

TRANSPORTING CHANNEL CATFISH FRY AND FINGERLINGS IN PLASTIC BAGS

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Live channel catfish are usually transported by truck in hauling tanks. Fish size ranges from 4- to 10-inch fingerlings to 1- to 3-lb food-fish. Hauling large numbers of fish of these sizes usually requires considerable amounts of water and a big truck. However, shipping fry and 1- to 2-inch fingerlings can be accomplished effectively in a van or small truck using plastic bags, styrofoam ice chests and pure oxygen gas.

Large plastic bags (18 X 32 inches) are commonly used for fish transport. Four cornered bags are preferred to avoid corner collapse which can suffocate large numbers of fry that become trapped when pockets form. Bag thickness should be 4 mil to help minimize punctures. Bags are usually doubled to ensure that they remain air tight if one should leak.

The plastic bags are filled with water, fish and oxygen gas. Typically, each bag is filled such that 1/4 of the volume is water (2 gallons is common) and 3/4 will be oxygen. Water and fish are added. The remaining air is removed by hand, compressing or squeezing it from the bag. The bag is completely refilled with pure oxygen gas. Oxygen is added through a flexible tube attached to a small compressed gas cylinder. The neck of the bag is twisted and then sealed tightly with one or more large rubber bands. The number of fish placed in each bag is determined by fish size and weight, and estimated travel time (Table 1).

The data in Table 1 were presented by Dupree and Huner in 1984, and are for a variety of fish species. The fin spines of 4- to 10-inch catfish fingerlings readily puncture bags and make transport by this method risky. A reasonable but conservative loading rate (24-hour transport) for channel catfish fry is 1/2 lb of fry to each gallon of bagged water (Table 1). There are approximately 10,000 catfish fry to the pound. Two gallons of water would be required to ship 10,000 channel catfish fry on a 24-hour trip (1/2 lb fry/gal X 2 gal X 10,000 fry/lb). The presence of organic substances in shipping water -- material released by hatching eggs or feces from fish fed, less than 12 hours, before transport -- reduces the load capacity. Ice can be added to an insulated shipping container (ice chest) to help keep water temperature close to 65o F. Ice should not be used with tropical fish or tilapia.

Shipping water should have several desirable chemical characteristics: pH, 7-8; carbonate alkalinity, 100-150 mg/l; and calcium hardness, 125-250 mg/l. Because the bags are sealed, respiratory carbon dioxide accumulates in the water and lowers pH. Bicarbonate alkalinity helps to prevent pH from dropping. Sodium bicarbonate (baking soda, 1/8 to 1/4 tsp/gal) will increase bicarbonate alkalinity and pH. Food grade calcium sulfate (gypsum, 1/4 to 4/10 tsp/gal) will enhance calcium hardness. Adding 0.2 to 0.5% sodium chloride (table salt, 1-1/4 to 3 tsp/gal) is recommended.

Once fish have arrived at their destination, they should be tempered to their new environment as soon as possible. Float the bags in the new water (pond or tank) for 30 minutes to allow bag temperature to equilibrate with environmental temperature. Resist the temptation to open the bag and aerate it with a bait agitator or air stone. The build up of carbon dioxide during transport lowers the pH of bag water. Aeration will rapidly remove carbon dioxide and simultaneously increase pH. A sudden change in pH can shock and kill the fish. After the 30 minute acclimation period, open the bag and gradually mix the bag water with new water; then release the fish.

Table 1. Pounds per gallon* of fish that can be transported in bags for several shipping times.

Fish size	Travel time (hours)			
	1	12	24	48
Eggs	0.5-1.5	0.5-1.2	0.5-1.0	0.2-0.5
Yolk-sac fry	1.0-3.0	0.7-2.5	0.4-2.0	0.1-1.0
Swim-up fry	0.5-2.0	0.4-1.6	0.4-1.2	0.2-0.6
1- to 2-inch fingerlings	1.0-3.7	0.9-3.2	0.7-2.7	0.3-1.3

* At a water temperature of 65° F.