EAST AFRICAN COMMUNITY

EDICT OF GOVERNMENT

In order to promote public education and public safety, equal justice for all, a better informed citizenry, the rule of law, world trade and world peace, this legal document is hereby made available on a noncommercial basis, as it is the right of all humans to know and speak the laws that govern them.

EAS 62-1 (2000) (English): Fish handling, processing and distribution — Code of practice, Part 1: Fresh fish handling and processing

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ICS 67.120

EAST AFRICAN STANDARD

Fish handling, processing and distribution — Code of practice

Part 1:

Fresh fish handling and processing

EAST AFRICAN COMMUNITY

First Edition 2000

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Foreword

Development of the East African Standards has been necessitated by the need for harmonizing requirements governing quality of products and services in East Africa. It is envisaged that through harmonized standardization, trade barriers which are encountered when goods and services are exchanged within the Community will be removed.

In order to achieve this objective, the Partner States in the Community through their National Bureaux of Standards, have established an East African Standards Committee.

The Committee is composed of representatives of the National Standards Bodies in Partner States, together with the representatives from the private sectors and consumer organizations. Draft East African Standards are circulated to stakeholders through the National Standards Bodies in the Partner States. The comments received are discussed and incorporated before finalization of standards, in accordance with the procedures of the Community.

East African Standards are subject to review, to keep pace with technological advances. Users of the East African Standards are therefore expected to ensure that they always have the latest versions of the standards they are implementing.

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Fish handling, processing and distribution — Code of practice

Part 1:

Fresh fish handling and processing

1 Scope

This East African Code of practice establishes the hygienic and quality requirements for the handling, processing and distribution of finfish intended for human consumption.

It covers with the exception of tuna:

a) Fresh fish

b) Frozen fish

c) Smoked fish

In addition it includes, in Annex C, a list of common and scientific names of fish species, including some molluscs, echinoderms and crustaceans.

This code is divided into 4 Sections as follows:

Section 1 — Product.

Section 2 — Sanitation.

Section 3 — Requirements for retailers.

Section 4 — Requirements for all staff engaged in handling fish.

2 Definitions

2.1 In this Code unless the content requires.

2.1.1
fin fish
freshwater and marine vertebrate fish. In this Code fish shall have the same meaning.

2.1.2
fresh fish
fish that has never been frozen, smoked or otherwise preserved, except by chilling, and that complies with the quality requirements of this Code. Fish in rigor shall be deemed to be fresh fish.

2.1.3
frozen fish
fresh fish in accordance with Clause 4 of Section 1

2.1.4
thawed fish
fish which has been frozen but is now unfrozen

2.1.5
smoked fish
the product prepared from any wholesome fish in fresh, frozen or salted state which has been subjected to a smoking process in an appropriate equipment

2.1.6
detergent
a cleaning agent whose primary function is to assist in the removal of dirt and organic matter

2.1.7
sanitizer
a compound whose primary function is to reduce or, inhibit the growth of microorganisms

3 Water supplies

For the washing of fish there shall be an adequate supply of potable water under satisfactory pressure.

4 Cleaning and sanitizing procedures

4.1 In the cleaning and sanitizing of plant and equipment, the following 5 distinct operations shall be employed:

a) Dry-clean.

b) Rinse with cold water to remove gross dirt and contamination.

c) Rinse with warm water containing a detergent, preferably heated from 40 °C to 50 °C. Rinse off with warm water.

d) Sanitize by steaming, immersion in hot water, or rinsing with a sanitizer preferably heated from 40 °C to 50 °C.

e) Rinse off with warm water before processing recommences.

4.2 Standard cleaning procedures shall be developed for use in the various stages of the catching and processing line. Where practicable the effectiveness of routine cleaning shall be checked by periodic bacteriological sampling.
Other points to be noted are as follows:

a) Cold voter, preferably under pressure, shall be used for the preliminary rinse

b) Cleaning is the most important stage in the whole operation. All possible aids including warm water 40 °C to 50 °C, soap or synthetic detergents, scrabbling or high-pressure sprays shall be used. The choice of detergent depends on the type of dirt, the nature of the surface, and the degree of hardness of the water being used. Such detergent shall be of an approved non-tainting type. After scrubbing, hot water shall be used to rinse off remaining dirt and excess detergent. This is necessary as detergent neutralizes any sanitizers.

c) Sanitizing of well cleaned surfaces provides a safeguard against the build-up and spread of pathogenic and spilige micro-organisms. As sanitizers lose most of their effectiveness when used on dirty surface; the sanitizing procedure must not be employed as a substitute for thorough cleaning. Steam or hot water over 82 °C can be used for sanitizing only if the temperature at the surface of the object being treated is maintained above 82 °C for at least 2 minutes and preferably longer. Where conditions cannot be met consistently in practice the use of sanitizer rinses is recommended. Sanitjzers shall be non-corrosive, non-perfume, non-tainting and shall be used in the contact time available.

Section 1: Product

1 Scope

This Section 1 specifies the quality requirements, packaging and marking for the fresh, chilled, frozen and smoked fish.

2 General requirements

2.1 Chilling — Fish shall be chilled immediately after catching (or after bleeding and gutting if these processes are done immediately after catching) so as to reduce the temperature of the fish to below 2^0C as quickly as possible, and shall be maintained between 2 °C and –1 °C until processing begins. The chilling media shall be ice, refrigerated seawater or chilled sea voter. The ratio of fish to ice shall be 1:2.

2.2 Fish nomenclature

Where fish is described other than by scientific name, the common names listed in Annex C shall be used where for any reason (for example, sales in a foreign country) fish is described by a non-scientific other than the conmen name, the common name shall also be shown to permit positive identification of the species.

2.3 Recognized forms of preparation

The definitions of recognized forms of preparation are, listed in Annex B. Fish described by the terms listed shall conform to the appropriate definition.

2.4 Glazing

Where fish is glazed, the liquid used for glazing shall not exceed 10 °C and shall be changed sufficiently often to prevent a build-up of micro-organisms.

2.5 General quality

Fish shall be washed free of dirt, sand, grit or other contamination at the earliest practical point after catching. Fish which shows or obvious disease or traumatic injury shall be removed from the catch.

2.6 Bacteriological quality

Fish shall not contain micro-organisms, which represent a health hazard to consumers, and shall not show overt signs of spoilage. The limits for pathogens or pathogenic indicators for all the states of fish in this Code shall be as shown in Table 3.

2.7 Processed fish

After processing, each fish, fillet or steak shall be intact and free of torn or ragged edges. Scraps shall not be included. Processed fish shall be kept separately from unprocessed fish to avoid any cross contamination.

2.8 Temperatures and maximov holding times

The temperatures maximum holding times shall be as shown in Table 1.

3 Fresh fish

Fresh fish handled and treated in accordance with Clauses 2.1, 2 and 3 of Section 2 shall exhibit where applicable, the following characteristics:

a) A bright appearance.

b) A fresh characteristic smell.

c) Prominent, bright, clear and moist eyes and convex pupil.

d) If slime is present and natural to the species, it shall be transparent or creamy white.

e) Bright, red, gills.

f) Bright abdominal blood.

g) Firm and elastic flesh adhering to the bones.

h) Scales, which adhere strongly to the skin where this is normal.

4 Frozen fish

4.1 Treatment

Before freezing, fish shall be washed thoroughly and drained. The fish shall then be packed in suitable containers, and it shall pass through the critical zone from 0 °C to –5 °C in a period not exceeding 6 hours. The process shall not be regarded as complete unless and until the product temperature has reached –18 °C at the thermal centre.

4.2 Characteristics of frozen product

The frozen product shall be free from noticeable desiccation, discolouration or blemish.

4.3 Characteristics of thawed product

After the fish has thawed, the odour shall be fresh and characteristic. The fish shall be free from noticeable dessication, discolouration or blemish and it shall not yield excessive drip.

5 Smoked fish

5.1 Product designation

The end product of this process shall be designated under the following names, followed by the name of the fish:

a) Hot smoked.

b) Dry smoked or hard smoked.

c) Cold smoked.

5.2 Essential composition and quality factors

5.2.1 Raw material

(a) Smoked fish shall be prepared from dressed fish fit for human consumption.

(b) The fish after dressing shall be subjected immediately to the smoking process.

5.2.2 Treatment

5.2.2.1 The fish shall be subjected in accordance with sound commercial practice, to the action of smoke from wood.

5.2.2.2 The wood shall be free from gum, paint, timber preservative or other added substances.

5.2.2.3 Hot smoking — The fish shall be subjected to the action of hot smoke until the fish is well cooked. The temperature for smoking shall not be less than 40 °C.

5.2.2.4 Dry or hard smoking — The fish shall be subjected to the direct action of fire until the fish is well cooked. A subsequent treatment by a cold smoke shall follow for at least one day, depending on the quantity and size of the fish being smoked.

5.2.2.5 Cold smoking — The fish shall be washed and salted. It is then vashed. The fish shall then be subjected to the direct action of cold smoke at a temperature of not more than 40 °C.

5.2.3 Equipment — Any smoking oven made from mud, concrete or drums may be used, provided that the distance from the fire to the fish shall be at least 90 cm. If the traditional rectangular ovens are used, any airtight material, so as to ensure a uniform smoked product, shall surround the gratings.

5.2.4 The premises for smoking — The place for handling and smoking fish shall be enclosed with a roof and screened with mosquito netting and shall be rodent-proof.

5.2.5 Characteristics of well-smoked fish

a) The smoked product shall have a characteristic smoke flavour.

b) The smoked product shall have a characteristic golden, colour, and shall show the dry glossy pellicle condition typical of satisfactory smoking process.

5.2.6 Storing temperature

The storage temperature of cold smoked fish shall be in accordance with Table 2.

6 Packaging of fish

a) The packaging of fish shall be such as to ensure that the product is properly protected from mechanical damage, contamination, leakage, desiccation, and excessive oxidation.

b) Units packed within a container shall be reasonably uniform in size.

c) Material, which Spares a flavour to or causes discolouration of the fish, or is itself discoloured by contact with the fish shall not be used as the immediate package or carton.

d) All packaging material shall meet the requirements of Public Health Regulations of Kenya and EAS 05-348: Kenya Standard for Food Containers.

e) Frozen fish shall be protected by means of waterproof or vapour proof wrapping.

f) All smoked fish shall cool

7 Marking of frozen fish

7.1.1 Immediate Package or Carton

7.1.2 The following information and such other information as inlay required by the sporting country shall be marked clearly, legibly and indelibly on the immediate package or carton:

i) The common name of the fish in accordance with Annex C. The name in accordance with Annex C and the form of preparation.

ii) The full name and business address of the processor or packer, or, in the case of packages or cartons packed for any other person, the full name and address of that person preceded by words indicating that the contents were packed for that person packed in the case of packages or carton packer, or, the full name and address of the for any other person, person preceded by words indicating that the contents were packed for that person.

iii) The net weight of the contents distinctly printed.

iv) The words Product of Kenya shall be clearly and durably marked on the package

v) In addition to the above, also be in accordance with the provisions of EAS 38.

Table 1 — Temperatures during processing, storage and transportation of fish

Stage	Maximum time	Temperatures
a) Storage (before freezing) of fish landed on shore	Storage of fresh fish shall not exceed 6 days	Minimum –1 °C
Iced or subjected to equivalent technique		Maximum +2 °C
b) Processing period for fish filets	3 hours form filleting and packing to freezing or chilling	Minimum –1 °C Maximum +7 °C
(c) Storage of fresh processed	Maximum 6 days	Minimum –1 °C Maximum –23 °C Maximum –18 °C
(d) Freezing	Maximum 6 hours for the thermal centre to pass through the zone of maximum ice crystals formation (critical zone)	-5 °C in centre block
(e) Storage of frozen fish frozen fish	3 months 6 months 12 months	Maximum –20 °C Maximum –23 °C Maximum –28 °C
(f) Transport of frozen fish	—	Maximum –18 °C

Table 2 — Temperatures during storage and display of fresh fish, frozen fish and smoked fish

Stage	Maximum time	Temperatures
(a) Storage of fresh fish, cold smoked fish and thawed fish	Up to and including 12 hours	Minimum –1 °C Maximum + 7 °C
(b) Storage of fresh fish and cold smoked fish	Over 12 hours and up to 6 days	Minimum –1 °C Maximum 2 °C
(c) Storage of frozen fish and fish products	In accordance with Table 1	In accordance with Table 1
(d) Display of frozen fish and fish products	—	Maximum –18 °C

Table 3 — Recommended microbiological limits for fish and fish products

Product	Test	Limit per g			
		n	*c*	*m*	*M*
1. Fresh and frozen fish including fish frozen at sea and fish blocks	Faecal coliforms (MPN)	5	3	4	400
	Staphylococcus (indicator)	5	3	10^3	2×10^3
2. Fresh water fish	Faecal coliforms (MPN)	5	3	4	400
	Staphylococcus (indicator)	5	3	10^3	2×10^3
	Salmonella	5	0	—	—
3. Cold-smoked fish					
(a) Cooked prior to eating	Faecal coliforms (MPN)	5	3	4	400
	Staphylococcus (pathogen)	5	3	10^3	2×10^3
(b) Eaten uncooked	Faecal coliforms (MPN)	5	1	4	400
	Staphylococcus (pathogen)	5	1	10^3	2×10^3

n = number of sample

c = number of samples that can have number of organisms between the two limits (M and m).

m = lower acceptable limit

M = upper limit. Only *c* cut off *n* samples would be acceptable at this limit.

Section 2: Sanitation

1 Scope

This Section 2 specifies sanitation requirements for fresh, frozen and smoked fish.

2 Requirements on board the fishing vessel

2.1 Fishing Vessel

a) The deck area used in sorting and clear fish shall be vashed immediately before and after each catch is stored.

b) The entire deck area of all fishing vessels (and, in the case of undecked vessels, the deck boards and bilge) shall be cleaned and sanitized immediately after the discharge of the fish taken on each trip.

c) The decks and holds of vessels, storage tanks and storage areas, containers and shelves and all surfaces coming into contact with fish shall be maintained in good repair, and shall be cleaned and treated with a sanitizer immediately after the discharge of each catch.

d) All cleaning areas including cutting benches shall be cleaned and treated with a sanitizer when necessary, as well as immediately before use and after the discharge of the catch.

e) Utensils and equipment used in processing fish shall at all times be maintained in a hygienic condition, and shall be cleaned and treated with a sanitizer at the end of each working day. Utensils and equipment shall be retreated with a sanitizer immediately before use.

f) Provisions shall be made on she vessel for proper storage of oils or materials, which could damage, contaminate or taint fish. Bait shall be stored in containers capable of being readily cleaned and shall be stored in such a Jay that it will not contaminate or taint the fish. The containers shall be cleaned and treated with a sanitizer before re-use. All edible fish shall be protected from damage or contamination.

g) The bilge of all vessels shall be maintained in a sanitary condition.

2.2 Treatment of fish

a) All fish shall be washed, and the debris removed from the fish prior to storage. Offal and voter shall be kept clear of the fish, and shall be disposed of at the earliest possible time.

b) Eviscerated fish shall be washed, and the belly cavity cleaned in clear cool running water.

c) Containers for holding fish on the vessel shall conform to the requirements of 4.1(d) and 4.1 (e)

d) All ice shall be derived form water in accordance with (Annex A) and shall be clean and wholesome. Ice shall not be re-used.

e) Storing of fish on the vessel shall be done under clean and hygienic conditions. Fish shall not be exposed to deterioration or damage, nor shall it be spiked in the flesh.

f) Ice fish stored in boxes, pounds, bins or pens shall be packed with sufficient ice to maintain the fish at temperature between 20 °C and –1 °C for duration of the trip.

g) Fish bins and pens shall be provided with removable shelves at not more than 1 m intervals so as to prevent the crushing of fish.

h) Where one variety of fish is known to have a detrimental effect on another variety when stored together, each variety shall be stored in separate bins.

i) Packing and storage of fish shall be so arranged so that adequate drainage is provided.

3 Requirements at point of unloading from fishing vessel.

3.1 Unloading procedures shall be in accordance with sound commercial practice, and fish shall not be left exposed to sunlight, rain, wind, extremes of temperature, or contamination by birds and vermin.

3.2 Any conveyors, fish pumps, or other mechanical systems which are used for unloading and which come into contact with the fish shall be maintained in good repair and thoroughly cleaned and treated with a sanitizer after each operation.

3.3 Unless the fish is to be processed immediately, fish which has been de-iced during unloading shall be re-iced or placed in a chiller operating at temperature between 2° and –1° within 3 hours.

4 Requirements during transportation

4.1 From the fishing vessel to shore establishment

a) Fish or fish products for human consumption shall not be transported in containers or vehicles where spoilage or contamination is likely to occur form contact with other goods. Offal or bait not treated in the same manner, as edible fish shall be kept physically separated.

b) Containers and the freight compartment of vehicles shall be so constructed as to be easily cleaned and drained. Material used for lining shall be corrosion resistant and impervious to water. The floor of the vehicle shall be constructed of corrosion resistant durable material impervious to water. All interior angles shall be rounded to facilitate cleaning.

c) Containers and the freight compartment to vehicles shall be kept clean.

d) Returnable containers shall be constructed of all metal or plastic material, or a combination of these materials. Returnable containers shall not be used for any purpose other than for holding and transportation of fish.

e) Non- returnable fish containers shall be constructed form new uncontaminated materials. Non-returnable fish container shall not be reused for the holding and the transportation of edible fish.

f) Containers shall not be filled to such a degree as to cause damage to the fish where one container is placed on another.

g) Where removal trays are used as liners in a vehicle, fish shall not be carried loose in them unless completely protected from contamination. Trays used for the transport of fish shall be effectively cleaned and treated with a sanitizer after use.

4.2 Specific requirements for processed fresh fish

Fish or fish products shall not be offered for transport when the internal product temperature is higher than 2 °C, except as provided for in Clause 3.3 Fish in a spoiled or an incipient spoiled condition shall not exceed the external temperature of 2 °C.

4.3 Specific requirements for frozen fish and frozen fish products

a) Frozen fish shall not be transported or offered to transport when the internal temperature of the product intermediately before loading is higher than –18 °C.

b) Frozen fish shall be continuously maintained at a temperature not higher than –18 °C during transportation.

c) Frozen fish shall be transported in insulated containers or insulated vehicles of thermal insulation efficiency, adequate to maintain the required temperature, or shall be kept at the required temperature by the use of mechanical cooling, frozen carbon dioxide, or other equivalent techniques.

d) Containers and vehicles equipped with refrigeration equipment shall be pre-cooled to an air temperature not higher than –7 °C before loading starts. Loading and unloading of frozen fish shall be completed with the minimum of delay.

e) Frozen fish shall be loaded within a refrigerated transport vehicle in such a manner as to leave an air space of at least 25 arm and preferably 50 mm between cargo and floor, wall and roof.

f) During any time interval when loading or unloading operations ceases, mechanical refrigeration equipment shall be turned on and be operation, and doors or containers and vehicles shall be kept closed.

5 Requirements for processing establishments

These shall comply with Heath Regulations as stipulated in the food, Drugs and Chemical Substances Act.

6 Equipment in processing establishments

These shall comply with the Health Regulations of as stipulated in the Food, Drugs and Chemical Substances Act (Cap. 254).

7 Operation in processing establishments

a) No other foods shall be processed, cooked or packaged in the processing room while fish is being processed.

b) All containers containing fish shall be moved within the establishment on trolleys, barrows, conveyors, or such suitable equipment and shall not be slid over the floor.

c) Containers that have contained fish or fish products shall be thoroughly clanged before being re-used.

d) Utensils and equipment, including preparation and packaging tables coming into with fish, shall at all times be maintained in a hygienic condition, and shall be cleaned and sanitized at the conclusion of each working day.

e) Insecticides, rodenticides, and other toxic chemicals shall not be applied when processing is in operation, or when the exposed product is present. Working surface, containers packaging, and raw materials shall at all times be kept free from toxic residues.

Section 3: Requirements for retailers

1 Scope

This Section 3 specifies the requirements for retailers handling fresh fish, frozen fish and smoked fish.

2 Fish preparation area

2.1 The preparation area shall comply with the provision of the Health Regulations as stipulated in the Food, Drugs and Chemical Substances Act.

2.2 The public shall not be permitted in this area.

3 Shop serving area

3.1 The shop-serving area shall be so constructed as to comply with the provisions of the Health Regulations as stipulated in the Food, Drugs and Chemical Substances Act and Public Heath Act.

3.2 Every retailer dealing in fresh fish shall have effective chilled storage with a capacity of not less than 1 day's supply. Retailers dealing in frozen fish shall provide refrigerated storage with a capacity of not less than 2 day's supply.

3.3 Fresh fish shall be stored in accordance with Table 2.

3.4 Frozen fish

Frozen fish shall be displayed at a temperature in accordance with Table 1.

3.5 Fish and fish products exhibited for sale shall be:

a) Shaded from the direct rays of the sun, and protected by windows from external contamination; and

b) Even where refrigerated windows or refrigerated slabs are in use; ice is still desirable.

4 Dwelling and utensils

Windows slabs and shelves used for displaying fish and fish products shall be made of, or covered with, stainless steel, glass, marble, plastic, or other material possessing similar surface characteristics and shall be so arranged as to facilitate drainage and cleaning.

5.2 Containers in which fish is washed and processed shall be made of stainless steel or material with similar surface.

6 Cleaning

6.1 The cleaning of the premises, equipment and utensils shall be in accordance with the Health Regulations as stipulated in the Food, Drugs and Chemical Substances Act and Public Health Act.

6.2 Returnable fish containers shall be effectively cleaned and treated with a sanitizer immediately after use and returned as practicable.

6.3 Returnable fish container shall not be used for any other purpose.

Section 4: Requirements for all staff engaged in handling fish

1 Scope

This Section 4 specifies the hygienic requirements for all staff engaged in handling fish.

2 Personal hygiene and conduct

2.1 No person who is suffering from a communicable disease or who is a carrier as defined in Kenya Health Regulations or who is suffering form a condition causing a discharge of pus or serum form any part of the head, neck, hands, or arms, or has reason to believe or suspect that he is likely to transmit disease producing organisms to any fish shall engage in the preparation, packaging or handling of fish or fish product for sale, or of any material used or likely to be used as wrapper or container for fish for sale.

2.2 If the occupier of any establishment engaged in handling fish has reason to believe or suspect that any person, whether suffering form a communicable disease or not, is likely to transmit disease shall be excluded from working in any such establishment until the person furnishes a certificate from a medical practitioner that he is free from infection and any condition causing a discharge of pus or serum form any par of the head, neck, hands or arms.

2.3 No person shall spit or smoke or chew tobacco being handled. The consumption of food or drink shall be prohibited. Notices to this effect shall be prominently displayed.

2.4 All persons in the processing area shall wear clean Protective clothing's, including headgear. All personnel coming in contact with unpacked fish shall wear waterproof protective clothing, which shall be kept clean at all times and treated with a sanitizer after each days operations.

2.5 Glove used for handling of fish shall be maintained in a sound, clean, and sanitary condition, and shall be made from an impermeable material except where their usage would be incompatible with the work involved.

2.6 Staff shall keep their fingernails short and clean. The wearing of fingernails varnish by employees while handling processed fish with the bare hands shall not be permitted. Employees shall wash their hands with soap and water before starting work and also after each absence from the processing area.

Annex A (informative) Bacteriological water quality

A.1 Ideally, water used for washing fish shall be free from microorganisms. In practice, this quality is not always attainable. The following standard for water from distribution system is therefore recommended:

a) Throughout any period of 12 months, 95 per cent of sample shall not contain any coliform organisms in 100 ml.

b) No sample shall contain E. coli in 100 ml.

c) No sample shall contain more than 10 coliform organisms per 100 ml.

d) Coliform organisms should not be detectable in 100 ml of any two consecutive samples.

A.2 Where it is impracticable to supply water through a piped distribution network and where reliance has to be placed on alternative source (for example, wells, springs, sea-water, etc.) the standard outlined in Clause A.1. may not be obtainable. However, such a standard should be aimed at, and polluted water shall not be used. Persistent failure to achieve a coliform count of less than 10 per 100 ml, particularly if E. coli is repeatedly found, shall as general rule, lead to condemnation of the supply.

Annex B Forms of preparation of fish

(*For the diagrammatic illustrations of these forms see Figures 1 to 7*)

a) Whole fish — A fish as taken from the sea with no processing, or a fish which has been bleeded only.

b) Gutted — A whole fish which has been eviscerated

c) Gilled and gutted — A gutted fish from which the gills have been removed.

d) Dressed fish — A gutted fish from which the head, tailfins have been removed.

e) Headed and gutted — A gutted fish from which the head has been removed.

f) Pan-dressed — A dressed fish from which all scales and traces of viscera and blood have been removed.

g) Steaks — Cross-wise cuts from pan-dressed fish not exceeding 40 mm in thickness.

h) Fillet — The meat from one side or part of one side of a fish cut length-wise as close to the backbone as possible. It shall be an intact cleanly cut section of fish so trimmed to exclude scraps.

i) Skinned fillet — A fillet as defined in h) but with fins and skin off.

j) Boned fillet — A fillet trimmed as in i) but with bones out.

k) Single fillet — A fillet from one side of a fish.

l) Double fillet — Two fillets from a single fish, joined together along the backbone or back.

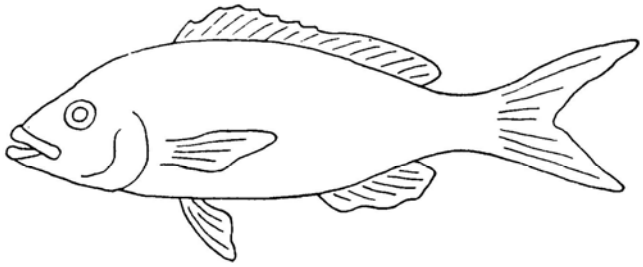

Figure 1 — Whole fish

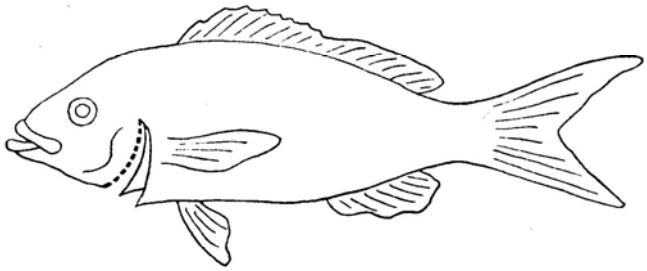

Figure 2 — Gutted fish

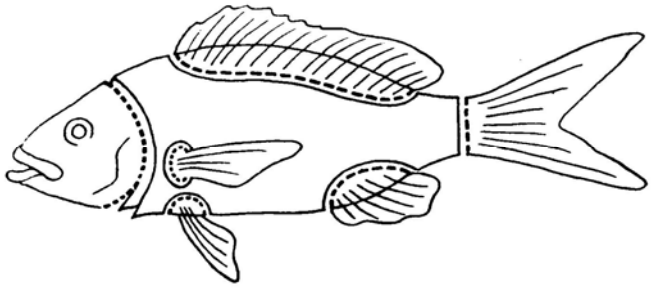

Figure 3 — Headed and gutted

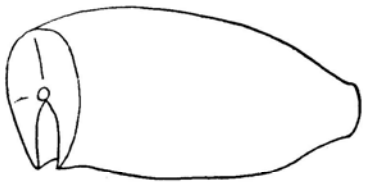

Figure 4 — Pan-dressed fish

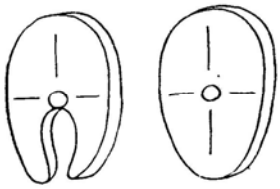

Figure 5 — Steaks

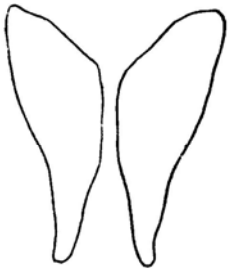

Figure 6 — Single fillets

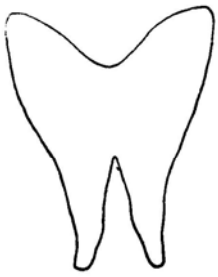

Figure 7 — Double fillets

Annex C (informative) Common species of fish

Below is a list of most common marine fish in Kenya waters:

Scientific name	***Common name***	***Swahili name***
Signus Oranism	Rabbit fish	Tafi
Siganus stellatus	Spotted rabbit fish	Tafi Manga
Aprion Verescens	Streaker	Murongo
Lutianus argentimaculatus	Red snapper	Tasanda
Lutianu vaigiensis	Speckled snapper	Haraki
Lutianus duodermlineatus	Snapper	Mrongo
Lutianus rivulatus	Speckled snapper	Cheusi
Lutianus Kashmira	Blue striped snapper	Tembo
Epinephelus macrospilus	Rock-cod	Tewa
Luthrinua rebulcsus	Scavenger	Changu
Mugil cephalus	Flathead mullet	Mkize
Scomberromous commersoni	King fish	Nguru
Acanthocybium solandri	Wahoo	Kanadi
Thunnus albacores	Yelow Fin tuna	Jodari
Euthynnus pelamis	Bonito or skippjack	Jodari
Rastrellige Kanagurta	Little mackerel	Kiboma
Istriophorous gladius	Sailfish	Sulisuli
Makaira herscheli	Marlin or spearfish	Nduaro
Makari nigricans	Blue marlin	Sulisuli
Caranx Kippos	King fish	Kole kole
Chorinemus tol	Queen fish	Pandu
Callyyodon guttatus	Parrotfish	Pono
Pomadasys operculare	Spotted grunter	Pamamba
Thala soma hebraicum	Rainbow fish	Pono
Upeneus tragula	Red fish	Mkundaji
Pscudeopeneous	Goad fish	Mkundaji
Chanos Chanos	Milk fish	Mwatiko
Achoviell indica	Anchovy	Simu
Sardinella Melanura	Sardine	Simu
Acanthopagrus berda	Mud Bream	Kiuwa
Gaterine gaterinus	Lemon fish	Mlea
Gaterin sordidus	Black sin	Fute
Rachyeentron Canadus	Runner	Songoro
Gterin batata	Grey skin	Kambu maji
Naso brevircayris	Unicorn fish	Sange
Acantrurus Fuliginosus	Surgeon fish	Kangaja
Molluscs		

Octopus Maorum	Octopus	Pweza
Ostrea lutaria	Oyster, dredge	Mshaza
Notodarus sloani	Squid, arrow	Mgisi
	Crabs	Kaa
	Prawns	Kamba ndogo
	Lobsters	Kamba mawe
	Bench-der-mer	Fongoola Pwani

Commercially important fresh water fishes

Common name	**Local name**
(a) Tilapia	Ndege
(b) Nile Perch (lates niloticus)	Mbuta
(c) Barbus	Fwani
(d) Bargus	Sewu
(e) Protopterus (Lungfish)	Kamongo
(f) Engraulicypris	Omena
(g) Crayfish (Procambarus clarkii)	Okela
(h) Crayfish (Catfish)	Mumi
(i) Black bass (micropterus Salmoides)	Chengu
(j) Trout	
(k) Haplochromis	Fulu
(l) Mormyrus	Suma
(m) Labeo	Ningu
(n) Shilbe	Sire
(o) Synodontis	Okoko
(p) Alestes	Osoga

Annex D Application of HACCP in the fish industry

D.1 Introduction

The Hazard Analysis Critical Control Point (HACCP) is a science-based system which is aimed to prevent food safety problems from occurring rather than reacting to non-compliance of the finished product. The HACCP system accomplishes this by the identification of specific hazards and the implementation of control measures. An effective HACCP system should reduce the reliance on traditional end-product testing.

This annex explains the principles of HACCP as it applies aquaculture and molluscan shellfish production and to the handling and processing, but the Code can only provide guidance on how to use these principles and offer suggestions as to the type of hazards which may occur in the various fishery products. The HACCP plan, which should be incorporated into the food management plan should be well documented and be as simple as possible.

This annex also explains how a similar approach involving many of the principles can apply to the broader application covering the essential quality, composition and labelling provisions of Codex standards or other non-safety requirements which in this case are referred to as **Defect Action Point Analysis**. This approach for defect analysis is optional and other techniques, which achieve the same objective, may be considered.

Figure D.1 summarises how to develop a HACCP and Defect Analysis system.

D.2 HACCP principles

The HACCP System consists of seven principles, which are

PRINCIPLE 1 — Conduct a hazard analysis.

PRINCIPLE 2 — Determine the Critical Control Points (CCPs).

PRINCIPLE 3 — Establish critical limit(s).

PRINCIPLE 4 — Establish a system to monitor control of the CCP.

PRINCIPLE 5 — Establish the corrective action to be taken when monitoring indicates that a particular CCP is not under control.

PRINCIPLE 6 — Establish procedures for verification to confirm that the HACCP system is working effectively.

PRINCIPLE 7 — Establish documentation concerning all procedures and records appropriate to these principles and their application.

These principles have to be followed in any consideration of HACCP.

HACCP is an important management tool, which can be used by operators for ensuring safe, efficient processing. It must also be recognized that personnel training is essential in order that HACCP will be effective. In following HACCP principles, users are requested to list all of the hazards that may be reasonably expected to occur for each product type at each step or procedure in the process from point of harvest, during unloading, transport, storage or during processing, as appropriate to the process defined. It is important that HACCP principles be considered on a specific basis to reflect the risks of the operation.

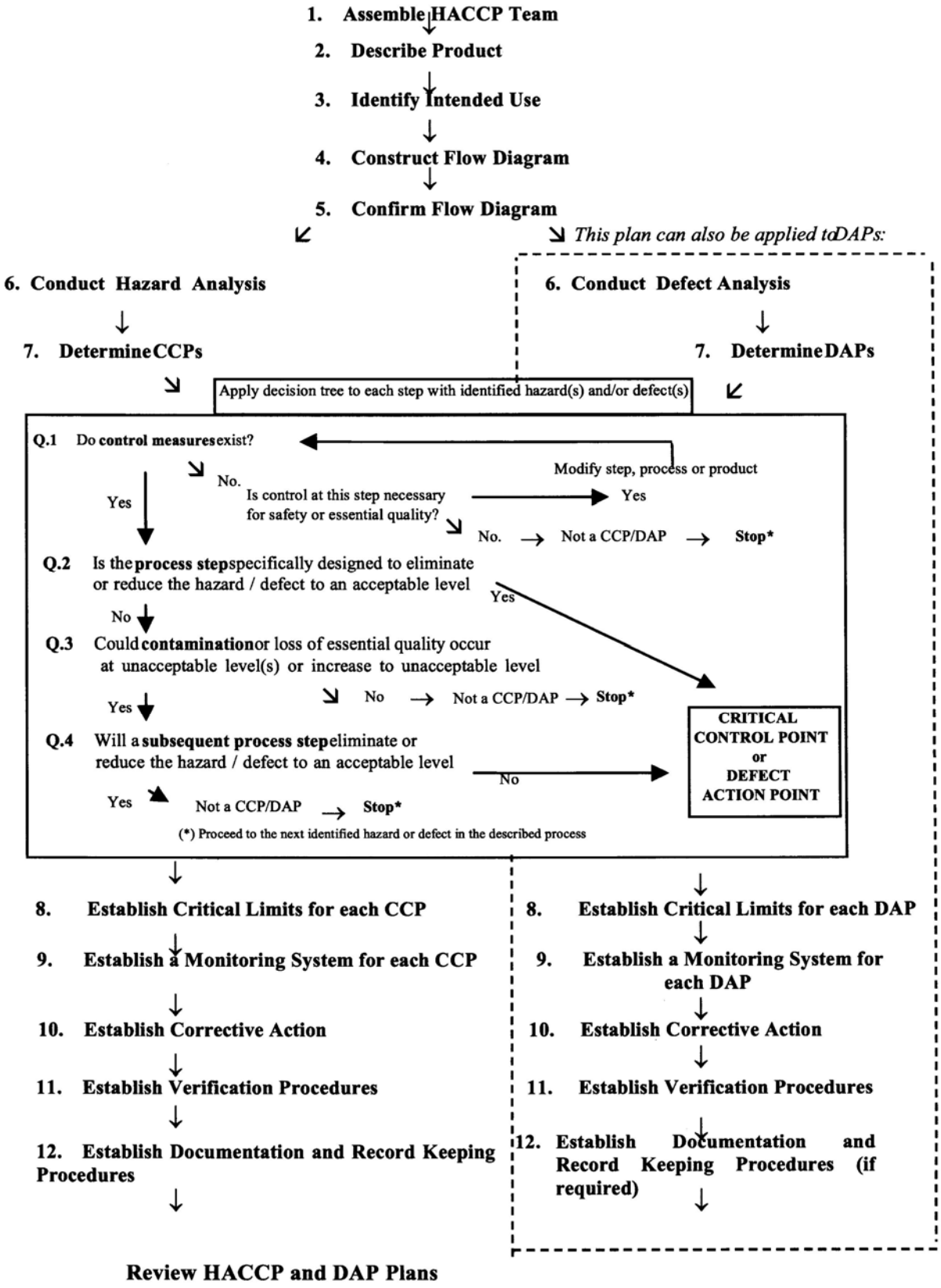

Figure D.1 — Summary of how to implement a HACCP and Defect Analysis

D.3 Defect action point analysis

Since the Code is intended to cover not only those hazards associated with safety but to include other aspects of production including the essential product quality, composition and labelling provisions as described in product standards developed by the Codex Alimentarius Commission, not only are critical control points (CCP) described but also defect action points (DAP) are included in the Code. The HACCP principles may be applied to the determination of a DAP, with quality instead of safety parameters being considered at the various steps.

D.4 Application

Each aquaculture, molluscan shellfish, shellfish and fish facility should ensure that the provisions of the appropriate Codex standards are met. To accomplish this, each facility should implement a food safety management system based on HACCP principles and should at least consider a similar approach to defects, both of which are described in this code. Prior to the application of HACCP to any segment of the growing, handling and processing chain, that segment must be supported by a pre-requisite programme based on good hygienic practice (see Section 3). It should be noted that parts of the pre-requisite programme may be classified as a CCP or DAP within a particular process.

The food management system developed should indicate responsibility, authority and the interrelationships of all personnel who manage, perform and verify work affecting the performance of such systems. It is important that the collection, collation and evaluation of scientific and technical data should be carried out by a multi-disciplinary team. Ideally, a team should consist of people with the appropriate level of expertise together with those having a detailed knowledge of the process and product under review. Examples of the type of personnel to include on the team are the processing facility manager, a microbiologist, a quality assurance/quality control specialist, and others such as buyers, operators, etc., as necessary. For small-scale operations, it may not be possible to establish such a team and therefore external advice should be sought.

The scope of the HACCP plan should be identified and should describe which segments of the food chain is involved and the general classes of hazards to be addressed.

The design of this programme should identify critical control points in the operation where the processing facility or product will be controlled, the specification or standard to be met, the monitoring frequency and sampling plan used at the critical control point, the monitoring system used to record the results of these inspections and any corrective action when required. A record for each critical control point that demonstrates that the monitoring procedures and corrective actions are being followed should be provided. The records should be maintained as verification and evidence of the plant's quality assurance programme. Similar records and procedures may be applied to DAPs with the necessary degree of record keeping. A method to identify, describe, and locate the records associated with HACCP programmes should be established as part of the HACCP programme.

Verification activities include the application of methods; procedures (review/audit) and tests in addition to those used in monitoring to determine:

— the effectiveness of the HACCP or DAP plan in delivering expected outcomes i.e. validation;

— compliance with the HACCP or DAP plan, e.g. audit/review;

— whether the HACCP or DAP plan or its method of application need modification or revalidation.

