CODE OF PRACTICE FOR THE SAFETY AND QUALITY ASSURANCE OF SUN DRIED MUKENE IN THE ARTISANAL FISHERIES SUB SECTOR

THE REPUBLIC OF UGANDA

Ministry of Agriculture,
Animal Industry & Fisheries
Directorate of Fisheries Resources

UNBS

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1.1 SUN DRYING OF MUKENE - THE PRINCIPLE:

When fish is dried, water is removed and the speed of growth of microorganisms is lowered.

1.2 VALUE CHAIN FOR DRIED MUKENE FISH

1.2.1 FISHING

1.2.2 TRANSPORT IN FISHING BOATS

1.2.3 TRANSFER FROM FISHING BOATS

1.2.4 DRYING

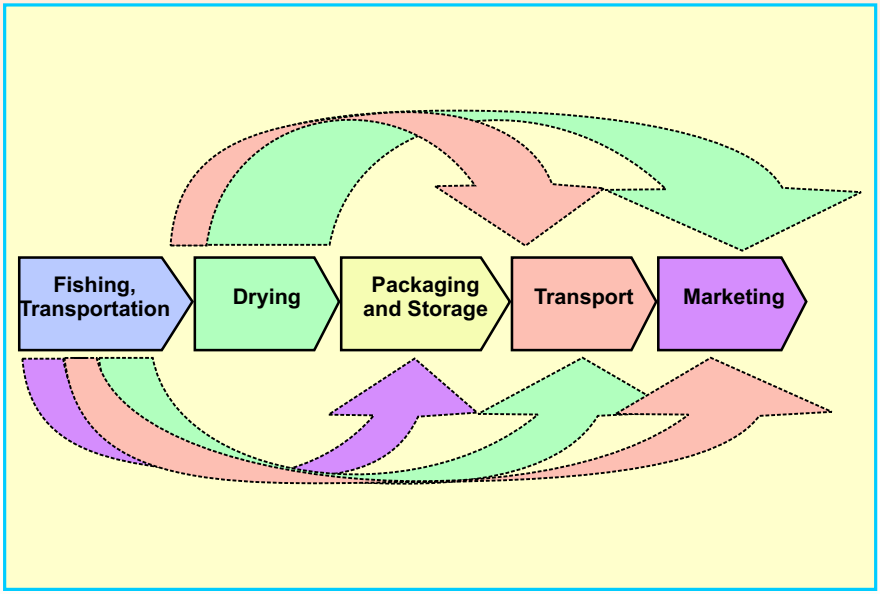
1.2.5 PACKAGING

1.2.6 STORAGE

1.2.7 TRANSPORT

1.2.8 MARKETING

1.2 VALUE CHAIN FOR DRIED MUKENE FISH



1.2.1 FISHING

1.2. 1.1 **Bad Practices**

a) Paraffin spilling on to the nets or the floor of the boats during fishing.

b) Piling up large quantities of fresh Mukene in the small Boats

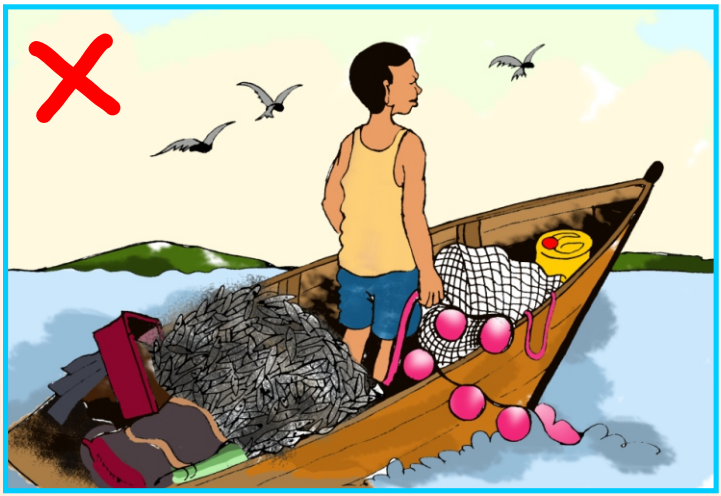
c) Use of polythene to cover fresh Mukene catches in the boats

d) Poor hygiene of the fishers and nets

e) Delays after fishing of fresh Mukene

f) Quality loss from insect attack

g) Poor fishing methods and gear



1.2.1.2 **Good Practices**

a) Avoid pilling of fresh Mukene on the boat during transportation

b) Avoid spillage of paraffin or spills from the lamps onto the water, boat or onto the Mukene

c) Reduce the fishing time between laying of nets and retrieval of the catch

d) Use large fishing boats

e) Avoid contamination of fish with human waste

f) Sort damaged Mukene from good catches

g) Monitor any visible spillage of paraffin or petrol, clean the affected area and isolate fish from the affected area

h) Ensure that all the chemical containers – paraffin or petrol containers or lanterns are correctly corked and kept in the section of the boat containing no fish

i) Ensure that boats and the fishers are adequately clean before fishing

j) Do not put jackets, shoes, bags and others with Mukene

k) Lay a perforated sheet in the boat before pouring Mukene

l) Proper storage of nets

1.2.2 TRANSPORT IN FISHING BOATS

1.2.2.1 **Bad Practices**

a) Dirty wooden surfaces of the boats

b) Paint coated on the boat surfaces

c) Poor hygiene and sanitation by the crew

d) Poor design of the boat which does not isolate personal belongings, containers of chemicals, or sanitary facilities of fishers in a proper manner

e) Bad boats and engines that move slowly

f) Failure to cover fish resulting in it being affected by direct sunrays or insect infestation like Ligula Worm Parasite

1.2.2.2 **Good Practices**

a) Do not pour Mukene directly on the boat during transportation

b) Avoid throwing, stepping or sitting on fish

c) Avoid keeping Mukene in the fish net during transportation

d) Remove parasites e.g worms, etc if observed

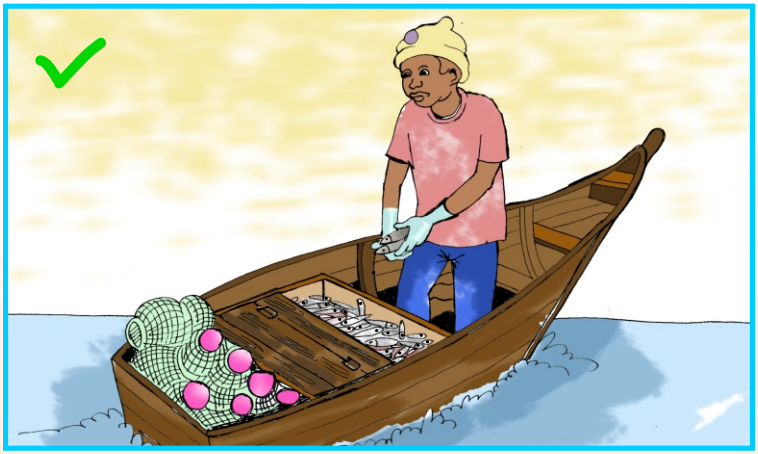
e) Boats should have designated areas for holding fuel, personal belongings and fish

f) Avoid contamination of fish with human wastes

g) Transport fish immediately to avoid hot and damp weather

h) Fish boats should be painted with food grade paint

i) Cover the fish to ensure that it is not affected by sunrays or infested with insects



1.2.3 TRANSFER FROM FISHING BOATS

1.2.3.1 **Bad Practices**

a) Dirty handling equipment and containers like tubs, baskets etc.

b) Poor hygiene of workers such as dirty clothes, hair and nails

c) Dirty water used to clean fish and containers

d) Dragging the wet Mukene (in sacks) on the beach sand

e) Improper ways of carrying wet Mukene fish which squeeze and mash it

1.2.3.2 **Good Practices**

a) Use clean equipment and containers, tubs etc.

b) Avoid contact of the landed Mukene catch with dirty water

c) Do not use uncleanable containers such as baskets, tarpaulin, sacks etc to carry wet Mukene fish

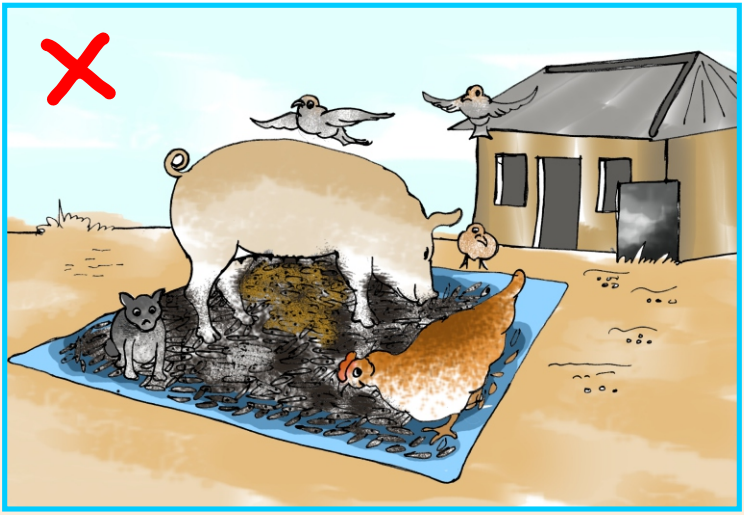
d) Do not drag the wet fish on the beaches which may contaminate the fish with sand, human and animal waste.

e) Use protective gear in removing Mukene from the boats

1.2.4 DRYING

1.2.4.1 **Bad Practices**

a) Drying fish directly on the ground
b) Drying on dirty surfaces
c) Dirty water running off on to the Mukene
d) Birds defecating in the Mukene
e) Insect infestation
f) Human and animal walking tracks through the drying ground
g) Poor hygiene of workers
h) Poor sanitation of drying areas
i) Use of improper drying facilities
j) Poor handling practices in the drying of Mukene
k) Drying Mukene on rusted racks
l) Failure to thoroughly dry the Mukene



1.2.4.2 **Good Practices**

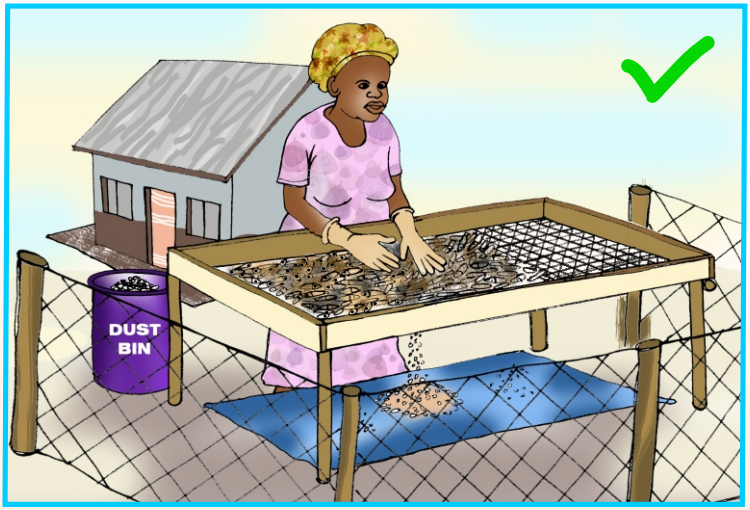
a) Drying should be done on racks placed off the ground to reduce contamination by sand/soil, stones and insects

b) Use the racks to improve air circulation all around the fish which shortens the drying time to 6-8 hours in good weather which may take days when dried on ground.

c) Racks ensure moisture is not kept within the product by helping in the turning of the fish to expose the other surface so as to quicken drying,

d) Racks should be placed in the sun not shade, away from sources of potential contamination such as toilets.

e) Drying racks should be located in areas with light winds to speed drying



f) Drying should be done in places where access by animals is limited

g) To reduce waste a plastic sheet can be placed under the racks so that debris is easily separated from the product resulting in a much cleaner product, thus less sorting and grading.

h) Remove any waste from drying area to minimize pests

i) Plant materials (like leaves on which to place the fish on racks) should be avoided as this encourages insect infestation

j) Keep rats, cats, dogs etc... away from the drying, processing and storage areas

k) Ensure proper hygiene and removal of rubbish from the site

l) Avoid drying the fish on the ground

m) Avoid rainy or wet conditions during the drying period by using waterproof covers

n) Mukene should be dried until the water content is reduced to 10-20% to avoid fungal growth.

o) Use plastic drying racks which do not rust and are easy to clean

p) Keep birds away from the drying area by using nets or strings

1.2.5 PACKAGING

1.2.5.1 **Bad Practices**

a) Dirty packaging area

b) Poor packaging material

c) Poor practices during packaging like sneezing, coughing etc

d) Poor hygiene of packers

e) Poor hygiene of containers and other materials used in the packing of Mukene

f) Failure to undertake quality checks and grading of fish before packaging

g) Re-use and abuse of packaging material

1.2.5.2 **Good Practices**

a) Clean packaging environment

b) Only fully dried Mukene should be packed to reduce microbial activity and growth of molds

c) Gunny bags with some aeration should be used for Mukene

d) Avoid squeezing Mukene into the bags and stepping on it.

e) Appropriate amounts should be packed in each bag to allow proper sealing.

f) Avoid exposing the products to air or damp conditions

g) Proper sorting and grading should be carried out before packing to ensure non-Mukene fish like *Hapalochromis* and other smaller fish are separated from the product

h) Remove physical materials such as debris, sand, stones etc and ensure insect (dead or alive) are separated from the product before packing,

i) Avoid re-use of packaging materials

j) Packaging premises should have good ventilation, proper sanitation and hygiene which should regularly be cleaned to avoid accumulation of any dirt, dust and attraction of insects and vermin

k) Only clean packaging bags, containers and facilities should be used in packaging

l) The packers should be clean and no person with communicable diseases should be allowed in the area.

m) The products should be adequately sorted to separate the by-catch species from Mukene

1.2.6 STORAGE

1.2.6.1 Bad Practices

a) Poor hygiene and sanitation of the stores; dust, fumes from moving vehicles or pests and vermin.

b) Over piling of fish in the store which leads to poor aeration, hence mould growth

c) Stores not guarded against intruders – pests, vermin and unauthorized access by humans

d) Poor stacking of product in the stores

e) Climbing and stepping on the packed bags containing the fish by workers

f) Wet and damp storage facilities

g) Fish stored directly on the ground in stores

1.2.6.2 **Good Practices**

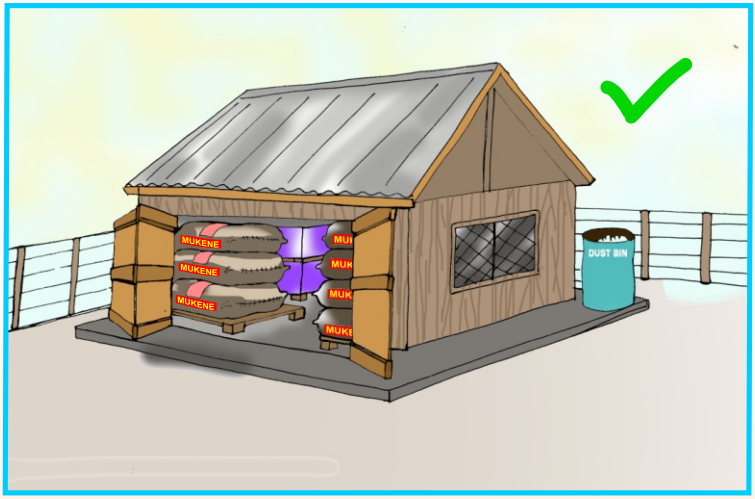
a) Dried Mukene should be stored in gunny bags with some aeration

b) Bags should be stored in a well-ventilated and aerated storage area and not be stacked on top of each other in long piles

c) The bags should be clearly labeled with an ID number to enable customers to identify it and the label should include the nature of the product e.g. 'Rack dried Mukene'

d) The stores for Mukene should be kept in good hygienic condition

e) The store should not be located in any place that is affected by dust and car exhaust fumes of moving vehicles



f) Access of vermin like snakes, lizards, birds etc. to the store should be controlled.

g) Control measures should be in place to control pests such as insects

h) Bags containing Mukene should be stacked on racks and avoid the bags getting in contact with the damp or wet ground

i) The store should be protected from rain with enough shelter to keep dry conditions inside

j) The store should be large enough to avoid stacking of several bags in a long pile

k) Stepping, standing, and stamping over the sacks of packed Mukene should be avoided.

1.2.7 TRANSPORT

1.2.7.1 Bad Practices

a) Lack of protection against dust, fuel exhaust fumes and rain during transportation

b) Stepping, sitting, stamping, sleeping etc on top of the Mukene transport trucks

c) Overloading, poor stacking of Mukene on the trucks

d) Use of slow means of transport that result in spoilage of fish before reaching the market

e) Poor sanitation of transport trucks

f) Poor hygiene of personnel who come in contact with fish during transport

g) Transportation of fish with other merchandise in the same truck cabin

h) Transportation of fish by use of old and un-serviced trucks which emit a lot of soot

1.2.7.2 **Good Practices**

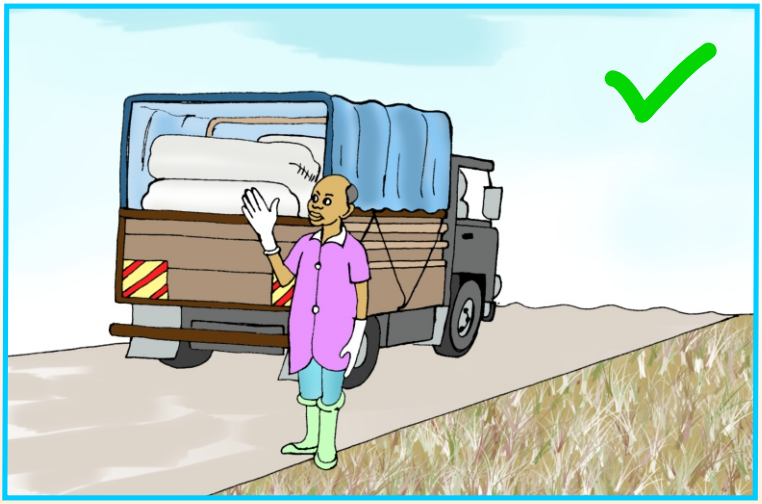
a) Ensure proper hygiene and sanitation of the transport vehicle

b) Cover the bags of Mukene with a water-resistant material e.g. plastic sheet or tarpaulin to protect the product from dust or rain during transportation

c) Do not transport Mukene and other merchandise in the same truck cabin. If so, ensure that all the merchandise is securely packed to avoid cross-contamination

d) Do not carry persons or their belongings in the same truck with Mukene

e) Old trucks or pickups which emit a lot of exhaust fumes should not be used to transport Mukene, and all vehicle should be well maintained and serviced to deliver the product to the market with no delays.



1.2.8 MARKETING

1.2.8.1 Bad Practices

a) Selling Mukene on bare ground or on a wet surface
b) Using dirty containers to measure Mukene
c) Using dirty hands to transfer Mukene into measuring containers
d) Selling Mukene when it is not adequately dried
e) Failure to sort Mukene to remove unwanted material before sale
f) Selling Mukene that is mixed with sand/earth material
g) Selling Mukene in an unhygienic environment.
h) Poor hygiene of the seller
i) Failure to carry out a quality check resulting in selling spoilt, unsafe and poor quality Mukene
j) Using old metallic containers that have loose parts and are rusted for measuring Mukene.

1.2.8.2 **Good Practices**

a) Carry out grading to ensure that spoilt/rotten (very badly smelling) fish is separated from good fish to be sold

b) Ensure that Mukene is sold on a raised surface that is made up of cleanable material such as aluminum, or steel racks which should be self-draining of any water after cleaning.

c) In small local markets, raised surfaces like a table or stall stand is recommended to minimize contamination from dust, insects and also being stepped on by people when sold on ground.

d) In retailing, avoid using metallic tins that are already rusted or broken to avoid contamination of the product; plastic containers are best and should regularly be cleaned.

e) Ensure that the surface where Mukene is sold is clean and dry

f) Ensure that all the containers for measuring are clean and dry

g) Use smaller containers as opposed to hands to draw Mukene from the pile or bag into the measuring containers.

h) It is illegal to sell contaminated fish. Avoid selling fish with clear signs of fungal growth, rotten fish or fish of off smells uncharacteristic of dry Mukene

i) It is illegal to sell fish that is contaminated with sand, soil and any earth material. Traders must not buy sand-contaminated fish at the drying beach as this could lead to loss of capital.

j) The fish seller should be hygienically clean to handle fish.

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