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SWIOTUNA

South West Indian Ocean Tuna Forum

SOUTH WEST INDIAN OCEAN TUNA FORUM (SWIOTUNA)

Training manual for Fish Quality, Safety & Handling



10/21/2021

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Introduction

The best quality fish attracts the best prices at the market. So how should fish be handled to keep them at their best?



The SWIOTUNA Training Manual for Fish Quality, Safety & Handling provides easy-to-use information for guiding Small Scale fishers towards the improvement of quality and safety of fish and fishery products, through promoting good hygiene practices and good manufacturing practices.

The manual will help fishers get the best quality fish to the market by showing them how to harvest, chill, Pack and store so they attract the best prices possible and increase their incomes



Foreword

In the recent years, the need for food safety and quality management in the seafood sector has been rapidly growing. Changing food legislations and international trends means that the traditional methods and systems may not generate the level of compliance demanded by the markets.

In the SWIO region the need for change to meet the quality and food safety compliance is critical because of the traditional nature of the fishing and post-Harvest fisheries and its inherent issues yet, actively and notably supplying fish and fishery products globally. Furthermore, it is estimated that 30-70 % of fish and fishery are lost after harvest. The high post-harvest losses along the fishery value chain negatively contribute to the household's income of the fisher-folk as well as to the poverty of the rural fishing communities.

To assist the sector, SWIOTUNA developed this training manual to ensure that small-scale fishers who produce over 70% of seafood that is consumed locally and globally have access to relevant information on fish quality, safety and handling packaged in simple and easy format for them to understand, internalize and put to practice. The manual will form a valuable input into ensuring the safety and health of fish and fishery products with a view to protecting and safeguarding the health of consumers, ensure consumer confidence in fish and fishery products by providing and maintaining products of good quality and standards and reduce post -harvest losses

The manual on fish quality, safety and handling targets small-scale fish producers and handlers in the SWIO region. The manual aims to disseminate technical information on good hygiene practices in fishing boats and landing sites in small scale fisheries to improve the capacity of the fisher community, fish transportation fish processing at small scale level and other stakeholders to produce fish and fishery products in compliance with food safety standards and also demonstrate the commitment to professionalism of the SWIO seafood sector.

Acknowledgement

This Manual was put together with the financial support from SWIOTUNA. Many thanks to all those who provided relevant information and input which enabled the production of this training Manual. This manual was compiled by Ms. Beth Wagude, an expert in Fisheries Quality and Safety matters.

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Part I: Background and Context

This part of the manual highlights the importance of fish quality and safety, objectives of the training on fish quality and safety, highlight of the content of the training modules, structure and design of the training. The guidelines for the training facilitators are also provided in this section.

The context

The fishery sector is of great importance for the SWIO region, as it contributes significantly to food security and nutrition, livelihoods of the people and national economic development. Particularly, Post-Harvest fisheries is considered as a very important sub sector in contributing to poverty alleviation, economic growth, and public health protection.

Presently, Post-Harvest fisheries is actively and notably supplying fish and fishery products to meet domestic demand and to promote export to international markets. The main challenge remains the quality and safety of the fisheries products which could have an impact on public health and product value this is especially significant with respect to the small-scale fishers. It is estimated that 30-70 % of fish and fishery are lost after harvest. The high post-harvest losses along the fishery value chain negatively contribute to the household's income of the fisher-folk as well as to the poverty of the rural fishing communities.

Assuring the safety of fish and fishery products is mandatory for consumption and trade nationally, regionally and internationally. All fish value chain actors have a responsibility to ensure the safety of fish and fishery products to the consumer while the government must play its role in ensuring that the requisite policies, laws and regulations are developed and understood by all Fish Business Operators in the fish industry. Every effort should be made to improve the quality and safety of fish and fishery products, through promoting good hygiene practices and good manufacturing practices. The production of this training manual on fish safety, quality and handling is one of the interventions to help improve the quality and safety of fish and fishery products.

This manual aims to help build the capacity of small-scale fish producers and handlers in proper fish handling with a view to minimizing post-harvest losses, enhance fish quality and safety for human consumption besides value addition. Proper fish handling provides adequate confidence that fish and fishery products meet specific safety and quality requirements in line with the sanitary and phyto-sanitary measures that are put in place with national, regional and global standards.

Proper handling of fish between capture and delivery to the consumer is a crucial element in assuring final product quality. Standards of sanitation, method of handling and the time/temperature of holding fish are all significant quality factors. The presence of bacteria harmful to human beings generally indicates poor sanitation in handling and processing of fish and fishery products. Preventive strategies based on

thorough analysis of prevailing conditions are much more likely to provide an assurance of fish quality and reduce post-harvest losses as well.

The Purpose and Objectives of the Training Manual

The main objective of this training manual is to build the capacity of small-scale fisher folk on fish quality, safety and hygiene handling practices.

Specifically, the objectives of the training are to;

- i. Provide fisher folk (including fishers, fish traders, fish dealers, fish processors, and other handlers) with the necessary knowledge and skills on proper fish handling, quality, and safety for enhanced consumption and market access.
- ii. Provide trainers with knowledge and skills on how to keep hygiene on environmental, physical, and biological factors that contribute to the deterioration of fish quality and safety including reduction of shelf life of fish and fishery products.
- iii. Provide trainees with knowledge and skills on post-harvest losses reduction and small-scale value addition.
- iv. Provide guidance or good practices on health solutions for improved fish quality and safety.

Target Beneficiaries

This training manual is designed for;

- i. Small-scale fishers (fishing areas and skippers)
- ii. Supervisors for fish workers and fish handling establishment
- iii. Owners of boats both fishing and transporting boats
- iv. Association of small-scale fishers and traders; other beneficiaries include but are not limited to the following;
- v. Relevant national/local government fisheries agencies.
- vi. Trade associations that have an interest in the fisheries sector.
- vii. Non-governmental and development agencies that promote. Small-scale enterprises in the fisheries value chain.

Guidelines for the Training Facilitators

Target Trainees

The trainees will be selected depending on whether they are Trainer of Trainers (ToT) or the main target beneficiaries. Nevertheless, the training will include among others, fishers, fish traders, owners of fishing boats and those involved in small-scale fish value addition and processing. The ToT will be drawn from relevant government agencies, the private sector and NGOs that promote small-scale fisheries production, processing and marketing initiatives. ToT will be facilitators of the training but not teachers and or lecturers, with practical experience on the subject matter. The cardinal rule here is that facilitators should not lecture participants but facilitate and listen keenly and allow the training to be as participatory and interactive as possible.

Training Materials

- i. The training materials should be prepared and made available ahead of the actual training dates.
- ii. Prior to the training date, facilitators should acquaint themselves with the training manual content as well as guidelines provided

- iii. Materials and teaching aids to be used during the training should be provided and made ready some few days prior to the actual training. Such materials and aids including writing materials, pens, name tags, flip charts, marker pens etc.
- iv. Visual aids, field equipment and tools should also be arranged in time before the sessions start.
- v. The equipment and tools for the training should be tested beforehand to ensure that they are in good working conditions to avoid delays and wasting of time on the onset of the training.
- vi. Prepare adequate copies for handouts for all the participants. Ideally one handout per participant is recommended.
- vii. Handouts for the training should only be given out at the end of the training for each module. This helps avoid disruption and detraction of attention.

Training Venue

- i. The training venue may vary depending on the locality, distance and cost implications.
- ii. The training venue can be in a public and or private facility, or owned by the community (Communal)
- iii. The training venue should have adequate rooms and space. The field demonstrate sites should also be handy for practical sessions.
- iv. Training Room should be big enough to accommodate at least 25 participants seated in semi-circular or U-shaped arrangement so as not to obstruct the front.
- v. There should be adequate sitting space, a desk and some seats for at least three trainers at any given one session.
- vi. Provision should be made for a space to place the LCD project, laptops and flip charts and for holding any other training materials.
- vii. Sites for demonstration and practical, should be close to the training venue otherwise adequate arrangements should be made in advance in-case such sites are several kilometers away from the training venue such as the fish landing site, fish market and or fish processing facility. The management and or owners of those sites/ facilities should be informed well in advance and approval secured in writing before the visits.

What to do during the training session

- i. Keep the trainees attentive and interested. This can be done by using examples as necessary, interactive and participatory, use of pictures and video clips to illustrate points and ideas, keeping sessions short and avoiding distractions.
- ii. Help trainees comprehend. Use simple and easy to understand words, maintain the flow of topics, give information in bits, prop them with some follow up questions.
- iii. Help participants to remember by introducing important issues at the beginning, giving a summary of the topic, emphasizing certain aspects, give handouts

Delivery of the Training Manual

The delivery of this manual uses a participatory training methodology that can be delivered by the different partners and practitioners. The delivery system of the training consists of two stages;

Stage 1: Team of facilitators

This entails putting together the core team of training facilitators. The core team of facilitators will train trainers of trainers (ToT). They use this manual including the modules therein here.

Stage 2: Outreach Programme

The outreach program entails ToTs going out to train fisherfolk and other relevant fishing industry players as outlined in the above section of the target group. The partners and other industry players can support the rolling out at the training program.

Training Program and methodology

The training programme has been structured to comprise of presentations on the topic to give participants an opportunity to comprehend what are the fish safety and quality is all about.

The presentations are blended with interactive sessions including role play, discussions, practical and field visits. Health breaks and mealtime are also factored in the programme.

The training follows a logical sequence of flows, the previous topic building on the next one with flexibility allowed depending on the circumstances as the trainer finds its necessary to do so would be beneficial to the trainees.

Participants including the trainers and trainees should be allowed adequate time to travel to and from the training programme. Ideally the training should commence and or end on the travel dates, however, cost implications should be factored in deciding on the logistical arrangements and planning for the travel dates.

Part II: The Training Modules

This part consists of modules which are structured in a way that all aspects of the fisheries safety, quality and hygiene aspects are handled though targeting different targets across the value chain nodes.

There are 6 modules, namely;

1. Describing Seafood Spoilage factors and their controls
2. Maintaining Personal Hygiene & Use Hygienic Work Practices
3. Cuts, Sores and diseases
4. Food borne diseases
5. Cleaning and Sanitation
6. Handling Seafood Product

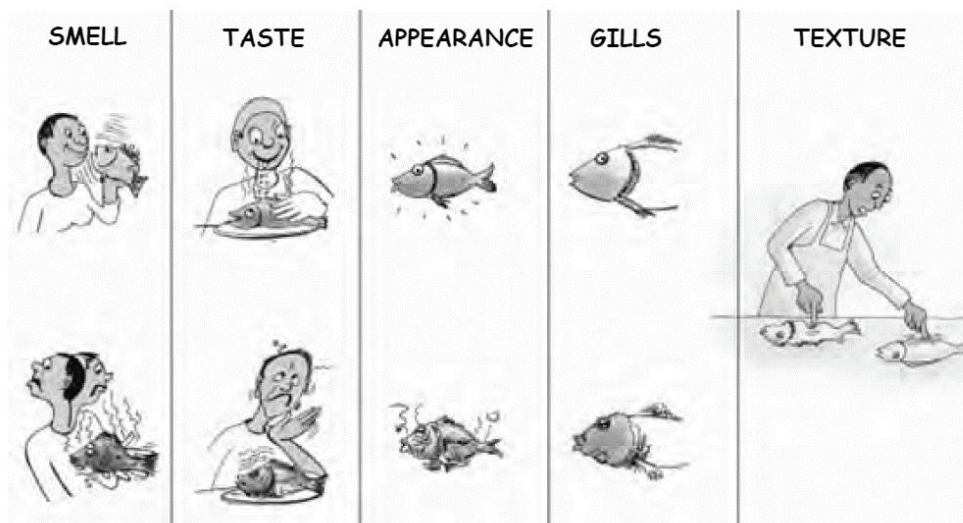
Section 1: Describe Seafood Spoilage factors and their controls

Aim

The aim of this section is to introduce you to seafood spoilage. It will help you to Describe seafood spoilage factors and their controls.

What is Spoilage?

Seafood is usually good to eat and generally good quality when it is caught or harvested. Over time the seafood changes and it loses its quality. It becomes not very nice to eat. These changes are called spoilage



Spoilage Factors

There are several factors that cause seafood to spoil or 'go off'. These are:

1. stress
2. rapid rigor mortis
3. enzymes
4. bacteria
5. oxidation
6. dehydration
7. rough handling

1.1 Stress

This section is about: The effect and control of stress

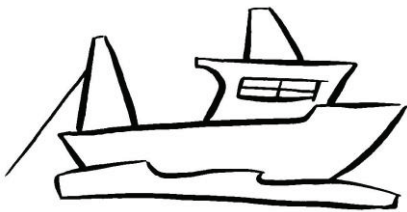
The Effects of Stress in Fish

Seafood gets stressed the same way people do. This can happen when seafood is taken out of its natural environment when it is caught or harvested. A fish that has been stressed before being brought onto the boat will have less energy. This means it will go into rigor mortis more quickly. It also means that it will begin to lose its nice fresh appearance and will not taste as good.

Fish left without icing it goes into rigor mortis more quickly

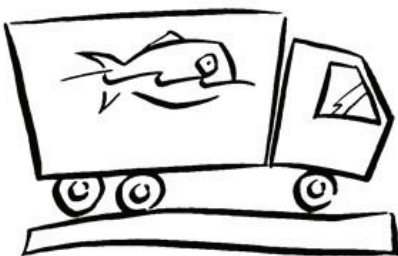


The Control of Stress in Fish



Get the fish onto the boat as soon as you can, after it is caught.

Get the fish into ice as soon as you can after it is caught.



Keep it cold until it reaches the factory or the market

The Effects of Stress in Shellfish

Shellfish will get stressed when they are harvested and taken from the water. This is because when they are taken from the water there is no more food for them to eat. They must live off their own energy. This causes them to lose their nice fresh taste. The longer they are left out of the water before being eaten or processed, the less taste they will have. If left out long enough the shellfish will starve and die.

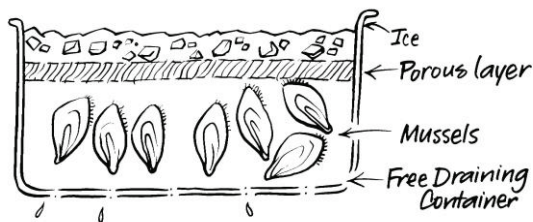
A freshly harvested shellfish



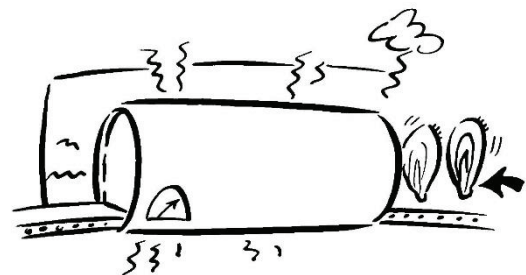
A shellfish that has been out of the water for a few days.

The Control of Stress in Shellfish

Don't leave shellfish out of the water too long



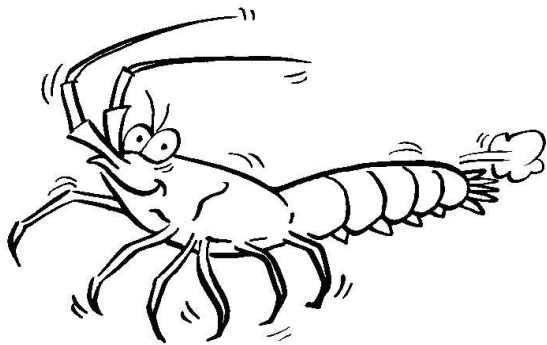
Once taken from the water keep the shellfish cool but not too cold



Process or eat the shellfish as quickly as you can

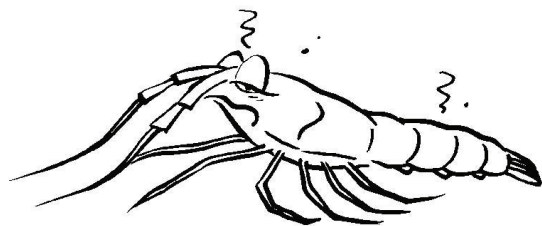
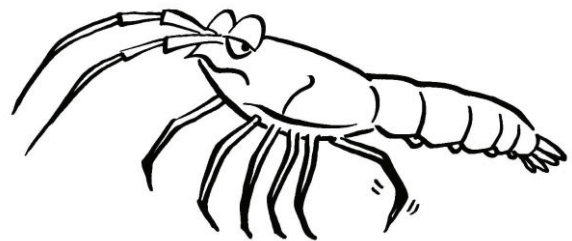
The Effects of Stress in Shrimp

Shrimp also get stressed when they are taken from the water. They become less lively and begin to lose quality. If the Shrimp are not handled properly, they will suffer from more stress. If they are left in the sun and wind, they get very stressed and become weak. They may even die.



A happy lively Shrimp

A stressed Shrimp



A very stressed Shrimp

The Control of Stress in Shrimp

- Don't leave shrimp out of the water too long
- Handle them carefully
- Keep them cool

Protect them from the sun and wind

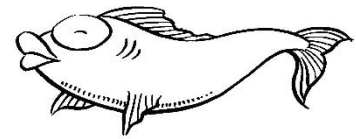
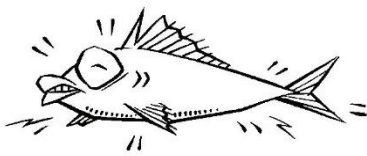


1.2 Rigor Mortis

This section is about: The effect and control of rapid rigor mortis

What is rigor mortis?

Rigor mortis is when the muscles of an animal contract shortly after death. This causes them to become stiff and hard. This happens to people as well as fish. Once a fish dies changes begin to happen. After about 1 to 6 hours, the muscles in the fish begin to go into rigor and they become stiff and hard. After a while the muscles become soft and limp again, like they are when a fish is first caught. Rigor mortis is a spoilage factor that mainly affects fish. Shellfish and shrimp will go through rigor mortis, but it doesn't change the quality significantly.



Fish post-rigor - the muscles are soft and limp

Fish in rigor – the muscles are stiff and hard

The effect of rapid rigor mortis

When rigor mortis occurs slowly the muscles become stiff and hard slowly. The fillets hold their shape. But if rigor happens fast the muscles can break apart. The fillet will gape (pull apart) and won't hold its shape very well. This changes the texture of the fish and it will become soft.

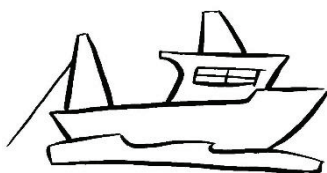
Gaping – torn muscle blocks, soft texture - due to fast rigor



No gapping – firm texture due to slow rigor



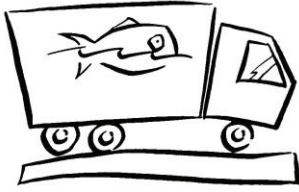
The control of rapid rigor mortis



Get the fish onto the boat as soon as you can, after it is caught.



Get the fish into ice as soon as you can, after it is caught.



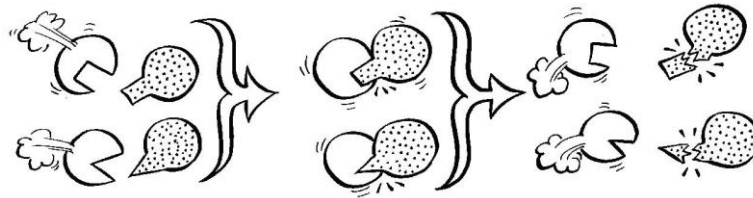
Keep it cold until it reaches the factory or the market

1.3 Enzymes

This section tells you about: Enzyme spoilage, its effect and control

What are enzymes?

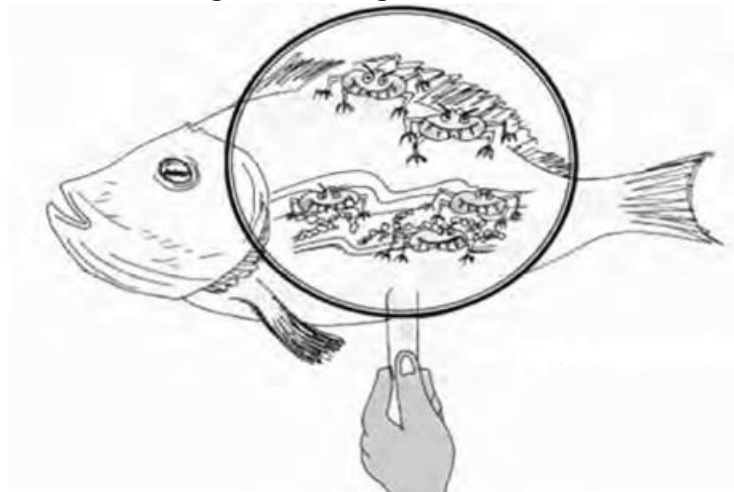
Enzymes are proteins inside all animals like fish, shellfish and shrimp. Enzymes are not alive but help to keep the animal alive. Enzymes help to break down the food and turn it into energy for the fish or shellfish or shrimp to use. They also help to build up tissue and flesh and remove waste from the body.



Enzymes are like keys that lock into place to make things work

Enzyme spoilage

Once the fish (or shellfish or shrimp) dies, the enzymes start to break the tissue down. The enzymes can eat into the stomach and flesh of the fish (or shellfish or shrimp). This causes the texture to be soft and mushy and changes the taste. One sign of enzyme spoilage in fish is 'belly-burn'. This is the softening and staining of the flesh around the belly of the fish.



Enzymes are found in the stomach

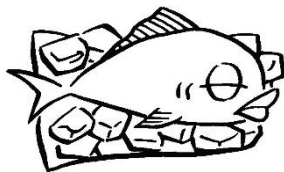
The control of enzyme spoilage

Get the fish into ice as soon as you can, after it is caught.



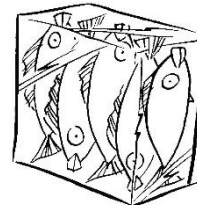
Avoid rough handling fish, so the stomach doesn't burst and enzymes are not released.

Keep it cold until it reaches the factory or the market



Keep it cold while it is being processed

Freeze seafood to $-18\text{ }^{\circ}\text{C}$ as quickly as possible

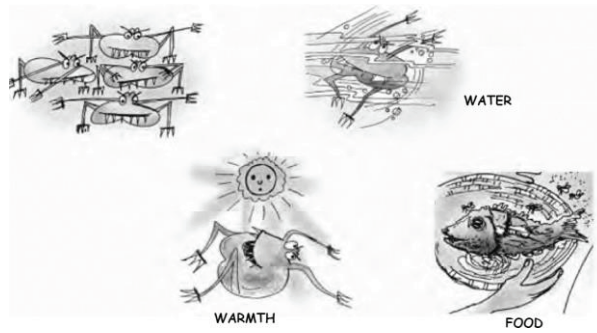


1.4 Bacteria

This section tells you about: The effect and control of bacteria

The effect of Bacteria

Bacteria are very small living things that you cannot see. Some bacteria can make people sick. Sometimes this happens when they get into the food people are eating. Fish have bacteria on their skin and in their gut. In shellfish the bacteria are in their gut and on the outside of the shell. When the fish or shellfish dies the bacteria grow and start to make the product smell and taste bad. If a customer eats this fish or shellfish they may also get sick.



Bacteria thrives in warm, wet environment and food

The control of bacteria

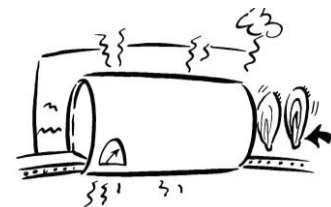
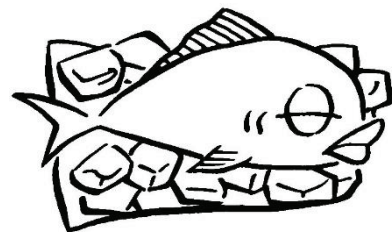
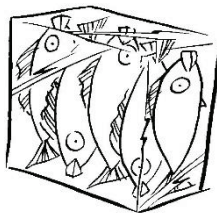
Get the fish into ice as soon as you can, after it is caught.



Keep it cold until it reaches the factory or the market



Freeze seafood to – 18 °C as quickly as



Cook seafood to properly



and keep things clean

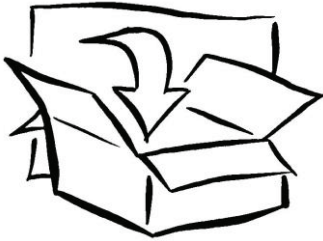
1.5 Oxidation

This section tells you about: The effect and control of oxidation

The effect of Oxidation

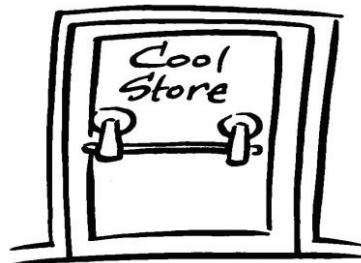
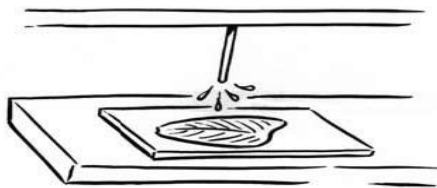
Oxidation happens when the air comes into contact with the seafood. Compounds in the seafood (like the fats) react with the oxygen in the air. When this happens, the fat breaks down and causes the fish to go rancid. The fish will smell and taste bad. Sometimes the fish goes a yellow or brownish colour. This reaction is similar to metal going rusty.

The control of oxidation



Good packaging to protect the product from the air

Store the product temp. as cold and stable as possible in the



Glazing the product to prevent the air from contacting the product

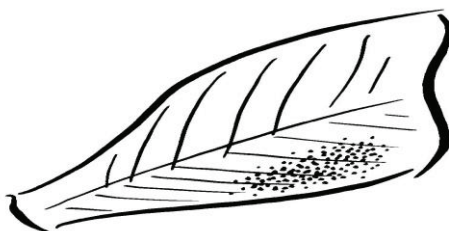
1.6 Dehydration

This section tells you about: The effect and control of dehydration (freezer burn)

The effect of dehydration

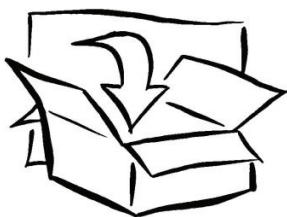
When seafood is frozen it can sometimes get dehydrated. Dehydration is often called freezer burn. It is the loss of water from the product. This causes the product to dry out. Freezer burn can happen to any food product. Dehydration (or freezer burn) happens when the temperature in the freezer changes.

As the water or moisture is lost from the product it becomes dry and spongy. You can often see it in patches on the surface of the product. This means that the product is dry when you eat it. Customers will not want to buy the product if it has got freezer burn.



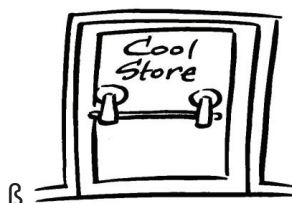
Freezer burn causes dry spongy patches on the product

The control of dehydration



Good packaging to protect the product from the air

Store the product as cold as possible in the freezer



Glazing the product to prevent the air from contacting the product

1.7 Rough Handling

This section tells you about: The effect and control of rough handling

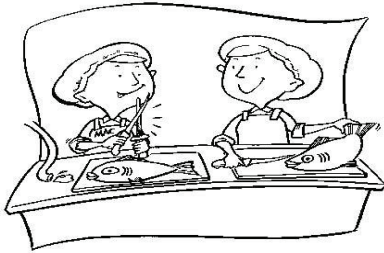
The effects of rough handling

Fish, shellfish and crustaceans are very easily damaged. They must be always handled with care. Rough handling of fish can cause damage such as bruising, softening of the flesh and poor eating texture. It may also increase the risk of bacteria getting into the 'sterile' flesh. Rough handling of processed seafood will damage the product. It may increase the risk of contamination from bacteria or other physical contamination.

Avoid rough handling fish, so the fish is not bruised, flesh is not softened and eating texture is maintained.



The control of rough handling



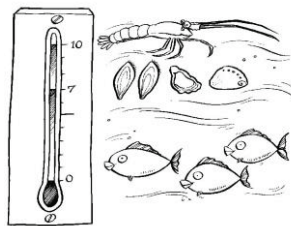
It is very important to make sure all staff are trained to handle the product carefully.

1.8 Shelf Life

This section tells you about: Amount of time you can keep a product before it must be eaten.

What is Shelf life?

Shelf life is the amount of time you can keep a product before it must be eaten. For seafood, the shelf life is the time that it takes before the product becomes spoilt or unsafe for people to eat. Different seafood products will have different a shelf life. This will depend on the type of seafood, how it is processed, how it is stored and the temperature it is kept at. The colder the temperature the longer the shelf life will be. For example, chilled fish fillets stored in the chiller will keep for a couple of days before they start to go off. Frozen fish fillets stored in the freezer will keep for quite a few months before they start to go off.



Here are some examples of the expected shelf life for seafood products

Product	Optimum temperature	Expected Shelf Life
Whole fish, stored on ice	0°C	12 days
Chilled fish fillets	0°C	5 days
Smoked fish (cold smoked), vacuum packed & chill stored	0°C	4-6 weeks
Frozen fish fillets	18°C	12-18 months
Canned Tuna	Ambient	2+ years

Section 2: Maintain Personal Hygiene & Use Hygienic Work Practices

Aim

The aim of this section is to introduce you to personal hygiene and hygienic work practices that you must use when working with seafood. In this section special attention is placed on hair, nose, skin and mouth as they harbour a lot of bacteria.



2.1 Personal hygiene

Personal hygiene is about the things you need to do, to keep yourself clean. If you keep clean you help to keep the product clean.

There are lots of times you need to **wash your hands** when you are working

- After you go to the toilet
- Before you start work
- Each time you go into the factory
- After you pick up product off the floor
- After you pick up your knife if it has fallen on the floor
- After you blow your nose
- After you cough or sneeze
- After you touch rubbish or seafood waste
- After you eat or smoke
- After you touch raw product and before you touch

Personal hygiene also includes things such as:



Washing your hands

Wearing clothing, such as hats, overalls, gumboots, aprons and gloves



Washing your aprons at the end of a shift

Using the footbaths



2.2 Hygienic work practices

Hygienic work practices are the things you need to do to make sure your product is handled so that it is kept clean. Hygienic work practices include things like:



Not eating or chewing when handling food.

Not spitting, coughing or sneezing over the product.



Washing your knives and equipment periodically and when they are dirty.

Keeping the worktable clean.



Reasons for personal Hygiene and Hygienic work practices

Bacteria are very small living things that you cannot see. Some bacteria can make people sick. Sometimes this happens when they get into the food people are eating. People have bacteria all over them. Bacteria are on your skin and hands. They are also in your hair, in your mouth, stomach and up your nose. Personal hygiene and hygienic work practices help to stop the bacteria getting from your body onto the product you work with. You are helping to stop contamination. By using good personal hygiene and hygienic work practices we help to make sure our seafood is safe for people to eat

There is another reason why we also must use good personal hygiene and hygienic work practices. It is a legislative requirement. Legislative requirements are laws that say what you must do. They include things such as Health and Safety and Food Safety.



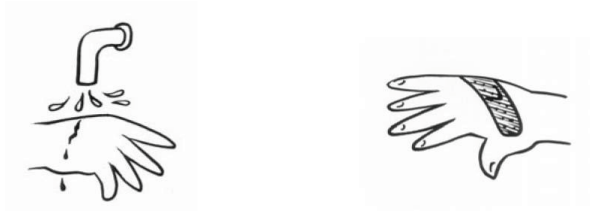
Fisheries Inspectors come around to ensure we are following the law to keep the product safe for people to eat.

Section 3: Cuts, Sores and diseases

This section is about: what to do with cuts and sores and what to do if you are sick or have a notifiable disease

3.1 Cut and Sores

Cuts and sores on your body also have bacteria in them. Cuts and sores must be washed and kept covered with a dressing or plaster. This is to stop the bacteria from getting into the product you are working with.



If you cut yourself when you are working you need to get the cut cleaned and covered. If the cut is on your hand you should also wear a glove to cover the plaster



You will also need to tell your supervisor about it.



3.2 Sickness or Illness

If you are sick or not feeling well while you are at work, you should tell your supervisor. They will tell you what to do.

If you are vomiting or have diarrhoea, then you **must not** come to work. You must stay at home until you are better.



If you have a cold you may be able to stay at work, so long as you are not coughing, sneezing or blowing your nose over the product.

3.3 Notifiable diseases

Notifiable diseases are serious illnesses that are important to the Health Department. This is because notifiable diseases can cause people to become very ill. The bacteria or viruses that cause the illness can also be easily passed onto other people or to food that you work with. Some examples of notifiable diseases are:

- Hepatitis
- Meningitis
- Salmonella
- *Listeria monocytogenes*

You don't need to remember the names of these notifiable diseases

What to do if you have a notifiable disease?

If you go to the doctor and they tell you that you have a notifiable disease, you must tell your employer or boss and you won't be allowed to work with food.

If you have a notifiable disease and keep on working, you can pass bacteria onto the product when you are working with it. This could make someone sick when they eat the product.



When you go to see the doctor they will give you a letter for you to give to your employer. This will tell your employer that you cannot work with food. You must not come to work until the doctor tells you that you are well again.



Section 4: Food borne diseases

Aim: This section tells you where food borne diseases come from and how to stop the growth of the bacteria.

Sources of Food Borne diseases

Sometimes the food you eat makes you sick. This is because the food has something in it that makes you sick. This is called a food borne disease. The food has been contaminated, usually with bacteria. The bacteria that cause food borne diseases come from 3 places.

- The person.
- The environment
- The product itself

4.1 The Person



People having bacteria all over them. Bacteria are on our skin and hands. They are also in our hair, our mouth and up our nose. If you don't use good personal hygiene and hygienic work practices, you will pass the bacteria from yourself onto the product you are working with. To stop you from passing on bacteria to the product you need to:

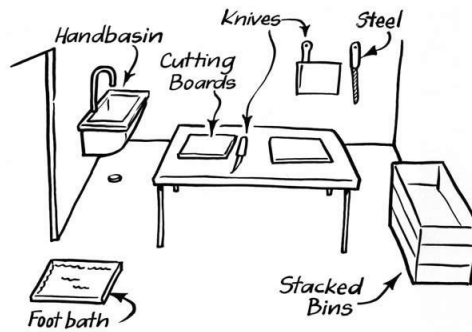
Take your rings, watches and earrings off before you go into the factory.



Wash your hands

**Wear clean overalls, hats, aprons and gumboots.
The company you work for may also need you to wear gloves.**

4.2 The Environment



The environment includes just about anything that comes into contact with the product, including:

- the factory you work in
- the equipment you work with
- the benches, tables and cutting boards you work on
- the water you use
- the air in the factory

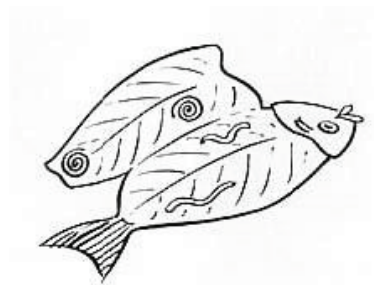
Bacteria can be passed on from these things to the product, if you don't have good cleaning and hygienic work practices. Some examples of good cleaning and hygienic work practices are:

- using clean knives and equipment
- changing your overalls each day
- cleaning your aprons and gumboots
- cleaning the factory, the tables, floors, walls and ceilings
- hosing so you don't splash the product

4.3 The Product

Many food borne diseases may occur on the food naturally or through contamination, but due to some lack of control, they grow to high numbers on the food product. It is either the organisms themselves, or toxins produced by them, which make people ill. We will deal with some of the pathogenic bacteria and viruses in a later Unit. At this stage we will deal with one of the potential problems, Parasites. Have you seen the things that look like tiny worms in some fish when you cut it? These 'worms' are called parasites. Some of these parasites can make people sick if they are left in the fish and people eat them.

If you see parasites in the product you are working with, you need to remove them. They can usually be pulled out with your hands but sometimes you need to cut them out with your knife.



Section 5: Cleaning and Sanitation

This Sub - section tells you about cleaning and sanitation practices that you must use when working with seafood and what happens if you don't clean & sanitise

5.1 Cleaning

Is the process of removing the visible 'dirt'. Cleaning is helped with the use of detergents, which soften the "dirt" and allow water to get in. Cleaning is also helped by the use of scrubbing. Even foam cleaners, which can create their own friction as the millions of tiny bubbles burst, need the additional application of the scrubbing brush in difficult areas.



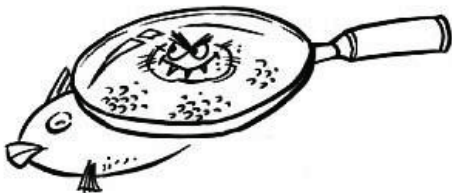
5.2 Sanitation

is when you kill bacteria. You do this by using a sanitiser which is a special chemical that kills bacteria. Sanitisers include chemicals such as chlorine.



Reasons for cleaning and sanitising

Cleaning and sanitising are a very important part of your job. The following is what will happen if you don't clean your workplace:



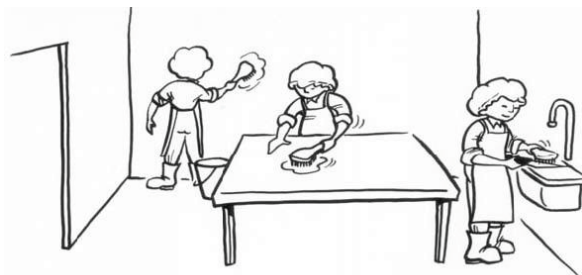
You will contaminate the product with bacteria.

This could make your customers sick when they eat the product.



The fish would be dirty and your customers would not want to buy it

You need a safe place to work. It could be very slippery walking around in an unclean floor.



You have to clean your workspace as it is part of the law

Cleaning your plant and equipment also helps to keep it in good condition. If you don't clean it, it will have a bad smell.



What happens if you don't clean and sanitize

If you don't clean and sanitise your factory and get rid of the contamination, then lots of things could happen:

- your product could make people sick
- your product would be dirty
- you might have an accident and hurt yourself
- your plant and equipment wouldn't last very long
- you wouldn't meet the law and your factory could get closed down
- your factory could smell

5.3 Cleaning and Chemicals

This Sub - section tells you about: Chemicals, the cleaning and sanitation procedures, important factors for detergents and sanitisers and ways to check if your cleaning and sanitation has worked

Chemicals

There are lots of cleaning chemicals you can choose from. Some are just detergents, which are to remove the dirt. Others are just sanitisers, which kill the bacteria. Sometimes you can get a chemical which is both a cleaner and a sanitiser; it does both jobs - it removes the dirt and kills the bacteria.

Cleaning and sanitation procedures

Cleaning and sanitation procedures will be different for each factory. Your company's procedures will depend on several things:

- the product being produced
- the size of the company
- the time of the year
- what cleaners and sanitisers are being used

The most *common steps in a cleaning and sanitation procedures*, using a separate cleaner and sanitiser are:






1. Remove the product and any boxes from the area
2. Hose with water to remove most of the dirt
3. Scrub all surfaces with the cleaner to remove all dirt
4. Hose off the cleaner
5. Put on a sanitiser
6. Hose off the sanitiser

If you are using a combined cleaner and sanitiser, the steps in the procedure will be something like this:

1. Remove the product and any boxes from the area
2. Hose with water to remove most of the dirt
3. With the cleaner and sanitiser, scrub all surfaces to remove all dirt and kill the bacteria
4. Hose off with water

Factors important when using Cleaning and Sanitizers

When you use cleaners and sanitizers, it is important that you use them correctly.

Important Factor	Why it is Important
Follow instructions	It is very important you follow instructions when you are using cleaners and sanitisers. If you are not sure what to do ask your supervisor.
Amount of chemical (strength) 	Chemicals need to be made up with the right amount of chemical otherwise they might not work
Time the chemical is left on 	Often chemicals need to be left on for a certain amount of time otherwise they will not work.
Temperature of the water 	Some chemicals need to be used at a certain temperature. Some chemicals will need to be made up with hot water and other chemicals will need to be made up with cold water. For some chemicals it doesn't matter what temperature the water is.
The job it does (purpose) 	Most chemicals are made to do a certain job. For example detergents only clean and will not kill the bacteria.
How it is put on (application) 	Some chemicals need to be put on a certain way otherwise they won't work.
Storage of the chemical	Some chemicals need to be stored in a certain way otherwise they won't last and will go off. For example some chemicals need to be stored in a cool, dark place.

Checking Cleaning and Sanitation

Cleaning

There are a number of things you can do to check if the 'cleaning' has worked. Remember cleaning is removing the dirt.

You can check by:



Using your eyes. Does it look clean?

Using your nose. Does it smell clean?



Using your hand. Does it feel clean?

The “water break” test – is there any dirt left?



The water break test is when you run a small amount of water over a surface. If the water runs smoothly off, the area is clean. If the water splits apart on the surface, it means that it has hit some dirt and the area is not completely clean yet.

There are other checks you can do as well – you can watch the people doing the cleaning to make sure they do it correctly.

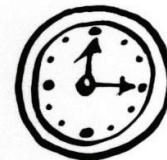
Sanitising

Remember sanitising is killing the bacteria. You can check to see if this has been done properly by:



Checking the “strength” of the sanitizer

Checking that the sanitiser has been left on for the right amount of time



You can also check to see if all of the bacteria have been killed. You can do this by taking swabs. After you have finished sanitising and before you start work again, you can swab the surface that you have sanitised. The swabs are then sent to a laboratory where they check to see if any bacteria are on the swab.



Section 6: Handling Seafood Product

Aim: This section is about how to handle fish so that it is good quality and safe for people to eat.

6.1 Fish Quality

Quality can mean different things to different people. The things that influence the decision of that person about the quality of the fish they are eating may include some or all of the following:

- Appearance or presentation
- Odour, flavour and texture of the fish when eaten
- Nutritional value or purity
- Price or value and sales service
- Consistency
- Food safety

The order or priority of these things will vary with each consumer. For most, food safety may be the most important, whereas others may consider the price to be almost as important

6.2 Food Safety

The food safety aspect of fish products is considered to be part of the overall quality of those products and is mandatory. In fact, the concern about food poisoning and food contamination by consumers the world over, means that food safety is now non-negotiable. Food must first be safe to eat. Then, it can be good to eat.



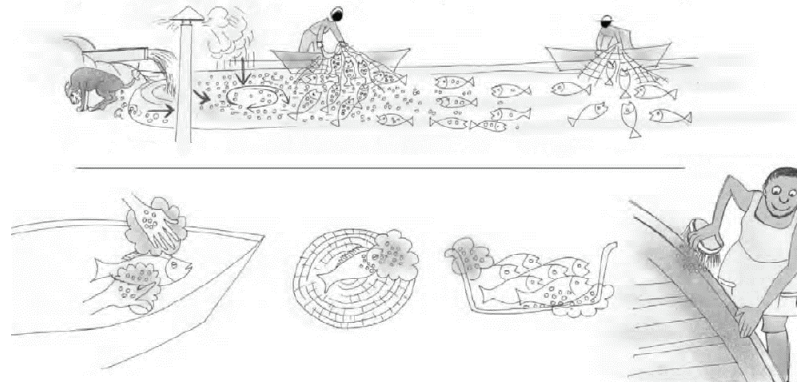
Some seafood products are more likely to be involved in causing diseases than others are. This has to do with the causes of unsafe food, or the food safety “hazards”, which may be associated with a food. Hazards are categorised in the following way:

Biological Hazards

Biological hazards include, most commonly, bacteria and other microorganisms which cause food poisoning, illness or infection. They are called food pathogens or pathogenic microorganisms.

They may occur on the food naturally or through contamination, but due to some lack of control, they grow to high numbers on the food product. It is either the organisms themselves, or toxins produced by them, which make people ill. Microorganisms other than bacteria, which may be hazards, include viruses, toxic algae and parasites.

BACTERIA, VIRUSES AND SOME POISONS CAN CONTAMINATE FISH IN WATER AND AFTER CATCHING



Dirty boat, gear and equipment contaminates fish so keep them clean

Chemical Hazards

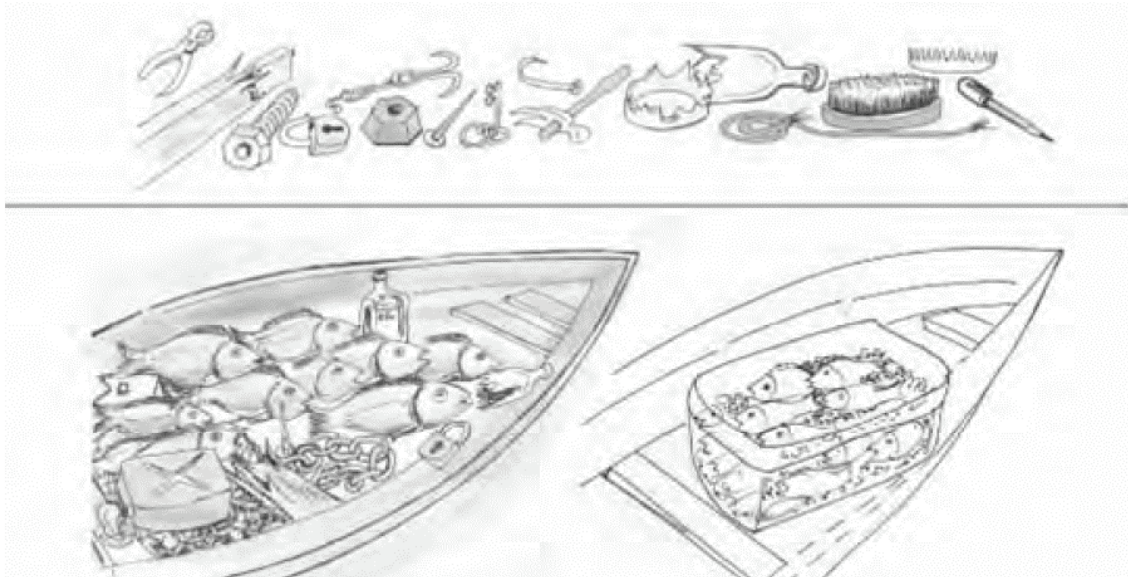
Chemical hazards include any form of chemical compound, which may contaminate food products and which result in illness or harm to consumers. These may include fuel or oil from the catching vessel, cleaning chemicals within the factory, etc. Or Chemicals accumulated by the seafood species, like heavy metals (lead, mercury, cadmium, etc), pesticides, veterinary drugs, etc. And sometimes product of metabolic activities in them selves (like Histamine) or on their food (like algal toxins)



Catching fish in dirty or polluted waters can mean the fish is also dirty and can harm consumers

Physical Hazards

Physical hazards can include a wide variety of contaminants such as glass, metal, bone, shell, etc, which may cause harm to the consumer while they are eating the food product. In many cases, objects that are called physical hazards are in fact the source of biological hazards. These would include sticking plasters, insects, rodent droppings, etc, which are themselves contaminated with pathogenic organisms.



Metals, glass, hair and other non-edible physical matter get stuck in fish and make it hazardous to eat the fish

6.3 Good Product Handling

To make sure your fish is good quality and safe for people to eat, you need to:

- Handle the fish with care so you don't damage it
- Handle it in clean way so it doesn't become contaminated
- Keep it cold
- Work rapidly

Preventing damage

You need to handle fish with care, so you don't damage it. Things that will make sure you don't damage the fish are:

Carry whole fish by the head and not the tail.

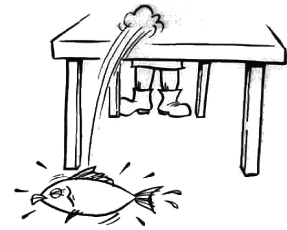


Don't throw fish around.





**Don't put too many fish in one bin,
and don't leave it in the sun**



Don't drop fish.

What happens if you don't handle fish with care

If you don't handle fish with care it will get damaged. The damage could include:

- the fish could get bruised and have blood spots on it
- the fish could become soft and mushy
- the fish could get contaminated – for example, if the skin is broken then bacteria, glass or metal could get into the fillet and make it unsafe for people to eat.
- the box the fish is in could get ripped or torn

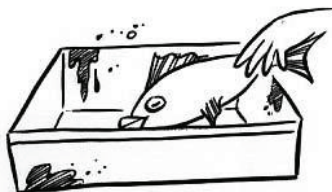
Customers don't want to buy fish that is damaged. It will be poor quality.



How does contamination happens?

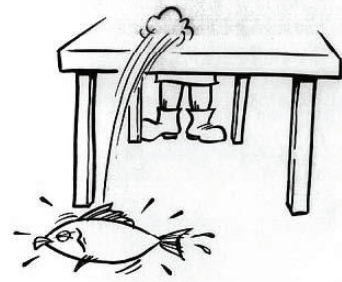
Contamination happens when the fish gets into contact with something that is dirty. Some examples of when 'contamination' can happen are:

If you don't wash your hands before touching fish



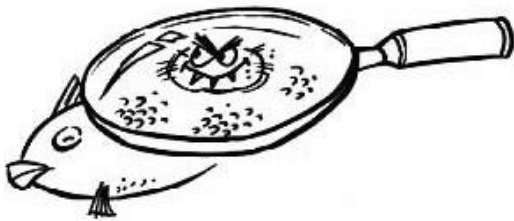
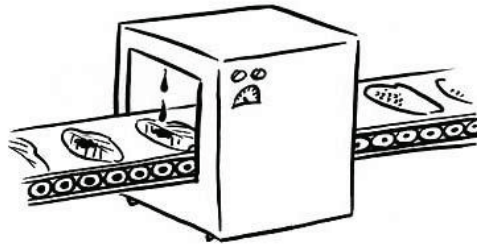


If you sneeze over the fish



If the fish is dropped on the floor.

If grease or oil drops on the fish from a machine – like the skinning machine.



If the fish is put in a dirty bin.

Preventing contamination

To make sure fish doesn't get contaminated or touch something it shouldn't, you must:

Wash your hands



Wear clean overalls, hats, aprons and gumboots.



Keep your tables and benches



Don't eat or chew in the work place



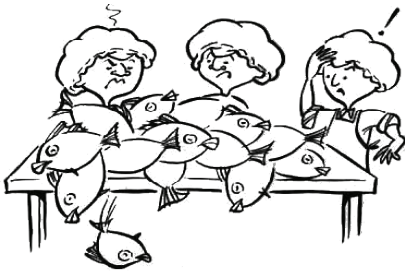
Clean the work space
and everything that is

Chemicals and Fuel on board vessels. They should never be in contact with the fish, the ice directly or via your hands



Don't cough or sneeze over the fish

Keep your working gear clean



Don't let the fish build up on the bench
and keep it iced

Pest, insects, rodents and birds need to be controlled in the premises and transport vehicles. If domestic animals are needed for food or security, they need to be controlled to avoid contamination.

What happens if fish gets contaminated?

Lots of bad things can happen if fish gets contaminated



The contamination could make the
person who eats the fish sick.



The contamination could even cause
the factory to get closed down.

Keeping the Fish Cold

You need to make sure you keep fish cold. This is the best way to keep it fresh and to make sure it is good quality. You can help keep fish cold by:

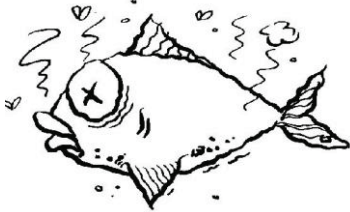
- putting ice on it
- putting it in a slurry (this is a mixture of ice and water)
- putting it in the chiller
- processing it quickly
- putting it in the freezer



Getting fish as cold as possible and keeping it as cold as you can is called 'maintaining the cold chain'. This helps to stop the fish from going off. It helps to prevent 'spoilage'. By keeping fish as cold as possible you are also going to slow down the growth of bacteria. This will help to make sure fish is safe for people to eat.

What happens if you don't keep the fish cold?

If you don't keep your fish cold:



The fish will spoil or get off very quickly

Bacteria will grow faster and could make people sick



People pay less money for fish, if it is not fresh

Appendices.

Annex 1: Summary of Spoilage Factors

Spoilage Factor	Effect on Quality	Controlled By
Stress - Live product	Causes overall loss of quality, reduces shelf life and increases risk of rapid rigor mortis in fish.	Careful handling of live product. Get it cold as soon as possible after catching and keep it cold.
Rapid rigor mortis - affects fish mainly	Causes gaping by damaging the tissue. Results in poor texture.	Get it cold as soon as possible after catching and keep it cold.
Enzyme activity	Causes softening and breakdown of the texture and flavour of seafood product. Causes belly-burn in fish.	Get it cold as soon as possible after catching and keep it cold (temp of melting ice). Freezing to -18°C as quickly as possible. Cooking destroys the enzymes.
Bacteria	Cause off flavours and odours. Possible food safety problems if contaminated with pathogens. (Food poisoning bacteria)	Get it cold as soon as possible after catching and keep it cold. Freezing to -18°C as quickly as possible. Cooking kills bacteria. Personal hygiene, and good cleaning to prevent contamination.
Oxidation	Causes off flavours & odours to develop, may cause some colour changes to some species	Good packaging, glazing if possible, low frozen storage temperatures.
Dehydration (Freezer Burn)	Causes changes to appearance, colour and texture	Minimising changes in temperature during frozen storage and good packaging or glazing.
Rough handling – of live and dead product, at all stages of the chain.	Can causes damage such as, bruising & poor eating texture, possible contamination.	Careful handling at all stages of process. Training of staff.

Annex 2: Quality evaluation of fresh fin fish using sensory evaluation

class	Gills	Eyes	Body appearance	Texture	Quality
5	Dark red colour Some thin clear slime Foul smell	Bright, metallic, Clear pupils, Convex eyes	Natural colour, Iridescent Firm scales Little/or no slime	Firm before or in rigor	Excellence
4	Red colour Some slime, but still thin and clear No smell	Bright metallic Slightly cloudy pupils Slightly convex eyes	Natural colours Firm scales Some slime	Firm	Good
3	Red –brown colour Some thick slime Beery/mousey /warm smell	Dull Pupils cloudy Flat Some blood	Slight red colour Scale loose More thick slime	Firm	Average
2	Brown colour A lot of slime Slight off smell	Dull Pupils cloudy Slightly concave eyes Bloody	Red/yellow colour Scales missing Dry skin A lot of slime	Soft	Poor
1	Brown colour A lot of slime Bad/ammonia smell	Dull Pupils cloudy Concave eyes With blood	Red/yellow colour Few scales Dry skin A lot of thick yellow slime	Very soft Mark of finger left if pressed	Very poor

Resources used for this guide

Training materials and illustrations courtesy of

1. *Better training for Safer Food EU Directorate General for Food and Consumers*
2. *Manual of Standard Operating Procedures for Fish Inspection and Quality Assurance in Kenya*
3. *Codex HACCP Training Manual*
4. *Post-harvest fish losses in small-scale fisheries FAO 2011*



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