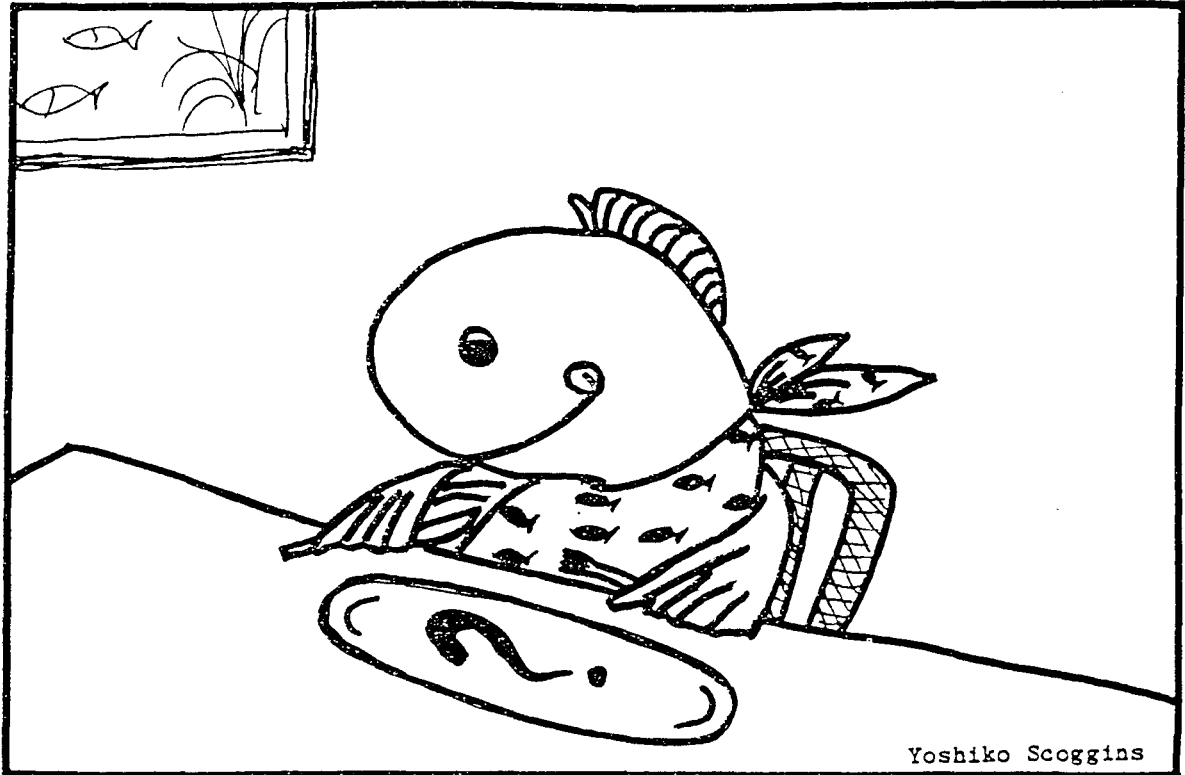


# Fish Feeding by Midge Hill

Many factors affect the amount of food fish need for optimum growth...body size, age, water temperature, type of food fed, activity, stress, etc.

As a general rule smaller fish need more food proportionally than large fish, because small fish have relatively more body surface through which energy (in the form of heat) is lost to the water. If the smaller fish also happens to be a young fish it will require even more energy because more of the intake goes toward growth. As the growth process tapers off, the food requirements decrease as more of the intake is used directly for activity. However, unlike mammals, fish continue to grow throughout their life span so always need some protein available for tissue growth. The younger fish also need more frequent feeding as food passes quickly through their small digestive systems.



Water temperature has quite an effect on food requirements. For every rise of 10 degrees in water temperature, the metabolic rate of fish doubles. (Schaeperclaus 1933). Thus if all other things were equal, you would expect fish held at 80 degrees to need twice as much food as fish held at 70 degrees. Of course, the quality of the food is also important to this ratio so the difference cannot be measured in bulk alone.

Fish fed high calorie diets need less food than fish fed on low calorie diets. The composition of the diet also affects the amount of energy that will be available to the fish's body. An all-protein diet would give the most energy, but this also increases the metabolic rate as it takes more energy to rid the body of the increased nitrogenous waste products. A diet combining carbohydrates (vegetation), fats and protein provides a better balance. The fats and carbohydrates provide immediate energy and allow a larger percentage of the protein to go toward growth. On the other hand, too much carbohydrate or fat can cause problems with some fish.

Fish have a higher energy requirement during spawning, not only because the increased activity burns up more energy, but also because part of the caloric intake is used to produce the eggs.

The more active the fish, the higher are its energy requirements. Many environmental factors increase activity:

Lights: bright light encourages more activity than dim light, and the longer the light period the longer the fish remain active.

Increased water flow: such as occurs when filter action is stepped up or when a current is set up by a refill hose, causes more active swimming and so increases energy requirements.

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Reduced oxygen content of the water increases the respiratory rate and the energy requirement.

Organic pollution increases metabolism and the need for increased food. Fish waste products are a form of organic pollution as they accumulate in the environment.

Physical handling or fright or anything that similarly increases the respiratory rate will also require more energy, although these effects can so disturb fish that they will be "put off their feed" and the extra energy needs will more likely be met from energy previously stored in the body.

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