

# Segment 10 - Essential Food Hygiene for Fish Friers

Seafish and the National Federation of Fish Friers have distance learning packs that cover fish frying skills and customer service skills. Each of these packs has a section on the principles of food hygiene for fish friers.

This hygiene open learning programme covers similar material in greater detail, and this segment of module briefly summarises the main issues facing fish friers.

## AIMS OF THIS SEGMENT

At the end of this segment you will be able to:

List the key temperatures important for maintaining food safety in a fish and chip shop.

Describe the main elements in an effective fish and chip shop cleaning schedule.

Explain the appropriate storage and handling procedures necessary to maintain food safety in a fish and chip shop.

List the main food safety hazards and appropriate measures to control them.

Understand the importance of:

- Oil management and the avoidance of contamination.
- Allergens and other contaminants.

If a topic has been covered in sufficient detail earlier in this module, then we will NOT cover it in this Segment.

## KEY TEMPERATURES

### Storage Temperatures

#### Uncooked food

Fish	frozen unfrozen	-18°C 0°C to 4°C
Meat Meat with Pastry	e.g. Sausage e.g. pies	0°C to 5°C 5°C to 8°C
Poultry	frozen unfrozen	-18°C 0°C to 4°C

The perfect temperature to store uncooked pies at is 5°C, but don't keep them too long as they will deteriorate even when chilled, and one mouldy pie can destroy your reputation. Storage temperatures below 8°C are recommendations.

#### Dairy Produce

Butter	Chilled Frozen	0°C to 4°C -18°C
Cheese Milk Margarine		0°C to 4°C

Flour		5°C to 10°C
Mineral Waters		2°C to 3°C
Cooked food on display		Above 63°C

Hot food should first be cooled as quickly as possible but for not longer than 1½ hours, before being replaced in the refrigerator at about 4°C. Any food that is past its sell by date should be disposed of.

### Heating and Reheating

Hot pies should be served hot i.e. over 63°C and should first be heated as quickly as possible. to 75°C. If your cooked pies have cooled below 63°C then do not reheat them.

Cooked meat pies supplied by the manufacturer can be reheated, but their core temperature should rise above 82°C\* and then they can be kept at 63°C until served.

\* mandatory in Scotland, advisory elsewhere in UK.

## EFFECTIVE CLEANING

To ensure that all parts of the premises are cleaned at the proper intervals, a written cleaning programme should be produced, setting out the item to be cleaned, how often, using what chemicals and methods. The programme should be displayed in the premises and copies given to the persons responsible for the cleaning.

A named person should be given the responsibility for checking that the programme is adhered to and the cleaning carried out to a satisfactory standard.

The following should be regarded as the minimum frequency for cleaning:

- **Floors** daily and should be in a clean state at the end of the working day.
- **Work surfaces** after each use.
- **Equipment, utensils** after each use.
- **Shelves, cupboards** cleared weekly and cleaned.
- **Machinery** after each day's use and between different products.
- **Walls and ceilings** as often as necessary, some areas may need daily cleaning.
- **Toilets** daily or more frequently if required.
- **Food contact surfaces** and fridge handles should be disinfected on a regular basis to prevent the spread of bacteria, perhaps after each shift.

If cleaning the equipment, utensils, crockery, etc, is to be done by hand, a double sink unit should be used for washing and rinsing, using detergent and a disinfecting agent.

**If a disinfectant is not used the temperature of the final rinse water should be above 82°C.**

Hot water does kill most bacteria, but it will have little or no effect on spores. Water from the hot tap (around 45°C) is not hot enough to kill most pathogens, but water at 82°C will. Most commercial dishwashers will heat the cleaned dishes to this temperature to kill off pathogens and to help air drying of dishes. 82°C for 2 minutes is a good rule of thumb.

## STORAGE

If you store food in your preparation area you must make sure that it is protected from vermin. Flour, therefore, should be stored in a stainless steel bin and the lid should fit tightly.

You should not store potatoes in your preparation area. They should be stored off the floor, on pallets in a special area. Make sure that potatoes are kept well away from the walls, and, of course, the room must be spotless.

You must not allow refuse to accumulate anywhere inside the shop unless it is in a bin with a tight lid.

Store cleaning chemicals away from food and raw materials to avoid cross contamination or tainting.

Keep raw materials in their original packaging and if it is necessary to transfer them to other containers make sure they are clearly labelled with enough information to allow for full traceability.

Keep any known allergens (e.g. gluten containing flour) separate from anything that might be contaminated by it (e.g. gluten free flour).

Store chilled fish in your fish fridge. If at the end of the day you have fish fillets left over then if these are still of good quality they are perfectly safe if kept chilled until the next day, provided they are used first.

## OIL MANAGEMENT AND ALLERGENS

We have included allergens and oil management together. One of the reasons for this is that the frying medium can be the means that an allergen is transferred from one product to another.

Restaurants and Takeaways are required by law to tell customers if any of the main 14 food allergen ingredients are in the food they serve.

The 14 allergens which need to be declared are:

- Celery, Gluten (in cereals for example), Eggs, Milk.
- Fish, Crustaceans, Molluscs.
- Lupin, Mustard, Nuts, Peanuts, Sesame seeds, Soya and Sulphur Dioxide (sometimes known as sulphites).

Eggs may be found in the mayonnaise used to make home-made tartare source, presenting both an allergy risk and possibly a food safety risk if poor temperature control leads to bacterial multiplication.

That's why home-made tartare sauce should be considered a **high care or high risk dish**.

Gluten in flour is another well-known allergen, and one that many fish and chip shops have addressed by having gluten free days and gluten free frying equipment.

As the gluten in standard flour/batter can easily contaminate the oil and anything else fried in it, fresh or uncontaminated oil should be used for gluten free fish and chips.

The gluten contamination cannot be sieved out or otherwise removed so don't cross contaminate your oil.

Some shops are full time gluten free. They will have a dedicated pan that is only used for frying fish in gluten free batter, as well as separate serving tongs, sieves etc. to avoid any cross contamination.

Oil management is important in frying operations. If oil temperatures are too high or frying lasts too long then your fish and chips can have higher levels of a chemical called acrylamide as well as appearing darker brown. Lower levels of acrylamide are more desirable.

Poor oil management and in particular poor sieving/filtration can lead to carbon build up and oil breakdown. This is wasteful of your oil although not a food safety risk.

With good oil management, frying pans rarely need deep cleaning but even in the best run fish and chip shops an occasional deep clean is required. The significant food safety risk from deep cleaning is any residual cleaning chemicals left in the pan that can taint the new oil.

For more information on oil management please read the online guide available from the Seafood Academy website or attend a NFFF Fish Frying training course.

## OTHER FOOD SAFETY HAZARDS

Fish and chip shops are prone to all of the usual food safety hazards described in earlier parts of the module, as well as hazards associated with serving hot food to customers. Here are a few.

- Mushy peas, curry sauce and gravy – kept hot in a Bain Marie – but are they hot enough to avoid bacterial growth and toxin production? All parts of the contents must reach 75°C during cooking and stay above 63°C during hot holding. Don't reuse unsold product the next day.
  - In Scotland these cooked foods must be heated to at least 82°C during cooking.
- Bones in the fish fillet. Hard to believe but they count as a physical contaminant, particularly if they get lodged in someone's throat.
- Green potatoes contain a toxin called Solanine. Store your potatoes away from sunlight and discard any green ones.
- Fish substitution. Strictly speaking this is not a food safety issue, but it is still something that can lead to a prosecution by Trading Standards.

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

## RESPONSES TO THE SELF-ASSESSMENT QUESTIONS

### SAQ 1

- a. People are very bacterially dirty because they are covered in bacteria, especially round the nose, mouth, genitals and anus.

Normal breathing spreads germs around and coughing and sneezing spreads them faster. Touching and scratching the body transfers germs to the hands to be passed on elsewhere.

- b. Because we're too fragile! Any process that could really kill off bacteria would damage us too. We have to settle for reducing the numbers and then confine the bacteria which remain behind by using clean clothing.

### SAQ 2

- a. Bacteria multiply and reproduce by dividing into two new bacteria, whenever a certain size is reached.
- b. 500,000,000 - that's right, 500 million bacteria on 1 pinhead.
- c. 4,000,000,000. If we had asked for the number after 8 hours it would have been about 8,400,000,000,000,000. The volume of this number of bacteria would be about 18 litres (about 4 gallons) - our pinhead would have become a couple of buckets full!

### SAQ 3

- a. It's important that you know the difference between these types of disinfectant. Residual disinfectants last a long time - they cling to surfaces and leave a taint.

Non-residual disinfectants don't last too long, as they evaporate from surfaces-they leave no taint.

- b. i. Residual disinfectants are generally **Phenol** based.
- ii. Non-residual disinfectants are often **Chlorine or iodine** based.
- c. Areas
- i. Residual: You use them in toilet areas, down drains, in waste bins, in yards and, generally **outside food rooms**.
- ii. Non residual: They are best used in food rooms, for

soaking and cleaning equipment, fish boxes etc.

#### SAQ 4

Your answer should have contained these points:

- Keep them away from suitable food.
- Keep suitable food at low temperatures.
- Keep the numbers down at all times, by frequent cleaning.
- Don't help them to move from food to food, by using dirty surfaces and equipment. **Keep cold - keep clean.**

#### SAQ 5

In general: Responsibility lies with the Local Authority who will have full time officers appointed to oversee the operation of the Act.

#### SAQ 6

A very difficult one this because the real answer is 'don't know', but we reckon it's handled at least:

- Twice on a boat.
- Three times at market.
- Three times in processing.
- Three or maybe four times after that.

So a good guess would be at least ten times and possibly up to fifteen times.

#### SAQ 7

- a. Tiles are better - because they are non-porous, making them easy to clean, and don't crack easily if properly laid. Concrete is porous and cracks. Tiles are easier to replace, but may need replacing more often than concrete needs repairing.
- b. Problems with tiles - they can be slippery and special attention needs to be given to the joints.

#### SAQ 8

**Visually clean** means that it looks clean. Some bacteria will be removed, but many will be left.

**Bacterially clean** means that almost all bacteria have been killed off.



**SAQ 9**

- a. It should be removed from the food handling room to offal bins more or less as it is produced. The offal bins should be emptied and cleaned at least every other day.
- b. Bins should have tight lids. They should never be overfilled. They should be at least 60cm off the floor so they can be cleaned underneath.

**SAQ 10**

Personal hygiene is the only area where you are in sole charge! You're the only person who can make sure that your standards of hygiene are first class.

**SAQ 11**

It's very difficult to clean under things which are less than 25cm above the ground. It's very easy to lose waste under machinery, making conditions ideal for pests. Equipment should be either flush with and sealed to the floor, be raised, at least 25cm, or be easy to move for cleaning.

**SAQ 12**

Cold water rinsing never does any harm and it's cheaper than hot. It's especially good for removing blood, slime and any protein based substance.

**SAQ 13**

- a. Cover with a clean, brightly coloured waterproof dressing and advise your employer about the boil.
- b. We'll spare the weak jokes here but **you must notify your employer**. You should tell him or her even if you do not attend work so that he or she may carry out special cleaning procedures if needed. They will tell you when you can come back to work.

**SAQ 14**

If people are not dressed in clothes that are suitable for food rooms and have not washed their hands, they are as dangerous to human health as any of the other pests.

**SAQ 15**

Here are some of our suggestions. We hope yours are similar.

- i. Keep them out - different pests will need different measures.
- ii. Don't attract them - this means cleanliness inside and outside.
- iii. Don't feed them - either deliberately (cats, dogs, birds) or accidentally by not covering food and putting lids on containers.
- iv. Remove them as soon as they're detected - call in the EHO if appropriate.

**SAQ 16**

You could have said:

- i. Toxins poison much more quickly.
- ii. Toxins are usually not destroyed by cooking or reheating. An exception is botulism toxin which is easily destroyed by heating.

**SAQ 17**

The most likely thing would be to notice holes in sacks or bags or sometimes gnawing marks on containers.

You might find droppings if you went looking in cupboards or behind equipment with a torch.

**SAQ 18**

A bit of a catch question this!

The answer is YES, but the waste water drain pipe must have a trap between it and the sewer. Toilets already have traps built into them and this is essential.

**SAQ 19**

Because food poisoning bacteria don't multiply very well below 5°C or above 63°C whereas most bacteria multiply quite well between these temperatures. Fish is best kept colder than 5°C.

Remember that these are legal maximum and minimum figures.

**SAQ 20**

You might find this one a bit confusing because we use the term 'protective clothing' in two ways:

- Clothing which protects you = PPE.
- Clothing which protects the food from you = hygiene clothing.
  - a. The regulations deal with protecting the food, and require any part of the body that is likely to contact food to be covered, in clean clothing, except the hands which must be regularly washed. i.e. wear overalls, waterproof aprons, wellington boots, hat etc.
  - b. Wash it regularly - every other day, or even daily, and enclose it all inside suitable headgear, when handling food.

**SAQ 21**

**Chlorination.** Adding chlorine to water makes the water a mild disinfectant. Regular use of chlorinated water keeps bacterial numbers down and makes routine cleaning easier.

**SAQ 22**

We hope you had to think about this one!

If you wash a surface you remove a lot of bacteria, you probably even wash some off if you use detergent, but you leave quite a few behind too.

It depends on what standards of hygiene are required whether or not you then need to sterilise the surface.

**SAQ 23**

- a. Hygienic You could say a lot here- but we would summarise it as 'a level of cleanliness which prevents food borne disease from developing.'
- b. Clean You should have mentioned that there are two levels. Visually clean and bacterially clean. You want things to be visually clean because this gives your customers a good impression and it is a good start. Complete hygiene will require surfaces and equipment to be bacterially clean as well.
- c. Bacteria Plenty of people have written books with this title and we

only left you a few lines. We just wanted you to note that they are small organisms sometimes called germs. They are found everywhere. They can multiply quickly. Although many types of bacteria are harmless, they can cause trouble like fish spoilage and food poisoning.

d. Dirty Just the opposite of clean. The main point here is that if bacteria are present, then the article is dirty even though it might not look dirty.

A shiny knife or work surface is dirty, if there are bacteria present. Your recently washed hands are dirty, if they have become covered in bacteria from the door handle.

Everything is dirty in this sense, unless you have taken some steps to get it and keep it free from bacteria.

e. Harmful You should be thinking of the harmful effects of bacteria. All bacteria are harmful to fish once it is caught. They cause spoilage and they can cause food poisoning. This results in poor quality fish which can be harmful to:

- The fish industry generally.
- You and your company if you are prosecuted by the law.
- People who might be poisoned by food.

### SAQ 24

They all carry disease and food poisoning bacteria. You might have said they are all dirty.

### SAQ 25

You should have remembered that:

A detergent is a substance that helps water to wet things, by lowering the surface tension.

Also it helps dirt dissolve in water and holds it in the foam, so that it doesn't settle out. **Detergents do not kill bacteria** on their own.

### SAQ 26

Around 5°C and above and that is quite cool.

A lot of household fridges will be around this temperature.

### SAQ 27

Cleaning materials should be stored in an outside store, away from rooms where food is handled.

### SAQ 28

- a. From your point of view the most important thing is that a disinfectant kills bacteria.
- b. You could give any two of the following three.
  - Chlorine based.
  - Phenol based.
  - Iodine based.

### SAQ 29

It applies to all food that is to be offered for sale for human consumption.

### SAQ 30

Your answer should be something like:

- i. They cause loss of quality and value.
- ii. They can poison people.

### SAQ 31

We hope you have included these points and, possibly, some of your own.

- a. **Rooms and equipment** should have as few places as possible where waste food and bacteria can lodge. It should be hard for contamination to get in and easy to get rid of any that does.
- b. **Materials** must be non-porous and must stand up to frequent cleaning without being damaged or retaining the smell of cleaning materials.
- c. **Layout - rooms** and equipment need to be laid out so that they are easy to clean and allow enough working space.

### SAQ 32

- a. Handwashing:

- Because hands are the most likely things to actually contact food - that's why it's called handling!
  - Also, hands touch all sorts of things that could contaminate food if they weren't washed regularly.
- b. Hands should be washed at least each time you enter a food room as a matter of routine, also:
- Each time you change from handling one food to another.
  - Each time you have touched a contaminated surface (including yourself).
  - After using the lavatory and before leaving the wash room.
  - After smoking, coughing, sneezing or using a handkerchief.
  - After taking a break e.g. eating or drinking in the canteen.
  - And whenever you feel you need to.

### SAQ 33

Did you remember the three sketches in the text showing :

- i. **Starve** them, by removing their food supply.
- ii. **Isolate** them, by not helping them move from place to place.
- iii. **Kill** them, by using disinfectants or sanitisers.

### SAQ 34

If you said sanitising means killing off all the bacteria you've confused it with sterilising.

Sanitising means reducing the number of bacteria to a safe level. Look again at the text for the definitions.

### SAQ 35

Your list should include at least the following:

- Before starting work.
- After visiting the lavatory.
- After leaving the room for any reason and before returning to handle food.
- After touching anything likely to be contaminated.
- When changing from one product to another.
- And whenever you feel you need to.

**SAQ 36**

None is the short answer! Customers rely on everyone who has handled the food to work hygienically, so please don't let them down, one of them could be us.

**SAQ 37**

They would send a sample for testing at a food laboratory.

**SAQ 38**

a. Disagree You might have found this difficult because we said a lot about how quickly they multiply under ideal conditions, but they certainly keep on multiplying until conditions become impossible for them.

b. Disagree Another tricky one - some bacteria are able to multiply on unusual foods and under extreme conditions, but they will mostly still multiply very well on ordinary foods and in ordinary conditions.

c. Disagree In fact they live in water better than on surfaces, and they need water to multiply.

d. Disagree Poisoning bacteria do not occur naturally on food, they have to get there in some way.

e. Disagree Food poisoning is caused by **bad management**. Luck has nothing to do with it.

**SAQ 39**

You may have remembered some other points, but these are possibly the four most important.

- i. Use at recommended strength.
- ii. Do not mix with other cleaning agents.
- iii. Leave in contact with the surface for as long as possible.
- iv. Protect your skin and eyes from splashes.

**SAQ 40**

None is the right answer, but **Pyrethrum** is fairly safe if used carefully. All the others are best handled by experts.

**SAQ 41**

You were probably expecting something complicated here but, when using a detergent, follow the instruction on the container. There are many different types, so do what the manufacturer says.

**SAQ 42**

So that draining is easy after the frequent washings. They should slope towards the drains.

**SAQ 43**

Change from it into your clean, protective clothing and store it outside food handling rooms.

**SAQ 44**

Keep your output (**cooked product**) well away from your input (raw materials). Don't handle one after the other without washing hands and changing overalls. Different colours of overalls for raw and cooked foods are a good idea. In addition, different refrigeration cabinets, containers, tools and work surfaces should be used.

**SAQ 45**

This might have seemed difficult but it's really quite simple:

When you use cleaning equipment, it gets dirty and must be cleaned itself before it's suitable for further use.

**SAQ 46**

It's more complicated than the question and options would suggest. The relevant legislation is the Workplace (Health, Safety and Welfare) Regulations 1992. Regulation 20 covers sanitary conveniences. You may want to search for it online.

The number can be anything between 4 for mixed or women only toilets to 3 toilets and 2 urinals for a male only workforce. Or for a 50:50 split it would be 5 toilets, 2 urinals and several sinks.

**SAQ 47**

If steam condenses on the gloss paint, after a while this causes it to flake, leaving a porous surface which is hard to clean.  
Food grade cladding is the best finish.



**SAQ 48**

Handwashing.

- It requires facilities to be provided and warning notices to be displayed.
- It requires you to wash your hands frequently.

**SAQ 49**

Don't worry about the exact wording, but you should have written something like:

- a. Birds: Bird droppings are the biggest problem - not only because they go directly onto food but because they are a pool of disease for insects to visit.
- b. Dogs: Excreta - traces of which can be tracked in by the dog or by people on their shoes. Just think how you get your shoes on and off!
- c. Insects: The disease they carry on their legs and their bodies.

**SAQ 50**

We asked you to do it this way because it's often easier to remember a few key words. Our answer would be:

- Remove **waste** as produced.
- Rinse with cold water.
- Hot scrub with clean water.
- Apply **disinfectant** and leave to dry.

**SAQ 51**

This is an important point.

Every work place should have its own **cleaning code of practice** and a **well-established routine**.

Every employee should have **clear instructions** in how to carry out cleaning properly. These instructions should be clearly displayed in the workplace.

**SAQ 52**

Always contact your local Environmental Health Officer.

**SAQ 53**

Routine.

- Once things become a routine, it's much less trouble to carry them out.
- You get organised to do it and it becomes easier.

**SAQ 54**

1. You could have chosen two from amongst the following: oil waste, metals, radioactive waste and other chemical wastes.

2. Quite difficult to say exactly - basically it contacts something that has a strong smell or flavour which then becomes a permanent smell on the fish. The fish doesn't smell as it should. 3.

Bacteria, Chemical and Physical.

Bacterial - often by dirty handling of fish.

Chemical – poorly maintained equipment, poor cleaning practices

Physical by the careless introduction of foreign bodies.