are doing.
2. Why diet (ration) making might be important in certain aquaculture operations.
3. Why would animals need supplemental or complete rations.

| Have students dry the diets on wax paper for feeding to fish the next day.

Post work/Clean-up:

Wash all the apparatus and throw away any extra ingredients which will not be stored in the refrigerator.

Anticipated Results:

1. The instructor should expect the students to be able to identify the following after students examine several feeds (Refer to VM 114 during this discussion):

Live fish food:

Pros

- Nutrient rich for small fish
- Small size often eliminates consumption problems
- Complete nutrition for small fish
- Technology associated with rearing of live foods is improving rapidly.

Cons

- Difficult to maintain stocks
- Expensive

Commercial fish food:

Pros

- Complete, uniform quality nutrition in each feed pellet*
- Easier to maintain a balanced diet*
- Sold dry or semi-moist (easy shipping)*
- Semi-moist provides good texture, more like live foods.*
- Pellets or flakes*

Cons

- Rapid sinking unless the pellet is extruded (made like breakfast cereals).*
- Ultra small pellet size may be impossible to manufacture for larval fish.*

2. Review food size and how it relates to texture (have students explain).
3. Remind students how they distinguished food textures by how they felt.
4. Review out loud with students. Ask the following questions and call on students for their answers. Students should understand the following after the lesson:
5. If questions are not answered correctly review the topic as needed.

Support Materials:

1. Fish Diet Recipe
2. Aquaculture Nutrition ARC PowerPoint

Explanation of Concepts:

Math conversions

Animal nutrition



Support Materials



FISH DIET RECIPE: **BASIC/GOLDFISH/CARNIVORE**

INGREDIENT	AMOUNT (g)	MEASURED (g)
Canned Tuna in light oil (or can of sardines)	25	_____
Wheat Flour	20	_____
Corn Meal	10	_____
Soybean meal or flour	15	_____
Egg powder	5	_____
Spirulina Powder	5	_____
Wheat Germ	5	_____
Gelatin	10	_____
Cod Liver Oil	5	_____
	100	

Methods:

1. Weight all ingredients into weight boats, recording weight to the nearest gram.
2. Write actual weight on the data spaces at the right of the ingredient list. (If a value of weighed ingredients total exceeds 100%, subtract weight of Wheat Flour until 100% is obtained.)
3. Mix ingredients until well blended.
4. Add small amounts of water until dry ingredients stick together forming a dough (Similar to cookie dough.)
5. Place dough in ice tray sprayed with light coating of vegetable oil and freeze overnight.
6. Remove the “dough cubes” from the freezer the next class and examine.
7. Describe the texture, consistency, feel and smell of your diet.
8. Feed to fish and observe the results. How is this different than if you fed live diets?