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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

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Technical specification for live aquatic products transportation

活水产品运输技术规范

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1 Scope

The document sets the basic requirements for the transport of live aquatic products and the technical requirements for transport management and for records, and describes the corresponding methods of substantiation.

It applies to the transport of live fish, live shrimp, live shellfish and live crab.

3 Terms and definitions

3.1 transportation in cabin with circulating water: a way of carrying live fish in a vessel fitted with a fish-carrying water cabin below the waterline, the cabin having holes evenly distributed over its upper, middle and lower levels that open to the water outside, so that under way water enters through the forward holes and leaves through the after ones and the water in the cabin is kept fresh and stable.

4 Basic requirements

4.1 Products awaiting carriage are to be free of disease and contamination and in good condition, and the inspection report or certificate of conformity is to be checked batch by batch. Where no certificate of conformity can be produced, the batch is to be inspected and found conforming before purchase.

4.2 The water used in transport and in holding is to meet GB 11607; where artificial sea salt

for holding is used, it is to meet QB/T 4972.

4.3 The method of transport, the means of transport and the transport time are decided on the species, the properties of the product, the season and the quantity.

4.4 Temperature monitoring equipment is to be carried; transport in water is also to carry dissolved oxygen monitoring equipment and transport without water relative humidity monitoring equipment.

4.5 Means of transport, materials and containers are to be clean and hygienic, and the moisture-retaining material is to be light, absorbent and good at holding moisture.

4.6 For long carriage it is preferable to use purpose-built equipment with temperature control, water circulation or filtration, or oxygenation.

5.1 Transport of live fish

5.1.1 Before loading, live fish are held without feed for 1 d to 2 d in cages, tanks or ponds, at a density that depends on the species, preferably 20 kg to 45 kg per cubic metre. During holding, attention is paid to changes in water temperature, salinity, dissolved oxygen and pH and to the condition of the fish and the holding density, and weak or badly injured individuals are removed.

5.1.2 For transport in water, the temperature of the holding tank is preferably brought down to the transport temperature at a rate no greater than 5 °C per hour; the container is checked for damage before loading; fresh water at the same temperature as the holding tank is put into the container before the fish are loaded; for marine fish, seawater of the same salinity as the farm is used, and salinity is kept stable when ice is added to cool. During carriage the water temperature is set by species, preferably 6 °C to 8 °C for cold-water fish and 10 °C to 20 °C for warm-water fish, aeration is kept up without interruption so that dissolved oxygen stays at not less than 8 mg/L. Where closed plastic film bags with water and oxygen are used, the bag is checked for leaks, filled with about one third of its volume of fresh water, the live fish are put in, pure oxygen is blown in and the mouth is tied, and the bag is carried in a cardboard or expanded plastic box; for air carriage the oxygen bag is not to be over-inflated.

5.1.3 For transport without water, the fish are first cooled to dormancy at a rate no greater than 5 °C per hour, and the moisture-retaining material is moistened and cooled to the same temperature beforehand. The carton is lined with absorbent paper, the bottom covered with the moistened and cooled material to a thickness of 1.5 cm to 2.0 cm, one to three layers of fish are laid in and more material is spread over the top. Where the load is split between boxes, temperature and moisture are controlled and the boxes are protected from sun, wind, rain and crushing. Insulated vehicles or vessels may be used to hold the fish close to dormancy; where there is no temperature control equipment, ice packs may be used when it is warm.

5.1.4 For carriage in a circulating-water cabin, the gear on board is checked before departure, together with the inlet and outlet valves and the anti-escape net in the cabin, and the cabin is thoroughly cleaned. The loading density is decided on the water temperature of the area sailed and the transport time, and is generally not higher than 150 kg per cubic metre. If pollution, unsuitable salinity, turbidity or other poor water is met under way, or the vessel lies at moorings long enough to be unable to take in fresh water, the inlet and outlet holes are closed at once and oxygen is supplied. The behaviour of the fish is checked often during the voyage and anything abnormal is dealt with at once.

5.2 Transport of live shrimp

5.2.1 Before loading, live shrimp are preferably held without feed for 1 d to 2 d in cages, tanks or ponds, at a density that depends on the species, preferably 20 kg to 40 kg per cubic metre.

5.2.2 For transport in water, the holding tank is preferably cooled to the transport temperature at a rate no greater than 5 °C per hour. About two thirds of the container is filled with fresh water of the same temperature and salinity as the holding tank and aeration is started; the shrimp are packed into purpose-made mesh cages or plastic baskets, the lids are tied down and the cages are stacked in order in the container, preferably with not more than 20 kg in each. During carriage the water temperature is held steady as the species requires, preferably varying by less than 2 °C; aeration and circulating filtration are kept up so that the water stays stable and dissolved oxygen does not fall below 5 mg/L. For marine shrimp, measures are taken to keep the salinity stable when ice is added, or sealed ice is used for cooling. Where plastic bags with water and oxygen are used, about one third of the bag is filled with fresh water of the same temperature and salinity as the holding tank, the cooled shrimp are put in, pure oxygen is blown in, the mouth is tied and the bag is carried in a carton or a plastic or expanded plastic box.

5.2.3 For transport without water, the shrimp are cooled to dormancy in the holding tank at a rate no greater than 5 °C per hour as the species requires, then stacked in layers in purpose-made transport boxes, every layer having its gaps filled with disinfected, moistened and cooled moisture-retaining material and the top layer covered with the same material before the lid is tied down, and held in a damp environment at 1 °C to 5 °C until loading. In packing, the bottom of the box is lined with moisture-retaining material to a thickness of 1.5 cm to 2.0 cm, one to three layers of cooled shrimp are laid in evenly, the gaps around the shrimp are filled with the material and the top layer is covered before the lid is tied down. The boxes are then carried into the vehicle and stacked in order without delay, and the doors are closed and cooling started as soon as loading is finished. During carriage the temperature in the body is set by species so that the shrimp stay dormant and is held roughly steady, with the relative humidity preferably above 70 %.

5.3 Transport of live crab

5.3.1 After capture the crabs are washed clean with water and held without feed in a holding tank for not less than 24 h. Crabs with all their limbs are picked out and put into a cold water tank at 2 °C to 5 °C for 3 min to 5 min so that they are chilled into dormancy; on larger individuals the chelae and walking legs may first be tied against the abdomen.

5.3.2 For transport in water, the chilled crabs are stacked in layers in purpose-made transport baskets, the lids are tied down and the baskets are put into an aerated cold water tank at 5 °C to 15 °C to await loading. At loading, the container is first filled to two thirds with fresh water of the same temperature and salinity as the holding tank and aeration is started; the baskets are then carried from the holding tank into the water tank of the vehicle and stacked in order, and the doors are closed as soon as loading is finished. During carriage the water temperature is set by species and by the transport time and held steady, preferably within 2 °C, and aeration and circulating filtration are kept up as the species requires so that dissolved oxygen stays between 4 mg/L and 5 mg/L.

5.3.3 For transport without water, the chilled crabs are stacked in layers in purpose-made transport boxes, every layer having its gaps filled with disinfected, moistened and cooled moisture-retaining material and the top layer covered with the same material before the lid is tied down, and are held in a damp environment at 5 °C to 15 °C until loading. The vehicle is thoroughly cleaned before loading, the boxes are carried into the body and stacked in order, and the doors are closed as soon as loading is finished. During carriage the temperature in the body is kept roughly steady, preferably varying by less than 2 °C, and is preferably held at 5 °C to 8 °C for cold-water crabs and 10 °C to 15 °C for warm-water crabs, with the relative humidity preferably above 70 %.

5.4 Transport of live shellfish

5.4.1 Harvested shellfish are washed thoroughly and put into a holding tank with continuous aeration and circulating filtration. Shellfish taken from different waters and of different species are stored and loaded separately. Before carriage the live shellfish are packed into mesh bags or plastic baskets and put into an oxygenated tank at the transport temperature.

5.4.2 For transport in water, the container is first filled to two thirds with fresh water of the same temperature and salinity as the holding tank, then the live shellfish are added, the layers being staggered and a suitable gap left between bags or baskets. During carriage the water temperature is set by species, as given in Annex A, and aeration is kept up without interruption so that the water stays stable.

5.4.3 For transport without water, the live shellfish are carried into the body of the vehicle and stacked in order, and the doors are closed and cooling started as soon as loading is finished. The surface of the shells is kept moist throughout. The temperature in the body is