FISH HANDLING, PROCESSING AND STORAGE IN UGANDA

The Role of the Extension Worker

by

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Introduction

Fish production - 220,000 m tonnes annually with more than Shs.50/- billion at the shore


Fish Disposal - Fresh, or processed: smoked, salted, fried in merely sundried.

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Fresh Handling & Distribution

Main catching method is gill netting.

- Nets set and hauled after periods ranging from one to ten hours.

On water Problems

- Damage of fish from predators like others.
- Fish at various degrees of deterioration.
- Some unfit for human consumption.

In boat (Canoe)

- Ambient temperatures 22 to 28°C but there is no refrigeration.
- Fish hauled after sunrise exposed to direct sun-rays no shade.
- Boat not powered - delay of delivery of fish to landing
- No refrigeration except for the paired trawlers who use ices which may be inadequate.
At Landing
- Fish roughly handled: washed in water, sometimes dragged on muddy grounds.
- Area of landing inadequately served with toilet facilities.
- No refrigeration.

Distribution:
- Fresh fish is consumed at the fishing villages but the excess is transported by open pickups - no boxes; fish heaped on bicycles, no boxes sometimes baskets, or hessian bags.
- Distribution of fresh fish restricted by poor road network.

At the Market
- Fresh fish handled without shelters - subject to increased temperature from direct sun rays.
- Fish could be handled on the ground without any raised platform.
- There is often no running water.

Fish processing plants: purchase their fish direct from the landing or even at the market. The plants attempt to ice the fish on purchasing it. As these industries are anxious to process top quality fish to cater for their export markets they should be encouraged to provide the fisherman with ice so that the fish destined for their plants can be iced immediately on harvesting.

The Role of the Extension Worker

a) Fishing Activity - Encourage Fisherman
- to haul net/long lines as soon as possible (max. 6hrs)
- clean container on board.
- Fish should not be trodden on.
- Introduce ice at least in transport boats from fishing ground to the shore.
b) At Shore - Advocate to:
- Avoid washing in muddy water
- Avoid dragging fish on ground.
- Construct sheltered raised platforms.
- Avoid desiccating the fish - evaporative cooling.
  Evaporative cooling should be extended to transport pickups.
- Avoid roughing up fish in pickups.
- No sitting on the fish.

Extension services should be to fishermen, processors, fish handlers but above all consumers should be made aware of the need for good fish handling practices. The administrators, i.e. Gabunga, RC and Health workers should be made aware of the need for basic facilities.

Fish Smoking

Employed as a preservative method for the fish as well as a means of imparting the desired flavour.

Hot Smoking:

Basic unit is an excavation in the ground, overlayed with pipes on which rows of fish are laid.

The fish is scaled; the large pieces are either split open or chopped into roughly 2 kg portions, the dressed fish is then washed and allowed to drip for about one hour. This is carried out on the ground. The fish is then placed on the kiln, covered with iron sheets and smoked using wet logs of wood. The fire is gradually increased in intensity and the fish is turned over several times to prevent overcooking. The curing process can be for only 6-8 hrs giving a soft produce that can keep for only 72 hrs. Where a prolonged smoking process of more than 20 hours is employed a hard cure is obtained and this can keep for more than 7 days.

Smoked product is allowed to cool before it is packed in carton boxes or bundles cushioned with grass. Such bundles range from 40 kg to 500 kg. Alternatively the smoked fish may be neatly packed on open pickups which are later covered with waterroof material. At the retail market smoked fish is often stored in inadequately ventilated areas which are not vermin proof. This inevitably leads to losses through spoilage or attack by vermin. The retailed fish is exposed to dust, flies and even rain.
Extension Worker

1. Traditional kiln fish at ground level encourage use of raised smoke units which are sheltered.

2. Product should be hard smoked to prolong its keeping time.

3. Smoked fish should be packed in small loads that can be easily handled to reduce fragmentation losses. The smoked product should be stored in well ventilated stores that are vermin proof.

4. A combination of smoking and brining could be encouraged after extensive trials.

5. The use of grass may lead to contamination but an alternative method of cushioning the fish should be developed.

Fish Salting

The salting practices on Lake Albert and Albert Nile involving Ngassa, Ngora, Ngege and Nile Perch. This fish are dressed and big fish like Nile Perch are scored to facilitate salt penetration and then dry salted with brine liquor allowed to drain. Because of the high cost of salt other fish are only lightly sprinkled with salt and then left to dry in the open air.

The salted fish is often stored in heaps in stores that are inadequately ventilated. Regular air drying of the salted fish is necessary but sometimes the product is subject to infestation by maggots where insufficient salt is used or where drying is incomplete. It is also common for the product to be attacked by beetles (Dermestes spp).

The product is packed in 20 kg bundles which may be covered with hessian cloth or polythene sheeting. Salted products consumed in Zaire or North-West Uganda.

Extension Worker

1. Encourage hygienic handling at shore.

2. Proper dressing.

3. Use of adequate salt.

4. Fish stores should be adequately ventilated - vermin proof.
Sundrying

The traditional air drying of fish makes use of the high temperature and the favourable relative humidity conditions. The preservative action is based on reduction of water content and the corresponding lowering of $A_w$.

Sundrying is practised mainly on small size fish like Restremeabola argentea and Haplochromis spp. are merely spread in the open air without dressing. The drying process is facilitated by the large surface area/volume ratio. The medium size fish like Alestes are split open from the dorsal side, gutted, washed and then allowed to dry. The large size fish like Nile Perch are beheaded and the flesh sliced into thin sheets which are spread to dry. The fish is spread on rocks, mats or even bare ground - making the fish gritty.

Extension Worker

Like for smoked fish.

Encourage use of raised racks for drying the fish.

Fish Frying

The frying of fish in oil as a method of fish preservation is limited to Oreochromis spp. The fish is dressed in the usual way, scored to allow oil penetration and then deep fried in oil on open sauce pans. The fish is packed in cardboard boxes and delivered to consuming centres. The fried fish can be eaten without further processing.

The Nile Perch (Lates niloticus) has also become a delicacy when fried in oil particularly at social gatherings like beer parties. The fish is cut into small pieces that are deep fried in oil and the fish is consumed immediately.

Extension Worker

1. Encourage the processors to keep fried fish away from contamination by dust or flies.

2. Hygienic practices.

Canning

There is no canning at the moment but may be in future the canning of Lates niloticus in brine should be investigated.
CONCLUSION

The handling and processing of fish in Uganda has until recently been carried out exclusively by the artisanal fishermen and fish processors. Their operations have left much to be desired as the product is often of low quality and its keeping time is limited. The handling of fresh fish has been without refrigeration but with the recent establishment of commercial fish processing plants a cold chain of fish distribution is being set up for domestic and export markets. Some of the fishermen are beginning to ice their catch immediately after reaching the shore. It is hoped that fishmongers will increasingly find it more profitable to market their products iced. This will make fish available to a large sector of the population and in the process there will be reduced post-harvest losses.

The extension worker has a very important role to play in this transformation. Already the Extension Workers have initiated improvements in good manufacturing practices and the response from the fish industry has been encouraging. The emphasis is to be placed on improvements on simple handling practices rather than sophisticated technology. Although the present role of the Extension Worker is advisory, it is hoped that the law will be amended to make it obligatory for the fishermen, fish processor and fish dealers to provide the consumer with wholesome fish. This will be achieved when the economic benefits are realised by all those involved in the industry.