Appendix – Summary of Key points

INTRODUCTION

In the main body of the Open Learning module **Hygiene and Cleaning in the Seafood Industry** we have looked at bacteria, how people cause problems, contamination, cleaning and the law.

The appendix will take a further look at four important areas of Food Hygiene. These areas are **Contamination, Temperature, Stock Control** and **Personal Hygiene.**

You may want to use this as last minute revision before your exam.

SOURCES OF CONTAMINATION

People

You, the food handler, can be a significant source of contamination.

Your hands frequently touch contaminated surfaces such as parts of your body, raw material, contaminated work surfaces, tools or money.

Always wash your hands before handling different food types, after going to the toilet, returning to the food room, blowing your nose, and after touching anything dirty or contaminated.

Raw Vegetables

Bacteria are common on unwashed vegetables and in soil. Thorough washing is usually enough to reduce the number of bacteria to a safe limit, but there is still a slight risk of contamination.

Do not allow contact between raw vegetables and other foods if at all possible. Examples of raw vegetables used in the fish industry include the potatoes used by fish friers and the garnishing in fish mongers' displays.

Raw Meat

Many battery grown and processed chickens are contaminated with *Salmonella* bacteria and represent a significant source of contamination. All forms of raw meat may be contaminated. Raw meat and vegetables are two potential sources of **pathogenic bacteria** contamination which can sometimes kill.

Raw Shellfish

Live mussels and other shellfish may provide a source of both bacterial and viral contamination. Dead shellfish are a particular hazard and should always be thrown away and never cooked or eaten.

The Environment

Dust, rust from poorly maintained machinery and all forms of unhygienic work surfaces (e.g. absorbent wooden cutting boards) are a source of contamination.

Keep all food covered whenever possible. Keep all food contact surfaces clean.

Food Pests

Food Pests such as flies, rodents, birds and insects and domestic pets are a major source of bacterial and physical contamination. Keep them out of food areas.

AVOIDING CROSS CONTAMINATION

Cleaning and disinfection

Clean all equipment and work surfaces frequently. Always clean when changing from one food type to another. Use a **food grade** disinfectant whenever it is needed. Food grade disinfectants (and sanitisers) are bactericides – they kill bacteria if used according to the manufacturer's instructions.

Cutlery, knives and similar items may be disinfected using the appropriate chemicals or by placing them in hot water above **82°C,** and by air drying afterwards.

Water above 82°C will kill bacteria.

Dish washers usually have a hot rinse cycle which disinfects in this way.

The **detergents do not kill** bacteria. they are only intended to help remove grease and to clean. Sanitisers are a range of cleaning chemicals that combine a disinfectant action with their detergent action.

Generally, detergents **do not** kill bacteria.

Processing

Use separate boards, knives and other equipment for cooked and uncooked foods. Colour coding of equipment is a good idea.

If you must use the same items for both types of food then clean them thoroughly and then disinfect and rinse them before processing different foods.

Processing cooked foods **before** uncooked foods is advisable. Don't forget to wash your hands between each type of operation.

Storage

Always store cooked and uncooked foods separately. If both types are stored in the same refrigerator, place cooked foods at the top and uncooked foods below.

Store raw vegetables at the bottom of the refrigerator, high risk foods (ready to eat foods for example) at the top.

Always keep food covered whenever possible using containers with lids or food-safe over-wrap film such as Clingfilm.

Would you like blood from your steak dripping down onto your trifle for desert?

Display

Always prevent different types of food in a display from touching each other. It is important that you keep cooked and uncooked foods well separated from each other. This is of particular importance to fishmongers.

If you have just handled raw foods then wash your hands before touching cooked foods. If you use vegetables as a garnish in the display then these must be washed and if possible sanitised before use.

You might consider using artificial plastic garnishing which is more hygienic since it can be washed and disinfected each day.

Chilled and refrigerated display cabinets should be capable of keeping foodstuffs at the correct storage temperatures, even during the summer. For fresh fish this is best achieved by thorough icing. Even smoked products can be well iced if they are properly wrapped to protect the fillets or whole fish from the melt water.

In general, chilled display cabinets should not be exposed to direct sunlight or intense shop lighting. Intense lighting can warm up the products and cause refrigeration equipment to run longer than is necessary.

Handling

Use clean tongs, paper sheets, or gloves to avoid contamination. Use separate tools for each cooked product and for uncooked products. If it is not possible to use the "no touch" technique then use clean hands to handle the food product.

Wash hands, tools and work surfaces thoroughly after handling raw foods such as poultry, fish or vegetables, and cooked foods. Colour coded equipment for each separate food product is often used to reduce the risk of cross contamination. Keep all waste, offal and trimmings separate from food products.

THE EFFECTS OF CONTAMINATION

Food Poisoning

Foodstuffs contaminated with food poisoning bacteria which are then allowed sufficient time to multiply before cooking may still cause food poisoning even after the food has been cooked properly.

- Cooking may not be long enough or hot enough to destroy the toxin produced by bacteria such as *Staphylococcus aureus,* so hygiene is our first and only effective means of defence.

Spoilage

Increased bacterial contamination will also produce a faster spoilage rate of foods and a subsequent greater loss in quality.

Any fish that is not of good quality should be withdrawn from sale. After all, if you wouldn't eat it why should you expect your customers to eat it?!

High Risk Foods

All foods are at risk from contamination and may be a source of bacterial poisoning, but some types of food are a particularly high risk.

Generally, this category of food includes high protein foods which are not cooked after sale or before consumption – they are often called r**eady to eat**. Examples include hot smoked mackerel, cooked shellfish, cream, real mayonnaise (perhaps used to make a tartare sauce) and salad vegetables.

Foods that become contaminated are usually, though not always rendered safe if they are cooked before consumption. You should prevent opportunities for contamination and reduce bacterial multiplication as much as possible. Keep these foods out of the danger zone temperatures (5°C to 63°C) as much as possible.

We have looked at contamination and how to avoid it. This next section looks at temperature and how it can be used to control or prevent food poisoning. Temperature has been briefly discussed in segment two of the module.

Allergens
With more than a dozen groups of known allergens and the requirements of **food information and labelling regulations**, allergens are a complex issue. To put it simply:

There are many types of allergen in the seafood industry, from the gluten in fish batter to some of the spices that may be used in the sauce for a fish dish. Crustaceans, bivalves and even fish are allergens to some people.

We control allergens by avoiding contamination and by providing guidance. Keeping possible allergens away from or separate to your main production area in a fish factory is one way. Knowing what may be in a particular dish as an ingredient or possible contaminant is another control.

Knowledge is key to allergen control so if a customer asks “is there any XXX in my food” you must be able to answer accurately yes or no. Labels the say “May contain…..” are increasingly common.

Of the (currently) 14 groups of food allergens, celery seems to be the only mainline vegetable on the list, so sweetcorn is safe enough! But many nuts, cereal products (gluten containing), milk, eggs, seeds and seafood are notifiable allergens.

TEMPERATURE CONTROL

Frozen Foods
Frozen foods such as fish, poultry and pies should all be stored at -18°C or below.

Some products will be sold frozen or may be cooked from frozen, so follow the manufacturer's instructions.

If the foodstuff needs to be thawed then particular care should be paid to the thawing time and temperature. Large fish and poultry can take a considerable time to thaw properly if this is done in a refrigerator, as long as 70 hours for a 1.1 kg chicken in a refrigerator at 1°C while a cod of about 4 inches thickness will take over 50 hours to defrost in the same refrigerator. However, most domestic fridges are usually around 4^0C or warmer.

Purpose-built thawing cabinets are useful if quantities of product are to be thawed regularly. Refrigerators can be used to thaw small items such as individual fish fillets, although individual fish fillets will usually thaw quite quickly at room temperature without any problems.

An alternative is to thaw the product at room temperature (but **not high risk foods**), whilst keeping it covered and kept separate from other foodstuffs. **High risk foods should be defrosted in a refrigerator/chiller.**

Shatter packs of fillets should first be broken up to speed thawing. Once thawed the food product should be cooked without delay, or else kept refrigerated briefly until needed.

Cooling Food

One problem in some parts of the fish industry, for example secondary processing, is how to cool food products after they have been cooked and before they are refrigerated or frozen.

Hot food products such as cooked chickens, fish in precooked batter and cooked shellfish should not be put into refrigerators, chill stores or freezers without being cooled first. Placing hot food in a refrigerator will warm up the other contents of the refrigerator for a considerable time.

Most freezers, chill stores and refrigerators are only designed to keep cold food cold. Hot food should first be cooled down to chill temperature before placing in a refrigerator.

The cooling process should not take more than 1½ hours (90 min) so that bacteria do not have time to multiply. Some foods such as pies can be stored at temperatures up to 8°C, although 5°C is better. (Frozen pies should be thawed unless otherwise recommended by the manufacturer and then cooked without delay).

Fresh and thawed poultry should also be stored between 1°C and 4°C.

Hot Cooked Foods

Foods such as fish, chips, chicken portions, pies, sauces, peas, gravies are usually cooked and stored at a high temperature until they are sold.

The minimum storage temperature of these products should not fall below 63°C between cooking and sale.

Inefficient heaters that keep the bottom of the Bain Marie (the large pans used by fish friers to cook and keep hot, dishes such as peas, gravy and curry sauce) or display cabinet at 63°C but cannot keep the top at this temperature can cause food poisoning problems.

Keep the lids on, the sliding doors closed and the food hot! If the food tends to dry out at these temperatures then cook smaller batches at a time.

The practice of storing **pre-cooked pies** at room temperature until the time of sale and then heating them rapidly in a microwave can cause problems if the microwave oven is not used properly. Proper heating in a microwave will produce a uniform high temperature (above 82°C) throughout the pie.

Given sufficient time this temperature will kill off any bacteria contaminating the pie. Even so, some toxins produced by bacteria, and most bacterial spores will survive the cooking process.

Use a microwave designed for the job. A domestic model may not be suitable.

Since pies spoil rapidly when stored between 8°C and 63°C, and because the potential health risks are high, it makes sense to keep your pies frozen or in the refrigerator until needed for cooking or reheating.

It is an offence to store certain foods between 8°C and 63°C. Although hot foods may be displayed for a short time before sale at temperatures below 63°C

For further details of food types, and which temperature limits apply, consult your local EHO or trade body.

Temperature Measurements

Regular measurements are necessary if you are to be confident that your equipment is operating properly. A small digital thermometer is an ideal way to check on the operation of freezers, refrigerators, Bain Maries and hot cabinets. It can be used to confirm the temperature of iced fish, and deliveries of frozen and chilled products.

Choose a thermometer with a non-corroding probe and be careful not to cross contaminate foods when you use it. Wash and disinfect the probe before and after use.

A series of measurements should be taken over a period of time. When you measure the temperature of any equipment you should record the results for future reference. Refrigerators should all have thermometers or temperature strips fitted so that you can see the refrigerator is functioning properly.

Cleaning the Thermometer
As the thermometer is often placed into food there is a danger of contamination. The probe should be disinfected with anti-bactericidal wipes before use and after it has been used it should be cleaned in hot water and detergent.

Calibrating Thermometers
To ensure the thermometer is accurate it is necessary to calibrate it. This is normally carried out every three months. You can calibrate a thermometer by placing it in water at different temperatures.

An accurate thermometer will show -1°C to +1°C when placed in ice water and 99°C to 100°C when placed in boiling water.

For more advice on temperature control and measurement consult your local **EHO** or food safety consultant.

STOCK CONTROL

Proper stock rotation is essential if product quality is to be maintained. Perishable, high risk foods such as pre-packed cooked meat are labelled with **use-by dates.** Food should not be eaten if used after its use-by date has gone. If we can avoid food becoming contaminated, and we keep the food at a temperature at which the bacteria will not multiply then we have solved most of the problems that cause food poisoning. This section on stock control really means not giving the bacteria time to multiply. Proper stock control starts with making sure the raw materials are of the right standard and ends by seeing that the product is not kept too long before sale and consumption.

It's really common sense, but:

- The **use-by date,** temperature, and condition of the packaging should all be checked **before** accepting a delivery. If the consignment is at the wrong temperature, for example, if frozen fish is above -12°C or bears the wrong use-by date, then you should reject the consignment. In most companies

there is a particular person responsible for checking deliveries.

- Don't buy too much stock at once.

- **First in-First out**. Proper stock rotation ensures that older stock is not left in storage while newer stock is used.

  But do not use out of date stock.

- Don't re-use reheated cooked foods such as sauces, gravy or pies. This is one of the commonest causes of poisoning by ***Clostridium perfringens*** and ***Staphylococcus aureus*****.**

- If the product is suspect, old or is damaged in any way, then throw it away.

- When stocking a refrigerator with cooked and uncooked foods, always place the (chilled) cooked food above the uncooked foods and store raw vegetables at the bottom. This avoids bacteria from contaminated raw foods dripping onto those foods which are intended to be eaten without further cooking.

- When decanting ingredients into smaller containers, always label the containers – how else will you be certain what is in which container?

- All waste material should be placed in designated waste bins as soon as possible. Suitable bins are made of metal or hard wearing plastic and have well-fitting lids which are kept in place to exclude flies and other pests.

Because of the fire risk, fish fryers should use metal waste bins for the disposal of batter scraps, and store these outside the premises.

As well as having tight-fitting lids, it is important to clean bins after they are emptied.

Each of the three sections we have looked at in the appendix are important in maintaining hygiene working conditions.

We can all play our part in seeing that temperatures are right, that contamination is avoided, and that fish moves smoothly and quickly from processor to consumer.

There is one area in which everything we do is very important and any mistakes we make can cause a disaster. That area is **personal hygiene,** and each one of us is responsible for making sure that our own personal hygiene is up to standard.

PERSONAL HYGIENE

Some important points to remember about personal hygiene are:

- Wash your hands after using the toilet.
- Wash your hands before entering the food production area.
- Wash your hands after blowing your nose or touching your face.
- Wash your hands after touching anything dirty or contaminated.
- Wash your hands after disposing of rubbish.
- Wash your hands after handling raw foods such as wet fish, and before touching cooked, ready to eat or other high care foods such as smoked salmon.
- Washing must be followed by hygienic drying using an air drier, disposable paper towels or a roller towel.
- Wear a hair net which covers all of your hair, and wear a hat. If you have a beard then wear a beard net! A single hair or piece of dandruff may carry with it millions of bacteria if it falls onto your food product.
- Change your protective clothing as soon as it becomes soiled.

Wearing an unhygienic overall while handling food is illegal.

- Do not eat food, drink or chew gum in any part of the food preparation area, only in the rest room or other designated areas.
- Do not smoke in any part of the food preparation area - it is illegal to do this. Smoke only in the rest room or other designated areas.
- Do not wear perfume, nail varnish, jewellery, a watch or false nails when handling food because they can cause contamination. Keep nails short and clean.
- When you handle food use tongs, gloves, or another "no touch' method. If you must use your hands then make sure you have washed them thoroughly and hygienically.
- Your normal outer clothing should be stored outside of food rooms and food handling areas. Your protective clothing should not be worn in the street!
- Do bathe often and wear clean clothing each day.
- Visitors to food rooms must follow all the rules governing the actions of food

handlers.

And finally a few reminders of the most important rules to follow.

- Freezing does not kill bacteria and spores, it simply stops them multiplying.
- Between 0ºC and 5ºC bacteria do not die, they only multiply SLOWLY.
- The danger zone temperatures to avoid are from **5°C to 63°C**
- Food poisoning bacteria do not multiply quickly between **63°C and 82°C**
- Above **82°C** they are killed.

But remember, SPORES are not killed until much higher temperatures are reached. A spore is the way some bacteria survive dry conditions and higher temperatures. During canning temperatures at or above121°C are used to destroy spores.

- Tell your supervisor if you are ill, have any skin infections or bowel trouble. If you do not inform your employer then you may be breaking the law.

- Cover all cuts with waterproof, coloured dressings.

- Dispose of waste food properly. Place it in bins with lids so that pests cannot get at it. Clean as you go.

- Keep pests and all pets out of food rooms.

- Don't touch food with your bare hands unless it is necessary and make sure your hands are always clean.

- Wear the proper, clean clothing for the job.

MORE INFORMATION AND WHAT TO DO NEXT

For more information on food hygiene and what to do next please contact the person who provided this open learning module or email:

onshore@seafish.co.uk .

Once you have completed this module you can sit a multiple choice test to gain a qualification in Elementary Food Hygiene from REHIS.