

Hauling Tank Notes

To transport fish requires an understanding of the physiological aspects of the fish and their temporary hauling environment - the tank. If fish die shortly after delivery it usually the hatchery taking the blame but all too often it is the hauler at fault.

Normally it is desirable to take fish off all feed at least 24 hours before transporting. This will reduce fouling of the hauling tank water. The fish are then counted by weighing and placed in the appropriate chamber or hole in the hauling truck. Attention to detail in the loading process can make a big difference.

Over crowding results in too much ammonia or carbon dioxide and can also lead to a shortage of oxygen. For average travel times a rule of thumb is no more than 2 pounds of fish per gallon of water. Some species do best at only one pound of fish per gallon so check with the farmer when planning to transport an unfamiliar species. These densities normally require diffused pure oxygen systems as opposed to agitators or diffused compressed air. Short trips with cool water (below 55°F) will allow high fish density with just an aerator but push the limit at your own risk. Catfish haulers can take 5 pounds of fish per gallon on short hauls to a processing facility but they aren't intended to live long after delivery.

Cooler water temps play an important role in keeping fish in good condition. Since they are cold-blooded vertebrates, their metabolism slows as temperature drops. Oxygen intake decreases as well along with ammonia and CO₂. Just the opposite happens as the temperature rises.

Many haulers use salt to counter the stress associated with fish transport. Salt boosts the fish's electrolytes and enhances mucous production useful in warding off bacteria infection and parasites. A rule of thumb is three pounds of iodised salt per 100 gallons of water. For non-food fish haulers may use anaesthetics, ammonia removers and defoamers.

Oxygen Replenishment

There are three types of systems in common use; agitators or aspirators, compressors with air diffusers, and pure oxygen. Agitators use mechanical disturbance at the surface and create splashing to drive oxygen into the water. They are not very efficient and being mechanical are prone to problems. Compressed air distributed through diffusers is very popular in low density trucks in short hauls. These rely on bubble size to and bubble contact time to transfer oxygen. If more O₂ is required more diffusers are added. Generally these systems are great up to one pound of fish per gallon of water.

Pure oxygen systems are used for high stocking densities, longer trips and sensitive species. Think about tropical fish, which are commonly shipped around the world on trips of up to 30 hours. Tropicals are sent in plastic bags containing 1/3 water and 2/3 oxygen. The key to oxygen efficiency in a hauling tank is the diffuser. The finer the bubble the better the oxygen is diffused. The best diffusers available are only 50% effective meaning for every dollar of oxygen purchased the hauler only gets 50 cents worth of it in the water. Even with these poor transfer

rates, the cost is outweighed by the high carrying capacity and vastly improved health of the fish delivered. Larger trucks making longer runs will benefit from the compact nature of liquid oxygen.