

Segment Three

Raw Material Selection and Preparation

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AIMS OF THE SEGMENT

The main aim of this segment is to help you to achieve objective 3 given on page xiii.

When you have completed this segment you should be able to:

- State the need for having a grading system;
- State in what conditions the fish must be in each of the EEC quality grades;
- Describe methods of preparation of raw material for the brining and smoking processes.

RAW MATERIAL QUALITY

The first, and very important, point to understand is that:

- **The best quality cured products can only be produced from the best quality raw material.**

Smoking will not bring back the already used shelf life of fish that have been graded as poor quality i.e. down graded fish.

In fact buying down graded fish for smoking would be a bad commercial risk because it would not be safe to assume the normal, expected shelf life.

GRADING

A fish market will have many species, many sizes, many qualities and, of course, many prices. The buyer cannot inspect every fish in every box. He must have confidence that the whole content of a box conforms to a particular standard.

The European Economic Community (EEC) has set up regulations for grading certain species of fish before first sale. Although its' prime purpose is to help in assessing compensation to the fishermen it will also assist the buyer in specifying the product he requires.

Fish must be sorted into lots that are the same:

- Species;
- Size range;
- Freshness.

It is the grading of freshness which we shall look at in some detail now.

The fish are put into one of 3 freshness categories: E, A or B.



There is also an unfit grade and fish in this category **must not** be sold for human consumption.

The following table gives the main features of fish in each of the categories E, A and B.

Grades of Freshness
<p>Grade E (is extra quality)</p> <p>Extra quality fish; For very demanding market; No mechanical damage; Spent up to 3 days in ice; Would score above 8½ on the Torry freshness scale.</p>
<p>Grade A</p> <p>Good quality fish; Lost initial freshness; No sign of spoilage; Spent 3 – 8 days in ice; Would score above 7 on the Torry freshness scale.</p>
<p>Grade B</p> <p>Poor quality fish; Acceptable for consumption; Spent more than 8 days in ice; Would score above 4½ on the Torry freshness scale.</p>

Table 1

Apart from appearance there are a number of other methods of grading including one which assesses the quality according to the **smell** of the fish. This is called a **raw odour scale** and the figures of freshness in the above table refer to this.

A raw odour scale for white fish is shown below. There are also special scales for pelagic fish such as herring and mackerel.

The Raw Odour Scale for White Fish	
Odour Score	Description of Odour
10	Fresh seaweedy odour.
9	Loss of fresh seaweediness, shellfish odours.
8	No odours, neutral odours.
7	Slight musty, mousy, garlic, peppery odours.
6	Bready, malty, beery, yeasty odours.
5	Lactic acid, sour milk, oily odours.
4	Acetic, butyric acid, grassy odours.
3	Stale cabbage water, turnipy, sour sink, wet matches odour.
2	Ammonia and strong byre-like odours.
1	Hydrogen sulphide and strong ammonia odours.
0	Indole, ammonia, faecal, nauseating, putrid odours.

Table 2

As an example of applying the grading systems just described a haddock which has been kept in ice for 5 days and has a slight musty odour would be graded as A7.

A more complete description of the grading system is contained in the module 'Maintenance of Fish Quality'.

Now for your first SAQs in this segment.

? SAQ13
 State briefly why it is necessary to employ a quality grading system for fish at the first point of sale.

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? SAQ18
 Write alongside each of the following descriptions the quality category in which each fish should be placed.

1. Cod showing no damage and having no odours
2. Good quality Haddock which has lost its initial freshness
3. Herring which has spent 10 days in ice

SELECTING THE RIGHT SPECIES



A large range of fishery produce is suitable for smoking. The following table lists some of the popular species and products in the UK. The hot and cold smoking processes are described in Segment Four.

Species	Preparation	Smoked Process	Product
Mackerel	Fillets	Hot/Cold	Smoked Mackerel
Mackerel	Whole	Hot	Smoked Mackerel
Mackerel	Gutted & Split	Cold	Kippered Mackerel
Herring	Gutted & Split	Cold	Kipper
Herring	Fillets	Cold	Kipper Fillets
Herring	Whole	Cold	Bloaters
Herring	Whole (nobbed)	Hot	Buckling
Herring	Immature whole	Hot	Sild
Sprat	Immature whole	Hot	Brisling
Haddock	Gutted Split	Cold	Finnan Haddock
Haddock	Fillets	Cold	Golden Cutlets
Whiting	Fillets	Cold	Golden Cutlets
Haddock	Nobbed	Hot	Arbroath Smokies
Cod	Fillets	Cold	Smoked Cod
Cod Roes	Whole	Cold/Hot	Smoked Cod Roes
Salmon	Gutted Split	Cold	Smoked Salmon
Salmon	Fillets	Cold	Smoked Salmon Fillets
Trout	Gutted Split	Cold/Hot	Smoked Trout
Trout	Fillets	Cold	Smoked Trout Fillets
Eel	Gutted	Hot	Smoked Eel
Oysters	Brushed with oil	Cold/Hot	Smoked Oysters

Table 3

With pelagic, or oily fish a fat content of at least 7% is required. The best fish for smoking should have a fat content of about 15%. Figure 3 shows an example of how the fat content varies throughout the year. The Cornish Mackerel is at its' best in December and January.

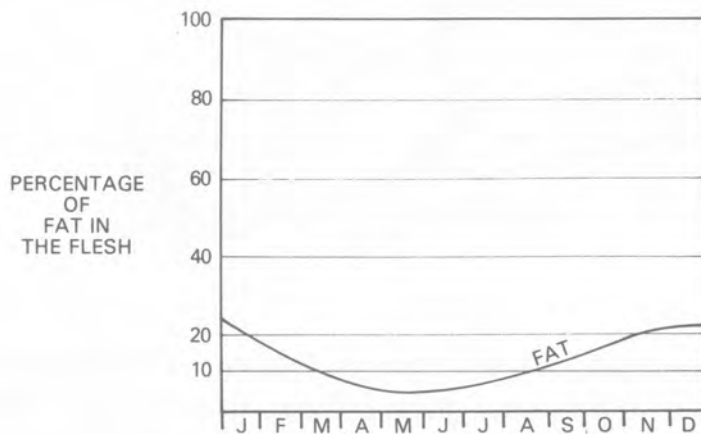


Figure 3 Seasonal Variation in Fat Content of Cornish Mackerel

A similar chart for Scottish Mackerel would show that they have their highest fat content around September and October.

PREPARATION OF THE RAW MATERIAL



The following pages give brief descriptions of the preparation by hand of each of the species given in Table 3. **Remember that the methods used may vary and these descriptions are given as examples only.**

Machines may be used in some cases but their description is beyond the scope of this module. They are covered more fully in the module 'Primary Processing of White Fish'. There is also a video entitled 'An Introduction to Fish Processing Skills' which shows many of the hand techniques mentioned in this module.

An important part of any preparation is to thoroughly wash the fish in clean cold water.



Mackerel

Mackerel fillets are taken off the whole ungutted fish by cutting into the flesh behind the gills. Then, keeping the non-cutting hand flat on the head, run the knife mid blade along the backbone to the tail. In this way, first one side is removed, the fish is turned over and the second fillet is removed. The backbone guts and head are thrown away.

Mackerel may also be smoked whole. They must be gutted, or headed and gutted, as required. The gut cavity must be cleaned and the black bellywall lining removed.

The fish may also be prepared as **kippered mackerel**. The gutted fish is split from the dorsal side, through the head, down the back to the tail. The split fish is opened out flat. It is then washed, the kidneys removed and the black bellywall lining gently scraped away.

Herring

By far the largest quantity of herring that is smoked is in the form of kippers or kipper fillets.

Fish with more than 12% oil content should be used to give a good smoked product.

The fish for **kippering** are prepared in a similar way to the kippered mackerel:

The herring is laid on the filleting bench with the back facing the filleter. The blade of a small knife is inserted at the centre of the back of the head and a cut is made to the mouth. Next, from the same entry point the knife is held near to the backbone and a deep cut is made down to the tail.

The herring is then opened out so that the backbone is on the left side of the kipper. The gills and guts are removed and the backbone trimmed. Finally the split herring is washed.

The **kipper fillet** is obtained by the same preparation as the mackerel fillet.

Smaller quantities of herring are used to produce smoked products from the whole fish for example:

Bloaters are whole ungutted herring.

If small (immature) herrings are smoked whole they are called **sild**.

Sprat

Like the small herring the sprat is smoked whole to produce a product called **brisling**. The only preparation is to wash the fish before processing.

White Fish

All slime blood and scales should be removed from cut surfaces otherwise the smoked product will not have an attractive glossy appearance.

Haddock

A **Finnan Haddock** is prepared from medium sized fish. By cutting around the gill and through the backbone the head is removed.

The shoulder bones are left intact if the fish is to be hung by them.

The gut cavity is cleaned by removing the black skin and any traces of blood and kidney lying under the backbone.

The fish is then split open by cutting from the neck to the tail.

The backbone may lie on either side of the split fish: The 'London' cut leaves it on the left side and the 'Aberdeen' cut leaves it on the right side.

Golden Cutlets are made from a **block fillet** of haddock or whiting.

The fillet is removed from both sides of the fish without cutting through the thick flesh above the backbone. The fillets are therefore left joined together when opened out from the belly side.

Haddock is also prepared as **fillets** with the skin left on the fillet. This helps to prevent the soft flesh of the haddock from gaping and tearing during the smoking process. It also helps to distinguish the haddock fillet from the cod fillet.

Small whole haddocks can be prepared as **Arbroath Smokies** by removing the head and cleaning out the gut cavity. The fish are said to have been **nobbed**.

The fish are then tied in pairs by their tails before putting them through the brining and smoking processes.

Cod

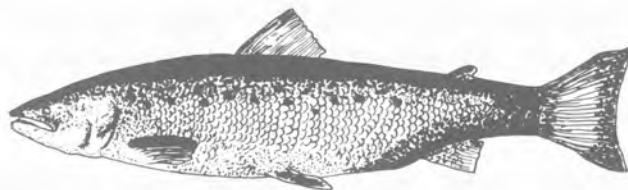
Cod fillets are prepared in a similar way to haddock fillets but usually with the skin removed.

Cod Roe

The only preparation required is a thorough washing in cold water. However, during this procedure, it is important to handle the roes with care in order to prevent the skins from bursting.

The roes chosen for processing should be fresh and firm. They become softer and more liable to burst as they ripen.

Salmon



A salmon suitable for smoking should contain up to 15% fat. It should be well gutted taking care that the stomach, ovaries, heart and swim bladder are all removed along with the guts. The gut cavity should then be scraped and all traces of blood removed.

The salmon may be split from the back and the head left on. The fins and backbone are then removed except for a few inches near to the tail which gives extra strength when handling if required.

Finally the eyes and gills are removed.

A second method of preparing salmon involves taking the two fillets. It is a more widely used method for the larger fish. The head is removed by first cutting around the gills and then breaking or cutting through the backbone.

If the fillets are to be hung during the smoking process then they should be taken from the fish each complete with shoulder bones and lugs. These give support to the sides when hanging. The belly bones and covering skin may be carefully removed from the lugs if required. Finally the fins are removed.

The more usual support for the fillets, in modern processes is to lay them on mesh trays.

Trout and Trout Fillets

The most common form of product uses whole gutted fish. The preparation of the whole fish is the same as that for the smaller salmon and the preparation of the fillets is the same as that for salmon fillets.

Eels

Eels are naturally very slimy. This slime should be removed by soaking the live eels in a strong tepid brine or by rubbing them with dry salt.

Dead eels should be washed for up to half an hour in cold water. They should then be carefully scraped to remove any final traces of slime.

If the eels are to be smoked whole then the skin should be scrubbed to give a good appearance to the smoked product.

The eels are gutted by slitting the belly from about 2-3 cms beyond the vent. This allows the kidney to be removed. The gut cavity should be scrubbed and washed out to remove all traces of blood. A final rinsing is also necessary.

Oysters

Whole oysters require steaming for 20-30 minutes in order to allow the meats to be removed. These are allowed to cool and are then washed before processing.

Now a final SAQ for you to attempt before completing this segment:

🔍 SAQ23
For each of the following state the cleaning, gutting and trimming needed in the preparation for brining and smoking.

1. Haddock for 'Arbroath Smokies'
2. Herring for 'Buckling'
3. Cod Roes
4. Salmon for 'Smoked Fillets'

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SUMMARY

This segment emphasises the need to use good quality raw material in order to obtain good quality smoked products.

The EEC method of grading for quality gives 3 grades:

E denotes extra quality;

A denotes good quality;

B denotes fair quality.

In addition there is an unfit grade.

The choice of species to provide some of the more popular smoked products is listed and the methods of preparation for each species is given.

You have now achieved objective 3 given on page xiii.

In the next segment we shall look at the brining and smoking processes and give examples using some of the products mentioned in this segment.

Before turning to Segment Four, however, you may wish to take a break.