



Photo credit: Adeanya Omotomiwa/ITA and Olaniyi Aljola/WorldFish

Harvesting and post-harvest handling of tilapia from cages

Harvesting involves the total removal of fish from the cage at the end of the culture period. If all management practices are well followed, tilapia will be ready for harvest 5–6 months after juveniles are stocked. The standard table size at this point is 350 g. Catering establishments prefer fish weighing 350 g or more for grilling, while fried fish vendors prefer smaller sizes. The fish are sold in weight classes known as “sizes.” Typically, the lower the weight of the size class, the less expensive the price, while higher size classes command higher prices.

Harvesting in cages is less stressful compared to other culture systems. This involves removing the net from the cage to harvest the fish. Freshly harvested fish, processed and packaged hygienically, fetch a high price and are of optimal quality, and using ice allows farmers to keep their harvested fish fresh for onward storage or transportation to market centers or clients. Freshly harvested fish must be gutted (have the internal organs removed) and washed thoroughly to minimize spoilage and maintain freshness. Always ensure there is an adequate amount of ice for harvested fish. A ratio of about 1 kg of ice for every kilogram of gutted fish is advisable.

Before harvesting, carry out the following steps:

- Sample matured grow-out cages to determine if the fish have reached table/market size.
- Select the cages for harvest.
- Estimate the total biomass of the fish in the selected cages and factor cumulative mortalities into your calculation.
- Decide on whether you want to carry out a partial or complete harvest, or harvest from multiple cages.
- Estimate your projected revenue based on prevailing market prices for whole and gutted fish.
- Calculate how much feed the fish intended for harvest have consumed.
- Ensure you have the market, off-takers and/or buyers ready to buy your projected metric tons of the harvest.
- Advertise your harvest date(s) across various media and local platforms to ensure maximum sales.
- Starve your fish for at least 24 hours before harvest time so that they flush all waste from their internal organs and to eliminate off-flavors and metabolites. This will affect the taste and quality of the final product and, thus, your revenue and client base.

The following are the requirements of the harvesting process:

- Harvest in the morning before the weather becomes too harsh in the afternoon.
- Try to finish harvesting before sunrise to avoid high temperatures when handling and transporting fish, especially in the summer, as this prevents stress on the harvested fish.
- For partial harvests, once the desired quantity of fish has been harvested, replace the weights and drop the net, releasing the bagged fish back into the cage.
- For complete harvests, empty the cage, remove the inner production net and harvest any stray fish in your outer protection net.
- Count the number of fish harvested to calculate the survival rate.
- After harvesting, farmers should make sure that the fish are transported to the washing and sorting facility as soon as possible.
- Handle the fish carefully to avoid damaging the body.
- Feeding the remaining fish in a partially harvested cage immediately after harvest will stress the fish.
- Allow them to rest overnight before resuming feeding.
- When selling fish to traditional markets, put ice in the box to maintain the freshness of the fish.



Plate 1. Harvesting tilapia from a cage at Orisha farm.

Post-harvest handling of tilapia

Follow proper post-harvest procedures is necessary, as fish begin to deteriorate immediately after being harvested from the water. The post-harvest process involves placing the fish in very cold water directly after harvest to cool the surface of the body. This will prevent deterioration and maintain freshness longer after harvesting, allowing the fish to be transported freshly to the market without adding ice, which will increase their shelf life for sale.

All fish belonging to a specific size should be taken to workers in charge of that size for evisceration. Using sharp knives, slit the belly of the fish open and remove the internal organs/viscera. Wash the gutted fish under clean running water and place it in perforated crates for weighing (a standard crate of fish weighs 25 kg). Do not use the same bowl of water to wash several fish, as this leads to contamination. Use crushed ice to chill the fish thoroughly to ensure freshness prior to delivery.



Plate 2. Harvesting tilapia from a cage.

The following are the steps involved in proper post-harvest procedure:

- Send each weighed crate of fish for icing.
- Take a clean fish crate and first spread a layer of crushed ice at the base of the crate.
- Add a layer of fish from the 25 kg crate, and then top it up with another layer of crushed ice, and so on, until 25 kg have been layered into the crate. Top up with an extra layer of ice.
- Do not use huge pieces of ice, as the fish will not chill evenly. Make sure your ice is well crushed.
- Move the fish into a refrigerated truck or holding facility for onward transportation to the clients/market.
- Record how many kilograms of fish were harvested, the number of crates sent to the market/clients and details of the sizes harvested for your records.

Other post-harvesting preservation methods include salting, freezing, drying and smoking.



Plate 3. Prepared crushed ice.



Plate 4. Adding crushed ice to tilapia.

Acknowledgement

This work was undertaken as part of the CGIAR Initiative on Aquatic Foods under the ProSCAWA project led by WorldFish. The project was supported by the CGIAR Trust Fund with funding from the China-IFAD South-South and Triangular Cooperation Facility administered by the International Fund for Agricultural Development (IFAD). The project was implemented in partnership with two private sector entities: ProSCAWA Fish Hub, Ghana and Orisha Farms, Nigeria.

Citation

This publication should be cited as: Olaniyi AA, Siriwardena SN and Nasr-Allah A. 2022. Harvesting and post-harvest handling of tilapia from cages. Penang, Malaysia: WorldFish. Program Brief: 2022-33.

Creative Commons License



Content in this publication is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited, and is not altered, transformed, or built upon in any way.

© 2022 WorldFish.

For more information, please visit www.worldfishcenter.org



In partnership with



This initiative is funded by the Ministry of Finance of the People's Republic of China through the China-IFAD South-South and Triangular Cooperation Facility