



# Preparing Fish for Winter

By Jan Schreier

## **Diet**

Whether or not you winter your fish outside, start by changing your fish's diet as the weather cools. When the water temperature falls below 60F, change the diet to less protein and higher carbohydrates. A very cheap & inexpensive food is plain Cheerios cereal. Once water temperatures fall below 50F, do not feed your fish at all! Their bodies are shutting down, and feeding them disrupts their digestive system, and adds unnecessary biological burden to your pond.

## **Cold-Hardiness**

Goldfish & Koi can handle very low temperatures. In general, the larger the fish, the less tolerant they will be to extreme temperatures. Very large Koi can begin to experience some gill damage at temperatures below 39F. Most goldfish and small koi are fine at temperatures of 35F and higher. In the winter, ponds have a temperature inversion, meaning that the coldest temperature is at the surface (where the ice is), and the warmest temperature is at the bottom. If you are circulating water or air within your pond to keep the surface open, it is important to keep water moving only in the upper 1-2 feet. This helps to keep the temperature inversion intact (you are not circulating the cold water or air into the warmer bottom water).

## **Indoor wintering**

Preparation of the stock tank or aquarium is critical. On the day that you transfer the fish, pump water from the pond to your indoor tank. Be careful not to disrupt the pond when pumping water, or you'll get mucky water, and the tank will smell foul. Superior filtration for indoors is essential. The warmer the water, and the higher the fish count (in inches of fish, not quantity), the more filtration you will need. If you keep your fish where the water temperature remains at 50F or lower, do not feed your fish! This is ideal for winter storage since it greatly reduces the filtration burden on the tank. If the temperature is above 50F feed very sparingly and keep lots of underwater plants in the tank (like anacharis, elodea or hornwort). We don't recommend keeping lilies with Koi, since it's better for the hardy lilies to undergo a dormant stage, and koi like to root in the soil, and spit it out all over the bottom of your tank. Check the water daily for a few weeks to monitor ammonia and nitrate levels. Once the readings are constant, once a week monitoring should suffice. During the winter, perform water exchanges regularly (empty 10-20% of the water, and fill with fresh water). Frequency of water exchanges will depend upon how much filtration is in place, and how warm is the water. More frequent exchanges for warmer water, and less filtration. Keep on hand a large bag of activated charcoal which can be used quickly in an emergency to reduce toxic levels of ammonia.

## **Indoor temperatures**

If wintering fish indoors, it is best to transfer them when the outdoor temperature is equivalent to the indoor temperature. For example, in heated basements, where the water temperature will be 65F, don't wait until the outdoor temperature falls below 50F. Some members keep their stock tanks in the garage with air temperatures of +30F. The occasional thin layer of ice on the surface can be eliminated with a cover for the tank, or with the movement of the water through the filtration system.

### **Indoor feeding**

The most common problem is overfeeding. Below water temperatures of 50F, feed your fish NOTHING. Between 50 & 60F, feed sparingly (once/week) and use easily digestible carbohydrate diet. Above 65F, feed as you would normal aquarium fish.

### **Depth for outdoor wintering**

Our members have had lots of success overwintering fish outdoors at depths from 18" to 9 feet. In general, depths shallower than 36" will take extra care to keep from freezing including more water movement and some insulation with heating elements. People with very expensive koi hesitate at depths shallower than 48". Remember only one small portion of the pond needs to be this deep.

### **Keeping the surface open**

Aside from having an area in your pond that doesn't freeze solid, fish need to have an area of the water exposed to air. Otherwise, decomposing plant material & fish waste produce toxic levels of nitrogen, killing the fish. The area does not need to be large (less than 6" in diameter is plenty), but it does need to allow for exchange of nitrogen to the air. Don't worry if there is up to one week when the pond is completely frozen, as long as it thaws within that time, usually, the fish will survive. Take care not to keep the surface open by regularly chipping through the ice, as the percussive force of ice chopping adds undue stress to your fish, and there are times in Minnesota that you would need to do this every hour. Products used to keep the ice open include a good heavy-duty aerator, a floating stock tank heater, a small recirculating pump that "boils" the water surface, or an insulated floating "bubble" cover. Using any of these separately or in combination depend upon the conditions (including depth) of your specific pond. Most Minnesotans use a combination of two of the above products.

### **Time of Year**

The best time of year (for the fish) to transfer your fish from outdoors to indoors, is in September. This is before the fish shut down their systems, and they are far more tolerant of stress, and recover faster. However, this is highly impractical in our short Minnesota summers unless you like to cut off two months of enjoyment from your pond. Most of our club members wait until early November after the first hard freeze, when the foliage on the water plants has died back, and the fish are slower & easier to catch. Although remember that the water & outside conditions are quite cold that time of year, and with layers of dead leaves in the pond, it can be very hard to find smaller fish.

### **Technique**

Get yourself a pair of good hip waders, wear plenty of insulation including water-proof gloves, and use two nets. It's easier to guide the fish with one net into a second net. Large koi can be transferred easily and without a lot of stress using a net called a koi sock. Essentially a koi sock looks like a black windsock, open on both ends. The koi swim in, because it is a nice dark tunnel. Once the koi is inside, the open end of the sock is twisted closed and the net is lifted out of the water. The sock holds water, so the koi is not exposed to the fabric of the net. Once the sock is over the indoor tank, just let go of the twisted end, and the koi & pondwater are gently incorporated into the new tank. It's easier to do this with two people. One in the pond catching the fish, and the second on land putting the fish into the new tank.