Chefs with Compassion

rescue | cook | feed

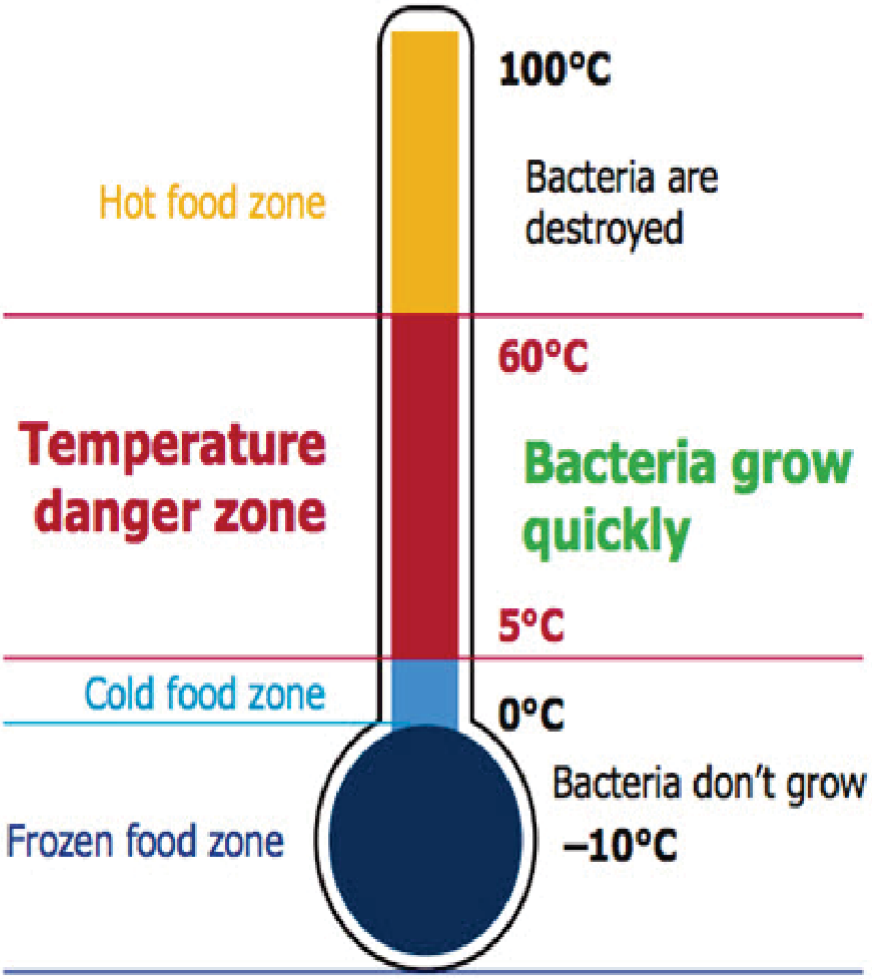
Food Handling and Safety Best Practice

67 000 LITRES
FOR MANDELA DAY

PLEASE ENSURE THAT YOU ARE FULLY FAMILIARWITH THE CONTENTS WITHIN THIS HANDBOOK.

Food Safety - The Danger Zone

- The temperature danger zone is between 5°C and 60°C, when it is easiest for harmful bacteria to grow in food
- Minimise the time that food spends at these temperatures in order to keep food safe
- Refrigerated food needs to be kept at 5°C or below
- Hot food needs to be kept at 60°C or above



4-hour/2-hour rule

If a refrigerated food (eg dairy, cut fruit, sandwiches, salad) or a hot food (eg casserole, pie, lasagne, meatballs) has been in the temperature danger zone for a total time of:

0 to 2 hours	2 to 4 hours	More than 4 hours
Use immediately, or keep at or below 5°C, or at or above 60°C	Use immediately	Throw away

If you intend to use the 4-hour/2-hour rule you will need to demonstrate that the food is safe. See the guideline on the 4-hour/2-hour rule on the Authority's website.

INTRODUCTION

Food hygiene is critical in the management of food. It ensures the safety of food from production to consumption. Food can become contaminated at any point during slaughtering or harvesting, processing, storage, distribution, transportation and preparation.

1.) BEST HYGIENIC PRACTICES

KEY RULES FOOD HANDLERS MUST FOLLOW

- Practice high standards of personal hygiene as listed
- Wear clean uniforms
- Use separate storage areas for raw foods. If this is not possible, **NEVER** store raw foods above cooked foods, as raw foods can drip onto cooked foods and contaminate them. Different types of foods should be stored in separate containers and on different shelves in the refrigerator
- Cool cooked foods as quickly as possible. Food cooked in large batches should be divided into smaller containers so that it will cool more quickly
- Use separate preparation areas, utensils and equipment for raw and cooked food
- Wash salad vegetables and fruit thoroughly before cooking or serving
- Perishable food must be stored at a temperature below 7°C
- Food that is kept hot must be held at a temperature above 82°C
- Frozen food to be thawed should be placed in the refrigerator and allowed to defrost slowly
- Defrosted food should be cooked and eaten as soon as possible. **NEVER** refreeze food that has already been defrosted
- Ensure the temperatures of fridges and freezers are correct
- Cover food
- Keep food within the safe temperature zones
- Keep pets and live animals out of the kitchen
- Do not re-use any disposable items

HOW TO ENSURE FOOD DOES NOT GET INFECTED

- Persons who are ill should not work with food
- All food handlers must observe the practices of personal hygiene
- Rodents and insects must be strictly controlled
- Equipment and utensils must be clean and sanitary
- Food must be stored outside the `danger zone` i.e. below 7°C and above 63°C
- Kitchen walls, floors, etc. must be washed and sanitised daily
- Food supply must come from uncontaminated sources

PREVENTION OF BACTERIAL INFECTION BY CROSS-CONTAMINATION

- Ensure food is obtained from reliable suppliers
- Handle foods as little as possible: use tongs, palette knives, plastic gloves, etc
- Ensure utensils and work surfaces are clean and sanitised
- Pay attention to the handling of raw eggs, poultry, meat and fish
- Wash raw fruits and vegetables
- Clean as you go
- Keep foods covered as much as possible
- Have boards and knives coloured for particular foods, for example red for meat, blue for fish, green for fruit and vegetables and white for cheese and bread
- Take care when reheating prepared foods
- Main kitchen and pastry equipment should be kept separate

2.) FOOD SPOILAGE AND DETERIORATION

TYPES OF SPOILAGE

1. CHEMICAL SPOILAGE

Chemical changes, which cause changes in the taste of food, also occur when food is stored. Some of these changes are acceptable, for instance the changes that occur during the ripening of food like fruit. Should this chemical process however be allowed to continue for long periods, undesirable changes like rot will occur. Another example of an undesirable chemical change is meat or fat which becomes rancid.

2. SPONTANEOUS FOOD SPOILAGE (AUTOLYSIS)

- Food becomes spoiled automatically or spontaneously when stored for long periods.
- This process sets in due to the action of substances called **enzymes,** which are present in all plant and animal material.
- This means that the enzymes break down the cells of plants or animals (which have been slaughtered).
- Micro-organisms also assist with this natural breakdown process.
- Certain elements are again released to nature by this process for other forms of life, i.e. plants which rot to make compost available for the growth of other plants.

3. PHYSICAL FOOD SPOILAGE

- Physical food spoilage includes the damage caused to food through contusion (bruising) or spoilage by insects or rodents.
- This means that the natural, protective outer coating of foods like skins or shells is damaged.
- This type of spoilage also includes damage to tins which are not properly sealed and broken packaging materials.

FOOD CONTAMINATION ROUTES

Micro-organisms can enter food in different ways. Inconsiderate human actions often cause food contamination. Food service personnel must know the routes of food contamination in order to learn how to prevent it.

Food contamination can be transmitted by food handlers, work tops, utensils and pests and plagues such as flies, ants, other insects and rodents. Cross-contamination is an important concept which has to be understood to ensure food safety.

PREVENTION OF FOOD SPOILAGE

- All food service staff bears a responsibility to prevent food spoilage.
- The food service manager has the difficult task of ensuring that just enough provisions are ordered to prevent food spoilage before products can be prepared. He must also ensure that food is stored in such a way that the least chance for food spoilage may occur.
- All food service staff should therefore assist with the correct handling of provisions and the care of store rooms to prevent the accumulation of food which can result in spoilage.
- Staff who receive food should reject poor quality food.
- High quality food cannot be prepared with spoilt or low-quality ingredients.
- All inferior produce or products of an unacceptable quality should be replaced with better quality products by the supplier.
- The ideal way to treat various foods will differ from one food to another.
- Food service personnel should therefore know the best methods for the storage and handling of food.

3.) FOOD POISONING

Food poisoning can be defined as an illness characterised by stomach pains and diarrhoea and sometimes vomiting, developing within one to thirty-six hours after eating affected food.

Food poisoning is the second largest cause of disease in the world. Only common colds occur more frequently than food poisoning. Most people are not always aware that they suffer from food poisoning and only about 5% of all cases of food poisoning are reported. Babies, elderly people and ill persons have the lowest resistance against food poisoning and can die as a result of contracting a serious attack of food poisoning.

CAUSES OF FOOD POISONING

- Chemicals which entered foods accidentally during growth, preparation or cooking of the food.
- Harmful bacteria have entered the food from humans, animals or other sources and the bacteria themselves or the toxins (poisons) produced in the food by certain bacteria have caused the foods to be harmful.
- Food poisoning is caused by micro-organisms which make food look, taste and smell bad. Although a person can contract food poisoning from contaminated food, all spoiled food does not cause disease.
- Spoiled food is not suitable for human consumption and must be discarded.

SYMPTOMS OF FOOD POISONING

TYPE	CARRIERS	SYMPTOMS	OTHER
SALMONELLA	• Raw meats, especially chicken and eggs.	• Fever • Vomiting • Diarrhoea	Can live in human intestines in small quantities without causing harm, thereby making humans carriers as well.
CLOSTRIDIUM PERFRINGENS	• Soil and Faeces • Raw meats • Unwashed vegetables	• Diarrhoea • Abdominal Cramps	Grows in the human intestine Typical vectors are meat pies, stews and large stuffed meat items, while they are being kept warm.
STAPHYLOCOCCUS AUREUS	• Human Skin and Hair • Moist areas of the body (mouth, nose, ears, spots, boils, infected wounds)	• Vomiting • Abdominal Cramps	Can also be transferred by pests and pets Onset of symptoms is rapid (as little as one hour)
BACILLUS B.CEREUS	• Cereal products (rice, spices)	• Vomiting • Abdominal Cramps • Diarrhoea	Also present in corn flour Not easily killed (they survive in rice in the par-boiling process)
B.SUBTILIS B. LICHENIFORMIS	• Dust • Rubbish • Spoiled Food	• Vomiting • Abdominal Cramps • Diarrhoea	Also present in corn flour Not easily killed (they survive in rice in the par-boiling process)
VIBRIO PARAHAEMOLYTICUS	• Seafood, especially prawns	• Vomiting • Abdominal Cramps • Diarrhoea • Fever	Very quick incubation Easily destroyed by cooking

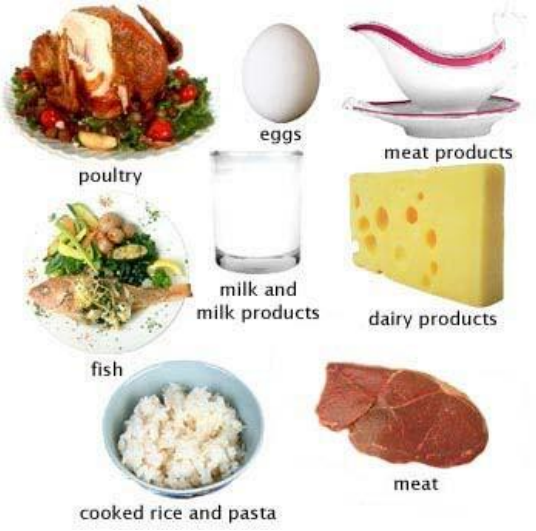
ESCHERICHIA COLI (E.COLI)	• Food Handlers who lack personal hygiene • Found in human intestine • Faeces and Sewage	• Depression • Abdominal Cramps • Diarrhoea • Fever	Typical travellers' disease Symptoms can recur for up to three months
SHIGELLA SONNEI	• Food Handlers who lack personal hygiene	• Diarrhoea (often bloody) • Fever • Abdominal Cramps	Causes dysentery (severe diarrhoea) Highly infectious, only a few organisms cause illness
CLOSTRIDIUM BOTULINUM (CAUSES BOTULISM)	• Soil • Rotting vegetables • Marine Mud	• Blurred or doubled Vision • Difficulty in swallowing and speaking • Paralysis • High Fatality Rate	Very resistant, can grow in canned or vacuum packed foods without air Controlled by keeping pH levels below 4.5, by using sodium nitrate as a preservative

HIGH RISK FOOD ITEMS

Most foods are easily contaminated. Those less likely to cause food poisoning have a high concentration of vinegar, sugar or salt or are preserved in some special way.

The following foods are especially susceptible to the growth of bacteria because of their composition; extra care should be taken to prevent them from being contaminated:

- Stocks, sauces, gravies, soups
- Meat and meat products (sausages, pies, cold meats)
- Milk and milk products
- Eggs and egg products
- All foods which are handled
- All foods that are reheated



SPECIAL CONTAMINATION THREATS

Foods that will support the growth of food poisoning bacteria are the ones which provide a nutrient or protein environment. This is why the foods that are most often the cause of food poisoning are meat and poultry, fish and fish products, eggs and egg products and milk and dairy products.

MEAT AND POULTRY

RAW

Raw meat and poultry may be the source from which other foods, especially cooked foods, are contaminated through unclean surfaces, food workers and equipment. Meat that has been broken up in some way like mince, sausages and rolled, stuffed joints, etc. have more bacteria on them because they have a larger surface area and have been handled more than other meats. Bacteria can also get into the inside of these types of meat, not just staying on the surface as with a solid piece of meat like a topside.

FROZEN

Frozen meat and poultry still carries lots of bacteria and when thawed, these bacteria are still able to cause food poisoning. Food must never be cooked from the frozen state and must be thawed properly before cooking otherwise it does not get hot enough during cooking to destroy the bacteria. This is of special concern with chicken carcasses. Thawed food should never be refrozen. The water that drips off defrosting meat and poultry has lots of bacteria in it, so it should not be allowed to come into contact with any other foods as it will contaminate them. For this reason, always store raw foods below cooked foods in the cold room or refrigerator in case they leak or drip. Eight hours at room temperature for small (less than 2kg) frozen carcasses, or twenty-four hours in a refrigerator for bigger foods, should be enough thawing time.

COOKED

Cooked meat and poultry can easily cause food poisoning if the bacteria in the meat are not destroyed in the cooking process. If the meat is left to stand at a warm temperature, then the bacteria will grow, and anyone who eats it will then get food poisoning. This happens if the cooking temperature and time combined are not enough to provide lethal heat in the centre of the meat, (if a slow cooking method is used), or if the meat is very large in relation to oven size. It could also happen if entirely or partially frozen meat is cooked, if the chicken is stuffed, or a microwave is not used properly. To prevent this, the oven temperature should be between 190˚C and 204°C, with thirty minutes cooking time for every 0.5kg of meat to reach the correct level of heat to kill the bacteria.

If meat becomes contaminated after it has been cooked and it is kept under conditions where food poisoning bacteria could multiply, then there is always a risk of food poisoning. There are lots of circumstances in which food may be left too long in warm conditions.

These include:

- Keeping food in heated cabinets or in the kitchen overnight
- Warming of pies and previously deep-frozen stews and casseroles
- Putting food on plates long before it is served
- Displaying cooked food for sale in unrefrigerated counters
- Leaving food in the sun
- Re-using food from a carvery or hot buffet

FISH AND FISH PRODUCTS

In general, fish is eaten fresher than meat, so it needs to be kept at the correct chilled storage temperatures and conditions. Proper cooking of fish kills bacteria, but it is easily re-contaminated after cooking. Fish do not generally carry much bacteria of their own, but without careful handling, can pick up bacteria through cross-contamination from other sources, such as raw meat, chicken and vegetables.

Fish that has been cooked and then made into something else, like fish cakes or fish pie, are most likely to cause food poisoning and must therefore be cooled and heated quickly and thoroughly for use.

EGG AND EGG PRODUCTS

Raw egg is a medium in which Salmonella can thrive. When fresh eggs are being used, care must be taken to prevent cross-contamination from the shell or from the eggs themselves to other foods.

Fresh eggs should be stored in the refrigerator and on delivery, should be checked for damaged or dirty shells, as these are contamination threats.

Desserts, sauces and mayonnaise containing uncooked egg should be handled with care. Egg custards and sauces also contain protein, which provides good food for bacteria and if custards (crème caramel, trifle and quiche) are not heated and cooled properly and quickly, bacteria that are present in the custard can grow to dangerous numbers quickly.

MILK AND DAIRY PRODUCTS

Milk and dairy products are nutritious foods in which food poisoning organisms may grow. Although milk is pasteurised to kill harmful bacteria that it may be carrying, it can quite easily become contaminated in the kitchen environment by food handlers, or by cross-contamination from utensils and equipment.

If milk and cream are used in products like trifle, cream cakes, custards, quiches, etc. and are left to stand on a buffet for a few hours, food poisoning can quite easily occur.

These foods should be kept in the fridge until the last possible moment before being served.

VEGETABLES

Vegetables themselves cannot support the growth of bacteria, but they often carry soil on them. The soil can be contaminated by human and animal manure and this can then be brought into the kitchen on the vegetables. Salads and greens also carry soil particles. This is why it is so important to wash fruits and vegetables thoroughly before using them. The soil (and bacteria) can get onto the hands of the food handlers and if they do not wash their hands properly after working with raw vegetables, they can easily spread these germs onto other foods.

4.) FOOD STORAGE

Correct food storage is fundamental to the hygienic operation of any food business. All foods must be stored under conditions that will maintain freshness and reduce the likelihood of contamination.

Here are a few guidelines for the safe and correct storage of food:

- Perishable foods such as meat, fish, poultry, eggs and dairy products should be purchased in amounts that can be used up without having to keep them for too long, and should be refrigerated in the raw food section of the store area. Each item should be kept separately either wrapped or sealed in a container, particularly meat and poultry.
- Frozen foods should be placed in the freezer immediately after delivery as any delay might allow bacteria to grow.
- Leafy vegetables should be washed, trimmed and placed in containers or tubs and refrigerated.
- Small goods like ham, salami or cheese should be wrapped in Clingfilm and placed in an airtight container.

DELIVERIES

All deliveries should be checked for:

- Freshness
- Temperature
- Colour and odour
- Contamination
- Unbroken packaging and labelling

As far as practical, external packaging should not be brought into food preparation areas, as it can bring in contaminants from outside the establishment.

DRY-FOOD STORES

Rooms used for the storage of dried and canned foods should be dry and cool, well ventilated, vermin-proof and kept clean and tidy at all times.

The following guidelines apply to dry storage:

- Food should be stored away from the walls and off the floor on shelves or in bins.
- Spillages should be cleared away quickly.
- All goods should be inspected for leaks, damage, contamination, rust and expired dates before being stored.
- Food stores should be cleaned as often as is necessary to ensure that food is kept in the cleanest possible environment.

- Fruit and vegetables should be stored in dry, cool, well ventilated areas, preferably separate from other food.
- Fruit should be examined regularly as mould spreads very quickly.

TEMPERATURE CONTROL

The correct control of temperatures when storing, handling, cooking and serving food is vital to ensure the safety of your guests when they eat it.

If food is kept cool below 7°C and is kept hot at temperatures above 63°C, then the food will be too cold or too hot for bacteria to grow. The temperature zones in between these are very dangerous as they promote bacterial growth.

The normal temperature in a kitchen is between 18°C and 32°C, and therefore, if any food is left lying around or standing in the kitchen, bacteria has the time and temperature to grow quickly to enormous numbers that can make people who eat the food very sick.

CATEGORY	REQUIRED MINIMUM CORE TEMPERATURE OF FOOD PRODUCTS
FROZEN PRODUCTS Ice cream and sorbet, excluding sorbet which is used for soft-serve purposes.	**-18°C**
Any other food which is marketed as a frozen product.	**-12°C**
CHILLED PRODUCTS	
Meat	**3°C-5°C**
Fish	**2°C-3°C**
Fruit and Vegetables	**3°C-5°C**
Dairy	**3°C-5°C**
HEATED PRODUCTS Any perishable food not kept frozen or chilled.	**+82°C**

CORRECT USE OF REFRIGERATORS

- Refrigerators should be sited in well-ventilated areas away from heat sources and the rays of the sun
- They should be constructed so that they are easy to clean. Shelves should be plastic-coated, or made of a material that does not rust
- Door seals (gaskets) must be in good condition and the unit should be serviced regularly
- Refrigeration units should be operating at between +1˚C and +4°C. A thermometer should be positioned in the warmest part of the refrigerator to ensure that the correct temperatures are maintained
- Temperatures must be checked and recorded at least three times a day
- Defrosting and cleaning should be carried out often in accordance with the manufacturer's instructions. Units that defrost automatically should still be cleaned at least once a week
- Refrigerators must not be overloaded and food should never be placed in front of the cooling units or fans
- Food should never be placed directly on the floor
- The lowest shelf should be a minimum of 30cm above the floor
- Vegetables should be stored at low levels in case they drop soil, as then it will drop onto the floor and not onto other foods
- Hot food should never be placed directly into a refrigerator, as this would raise the temperature inside the fridge and affect the food already stored inside
- Large batches of cooked food should be broken down into small batches so it can cool quickly, as the colder temperature inside the fridge can then penetrate it faster and more easily
- Raw food must always be kept apart from high-risk food. Separate fridges are best for storing raw and cooked foods
- Food should be covered to prevent drying out, cross-contamination and absorption of smells from other foods

HEATING OF FOOD

- When food is cooked, it must reach an internal temperature of 75°C to ensure that bacteria have been killed
- Food should be eaten as soon as possible and should not be left warm for hours before service
- Food that is reheated should be heated to a temperature of at least 82°C
- Any reheated food that is left over must be thrown away and not used again later

STORAGE CONTAINERS

Care must be taken to thoroughly wash articles that are used for storage of food because if these are contaminated with bacteria, they will have time to multiply whilst food is being stored in them, and the food will become contaminated.

WORKING SURFACES

Working surfaces should be cleaned as follows:

- Wipe off crumbs and loose dirt.
- Wash down with a detergent and water at a temperature of 50-60°C. Use disposable cloths or disinfect cloths daily to prevent them from redistributing bacteria from one surface to another.
- Rinse thoroughly with a chemical disinfectant added to the water. This disinfectant solution must remain in contact with the surface for the time recommended in the instructions, so that all bacteria can be killed. Sanitisers (a detergent mixed with a disinfectant) can be used for surfaces that are visibly clean, in which case, stages two and three are combined.

OTHER EQUIPMENT

A cleaning routine should be established for all large pieces of equipment in use in the kitchen. As a general rule, all equipment that comes into direct contact with food should be taken apart and cleaned after every use. Other surfaces and equipment should be cleaned as necessary.

To ensure that cleaning is not neglected, it is a good idea to draw up a schedule that lists:

- The items to be cleaned
- How often they must be cleaned
- How they must be cleaned
- Who must clean the items

5.) WASTE HANDLING

Food waste is ideal for the growth of bacteria and unless it is carefully protected, it will attract flies, rats, mice and other pests that may then transfer bacteria back to fresh food in the kitchen. It is very important for the health and safety of customers and people working in hospitality to make sure that rubbish is removed regularly and safely.

- Kitchen refuse should be taken out a few times a day
- It should be sealed and placed in containers a safe distance from the kitchen
- Waste materials should be separate into wet and dry garbage
- If there is a recycling program for glass, plastic, paper or cans in the area, make use of the opportunity to cut down on the amount of waste that is being dumped into the environment
- Refuse bins used inside must be emptied as often as possible and always at the end of the day
- After emptying, the containers must be thoroughly cleaned before being brought back into the food handling environment

Refuse is the ideal place for bacteria to grow, as it provides food, warmth, moisture and time for bacteria to multiply to huge numbers. This is why the containers must be cleaned, as well as your hands, if you have been handling refuse.

6.) STORAGE DIAGRAMS

GENERAL POINTS

- Ideally, it is necessary to have four fridges to contain meat, fish, vegetables and dairy.
- Each fridge will contain a section for raw items, prepped items and cooked items.
- It would also be ideal to have a separate fridge solely for prepped and cooked items (raw or cooked).
- No food items should be stored in the boxes they arrived in as these may be contaminated.

MEAT FRIDGE

- All raw meat or poultry needs to be wrapped or ideally vacuum packed and placed into a deep inset tray in order to catch the remaining blood.
- All raw meat or poultry needs to be placed below cooked meat or poultry.
- All items need to be labelled. Raw items need to be dated with the date of delivery and all cooked items need to be labelled with the date it was cooked.
- It is important to keep meat items separate from poultry so as to avoid cross-contamination of bacteria.

FISH FRIDGE

- All raw fish or shellfish needs to be wrapped or ideally vacuum packed and placed into a deep inset tray in order to catch the remaining blood or liquids.
- All raw fish or shellfish needs to be placed below cooked fish or shellfish.
- All items need to be labelled. Raw items need to be dated with the date of delivery and all cooked items need to be labelled with the date it was cooked.
- It is important to keep fish and shellfish items separate so as to avoid cross-contamination of bacteria.

FRUIT AND VEGETABLE FRIDGE

- All raw fruit or vegetables needs to be placed below cooked meat or poultry.
- All items need to be labelled. Raw items need to be dated with the date of delivery and all cooked items need to be labelled with the date it was cooked.
- It is important to remove all fruit and vegetables from the boxes they were delivered in to avoid contamination. Please all fruit and vegetables in clean containers for storage.

DAIRY FRIDGE

- All cheese wrapped or ideally vacuum packed and placed into a deep inset tray in order to catch the remaining blood or liquids.
- All raw fish or shellfish needs to be placed below cooked fish or shellfish.
- All items need to be labelled. Raw items need to be dated with the date of delivery and all cooked items need to be labelled with the date it was cooked.
- It is important to keep fish and shellfish items separate so as to avoid cross-contamination of bacteria.

This Handbook was compiled
from the volume 1 textbook of

Chefs with Compassion

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