Segment Five - Keep it Clean

We've already said quite a bit about cleaning. We've talked about personal hygiene, about setting up premises and equipment to allow easy cleaning.

In this segment we want to talk about:

- How, when and what to clean:
- What methods to use.

AIMS OF THIS SEGMENT

The main aim of this segment is to help you to achieve Objective 5 –

Describe properties of suitable cleaning materials and plan a cleaning routine.

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

- Realise the importance of routine cleaning methods.
- Recognise possible areas of contamination.
- Distinguish between disinfectants, sanitisers, sterilisers and detergents.
- List the properties and uses of cleaning chemicals.
- Plan an appropriate cleaning schedule.

WHAT IS CLEAN?

We need to start off by defining what we will be talking about.

It's easy to get confused unless we get the meaning of the words clear.

Visually Clean
We've mentioned this before!

It means: free from any **obvious** dirt**.**

An item that only looks clean may **still have** bacteria on it.

Bacterially Clean
This means that there are **no living bacteria on it.** Cooked food is usually bacterially clean at first. Surfaces that are properly treated with disinfectants or sanitisers are usually bacterially clean.

Sterile
Sterile is similar to bacterially clean, but is used when there are no living organisms present at all. This includes bacterial spores, moulds, viruses etc. This is hard to do with many types of food, other than canned food.

We have to think about the two things together.

From the food safety angle bacterially clean matters the most.

CLEANING

Cleaning is a common and important operation.

In the seafood industry it's often a cold water and hand scrubbing process. If you work in the industry, we're sure you'll have done your share.

Cleaning usually means removing visible dirt from a dirty surface. The process also removes a lot of bacteria, but it **won't** leave the surface completely free of bacteria.

In order for cleaning to be performed properly, the right cleaning agents must be selected for the job. Cleaning agents commonly used include the following:

• **Detergents** contain surfactants to reduce surface tension between food soil and the surface so the detergent can penetrate quickly and lift off the soil from the surface.

• **Solvent cleaners** contain a grease-dissolving agent that can be used in areas with burned-on grease.

• **Acid cleaners** are used on mineral deposits that alkaline detergents cannot remove.

• **Abrasive cleaners** are used to remove heavy accumulations of soil often found in small areas. The abrasive action is provided by small mineral or metal particles, such as fine steel wool, copper or even nylon.

Disinfecting or Sanitising are really the same thing. Sanitising is the newer ‘foody’ word! It's a half-way house between cleaning and sterilising.

It means:

Not all of the bacteria will be removed or killed, but their numbers will be very greatly reduced.

Sanitising is a process which reduces the number of bacteria to a safe level.

Sterilising

Sterilising is a process which removes or kills all of the bacteria.

It's very hard to sterilise things. Often it's a waste of time because you can't keep them sterile for long anyway.

Sterilising is usually carried out with strong chemicals or high temperatures.

It might be worth reminding you that:

- Bacteria are everywhere.
- We can't really get rid of them, so we have to learn to cope with them being around.
- We have to keep their numbers down, otherwise they cause spoilage and poisoning.
- They cost us money and can lose a business their customers.

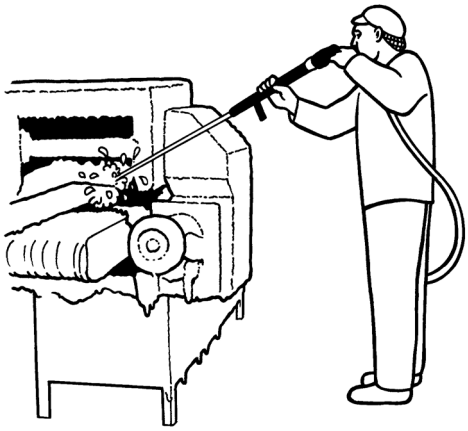
Since bacteria are always there waiting, we have to be fighting them all the time. This can be done in three ways:

- Removing food they can multiply on. this is harder than you may think. The food they multiply on is usually the food product we are working on and we cannot remove that. What we can do is remove all waste material and scrub work surfaces on a regular basis and this will stop the build-up of large numbers of contaminating bacteria.
- Not helping them to move around is best accomplished by regular

cleaning of tools, clothes, etc. This stops contamination from moving from food to food easily. For the same reason we change clothes and tools and clean ourselves when moving to a new product, or when entering the food room again.

Why transfer bacteria from the street or toilet onto our food product?

Why transfer the bacteria from one type of product to another type of product when following a few simple guidelines is all that is needed to keep them under control?



- Seeking them out and killing them frequently takes away the time they need to multiply. Regular and thorough cleaning can keep the numbers of bacteria present down to an acceptably low (hygienic) level.

Cleaning can help in all three areas. It helps to prevent food poisoning and reduces food spoilage.

We've told you why cleaning matters, so now it's time to get down to more detail.

- How?
- When? and
- With what?

We've got a problem here because we don't know your exact work situation. So, we've just got to give you some basic information that you can then use for your own particular purpose:

- Every food handling work place should have its own detailed **code of cleaning** or **cleaning schedule**.
- Every employee should be clearly instructed in what to do, and how and when to do it.
- The instructions should be clearly displayed.

Let's start with the **'how'** to clean and look at materials that help cleaning.

We have already mentioned chlorinated water, which is useful to have available. A solid powder or liquid can be added to water to give it a disinfecting quality.

The liquid is often called **Hypo** (for hypochlorite). It is more or less the same thing as household bleaches, but the strengths will vary. Hypochlorite is a disinfectant. Domestos is a well-known domestic brand product containing hypochlorite.

DISINFECTANTS

There are three main types of disinfectants:
- Chlorine based.
- Iodine based.
- Phenol based.

Let's look at the properties of each type.

Chlorine Based
Chlorine solutions **kill** bacteria.

- **Strength** They must always be used as recommended
- **No mixing** They must **never** be mixed with other chemicals
- **Contact** They should be left in contact with work surfaces for maximum effect.

⚠ The instructions for use must be followed carefully.	
Strength (not less or more)	Adding extra does not necessarily make them kill the bacteria better.
Time	Being cleaned for as long as possible.
Chemicals	Soaps, detergents, sanitisers, disinfectants etc.
Cleaning chemicals are best made up fresh for each cleaning session, according to the manufacturer's instructions.	

Cleaning Chemicals are Dangerous. They kill bacteria, so they can also damage you!

Protect your skin and eyes from splashes. Rinse any splashes off yourself, **immediately,** with plenty of cold water.

There is a range of chlorine based disinfectants on the market. They have advantages and disadvantages according to their different uses.

Chlorine solutions are probably the best general purpose disinfectants for food premises:

- They are **safe** (provided instructions for use are followed).
- They are **cheap.**
- They **work.**

When the disinfectant dries out, the chlorine goes into the air. Therefore it does not leave a taint on surfaces.

This has an advantage and a disadvantage.

Advantage
- No taint is left to get on food.

Disadvantage
- Once the surface is dry it can be re-infected, because there is no disinfectant left.

Remember: These disinfectants have a short effective life and have no residual effect.

There are some other drawbacks. They are useless if:

- Soap is still present.
- Grease is present.
- Organic matter or food is present.

So, they are not much good for toilet areas or for visually dirty surfaces.

They are ideal for:

- Disinfecting washed surfaces.
- Disinfecting cloths, knives, nail brushes etc.

They will eventually cause cloths to rot, but it is a price worth paying.

Don't soak cloths for too long or in a solution that is too strong.

Cloths often hold large numbers of bacteria and can spread contamination around. The best way is to use disposable cloths, or to apply disinfectants with a hand sprayer. Clothes can also be sanitised by hot water – known as hot water disinfection.

Iodine Based
These are sometimes called **Iodophors.**

They work well, but are expensive. They are most often found in skin lotions or mixed in with detergent for hand washing, but have limited use for industrial cleaning.

Phenol Based
These are the types that most people are used to thinking of as disinfectants. They smell strong and they can **taint** food.

They work in the presence of organic (food) matter and have a long lasting (residual) effect. They are used extensively in toilet areas, are cheap and are effective.

They should **not be used near food,** they taint it permanently and are harmful.

Splashes damage the skin and eyes.

Ozone
Because ozone is a safe, powerful disinfectant, it can be used to control multiplication of bacteria in products and equipment used in the food processing industries.

Ozone is particularly suited to the food industry because of its ability to disinfect without adding chemical by-products to the food being treated, or to the food processing water or atmosphere in which food are stored.

Ozone is not yet a common disinfectant in the seafood processing industry, but is increasingly used in place of chlorination of process water.
SANITISERS

Disinfectants and sanitisers are often confused and both words may be used for the same product. Generally in the food, industry sanitisers

combine the cleaning effect of detergents with the properties of disinfectants.

Sanitisers are mainly used to reduce the level of bacterial contamination, which is improved by having some detergent/washing properties.

Disinfectants are used simply to kill bacteria. Under **NO** circumstances mix different cleaning chemicals together unless recommended by the manufacturer. The results can be very dangerous.

The important questions to ask about any cleaning product are:

- Does it have detergent properties? i.e. does it clean ?
- Does it have disinfectant properties? i.e. does it kill bacteria?
- Is it residual? i.e. does it leave a taint or residue ?

It is important to realise that **detergents do not kill bacteria**, and disinfectants do not remove grease and grime, while a suitable specialist cleaning product may do both.

Remember this:

Bactericide
A bactericide is a substance (chemical) that will kill certain types of bacteria. All disinfectants and sanitisers are types of BACTERICIDE.

BS-EN Compliance
All cleaning chemicals used in food premises must conform to British Standard BS-EN 1276 or later, so check your bottles and equipment.

Contact Time
Did you know that your EHO will expect you and your cleaning staff to know the correct contact time for the chemicals you use, whether it's 30 secs or 5 minutes?

Touch Areas are those surfaces that are frequently touched, but not as frequently cleaned as they should be. Door handles are the worst offenders.

Now let's try some SAQs on what you've read so far.

SAQ8

What is the difference between **visually** clean and **bacterially** clean?

SAQ34

What does **sanitising** or **disinfecting** mean?

SAQ22

If you wash a surface that is visually clean, what happens to the bacteria on the surface?

SAQ33

What are the three general methods of keeping bacterial numbers down (from a cleaning point of view)?

SAQ51

What should be established in every workplace and what should every employee have, in order to create an effective cleaning programme?

_____

_____

_____

SAQ3

a. What is the difference between residual and non-residual disinfectant?

Residual disinfectants are _____ based.

Non-residual disinfectants are _____ or _____ based.

b. Name an area where each can be used.

i. Residual _____

ii. Non-residual _____

Check your answers with ours at the back. If you got some answers wrong don't despair, read the section again. This is a difficult section and you might have to read it a few times to understand it properly.

DETERGENTS

We hope you picked up the fact that disinfectants work best on **clean** surfaces. This means that, ideally, dirt has to be removed in the first place before they are used.

You'll probably know from your own experience that water on its own doesn't wash very well. You can prove this by trying to get grease off your hands with water or see what the washing or washing-up looks like if plain water is used.

The reason for this is that water has difficulty in **'wetting'** things, especially if grease is present. This might sound a bit strange, but it means that the water cannot contact the dirt properly. The grease and the water try to avoid touching each other and the water tends to form 'blobs' on the grease.

The water and grease surfaces are unable to contact one another because of something called surface tension.

Removing Dirt

Dirt is removed from surfaces by becoming suspended in the washing liquid. If the water in the washing liquid cannot contact the dirt then the dirt doesn't leave the surface, and the surface stays dirty.

In order to help water contact dirt, special chemicals have been developed that reduce the surface tension of dirt and water.

- **Soap is the** oldest example.
- **Detergents** are the newer examples.

As well as helping dirt to mix with water, they are also able to hold dirt in their foam, well away from the surface being washed.

Let's talk briefly about soaps and detergents and their types and uses.

Soaps

Soaps are available as solids or liquids. They are suitable for frequent use on skin and are best for washrooms.

Soaps can contain antiseptic, but this is not really necessary.

A **Final Word on Types of Cleaning Materials.**
There are many cleaning materials, all are advertised, most promising a great deal.

Whatever you use:
Read the instructions and use accordingly and **NEVER** mix with other cleaning agents.

Remember: A cheap, simple, detergent followed by chlorine disinfectant is probably the cheapest and best cleaning routine for many wet fish operations. For other types of food businesses, more sophisticated methods and chemicals may be required.

Try to answer these two questions about detergents.

SAQ25

How does a detergent make water more effective for cleaning purposes?

SAQ41

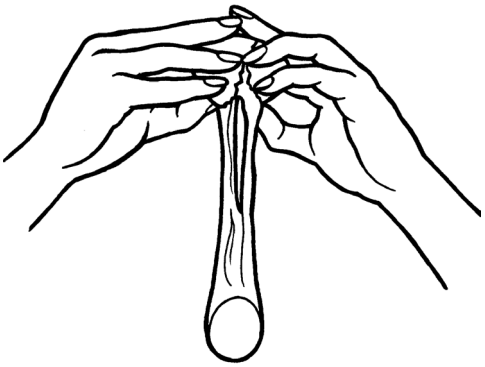
What is the **most important** thing to do when using a detergent?

Compare your answers with ours at the end.

HOT OR COLD CLEANING?

We're going to talk about this in a roundabout way by talking about eggs and butter!

Eggs
If you crack an egg, the 'white' is clear, you can't pick it up and it can be dissolved in cold water.



If you heat the 'white', it becomes opaque and solid. It won't dissolve in hot or cold water. The egg white has been changed by heat.

A number of other substances,
including fish slime, behave like this.

Dirt like this is best removed by cold water and no detergent.

Butter
If you put a piece of butter in cold water nothing much happens. In hot water the butter melts and will mix with water. Detergent helps this mixing process. With detergent the butter will dissolve completely.

Removing Dirt and Stains
Protein stains such as egg, blood and fish slime are best removed by a **cold wash and gentle handling.**

Grease stains, and most others, are best removed by **hot water and detergent,** together with **a good scrub.**

Equipment
Cleaning equipment includes:

- Cloths.
- Brushes.
- Mops.
- Scrubbing machines.

Use whatever cleaning equipment is necessary to do the job, but remember:

Cleaning aids and equipment need cleaning themselves after use.

Cleaning aids, cloths and chemicals should always be kept away from the food production/handling operation when cleaning is not taking place. Store them in a separate store room, cupboard or other out of the way place. Tainting chemicals (phenol based disinfectants for example) will taint raw materials, dry goods and packaging materials if they are store incorrectly.

To Conclude
We have been looking at **'how'** to clean food premises. We said at the beginning that we couldn't give you specific instructions for your own work place. We'll finish this section by summarising what needs to be done in a water-based cleaning routine.

It needs several stages which will vary with your particular circumstances. There are many organisations that can help with cleaning schedules.

WHEN TO CLEAN

We've covered the **how** of cleaning.

Now we need to think about **when and how often** to clean.

Again, this will vary with circumstances and so we can only give general guidance.

Work Areas
Remove waste as soon as it is produced.

Rinse at least at every break, and more frequently if needed:

- Morning.
- Mid-day and.
- Afternoon.

Fully clean - floor, equipment and work surfaces at least **once a day** and in between **any change in use of the work area.**

Other areas such as walls, window ledges etc. need cleaning **weekly.**

Toilet Areas
Should be cleaned at least **daily.**

This cleaning should include a thorough disinfection of:

- Door handles.
- Taps.
- Sinks.
- Lavatories.

A **residual disinfectant** (phenol type) can be used in these areas.

Yards
Yards should be cleaned daily and treated **with a residual disinfectant.**

Waste bins should also be cleaned and treated with **residual disinfectant daily.**

Special Cleaning Methods
We can't go into this too much, because it's too big an area to cope with here. However here are a few important points.

Generally, anything that involves a good flow of clean water and heat is helpful. So, things like steam cleaners and high pressure hoses are useful for particular jobs. They **won't** take away the need for the routine cleaning we've already talked about. The drawback with pressure washers is that they can throw so much spray about that they actually move dirt from dirty equipment onto cleaned equipment!

After pressure washing it's common to rinse down with low-pressure water and even to apply overnight a non-residual food safe disinfectant through fogging. If you do, then be sure to rinse off the disinfectant before starting the next day[2].

If you haven't been taking breaks while doing this segment, take one now- you certainly deserve it!

? SAQ12

When is cold rinsing a useful thing to do?

[2] The law doesn't allow unnecessary chemicals to come into contact with food. Even food-safe disinfectants can be deemed 'unnecessary'.

SAQ45

What happens to cleaning equipment when you use it?

SAQ50

Write down a general cleaning schedule, but only use a **few** words for each stage.

SUMMARY

It's taken a long time to get here, but we can summarise the most important principles:

Detergents – are chemicals which when added to water release the fat, grease and oil particles of food in order that they can be rinsed away. An example of a detergent is washing up liquid. Detergents **do not** kill bacteria

Disinfectants – are chemicals (bactericides) we use to kill the micro-organisms on food contact surfaces. They do not kill all the micro-organisms but they will reduce them to a safe level. An example of a disinfectant is bleach.

But don't forget hot water above 82°C will cheaply and effectively disinfect equipment.

Sanitisers – are a mixture of detergent and disinfectant. They do two jobs at the same time, removing grease and reducing micro-organisms.

- Get surfaces visually clean as frequently as possible.

- Apply a Food-Safe disinfectant to surfaces at least once a day and leave it in contact for as long as possible, preferably overnight, then rinse off just before use if it's residual .

For work places to operate hygienically the management must.

- Have a routine cleaning code of practice.

- Train all the workers to carry out cleaning:
  - Regularly
  - Using the correct cleaning materials at the correct temperatures.

This brings us to the end of segment five and you have now achieved Objective 5.

