

	SEAFARERS TRAINING CENTER INC	M-SCC(I)-16
	SHIP'S COOK	REV. 3 - 2017

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SHIP'S COOK

According to Maritime Labour Convention, 2006 and Resolution ADM N° 068-2013 (Regulation 3.2, Standard A3.2 and Guideline B3.2 of Maritime Labour Convention, 2006).

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COURSE PURPOSE

This course provides training on the food and catering's fundamental for ship's cook according to the Maritime Labour Convention, 2006. It is based on Regulation 3.2, Standard A3.2 and Guide B3.2 of the Maritime Labour Convention 2006.

COURSE OBJECTIVE

A student who satisfactorily ends the course, and complies with the demanded performance standards, shall be competent in the areas related with the:

- management of food and catering;
- food and personal hygiene,
- as well as the on board ship's handling and storage,
- ensuring that the seafarers will dispose of good quality of food and running water given in ruled hygienic conditions.

ENTRY LEVEL

This course was specially focused for cooks of ship according to the Maritime Labour Convention, 2006. Before starting the course, students shall have basic cooking skills.

STAFF REQUIREMENTS

An instructor is required to teach the complete content of this course:

- The instructor shall hold the model course IMO 6.09 , training course for instructors, according with Regulation I/6 of the STCW'78 Convention, as amended.
- Enough training on food and catering management.
- Proof training in Maritime Conventions (MARPOL, SOLAS, IGS, CTM, 2006).

COURSE INTAKE LIMITATIONS

The maximum number of trainees attending each session will be 25 persons.

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ASSESSMENT METHOD OR CRITERIA

The student's assessment method will consist of a written and practical test. The practical test must cover the competencies of cooking skills knowledge, food and personal hygiene, food storage, reserves' management, environment protection, and catering security and health.

REFERENCE TEXT

- Maritime Labour Convention, 2006.
- Guideless on the training of ships' cooks MESC/2013/9 (ILO)
- Professional Cooking, Wayne Gisslen, Seventh edition

TEACHING AIDS

- STC slide presentation: Ship's cook course
- Equipment of the galley

TRAINING FACILITIES AND EQUIPMENT

- Ordinary classroom
- Computer
- Overhead projector
- Greenboard
- Data show

CERTIFICATE, DIPLOM OR SUPPORTING DOCUMENT

Once the student has satisfactorily finished and passed all the assessments, a certification can be issued, in which will be credited that the holder has followed the training course and complies or surpasses the level of knowledge and competency that have been specified in the Regulation 3.2, Standard A3.2. and Guideline B3.2. of the Maritime Labour Convention.



TIMETABLE

COURSE OUTLINE

Knowledge, learning, and sufficiency	Theoretical hours	Practical hours
1. Practical cookery- Basic cooking skills 1.1. Menus 1.2. Fundamentals of cooking 1.3. Practical cooking skills 1.4. Methods of preparation 1.5. Presentation and serving 1.6. Practical cookery under unforeseen circumstances 1.7. International cuisine – Religious and cultural aspects 1.8. Language skills 1.9. Calculation skills 1.10. General communication skills	4	2
2. Food and personal hygiene 2.1. Food hygiene 2.1.1. Food-borne disease. 2.1.2. Symptoms of food-borne disease 2.1.3. Food-borne disease prevention 2.1.4. How to break the food-borne disease chain 2.1.5. Food can cause illness 2.1.6. High-risk foods 2.1.7. Bacteria and other micro-organisms that can cause illness 2.1.8. Cross-contamination 2.1.9. Food safety self-assessment system 2.1.10. How to clean and sanitized the galley, mess and stores and why it is important to do so 2.1.11. How to handle food during preparation 2.1.12. How to serve food safely 2.2. Personal hygiene 2.2.1. Personal hygiene 2.2.2. Skin infections 2.2.3. Gloves 2.2.4. When to stop working for the sake of the health of others	6	2
3. Food storage 3.1. How food should be stored and why it is important to keep good orders in stores 3.2. How to handle refrigerated and frozen products 3.3. How to keep and reheat leftovers and how to reuse them in other dishes	4	2
4. Food storage management 4.1. Purchasing management 4.2. Stock's Management and Control	2	
5. Environmental protection and catering health and safety 5.1. Awareness of potential hazards	4	2



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5.2. Safe behavior in the galley 5.3. Risk assessment 5.4. Basic knowledge of MLC, 2006 5.5. Knowledge of Chapter IX of the SOLAS Convention 1974, as amended. 5.6. Basic Knowledge of the IGS Code and of the security management systems 5.7. Reporting occupational injuries 5.8. First aid in the galley 5.9. Firefighting in the galley 5.10. MARPOL Annex V concerning Prevention of pollution by garbage from ships. 5.10.1. Waste 5.10.2. Wastage, hygiene and safety 5.10.3. Waste collection 5.10.4. Waste storage 5.10.5. Waste disposal		
6. Nutrition and health 6.1. Health and nutrition 6.1.1. Understanding nutrition 6.1.2. Planning- purchasing and competencies 6.1.3. Food allergy and food intolerances 6.1.4. Awareness of the importance of nutrition for combating lifestyle disease	2	
	22 HOURS	8 HOURS
TOTAL HOURS	30 HOURS	

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COURSE TIMETABLE

<i>PERIOD DAY</i>	<i>DAY 1</i>	<i>DAY 2</i>	<i>DAY 3</i>	<i>DAY 4</i>
1st PERIOD (2 hours)	1. Practical cookery- Basic cooking skills	2. Food and personal hygiene (continued)	5. Environmental protection and catering health and safety	2. Food and personal hygiene (Practical hours)
2nd PERIOD (2 Hours)		3. Food storage		3. Food storage (Practical hours)
BREAK				
3rd PERIOD (2 hours)	2. Food and personal hygiene	3. Food storage (continued)	6. Nutrition and health	5. Environmental protection and catering health and safety (Practical hours)
4th PERIOD (2 hours)		4. Food storage management	1. Practical cookery- Basic cooking skills (Practical hours)	

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1. Practical cookery – Basic cooking skills

1.1. Menus

Menu a list of food and meals shown to aid them in choosing.

Menu planning

Menu planning is done in advance to serve as a deciding factor on the kinds of foods to be served in various meals.



Often I compare the making of a menu to a composer composing a symphony. The Composer uses the different characteristics of the instruments in the orchestra to weave a theme throughout a symphony. At times he or she will build movements in volume and complexity until the crescendo or climax of the piece. The chef does the same using different foods and ingredients to weave a theme throughout the meal. Different textures, temperatures, and cooking methods build on each other, from course to course up until the main entree or crescendo. The finish - dessert - must be grand and memorable as in the composer's symphony.

So, you can understand why we say that menu planning calls upon all the talent and experience of the chef. Not only does the chef have to be knowledgeable in all aspects of food, but must also understand the guests to be served, the talents and limitations of his or her staff, and the terminology that markets his or her ideas to the guests in terms they understand. Considering all of these points, several basic fundamental rules apply and are outlined under Initial Considerations and Creating a Menu.

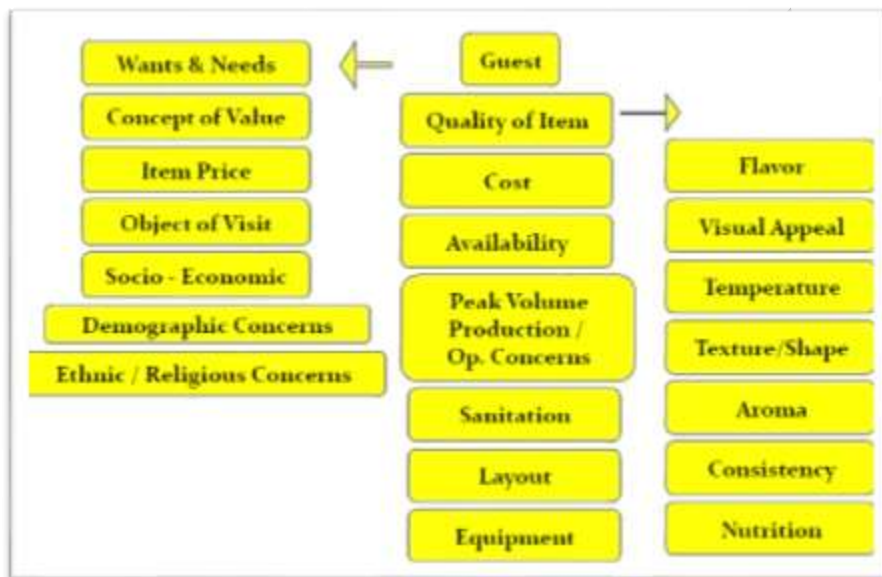
Remembering the points outlined and combining careful planning with basic common sense with flavors, cooking methods, and texture will ensure a perfect menu composition. Keep the portion size comfortable, cook within the talents of your staff, and execute simplicity to perfection and you will achieve a successful symphony of presentation and flavors.



The Menu is not only a Control Tool. Since it list of items that your operation has to offer, it also doubles up as a Marketing tool.

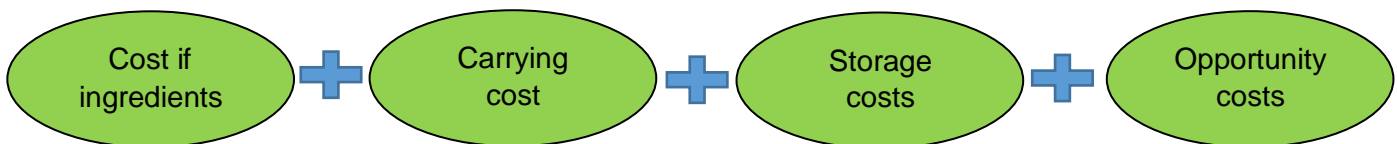
In this manner the menu doubles up as a control and marketing tool and blends them into a workable system.

Priority concerns of the menu planner:



Menu planning strategies:

- The past: in the past, the food service operators tried to diversify their menus by adding new menu items. This increased the number and variety of raw ingredients.
- This would in turn lead to problems in storage.
- And increased inventory costs



- Present: the present – Rationalization strategy: this strategy limits the menu of the operation to only those items that best enhance the operation's image.

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- The objective is simplification for the purpose of operation efficiency.
- Alternatively, an operator can offer several menu item using the same raw ingredients.

To start with, it is best to base your menu plans on the needs and desires of your targeted segment.

However, other factors to look at when designing a menu are:

- a) Storage conditions – (time & temperature)
- b) Personnel skill levels
- c) Product's availability / seasonality
- d) Quality and price levels
- e) Ability to produce the menu item in sanitary / cost effective way

Menu pattern

Breakfast	Appetizer Entrée Staple Beverage	Fruit Protein dish Rice or bread Coffee, milk, tea chocolate
Lunch	Appetizer	Soup / salad
Supper	Entrée Side dish Staple Dessert Beverage	Protein dish Vegetable dish Rice Fruits, tarts, ice cream, etc After dinner Coffee, juice, etc

Components of menu pattern:

- Appetizer – food or drinks served at the beginning of the course to whet the appetite.
- Soups – liquid food made by boiling meat, vegetable, etc.
- Salads – dishes of green herbs, vegetables, or pasta and served with a dressing.
- Entrée – these are subordinate dishes served between meat and fish courses or directly before the main course.
- Main course – chief part of course containing the heaviest and usually the most expensive item on the menu.
- Desserts – serving of sweets such as pie, cake, pudding, fruit etc.
- Beverage – drinks such as tea, code, milk, chocolate, wine, soft drinks, and juices.

Out at sea, maintaining a healthy lifestyle is more importance than ever. While most crew members partake in physical activity on a daily basis, exercise is only part of the big picture. Diet and nutrition needs to take precedence for crew members aboard merchant vessels

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and offshore sites in order to stay able-bodied. Sometimes, however, eating the right foods at sea is difficult – especially without variety.



Healthy menu questionnaire:

- Do you have a least two salad choices?
- Does you menu feature at least one fish dish?
- Do you serve dishes with plenty of vegetables/fruit?
- Do you use “low saturated fat spreads” on sandwiches/bread/vegetables rather than butter?
- Do you use lean meat in your dishes?
- Do you limit adding salt to your dishes?
- Do you limit adding sugar to your dishes?
- Do you offer any whole grain bread, pasta, noodles or rice options?
- Do you use deep-frying techniques sparingly?
- Do you serve at least one vegetarian option in each section of your menu?
- Do you use dairy products with a lower fat content such as lower fat cheese and semi-skimmed milk?
- Do you use a measurement to control your portion sizes?
- Do you serve sauces separately?

Check your results! If you've answered yes to...

- ...All 13 question: You have you're on board staff's health interests at heart!
- ...7-12 questions: Your menu is well balanced and your ship staff has the choice to eat healthy, in saying this, you could offer a bit more selection!
- ...6-3 questions: Your ship staff may want healthier choices.
- ...2 questions or below: Your menu could limit your appeal and needs to have healthier options.

Some ideas that you ca use to make your menus healthier:



Fresh, healthy dishes for your crew!

- **Basics**

- Use as fresh ingredients as possible.
- Increase variety and choice, offer healthy dishes alongside more indulgent options.
- Try to encourage portion control in a subtle way (e.g. ensure spoons and plates are not too large).
- Serve dressings, gravies and sauces separately so one can choose the quantity.
- Encourage healthy choices by putting the most healthy dishes first on the table.
- Use different colors, shapes and texture to add excitement to your dishes.
- Offer colorful starters such as salad and soups.

- **Fats/Oils**

- Replace products high in saturated fat such as butter, lard, suet, creamed coconut, ghee and palm oil with food containing unsaturated fat like sunflower, olive, peanut or sesame oils and (low-fat) mayonnaise.
- For cooking use heat stable refined vegetable oils like canola, soy, olive, peanut, soft and liquid fats and use a spray to apply them rather than straight from the bottle.
- Use lean meat such as roast beef, pork tenderloin, lamb filler, skinless chicken or turkey breast.
- Cut visible fat from meat and remove the skin from poultry.



- Use lean and fatty fish. Fatty fish is a source of good fat. Use shellfish, whitefish such as cod and Pollock and fatty fish such as salmon and mackerel.
- Try to use nuts, seeds and pulses as an alternate protein source. They are source of good fats and cost effective alternative.
- Use low fat or skimmed alternative of dairy products such as semi-skimmed milk, buttermilk, low-fat yoghurt or low-fat alternatives of cream, cottage cheese, ricotta, feta or mozzarella.
- When stir frying use a tiny amount of vegetable or sunflower oil, add water to steam cook.
- **Sugar/Fibre**
 - Increase the fibre content of your dishes by serving brown rice, wholegrain noodles and pasta whole meal or granary bread.
 - Add vegetables to your main dishes such as stir fries, casseroles and stews. This will add color and help reduce costs on meat.
 - Offer more fruit based dessert like fruit salads, yoghurts with fruit, or stewed fruit with spices.
 - Offer a choice of potatoes not just French Fries. Try baked potatoes, new potatoes boiled in their skins and then lightly crushed, oven roasted sweet potato, or mashed using semi-skimmed milk, herbs and spices or horseradish for some extra flavor.
 - Be careful with adding sugar, syrup and honey to dishes, use 100% fruit juices or fruit purées factory food.
- **Salt**
 - Limit the addition of salt during cooking. To compensate use herbs and spices that give robust flavor. Add lemon juices or a little vinegar to finish seasoning dish and a good pinch of black pepper instead of further salt.
 - Be careful with products that are often high in salt such as soy sauce, anchovies, olives, capers, pickles, cheese, ham, bacon, yeast extract, processed meats, smoked meat and fish – a little goes a long way in terms of flavor.



CHALLENGE: Make your own menu plan.



1.2. Fundamentals of cooking

Handled and Stored

In the food industry, incoming and outgoing materials need to be properly shipped, received, handled and stored to prevent the risk of biological, chemical or physical hazards.

Loading and unloading

Considerations for loading and unloading include:

- Employees responsible for loading and unloading food materials should follow company standards for hygiene and sanitation practices.
- Food products should be packaged in suitable containers to prevent product damage.
- Proper product temperature must be maintained during transport, loading and unloading. Movers should be aware of the product temperature requirements.

What is a 'pallet of mixed product'?

To make good use of space, some suppliers ship products by creating 'a pallet of mixed product.' This means that two or more different products are transported on one pallet (e.g. three different kinds of spice blends, flavouring jugs, bags of starch and boxes of fruit). This increases the chances of cross-contamination between the different products. If the suppliers ship the raw materials this way, make sure there is some form of physical barrier (e.g. plastic wrap, cardboard sheets, etc.) between the different items.

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Document specific information when receiving any ingredients. This is important for tracing shipments in case of a recall and should include:

- time of receipt
- type of product
- ingredient and product packaging
- labeling
- lot number
- pallet tag, quantity, size and weight

Handling

Food products should be handled according to Good Manufacturing Practices (GMPs).

Handling procedures should include controlled temperature, humidity, personal hygiene, etc. This will protect food from contamination by pests, microbiological, physical or chemical hazards, and prevent deterioration or spoilage.

Storage

- Products should be stored adequately to maintain package/pallet integrity:
- Allow maximum air circulation and stock rotation.
- Assign different storage areas for different products (ingredients, raw materials, finished products) to avoid cross contamination.
- Food should be used within the manufacturer's specified time period to maintain shelf life requirements. Appropriate rotation of food and packing materials -- first in, first out (FIFO) -- helps minimize food product contamination, damage and spoilage.

Allergen control precautions for raw materials purchasing, transportation and storage

Ensure suppliers have documented and implemented an allergen control plan.

Check labels on incoming ingredients to ensure supplier has not sent the wrong product, a substitute product or used the wrong label.

Ensure vehicles and shipping containers are cleaned before shipping.

Clearly label raw materials to indicate they contain food allergens (ex: color-coded containers, tags).

Heat and food

To cook food means to heat it in order to make certain changes in it. Skillful cooks know exactly what changes they want to make and what they have to do to get them right. To



learn these cooking skills, it is important for you to know why foods behave as they do when heated. For this, you have to study the theory.

Perhaps not all of this section will make sense to you at first. But the ideas should become clearer to you after you think about them in relation to specific techniques, as demonstrated by your instructor. Later in your studies, when you are learning about cooking meats, fish, vegetables, and other foods, review this section from time to time. Not only will you understand it better but also it should help you make more sense of the procedures you are learning and practicing.

What Is Heat?

Heat is a form of energy associated with the motion of atoms or molecules. When a substance absorbs heat, its molecules move faster. In liquids and gases, the molecules move more quickly from place to place and bounce off each other more frequently. In solids, the molecules stay mostly in place, but they vibrate with more energy. Temperature can be defined as a measure of this molecular activity. The higher the temperature, the faster the molecules are moving.

When fast-moving molecules in hot substances come in contact with slower molecules in cold substances, the fast molecules bump into the slower ones and transfer some of their energy, making the slower molecules move faster, or heat up. Thus, as heat is transferred, the hot substance loses energy and the colder substance gains energy.

The moving molecules in a liquid such as water sometimes move to the surface with enough energy to break through and escape to become a gas. This is called evaporation.

When the molecules in the liquid move faster, more of them can escape in a shorter time.

This is why hot water evaporates more quickly than cold water.

When we add enough heat to foods, the molecules may move so fast the structure of the food changes. For example, sucrose (regular sugar) may break apart and form new molecules that happen to have a brown color and the taste of caramel. Or protein molecules may break apart and reform with a different structure. Creating these molecular changes is called cooking.

Effects of Heat on Foods

Foods are composed of proteins, fats, carbohydrates, and water, plus small amounts of other compounds such as minerals (including salt), vitamins, pigments (coloring agents), and flavor elements. It is important to understand how these components react when heated or mixed with other foods. You will then be better equipped to correct cooking faults when they occur and to anticipate the effects of changing cooking methods, cooking temperatures, or ingredient proportions.



In other words, when you know why foods behave as they do, you can understand how to get them to behave as you want them to.

The following discussion is concerned with the physical and chemical reactions that affect the components of food.

Carbohydrates

1. Starches and sugars are carbohydrates. Both compounds are present in foods in many forms. They are found in fruits, vegetables, grains, beans, and nuts. Meats and fish also contain a small amount of carbohydrate.
2. For the cook, the two most important changes in carbohydrates caused by heat are caramelization and gelatinization.

Caramelization is the browning of sugars. The browning of sautéed vegetables and the golden color of bread crust are forms of caramelization.

Gelatinization occurs when starches absorb water and swell. This is a major principle in the thickening of sauces and in the production of breads and pastries.

Acids inhibit gelatinization. A sauce thickened with flour or starch will be thinner if it contains acid.

Fruit and vegetable fiber

1. Fiber is the name for a group of complex substances that give structure and firmness to plants. Fiber cannot be digested.
2. The softening of fruits and vegetables in cooking is, in part, the breaking down of fiber.
3. Sugar makes fiber firmer. Fruit cooked with sugar keeps its shape better than fruit cooked without sugar.
4. Baking soda (and other alkalis) makes fiber softer. Vegetables should not be cooked with baking soda because they become mushy and lose vitamins.

Proteins

1. Protein is a major component of meats, poultry, fish, eggs, milk, and milk products. It is present in smaller amounts in nuts, beans, and grains.



2. Proteins consist of long chains of components called amino acids. These chains normally form tight coils. As proteins are heated, the coils gradually unwind. At this point, the protein is said to be **denatured**.

For the cook, the important fact about denaturing is that, when the protein coils unwind, they become attracted to each other and form bonds. This bonding is called **coagulation**. The coagulated proteins form a solid network of bonds and become firm.

As the temperature increases, the proteins shrink, become firmer, and lose more moisture.

Exposure of proteins to excessive heat toughens them and makes them dry. Most proteins complete coagulation or are cooked at 160°–185°F (71°–85°C).

3. Many protein foods, such as meats, contain small quantities of carbohydrate. When proteins are heated to about 310°F (154°C), the amino acids in the protein chains react with the carbohydrate molecules and undergo a complex chemical reaction. The result is that they turn brown and develop richer flavors. This reaction is called the

Maillard reaction. It is what happens when meat browns. Because of the high temperature it requires, the Maillard reaction takes place only on the dry surface of the food. Because of its water content, the interior of the meat cannot get this hot.

4. **Connective tissues** are special proteins present in meats. Meats with a great deal of connective tissue are tough, but some connective tissues are dissolved when cooked slowly with moisture. Cooking tough meats properly, therefore, makes them more tender.
5. Acids, such as lemon juice, vinegar, and tomato products, have two effects on proteins:
 - They speed coagulation.
 - They help dissolve some connective tissues

Fats

1. Fats are present in meats, poultry, fish, eggs, milk products, nuts, whole grains, and, to a lesser extent, vegetables and fruits. Fats are also important as cooking mediums, as for frying.
2. Fats can be either solid or liquid at room temperature. Liquid fats are called oils. When solid fats are heated, they melt, or change from solid to liquid. The melting point of solid fats varies.
3. When fats are heated, they begin to break down. When hot enough, they deteriorate rapidly and begin to smoke. The temperature at which this happens is called the



smoke point, and it varies by type of fat. A stable fat—one with a high smoke point—is an important consideration in deep-fat frying.

4. Many flavor compounds dissolve in fat, so fats are important carriers of flavor. When fats melt and are lost from food, some flavors, as well as some vitamins, are lost with them.

Minerals, vitamins, pigments, and flavor components

1. Minerals and vitamins are important to the nutritional quality of the food. Pigments and flavor components are important to a food's appearance and taste and may determine whether the food is appetizing enough to eat. So it is important to preserve all these elements.
2. Some of these components are soluble in water, and others are soluble in fats. All of these components may be leached out, or dissolved away, from foods during cooking.
3. Vitamins and pigments may also be destroyed by heat, by long cooking, and by other elements present during cooking.
4. It is important, then, to select cooking methods that preserve, as much as possible, a food's nutrients, taste, and appearance. This is addressed whenever cooking techniques are explained in the remainder of this book.

Water

1. Nearly all foods contain water. Dried foods may contain as little as a fraction of 1 percent water, but fresh meats, fish, vegetables, and fruits consist mostly of water.
2. Water exists in three states: solid (ice), liquid, and gas (water vapor or steam). At sea level, pure liquid water becomes solid, or freezes, at 32°F (0°C) and turns to steam at
 1. 212°F (100°C). When water molecules turn to steam and energetically escape into the atmosphere, water is said to be boiling.
 2. Water can also turn from liquid to gas at lower temperatures. When water turns to gas at any temperature, the process is called evaporation. Evaporation occurs more slowly the lower the temperature is. Evaporation is responsible for the drying of foods. The drying of food surfaces as they are cooked enables them to be browned.
 3. Many minerals and other compounds dissolve in water, so water can be a carrier of flavor and of nutritional value.
 4. When water carries dissolved compounds, such as salt or sugar, its freezing point is lowered and its boiling point is raised.

Heat Transfer

In order for food to be cooked, heat must be transferred from a heat source (such as a gas flame or an electric element) to and through the food. Understanding the ways in which heat

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is transferred and the speed at which it is transferred helps the cook control the cooking process.

Heat is transferred in three ways: conduction, convection, and radiation. It is important to remember that, during a cooking process, more than one of these methods of transfer may be happening at the same time. For example, food on a grill may be heated by conduction from the hot metal grill, by convection from hot air rising from the burner or charcoal, and by radiation from the glowing burner or coals.

Conduction

Conduction occurs in two ways:

1. When heat moves directly from one item to something touching it—for example, from the top of the range to a soup pot placed on it, from the pot to the broth inside, and from the broth to the solid food items in it.
2. When heat moves from one part of something to an adjacent part of the same item—for example, from the exterior of a roast to the interior, or from a sauté pan to its handle.

Different materials conduct heat at different speeds. Heat moves rapidly through copper and aluminum, more slowly in stainless steel, more slowly yet in glass and porcelain. Air is a poor conductor of heat.

Convection

Convection occurs when heat is spread by the movement of air, steam, or liquid (including hot fat). There are two kinds of convection:

1. Natural.

Hot liquids and gases rise, while cooler ones sink. Thus, in any oven, kettle of liquid, or deep-fat fryer a constant, natural circulation distributes heat.

In convection ovens and convection steamers, fans speed the circulation of heat. Thus, heat is transferred more quickly to the food, and the food cooks faster.

Stirring is a form of mechanical convection. Thick liquids cannot circulate as quickly as thin ones, so the rate of natural convection is slower. This explains, in part, why it is so easy to scorch thick soups and sauces. The heat is not carried away from the bottom of the pan quickly enough, so it stays concentrated on the bottom and scorches the food. Stirring redistributes the heat and helps prevent this. (Using heavy pots made of a material that conducts heat well also helps prevent scorching because the pot conducts the heat more quickly and evenly across the bottom and up the sides.)



Convection is the process that carries the heat from the heat source to the food. Once the carrier of the heat (air or liquid) comes in contact with the food, the heat is transferred from the carrier to the food by conduction.

Radiation

Radiation occurs when energy is transferred by waves from a source to the food. The waves themselves are not actually heat energy but are changed into heat energy when they strike the food being cooked. (Light waves, radio waves, and X-rays are examples of radiation not used for cooking.)

Two kinds of radiation are used in the kitchen:

1. Infrared.

Broiling is the most familiar example of infrared cooking. In a broiler, an electric element or a ceramic element heated by a gas flame becomes so hot it gives off infrared radiation, which cooks the food. High-intensity infrared ovens are designed to heat food rapidly.

2. Microwave.

In microwave cooking, the radiation generated by the oven penetrates partway into the food, where it agitates the molecules of water. The friction this agitation causes creates heat, which cooks the food.

- Because microwave radiation affects only water molecules, a completely waterless material will not heat in a microwave oven. Plates become hot only when heat is conducted to them by hot foods.
- Because most microwaves penetrate no more than about 2 inches (50 mm) into foods, heat is transferred to the center of large pieces of food by conduction, just as in roasting.

Heat Management

The final temperature to which we cook a food ranges from about 120°F (49°C) for rare meats and fish to about 400°F (200°C) for the crisp exterior of such foods as breads and seared meats. The boiling point of water, 212°F (100°C), falls within this range. Notice, however, the heat sources we use in the kitchen, from electric elements to gas flames, are much hotter than this temperature. Managing the heat to cook foods to the desired degree is an important part of cooking.

In the discussion that follows, we first consider cooking time—that is, the time it takes to heat food until it changes to a condition that we call done. We then look at other problems with controlling heat in cooking.



Doneness and Cooking Times

We say a food is “done” when two things have happened:

1. The interior temperature has risen to the desired degree.

Interior temperature is the most important factor when we are cooking tender meats.

The difference between rare, medium, and well done (see p. 298) is a difference in temperature, and we can measure this doneness with a thermometer. Interior temperature is also important for food safety

2. The desired changes have taken place in the food.

Earlier in this chapter, we discussed the changes that take place in foods as they are heated. These changes include gelatinization of starches, coagulation of proteins, breaking down of connective tissues, caramelization of sugars, and Maillard browning.

In many foods, creating these changes is more important than simply heating the interior to a desired temperature. For example, the inside of a small piece of stew meat quickly becomes just as hot as the liquid in which it is simmering. However, we don't say it is “done” until enough connective tissue has broken down so it has a tender texture.

It's not enough just to heat it to the desired degree.

Similarly, the inside of a strand of spaghetti quickly rises to the temperature of boiling water, but it is not done until enough starch has absorbed water and gelatinized, so it has the desired texture.

Standards of doneness are different for every type of food and for every cooking method.

As we discuss individual foods throughout the remainder of this book, we learn more about doneness in meats, poultry, fish, vegetables, starches, and other foods.

The time it takes to achieve doneness is affected by three factors:

1. Cooking temperature.

This means the temperature of the air in the oven, the fat in the fryer, the surface of a griddle, or the liquid in which a food is cooking.

2. The speed of heat transfer.

Different cooking methods transfer heat at different rates, as shown by these examples:

Air is a poor conductor of heat, while steam is much more efficient. A jet of steam (212°F/100°C) will easily burn your hand, but you can safely reach into an oven at 500°F (260°C). This is why it takes longer to bake potatoes than to steam them.



A convection oven cooks faster than a conventional oven, even if both are set at the same temperature. The forced air movement transfers heat more rapidly.

3. Size, temperature, and individual characteristics of the food.

For example:

A small beef roast cooks faster than a large one.

A chilled steak takes longer to broil than one at room temperature.

Fish items generally cook more quickly than meats.

Beef shank, which has a lot of connective tissue, takes longer to cook than beef tenderloin.

Because there are so many variables, it is difficult or even impossible to determine exact cooking times in most recipes. Individual ovens, fryers, and steamers, for example, may transfer heat more or less efficiently or have different recovery times. Roasting charts that give cooking times for various cuts of meat can be used only as guidelines, and the cook must use his or her judgment to make the final determination of doneness.

Controlling Heat

To control cooking, we must control how heat is transferred. The kitchen contains dozens of kinds of heat sources as well as a great array of pots, pans, and other cooking tools. Controlling cooking with so many options is a skill a cook gains with experience, by performing cooking tasks over and over.

In this section, we introduce the topic of heat management with a summary of two of the most common kinds of heat control problems.

How to boil water

It's a common joke that boiling water is a cooking skill many noncooks have never learned.

However, boiling water is a little more complex than such quips suggest. There is more to boiling water than just putting a pot on the stove.

- **Covering the Pot**

To bring water to a boil on a cooktop, we apply heat to the bottom of a pot containing the water.

The heat is transferred to the water, raising its temperature. Some of this heat energy quickly escapes from the top of the pot. If the pot is covered, much of the heat is trapped inside, and the water comes to a boil much more quickly. To raise the temperature of 1 gram of water 1 degree Celsius takes only 1 calorie of heat energy. But to turn 1 gram of boiling

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water to steam takes 539 calories. When the steam escapes, it takes this energy with it. A lot of energy is lost from an uncovered pot. By covering it, we save energy and shorten heating times.

After a liquid has come to a boil, keeping the pot covered can still be helpful. You have probably had the experience of removing the lid from a pot simmering over a low flame and seeing the bubbling slow down as soon as the lid is off. This is because so much heat escapes as soon as the cover is removed. By keeping the pot covered, you can maintain the desired cooking temperature using a lower burner setting.

Although covering pots is a more efficient use of energy, sometimes you must keep them uncovered:

- When evaporation is desired. In many cooking operations, one of the goals is to evaporate moisture to concentrate flavors or change textures. Keep the pot uncovered to speed evaporation.
- When the contents must be visually monitored. In some cases, you must keep an eye on the food as it simmers or boils, if only to make sure it continues to simmer at the proper rate, not too fast or too slow.
- When green vegetables are cooked. Plant acids that destroy green pigments must be allowed to escape.

- **Controlling the Heat**

Water boils at 212°F (100°C) at sea level and at standard atmospheric pressure. When water is boiling, any additional heat is used to turn water to steam, which then carries the heat away.

No matter how high you turn the heat, the water can never rise above 212°F (100°C). In other words, turning up the heat under a pot that is already boiling is a waste of energy and does not decrease cooking time. Furthermore, the increased agitation of rapidly boiling water does more damage to delicate foods. Remember, a rapid boil is no hotter than a slow boil.

Cooking to the center

As we read earlier, heat is transferred from the outside of food to the inside by conduction.

Conduction takes time, so cooking takes time.

Think of a steak cooking on a grill. Let's say we want to cook the steak to an interior temperature of 140°F (60°C), for medium doneness. When we first put the steak on to cook, the interior temperature is room temperature, or possibly refrigerator temperature. The outside, however, rises to perhaps 400°F (200°C) very soon after we place it on the grill. Gradually, this heat moves to the center. By the time the center reaches the target

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temperature, the outside is much hotter. If we cut the steak through the center, we see a gradation from very well done at the outside to medium done in the middle.

Often this is just what we want. This is how people are used to eating steaks, so a person might be surprised to get a steak that was a uniform medium done all the way through.

By contrast, if we cook the steak at a low temperature, there is less temperature difference between the outside and inside, so the doneness of the meat is more uniform from outside to inside.

The same is true of large roasts. Roasting at a high temperature produces a strong gradation of doneness, from well done on the outside to less done in the center. Roasting at a low temperature gives more uniform doneness throughout. The roasting temperature we use depends on the results we want.

Of course, cooking at a low temperature doesn't create the well-browned crust most diners desire. We have two options to solve this problem:

- Brown the exterior with high heat, then cook to doneness at lower heat.
- Cook to doneness at low heat, then brown the exterior with a quick blast of high heat.

1.3. Practical cooking skills

Your Losses

Food waste impacts the environment and your profits. Get tips on how to reduce food waste and save money.

Food Waste Reduction Tips

Food waste is a global problem that needs to be addressed, not only for environmental reasons, but also because of the economic implications it has on your company. The situation is becoming top of mind for consumers in their own kitchens as well as when they're dining away from home.

Types of Waste & Tips for Reduction

Effective waste management can be summed up by the three R's: Reduce, Reuse and Recycle. These three R's are evident in several stages of the kitchen process. Below we've outlined three types of waste and have included tips to help you manage and reduce waste in each category.

Preparation Waste - Several things can be done to reduce waste during preparation:

Effective Purchasing:



- Try not over-order food: Only order the minimum amount required for a period to avoid unnecessary spoilage.
- Cook seasonal: Ingredients that are out of season have made a longer journey to your kitchen and have a higher risk of spoilage.
- Only buy bulk if it fits with your demand/are non-perishable.
- Consider frozen, dried, bottled or tinned goods as opposed to fresh where a comparable quality can be achieved.
- Perishable items should be used throughout the menu so that they are not wasted.



Production Planning – reduce and reuse

While most waste in restaurants is generated by the end product — cooked food that can't be donated or re-purposed — there are BOH steps that minimize waste.

- During the production phase, waste occurs when ingredients are not prepared carefully (e.g., excess trimming of meat, vegetables, or fish) or ingredients that can actually be used are discarded (e.g., onion trimmings, carrots peels and parsley stems can enhance any soup or stock). As a result, a lot of costly waste can be reduced and reused during the production stage in most kitchens.
- Meat trimmings can be used for a pâté, a filling or in an appetizer format. You can even go as far as rendering the fats from the meat for other purposes.
- Cook smaller batches of pre-prepared staple food to make sure you don't over order.
- Plan carefully. This optimizes your labor efficiency and reduces waste.
- Be flexible and reactive: tailor your mise en place to weather, holidays, etc, increasing and decreasing par levels accordingly.
- Avoid exceeding par stock levels and overdoing the mise en place, as often this leads to wasted stock and effort.

Spoilage Waste

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How you store your ingredients plays a large role in reducing waste during storage. Use the ABC strategy to optimize the space of your storage:

- Category A: products that have a high consumerism but relatively little pick locations.
- Category C: products that will be stored a lot longer than products in group A. They have a low consumerism and take lots of space in the store room.
- Category B: products in between A and C according to turnover and pick frequencies.



When you use these categories to classify your products you can group your storage room and fridge into three zones. Zone A will always be closest to the door, then B, then C. Improved storage using this model can save you up to 60% of your time.

Basic Principles of Baking

If you consider that most bakery products are made of the same few ingredients—flour, shortening, sugar, eggs, water or milk, and leavening—you should have no difficulty understanding the importance of accuracy in the bakeshop, where slight differences in proportions or procedures can mean great differences in the final product.

If you have begun your food-service studies in a kitchen production laboratory, you surely have been told many times of the importance of measurement, not only for portion control and cost control but also for consistency in the quality of the final product. However, you have, no doubt, also learned there is a great deal of margin for error and that it is possible (if not desirable) to cook many foods without measuring anything. Coming into the bakeshop, where measurement is absolutely essential, may be a bit of a shock to you after your kitchen experiences, but it should reinforce the habits of accuracy you may have let slip.

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If, on the other hand, you are beginning your practical studies in the bakeshop, then you will do well to pay particular attention to the principles of measurement presented here. They will be valuable to you throughout your career.

Formulas and Measurement

Bakers generally talk about formulas rather than recipes. If this sounds more like the chemistry lab than the kitchen, it is with good reason. The bakeshop is much like a chemistry laboratory both in the scientific accuracy of all the procedures and in the complex reactions that take place during mixing and baking.

Measurement

All ingredients must be weighed. Accuracy of measurement, as we have already said many times, is critical in the bakeshop. Measurement is by weight rather than by volume because weight is much more accurate. Unlike in recipes for the home baker, you will not see a professional baker's formula calling for 6 cups flour.

To demonstrate to yourself the importance of weighing rather than measuring by volume, measure 1 cup flour in two ways. (1) Sift some flour and lightly spoon it into a dry measure.

Level the top and weigh the flour. (2) Scoop some unsifted flour into the same measure and pack it lightly. Level the top and weigh the flour. Note the difference. No wonder home recipes can be so inconsistent!

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Digital professional scale
Courtesy of Cardinal Detecto

Procedure for Using a Baker's Balance Scale

The principle of using a baker's scale is simple: The scale must balance before setting the weights, and it must balance again after scaling. The example cited illustrates using a scale with U.S. units. The same procedure is used for metric scales.

1. Set the scale scoop or other container on the left side of the scale.
2. Balance the scale by placing counterweights on the right side and/or adjusting the ounce weight on the horizontal bar.
3. Set the scale for the desired weight by placing weights on the right side and/or by moving the ounce weight. For example, to set the scale for 1 pound 8 ounces, place a 1-pound weight on the right side and move the ounce weight to the right 8 ounces. If the ounce weight is already over 8 ounces, so that you cannot move it another 8, add 2 pounds to the right side of the scale and subtract 8 ounces by moving the ounce weight 8 places to the left. The result is still 1 pound 8 ounces.
4. Add the ingredient being scaled to the left side until the scale balances.



Balance scale
Courtesy of Cardinal Detecto

The baker's term for weighing out ingredients is scaling.

The following ingredients may be measured by volume because they weigh 1 pound per pint or 1 kilogram per liter.

Water

Milk

Eggs

Thus, if a formula calls for 2 pounds eggs, you may measure 2 pints (1 quart). (Liquid flavoring ingredients, such as vanilla extract, normally measured in very small quantities, may also be measured by volume; 1 tablespoon equals 1/2 ounce.) In the metric system, 1 milliliter water weighs 1 gram; 1 liter weighs 1 kilogram. All other liquid ingredients (such as corn syrup and molasses) and all dry ingredients are normally weighed.

Baker's Percentages

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Bakers use a simple but versatile system of percentages for expressing their formulas. Bakers' percentages express the amount of each ingredient used as a percentage of the amount of flour used.

To put it differently, the percentage of each ingredient is its total weight divided by the weight of the flour and multiplied by 100 percent, or

$$\frac{\text{weight of ingredient}}{\text{weight of flour}} \times 100\% = \% \text{ of ingredient}$$

Thus, flour is always 100 percent. (If two kinds of flour are used, their total is 100 percent.)

Any ingredient that weighs the same as the flour is also given as 100 percent. The following ingredients from a cake formula illustrate how these percentages are used. Both U.S. and metric examples are given. (Note that numbers may be rounded off for practical measuring.)

Check the figures with the above equation to make sure you understand them.

INGREDIENT	WEIGHT	PERCENTAGE	INGREDIENT	WEIGHT	PERCENTAGE
Cake flour	5 lb	100 %	Cake flour	2500 g	100 %
Sugar	5 lb	100 %	Sugar	2500 g	100 %
Baking powder	4 oz	5 %	Baking powder	125 g	5 %
Salt	2 oz	2.5 %	Salt	60 g	2.5 %
Emulsified shortening	2 lb 8 oz	50 %	Emulsified shortening	1250 g	50 %
Skim milk	3 lb	60 %	Skim milk	1500 g	60 %
Egg whites	3 lb	60 %	Egg whites	1500 g	60 %
	18 lb 14 oz	377.5 %		9435 g	377.5 %

The advantage of using baker's percentages is that the formula is easily adapted for any yield, and single ingredients may be varied without changing the whole formulation. Please remember that these numbers do not refer to the percentage of the total yield. They are simply a way of expressing *ingredient proportions*. The total of these percentage numbers will always be greater than 100 percent.

**Procedure for Calculating the Weight of an Ingredient If the Weight of Flour Is Known**

1. Change the ingredient percentage to decimal form by moving the decimal point two places to the left.
2. Multiply the weight of the flour by this decimal to get the weight of the ingredient.

Example (U.S.): A formula calls for 20 percent sugar and you are using 10 pounds flour. How much sugar do you need?

$$20\% = 0.20$$

$$10 \text{ lb} \times 0.20 = 2 \text{ lb sugar}$$

Note: In the U.S. system, weights must normally be expressed all in one unit, either ounces or pounds, in order for the calculation to work, as explained in Chapter 5.

Example (Metric): A formula calls for 20 percent sugar and you are using 5000 grams (5 kg) flour. How much sugar do you need?

$$20\% = 0.20$$

$$5000 \text{ g} \times 0.20 = 1000 \text{ g sugar}$$

Procedure for Converting a Formula to a New Yield

1. Change the total percentage to decimal form by moving the decimal point two places to the left.
2. Divide the desired yield by this decimal figure to get the weight of flour.
3. If necessary, round off this number to the next highest figure. This will allow for losses in mixing, makeup, and panning, and it will make calculations easier.
4. Use the weight of flour and remaining ingredient percentages to calculate the weights of the other ingredients, as in the previous procedure.

Example: In the previous sample cake formula, how much flour is needed if you require 6 pounds (3000 g) cake batter?

$$6 \text{ lb} = 96 \text{ oz}$$

$$377.5\% = 3.775$$

$$96 \text{ oz} \div 3.775 = 25.43 \text{ oz}$$

or, rounded off, 26 oz (1 lb 10 oz)

$$3000 \text{ g} \div 3.775 = 794.7 \text{ g}$$

or, rounded off, 800 g

Clearly, the percentage system we have been discussing is used only when flour is a major ingredient, as in breads, cakes, and cookies. For these formulas, we use a written format different from our regular recipe format in this book.

In these formulas, the indicated yield is the total weight of the ingredients. This figure indicates the weight of the batter or dough. It is the figure we need to know for the purpose of scaling the dough or batter into loaves or pans. The finished weight of the baked goods will be less because moisture is lost during baking.

Also, please note that all yields, including percentage totals, are rounded off to the next lower whole number. This eliminates unimportant fractions and makes reading and calculating easier.

Selection of Ingredients

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In addition to measuring, there is another basic rule of accuracy in the bakeshop: Use the exact ingredients specified.

Occasionally, a substitution may be made, such as active dry yeast for compressed yeast, but not without adjusting the quantities or rebalancing the formula.

Different flours, shortenings, and other ingredients do not function alike. Bakers' formulas are balanced for specific ingredients. Do not substitute bread flour for pastry flour or regular shortening for emulsified shortening, for example. They won't work the same way.

Occasionally, a substitution may be made, such as active dry yeast for compressed yeast but not without adjusting the quantities or rebalancing the formula.

When yeast is required in a formula, fresh yeast is specified. To substitute dry yeast, use the following guidelines.

To convert fresh yeast to regular active dry yeast, multiply the quantity by 0.5. For example, if the formula calls for 1 1/2 ounces fresh yeast, multiply by 0.5 to get 3/4 ounce active dry yeast.

To convert fresh yeast to instant dry yeast, multiply the quantity by 0.35. For example, if the formula calls for 40 g fresh yeast, multiply by 0.35 to get 14 g instant yeast.

Yeast contributes flavor in addition to leavening action.

Work tables and chopping boards

The surfaces on which food is placed must be kept in good condition and be easy to clean and disinfect. The only materials that should be used in the galley are stainless steel, porcelain and food grade plastic. Wood is unsuitable for table tops and for preparing food on.

It is only with clean chopping boards that you can be certain that there will be no cross contamination, that means no bacteria pass from one raw product to another. If the galley has coloured chopping boards, then use them. Do not wait but wash chopping boards immediately after use so that they are always ready the next time you need them.

If there are no coloured chopping boards for raw ingredients in the galley, always use a clean chopping board. Use a chopping board for fresh vegetables and another for raw meat, poultry, fish and shellfish. When a chopping board is worn or heavily scored, it can be difficult to clean it and so it should be replaced. If a wooden chopping board splits because of frequent washing, it should be replaced.



Wooden chopping boards are usually used to protect sharp knives and the table top. But only food grade hard plastic chopping boards should be used.



Red plastic chopping board for red meat, yellow for poultry, blue for fish and shellfish, and green for vegetables, and possibly brown for bread.



PREVENT CROSS CONTAMINATION
USE CORRECT COLOUR CODED CHOPPING BOARDS & KNIVES

- RAW MEAT**
- RAW FISH**
- COOKED MEATS**
- SALADS & FRUITS**
- VEGETABLES**
- DAIRY PRODUCTS**

Using the Knife



Many laborsaving tools are available for cutting, chopping, and slicing fresh foods.

The chef's knife or French knife, however, is still the cook's most important and versatile cutting tool. The knife is more precise than a machine. Unless you are cutting a large quantity, the knife can even be faster. Cleaning a large machine takes time.

To get the best use out of your knife, you must learn to keep it sharp and to handle it properly.

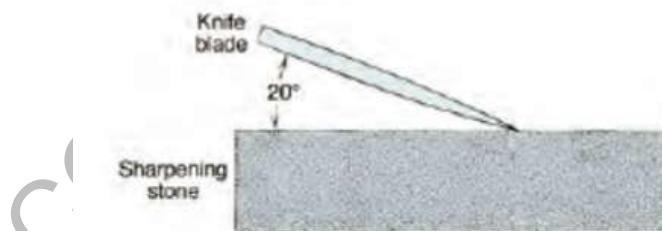
Keeping a Sharp Edge

- **The sharpening stone**

A stone is the traditional tool for sharpening a chef's knife. The best electric sharpeners do an excellent job of sharpening chef's knives, but many models wear away too much of your expensive knife without making a good edge. Modern professional knives are much harder than the old carbon steel knives, so they are more difficult to sharpen on a stone. Nevertheless, using a stone correctly is a valuable skill.

Follow these guidelines:

1. Hold the blade at a constant 20-degree angle to the stone, as shown in Figure.
2. Make light, even strokes, the same number on each side of the blade.
3. Sharpen in one direction only to get a regular, uniform edge.
4. Do not oversharpen.
5. Finish with a few strokes on the steel (see next page), and then wipe the blade clean.



When sharpening a knife, hold the blade at a 20-degree angle to the stone.

Figure illustrates one of several sharpening methods. There are other good ones, too, and your instructor may prefer a method not illustrated here.



Using a sharpening stone.



(a) Hold the knife firmly. Start with the tip of the knife against the stone as shown, and hold the edge against the stone at a 20-degree angle. Use the guiding hand to keep an even pressure on the blade.



(b) Start to draw the knife over the stone. Press very gently on the blade.



(c) Keep the motion smooth, using even, light pressure.



(d) Draw the knife across the stone all the way to the heel of the blade.

Other knife sharpeners

As mentioned previously, today's professional knives are made of an especially hard material that is more difficult to sharpen by traditional methods. As a result, chefs often use other sharpeners to simplify the task. Such sharpeners typically have two stones set at the correct angle, so it is necessary only to draw the knife between them. Manual and power models of these sharpeners are available.



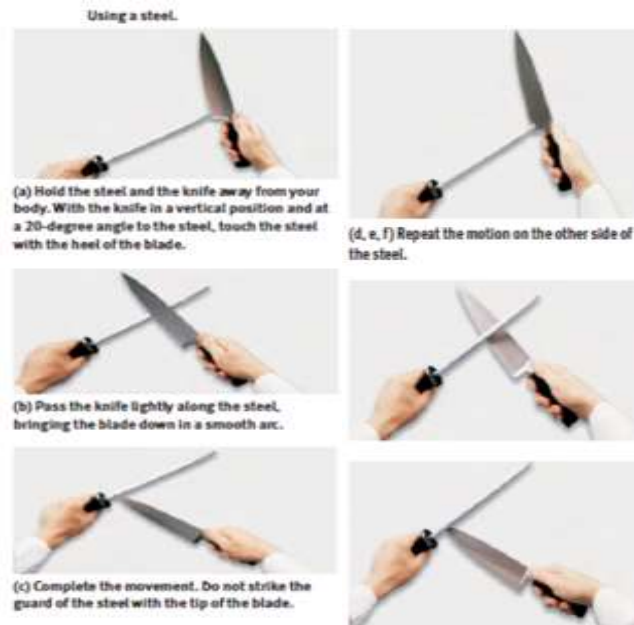
To use a manual sharpener, draw the blade through the sharpener from the heel to the tip of the knife. Do not press down hard, but make several light strokes.

The steel

This tool is used not to sharpen the edge but to true the edge (to perfect it, or to smooth out irregularities) and to maintain the edge (to keep it sharp as it is used).

Observe these guidelines for using the steel:

1. Hold the blade at a constant 20-degree angle to the steel, just as when using the stone. A smaller angle will be ineffective. A larger one will dull the edge.
2. Make light strokes. Do not grind the knife against the steel.
3. Make even, regular strokes. Alternate each stroke, first on one side of the blade, then on the other.
4. Use no more than five or six strokes on each side of the blade. Too much steeling can actually dull the blade.
5. Use the steel often. Then you will rarely have to sharpen the knife on the stone.



Handling the Knife

The grip

A proper grip gives you maximum control over the knife, increases your cutting accuracy and speed, prevents slipping, and lessens the chance of an accident. The type of grip you use depends, in part, on the job you are doing and the size of the knife.

The grip illustrated in Figure is one of the most frequently used for general cutting and slicing. Many chefs feel that grasping the blade with the thumb and forefinger in this manner gives them greatest control.

Holding the knife may feel awkward at first, but practice will make it seem natural. Watch your instructors demonstrate the grips they use, and then practice under their supervision.



Grasping the blade of the knife between the thumb and forefinger gives the worker good control over the blade.

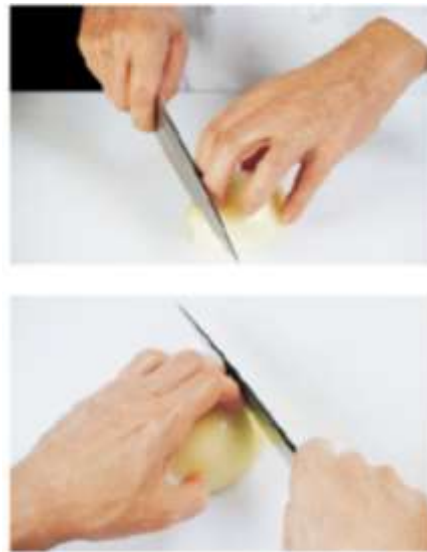
The guiding hand

While one hand controls the knife, the other hand controls the product being cut. Proper positioning of the hand achieves three goals:

1. Hold the item being cut. In Figure, the item is held firmly so it will not slip.



2. Guide the knife. Note the knife blade slides against the fingers. The position of the hand controls the cut.
3. Protect the hand from cuts. Fingertips are curled under, out of the way of the blade.



The position of the guiding hand, which holds the item being cut or sliced and also guides the blade, from two points of view.

Basic Cuts and Shapes

Cutting food products into uniform shapes and sizes is important for two reasons:

1. It ensures even cooking.
2. It enhances the appearance of the product.

Figure shows common shapes, with their names and dimensions. The following terms describe other cutting techniques:

Chop: to cut into irregularly shaped pieces.

Concasser (con-cass-say): to chop coarsely.

Mince: to chop into very fine pieces.

Emincer (em-man-say): to cut into very thin slices (does not mean “to mince”).

Shred: to cut into thin strips, either with the coarse blade of a grater (manual or power) or with a chef’s knife.



Basic cuts and shapes.



(a) Tourné: 2 inches long \times $\frac{3}{4}$ inches in diameter, with 7 sides, and flat-ended (5 cm \times 2 cm).



(b) Large dice: $\frac{3}{4}$ \times $\frac{3}{4}$ \times $\frac{3}{4}$ inch (2 \times 2 \times 2 cm).



(c) Medium dice: $\frac{1}{2}$ \times $\frac{1}{2}$ \times $\frac{1}{2}$ inch (12 \times 12 \times 12 mm).



(d) Small dice: $\frac{1}{4}$ \times $\frac{1}{4}$ \times $\frac{1}{4}$ inch (6 \times 6 \times 6 mm).



(e) Brunoise: $\frac{3}{8}$ \times $\frac{3}{8}$ \times $\frac{3}{8}$ inch (3 \times 3 \times 3 mm).



(f) Fine brunoise: $\frac{1}{8}$ \times $\frac{1}{8}$ \times $\frac{1}{8}$ inch (1.5 \times 1.5 \times 1.5 mm).



(g) Rondelle: round or bias-round cuts, varied diameter or thickness.



(h) Paysanne: $\frac{1}{2}$ \times $\frac{1}{2}$ \times $\frac{1}{2}$ inch (12 \times 12 \times 3 mm; round, square, or rectangular).



(i) Lozenge: $\frac{1}{2}$ \times $\frac{1}{2}$ \times $\frac{1}{4}$ inch (12 \times 12 \times 3 mm; diamond-shape).



(j) Fermière: irregular shape, varied diameter; thickness as needed.



(k) Bâtonnet: $\frac{3}{4}$ \times $\frac{3}{4}$ \times 2–2 $\frac{1}{2}$ inches (6 \times 6 \times 5–6 cm).



(l) Julienne (or allumette potatoes): $\frac{3}{4}$ \times $\frac{3}{4}$ \times 1–2 inches (3 \times 3 \times 25–50 mm).



(m) Fine julienne: 2 \times $\frac{1}{4}$ \times 1–2 inches (1.5 \times 1.5 \times 25–50 mm).



Cutting Techniques

Different parts of the blade are appropriate for different purposes, as shown in Figure.

(Note: Prying off bottle caps is not a function of any part of the knife.)

Using different parts of the knife blade.



(a) The tip of the knife, where the blade is thinnest and narrowest, is used for delicate work and small items.



(b) The center of the blade is used for most general work.



(c) The heel of the knife is used for heavy or coarse work, especially when greater force is required.

1. Slicing.

Two basic slicing techniques are illustrated in Figures. When carrots and similar items are cut into round slices as shown, the cut is called *rondelle*.

Slicing technique 1.



(a) Start the knife at a sharp angle, with the tip of the knife on the cutting board.



(b) Move the knife forward and down to slice through the carrot.



(c) Finish the cut with the knife against the board. For the second slice, raise the heel of the knife and pull it backward, but be sure the tip stays on the board.

Slicing technique 2.



(a) Start the blade at a 45-degree angle, with the tip on the cucumber against the fingers of the guiding hand.



(b, c) Slice downward and forward through the item.

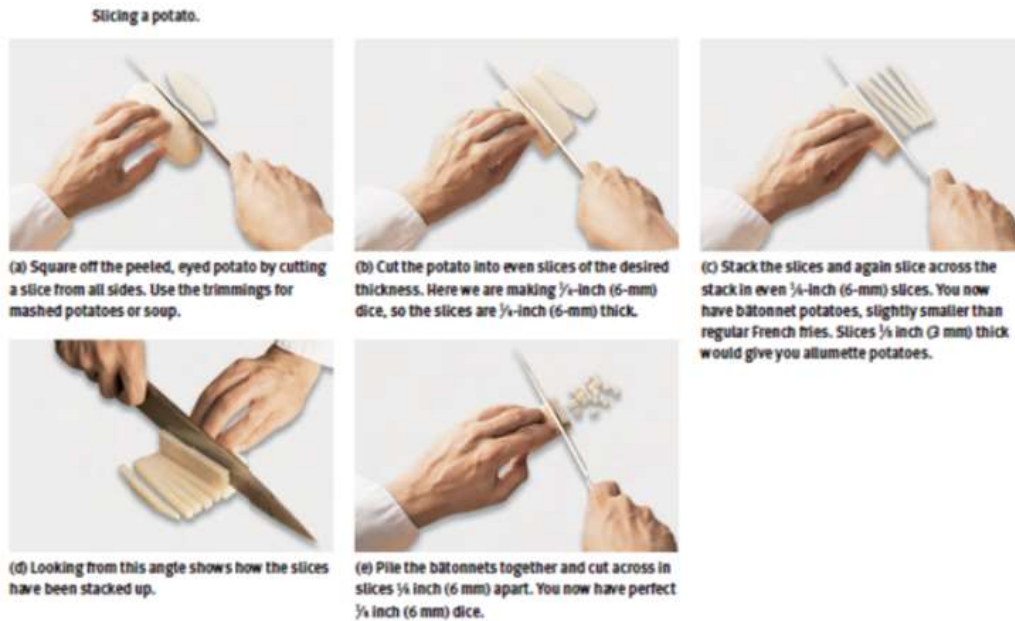


2. Cutting dice, brunoise, bâtonnet, allumette, and julienne.

Figure shows the steps in dicing a product, using a potato to illustrate. Note in Figure c that the process of cutting dice first requires you to cut stick shapes, such as *bâtonnet*. Thus,



this illustration demonstrates the method used to cut not only dice and brunoise (broon wahz) but also bâtonnet (bah toh nay), allumette (ah lyoo met), and julienne (zhoo lee enn).



3. Cutting paysanne.

Paysanne are thin square, or roughly square, cuts. The procedure begins the same as cutting medium dice. However, in the last step, cut the $\frac{1}{2}$ -inch (12-mm) -thick sticks into thin slices rather than into dice. Figure illustrates.



Cut the vegetable into sticks $\frac{1}{2}$ inch (12 mm) square. To cut the sticks into paysanne, cut them crosswise into thin slices.

4. Cutting lozenges.

This is a diamond-shape cut, as illustrated in Figure.



To cut lozenges, first cut the vegetable into thin slices, and then cut these slices lengthwise into strips about $\frac{1}{8}$ inch (3 mm) wide. Cut the strips at an angle to form diamond shapes.

5. Cutting fermière.

Fermière is an irregular slice. Shapes may vary, depending on the item, but the pieces should be of uniform size. Thickness must also be uniform, usually around $\frac{1}{8}$ inch (3 mm). Cut the item lengthwise into pieces of roughly uniform size and shape, and then slice as shown in Figure.



To cut fermière, cut the item lengthwise into roughly equal pieces, and then slice uniformly.

6. Making oblique cuts.

Also called the roll cut, this cut is for long, cylindrical vegetables such as carrots. As illustrated in Figure, hold the knife at an angle, cut, roll the vegetable one quarter-turn, and make the next cut. For tapered vegetables, change the angle as you go to keep the pieces of approximately equal size.



To make oblique cuts, cut the vegetable at a sharp angle, roll one quarter-turn, and make another cut.



7. Dicing an onion.

Dicing an onion presents a special problem for cutting because its form is in layers, not a solid piece. This technique is illustrated in Figure.



(a) Cut the peeled onion in half lengthwise, through the root end. Place one half on the cutting board, cut side down.



(b) With the root end away from you, make a series of vertical lengthwise cuts. Do not cut through the root end. The closer together you make the cuts, the smaller the dice will be.



(c) Holding the onion carefully at the top, make a few horizontal cuts toward but not through the root end, which is holding the onion together.



(d) Finally, slice across the onion to separate it into dice. Again, the closer together the cuts, the smaller the dice.



(e) Continue making slices almost to the root end. The root end may be rough cut for mirepoix, to be used for stocks, sauces, and roasts.

8. Chopping mirepoix.

Mirepoix is a mixture of coarsely chopped vegetables, primarily onions, carrots, and celery, used to flavor stocks, gravies, sauces, and other items.

Because mirepoix is not served—rather, it is almost always strained out of the product before finishing—neatness of cut is not important. The products are cut roughly into pieces of approximately uniform size—small pieces if cooking time will be short, larger pieces for longer cooking times. Figure illustrates mirepoix ingredients being cut.



9. Chopping herbs.

This chopping technique is used to cut a product when no specific shape is needed. Figure illustrates chopping parsley.



Chopping with a French knife. Holding the tip of the knife against the cutting board, rock the knife rapidly up and down. At the same time, gradually move the knife sideways across the product on the board so the cuts pass through all parts of the pile of food. After several cuts, redistribute the pile and begin again. Continue until the product is chopped as fine as you want.

In the case of chives and scallions, a more regular cut is used, similar to the slicing cut used for larger items like carrots. Figure illustrates this procedure.



Stack chives and cut crosswise into very thin slices.

10. Peeling grapefruit.

This technique, as shown in Figure, can also be used for peeling yellow turnips or other round vegetables and fruits with heavy peels.



(a) Cut off the ends of the grapefruit and turn it on a flat end so it is stable. Slice off a section of the peel, following the contour of the grapefruit.



(b) Make sure the cut is deep enough to remove the peel but not so deep as to waste the product.



(c) Continue making slices around the grapefruit until all the peel is removed.



(d) Slice or section the fruit. Squeeze the remaining pulp for juice. The membrane-free citrus section cut by this method are called suprêmes.

11. Chiffonade.

This term refers to cutting leaves into fine shreds. It is applied most often to lettuce and sorrel. To cut chiffonade, remove the heavy leaf ribs, roll the leaves into a tight cylinder, and then slice the cylinder crosswise into thin shreds, as shown in Figure.



a) Roll the leaves into a cylinder.



(b) Cut crosswise into thin strips or shreds.

12. Cutting citrus zest.



With a paring knife, cut strips from the citrus peel, removing only the colored part, not the white part below it. Then, with a chef's knife, cut the zest into thin strips or julienne, as shown in Figure b. An alternative method is to use a citrus zester, as shown in Figure c.



(a) Use a paring knife to cut thin strips from the peel, being careful to cut only the outer colored part, not the inner white pith.



(b) Cut the strips of peel into julienne.



(c) Alternatively, draw a zesting tool over the fruit to cut thin strips of zest.

Preliminary Cooking and Flavoring

Advance preparation often requires precooking and flavoring of ingredients to make them ready for use in the finished recipe.

On the most obvious level, if a recipe for chicken salad calls for cooked, diced chicken, you must first cook the chicken before you can proceed with the recipe. A complete cooking procedure, in such a case, is part of the *mise en place*, or pre-preparation.

Blanching and Parcooking

Partial cooking is a significant part of advance preparation. It requires a degree of culinary skill and judgment to determine when and how much cooking is necessary or desirable.

Partial cooking may be done by any moist-heat or dry-heat method. Those commonly used are simmering or boiling (parboiling), steaming, and deep-frying (especially for potatoes).

The term blanching may mean any of these methods, but it usually implies very brief cooking.

There are four main reasons for blanching or parcooking:

- 1. To increase holding quality.**

Heating helps preserve foods by:

- Destroying bacteria that cause spoilage.
- Destroying enzymes that discolor foods (as when potatoes turn brown) and cause them to deteriorate.

- 2. To save time.**

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It takes less time to finish parboiled vegetables for service than it does to finish raw vegetables. Large batches of foods may be blanched and chilled, and individual portions then finished to order.

Items, such as roast duck, that take too long to cook completely to order are often roasted half to three-quarters done and then finished as the orders are received.

3. To remove undesirable flavors.

Some variety meats and certain strong-flavored vegetables, such as rutabaga, are sometimes blanched to make them milder and more acceptable to the customer.

4. To enable the product to be processed further.

For example, vegetables and fruits such as tomatoes and peaches, as well as some nuts, are blanched to loosen the skins for peeling.

Sweetbreads are blanched so they are firm enough for slicing and breading or other kinds of handling.

Marinating

To marinate means to soak a food product in a seasoned liquid in order to:

1. Flavor the product.
2. Tenderize the product.

The tenderizing effect of the acids in the marinade is relatively small. It is still essential to match the proper cut of meat with the proper cooking techniques for greatest tenderness.

The marinade can also serve as the cooking medium and become part of the sauce. Vegetable marinades, called vinaigrettes, are served cold with the vegetables as salads or hors d'oeuvres without further cooking or processing.

Marinades have three categories of ingredients:

1. Oil.

Oil helps preserve the meat's moisture. Sometimes it is omitted, especially for long marinations, when the oil would only float on top, out of contact with the product being marinated.

Tasteless vegetable oils are used when a neutral flavor is required. Specialty oils, as olive oil, are used to add flavor to the item being marinated.



2. Acid from vinegar, lemon juice, wine.

Acid helps tenderize protein foods.

It carries flavors (its own and dissolved flavors from spices and herbs).

Use caution when employing strong acids, such as vinegar and lemon juice. A marinade that is too acidic will partially coagulate the protein of the meat, making it seem partially cooked. When the meat is then cooked, its texture will not be as desirable.

Strong acids can be used in marinades if they are used in small quantities or if the meat is marinated only a few hours.

3. Flavorings—spices, herbs, vegetables.

A wide choice is available, depending on the purpose.

Whole spices release flavors more slowly, so they are more suitable for long marination.

Kinds of marinade

1. Cooked.

Used when long keeping quality is important. Modern refrigeration has made cooked marinades less widely used. An advantage of cooked marinades is that spices release more flavor into the marinade when it is cooked.

2. Raw.

Most widely used for long marination under refrigeration.



Beef chuck in a raw marinade of red wine, wine vinegar, spices, and aromatic vegetables.

3. Instant.



The range of flavors and purposes is wide. Used for marinating a few minutes up to several hours or overnight.

4. Dry.

A dry marinade, also called a dry rub or a spice rub, is a mixture of salt, spices, and herbs that is rubbed or patted onto the surface of a meat, poultry, or fish item. In some cases, a little oil or a moist ingredient, such as crushed garlic, is mixed with the spices to make a paste. The item is then refrigerated to allow it time to absorb the flavors. The rub may be left on the item or scraped off before cooking. This technique is widely used for barbecued meats. Figure shows a dry rub being applied to a large cut of meat.

Dry marinades are an effective way to flavor meats. Naturally, because they usually don't contain an acid, you can't expect dry marinades to produce the slight tenderizing effects of liquid marinades containing acids.



Guidelines for Marinating

1. Marinate under refrigeration (unless product is to be cooked only a few minutes).
2. Remember: The thicker the product, the longer it takes for the marinade to penetrate.
3. Use an acid-resistant container, such as stainless steel, glass, crockery, or some plastics.
4. Tie spices in a cheesecloth bag (sachet) if easy removal is important.
5. Cover product completely with marinade. When marinating small items for a short time, you may use less liquid, but you must then turn the product frequently for even penetration.

Brines

A brine may be considered a special kind of marinade. However, many chefs also use them for roast poultry and pork because of their tenderizing and moisturizing effects. Brines are rarely used for red meats.



Procedure for Brining Meats and Poultry

1. Assemble the following ingredients:

Water	1 gal	4 L
Kosher salt	4 oz	125 g
Sugar	3 oz	90 g
Bay leaves	2	2
Dried thyme	2 tsp	10 mL
Whole cloves	4	4
Peppercorns	1 tbsp	15 mL

2. Combine the water, salt, and sugar in a stockpot. Make a sachet by tying the herbs and spices in a piece of cheesecloth. Add the sachet to the pot.
3. Bring the water to a boil, stirring to make sure the salt and sugar are dissolved.
4. Let cool, then refrigerate until completely cold. Remove the sachet.
5. Put the meat or poultry into the brine. Poultry must be weighted to keep it submerged. Refrigerate.
6. For large cuts, marinate at least 6 hours or as long as 2 days. For small pieces, such as chops and cutlets, marinate 2 to 6 hours.
7. Remove the meat from the brine, dry it, and proceed with the recipe. Treat the brined meat like fresh meat.
8. Discard the used brine.

A brine consists primarily of salt dissolved in water. Because of the harsh taste a high salt concentration can give to meats, chefs usually add sugar to the brine as well to counteract the strong salt flavor. In addition, herbs and aromatics may be added to the brine, although these have only a mild flavoring effect.

Salt concentration in brines ranges from 3 to 6 percent. The formula given in the procedure makes a concentration of 3 percent, so you could double the salt (and sugar) if desired.

Because of the salt and sugar concentration in the meat, pan drippings may not be usable for deglazing. Also, the sugar may burn to the bottom of the pan, so you may want to put a little water in the bottom of the roasting pan.

1.4. Methods of preparation

Preparation for Frying

Most foods to be deep-fried, with the major exception of potatoes, are first given a protective coating of breading or batter. This coating serves four purposes:

1. It helps retain moisture and flavor in the product.
2. It protects the fat against the moisture and salt in the food, which would speed the deterioration of the frying fat.
3. It protects the food from absorbing too much fat.
4. It gives crispness, flavor, and good appearance to the product.



Breading

Breading means coating a product with bread crumbs or other crumbs or meal before deepfrying, pan-frying, or sautéing. The most widely used method for applying these coatings is called the Standard Breading Procedure.

The three stages of the standard breading procedure

1. Flour.

Helps the breading stick to the product.

2. Egg wash.

A mixture of eggs and a liquid, usually milk or water. More eggs give greater binding power but increase the cost. A small quantity of oil is occasionally added to the egg wash.

3. Crumbs.

Combine with the egg wash to create a crisp, golden coating when fried. Fine, dry bread crumbs are most often used and give good results. Also popular are Japanese-style dry bread crumbs called panko (Japanese for "bread crumbs"). These coarser crumbs give a pleasing texture to fried items. Other products used are fresh bread crumbs, crushed corn flakes or other cereal, cracker meal, and cornmeal.

For small items like scallops and oysters, breading may be done with the aid of a series of wire baskets placed in the flour, egg wash, and crumbs, instead of by hand. The procedure is the same except the baskets are used to lift and shake small quantities of the product and to transfer them to the next basket.

To keep one hand dry during breading, use your right hand (if you are righthanded; if left-handed, reverse the procedure) only for handling the flour and crumbs. Use your other hand for handling the product when it is wet. In order to keep your dry hand dry, never handle a wet product with that hand. For example, to complete the breading of an item that has been dipped in egg wash, place it in the pan of crumbs and push more crumbs over the top of the item, as shown in Figure, and then pat them down, so all sides of the item are covered in dry crumbs before you pick it up.



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To keep your dry hand dry, push crumbs over the top of egg-washed items in the crumb pan before touching them.

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Procedure for Making Bread Crumbs

1. For fresh bread crumbs, use bread that is one or two days old. If the bread is fresh, its moisture content will make it difficult to process into crumbs without making gummy wads of bread. For dry bread crumbs, lightly toast the bread in a warm oven until the bread is dry but not browned. Do not use stale bread, which has an off flavor.
2. Trim off crusts to make crumbs of a uniform light color.
3. Cut or tear the bread into smaller pieces.
4. Depending on the quantity, place the pieces in a food processor or a vertical cutter/mixer. Process until the crumbs are of the desired fineness.
5. For dry bread crumbs of uniform size, pass the processed crumbs through a sieve (also called a *tamis*). See page 60.

Procedure for Proper Breading

Figure 7.28 illustrates a station setup for the Standard Breading Procedure.

1. Dry the product to get a thin, even coating of flour.
2. Season the product—or, for greater efficiency, season the flour (step 3). Do not season the crumbs. The presence of salt in contact with the frying fat breaks down the fat and shortens its life.
3. Dip the product in flour to coat evenly. Shake off excess.
4. Dip in egg wash to coat completely. Remove. Let excess drain off so the crumb coating will be even.
5. Dip in bread crumbs. Cover with crumbs and press them gently onto product. Make sure it is coated completely. Remove. Carefully shake off excess.
6. Fry immediately, or hold for service.
7. To hold for later service, place the breaded items in a single layer on a pan or rack and refrigerate. Do not hold very moist items, such as raw clams or oysters. The breading will quickly become soggy.
8. Strain the egg wash and sift the flour and crumbs as often as necessary to remove lumps.



Figure 7.28 Setup of station for Standard Breading Procedure. Right-handed cooks work from left to right. Left-handed cooks work from right to left, with order of pans reversed, as well.

Dredging with Flour

The purpose of dredging is to give a thin, even coating of flour to a product.

Meats to be sautéed or pan-fried are often dredged with flour to give them an even, brown color and to prevent sticking.

Vegetables, such as sticks of zucchini, are sometimes coated only in flour before deepfrying to give them a light golden color and a very thin coating.

Procedure

Follow steps 1 to 3 of the Standard Breading Procedure above.



Batters

Batters are semiliquid mixtures containing flour or other starch. They are used in deep-frying to give a crisp, flavorful, golden brown coating. There are many formulas and variations for batters.

1. Many liquids are used, including milk, water, and beer.
2. Eggs may or may not be used.
3. Thicker batters make thicker coatings. Too thick a batter makes a heavy, unpalatable coating.
4. Leavenings are frequently used to give a lighter product. These may be:
 - Baking powder
 - Beaten egg whites
 - Carbonation from beer or seltzer used in the batter

Two recipes for basic, typical batters are given in the recipe for deep-fried Onion Rings and the recipe for Fish and Chips, These batters may be used on a wide variety products.

1.4.1. Handling Convenience Foods

Convenience foods play an increasingly prominent role in the food-service industry. Their use has become so important that no student of professional cooking can afford to be without knowledge of them.



Guidelines for Handling Convenience Foods

- 1. Handle with the same care you give fresh, raw ingredients.**
Most loss of quality in convenience foods comes from assuming they are damageproof and can be treated haphazardly.
- 2. Examine as soon as received.**
Particularly, check frozen foods—with a thermometer—to make sure they did not thaw in transit. Put away at once.
- 3. Store properly.**
Frozen foods must be held at 0°F (-18°C) or lower. Check your freezer with a thermometer regularly. Refrigerated foods must stay chilled, below 41°F (5°C), to slow spoilage. Shelf-stable foods (dry products, canned goods, etc.) are shelf-stable only when stored properly in a cool, dry place, tightly sealed.
- 4. Know the shelf life of each product.**
Nothing keeps forever, not even convenience foods. (Some, like peeled potatoes, are even more perishable than unprocessed ingredients.) Rotate stock according to the first in, first out principle. Don't stock more than necessary.
- 5. Defrost frozen foods properly.**
Ideally, defrost in a tempering box set at 28° to 30°F (-2° to -1°C) or, lacking that, in the refrigerator at 41°F (5°C) or lower. This takes planning and timing, because large items take several days to thaw.
If you are short of time, the second-best way to defrost foods is under cold running water, in the original wrapper.
Never defrost at room temperature or in warm water. The high temperatures encourage bacterial growth and spoilage.
Do not refreeze thawed foods. Quality will greatly deteriorate.
Certain foods, like frozen French fries and some individual-portion prepared entrées, are designed to be cooked without thawing.
- 6. Know how and to what extent the product has been prepared.**
Partially cooked foods need less heating in final preparation than do raw foods. Some cooks prepare frozen, cooked crab legs, for example, as though they were raw, but by the time the customer receives them, they are overcooked, dry, and tasteless. Frozen vegetables, for a second example, have been blanched and often need only to be heated briefly.
Manufacturers are happy to give full directions and serving suggestions for their products. At least you should read the package directions.
- 7. Use proper cooking methods.**
Be flexible. Much modern equipment is designed especially for convenience foods. Don't restrict yourself to conventional ranges and ovens if compartment steamers, convection ovens, or microwave ovens might do a better job more efficiently.
- 8. Treat convenience foods as though you, not the manufacturer, did the pre-preparation.**
Make the most of your opportunity to use creativity and to serve the best quality you can. Your final preparation, plating, and garnish should be as careful as though you made the dish from scratch.

A convenience food may be defined as “any product that has been partially or completely prepared or processed by a manufacturer.” In other words, when you buy a convenience product, you are having the manufacturer do some or all of your preparation for you.

Processed foods for restaurants and institutions range from partially prepared items that can be used as components in your recipes, such as frozen fish fillets, peeled potatoes, concentrated stock bases, and frozen puff pastry dough, to fully prepared items that need only be reconstituted or served as is, such as frozen prepared entrées and frozen pies and pastries. Some items, like frozen French fries, have wide acceptance, while other more fully prepared foods continue to be resisted by both customer and operator.

In general, the more completely a product is prepared by the manufacturer, the less it reflects the individuality of the food-service operator—and the less opportunity the cooks have to give it their own character and quality.



Is a stock made from scratch better than a product made from a convenience base? Most quality-conscious chefs would probably answer “Yes!” But the correct answer is, “Not if the homemade stock is poorly made.” No matter what products you use, there is no substitute for quality and care. The fresh product is potentially the best, but not if it is badly stored or handled. Of course, convenience foods also require proper handling to maintain their quality.

The key to understanding and handling convenience foods is considering them as normal products with part of the pre-prep completed rather than as totally different kinds of products unlike your normal raw materials. Convenience products are not a substitute for culinary knowledge and skill. They should be a tool for the good cook rather than a crutch for the bad cook. It takes as much understanding of basic cooking principles to handle convenience products as it does fresh, raw ingredients, particularly if you want the convenience product to taste as much like the fresh as possible.

1.5. Presentation and serving

Planning is essential for excellence in plate presentation. Planning must not only include what will be on the plate but also how the plate will be set up. The presentation must be sufficiently strong and stable so that when food arrives at the table, it is presented in an attractive and inviting way.



Sauces

Sauces need to be carefully nappé so that the correct amount is served in the right place. Any spills should be immediately wiped with a fresh, clean, damp cloth. Always wipe towards the spill and check that there are no signs of the spill remaining.





Accompaniments

Examples of main meal and dessert served with accompaniment

If the meal is to be plated with an accompaniment, such as vegetables or a salad, then these need to be placed on the plate so as to enhance their natural colour and shape, yet not distract from the main dish.

If serving vegetables as an accompaniment make sure there is sufficient variety of colour in the vegetables chosen. Do not use all green vegetables and avoid placing vegetables of the same colour next to each other on the plate.



Handling

Wiping spillage from the side of the plate

It is important to notice whether food service staff are correctly handling plated dishes so that they are served correctly without spills, drips or displaced food. If service staff encounter problems with plated food they should return it immediately so that it can be reset or replaced.

Also, the chef may specify the angle at which the dish must be placed in front of the customer. For example, the chef might want the meal to be served with the meat at the front of the plate, or at the left. It all depends on the presentation of the dish.

Temperature

In general hot food is served on hot plates, cold food is served on cold plates, frozen food may be served on chilled plates. Warm salads are generally served on cold plates.

Plates should be sufficiently hot to stay hot and keep food hot for the time that a diner would complete eating a dish. The plate should not be so hot that food would be cooked or that



saucers would boil on the plate unless the dish is a sizzling plate dish designed to sizzle food (usually made of cast iron). Plates that are kept too hot are very difficult for staff to handle.

Hot sauces should be held and served above 85°C. Warm emulsion sauces are held and served between 30-37°C.

Plate selection

The importance of the plate selection should not be underestimated. To achieve a well presented dish, the plate must be in harmony with the food and the garnishes. Also keep in mind that the plate must be appropriate for the type of food being served.

The table below lists some common plate sizes and their uses.

Are you prepared?	
<p>Butter plate</p> <p>This is a small flat plate used for serving bread rolls and is placed to the left of the main plate on the table.</p>	
<p>Entree plate</p> <p>This is typically a medium sized, flat plate, slightly smaller than the main plate.</p>	
<p>Sweet or pasta plate</p> <p>This is a medium sized plate with curved edges to form a slight bowl shape. The curved edges help prevent dessert and pasta sauces from spilling.</p>	
<p>Fish plate</p> <p>This is a large flat plate. Its oval shape is particularly well suited to serving whole fish.</p>	
<p>Soup plate</p> <p>This is a medium sized plate with high edges to form a bowl. It is slightly smaller than the main plate.</p>	
<p>Main plate</p> <p>This is a large flat plate used for the main course.</p>	

Hot soups must be served out of the temperature danger zone, about 80°C is ideal.

1.6. Practical cookery under unforeseen circumstances

Standing in front of a hot stove, concentrating on the task at hand while the boat heaves and pitches, can make even the heartiest sailor feel a little ill. To cut down on time in the galley



I use a pressure cooker most of the time I cook underway. Dinner is ready in record time and with its securely locking lid it ensures that the meal will end up in the bowl not on the floor. But one-pot-wonders can get boring and sometimes a standard pot or frying pan is called for. Choosing a pot that is a little larger than necessary gives food plenty of room to slop around without jumping out of the pan, and making sure pots and pans used at sea have properly fitted lids and heat proof handles will reduce risk of accidental burns or scalds.



Work slowly and with the rhythm of the boat, and never leave cupboards doors ajar or drawers open, it only takes one mistimed wave to empty the shelves and create a huge mess.

When doing dinner prep, have all the necessary tools, bowls and pots at hand and secured, either with rubber feet or on a piece of non-skid. Knives are a necessity in any galley but can easily become a serious hazard if left on a countertop while sailing. A great way to secure knives is with a magnetic knife strip. Mounted on a bulkhead it will not only protect your blades but will keep even heavy knives secure at sea. When you're up to your elbows and you're running out of counter space don't forget about the galley sink. It is a great catch all and quick way to secure dirty dishes, a hot pot or a sharp knife.



If the movement of the boat is too erratic, clean a space on the floor and work sitting down. Or take a small cutting board and paring knife out to the cockpit while on watch and do all the chopping and slicing al fresco, scraps can get tossed directly overboard, sea water can be used for cleanup and fresh air prevents feelings of sickness. Don't forget that heaving to is also an option, giving you a break to cook and eat. Cooking underway is not a timed event, nor is it a solo sport, so divide the work load, don't rush and ease the stress come meal time.



On galley ranges and stove tops:

- Use guard rails, especially in rough weather.
- Never fill pots and pans so full that contents spill when ship rolls.
- Avoid deep frying in rough weather.
- Cloths for handling pots should be dry.
- Correct personal protective equipment (PPE) should be worn: gloves, apron, shoes etc.



Cooking underway involves open flame burners, sharp knives, pots of scalding hot liquids and unpredictable seas, but that doesn't mean it is a recipe for disaster. With a well-appointed galley, some pre-passage planning and a safety conscious cook, everyone can enjoy healthy, hot meals at sea.



FIVE HOT TIPS

- If it looks like you're in for some bad weather take the opportunity before conditions get too uncomfortable to cook a meal or two; it is easier to reheat leftovers when it is rough then make a meal from scratch.
- Instant noodles are great in a pinch, but ditch the chemical laden flavor pack. Instead use a MSG free stock cube or some miso soup broth, add some thinly sliced veggies and leftover meat or tofu and you've got a healthy, hot meal ready in minutes!
- Pasta can be pre-cooked. Simply cook al dente, drain and rinse with fresh water and drain again. Toss lightly in oil and store in an air tight container in the fridge. To serve pour boiling water over cooked noodles to reheat.
- A hot breakfast is quick and easy. Instant oatmeal with fruit preserves or instant grits with a hardboiled egg, (I always keep a half a dozen in the fridge on passage).
- To avoid spills and make the morning easy store sugar, instant coffee and hot chocolate in squeeze bottles. And when you boil the kettle make sure to fill a thermos so you can have hot drinks later without lighting the stove.

1.7. International cuisine – Religious and cultural aspects

Religion and food

Many of the features that shape dietary habits are derived from religious laws. All over the world many people choose to eat or avoid certain foods according to their religious beliefs. When a dietary practice is preserved by religious dogma it is given additional force. Dietary

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differences linked to religion should be considered when planning a balanced diet. While not all religions have specific guidance regarding food, here are some of the major religions and a brief look at how they impact eating habits:

- Buddhism

Buddhism considers living beings to be sacred, a belief that has translated into widely practiced vegetarianism and veganism. Violence towards animals is considered to translate into human aggression; hence most Buddhists will keep to the principle of ahimsa (non-violence or harmlessness) and avoid all foods related to processes where harm was done. Some Buddhists avoid meat and dairy products while others avoid only meat. Buddhists also avoid the consumption of alcohol. Monks of this religion fast in the afternoon and rely on 'alms' or donations of food as they, along with Buddhist nuns, are not allowed to cultivate, store or cook their own food.

- Christianity

Food regulations differ from one Christian denomination or group to another, with some groups not observing any restrictions at all. Some fasting days are observed by Catholic and Orthodox Christians on certain days such as Good Friday or during Lent. In earlier centuries, meat and dairy products were avoided during a substantial portion of the year, but today it often just means eating fish on a Friday. The ritual of consuming bread and wine (Holy Communion or the Eucharist) is regularly celebrated but its symbolic or actual meaning in relation to the body and blood of Jesus Christ depends on the denomination.



- Hinduism

Hinduism is one of the most ancient religions in the world and, although meat was not originally prohibited, many Hindus today regard vegetarianism as a way to maintain the



respect observed for life. Hinduism is characterized by the avoidance of the killing of any animal, the cleansing of those involved in food preparation, which is a reflection on previously existing caste-restricted practices, and the symbolism of certain foods. The cow is held in high regard as a symbol of abundance and so it is not eaten by Hindus, yet products such as milk, butter and yogurt may be eaten. Some Hindus fast on selected days as a mark of respect to certain gods.

- Islam

Mosque Hassan II (image courtesy of Sara Garduno)The main food practices in Islam involve specific ritual slaughtering procedures for animals of consumption (haram practices), fasting during the month of Ramadan, the avoidance of pork and of intoxicating liquor. Foods are categorised as halal (those that may be eaten) and haram (those that should be avoided), as are other aspects of life. Most foods are halal while the list of haram foods includes pork, alcohol and any products that may contain emulsifiers made from animal fats (such as gelatines and margarines). Bread and bread products fermented by yeast may contain traces of alcohol and in some cases may be considered haram. Moderation in all things, including eating and dietary habits, are an integral part of Islam.



- Rastafari movement

Most Rastafarians are vegetarian or vegan. Foods that may be consumed by people practicing this religion are called ital; these foods are characterised by having no artificial colours, flavours or preservatives, hence being considered pure or natural. Rastafarians also avoid the consumption of alcohol and in some cases also tea, coffee and other caffeinated drinks as it is considered that these foods confuse the soul.

- Judaism

In this religion foods are divided into kosher (allowed) or trefa (forbidden). Characteristics of kosher foods include animals that have a completely split hoof and chew cud (such as cows,

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goats and sheep), while kosher fish must have fins and scales. In general all plant foods are kosher. In addition, a specific slaughtering process must be followed for meat to be considered kosher. Meat and dairy products must not be prepared, stored or eaten together and certain fasting days are observed (especially Yom Kippur). During the celebration of Passover, food helps to tell the story of the Exodus from Egypt.

Food selection is due to different reasons, with religion being one of the strongest principles on which diets are based. Sacred space and time (altars, shrines, feast and fasting days), as well as symbolism and myth (what foods represent or the stories they recall) are all part of religious rituals linked to food. Regardless of religious views, it is important to follow a balanced diet and favourable lifestyle for optimum health.

Top 10 International Cuisines on Cruise Ships

The top 10 international cuisines served on cruise ships feature an array of foods from a diverse selection of chef-inspired creations. Some of the countries represented in cruise ship fare include Italy, France, India, the Caribbean, Greece, Spain, Mexico and Thailand.

1. American Cuisine

First time cruisers often are impressed to find that, among cruise amenities, are a variety of international foods. American cuisine is often featured among the top 10 international cuisines, showcasing such popular fare as barbecued meats made of pork, chicken or beef as well as grilled steaks. The meats are featured with a variety of vegetables, including corn, potatoes, green beans and carrots.



2. Italian Cuisine

One of the popular cruise ship specialties are entrees made that are Italian in origin.



After all, who does not like such delicious entrees as spaghetti carbonara or fettucine alfredo? Caprese salad is a before-dinner salad that is often featured too. It's not surprising then that Italian cuisine is among the more popular foods that are served onboard ship.



3. French Cuisine

The French indeed prove that they have a keen cooking sense when they offer such selections as crème brulee and nicoise salad.



4. Greek Cuisine

You cannot list the top 10 international cuisines on a cruise ship without including the varied selections of foods offered in Greek cuisine.

Whether you are sailing to Greece or not, you cannot but admire the cooking skill and flair that is expressed when Greek entrees are made. A Greek salad is a nice introduction to dishes such as souvlaki.





5. English Cuisine

The British enjoy tea time as well as a full English breakfast, which is another one of the top international cuisines featured on cruise ships. The breakfast food includes sausages, bacon, and eggs.

In England, different regions have their own versions of the breakfast cuisine. For example, the fried potatoes served in Cornwall consist of mashed potatoes mixed with flour and butter and fried. Another well-known specialty dish is the fish and chips, often served for lunch or at dinner aboard a cruise ship.



6. Indian Cuisine

You don't have to go to India in order to enjoy the aforementioned dishes as you can savor the food on a sailing vessel, whether you have set sail for Amsterdam or are on your way to India and the Far East. It does not hurt to sample the cuisine onboard ship however, of the country you are visiting. At least, you will know what to anticipate.



7. Caribbean Cuisine

If you have plans to cruise to the Caribbean, then you can sample the food onboard ship or when you are scheduled to disembark. However, it is nice to know that you don't have to wait to get to a Caribbean port of call in order to savor Caribbean entrees and side dishes.



The entrees and sides are memorable foods, given the kinds of seasonings and various toppings that are used. Cruise ship passengers like such dishes as curry prawns with rice and fried banana with cream and cheese for dessert. Therefore, it definitely comes as no surprise that Caribbean fare is listed among the top 10 international cuisines on cruise ship voyages.



8. Spanish Cuisine

Always appreciated by cruise travelers, Spanish cuisine is always a delight. The Spanish people like to add to the local flavor with such foods as gazpacho and entrees such as paella with seafood and chicken breast.

These foods are featured onboard a cruise ship too. You can also enjoy Spanish desserts that are often eaten in the wee hours of the morning. Popular Spanish desserts that will stay on your palette and memory include mantecados (crumble cakes), polvorones (almond cookies) and flan, which is a custard that swims in a caramel sauce.



9. Thai Cuisine

Yet another one of the top international cuisines that are featured on a cruise ship is Thai cuisine. You don't need to be sailing to Thailand to appreciate this delicious Asian fare.

Some of the names that are featured on the menu are enough to pique your curiosity in and of themselves. For example, yung goong is a ship specialty as is spicy fried noodles. Thai soups are a popular food too and are always served with the main course and not as a starter. Rice often accompanies the liquid fare.



10. Mexican Cuisine

While Tamales are starter foods in the Mexico, entrees are represented by such foods as Gorditas, which are corn patties with stuffing in the form of chicken and cheese and topped with cream cheese a hot sauce.

Carnitas represent deep-fried pork while Chilaquiles are made up of tortilla chips that have been topped with a green tomato sauce. If you are traveling to Mexico and want to become acclimated to the culture, then sampling the Mexican fare onboard first is a good place to start.



1.8. Language skills

Ships' cooks must be able to read and speak English clearly in order to interpret documents such as recipes and manuals. Other languages are considered a plus.



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1.9. Calculation skills

Converting Recipes

Unless you are working in an operation that uses only its own standardized recipes, you will frequently be required to increase or decrease recipes to different quantities. Each recipe is designed to make a specific amount of finishes product. This amount is called the yield. For example, you may have a recipe for 50 portions of

Swiss steak but need only 25 portions. You need to change the yield of your recipe. This is called converting the recipe.

Converting recipes is an important technique. It is a skill you will probably need to use many times in this book. There is no “best” yield to write recipes for, as every operation, every school, and every individual has different needs.

Yields

Recipe yields are expressed in several ways. For example:

- As a total quantity. (A soup recipe that makes 3 qt; a pot roast recipe that makes 5 lb meat.)
- As a total number of portions. (A recipe for Eggs Benedict that makes 12 portions; a recipe for grilled breast of duck that makes 4 portions.)
- As a total number of portions of a specified size. (A recipe for beef stew that makes 8 portions of 6 oz each; a recipe for individual chocolate soufflés that makes 6 soufflés, 4 oz each.)

Most recipe conversions require changing the total quantity or the total number of portions. The math for doing both of these is the same. As long as the portion size stays the same, you can use either the total quantity or the total number of portions as the yield when you make your calculations.

A little later in the discussion, after you are familiar with solving these problems, we discuss how to change both the number of portions and the portion size when converting recipes.



CHANGING TO COMMON UNITS

Before we start converting recipe yields, we must deal with one more problem with our measuring system. As explained earlier, the U.S. system of measurement has many units that simply must be memorized: 16 ounces in a pound, 2 cups in a pint, 4 quarts in a gallon, and so on. When you are converting recipes, you often have to change back and forth between large and small units to get measurements you can work with. In most cases, the easiest way to make the calculations is to change larger units to smaller units.

- To change pounds to ounces, multiply by 16.
- To change cups to fluid ounces, multiply by 8.
- To change pints to fluid ounces, multiply by 16.
- To change quarts to fluid ounces, multiply by 32.

Note that these are the same numbers as found in Table 5.3.

After you have finished converting the recipe, you usually must convert the ounces and fluid ounces back to larger units in order to get units that are easy to work with. To do this, divide by the same numbers you used to multiply in the calculation above. For example, to change ounces back to pounds, divide by 16.

If you divide by hand, you often get a remainder. Leave this remainder in the smaller unit. For example:

$$\begin{aligned} &\text{Change 60 ounces to pounds.} \\ &60 \div 16 = 3, \text{ with a remainder of } 12 \\ &60 \text{ ounces} = 3 \text{ lb } 12 \text{ ounces} \end{aligned}$$

If you are using a calculator, you often get a decimal. In order to change the numbers to the right of the decimal point to ounces, you have to again multiply this decimal portion by 16. Either way, you end up with the same answer.

$$\begin{aligned} &60 \div 16 = 3.75 \\ &0.75 \times 16 = 12 \\ &60 \text{ ounces} = 3 \text{ lb } 12 \text{ ounces} \end{aligned}$$



Conversion Factors

Nearly everyone instinctively can double a recipe or cut it in half. It seems more complicated, though, to change a recipe from 10 to 18 portions, say, or from 50 to 35. Actually, the principle is exactly the same: You find a number called a conversion factor, and then multiply every quantity by this number.

The conversion factor can be defined as the number used to increase or decrease each ingredient when converting a recipe to a different yield.

The first step in converting a recipe is to calculate the conversion factor.

Procedure for Calculating Conversion Factors

There is only one step in this procedure:

Divide the desired yield by the old yield stated on the recipe. This formula may be written like a mathematical calculation, as on a calculator, or as a fraction:

Mathematical Calculation: $\text{new yield} \div \text{old yield} = \text{conversion factor}$

Fraction: $\frac{\text{new yield}}{\text{old yield}} = \text{conversion factor}$

Example 1: You have a recipe with a yield of 8 portions, and you want to make 18 portions.

$$18 \div 8 = 2.25$$

Your conversion factor is 2.25. If you multiply each ingredient in your recipe by 2.25, you will prepare 18 portions, not the 8 of the original recipe.

Example 2: You have a recipe that makes 20 liters of soup, and you want to make 5 liters.

$$5 \div 20 = 0.25$$

Your conversion factor is 0.25. That is, if you multiply each ingredient by 0.25, you will prepare only 5 portions.

Notice in the second example the conversion factor is a number less than 1. This is because the recipe yield is decreased. You are making the recipe smaller. This is a good way to check your math. Decreasing the recipe yield will involve a conversion factor less than 1. Increasing the yield of a recipe will involve a conversion factor larger than 1.

COI

**Procedure for Converting Total Yield**

1. Calculate the conversion factor as explained in the procedure given above:
2. Multiply each ingredient quantity by the conversion factor:

$$\text{old quantity} \times \text{conversion factor} = \text{new quantity}$$

Note: In order to do this in the U.S. system, you may have to convert all weights to ounces and all volumes to fluid ounces. (This is not necessary in the metric system.) See page 107 for more explanation.

Example 1: You have a recipe for 10 portions of Broccoli Mornay requiring 3 lb AP broccoli and 2½ cups Mornay Sauce. Convert to 15 portions.

$$\frac{\text{new yield}}{\text{old yield}} = \frac{15}{10} = 1.5$$

Broccoli: 3 lb = 48 oz

$$48 \text{ oz} \times 1.5 = 72 \text{ oz} = 4 \text{ lb } 8 \text{ oz}$$

Sauce: 2½ cups = 20 fl oz

$$20 \text{ fl oz} \times 1.5 = 30 \text{ fl oz} = 3\frac{3}{4} \text{ cups}$$

Example 2: You have a recipe for 10 portions of Broccoli Mornay requiring 1,500 grams AP broccoli and 600 mL Mornay Sauce. Convert to 15 portions.

$$\frac{\text{new yield}}{\text{old yield}} = \frac{15}{10} = 1.5$$

Broccoli: 1500 g × 1.5 = 2250 g

Sauce: 600 mL × 1.5 = 900 mL

CONTROL



In order to make these procedures clearer, let's work through the conversion of a full recipe to give you practice with the equations. The following examples are in the U.S. system of

Beef Tenderloin Tips and Mushrooms à la Crème

PORTIONS: 8 PORTION SIZE: 250 G

Butter	60 g
Onions	125 g
Flour	15 mL
Mushrooms	250 g
Beef tenderloin	1250 g
White wine	125 mL
Prepared mustard	10 mL
Brown sauce	750 mL
Heavy cream	250 mL
Salt	to taste
Pepper	to taste

To determine quantities for 18 portions, divide the new yield by the old yield to find the conversion factor:

$$\frac{\text{new yield}}{\text{old yield}} = \frac{18}{8} = 2.25$$

measures. For metric examples,

In the sample recipe that follows are the ingredients and quantities for a sautéed beef dish. As you can see, the quantities indicated are enough to make 8 portions each.

To convert the recipe to 18 portions, we simply multiply each ingredient quantity by the conversion factor of 2.25.

First, to make this easier, we should change pounds to ounces and cups, pints, and quarts to fluid ounces. This is called converting to common units of measure, as explained earlier. For example, to change the measurement for beef tenderloin to ounces, multiply 2 ½ (the weight in pounds) by 16 (the number of ounces in a pound) to get 40 ounces.

The equivalents we need for this recipe are as follows:

½ lb equals 8 ounces

2 ½ pounds equals 40 ounces

½ cup equals 4 fluid ounces

1 ½ pints equals 24 fluid ounces



In Example 1, we have substituted these equivalent quantities. Then we have multiplied all the ingredient quantities by the conversion factor to get the quantities we need for 18 portions.

Check through all the calculations to make sure you follow them. The quantities for salt and pepper will still, of course, be indicated as "to taste."

Example 1					
INGREDIENT	QUANTITY	TIMES	CONVERSION FACTOR	EQUALS	NEW QUANTITY
Butter	2 oz	x	2.25	=	4.5 oz
Onion	4 oz	x	2.25	=	9 oz
Flour	1 tbsp	x	2.25	=	2.25 tbsp or 2 tbsp plus ¼ tsp
Mushrooms	8 oz	x	2.25	=	18 oz or 1 lb 2 oz
Beef tenderloin	40 oz	x	2.25	=	90 oz or 5 lb 10 oz
White wine	4 fl oz	x	2.25	=	9 fl oz
Prepared mustard	2 tsp	x	2.25	=	4½ tsp or 1½ tbsp
Brown sauce	24 fl oz	x	2.25	=	54 fl oz or 3 pt plus 6 fl oz
Heavy cream	8 fl oz	x	2.25	=	18 fl oz or 2¼ cups

Now let's suppose we want to find the quantities needed to give us 40 portions, 6 ounces each. Because the portion size changes, we have to add extra steps to our procedure for calculating the conversion factor. The Procedure for Calculating Conversion Factors When Portion Size Changes explains these steps. Then we use this new conversion factor in the same way as we did in Example 1 above. For our Beef Tenderloin Tips recipe, we first calculate our new conversion factor:

$$8 \text{ (portions)} \times 8 \text{ oz} = 64 \text{ oz}$$

Do the same calculation for the desired yield:

$$40 \text{ (portions)} \times 6 \text{ oz} = 240 \text{ oz}$$

When we divide the new yield by the old yield ($240 \div 64$), we arrive at a conversion factor of 3.75. In Example 2, we have done the conversions using the new factor of 3.75.

The new calculations, using the conversion factor of 3.75, are shown in the Example 2 table.



Example 2						
INGREDIENT	QUANTITY	TIMES	CONVERSION FACTOR	EQUALS	NEW QUANTITY	
Butter	2 oz	×	3.75	=	7.5 oz	
Onion	4 oz	×	3.75	=	15 oz	
Flour	1 tbsp	×	3.75	=	3.75 tbsp or 3 tbsp plus 2¼ tsp	
Mushrooms	8 oz	×	3.75	=	30 oz or 1 lb 14 oz	
Beef tenderloin	40 oz	×	3.75	=	150 oz or 9 lb 6 oz	
White wine	4 fl oz	×	3.75	=	15 fl oz	
Prepared mustard	2 tsp	×	3.75	=	7½ tsp or 2½ tbsp	
Brown sauce	24 fl oz	×	3.75	=	90 fl oz or 5 pt plus 10 fl oz	
Heavy cream	8 fl oz	×	3.75	=	30 fl oz or 3¾ cups	

Procedure for Calculating Conversion Factors When Portion Size Changes

- Determine the total yield in the old recipe by multiplying the number of portions by the portion size:

$$\text{old recipe number of portions} \times \text{portion size} = \text{old yield}$$
- Determine the total yield desired (new yield) by multiplying the number of portions desired by the portion size desired.

$$\text{desired number of portions} \times \text{desired portion size} = \text{new yield}$$
- Divide the new yield by the old yield. This formula may be written like a mathematical calculation, as done on a calculator, or as a fraction:
 Mathematical Calculation: $\text{new yield} \div \text{old yield} = \text{conversion factor}$
 Fraction: $\frac{\text{new yield}}{\text{old yield}} = \text{conversion factor}$

Example: You have a recipe with a yield of 20 portions, 4 ounces each, and you want to make 30 portions, 5 ounces each.

- Calculate the total yield of the original recipe.

$$20 \text{ portions} \times 4 \text{ ounces} = 80 \text{ ounces}$$
- Calculate the total yield desired.

$$30 \text{ portions} \times 5 \text{ ounces} = 150 \text{ ounces}$$
- Divide the new yield by the old yield.

$$150 \div 80 = 1.875$$

The calculation gives us a conversion factor of 1.875. We use this conversion factor the same way as explained above, using the Procedure for Converting Total Yield.

Problems in Converting Recipes

For the most part, these conversion procedures work well. But when you make some very large conversions—from 10 to 400 portions, for example, or from 500 to 6—you may encounter problems.



For example, you may have to make major equipment changes, like from a 2-quart saucepot to a large steam kettle. Consequently, you have to adjust your techniques and, sometimes, even ingredients. Evaporation rates may be different, thickening agents may need increasing or decreasing, seasonings and spices may have to be cut back. Sometimes quantities are too large or too small to mix properly.

This is one more example of the importance of cooking with judgment. Experienced chefs develop a feel for these problems over the years. When you make such adjustments on converted recipes, be sure to make a note of them for future reference.

Although there are no fixed rules you can learn for these adjustments, it is possible to list the most common types of problems encountered so you can be on the alert for them when making recipe conversions. In general, most of the pitfalls fall into one of the following categories.

- **Measuring**

This is most often a problem when you are expanding small recipes, such as when you want to take a consumer recipe for 4 portions and adapt it to a high-volume operation such as a large cafeteria. Many such recipes use volume measures for both solids and liquids. As we explained earlier, volume measurement of solids is inaccurate. Of course, small inaccuracies become large ones when a recipe is multiplied. Therefore, it is important to be cautious and to test carefully when you are converting a recipe that uses volume measures for solid ingredients.

Problems also occur in the opposite situation—when converting a large-quantity recipe to a much smaller yield. This is a typical problem when adapting a quantity recipe to single-portion size for à la carte service. Some quantities in the converted recipe may be so small as to be difficult to measure.

These problems usually can be avoided when all solids are measured by weight. But such items as spices and seasonings may be too small to be measured easily by weight, unless you use a scale that is accurate to a tiny fraction of an ounce. For this reason, it is usually a good idea to cut back on spices and salt in a converted recipe. You can always add more if you taste the product and decide it needs more seasoning.

- **Surface and volume**

If you have studied geometry, you may remember that a cube with a volume of 1 cubic foot has a top surface area of 1 square foot. But if you double the volume of the cube, the top surface area is not doubled but is in fact only about 1½ times as large.

What in the world, you ask, does this have to do with cooking? Consider the following example.

Suppose you have a good recipe for 1½ gallons cream soup, which you normally make in a small soup pot. You want to make 16 gallons of the soup, so you multiply all ingredients

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by a conversion factor of 32 and make the soup in a steam kettle. To your surprise, not only do you end up with more soup than you expected but also it turns out rather thin and watery.

What happened?

Your converted recipe has 32 times as much volume to start, but the amount of surface area has not increased nearly as much. Because the ratio of surface area to volume is less, there is less evaporation. This means there is less reduction and less thickening, and the flavors are not as concentrated. To correct this problem, you would have to use less stock, and preferably a stock that is more concentrated.

Suppose instead that you made the expanded recipe in a tilting skillet. In this case, there is so much surface area that the liquid would evaporate very quickly, resulting in an overly thickened and overly seasoned soup.

Differences in surface area and volume can cause other problems as well. Food-service operations must be more careful than home cooks do about food spoilage and the Food Danger Zone because large volumes of food cool and heat much more slowly than small volumes do.

For the same reason, a home baker worries about keeping a bread dough warm so it will ferment, but a commercial baker worries about keeping a dough cool enough so it doesn't ferment too fast. This is because a large batch of dough has so much volume in comparison with its surface area that it tends to retain heat rather than cool quickly to room temperature.

- **Equipment**

When you change the size of a recipe, you must often change the equipment, too. This change often means the recipe does not work in the same way. Cooks must be able to use their judgment to anticipate these problems and to modify their procedures to avoid them. The example just given, of cooking a large batch of soup in a steam kettle or in a tilting skillet, is among the kinds of problems that can arise when you change cooking utensils.

Other problems develop because of mixers or other processing equipment. For example, if you break down a salad dressing recipe to make only a small quantity, you might find there is so little liquid in the mixing machine that the beaters don't blend the ingredients properly.

Or you might have a recipe for a muffin batter you usually make in small quantities and mix by hand. When you increase the recipe greatly, you find you have too much to do by hand.

Therefore, you use a mixer but keep the mixing time the same. Because the mixer does the job so efficiently, you overmix the batter and end up with poor-quality muffins.

Many mixing and stirring jobs can be done only by hand. This is easy with small quantities but difficult with large batches. The result is often an inferior product. In contrast, some

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handmade products are better if they are done in large batches. It is hard, for example, to make a very small batch of puff pastry because the dough cannot be rolled and folded properly.

- Time

Some people make the mistake of thinking that if you double a recipe, you must also double the cooking time. That this is an error can be shown by a simple example. Assume it takes 15 minutes to cook a steak in a broiler. If you put two steaks in the broiler, it still takes 15 minutes to cook them, not 30 minutes.

If all other things are equal, cooking times stay the same when a recipe is converted.

Problems arise, however, because all other things are not always equal. For example, a large pot of liquid takes longer to bring to a boil than a small pot. Therefore, the total cooking time is longer.

On the other hand, a big kettle of vegetable soup you are making ahead for tomorrow's lunch takes longer to cool than a small pot. Meanwhile, the vegetables continue to cook in the retained heat during the cooling. In order to avoid overcooking, you may need to undercook the large batch slightly.

In cases where the cooking time must be increased, you might find you must increase the amount of herbs and spices. This is because the flavors are volatile (see p. 85), and more flavor is lost because of the increased cooking time. (Another answer to this problem is to add the spices later.)

Changing recipe sizes can affect not only cooking times but also mixing times. The best way to avoid this problem is to rely not on printed cooking and mixing times but on your own judgment and skills to tell you when a product is properly cooked or properly blended.

- Recipe Problems

Many recipes have flaws, either in the quantities or types of ingredients or in the cooking procedures. When the item is made in small quantities, these flaws may not be noticeable, or the cook may almost unconsciously or automatically make adjustments during production.

When the recipe is multiplied, however, the flaws may suddenly become apparent and the product quality lower. The only solution here is to carefully test recipes and to have a good understanding of basic cooking principles.

Amount of Garbage

The amount of garbage onboard should be estimated in M³, if possible separately according to category. The Garbage Record Book contains many references to estimated amount of garbage. It is recognized that the accuracy of estimating amounts of garbage is left to interpretation. Volume estimates will differ before and after processing. Some processing

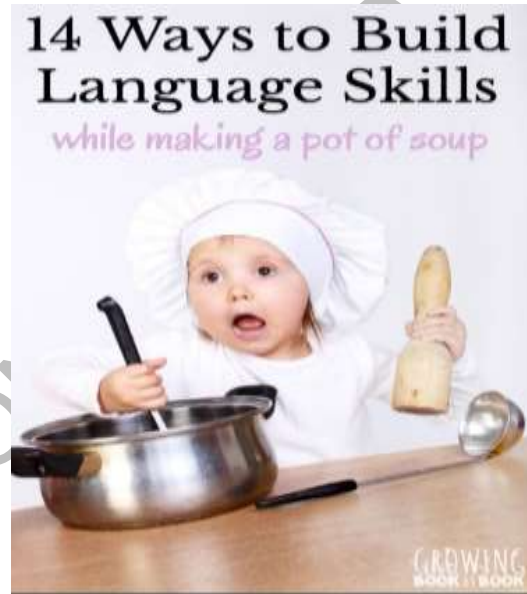


procedures may not allow for a usable estimate of volume, e.g. the continuous processing of food waste. Such factors should be taken into consideration when making and interpreting entries made in a record.

1.10. General communication skills

Excellent communication skills:

- Chooses appropriate forms and methods of communication
- Uses terminology appropriately
- Clear and concise in approach
- Ability to work under pressure
- Positive approach
- Awareness of the deadlines
- Ability to work effectively as part of a team
- Demonstrates personal responsibility



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2. Food and personal hygiene

2.1. Food hygiene

2.1.1. Food-borne disease

Food Hazards

Preventing food-borne illness is one of the most important challenges facing every food service worker. In order to prevent illness, a food worker must understand the sources of food-borne disease.

Most food-borne illness is the result of eating food that has been contaminated. To say a food is contaminated means it contains harmful substances not originally present in it. In other words, contaminated food is food that is not pure. In this section, we first discuss the various substances that can contaminate food and cause illness. Afterward, we consider how these substances get into food to contaminate it and how food workers can prevent contamination and avoid serving contaminated food.

Any substance in food that can cause illness or injury is called a hazard. Food hazards are of four types:

- Biological hazards
- Chemical hazards
- Physical hazards
- Allergens

Notice it was said most food-borne illness is caused by eating food contaminated with foreign substances. Some illness is caused not by contaminants but by substances that occur naturally in foods. These include plant toxins (toxin means "poison"), such as the chemicals in poisonous mushrooms, and certain natural food components to which some people are allergic. This section considers all these kinds of food hazards.

Pathogens

The most important kind of biological hazards to consider are microorganisms. A microorganism is a tiny, usually single-celled organism that can be seen only with a microscope. A microorganism that can cause disease is called a pathogen. Although these organisms sometimes occur in clusters large enough to be seen with the naked eye, they are not usually visible.

This is one reason why they can be so dangerous. Just because food looks good doesn't mean it is safe.

Four kinds of microorganisms can contaminate food and cause illness:

- Bacteria

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- Viruses
- Fungi
- Parasites

Most food-borne diseases are caused by bacteria, but the other types can be dangerous as well. Many of the measures we take to protect food from bacteria also help prevent the other three kinds of microorganisms.

Bacteria

Bacteria are everywhere—in the air, in the water, in the ground, on our food, on our skin, inside our bodies. Scientists have various ways of classifying and describing these bacteria. As food workers, we are interested in a way of classifying them that may be less scientific but is more practical to our work.

1. Harmless bacteria.

Most bacteria fall into this category. They are neither helpful nor harmful to us. We are not concerned with them in food sanitation.

2. Beneficial bacteria.

These bacteria are helpful to us. For example, many live in the intestinal tract, where they fight harmful bacteria, aid the digestion of food, and produce certain nutrients.

In food production, bacteria make possible the manufacture of many foods, including cheese, yogurt, and sauerkraut.

3. Undesirable bacteria.

These are the bacteria that are responsible for food spoilage. They cause souring, putrefying, and decomposition. These bacteria may or may not cause disease, but they offer a built-in safety factor: They announce their presence by means of sour odors, sticky or slimy surfaces, and discoloration. As long as we use common sense and follow the rule that says “when in doubt, throw it out,” we are relatively safe from these bacteria.

We are concerned with these bacteria for two reasons:

- Food spoilage costs money.
- Food spoilage is a sign of improper food handling and storage. This means the next kind of bacteria is probably present.

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4. Disease-causing bacteria, or pathogens.

These are the bacteria that cause most food-borne illness, the bacteria we are most concerned with.

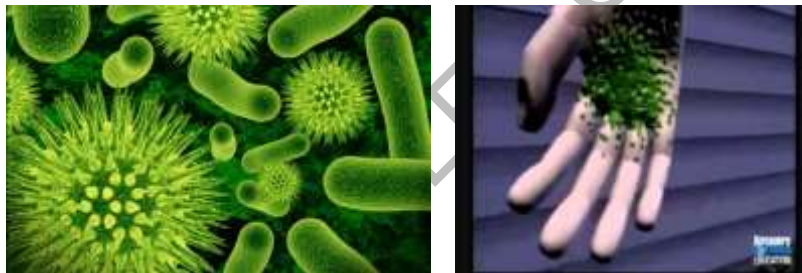
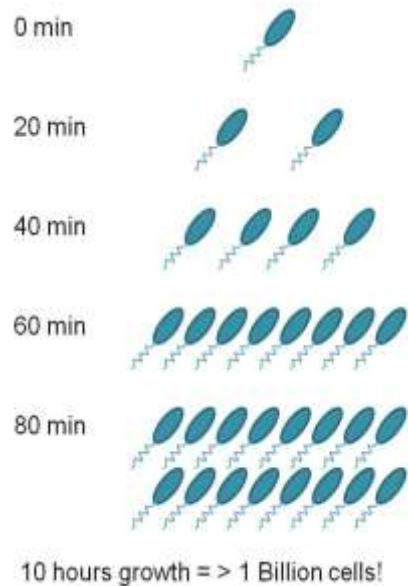
Pathogens do not necessarily leave detectable odors or tastes in food. In other words, you can't tell if food is contaminated by smelling, tasting, or looking at it. The only way to protect food against pathogenic bacteria is to use proper hygiene and sanitary food-handling and storage techniques.

Each kind of bacterial pathogen causes disease in one of three ways:

1. Intoxications are caused by poisons (toxins) the bacteria produce while they are growing in the food, before it is eaten. It is these poisons, not the bacteria themselves, that cause the diseases.
2. Infections are caused by bacteria (or other organisms) that get into the intestinal system and attack the body. Disease is caused by the bacteria themselves as they multiply in the body.
3. Toxin-mediated infections are also caused by bacteria that get into the body and grow.
Disease is caused by poisons the bacteria produce as they grow and multiply in the body. Most food-borne diseases are toxin-mediated infections.

Bacterial growth

Bacteria multiply by splitting in half. Under ideal conditions for growth, they can double in number every 15 to 30 minutes. This means that one single bacterium could multiply to one million in less than 6 hours!



Conditions for Growth

1. Food.

Bacteria require food in order to grow. They like many of the foods we do. Foods with sufficient amounts of proteins are best for bacterial growth. These include meats, poultry, fish, dairy products, and eggs, as well as some grains and vegetables.

2. Moisture.

Bacteria require water to absorb food. Dry foods do not support bacterial growth.

Foods with a very high salt or sugar content are also relatively safe, because these ingredients make the bacteria unable to use the moisture present.

The availability of water to bacteria is indicated by a measure called water activity, abbreviated aw. The scale runs from 0 (meaning no water available) to 1.0. Most pathogens grow best in an environment from 0.85 to 1.0 aw.

3. Temperature.

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Bacteria grow best at warm temperatures. Temperatures between 41°F and 135°F (5°C and 57°C) promote the growth of disease-causing bacteria. This temperature range is called the Food Danger Zone. (In Canada, 40–140°F or 4–60°C is the temperature danger zone. Until recently, these temperatures were also the standard in the United States.)

4. Acidity or alkalinity.

In general, disease-producing bacteria like a neutral environment, neither too acidic nor too alkaline (see sidebar top left). The acidity or alkalinity of a substance is indicated by a measurement called pH. The scale ranges from 0 (strongly acidic) to 14 (strongly alkaline). A pH of 7 is neutral. Pure water has a pH of 7.

5. Oxygen.

Some bacteria require oxygen to grow. These are called aerobic. Some bacteria are anaerobic, which means they can grow only if there is no air present, such as in metal cans. Botulism, one of the most dangerous forms of food poisoning, is caused by anaerobic bacteria. A third category of bacteria can grow either with oxygen or without it. These bacteria are called facultative. Most bacteria in food that cause disease are facultative.

6. Time.

When bacteria are introduced to a new environment, they need time to adjust to their surroundings before they start growing. This time is called the lag phase. If other conditions are good, the lag phase may last 1 hour, or somewhat longer.

If it weren't for the lag phase, there would be much more food-borne disease than there is. This delay makes it possible to have foods at room temperature for very short periods in order to work on them.

2.1.2. Symptoms of food-borne disease

The symptoms of food poisoning can vary, depending on what type of bacteria has caused the infection. Symptoms can be mild or severe. When you get sick, you usually have one or more of the following symptoms:

- Feeling sick (nausea)
- Stomach cramps
- Diarrhoea
- Vomiting
- Fever (feeling very hot)
- Headaches



Fortunately, most forms of food poisoning last only a short time - between one and three days. However you may feel sick for as long as seven or more days, and in extreme cases the symptoms can be fatal.

Bacterial diseases

Table describes some of the most common bacterial diseases. For each disease, pay particular attention to the way it is spread, the foods involved, and the means of prevention.

General practices and procedures for prevention of food-borne diseases are discussed in a later section.

Bacterial Diseases:



BACTERIA DISEASE	CAUSE/ CHARACTERISTICS	SOURCE OF BACTERIA	FOODS USUALLY INVOLVED	PREVENTION
Botulism	Caused by toxins produced by the bacterium <i>Clostridium botulinum</i> , <i>botulism</i> attacks the nervous system and is usually <i>fatal</i> , even if only a small amount of poisoned food is eaten. The bacteria are anaerobic and do not grow in high-acid foods. Most outbreaks are caused by improper canning techniques. The toxin (although not the bacteria) is destroyed by boiling (212°F/100°C) for 20 minutes.	soil on vegetables and other foods	home-canned, low-acid vegetables (very rare in commercially canned foods)	Use only commercially canned foods. Discard without tasting any bulged or damaged cans or foods with off odors.
Staphylococcal food poisoning (staph)	Caused by toxins produced in foods by the bacterium <i>Staphylococcus aureus</i> , <i>staph</i> is probably the most common food poisoning, characterized by nausea, vomiting, stomach cramps, diarrhea, and prostration.	usually food workers	custards and desserts made with dairy products, potato salad, protein salads, ham, hollandaise sauce, and many other high-protein foods	Practice good hygiene and work habits. Do not handle foods if you have an illness or infection. Clean and sanitize all equipment. Keep foods below 41°F (5°C) or above 135°F (57°C).
<i>Escherichia coli</i>	This bacterium causes severe illness, either as an intoxication or an infection. Severe abdominal pain, nausea, vomiting, diarrhea, and other symptoms result from <i>E. coli</i> intoxication. As an infection, <i>E. coli</i> causes intestinal inflammation and bloody diarrhea. While the illness normally lasts from 1 to 3 days, in some cases it can lead to long-term illness.	intestinal tracts of humans and some animals, especially cattle; contaminated water	raw or undercooked red meats, unpasteurized dairy products, sometimes fish from contaminated water, prepared foods such as mashed potatoes and cream pies	Cook foods, including red meats, thoroughly; avoid cross-contamination. Practice good hygiene.
Salmonella	The food infection caused by <i>salmonella</i> bacteria exhibits symptoms similar to those of staph poisoning, though the disease may last longer. Most poultry carry this bacterium.	contaminated meats and poultry; fecal contamination by food workers	meats, poultry, eggs, poultry stuffings, gravies, raw foods, and shellfish from polluted waters	Practice good personal hygiene, proper food storage and handling, and insect and rodent control. Wash hands and sanitize all equipment and cutting surfaces after handling raw poultry. Use certified shellfish.
<i>Clostridium perfringens</i>	An infection characterized by nausea, cramps, stomach pain, and diarrhea. The bacteria are hard to destroy because they are not always killed by cooking.	soil, fresh meats, human carriers	meats and poultry, reheated or unrefrigerated gravies and sauces	Keep foods hot (above 135°F/57°C) or cold (below 41°F/5°C).
Streptococcal (strep) infection	The symptoms of strep are fever and sore throat.	coughs, sneezes, infected food workers	any food contaminated by coughs, sneezes, or infected food workers, then served without further cooking	Do not handle food if you are infected. Protect displayed food (salad bars, pastry carts, etc.) from customers' sneezes and coughs.
Shigellosis	Caused by various species of <i>Shigella</i> bacteria. The symptoms of this disease are diarrhea, abdominal pain, fever, nausea, vomiting, cramps, chills, and dehydration. The illness can last 4 to 7 days or longer if not treated.	human intestinal tract, flies, and water contaminated by feces	salads and other raw or cold cooked foods, dairy products, poultry	Good personal hygiene. Good sanitary food handling practices. Control flies. Use foods from sanitary sources.



BACTERIA DISEASE	CAUSE/ CHARACTERISTICS	SOURCE OF BACTERIA	FOODS USUALLY INVOLVED	PREVENTION
Listeriosis	Caused by <i>Listeria monocytogenes</i> bacteria. This disease has many symptoms, including nausea, vomiting, diarrhea, headache, fever, chills, backache, and inflammation of the tissues around the brain and spinal cord. It can cause spontaneous abortion in pregnant women. The disease may not appear for days or even several months after the contaminated food is eaten, and it can last indefinitely if not treated properly. May be fatal in people with poor immune systems.	soil, water, and damp environments; carried in intestinal tracts of humans and animals, particularly poultry	unpasteurized dairy products; raw vegetables and meats; seafood; ready-to-eat foods that were contaminated and then not cooked further	Use good food-handling practices to avoid cross-contamination; use pasteurized dairy products; keep facilities clean and dry.
<i>Bacillus cereus</i> gastroenteritis	Caused by <i>Bacillus cereus</i> . Symptoms include nausea, vomiting, diarrhea, and stomach cramps or pain. This disease usually lasts less than a day.	soil and dust, grains, and cereals	grains and starches, including pastries and foods with starch thickeners; meats, milk, vegetables, and fish	Temperature control: Cook foods to proper internal temperatures; chill foods quickly and properly.
Camphylobacteriosis	Caused by <i>Camphylobacter jejuni</i> . This disease usually lasts 2 to 5 days, or up to 10 days, and causes diarrhea, fever, nausea, vomiting, abdominal pain, muscle pain, and headache.	meat and dairy animals and poultry	unpasteurized dairy products; raw poultry; contaminated water	Cook foods to proper internal temperatures; use pasteurized dairy products; safe food-handling practices to avoid cross-contamination; avoid using contaminated water.
<i>Vibrio</i> gastroenteritis and septicemia	Caused by two species of <i>Vibrio</i> bacteria. Symptoms include diarrhea, nausea, vomiting, stomach cramps, and headache. Severe cases of the disease can involve chills, fever, sores on skin, decreased blood pressure, and septicemia (blood poisoning). The illness lasts from 1 to 8 days and can be fatal in people with poor immune systems.	shellfish, especially from the Gulf of Mexico	raw or undercooked shellfish	Avoid eating raw or undercooked shellfish; avoid cross-contamination.
Yersiniosis	Caused by the bacteria <i>Yersinia enterocolitica</i> . The disease lasts from a few days to several weeks and is characterized by fever and severe abdominal pain and sometimes headache, sore throat, vomiting, and diarrhea.	domestic pigs, soil, contaminated water, rodents	meats, especially pork; fish, oysters, unpasteurized milk, tofu, untreated water	Cook meats, especially pork, to proper internal temperatures; avoid cross-contamination; proper sanitation procedures and food handling; avoid contaminated water.

Viruses

Viruses are even smaller than bacteria. They consist of genetic material surrounded by a protein layer. Unlike bacteria, they can't reproduce or multiply unless they are inside a living cell, but they can be carried on almost any surface and can survive for days or even months.

Viruses are inactive or dormant until they enter a living cell. Then they use that cell to make more viruses and release them into the organism. The new viruses can then enter new cells and continue to multiply.



Because viruses do not multiply in food like bacteria, food-borne viral diseases are usually caused by contamination from people, food contact surfaces, or, in the case of seafood, contaminated water.

Table identifies the most important food-borne viral diseases.

Viruses:

VIRUS	CAUSE/ CHARACTERISTICS	SOURCE OF CONTAMINATION	FOODS USUALLY INVOLVED	PREVENTION
Hepatitis A	This is a severe disease that can last for many months.	contaminated water or ice, shellfish from polluted waters, raw fruits and vegetables, milk and milk products, infected food workers	shellfish eaten raw, any food contaminated by an infected person	Practice good health and hygiene. Use only certified shellfish from safe waters.
Norovirus (also called Norwalk virus gastroenteritis)	This disease affects the digestive tract, causing nausea, vomiting, stomach cramps, diarrhea, and fever.	human intestinal tract, contaminated water	water, shellfish from polluted waters, raw vegetables and fruits	Practice good health and hygiene. Use only certified shellfish from safe waters. Use sanitary, chlorinated water. Cook foods to safe internal temperatures.
Rotovirus gastroenteritis	The symptoms of this disease are vomiting and diarrhea, abdominal pain, and mild fever. Around the world, rotovirus infections are the leading cause of digestive disease in infants and children. The illness lasts from 4 to 8 days.	human intestinal tract and contaminated water	water and ice, raw and cold prepared foods, such as salads	Practice good health and hygiene. Use sanitary, chlorinated water. Cook foods to safe internal temperatures.

Parasites

Parasites are organisms that can survive only by living on or inside another organism. The organism a parasite lives in, and takes nourishment from is called the host. Parasites may pass from one host organism to another and complete a different stage of their life cycle in each organism. Human parasites are generally transmitted to them from animal hosts.

Human parasites are usually very small, and although they may be microscopic, they are larger than bacteria. They can usually be killed by proper cooking or by freezing.

The most important diseases caused by human parasites transmitted by food are found in Table.

Parasites:



PARASITE	CAUSE/ CHARACTERISTICS	SOURCE OF CONTAMINATION	FOODS USUALLY INVOLVED	PREVENTION
Trichinosis	<i>Trichinosis</i> is often mistaken for the flu at first, but it can last for a year or more. It is caused by a tiny worm that becomes embedded in the muscles of pigs.	infected pork from hogs that ate unprocessed garbage. Modern farming practices have eliminated most, but not all, of this problem.	pork products	Trichinosis organisms are killed if held at 137°F (58°C) for 10 seconds. To be safe, cook all pork products to an internal temperature of at least 150°F (65°C). Some authorities recommend a higher temperature (165°F/74°C). Canadian pork is considered free of trichinosis and does not need to be cooked to these temperatures.
Anisakiasis	Anisakiasis is caused by a tiny roundworm. Symptoms are a tingling sensation in the throat, vomiting up worms, abdominal pain, nausea.	ocean fish, especially bottom-feeding fish	raw or undercooked fish, such as cod, haddock, fluke, herring, flounder, monkfish, and salmon	Cook fish properly. Fish to be eaten raw should be frozen at -4°F (-20°C) or lower for 7 days or 31°F (-1°C) or lower for 15 hours in a blast freezer.
Giardiasis	Giardiasis is caused by a protozoan (a type of single-celled organism) that gets into the intestinal tract. Symptoms include fatigue, nausea, intestinal gas, cramps, feeling of weakness, and weight loss. Symptoms usually last 1 to 2 weeks, but the human host may be infectious for months.	domestic pets; wild animals, especially bears and beavers; human intestinal tracts	water and ice; salads and other raw vegetables	Use sanitary water supplies; practice good personal hygiene; wash raw produce well.
Toxoplasmosis	Toxoplasmosis is caused by a protozoan. A human host sometimes shows no symptoms, but the disease can cause enlarged lymph nodes, severe muscle pain and headaches, and skin rash. Pregnant women and people with poor immune systems are most severely affected.	animal feces, mammals, birds	raw or undercooked contaminated meat	Good personal hygiene; cook meats to proper internal temperatures.
Cyclosporiasis	Cyclosporiasis is caused by a protozoan. Symptoms include diarrhea, weight loss, appetite loss, intestinal gas, cramps, nausea, vomiting, muscle aches, and fatigue. May last a few days to more than a month and may recur every month or two.	contaminated water, human intestinal tract	water, ocean fish, raw vegetables and fruits, and unpasteurized milk	Good personal hygiene. Use safe water supplies. Wash produce properly.
Intestinal cryptosporidiosis	Cryptosporidiosis is caused by a protozoan. This disease may last 4 days to 3 weeks. The host may have no symptoms or may have severe diarrhea. Can be long-lasting and very severe, even fatal, in people with poor immune systems.	intestinal tracts of humans and livestock; water contaminated by runoff from farms or slaughterhouses	water, raw vegetables and fruits, and milk	Good personal hygiene; wash produce properly; use safe water supplies.

Fungi

Molds and yeasts are examples of fungi. These organisms are associated primarily with food spoilage rather than food-borne disease. Most molds and yeasts, even those that cause spoilage, are not dangerous to most human beings. Some, in fact, are beneficial—for

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example, those responsible for the veining in blue cheese and the fermentation of bread dough.

Some molds, however, produce toxins that can cause allergic reactions and severe disease in those people who are susceptible. For example, certain molds produce a toxin called aflatoxin in such foods as peanuts and other nuts, corn, cottonseed, and milk. This toxin can cause serious liver disease in some people.

Other biological hazards

In addition to the biological hazards associated with bacteria and other organisms, some hazards occur naturally in foods and are not the result of contamination. These hazards include plant toxins, seafood toxins, and allergens.

Plant Toxins

Put simply, some plants are naturally poisonous to human beings. The only way to avoid plant toxins is to avoid the plants in which they occur, as well as products made with those plants.

In some cases, the toxins can be transferred in milk from cows that have eaten the plant (such as jimsonweed and snakeroot) or in honey from bees that have gathered nectar from the plants (such as mountain laurel).

The best-known plant toxins are those found in certain wild mushrooms. There are many kinds of poisonous mushrooms, and eating them causes symptoms that range from mild intestinal discomfort to painful death. Some mushroom toxins attack the nervous system, some attack and destroy the digestive system, and some attack other internal organs.

Other toxic plants to avoid are rhubarb leaves, water hemlock, apricot kernels, and nightshade.

Seafood Toxins

Some toxins occur in fish or shellfish that have eaten a kind of algae that contains the toxins.

Because these toxins are not destroyed by cooking, the only method of protection against them is to purchase fish and shellfish from approved suppliers who can certify the seafood comes from safe water.

Some fish naturally contain toxins. The best-known fish toxin is the one present in pufferfish, known in Japanese as fugu. Raw fugu is considered a delicacy in Japan, but it must be prepared only by certified chefs who have been trained to remove the glands that



produce the toxin without breaking them so they don't contaminate the flesh of the fish. This toxin attacks the nervous system and can be fatal.

Some other species of fish, such as moray eels, contain natural toxins and should be avoided.

2.1.3. Food-borne disease prevention



Follow these 4 simple steps to keep food safe:

CLEAN: Wash hands and food contact surfaces and utensils often, between tasks, and if they have become contaminated. Effective cleaning involves removing soil and debris, scrubbing with hot soapy water and rinsing, using potable/drinking water. Sanitizing involves the use of high heat (e.g., a dishwasher) or chemicals (e.g., chlorine bleach) to reduce or eliminate the number of microorganisms to a safe level.

- Wash hands with warm water and soap for 20 seconds and dry with a disposable paper towel or clean hand cloth.
- Alcohol based hand sanitizers are not a replacement for handwashing. They are not effective if the hands are dirty, they are not effective against Norovirus, and they do not eliminate all types of microorganisms.
- Wash cutting boards, dishes, and utensils after preparing each food item and before you use it for the next food.
- Use hot, soapy water, rinse with hot water, and air dry or dry with a clean paper towel or clean dish cloth.
- Or wash in the dishwasher.
- Wash countertops after preparing each food item and before you use it for the next food.
- Use paper towels or clean dish cloths to wipe kitchen surfaces or spills.



- Wash countertops with hot soapy water, rinse with hot water and air dry or dry with a clean paper towel or clean dish cloth.
- To sanitize for added protection for bacteria on surfaces, you can use the following:
 - Dilute mixtures of chlorine bleach and water are a cost-effective method of sanitation. Chlorine bleach is a very effective sanitizer. It comes in several concentrations.
 - If bleach is 8.25%: measure 1 teaspoon of bleach per 1 gallon of water or 1/8 teaspoon of bleach per 1 pint of water.
 - Apply to the cleaned countertop and allow to sit for 1-2 minutes and air dry or dry with a clean paper towel.
 - Alternatively, commercial products for sanitizing the home kitchen are available. Follow manufacturer instruction for use.
 - Wash dish cloths often in a washing machine.
 - Store sponge in a place so it can dry after use.
 - To lower the risk of cross-contamination, sanitize the dish sponge often:
 - Soak in a chlorine bleach solution for 1 min.
 - Microwave heat a damp sponge for 1 min.
 - Put sponge in dishwasher cycle.
 - Replace the dish sponge often.

SEPARATE to prevent cross contamination. Cross contamination is the transfer of harmful bacteria from uncooked food products (e.g. raw meat, fish, and poultry) or unclean people, countertops, and kitchen equipment to ready-to-eat foods (e.g., fruits, vegetables, deli meats/cheeses, and prepared or cooked foods).

- Prevent cross contamination when grocery shopping.
 - Physically separate raw meat, fish and poultry to prevent their juices from dripping onto other foods. This can be done by:
 - Segregating raw meat, fish and poultry on one side of the shopping cart.
 - Placing raw meat, fish and poultry in separate plastic bags (e.g. one bag for chicken, one bag for fish, etc.).
- Designate reusable bags for grocery shopping only. Reusable bags for raw meat, fish, or poultry should never be used for ready-to-eat products.
 - Frequently wash bags. Cloth bags should be washed in a machine and machine dried or air-dried. Plastic-lined bags should be scrubbed using hot water and soap and air-dried.
 - Separate raw meat, fish and poultry in disposable plastic bags before putting them in a reusable bag
 - Check that both cloth and plastic-lined reusable bags are completely dry before storing.
- Prevent cross contamination when storing food in the refrigerator.
 - In the refrigerator, store raw meats, fish, and poultry below ready-to-eat and cooked foods.

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- When thawing frozen raw meat, fish and poultry, put the food in a plastic bag or on a plate on the lowest shelf to prevent juices from dripping onto other foods.
 - After thawing in the refrigerator, food should remain safe and of good quality for a few days before cooking. Food thawed in the refrigerator can be refrozen without cooking, although quality may be impacted. See Chill section for other methods for thawing.
- Prevent cross contamination when handling, preparing, and serving food.
 - Thoroughly wash your hands before and after handling different foods, after using the bathroom, and anytime they can become contaminated.
 - Use separate cutting boards for meat and produce. Alternatively, prepare produce first, then meat.
 - Wash and rinse cutting board, knives, and preparation area after cutting raw meat, fish or poultry. These items can be sanitized after cleaning.
 - Use a clean serving plate to serve cooked meat. Do not use the plate that held the raw meat, unless it is washed.
 - Throw away any sauce or dip that has been used to marinate raw meat, fish, or poultry. Do not use this extra sauce as a dip for cooked food unless it is boiled first.

COOK food thoroughly and use a thermometer to verify the proper temperature was reached.

- Cook foods to the safe minimum internal temperature, as indicated in the table below:

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Product	Minimum Internal Temperature
Beef, Pork, Veal & Lamb steaks, chops, roasts	145 °F (62.8 °C) and allow to rest for at least 3 minutes
Ground Meats	160 °F (71.1 °C)
Ham , fresh or smoked (uncooked)	145 °F (62.8 °C) and rest for at least 3 min.
Fully Cooked Ham (to reheat)	Reheat cooked hams packaged in USDA-inspected plants to 140 °F (60 °C), all others to 165 °F (73.9 °C).
All Poultry (breasts, whole, legs, thighs, wings, ground, and stuffing)	165 °F (73.9 °C)
Eggs	160 °F (71.1 °C)
Fish & Shellfish	145 °F (62.8 °C)
Leftovers	165 °F (73.9 °C)
Casseroles	165 °F (73.9 °C)

USDA FSIS Safe Minimum Internal Temperature Chart
www.fsis.usda.gov/wps/portal/fsis/topics/food-safety-education/get-answers/food-safety-fact-sheets/safe-food-handling/safe-minimum-internal-temperature-chart/tot_index

- To determine that the proper temperature was reached, place a food thermometer in the thickest part of the food and allow the it to equilibrate.
 - Make sure it's not touching bone, fat, or gristle.
 - For whole poultry, insert the thermometer into the innermost part of the thigh and wing and the thickest part of the breast.
 - For combination dishes, place the thermometer in the center or thickest portion.
 - Egg dishes and dishes containing ground meat or poultry should be checked in several places.
- Clean your food thermometer with hot, soapy water before and after each use!

CHILL foods promptly. Cold temperatures slow the growth of harmful bacteria. Cold air must circulate to help keep food safe, so do not over fill the refrigerator. Maintain the refrigerator temperature at 41°F or below. Place an appliance thermometer in the rear portion of the refrigerator, and monitor regularly. Maintain the freezer temperature at 0°F or below.

- Refrigerate and/or freeze meat, poultry, eggs and other perishables as soon as possible after purchasing.
- Consider using a cooler with ice or gel packs to transport perishable food.

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- Perishable foods, such as cut fresh fruits or vegetables and cooked food should not sit at room temperature more than two hours before putting them in the refrigerator or freezer (one hour when the temperature is above 90°F).
- There are three safe ways to thaw food: in the refrigerator (see Separate), in cold water, and in the microwave. Food thawed in cold water or in the microwave should be cooked immediately.
- Submerging the food in cold water. It is important to place the food in a bag that will prevent the water from entering. Check the water every 30 minutes to make sure it is cold. Cook food prior to refreezing.
- Microwave thawing. Cook food immediately once thawed because some areas of the food may become warm and begin to cook during the thawing process. Cook food prior to refreezing.
- Cool leftovers quickly by dividing large amounts into shallow containers for quicker cooling in the refrigerator.

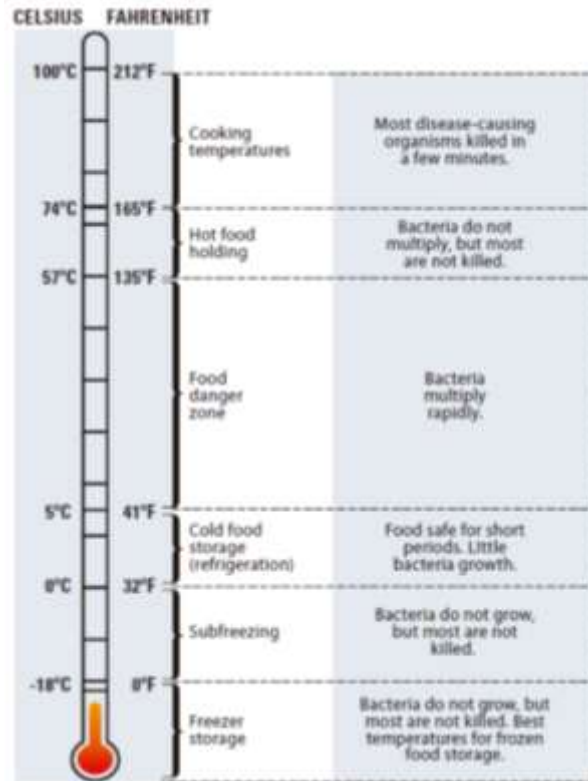
2.1.4. How to break the food-borne disease chain



The following rules of safe food storage have two purposes:

1. To prevent contamination of foods.
2. To prevent growth of bacteria that may already be in foods.

Temperature control is an important part of food storage. Perishable foods must be kept out of the Food Danger Zone—41°F to 135°F (5°C to 57°C)—as much as possible, because these temperatures support bacterial growth. See Figure for a chart of important temperatures.



Important temperatures in sanitation and food protection

The Four-Hour Rule

Food is handled in many stages between the time it is received and the time it is finally served. This progression, called the flow of food. During each stage, food might be allowed to remain in the Food Danger Zone for a time. To protect food and keep it safe, follow the four-hour rule: Do not let food remain in the Food Danger Zone for a cumulative total of more than 4 hours between receiving and serving.

For example, imagine a food that is left on the loading dock for 30 minutes before being put into cold storage, removed from storage and left on the worktable for an hour before being prepared, and finally cooked at a low temperature so that it takes 3 hours to reach a safe internal temperature. This food has spent a total of 4 ½ hours in the danger zone and should be considered unsafe.

Receiving

1. Safe food handling begins the moment food is unloaded from the delivery truck. In fact, it begins even earlier than this, with the selection of good, reputable suppliers. Keep the receiving area clean and well lit.

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2. Inspect all deliveries. Try to schedule deliveries during off-peak hours to allow proper time to inspect the items. For the same reason, try to schedule deliveries so they arrive one at a time.
3. Reject shipments or parts of shipments that are damaged or not at the proper temperature. Frozen foods should show no signs of having been thawed and refrozen.
4. Label all items with the delivery date or a use-by date.
5. Transfer items immediately to proper storage.

Dry Food Storage

Dry food storage pertains to those foods not likely to support bacterial growth in their normal state. These foods include

Flour

Sugar and salt

Cereals, rice, and other grains

Dried beans and peas

Ready-prepared cereals

Breads and crackers

Oils and shortenings

Canned and bottled foods (unopened)

1. Store dry foods in a cool, dry place, off the floor, away from the wall, and not under a sewer line.



2. Keep all containers tightly closed to protect from insects, rodents, and dust. Dry foods can be contaminated, even if they don't need refrigeration.



Freezer Storage

1. Keep frozen foods at 0°F (-18°C) or lower.
2. Keep all frozen foods tightly wrapped or packaged to prevent freezer burn.
3. Label and date all items.
4. Thaw frozen foods properly. Do not thaw at room temperature, because the surface temperature will go above 41°F (5°C) before the inside is thawed, resulting in bacterial growth. These methods may be used:
 - In a refrigerator
 - Under cold running water
 - In a microwave oven, but only if the item is to be cooked or served immediately



Refrigerator Storage

1. Keep all perishable foods properly refrigerated. Note the lower limit of the Food Danger Zone (41°F/5°C) is only the upper limit for refrigerator storage. Most foods keep even better at lower temperatures. The major exception is fresh fruits and vegetables, which are not considered potentially hazardous foods. See Table 2.4 for preferred storage temperatures for various foods.
2. Do not crowd refrigerators. Leave space between items so cold air can circulate.
3. Keep refrigerator doors shut except when removing or putting in foods.
4. Keep shelves and interiors of refrigerators clean.
5. Store raw and cooked items separately, if possible.
6. If raw and cooked foods must be kept in the same refrigerator, keep cooked foods above raw foods. If cooked foods are kept below raw foods, they can become contaminated by drips and spills. Then, if they are not to be cooked again before serving, they may be hazardous.
7. Keep refrigerated foods wrapped or covered and in sanitary containers.
8. Do not let any unsanitary surface, such as the bottoms of other containers, touch any food.
9. Chill foods as quickly as possible over ice or in a cold-water bath before placing in the refrigerator. A gallon of stock placed in a refrigerator hot off the stove may take 10 hours to go below 41°F (5°C), giving bacteria plenty of time to grow.
10. When holding foods such as protein salads in a cold bain-marie or refrigerated table for service, do not heap the food above the level of the container. The food above this level will not stay cold enough.

**FOOD STORAGE TEMPERATURES**

Raw vegetables and fruits (see note)	40°–45°F	4°–7°C
Eggs	38°–40°F	3°–4°C
Milk and cream	36°–40°F	2°–4°C
Poultry and meat	32°–36°F	0°–2°C
Fish and seafood	30°–34°F	–1°–1°C

Note: Potatoes, onions, and winter squash are best held at cool temperatures (50°–65°F or 10°–18°C).

Hot Food Holding

1. To keep foods hot for service, use steam tables or other equipment that will keep all parts of all foods above 135°F (57°C) at all times.
2. Keep foods covered.
3. Bring foods to holding temperature as quickly as possible by using ovens, steamers, rangetop pots and pans, or other cooking equipment. Do not warm cold foods by placing them directly in the steam table. They will take too long to heat, and bacteria will have time to grow.
4. Do not let ready-to-eat foods come in contact with any contaminated surface.

**2.1.5. Food can cause illness**

Foodborne illnesses are infections or irritations of the gastrointestinal (GI) tract caused by food or beverages that contain harmful bacteria, parasites, viruses, or chemicals. The GI tract is a series of hollow organs joined in a long, twisting tube from the mouth to the anus. Common symptoms of foodborne illnesses include vomiting, diarrhea, abdominal pain, fever, and chills.

Most foodborne illnesses are acute, meaning they happen suddenly and last a short time, and most people recover on their own without treatment. Rarely, foodborne illnesses may lead to more serious complications. Each year, an estimated 48 million people in the United States experience a foodborne illness. Foodborne illnesses cause about 3,000 deaths in the United States annually.



What causes foodborne illnesses?

The majority of foodborne illnesses are caused by harmful bacteria and viruses. Some parasites and chemicals also cause foodborne illnesses.

Bacteria

Bacteria are tiny organisms that can cause infections of the GI tract. Not all bacteria are harmful to humans.

Some harmful bacteria may already be present in foods when they are purchased. Raw foods including meat, poultry, fish and shellfish, eggs, unpasteurized milk and dairy products, and fresh produce often contain bacteria that cause foodborne illnesses. Bacteria can contaminate food—making it harmful to eat—at any time during growth, harvesting or slaughter, processing, storage, and shipping.

Foods may also be contaminated with bacteria during food preparation in a restaurant or home kitchen. If food preparers do not thoroughly wash their hands, kitchen utensils, cutting boards, and other kitchen surfaces that come into contact with raw foods, cross-contamination—the spread of bacteria from contaminated food to uncontaminated food—may occur.

If hot food is not kept hot enough or cold food is not kept cold enough, bacteria may multiply. Bacteria multiply quickly when the temperature of food is between 40 and 140 degrees. Cold food should be kept below 40 degrees and hot food should be kept above 140 degrees. Bacteria multiply more slowly when food is refrigerated, and freezing food can further slow or even stop the spread of bacteria. However, bacteria in refrigerated or frozen foods become active again when food is brought to room temperature. Thoroughly cooking food kills bacteria.

Many types of bacteria cause foodborne illnesses. Examples include

- Salmonella, a bacterium found in many foods, including raw and undercooked meat, poultry, dairy products, and seafood. Salmonella may also be present on egg shells and inside eggs.
- Campylobacter jejuni (*C. jejuni*), found in raw or undercooked chicken and unpasteurized milk.
- Shigella, a bacterium spread from person to person. These bacteria are present in the stools of people who are infected. If people who are infected do not wash their hands thoroughly after using the bathroom, they can contaminate food that they handle or prepare. Water contaminated with infected stools can also contaminate produce in the field.
- Escherichia coli (*E. coli*), which includes several different strains, only a few of which cause illness in humans. *E. coli* O157:H7 is the strain that causes the most severe

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illness. Common sources of E. coli include raw or undercooked hamburger, unpasteurized fruit juices and milk, and fresh produce.

- Listeria monocytogenes (L. monocytogenes), which has been found in raw and undercooked meats, unpasteurized milk, soft cheeses, and ready-to-eat deli meats and hot dogs.
- Vibrio, a bacterium that may contaminate fish or shellfish.
- Clostridium botulinum (C. botulinum), a bacterium that may contaminate improperly canned foods and smoked and salted fish.

Viruses

Viruses are tiny capsules, much smaller than bacteria, that contain genetic material. Viruses cause infections that can lead to sickness. People can pass viruses to each other. Viruses are present in the stool or vomit of people who are infected. People who are infected with a virus may contaminate food and drinks, especially if they do not wash their hands thoroughly after using the bathroom.

Common sources of foodborne viruses include:

- food prepared by a person infected with a virus
- shellfish from contaminated water
- produce irrigated with contaminated water

Common foodborne viruses include:

- norovirus, which causes inflammation of the stomach and intestines
- hepatitis A, which causes inflammation of the liver

Parasites

Parasites are tiny organisms that live inside another organism. In developed countries such as the United States, parasitic infections are relatively rare.

Cryptosporidium parvum and Giardia intestinalis are parasites that are spread through water contaminated with the stools of people or animals who are infected. Foods that come into contact with contaminated water during growth or preparation can become contaminated with these parasites. Food preparers who are infected with these parasites can also contaminate foods if they do not thoroughly wash their hands after using the bathroom and before handling food.

Trichinella spiralis is a type of roundworm parasite. People may be infected with this parasite by consuming raw or undercooked pork or wild game.

Chemicals



Harmful chemicals that cause illness may contaminate foods such as:

- Fish or shellfish, which may feed on algae that produce toxins, leading to high concentrations of toxins in their bodies. Some types of fish, including tuna and mahi mahi, may be contaminated with bacteria that produce toxins if the fish are not properly refrigerated before they are cooked or served.
- Certain types of wild mushrooms.
- Unwashed fruits and vegetables that contain high concentrations of pesticides.

What are the symptoms of foodborne illnesses?

Symptoms of foodborne illnesses depend on the cause. Common symptoms of many foodborne illnesses include

- vomiting
- diarrhea or bloody diarrhea
- abdominal pain
- fever
- chills

Symptoms can range from mild to serious and can last from a few hours to several days.

C. botulinum and some chemicals affect the nervous system, causing symptoms such as

- headache
- tingling or numbness of the skin
- blurred vision
- weakness
- dizziness
- paralysis

What are the complications of foodborne illnesses?

Foodborne illnesses may lead to dehydration, hemolytic uremic syndrome (HUS), and other complications. Acute foodborne illnesses may also lead to chronic—or long lasting—health problems.

- **Dehydration**

When someone does not drink enough fluids to replace those that are lost through vomiting and diarrhea, dehydration can result. When dehydrated, the body lacks enough fluid and electrolytes—minerals in salts, including sodium, potassium, and chloride—to function properly. Infants, children, older adults, and people with weak immune systems have the greatest risk of becoming dehydrated.

Signs of dehydration are:

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- excessive thirst
- infrequent urination
- dark-colored urine
- lethargy, dizziness, or faintness

Signs of dehydration in infants and young children are:

- dry mouth and tongue
- lack of tears when crying
- no wet diapers for 3 hours or more
- high fever
- unusually cranky or drowsy behavior
- sunken eyes, cheeks, or soft spot in the skull

Also, when people are dehydrated, their skin does not flatten back to normal right away after being gently pinched and released.

Severe dehydration may require intravenous fluids and hospitalization. Untreated severe dehydration can cause serious health problems such as organ damage, shock, or coma—a sleeplike state in which a person is not conscious.

HUS

Hemolytic uremic syndrome is a rare disease that mostly affects children younger than 10 years of age. HUS develops when *E. coli* bacteria lodged in the digestive tract make toxins that enter the bloodstream. The toxins start to destroy red blood cells, which help the blood to clot, and the lining of the blood vessels.

In the United States, *E. coli* O157:H7 infection is the most common cause of HUS, but infection with other strains of *E. coli*, other bacteria, and viruses may also cause HUS. A recent study found that about 6 percent of people with *E. coli* O157:H7 infections developed HUS. Children younger than age 5 have the highest risk, but females and people age 60 and older also have increased risk.³

Symptoms of *E. coli* O157:H7 infection include diarrhea, which may be bloody, and abdominal pain, often accompanied by nausea, vomiting, and fever. Up to a week after *E. coli* symptoms appear, symptoms of HUS may develop, including irritability, paleness, and decreased urination. HUS may lead to acute renal failure, which is a sudden and temporary loss of kidney function. HUS may also affect other organs and the central nervous system. Most people who develop HUS recover with treatment. Research shows that in the United States between 2000 and 2006, fewer than 5 percent of people who developed HUS died of the disorder. Older adults had the highest mortality rate—about one-third of people age 60 and older who developed HUS died.

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Studies have shown that some children who recover from HUS develop chronic complications, including kidney problems, high blood pressure, and diabetes.

Other Complications

Some foodborne illnesses lead to other serious complications. For example, *C. botulinum* and certain chemicals in fish and seafood can paralyze the muscles that control breathing. *L. monocytogenes* can cause spontaneous abortion or stillbirth in pregnant women.

Research suggests that acute foodborne illnesses may lead to chronic disorders, including:

- reactive arthritis, a type of joint inflammation that usually affects the knees, ankles, or feet. Some people develop this disorder following foodborne illnesses caused by certain bacteria, including *C. jejuni* and *Salmonella*. Reactive arthritis usually lasts fewer than 6 months, but this condition may recur or become chronic arthritis.
- irritable bowel syndrome (IBS), a disorder of unknown cause that is associated with abdominal pain, bloating, and diarrhea or constipation or both. Foodborne illnesses caused by bacteria increase the risk of developing IBS.
- Guillain-Barré syndrome, a disorder characterized by muscle weakness or paralysis that begins in the lower body and progresses to the upper body. This syndrome may occur after foodborne illnesses caused by bacteria, most commonly *C. jejuni*. Most people recover in 6 to 12 months.

A recent study found that adults who had recovered from *E. coli* O157:H7 infections had increased risks of high blood pressure, kidney problems, and cardiovascular disease.

How are foodborne illnesses diagnosed?

To diagnose foodborne illnesses, health care providers ask about symptoms, foods and beverages recently consumed, and medical history. Health care providers will also perform a physical examination to look for signs of illness.

Diagnostic tests for foodborne illnesses may include a stool culture, in which a sample of stool is analyzed in a laboratory to check for signs of infections or diseases. A sample of vomit or a sample of the suspected food, if available, may also be tested. A health care provider may perform additional medical tests to rule out diseases and disorders that cause symptoms similar to the symptoms of foodborne illnesses.

If symptoms of foodborne illnesses are mild and last only a short time, diagnostic tests are usually not necessary.

How are foodborne illnesses treated?

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The only treatment needed for most foodborne illnesses is replacing lost fluids and electrolytes to prevent dehydration.

Over-the-counter medications such as loperamide (Imodium) and bismuth subsalicylate (Pepto-Bismol and Kaopectate) may help stop diarrhea in adults. However, people with bloody diarrhea—a sign of bacterial or parasitic infection—should not use these medications. If diarrhea is caused by bacteria or parasites, over-the-counter medications may prolong the problem. Medications to treat diarrhea in adults can be dangerous for infants and children and should only be given with a health care provider's guidance.

If the specific cause of the foodborne illness is diagnosed, a health care provider may prescribe medications, such as antibiotics, to treat the illness.

Hospitalization may be required to treat lifethreatening symptoms and complications, such as paralysis, severe dehydration, and HUS.

Eating, Diet, and Nutrition

The following steps may help relieve the symptoms of foodborne illnesses and prevent dehydration in adults:

- drinking plenty of liquids such as fruit juices, sports drinks, caffeine-free soft drinks, and broths to replace fluids and electrolytes
- sipping small amounts of clear liquids or sucking on ice chips if vomiting is still a problem
- gradually reintroducing food, starting with bland, easy-to-digest foods such as rice, potatoes, toast or bread, cereal, lean meat, applesauce, and bananas
- avoiding fatty foods, sugary foods, dairy products, caffeine, and alcohol until recovery is complete

Infants and children present special concerns. Infants and children are likely to become dehydrated more quickly from diarrhea and vomiting because of their smaller body size. The following steps may help relieve symptoms and prevent dehydration in infants and children:

- giving oral rehydration solutions such as Pedialyte, Naturalyte, Infalyte, and CeraLyte to prevent dehydration
- giving food as soon as the child is hungry
- giving infants breast milk or fullstrength formula, as usual, along with oral rehydration solutions

Older adults and adults with weak immune systems should also drink oral rehydration solutions to prevent dehydration.

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How are foodborne illnesses prevented?

Foodborne illnesses can be prevented by properly storing, cooking, cleaning, and handling foods.

- Raw and cooked perishable foods—foods that can spoil—should be refrigerated or frozen promptly. If perishable foods stand at room temperature for more than 2 hours, they may not be safe to eat. Refrigerators should be set at 40 degrees or lower and freezers should be set at 0 degrees.
- Foods should be cooked long enough and at a high enough temperature to kill the harmful bacteria that cause illnesses. A meat thermometer should be used to ensure foods are cooked to the appropriate internal temperature:
 - 145 degrees for roasts, steaks, and chops of beef, veal, pork, and lamb, followed by 3 minutes of rest time after the meat is removed from the heat source
 - 160 degrees for ground beef, veal, pork, and lamb
 - 165 degrees for poultry
- Cold foods should be kept cold and hot foods should be kept hot.
- Fruits and vegetables should be washed under running water just before eating, cutting, or cooking. A produce brush can be used under running water to clean fruits and vegetables with firm skin.
- Raw meat, poultry, seafood, and their juices should be kept away from other foods.
- People should wash their hands for at least 20 seconds with warm, soapy water before and after handling raw meat, poultry, fish, shellfish, produce, or eggs. People should also wash their hands after using the bathroom, changing diapers, or touching animals.
- Utensils and surfaces should be washed with hot, soapy water before and after they are used to prepare food. Diluted bleach—1 teaspoon of bleach to 1 quart of hot water—can also be used to sanitize utensils and surfaces.

2.1.6. High-risk food

High-risk foods can be defined as “any ready-to-eat food that will support the growth of pathogenic bacteria easily and does not require any further heat treatment or cooking”. These types of foods are more likely to be implicated as vehicles of food poisoning organisms consumed in food poisoning incidents. Such foods are usually high in protein, require strict temperature control and protection from contamination and include:

- cooked meat and poultry such as; beef, pork, ham, lamb, chicken, turkey, duck
- cooked meat products such as; meat pies & pasties, pate, meat stock & gravy, cook-chill meals



- dairy produce such as; milk, cream, artificial cream, custards, products containing unpasteurised milk, ripened soft & moulded cheeses
- egg products such as; cooked eggs, quiche and products containing uncooked or lightly cooked eggs, for example; mayonnaise, mousse, home-made ice cream
- shellfish and other sea-foods such as; mussels, cockles, cooked prawns, raw oysters
- Farinaceous dishes including; cooked rice, pasta, couscous



Low-risk foods are ambient-stable such as; bread, biscuits, cereals, crisps and cakes (not cream cakes). Such foods are unlikely to be implicated in food poisoning and include:

- foods that have been preserved, for example; smoked or salted fish
- dry goods, those that contain minimal amounts of moisture, such as; bread, flour, biscuits
- acidic foods, for example; pickled foods, vinegar, fruit
- fermented products such as; salami, pepperoni
- foods with high sugar/fat content for example; jam & chocolate
- tinned food, whilst unopened

Food-poisoning bacteria grow and multiply fastest in the temperature danger zone between 5 °C and 60 °C. It is important to keep high-risk food out of this temperature zone.

Storing food in the fridge

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Your fridge temperature should be at 5 °C or below. The freezer temperature should be below -15 °C. Use a thermometer to check the temperature in your fridge.

Storing cooked food safely

When you have cooked food and want to cool it:

Put hot food into shallow dishes or smaller portions to help cool the food as quickly as possible.

Don't put very hot food into the refrigerator. Wait until steam has stopped rising from the food before putting it in the fridge.

Avoid refreezing thawed food

Food-poisoning bacteria can grow in frozen food while it is thawing, so avoid thawing frozen food in the temperature danger zone. Keep defrosted food in the fridge until it is ready to be cooked. If using a microwave oven to defrost food, cook it immediately after defrosting.

As a general rule, avoid refreezing thawed food. Food that is frozen a second time is likely to have higher levels of food-poisoning bacteria. The risk depends on the condition of the food when frozen, and how the food is handled between thawing and refreezing, but raw food should never be refrozen once thawed.

Store raw food separately from cooked food

Raw food and cooked food should be stored separately in the fridge. Bacteria from raw food can contaminate cold cooked food, and the bacteria can multiply to dangerous levels if the food is not cooked thoroughly again.

Always store raw food in sealed or covered containers at the bottom of the fridge. Keep raw foods below cooked foods, to avoid liquid such as meat juices dripping down and contaminating the cooked food.

Choose strong, non-toxic food storage containers

Make sure your food storage containers are clean and in good condition, and only use them for storing food. Cover them with tight-fitting lids, foil or plastic film to minimise potential contamination. Transfer the contents of opened cans into suitable containers.



If in doubt, throw it out

Throw out high-risk food left in the temperature danger zone for more than four hours – don't put it in the fridge and don't keep it for later. Check the use-by dates on food products and discard out-of-date food. If you are uncertain of the use-by date, throw it out.

Things to remember

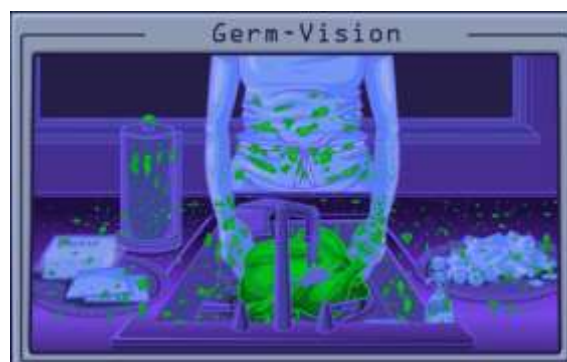
- Keep high-risk food at 5 °C or below and above 60 °C to avoid the temperature danger zone.
- Store raw foods below cooked foods.
- Store food in suitable, covered containers.
- Avoid refreezing thawed foods.
- Check and observe the use-by dates on food products.
- Take special care with high-risk foods.
- Clean and disinfect equipment and surfaces after preparing "raw" food.
- Do not leave food at room temperature for more than 1 hour

2.1.7. Bacteria and other micro-organisms that can cause illness

See section 2.1.1.

2.1.8. Cross contamination

Cross-contamination is the physical movement or transfer of harmful bacteria from one person, object or place to another.



Preventing cross-contamination is a key factor in preventing foodborne illness.



Heard a lot of fact and fiction about cross contamination, how it happens and how it to tackle it? Well we're here to help you understand and blow those myths out of the water, so to speak.

1. **Myth:** Once I rinse my dishcloth I know that it's clean.



Rinsing dishes under the tap.

Fact: This couldn't be further from the truth. Research showed that rinsing dishcloths under the tap did not remove germs. Remember, just because it looks clean doesn't mean it is! Dishcloths that are used for more than two days tend to have high levels of bacteria present. Food poisoning bacteria can survive and grow on dishcloths, particularly where food residues remain and when the cloth is damp. Dishcloths are usually stored crumpled up, so they stay wet and often contain larger numbers of bacteria. Of the dishcloths tested in the safefood survey, E. coli was present on 27.5% and Listeria was present on 13.5% of them.

What should I do?

It's best to change your dishcloth at least every other day. If you use your dishcloth to wipe off 'High Risk' food debris, such as raw eggs, raw meat, raw poultry, raw fish or raw vegetables make sure to change your cloth straight away. Boiling your dishcloth for 15 minutes or washing it the washing machine on a standard cycle are effective ways to clean dishcloths and kill any germs that might be present. Don't use a dishcloth that smells or if it looks dirty as it is very likely that a high number of bacteria are present on the cloth.

2. **Myth:** My work surface and cutting boards look clean so there is no bacteria on them.



Fact: In actual fact germs like Campylobacter can last on kitchen surfaces for up to 1 hour and E. coli can last for up to 24 hours. A recent study conducted by safefood found that 96% of kitchen surfaces were not thoroughly washed after food preparation and 43% were contaminated with raw meat bacteria after food preparation. A further 67% of people didn't



wash the chopping board after using it to prepare raw chicken and of the chopping boards tested, 50% were contaminated with raw meat bacteria after preparation.

What should I do?

It's always good practice to wash worktops and cutting boards with hot soapy water after preparing foods, especially after preparing raw meat, poultry, seafood or raw vegetables. Always clean as you go between preparing these foods and especially when handling raw foods and then handling ready to eat foods.

3. **Myth:** It's only the meat itself that needs to be handled carefully, the packaging goes straight into the bin to be thrown out.



Fact: Harmful bacteria such as E. coli can last on your food packaging for up to 24 hours, so you should be careful when handling packaging. These bacteria can be transferred quite easily from contaminated packaging to other kitchen surfaces and also lead to cross-contamination of hands and other kitchen surfaces such as worktops and press handles. In a report published in 2010 (FSAI), a reported 13.2% of chicken packaging was contaminated with Campylobacter.

What should I do?

When you do your shopping pack your raw meat and poultry separately from your ready-to-eat foods. If you use reusable bags you should keep one bag for raw meats only. Store your raw meat and poultry on the bottom shelf of your fridge below ready to eat foods. Remove your raw meat and poultry from their packaging and directly place on to your cutting board or baking tray, and throw the packaging straight in to the bin. By doing this you will help avoid contaminating any of your work surfaces. After you have finished preparing your raw meat or poultry, wash down all surfaces with hot soapy water.

4. **Myth:** I always wash my hands when I'm preparing food so I'm not at risk.



Fact: This isn't always the case. The recent research done by safefood has turned up some startling evidence with regard to handwashing, 80% of people didn't wash their hands thoroughly after handling raw mince, 84% didn't thoroughly wash their hands after handling raw chicken while preparing a warm chicken salad and 26% of people had raw meat bacteria on their hands after preparing food. Just think about where your hands have been and where and what they will touch.

What should I do?

You should always wash your hands thoroughly after handling any raw meat or poultry. Wet your hands thoroughly under warm running water and apply soap to them. Rub your hands together to make a lather and spread it over all areas of your hands and wrists, making sure it covers palms, the backs of your hands, wrists, fingers and fingernails and rub between each finger and round your thumbs. It's this action which helps the soap dislodge and remove dirt and germs. Dry your hands thoroughly, using a clean hand towel or hand dryer. Never your tea towel or your cloths.

5. **Myth:** I don't need to wash my utensils while I'm preparing my food.



Fact: The study done by safefood found that 72% of people failed to thoroughly wash a knife that was used in preparing raw chicken before reusing it to cut salad vegetables and 67% of people failed to thoroughly wash a knife that had been used to prepare raw beef before cutting salad vegetables. Of the knives that were tested, 18% were contaminated with E. coli and 5% were contaminated with Campylobacter. The side salads that were tested, a whopping 37% were contaminated with raw meat bacteria.



What should I do?

Kitchen utensils should be thoroughly scrubbed in plenty of clean hot soapy water or in a dishwasher, particularly after using them to prepare raw meat or poultry.

2.1.9. Food safety self-assessment system



Why is food safety in the galley important? Who is responsible for self-assessment aboard? How can I ensure that the provisioning's I get are in order? What are the rules for storage? What precautions should the cook take when preparing meals? How can I get going with self-assessment and written documentation?

These are questions that need answering so that everyone aboard can confidently eat their meals without being nervous about getting ill from the food supplied or cooked for them. Basically, food safety and self-assessment are about being at the leading edge and complying with current legislation.

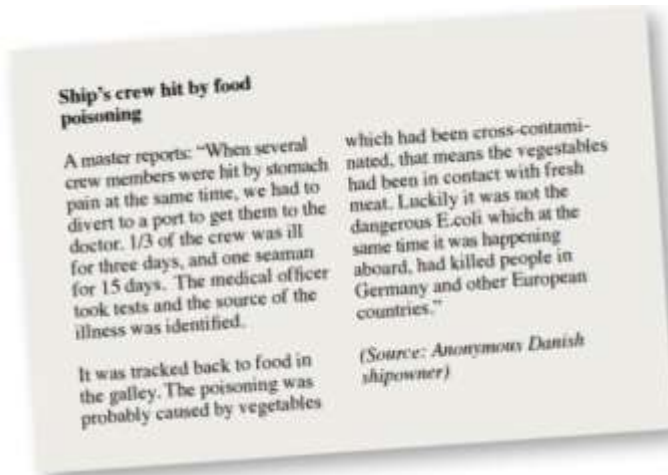
Food safety is important because on a ship it is not always possible to consult a doctor in an emergency if a serious illness arises. Illness can affect the crew's health and hospital admissions can be expensive.

Focusing on direct quality and hygiene is important, not only for food safety but also for the general health of the crew.

So good hygiene must be in place. Better management of the situation in the galley can also be reflected in better diet planning, less food waste, healthier food and a different "throw away" culture. Better financial control in the galley and taking the external environment into



consideration are two sides of the same issue; not throwing out so much and smaller quantities of packaging saves on resources and the environment.



Responsibility and authority

Food safety is part of overall safety aboard. A high level of food safety cuts the risk of disease-causing bacteria, undesirable chemicals and substances in food. This can be achieved with good hygiene and controls on all food products. The company and ship can draw up and implement a self-assessment programme to manage this. But what does the law say and who is responsible for carrying this out?

The rules can take to mean:

- Self-assessment

MLC places special emphasis on prevention by inspections, or in other words, self-assessment. Self-assessment must be done by the responsible person in the galley. The overall responsibility for self-assessment rests with the ship's management i.e. the master who is required to make regular inspections to see that self-assessment is working correctly.

- Quality of food and drink

The company is responsible for providing good quality food and drink aboard. The quality of raw materials can vary from port to port so it is especially important to control how raw materials are handled aboard. On board, good practice instilled by the ship's self-assessment system ensures that the quality of raw materials does not suffer.



- Conditions for preparation and eating

Good personal hygiene and cleaning standards are essential for being able to prepare and serve food under good conditions.

The general framework must always be in order. Bad design of the galley and incorrect choice of materials can be hidden sources of food contamination. The risk of this happening can be minimized by effective cleaning and cleaning controls.

- Organizational anchoring

The company is responsible for the general framework and for ensuring that ship's management and the responsible person in the galley have the necessary skills and tools to do their work in the best way possible. Ship's management can make use of self-assessment to maintain good hygiene and provide proper documentation and maintenance. Galley crew can use a self-assessment programme to comply with the hygiene regulations and report poor conditions. If allocation of responsibilities for the areas and roles has been well defined, there is a greater chance that the galley's self-assessment will continue to be an instrument for prevention so that potential sources of contamination can be spotted in good time.

- Training and skills

Work in the galley is only to be undertaken by people properly qualified to handle food correctly. For example skilled cooks with a certificate of competency and five months internship at a seagoing ship. Alternatively, personnel must have had at least 48 months apprenticeship as a cook, of which min. 24 months (documented) experience of galley work and under supervision of qualified personnel. Ships where personnel (one or more) cook for others and where there is not a trained cook aboard, need to be upgraded, so the person or persons who handle food get the qualifications. Hygiene and food safety skills for personnel aboard must comply with the "Order on Hygiene Competencies for seafarers handling food products aboard a ship", which means a standard corresponding to the content of this material. The qualifications can be achieved by a hygiene certificate course or on-the-job training over seven days

Allocation of responsibility and safety committee

Food safety and hygiene, or the lack of these, can be put on the agenda of the safety committee by the ship's safety representative. The safety representative can make sure ship's management and the other members of the committee are aware of a problem relating to crew safety and well-being.

This could for example be hygiene problems, such as cleaning and keeping the area around the mess tidy, repairs in the galley and personal hygiene in the mess (smells and untidiness that inconvenience others) but the safety committee cannot undertake internal inspections.

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Allocation of responsibilities between company and ship should be as follows:

- Shipping management

As owners, shipping management have the greatest responsibilities.

They are required to comply with current legislation and to ensure that general conditions are in order. Galley design and regular maintenance are important preconditions for the responsible person in the galley being able to maintain good hygiene, in other words to be able to clean properly and work safely. In most instances, the shipping deals with purchasing and timely delivery of food products. Shipping management is also required to ensure that galley personnel are trained and to notify applicable regulations and allocation of responsibility.



- Master

The master is responsible for managing daily operations and ensuring that health issues and cleanliness are in order aboard. The master is required to inspect the cleaning/refrigeration/self-assessment and at regular intervals, inspect the galley and mess and to order maintenance done. Critical issues must be reported to shipping management so as to improve working conditions in the galley. The master should also notify the crew and/or the safety committee when and if there is the need to improve hygiene standards. The master is required, if there is illness amongst galley personnel, to find a temporary crewing solution. In the event of an accident in the galley and mishaps with food-related illness in consequence, the ships procedures for treating illness will take effect. The master is responsible for ensuring that procedures are complied with.

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- Ship's cook

The ship's cook is responsible for maintaining a high standard of hygiene and for keeping the galley and mess clean.

Daily, the ship's cook should comply to the procedures and enter data into the self-assessment programme and remind the others in the galley, such as the assistant, if there are issues they need to be especially alert with respect to handling food products. The cook orders and checks-in provisionings in port and will thus know that goods as supplied are not damaged.

If the quality is not satisfactory, the cook must report the problem in a complaint. In the event of sickness or lack of personnel in the galley, it is up to the cook to notify the master of the situation.

- Rating/steward and other personnel in the galley

The assistant and other personnel employed in the galley are responsible for complying with the self-assessment programme that has been adopted aboard and for attending to the duties delegated by the cook. And to report any faults, deficiencies or inconveniences so that the self-assessment programme can be adapted to conditions aboard.

- Crew

Everyone aboard has a responsibility for maintaining good hygiene in the mess and all other areas to which there is common access. This means that hands must be washed before meals and dirty overwear should be left outside the mess. It is important for everybody to be aware of keeping toilets clean and their own cabins and not least, that they maintain proper personal hygiene. Everyone aboard should be able to ask the safety committee about hygiene, food safety and well-being. All aboard, regardless of their rank, are required to comply with current legislation.

Checking and supervision

As the person with the ultimate responsibility aboard, the master is required to regularly check that the galley is being operated according to the points laid down in the self-assessment programme. Self-assessment means that cooks check their own work in the



galley and associated areas. This means in practice that every day they should ensure (and document) that food is prepared under the most hygienic conditions possible.

The master has the overall responsibility for regular internal inspections. The intervals between inspections must always be entered in the ship's self-assessment programme. The master can alternatively appoint someone else to carry out internal inspections. In principle, it makes no difference who does inspections, provided that they are done and by as few people as possible. The master can always delegate the duty but cannot delegate responsibility for final self-assessment.

That is always down to the master aboard.

- Inspections by internal auditors

Internal inspections can also be done by personnel appointed by the shipowner. This may not apply to all shipowners, but some with many vessels and/or that cater for many passengers may prefer to train and educate their own auditor, tasked with carrying out inspections on their ships. The advantage is that specialists can quickly spot what could be done better because they can gather experience from ship to ship. An internal auditor may make inspections every six months, with the role being arranged between ship's management and the internal auditor.



An internal auditor does not mean that ship's management is not still involved. An internal auditor does not take over ship's management's responsibility for routine inspections aboard. Roles and tasking can be allocated, with for example ship management inspects

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monthly and the internal auditor approves for example every six month. This ensures a more balanced supervision regime aboard.

- SSC certificate

Most countries require ships to have a Ship Sanitation Certificate (SSC), issued by the national maritime authority.

The scheme comes under International Maritime Organization (IMO). It is intended to ensure the ship has no pests, that is a visual inspection of pests aboard and what can be done to prevent them. Inspections are done by medical officers and ships are exempt from inspection for six months when they can show a hygiene certificate which then has to be renewed.

Grant of a SSC certificate means that a visual inspection has shown no signs of pests aboard, that cleanliness is satisfactory and that work is being done to actively control pests.

- MLC certificate

When the flag state has signed up to the Maritime Labour Convention (MLC), all the flag state's ships must have an MLC certificate. The certificate is issued by the flag state or by a body authorized by the flag state to do so (classification companies). Certificates are valid for five years and are inspected at the midway point.

Possessing an MLC certificate means that a ship has basically already demonstrated that hygiene aboard is under control. Ships of individual states also have to comply with the convention's international requirements and also comply with any national requirements imposed by the flag state for the area concerned. These must be described in the first part of the certificate. If the flag state has not signed up to the convention and a ship does not possess an MLC certificate, an inspection by Port State Control (PSC) can be expected.



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- PSC inspections

In general, ship inspections done by the PSC are based on international legislation and are carried out in the port where the vessel is docked. According to the International Labour Organization (ILO) guidance for PSC, it is up to the PSC in national ports to conduct inspections on MLC and therefore also in the whole area of food and catering.

The Port State inspector is entitled to come aboard and a control normally ends when the MLC certificate has been found to be in order. If the certificate is not up-to-date or if good reasons are found to believe that the ship does not comply with the certificate, an inspection can be carried out on the ship.

Usually even before boarding, the Port State inspector will have already decided what the inspection will cover.

- Food and catering control

Inspections undertaken by the national foodstuffs authorities, also known as food inspections, are based on the national legislation of the country concerned and are done in the port where the vessel is lying. The foodstuffs authorities in various countries can also undertake inspections.

HACCP and self-assessment

Hazard Analysis Critical Control Points (HACCP) - a method for systematically monitoring and checking Critical Control Points (CCP). CCP are the points in the chain from loading stores to serving which require special attention. A critical control point can be a place or a process where an incorrect action can lead to a food product becoming a health risk for humans. Random sampling of critical control points is ideal when there is a requirement for written documentation for quality assurance of food products aboard.

HACCP and self-assessment are fundamentally the same.

Self-assessment is a system whereas CCP is more or less measurable processes or places in the production and/or in the galley:

- Where there is danger of microorganisms already present in food to multiply.
- Where there is danger of adding new microorganisms to food.
- Where physical or chemical contamination of food can occur.

A self-assessment programme may contain different measurements, for example temperatures when loading stores, during preparation or during other checks on food products aboard.

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Self-assessment gives the shipowner, masters and cooks a good overview of the risks and faults aboard that can arise in handling food products and can show who should take action after checks have been done. Self-assessment may be documented or unwritten.

- Documented self-assessment as part of:
 - Loading stores - when you load your stores aboard (packaging, board, packaging, temperature, expiry date, etc.).
 - Production, preparation (cleaning, surroundings, production, food temperatures, etc.).
 - Checking prepared food.
 - Maintenance of equipment, machinery and interiors.
 - Cleaning and disinfecting (use of detergents, dishwasher water temperature, etc.).
- Unwritten self-assessment but good work procedures and routines for general hygiene aboard:
 - Personal hygiene.
 - Hygiene in the mess and around the galley.

Ships and the daily routines aboard are often very different.

This is why a self-assessment programme should be adapted to the individual shipowner and ship in a way that everyone in the galley can understand, and useful in daily routines.

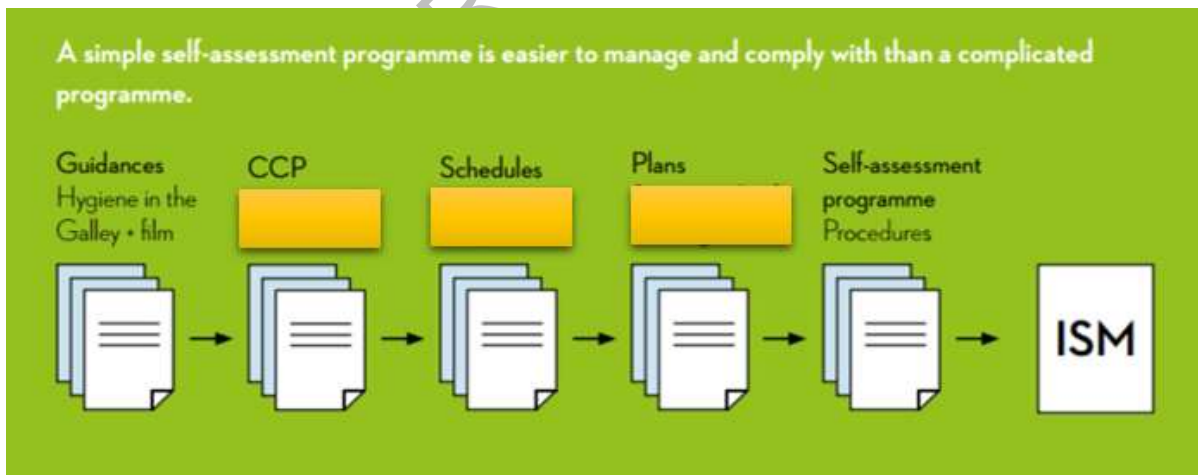
For example, a self-assessment programme may consist of:

(choose what is relevant for you)

- Procedures and instructions
 - Internal guidelines, safety procedures, inspection intervals and allocation of responsibility.
 - Description of good work processes and the decisions on what written self-assessment should cover.
 - Description of the selected CCP's and corrective action.
 - Procedures for revision of the self-assessment programme.
- Schedules

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- Schedule for temperature checks when loading stores and putting them in stock.
 - Schedule for quality checks on provisioning's.
 - Schedule for checking the quality of fruit and vegetable provisioning's.
 - Schedule for complaints about provisioning's.
 - Schedule for visual control of cleaning, temperature monitoring and loading stores.
 - Schedule for action to rectify faults in equipment in storage facilities.
 - Schedule for temperature checks during heating and chilling.
 - Schedule for action to rectify preparation and buffet.
 - Schedule - cleaning completion checklist.
 - Schedule for storing detergents and disinfectants.
 - Schedule for action to rectify faults and deficiencies (maintenance plan).
 - Schedule for annual control and revision.
- Plans
 - Cleaning plan (As add on, you can make a work plan with daily, weekly and monthly duties for the galley assistant).
 - Plan for using leftovers.
- Safety tips
 - Temperature requirements.
 - Food related sickness pathways.



Provisioning – responsibility and requirements for suppliers

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From the moment the ship receives deliveries of food and provisionings aboard, you are responsible for ensuring compliance with the temperature requirements applying to the products.

This is why all foodstuffs should be checked immediately they are received aboard.

If you unfortunately get deliveries of food products that you estimate to be spoilt and inedible or poor eating quality, you should immediately notify the supplier. All frozen goods delivered in bulk may when defrosted, turn out to be of a different quality than expected. You should not accept poor quality but notify your supplier of the poor consignment.

Complain and demand at the very least that products should be replaced or returned without charge. With the agreement of the supplier, you should return goods in the next port and let the supplier pay for the costs of carriage. You could also place goods by themselves in the freezer room, with a "Not for use" sign on them until the ship is in port again.

You should be able to document the name of the supplier of your goods. This means that you should retain delivery notes and receipts. You can also write down the details or save e-mails. Part of self-assessment is that it should be possible to trace goods back to the supplier. If there is a serious outbreak of food poisoning and someone dies, you are responsible for being able to show where the goods were bought. In that way the source of infection can be located and if there are legal proceedings, the person responsible can be identified.

Any self-assessment programme should include the requirements that you can expect your suppliers to comply with.

Suppliers should at the very least comply with the same requirements for self-assessment as the shipowner or ship.

Food producers and suppliers in EU and the US are legally required to comply with standard procedures so that you can ask suppliers the same questions that you asked yourself in drawing up a self-assessment programme aboard. This means that self-assessment can be used as a basis for specifying requirements to your suppliers.

In negotiating with suppliers centrally, shipowners that are provisioning outside the EU and the US can require that supplier for example comply to their own self-assessment/ self-regulation in production/distribution, sensory parameters for eating quality, etc. - requirements set up by the shipowner.

And in the specification of requirements, you can describe the terms and conditions for incorrect deliveries, exchanging and returning goods. For meat products, the company can also ask suppliers whether meat is certified to a GFSI recognized standard, e.g. IFS, GFS or a Global Red Meat Standard. Alternatively, discuss specific requirements with your supplier.



Goods on the quayside are the supplier's responsibility.
 Once the delivery notes have been signed and goods hoisted from the quay, they are the ship's responsibility.

	YOUR CCP'S	YOUR SELF-ASSESSMENT
01 PROVISIONING CHECK AND PRESERVE THE FOOD QUALITY	LOADING GOODS ✓ REFRIGERATED STORES MAX. 8°C (46°F) ✓ FROZEN STORES LESS THAN -12°C (10°F) ✓ FOOD PACKAGING UNBROKEN ✓ EXPIRY DATE ✓ NEW PACKS AT THE BACK ON THE SHELVES ✓ NO STORES ON THE FLOOR	HOTEL MANAGER E: 1 THERMOMETER IN FREEZER ROOM/ REFRIGERATOR BROKEN 1 PRODUCT QUALITY POOR → COMPLAINT, RETURN TO SUPPLIER 1 NO WRITTEN SELF-ASSESSMENT

Regardless of whether provisionings are supplied on contract under a catering scheme or whether the shipowner and ship do their purchasing in port, there are certain issues that you and the responsible master should consider. It is important to ensure that the supplier complies with current legislation in the area of food and that you and the master are aware of the quality requirements when purchasing stores abroad. Pay special attention to delivery of stores that have come a long way and might not meet the temperature requirements. Transport can mean that goods require fast, effective sorting. Goods may also have been packed incorrectly which can reduce their shelf-life and increase the risk of contamination during transportation. This is why provisioning always requires great attention in the ship's self-assessment programme.

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When the ship loads provisionings aboard, it is important to check all the products and use the CCP's in practice. Immediately after delivery of provisionings aboard, you should therefore comply with the ship's self-assessment programme.

CCP's on provisioning for inclusion in the ship's selfassessment could be:

- Check that the temperature of perishable products on receipt of order is maximum 8° C (46°F) (a higher temperature on the outer packaging for a short while such as 1-2 hours is acceptable).
- Check that the temperature of frozen products is less than -12° C (10°F) (a higher temperature on the outer packaging for a short while such as 1-2 hours is acceptable).
- Note the temperature in your self-assessment schedule.
- Observe the surface of goods and look for signs of taint such as unpleasant smell, wrong colour, wrong consistency for fresh meat, for example, and/or slimy surface (sign of decay).
- Check whether the packaging is intact, clean and (for tins) no bulges, and whether the expiry date has passed.
- Check that the quality of unpackaged fruit and vegetables is as expected and that the expiry date has not been exceeded.

How and what CCP's you should check when loading stores must have been decided and described in the ship's self-assessment programme.

When goods have been checked and found in order, they must be stored so they are kept in accordance with the current temperature requirements.

It is important for you to keep an eye on the temperature of food products and that it is not too high when you unpack.

Check that the temperature in the cold and freezer rooms does not rise, so keep doors closed as much as possible.

When all the goods are in place, make it a good habit to check the temperatures in the cold and freezer room and in your refrigerators.

When loading stores, it is also important to:

- Ensure you unpack all boxes and transport packaging.
- Check that food packaging, such as vacuum packed meat is intact.
- Sort and store products separately so they do not contaminate each other, also in the cold/freezer room.
- Distribute goods quickly to their proper places in the freezer and cold room and dry stores.
- Distribute products according to their expiry date. Move products on shelves forward in all rooms and always place the newest products at the back of the shelves.
- Check that no dirty boxes or dirty packaging get into the freezer/cold room or dry stores.



- Never keep anything directly on the deck in the food containers or pans (everything must be raised at least 15 cm (6 inches) above the deck allow space for cleaning).
- Consider heavy seas in bad weather when distributing your goods aboard and secure them according.
- Always reject items you can smell or see that they are not in order.



Do not accept goods that are not intact or have been transported at too high a temperature. Check the expiry date and for signs of poor quality and use self-assessment to impose demands on the supplier.

2.1.10. How to clean and sanitized the galley, mess and stores and why it is important to do so

Design – physical framework and working environment

Storage must be designed so that it is easy to keep order and check expiry dates, and so that goods are easy to access. It must be easy to get around corners and there must be enough space to set things safely aside in the galley. This means there must be enough room for furniture, equipment and materials to be used without the risk of crew get injured. In the galley, it is especially important that there is enough workplaces to keep raw materials separate.

On reviewing your work processes, you may possibly identify critical points where the physical working environment and work processes overload galley personnel, For example heavy lifting in bad positions, extreme exposure to heat every day, monotonous repetitive work, etc. You should also think about any risks in heavy seas and bad weather.

- Storage and the galley

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Not all ships are the same. Size, age and operational performance often dictate the physical framework under which you work. Here are some guidelines which should be followed:

- All store rooms should be organized so there is room to place products on shelves with elevated edges. There must be a suitable distance between the floor and the lowest shelf to make it easy to clean, especially when shelves are deep.
We recommend a minimum of 15 cm (6 inches) depending on the depth of the shelves. The deeper the shelves, the larger the space to allow access underneath with a mop or the like.
- The galley and store rooms should be organized so that they are safe to move around in, even in heavy weather.
- If heavy weather is on the way, it must be possible to prepare and to stow and lash loose items down.
- It is important that the deck is level, clear and non-slip and that there are no differences in level so there is no risk of slipping or falling. In the freezer or cold room, galley and dishwasher room, there is a special risk of slippery floors.
- Work tables for preparing food must either be joined together in their construction or have joints that are sealed to leave no cracks to collect food remnants.
- The surfaces of bulkheads and fittings, portholes and doors must be painted and maintained.
- Minimum one sink. If possible, there should be several sinks with good drainage and an appropriate floor drain.
- If the galley has only one sink (in or outside the galley), it's very important to keep food separated and wash hands between processes. The sink must be cleaned before use and hand washing is necessary before and after work is performed.
- Easy access to the toilet with wash basin, soap and paper dispensers.
- Efficient ventilation and well-proportioned cooker hood.
- Suitable shelving and space for setting aside with rubber nonslip underlay. Egg trays must not be saved and used to absorb grease, put pans on or as non-slip mats.



- Waste bins must be easy to clean, easily accessible and with a foot pedal and flipping lid, for example large pedal bins.

They should be emptied frequently, especially if it is tropical hot. Waste bins must be cleaned regularly and replaced if they are so worn that they cannot be cleaned properly.

- Washing facilities on board for washing dish cloths, tea towels and work clothing every day.



Mess

A high level of personal hygiene is essential for good hygiene in the galley and mess. Good habits can rub off on others, making the majority remember to wash their hands.

Good hygiene issues in and around the mess that you can justifiably point to:

- Always wash your hands with soap after going to the toilet.
- Hang dirty work clothing outside the mess (clean clothing in the mess should be obligatory).
- Always wash hands before a meal.
- Use the antibacterial dispenser in the mess (only works if hands are clean).
- Use the servers at the buffet and not your own fork.
- Sneeze and cough into your armpit and away from the food on the buffet.
- Wash hands for example after smoking if you need to smoke between courses or if disturbed, that is to start again by washing hands, etc.

There are legal requirements for organizing areas where food is stored and prepared:

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- Workplaces, machinery and equipment must be placed so that they prevent grease from building up, contact with poisonous material and the formation of condensation and mould.
- Interiors must be smooth, washable and non-toxic and the quality should be good enough to tolerate regular cleaning and disinfecting.
- It must be as easy as possible to clean and disinfect. The gallery, mess, dry stores and other rooms must be designed so that it is easy to keep them clean and tidy, also after heavy seas.
- It should be possible to carry out all duties safely and without galley personnel being physically subject to extreme loads, awkward working positions and monotonous, repetitive work.
- The mixer and meat slicer must be fitted with safety guards.
- Conditions should promote good hygiene practice so as to avoid food contamination between food products and the use of tools and equipment, water, ventilation and exhaust hood, including personal hygiene and pest control.
- It must be easy and practical to maintain the correct temperatures before, during and after cooking and easy to check while cooking.

Cleaning and disinfecting

It must be easy to clean and disinfect. So the galley and mess should be practically organized. Deck, tables and bulkheads should have smooth surfaces that are easy to clean and they can tolerate frequent washing and disinfection.

There are not detailed regulations for how to carry out cleaning and disinfecting. The responsible person in the galley decides how it should be done and described the systematic routines in the self- assessment programme. However, it is important for utensils and for example mixers and meat slicers to be cleaned and disinfected at least once every working day or immediately after use.

For the following reasons, it is necessary to have high standards of cleaning:

- Food remnants can contain harmful bacteria and must be removed to prevent food poisoning.
- To prevent pests from arriving.
- To cut the risk of foreign bodies physically contaminating food.
- To promote awareness of hygiene amongst galley personnel and crew.

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- To create a pleasant working environment and to take the lead by setting a good example for the rest of the crew.

Always consider which detergents you use in your daily cleaning. If possible, but and use detergent which do not put the environment and your health at risk. NEVER use products if you do not know whether they could be harmful to health. If the product comes with a datasheet, read it carefully before use. Save all datasheets for your cleaning and the use of products and disinfectants. You can also find the products in the ship's chemical database Health and Safety at sea.

Cleaning and disinfecting workplace, machinery and equipment should done in six stages:

1. Remove all visible dirt for example with a scraper, brush or broom with scraper blade (for the deck). Use gloves.
2. Use hot water with a measured dose of suitable detergent to remove dirt. Read the directions on the datasheet/label.
3. After cleaning, wash down the areas with clean water a take care to remove all soap remnants.
4. Use disinfectants at the correct dilution. Follow the directions on the packaging.
5. Wring out a clean cloth rinsed in clean water with disinfectant to dry off surfaces so there are not detergent residues on tables and surfaces that are in direct contact with food. Cleaned surfaces should be stored.
6. Your detergents and disinfectants should be stored separately from food to prevent contamination.

CCP's for cleaning in the ship's self- assessment could be:

- Clean the meat slicer thoroughly –taken it apart as much as you can and then disinfect it.
- Clean everywhere thoroughly and use how water and suitable soap.
- Follow the directions for mixing strength, overdosing has not effect, pollutes the environment and costs money.
- Avoid mixing different detergents – this can cause poisonous vapours – check the database.
- Use the right detergent design to dissolve the dirt when washing the floor.
- Always wash down the deck with clean water to remove detergent and use a squeegee to remove the water.
- Remember that you should only use chemical disinfectants on clean surface since the effects is lost on dirty surfaces.
- Use boiling water where this can replace chemical disinfectants, for example on chopping boards.
- Consider using a steam-cleaner on larger areas that can tolerate being clean with steam.
- Never use stronger detergents that necessary.

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- Ensure you frequently clean and disinfect all storage rooms such as dry stores, cold and freezer rooms, for example before each time the ship arrive at port.
- Ensure you replace dishcloths and tea towels daily-run the washing machine regularly so you always have clean dish cloths and tea towels available.
- Ensure you clean cooler hoods and grease filters regularly-dirty forms the perfect place microorganisms to grow. Unmaintained cooker hood reduces suction and forms condensation that can drip down onto food.
- The mess and galley are generally should also be thoroughly cleaned.
- Draw up cleaning plan for the galley and follow it. Large ships with several galley staff can draw up a checklist with "who does what" in the self-assessment programme as documentation.

Biofilm

Thorough daily cleaning with suitable soap and water is general sufficient. However, surface and places that are in daily contact with food can be more problematic. These surfaces should also be cleaned with a disinfectant to kill the bacteria effectively. But disinfectants only kill bacteria that are exposed to disinfectant.

If they are not killed, bacteria can unfortunately encapsulate themselves and hide behind a slimy layer called biofilms. Biofilms, consisting of bacteria, food residues and the slimy layer can prevent the disinfections contacting the bacteria.

Biofilms arise when food residues are not removed. A thin layer is sufficient for bacteria to reproduce and build up the slimy layer, which the bacteria use to protect itself from being killed. It is sticky and without effective cleaning, it really sticks to surfaces such as stainless steel, plastic utensils and wooden chopping board, and for example the interior of meat slicers and rubber seals and on all surfaces that are not cleaned daily, such as corners, joints, cracks and nooks. Biofilms cannot be seen with the naked eye and can appear on surfaces that look perfectly clean. The danger of biofilms is that they can contain many bacteria that under normal conditions reproduce in a very short time. There is no danger of food contamination as long as the bacteria remain encapsulated. But very little is required to break the biofilm, thus enabling the bacteria to be transferred to clean food.

Biofilms can be ticking bombs for contamination and are thus a risk for food safety. Remember to thoroughly clean and disinfect EVERYWHERE in the galley, that is all surfaces that clean, all corners, the floor, refrigerators, freezer and store rooms, etc.

Cleaning procedures

Planning and undertaking systematic cleaning make it possible to always maintain a high standard of hygiene aboard, especially in the galley area. Systematic cleaning can meet all the requirements for the galley self-assessment programme. Which is why everyone who does the cleaning should have signed up to a written cleaning plan.

As the responsible person in the galley, you should ensure that you:



- Introduce, carry out and maintain a cleaning plan for all areas and all equipment relating to the galley and mess.
- Communicate the plan and explain it so that everybody working in the galley understands it.
- The rest of the crew have an understanding of cleaning.

You could for example post the cleaning plan on a notice board in the mess or corridor outside so that everyone can see when cleaning is done.



2.1.11. How to handle food during preparation

Some food products are highly perishable and therefore require greater attention, especially during preparation.

Clean chopping boards, knives and a high level of personal hygiene are essential.

The following food products require a high level of hygiene and extra attention:



- Raw meat taken from refrigeration is highly perishable because it very quickly offers perfect conditions for bacteria to grow. In just a short while, bacteria in a hot galley can turn into a bacteria bomb.
- The same applies to raw poultry. Special attention should be paid to the raw meat, because in the production during slaughter, offal can contaminate meat and thus transfer dangerous bacteria. Raw meat must always be prepared under special hygienic conditions by always using clean chopping boards, knives, and washing hands carefully during preparation.
- Fresh fish must always be keep on ice or at 2°C (35°F) and for a maximum of 24 hours unless it is frozen fish. Shellfish and seafood require similar precautions.
- Minced meat and minced fish have a greater surface area. When meat and fish are minced and finely chopped, it gets easier spoiled because the bacteria have a greater surface area to multiply on. All minced meats and fish must only be kept for a maximum of 24 hours at 2°C (35°F). Mixed forcemeat should be used immediately and never left to the next day.
- Marinated raw meat must always be kept at a maximum of 5°C (41°F). Marinade can be used to tenderise meat orgive it extra flavour but only use stainless steel or hard plastic bowls, not plastic bags. Marinade containing for example lemon juice and vinegar are acidic which reduces the pH at the meat surface. The acid makes it difficult for bacteria to multiply. But only acidic and very sugary marinades provide conservation. Do not reuse marinades for other dishes.
- Eggs must always be kept separate from other foods because there can be bacteria on the shells and inside the eggs. Eggs require a high degree of hygiene, so always wash hands thoroughly if using fresh eggs and after touching them. All dishes containing fresh eggs must be heated to at least 75°C (167°F). Boiled and fried eggs served with liquid yolks should only be cooked using eggs from countries, which take active measures against salmonella. If there is doubt about eggs' country of origin, always use sufficient heat so that the yolk sets.
- Pasteurized eggs should replace raw eggs in dishes that may not have been cooked through. Do not serve dishes in which egg mixtures are liquid but ensure that all eggs have been cooked to 75°C (167°F) and have set. If eggs are in a recipe, for example for an uncooked dessert, always use pasteurized eggs. If it is not possible to procure pasteurized eggs, you should avoid serving uncooked desserts.
- Vegetables with visible dirt should be prepared by them-selves and preferably in a sink reserved for the job. If there are enough sinks in the galley, then use the same one for prepping every time. Or set aside a sink for prepping so you are certain that for example dirt from root vegetables and the intestines of fish do not come into contact with fresh ingredients. Remember also to clean the sink between cleaning vegetables and other foods such as fish. Always rinse fresh fruit and vegetables under running water before use. The fact that it comes packaged in plastic provides no guarantee.

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It can be hard on the hands always to be washed and touching food. Some food can cause allergic reactions, such as citrus fruits, shellfish, fish, meat (especially when vacuum packed) and certain vegetables. Reactions may be burning sensation, rash or itching. Detergents and disinfectants can also cause allergies.

CCP's for prepping in the ship's self-assessment could be:

- Thorough hand washing and removal of jewellery and wristwatches.
- Thorough hand washing when switching from one product to another, for example after having cracked eggs.
- Clean dishcloths and tea towels and clean work clothing.
- Prepare food as close to the time of serving as possible.
- Only take food out of the refrigerator when it is required.
- Use clean machinery, chopping board and knives, and paper for drying after washing.
- Separate your raw products while prepping, as well as all your work processes, and for example keep soiled and clean ingredients separate.
- Use different coloured chopping board for example red for meat, blue for fish, green for vegetables and yellow for poultry, and possibly brown for bread, and white for other things.
- Use minced meat and fish within 24 hours (must be correctly stored before use).
- Use forcemeat immediately, and if interrupted for example by provisionings arriving aboard while mixing it, always put it in the refrigerator.
- Use pasteurized eggs when mixing with milk to make custard, etc., or in uncooked desserts needing raw eggs.
- Always defrost food in the refrigerator. Frozen products that have been frozen in bulk take a long time to defrost.
- Defrost meat covered and in a pan at the bottom of the refrigerator so that meat juice does not drip on to other products and always cook food immediately after defrosting.
- Do use the microwave to defrost but always cook food immediately after it has been in the microwave. It must not go back into the refrigerator or stand at room temperature after defrosting in the microwave.
- Plan a day or two in advance when meat has to be defrosted or marinated. Only use food-grade packaging to marinate.
- Keep as much dirt out of the galley as possible, such as soiled packaging and scrub soiled vegetables separately in the same sink every time, to avoid dirt to be spread in the galley.



Heat treatment

When cooking, you must keep temperatures under control.

So make sure you always have surface thermometers and one or more roasting thermometers to hand (remember they must be cleaned and disinfected every time you use them; consider using alcohol wipes). If you lack thermometers in the galley or they are broken, report it immediately to the master for new ones to be ordered. Thermometers are essential for being able to check your food products aboard.

CCP's for cooking in the ship's self-assessment could be:

- All raw products that are being cooked must reach a minimum core temperature of 75°C (167°F).
- Always use a roasting thermometer and ensure that whole product or dish is heated to the core temperature throughout.
- Stir the sauce or stew to distribute the heat when measuring the temperature.
- All food that are being reheated must be heated to a core temperature of at least 75°C (167°F).
- Of reheating food in the microwave oven, only use packaging that is approved for the microwave.
- Regardless of the type, all thermometers must be calibrated every six or twelve months.



Exceptions to the rule. Bacteria are normally only to be found on the surface of a whole piece of meat, such as roast beef.

The core of a whole piece of meat is generally sterile and you can therefore roast the meat and leave it medium done inside although pork must never be eaten raw. When preparing pork, the meat juices should preferably be clear and the juices should not be raw and pink. If roasts served rare such as roast beef are preferred aboard, this is something you should decide on together with the master and write up in your self-assessment programme. We do however still recommend being careful and that you trust your supplier totally.



Bacteria die on being heated to at least 75°C (167°F), but the spores are still in the food. They can multiply if the right conditions for oxygen, water and temperature unfortunately are, or become, ideal.



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SELF-ASSESSMENT- Temperature monitoring for deliveries and storage		Note temperature and initials																												Ship: _____ MM/YYYY: _____	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28		
CHECKS ON DELIVERY DAY																															
Chilled goods on loading < 8°C (46°F) Frozen goods on loading < -12°C (10°F) (only delivery day)																															
Daily check:																															
Cold room < 5°C (41°F) (perishables, raw ingredients and cooked food)																															
Freezer room < -18°C (0°F) (frozen products)																															
Cold room < 5°C (41°F) (perishable food, raw ingredients and cooked food)																															
Refrigerator 1																															
Refrigerator 2																															
Refrigerator 3																															
Other storage																															
Fruit and vegetables <13°C (55°F)																															
Done by (Initials)																															
Remarks re. fluctuations or mechanical failure																															

Advisory example of self-assessment schedule (temperature chart)



Sliced cold cuts must never reappear on the buffet so only make small portions at a time. Sliced cold cuts last a shorter time than whole pieces of ham, etc.



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SELF-ASSESSMENT- Temperature checks		Tick the date and initial																												Ship: _____ MM/YYYY: _____					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28						
Heating/reheating min. 75°C (162°F) on cooking (enter product or dish, e.g. today's special) - CHECK AT LEAST WEEKLY																																			
Keep hot >65°C (149°F) on the buffet (enter product or dish e.g. today's special) - CHECK AT LEAST WEEKLY																																			
Keep cold < 5°C (41°F) on the buffet (enter product or dish e.g. cold cuts) - CHECK AT LEAST WEEKLY																																			
Chilling from hot <10°C (50°F) after buffet (from 65°C (149°F) to 10°C (50°F) in max 3 hrs) (enter product or dish e.g. today's special) - CHECK AT LEAST EVERY SECOND DAY																																			
Done by (Initials)																														Approved by _____					
At month end																																			

Advisory example of self-assessment schedule (temperature chart)

Cold table

Most ships get salted, smoked and cooked meat products, which have either already been sliced or packed as whole pieces and supplied frozen. You cannot check them visually when they come aboard. So it is extra important to check these goods when they are defrosted. Deliveries of such products are therefore always a matter of trust.

When working with cold cuts, if possible you should always arrange them so the different types of cold cuts do not touch each other. Proper hygiene and good hand washing are important, for example, when moving from arranging fresh vegetables to cold cuts, especially in a hot galley. All the routines working with cold cuts should be written into your self-assessment programme.

CCP's for the cold table in the ship's self-assessment could be:

- Prepare all your cold dishes, sandwiches, bread and butter, etc., as close to the time of serving and keep as cold as possible.



- Switch between the different coloured chopping boards and clean them as you proceed. Switch to a clean knife when you use a chopping board of another colour.
- Separate your work processes depending on the product and type of food.
- If you use a meat slicer, it must be completely disassembled and cleaned between each work process, for example if you have sliced cold cuts and then use the machine to slice cucumbers, it must be washed down. Never let it stand unwashed in a hot galley all day and then use it again.
- Use the smallest portion possible and never mix “new and old” when filling dishes and bowls.
- Always use pasteurized eggs when making dessert which need raw eggs. If you make for example dessert cream, it must be chilled as quickly as possible.
- When using fish and shellfish in dishes, make sure you comply with the use-by date.
- Never reuse food be heated to at least 75°C (167°F).
- Correct use of leftovers for example you can use salmon leftovers in a flan and it is heated up to a core temperature of 75°C (167°F). This ensures that you kill all the microorganisms but remember that the spores are still in the dish.

2.1.12. How to serve food safely

Buffet - heating, arranging and serving food

Regardless of whether food is being served on the buffet (often on larger ships) or as in an ordinary household (often on smaller ships), there are clear rules for how food should be kept hot at a certain temperature when it is on the table for some time. For example, if bowls are served on a table in the mess, it is important that food does not stand waiting for too long.

CCP's in the ship's self-assessment could be:

- All food should be heated to 75°C (167°F) for serving. You must be able to document this in your self-assessment programme when you have decided to take notes every time or if you have decided to take random samples. Be extra careful with food that can cause problems, for example if you serve flans made with fresh egg.
- Use a probe thermometer to take random sample. Be extra careful with food that can cause problems, for example if our serve flans made with fresh egg.
- Use a probe thermometer to take core temperatures, and in a stew, for example, stir it well to distribute the heat.
- You can either use hot plates or water baths on the buffet.
- All hot food on the buffet must have a constant temperature and note of at least 65°C (149°F). Check the temperature and note it in your self-assessment chart.
- If wiping off spills on the edge of dishes and bowls, use paper and not a dishcloth.

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- Make sure there are sufficient serving tongs, spoons, etc., so that crew do not touch the food or dishes. Maintain good hygiene at meal times and at table.
- If something gets spilt, wipe it up quickly and thoroughly.
- Never mix “new and old” and use small bowls, also to reduce food waste.
- Do not keep leftovers. Leftovers can only be reused if reheated to at least 75°C (167°F). For example, if reheating a stew, it must be heated to 75°C (167°F) before serving.
- Only use leftover cold cuts if they can be heated to 75°C (167°F). Cold cuts are often unsuitable for reheating when they have been a long time on the buffet, for example because the vitamins will have degraded.
- Only save leftovers in food-grade packaging. Never reheat leftovers in used packaging.
- Limit the time for buffet food should only stand out for a maximum of three hours from being taken from and replaced in the refrigerator. This requires that the hot food has been kept at a minimum of 65°C (149°F) the whole time and the cold food at a maximum of 5°C (41°F).
- In your self-assessment programme, you should decide how to handle leftovers from the buffet. Consider making a procedure for correct storage and reuse of leftovers.
- If someone postpone his meal, prepare an already chilled portion on a plate and reheat it in the microwave if you have one aboard.

2.2. Personal hygiene

2.2.1. Personal hygiene

Anyone who prepares meals on a daily basis must have proper personal hygiene. Ensure you have clean working clothes every day and remove all personal jewellery, wristwatches and bracelets so as not to transfer dangerous bacteria to food. Shower daily and take the lead in setting a good example. If you are ill, you must not work with food, even though you actually feel you could. You could then infect others and put the other crew aboard at risk.

Behavioural critical control points (CCP) for inclusion in the ship’s self-assessment could be:

How to ensure good personal hygiene in the galley:

- Always wash hands before starting to work with food in the galley.
- Always wash hands between work processes, for example between slicing vegetables and preparing chicken.
- Wash hands after you have sneezed or coughed into your hands (cough into your arm/arm pit).
- Always wash your hands thoroughly after going to the toilet.
We recommend an antibacterial dispenser at the entrance to the galley and mess.
- Consider using food-grade latex gloves but you still need to wash your hands.
- Wash hands when you switch from cooking to serving.



How to wash your hands before preparing food for others:

- Wet the front and back of your hands before adding soap.
- Spread the soap thoroughly.
- Wash thoroughly for at least 40 seconds.
- Rinse the soap off.
- Use paper to dry your hands.

You have a personal responsibility for good hygiene.

You can ensure this by:

- Being careful with your personal hygiene, especially by washing hands.
- Changing your work clothing every day.
- Being aware of cuts, sores, etc.
- Being aware of your own health.

You must basically not work with food if you have sores, cuts, infected fingers or boils. If you have, discuss with the master what you should do. You could perhaps work if you use suitable food-grade gloves which give sufficient protection.

When working with food, using latex gloves is no substitute for good hand hygiene.





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How to handwash?

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WASH HANDS BEFORE AND DURING FOOD HANDLING - SERVING TOO

Duration of the entire procedure: 40-60 seconds



0 Wet hands with water;



1 Apply enough soap to cover all hand surfaces;



2 Rub hands palm to palm;



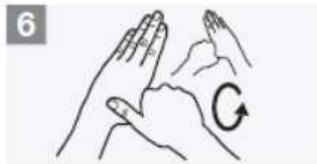
3 Right palm over left dorsum with interlaced fingers and vice versa;



4 Palm to palm with fingers interlaced;



5 Backs of fingers to opposing palms with fingers interlocked;



6 Rotational rubbing of left thumb clasped in right palm and vice versa;



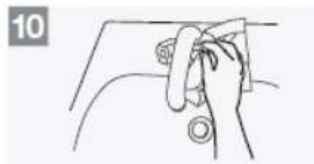
7 Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa;



8 Rinse hands with water;



9 Dry hands thoroughly with a single use towel;



10 Use towel to turn off faucet;



11 Your hands are now safe.

2.2.2. Skin infections

Rashes

Rashes are common with food allergies. The two most common rashes that can develop on your cheeks are hives and eczema. Hives can develop on anyone's face, while eczema is a pre-existing skin condition. If hives develop on your cheeks they will slowly migrate to other parts of your face and body. Hives appear as welts and are very itchy and red. They are typically harmless, unless they form in your inner ear or throat. Eczema is a chronic skin condition that can be triggered by a food allergy. Eczema on your cheeks will develop as blisters that weep and crust over. They are itchy and will spread when scratched.



Certain foods are more likely to trigger an eczematous reaction than others. Cows' milk, soy, fish, eggs, nuts and wheat are the most likely triggers. Eczema manifests itself as a pimple-like bump that is white in the middle with red around. It is often bothersome, itchy and painful and commonly appears on the neck, face and head.



Other Symptoms

Food allergies will not just cause a rash on your cheeks, but will cause various symptoms to develop. Not everyone develops the same symptoms or to the same severity. The most common symptoms from a food allergy include shortness of breath, wheezing, chest pain, coughing, diarrhea, nausea, vomiting, abdominal pain, cramping, nasal congestion, sneezing and a runny nose.

Anaphylaxis

In rare cases, a food allergy can cause anaphylaxis, a severe, life-threatening allergic reaction. Hives on the face are a common sign of anaphylaxis if hives is accompanied with facial swelling and an increased heart rate.

Fruits and Vegetables

Fresh fruits and vegetables may lead to a rash on your face, especially if you are susceptible to pollen allergies. Some fruits and vegetables have pollen-like substances inside of them. For example, melons contain substances close to ragweed; apples contain substances closely related to tree pollen. If you have allergies to either melons or apples, they may manifest themselves as a rash on your face after ingestion.



Food Additives

Certain food additives such as dyes, preservatives or thickening agents may induce an allergic reaction in some. Food additives are man-made substances that are added to foods that can enhance the flavor, look or shelf-life. These include sulfites, aspartame, parabens, tartrazine, monosodium glutamate (MSG), nitrates, butylated hydroxytoluene (BHT) and benzoates.

Parabens, benzoate, BHT and nitrates are preservatives. Aspartame, an artificial sweetener, and MSG enhance the flavor of foods. Sulfites and tartrazine enhance the color and look of foods. Though a reaction to a food additive is rare, symptoms can range from a rash on your face to full-blown anaphylactic shock. If you suspect an allergy to a food additive, the only cure is to omit the additive from your diet.

Symptoms of food-induced skin allergic reaction

Target Organ	Immediate Symptoms	Delayed Symptoms
Cutaneous	Erythema Pruritus Urticaria Morbilliform eruption Angioedema	Erythema Flushing Pruritus Morbilliform eruption Angioedema Eczematous rash

2.2.3. Gloves

Use of Gloves

If used correctly, gloves can help protect foods against cross-contamination. If used incorrectly, however, they can spread contamination just as easily as bare hands. Health departments in some localities require the use of some kind of barrier between hands and any foods that are ready to eat—that is, foods that will be served without further cooking.

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Gloves, tongs, and other serving implements, and bakery or deli tissue can serve as barriers. To be sure gloves are used correctly, observe the following guidelines.

Guidelines for Using Disposable Gloves

1. Wash hands before putting on gloves or when changing to another pair. Gloves are not a substitute for proper handwashing.
2. Remove and discard gloves, wash hands, and change to a clean pair of gloves after handling one food item and before starting work on another. In particular, never to fail to change gloves after handling raw meat, poultry, or seafood. Gloves are for single use only. Remember the purpose of using gloves is to avoid cross-contamination.
3. Change to a clean pair of gloves whenever gloves become torn, soiled, or contaminated by contact with an unsanitary surface.

Kinds of food preparation gloves:

There are three main kinds of food preparation gloves, the advantages of which are outlined below.

- Disposable Gloves are gloves designed to be worn and removed frequently. These are usually made out of latex, nitrile, vinyl or polythene. Nitrile is the strongest, but will fall apart quickly when cut. Latex is the most common, but is unsuitable for those with latex allergies. Vinyl provides more dexterity, but is quite weak. Polythene is the cheapest, but is also the weakest and offers the least defence. Which glove you need really depends upon your personal preference.
- Heat Resistant Gloves are basically oven gloves; gloves designed to resist heat. These are used to handle hot items such as baking trays straight from the oven and are designed to protect you against burns.
- Chainmail Gloves are gloves made from chainmail and offer an incredibly high level of cut protection, making them perfect for use during butchering meat and protecting against the high risk of injury it involves.

When should wear food preparation gloves?

There is no clear consensus on whether or not disposable food preparation gloves should be worn completely throughout the food preparation process. However, there are several key points in the food preparation process where it is clearly a good idea to wear these kinds of food preparation gloves.

One such point is serving food to customers. You'll be frequently handling money, which is a frequent carrier of disease and germs, so while you're handing food and putting it into a bag or container you should wear food preparation gloves to minimise the risk.

Another key point in the food preparation process where it is wise to wear food preparation is while wearing a dressing on your hand to cover a cut or injury. Wearing a glove to cover



the dressing reduces the risk of the dressing falling off or your blood leaking out of the dressing and into the food you are working with.

When butchering meat or shucking an oyster you should wear a chain mail glove. This reduces the chance of causing serious injury to yourself. Similarly, when you are handling hot items you should always use a heat resistant glove such as an oven glove, to ensure that you do not burn yourself.

You should change your gloves regularly. If working with customers, you should remove your glove after handling food but before handling money and replace it with a new one each time. When working in the kitchen you should also change your gloves regularly, especially when going from dealing with raw food to cooked food.

Remember to wash your hands before you put gloves on and after you take them off. Gloves should never be used as an alternative to hand washing.



2.2.4. When to stop working for the sake of the health of others

What must a food handler do if she or he is sick?

- If a food handler has a food-borne illness

Food handlers must tell their work supervisor if they have any of the following symptoms while they are at work - vomiting, diarrhea, a fever or a sore throat with a fever. The only exception to this is if the food handler knows that he/she has these symptoms for a different reason. For example, a food handler may be vomiting at work because of pregnancy.

Food handlers must also tell their supervisor if they have been diagnosed as having or carrying a food-borne illness.

As well as reporting the food-borne illness, the food handler must not handle any food where there is a chance they might make the food unsafe or unsuitable because of their illness. Also, if a food handler stays on at work to do other work, he or she must do everything reasonable to make sure that they do not contaminate any food.



Note: Illnesses that can be passed on through food include Hepatitis A and those caused by giardia, salmonella and campylobacter.

- If a food handler has skin injuries or sores or is otherwise unwell

Food handlers must tell their supervisor about any infections or conditions like a cold or other problem that may result in discharges from their ears or nose or eyes if there is any chance that they might make food unsafe or unsuitable for people to eat as a result of their condition.

Also, if they continue to handle food with such a condition, food handlers must do whatever is reasonable to make sure that they don't contaminate any food. For example, an infected sore could be completely covered by a bandage and clothing or by a waterproof covering if on an area of bare skin, and medication can be used to dry up discharges.

- If a food handler knows or suspects he or she might have contaminated some food

Food handlers must tell their supervisor if they know or think they may have made any food unsafe or unsuitable to eat. For example, jewellery worn by a food handler may have fallen into food.

Returning to work, after an illness

In most cases of infection, bacteria and viruses can still be found in someone's faeces after symptoms stop. It is therefore important that Captain continue to exclude food handlers for a period of time after this. 48 hours is the recommended length of time. This is counted from the time that symptoms (mainly diarrhoea) stop of their own accord or from the end of any treatment of the symptoms with medicine such as anti-diarrhoeal drugs (if they are used). For example, symptoms end from 5pm Monday, so the person can safely resume work from 5pm Wednesday. You can count from the time of the first normal stool if you aren't sure when symptoms ended.

If the individual is diagnosed with a specific infection, this may require different action.

If the cause has been confirmed as non-infective after they were excluded then they can also return.

It is reasonable to presume that a single bout (e.g. one loose stool) or incidence of vomiting is not infectious if 24 hours have elapsed without any further symptoms and this is not accompanied by fever. In this case, as long as there is no other evidence to suggest an infectious cause, the person would only pose a very low risk of being infected and could resume work before the 48-hour limit. Extra care should be taken over personal hygiene practices on return to work though, especially hand washing. A different approach may be needed if their work requires extra precautions to protect very vulnerable consumers, such as people who are already ill or young children.



Small numbers of bacteria and viruses can continue to be found in someone's faeces for weeks or more after they have recovered from an infection. However, this is unlikely to pose a risk as long as good hand washing and good hygiene practices are carried out when at work in a food business. Only in some special cases is it necessary to require negative faecal samples before returning to work, to ensure the infection has gone.

Contamination of food can happen at any point during its production: growing, harvesting, processing, storing, shipping or preparing. Cross-contamination — the transfer of harmful organisms from one surface to another — is often the cause. This is especially troublesome for raw, ready-to-eat foods, such as salads or other produce. Because these foods aren't cooked, harmful organisms aren't destroyed before eating and can cause food poisoning.

3. Food storage

3.1. How food should be stored and why it is important to keep good orders in stores

Storing and rotating food properly ensures that you are always serving food in the freshest and safest way. After you inspect your food delivery, be sure to store frozen foods in the freezer first, then refrigerated foods, and dry storage items last.

Maintain Proper Temperatures

Keep these temperatures in mind when storing food:

- Frozen foods must maintain a maximum internal temperature of 0°F or less
- Refrigerated foods must maintain a maximum internal temperature of 41°F or less
- Dry storage items should be stored between 50-70°F

An easy way to remember this is to check the temperature of stored food and storage areas at the beginning of each shift.

How to Rotate Food Product

After you've stored the items, rotate your existing stock using the First-In First-Out (or FIFO) method. This ensures that you are serving items stocked first before items stocked more recently. The FIFO method applies to frozen, refrigerated, and dry storage items. Here are some steps to follow the FIFO method:

- Identify the expiration date on the food
- Store items with the earliest expiration date in front of items with later dates
- Once on the shelf, use the items stored in front first

Check Expiration Dates and Storage Areas

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Throwing away food that is past the expiration date is also important in preventing foodborne illness. In addition, storage areas need to be kept clean and dry. These areas of the kitchen where food can be stored or served should be kept clean on a regular basis:

- Floors
- Walls
- Shelving (in coolers, freezers and dry storage)
- Storage bins/containers
- Carts/dollies
- Trays



Figure 1. Do not buy or use infant formula or baby food after its "use by" date.

Home dating of food

Example of product dating

Fruit and vegetables

Some vegetables, such as cauliflower and broccoli deteriorate quickly, so do not store them for too long. Here are some other guidelines for storing fruit and vegetables:



- Store vegetables such as carrots and potatoes in bins on racks or shelves and let the air flow freely around them. Keep potatoes in a cool, dark place, away from direct sunlight.
- Put green vegetables on a well-ventilated rack and keep salad leave in the packages they came in.
- Seeds and stems, such as peas and beans, should be stored in a cool place.
- Fruit and fruit vegetables, such as tomatoes, are stored between four and seven degree Celsius. Store them on trays in a cool room or a fridge. Never stack or crush them, as they bruise very easily.
- Do not freeze fruit as it does not freeze well.
- Fungi, such as mushrooms, are stored in their delivery containers in a cool room. They bruise easily, so handle them with care and never stack them. Keep the temperature between four and seven degrees Celsius.

Eggs

Store eggs in the fridge at temperature ranging from one to four degree Celsius. Keep them away from food with a strong smell as at their shells are porous, and the smell could affect their taste.

Dairy products

- Dairy products, such as milk, butter and yogurt, must go straight in the fridge after delivery to prevent bacteria from starting to grow.
- Butter and cheese are stored below five degree Celsius.
- Cheese are always kept wrapped, so that they do not dry out.
- Do not keep cheese for too long, as the quality will deteriorate.
- Check the packaging of all dairy products and reject any spoiled items

Bread, cakes and biscuit

Bread, cakes and biscuit do not usually need to be stored in the fridge, except from moist cakes follow this guidelines:

- Store bread in a salad containers to stop it from drying out. Use old bread first.
- Bread products freeze well. Serve them out hot, once they have been defrosted.

Cans

Cans are used to preserve food in a liquid containing salts or sugar. Cans can usually be stores for up to five years, depending on what type of food they contain.

Follow these guidelines when storing them:

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- Never stored canned food at a high humidity or high temperature. The cans could rust and the food became contaminated.
- Do not accept or store any damaged cans.
- Store canned processed meat in a store for dry goods.
You can refrigerated the meat for a while before serving it to make it easier to slice.
- Store leftovers from cans in the fridge in a covered container made of plastic, glass or stainless steel.
Never use aluminium containers as aluminum is poisonous.

Note: Never buy or use a can with a bulge. A bulge means that gas has built up inside the can because the food has gone bad.

Bottles and jars

When you use bottles or jars for storing food, follow these guidelines:

- Glass bottles or jars must not be cracked or chipped, as this lets air in, which will allow bacteria to grow. Also, small particles of glass may get into the food.
- The seal of the lid must not be broken or damaged.
- Store bottles and jars away from sunlight.
- Once you have opened a glass bottle or jar, store any leftovers in the fridge.
- You can only re-use bottles and jars after sterilizing them.

Packets and boxes

When packets and boxes are delivered, check that they are not torn or damaged. Reject them if they leak or are broken, as the food may be contaminated.

Note: Check for signs of cockroaches, silverfish or other insects in boxes and packets.

Bags and sacks

Bulks food are usually packaged in bags or sacks. Store bags and sacks on pallets off the surface of the floor in a well-ventilated areas. Keep the humidity and the temperature low to keep the bags and sacks dry.

3.2. How to handle refrigerated and frozen products

Refrigerator and freezer temperatures do not destroy pathogenic or spoilage microorganisms, but freezer temperatures do stop their growth.

Even when frozen foods are stored properly, they will lose color, texture, flavor, and nutritional value with excessive storage time, although they will not cause food-borne illness. Preparing foods for frozen storage requires some care.



To optimize your refrigerator conditions:

- Maintain your refrigerator between 34°F-40°F. Thermometers are available to monitor the temperature inside your refrigerator.
- Keep some foods, including milk, meats, and leftovers, colder than others. The coldest part of the refrigerator is usually the area nearest the freezer compartment, but a refrigerator thermometer will provide an accurate check for each appliance.
- Food placement in the refrigerator affects air circulation and efficiency. Don't stack foods tightly, and do not cover refrigerator shelves with foil or any material that prevents air circulation from quickly and evenly cooling the food. Refrigerators with glass shelving have air spaces at the back for circulation that should not be blocked.
- Wrap food with appropriate plastic or foil wraps, or use airtight containers to reduce transfer of odors between foods.
- Wrap raw meat and poultry securely and place it in a tray or pan to prevent leaking that would contaminate other foods.
- Store raw meats in a separate location from cheeses or ready-to-eat meats, such as deli meats. The meat drawer should be designated for either raw meats, or ready-to-eat meats – not both. This practice helps to minimize cross-contamination between raw meats, which frequently contain pathogens, and ready-to-eat foods, which by definition should be pathogen-free.
- Clean the refrigerator to remove spills and spoiled foods that provide a place for bacteria to grow.



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To optimize your freezer conditions:

- Keep your freezer at 0°F or below (-10°F to -20°F is best) to maintain the quality of frozen foods. At temperatures between 0°F and 32°F, food quality deteriorates more rapidly. If your freezer unit cannot maintain 0°F, do not plan to store frozen foods for the maximum suggested storage time. Fluctuating freezer temperatures that occur in self-defrosting freezers to clear ice build-up may also reduce food quality.
- Use moisture-proof, freezer-weight wrap. Examples are foil, freezer bags, and freezer paper.
- Label and date all packages.

Solving refrigerator and freezer odors. If food has been allowed to spoil in a refrigerator or freezer, the strong odors may be extremely difficult to remove. If mold gets into the insulation, the refrigerator may be impossible to clean. Some general recommendations include:

- Clean the appliance with a gentle household cleaning solution and water.
- Use a bleach solution (one tablespoon chlorine bleach per gallon of water) to rinse inside surfaces.
- Unplug the unit and leave the door open for a day or two to air it out.

If the odor remains, you may want to try one of the following methods:

- Place trays of activated charcoal, clean kitty litter, or baking soda on the shelves of the refrigerator or freezer. Run the appliance empty for two or three days. Activated charcoal can be purchased from stores that sell aquarium and terrarium supplies.
- Spread freshly ground coffee on cookie sheets in the refrigerator or freezer, close the door, and run the appliance empty for two or three days. A slight coffee odor may remain, but will disappear after washing and rinsing.
- Pack each refrigerator or freezer shelf with crumpled newspaper. Set a cup of water on the top shelf, or sprinkle the newspaper with water. Allow the refrigerator or freezer to run for approximately five or six days. This method is time-consuming, but effectively removes strong odors (figure 5).



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One way to get rid of freezer odors is to pack the shelves with newspaper.

- Use commercial products that are available for removal of refrigerator and freezer odors. These products may be purchased at hardware, grocery, discount, and variety stores.

Re-freezing foods

Once food is thawed in the refrigerator, it is safe to refreeze it without cooking. However, there may be some reduction in quality due to the moisture lost through defrosting. Previously frozen raw foods that have been cooked can be safely frozen. If previously cooked foods are thawed in the refrigerator, you may refreeze the unused portion. If you purchase previously frozen meat, poultry, or fish at a retail store, you can refreeze if it has been handled with food safety as a top priority.

If the power goes out. To ensure the safety of your food during a power outage:

- Keep the refrigerator and freezer doors closed as much as possible to maintain the cold temperature. The refrigerator will keep food safely cold for about 4 hours if it is unopened. A full freezer will hold the temperature for approximately 48 hours (24 hours if it is half full), if the door remains closed.
- Obtain dry or block ice to keep your refrigerator as cold as possible if the power is going to be out for a prolonged period of time. Fifty pounds of dry ice should hold an 18-cubic-foot, full freezer for 2 days. Plan ahead and know where dry ice and block ice can be purchased.
- Freeze refrigerated items such as leftovers, milk, and fresh meat and poultry that you may not need immediately.
- Re-freeze food that still has ice crystals or is below 40°F.
- Discard food that is above 40°F for more than two hours.

Special concerns with refrigerated ready-to-eat foods.

Ready-to-eat perishable foods are foods that are prepared to be eaten without heating, such as deli meats and salads. Listeria is a pathogenic bacterium that can grow on perishable foods at refrigerator temperatures, and is occasionally found in ready-to-eat foods. Consumers can reduce the risk of illness by:

- Using perishable items that are precooked or ready-to-eat as soon as possible;
- Cleaning their refrigerators regularly; and

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- Using a refrigerator thermometer to make sure that the refrigerator always stays at 40°F or below.

3.3. How to keep and reheat leftovers and how to reuse them in other dishes

Leftovers are cooked foods that have not been eaten within 2 hours of cooking. The following are specific guidelines regarding leftover use and storage:

- Observe the 2 hour rule by discarding any perishable foods (foods that decay rapidly if not refrigerated) left at room temperature longer than 2 hours total. This time is reduced to 1 hour in hot weather.
- To cool foods more quickly, use shallow containers (3 inches tall or less) when refrigerating or freezing foods. Alternatively, moisture-proof, freezer-weight wraps are good choices for freezer storage.
- Keep your refrigerator at 40°F or below, and your freezer at or below 0°F.
- Label leftovers with a date and the product name.
- Practice “first in, first out”.
- Never taste leftovers that are of questionable age or safety.
- Never keep leftovers in the refrigerator for more than 3-4 days. Freeze leftovers that will not be eaten within this time.

Reheating leftovers.

Leftovers may be reheated in the microwave, on the stovetop, or in the oven. However, when using the microwave oven, liquid foods should be stirred, and solid foods should rest for 2 minutes after heating, to allow the temperature to equalize throughout.

Basic rules for reheating leftovers:

- Heat solid leftovers to 165°F, using a food thermometer to check the temperature.
- Heat sauces, soups, and gravies to boiling.
- Set oven temperature no lower than 325°F.

Using a food thermometer. There are two types of instant-read thermometers commonly available that are useful for checking the temperature of reheated leftovers. An instant-read digital thermometer should be inserted so the bottom ½ inch of the probe or stem is in the center or coldest part of the food. For an instant read dial thermometer, insert the probe or stem 2-3 inches into the center or coldest part of the food.

When to throw out.

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When leftovers have been in the refrigerator for longer than 3 to 4 days, or if they look or smell unusual, throw them out. Any time you are in doubt about the freshness or safety of any food, dispose of it, using a garbage disposal or a tightly wrapped package so that other people or animals won't eat it.

Approximate Storage Times for Best Quality Leftovers

FOOD	REFRIGERATOR (40°F)	Freezer (0°)
Eggs, liquid pasteurized or egg substitutes, opened	3 days	Do not freeze
Deli, vacuum-packed, and home-prepared salads: egg, chicken, tuna, ham or macaroni salads	3-5 days	These products do not freeze well
Pre-stuffed pork and lamb chops, chicken breasts stuffed with dressing	1 day	1-3 months
Cooked meat and meat dishes	3-4 days	2-3 months
Soups and stews, gravy and meat broth	1-2 days	2-3 months
Cooked poultry, poultry dishes	3-4 days	4-6 months
Chicken nuggets, patties	1-2 days	1-3 months
Cooked fish	3-4 days	1-2 months
Hot dogs, opened package	1 week	1-2 months (wrapped)
Lunch meats, opened package	3-5 days	1-2 months (wrapped)
Baby food		
strained fruits and vegetables*	2-3 days	6-8 months
strained meats and egg yolks*	1 day	1-2 months
meat and vegetable combinations*	1-2 days	3-4 months

4. Food storage management

4.1. Purchasing management

A key component in effective kitchen management is inventory control. By knowing what supplies are on hand at a given time, the manager will be able to plan food orders, calculate food costs since the previous inventory, and make menu item changes if needed. By keeping an eye on inventory, it is possible to note potential problems with pilferage and waste.

Managing inventory is like checking a bank account. Just as you are interested in how much money you have in the bank and whether that money is paying you enough in interest, so the manager should be interested in the value of the supplies in the storeroom and in the kitchen.

Regardless of the size of your operation, the principles of inventory control are the same. In larger operations there will be more people and sometimes even whole teams involved with the various steps, and in a small operation all responsibility for managing the inventory may fall on one or two key people.

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Effective inventory control can be broken down into a few important steps:

- Set up systems to track and record inventory
- Develop specifications and procedures for ordering and purchasing
- Develop standards and procedures to efficiently receive deliveries
- Determine the frequency and processes for reconciling inventory
- Analyze inventory data and determine any areas for improvement

Purchasing

The purchasing process is an essential part of every food service operation. All competent cooks should be skilled in buying the appropriate ingredients, in accurate amounts, at the right time, and at the best price.

Every kitchen operation has different purchasing procedures. But there is one rule that should always be followed:

Buy only as much as it is anticipated will be needed until the next delivery.

This will ensure that foods stay fresh and will create a high inventory turnover. All foods deteriorate in time, some more quickly than others. It is the job of the purchaser to ensure that only those quantities that will be used immediately or in the near future are purchased.

Market Sourcing

Sources of supply vary considerably from location to location. Large cities have a greater number and variety of suppliers than do small towns and isolated communities. Purchasers should establish contact with available suppliers such as wholesalers, local producers and packers, retailers, cooperative associations, and food importers. In most instances, the person in charge of buying will contact several suppliers to obtain the necessary foods. Some wholesalers diversify their product lines in order to meet all food-related kitchen needs.

Food products are obtained from various sources of supply. For example, a packing house supplies meat and meat products, while a food wholesaler supplies dry goods. Once business is established with a supplier, all transactions should be well documented and kept readily available on file.

There are two major food categories: perishables and non-perishables.

Perishables

Perishable items include fruits, vegetables, fresh fish and shellfish, fresh meats, poultry, and dairy products. As a rule, perishables are bought frequently to ensure freshness. Frozen

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foods, such as vegetables, fish and meat products, have a longer lifespan and can be ordered less frequently and stored in a freezer.

Non-perishables

Non-perishable items include dry goods, flour, cereals, and miscellaneous items such as olives, pickles, and other condiments. These can be ordered on a weekly or monthly basis.

Factors That Impact Prices

Food products in particular fluctuate in price over the year, due to many factors:

Seasonality: When food is in season, there is more of it available in the local food supply, bringing prices down. Additionally, foods in season are usually of higher quality and have longer shelf life than those that are out of season and need to be transported long distances to market.

Weather: Severe weather can have a huge impact on the cost of food. Drought, flooding, and unseasonable frost have all affected major produce-supplying areas of the world in recent years, causing a rise in prices for many items.

Costs of transportation: If the cost of fuel or transportation rises, so does the cost of food that needs to travel to market.

Commodity prices: A number of foods are traded on the commodity market, such as meats and grains. These prices fluctuate as buyers who trade in these products in large volumes buy and sell, much like the stock market.

Before purchasing any food items, ask the following questions.

When is the item to be used?

Which supplier has the best price and the best quality? Where an item is purchased should be determined by the price and the quality of the available supplies. When ordering supplies, it is advisable to get prices from at least three sources, then purchase from the supplier who quotes the best price for comparable quality.

When will the item be delivered? Depending on the distance of the food service establishment from the supplier, delivery may take hours or days. Remember, it is extremely difficult to maintain food quality and consistency if you do not know when your order will be delivered. For this reason, menu planning and a running inventory are two of the most important aspects of purchasing procedures.

Specifications

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Meat, seafood, poultry, processed fruits and vegetables, and fresh fruits and vegetables can be ordered under different specifications. For example, Meats can be ordered by grade, cut, weight/thickness, fat limitation, age, whether fresh or frozen, and type of packaging.

Seafood can be ordered by type (e.g., fin fish/shellfish), species, market form, condition, grade, place of origin, whether fresh or frozen, count, size, and packaging,

Poultry can be ordered by type, grade, class (e.g., broiler, fryer), style (e.g., breasts, wings), size, whether fresh or frozen, and packaging.

Processed fruits and vegetables can be ordered by grade (sometimes), variety, packaging size and type, drained weight, count per case, packing medium, and whether canned or frozen.

Fresh fruits and vegetables can be ordered by grade (sometimes), variety, size, weight per container, growing area, and count per container.

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Beef	Grade	Weight, Size, and Cut Specifications
Prime rib	Grade AA	7 kg, fully trimmed
New York strip	Grade AAA	6 kg, bone out, fully trimmed, max. 15 cm width, min. 5 cm depth
Tenderloin	Grade AAA	3 kg, fully trimmed to silverside
Roast sirloin	Grade A	7 kg, boneless butt
Short loins	Grade AAA	6 kg, fully trimmed, 5 cm from eye
Pork	Grade	Weight, Size, and Cut Specifications
Pork leg	Fresh—Canada #1	6 kg, oven ready, lean
Pork loin	Fresh—Canada #1	5-6 kg, trimmed, lean
Ham		6-8 kg, fully cooked, lean, bone in
Poultry	Grade	Weight, Size, and Cut Specifications
Chicken—Frying	Fancy, Eviscerated	1.5 kg, always fresh
Turkey	Fancy, Eviscerated	9-13 kg
Lamb	Grade	Weight, Size, and Cut Specifications
Legs	Fresh—Canada #1	
Lamb loin		3-5 kg, bone in
		2-3 kg, trimmed with all fat removed
Seafood	Grade	Weight, Size, and Cut Specifications
Shrimp	Jumbo	24-30/kg, fresh
Oysters	Canada #1	35/L



Purchasing specifications

4.2. Stock's Management and Control

On the alleged inadequacies of food provisions supplied onboard affects the well being of the Officers and Crew on board ship, it is best to take a close look at the grass root level – the method of Ordering and Supply of provision.

The manner of ordering and supplying food provision to the seafarers on board the vessels differs from one company to another. Some companies allow Self Purchase of Provisions while others do it thru the companies Procurement Group. In the later, the companies do the requisitions on line and the Ship Chandlers delivers the food provisions at the designated port upon the vessels' arrival.

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A comparative evaluation of different methods of ordering and supplying provisions to the vessel discloses the following advantages and disadvantages:

When the Provisions are Self Purchased, the known advantages are:

1. The company provides Cash to Master to ensure that a two (2) to three (3) months food provision inventory is available on board, depending on the vessels' trade routes. This gives them the advantage and the adaptability in sourcing out the supply from a cheaper place depending again routes she plies.
2. The Percentage rebates received from the Ship Chandler may form as a buffer fund, thus having additional budget for the next purchase cycle.
3. The Master of the vessel has a direct control in the replenishment of supply for fresh vegetables and fruits.
4. They can enjoy the benefits of self-purchase from the wet markets while in Port.
5. This works best if the Food Allowance is at the minimum and the vessel has ample time to stay in port as in the case of the Bulk Carriers and some general cargo vessels.

Nevertheless, the system has some disadvantages too:

1. The Chief Cook and the Master of the vessel are vulnerable to some bribery attempts from the Ship Chandlers.
2. A Provision weight shortage is imminent because of a possible intentional oversight in the check and balance during the delivery of provisions if the Chief Cook receives a bribe.
3. This will entail additional workload and hassle to the Steward Department while in port.

On the other hand, when the supply of Food Provisions is through the company's Procurement group, the known advantages are:

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1. The Company does not need to provide "Cash to Master" for food provision purchase; therefore, the Master keeps a lesser amount of Cash in the ship's vault while at sea.
2. The Company can avail of consignment terms from the Ship Chandlers, allowing better flexibility in Operational Cash flow.
3. This is a more systematic way of handling food provision ordering and supply.
4. The Master's name and integrity are keeping intact. It will spare them from the allegations of receiving gifts and bribery from the Ship Chandlers. It is a good riddance from the "Provision, Bonded or Me" tagline, in the event that some lady ship chandler's will board the vessel in port, flirting with the Master's on board just to get some orders. I am sure this warms the heart, and bring smiles to the Master's wives ashore who are not sailing with their husbands.
5. The members of the Steward Department will have more time to devote for rest and recreation while in port.
6. This is beneficial for vessels with fast turn-around in port, as in the case of Car carriers and Containers.

Yet, there are also Disadvantages to this system:

1. It requires careful planning for the strategic re-ordering to replenish the supply of fresh fruits and vegetables.
2. The Chief Cook must possess adequate skills to manage and budget the food provision allowance within limits.
3. The ship's complement does not have the buffer amount for food provision from Ship Chandler's rebates.

From the foregoing, after weighing the pros and cons of either system, it seems apparent that the supply of food provisions on board merchant ships remains to be the Shipping companies prerogative. However, one of the best ways to maximize the buying potentials of the food provision allowance is to request for a price quotation from the different Ship Chandlers at the port of supply and compare prices.

Although, it does not necessarily guarantee that the cheapest provides the best quality, but it will be a good head start and is beneficial to either supply system. Every Seafarer appreciates a shipping company that cares for their welfare and provides them with an adequate supply of good quality food onboard. While it is true, that being sufficient is relative,

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at the very least, they expect that the basic food groups are readily available to them during their regular meals, coffee breaks, and off duties from their shipboard work schedules

Ships should have adequate storerooms including dry and cold storerooms and freezers. If storing capacity is limited, stock should be reduced and stores taken more frequently.

Food should not be stored on deck. Store in a way that commodities are used in strict date rotation (First in = First out). Especially perishable food should not be ordered nor accepted in quantities that cannot be consumed before the expiry date. Frozen foods maintained in hard frozen condition may be consumed beyond the date marking.

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5. Environmental protection and catering health and safety

5.1. Awareness of potential hazards

Galley crew are amongst those who use PPE the least; although the number of accidents in Engine Room area are the highest but the personal protective equipment are taken easy in the cooking areas aboard.

The ship's galley can be a very dangerous area. It is on board a moving vessel; there are electric devices and hot water/oil involved & surely flammable materials like oils, etc.

We do not expect the galley people to wear all safety gear but to be vigilant of the dangers. An overall may not be necessary but proper shoes are. Not safety shoes but no slippers either; you may slip with it and the hot spilt liquids can burn your feet.

Galley or kitchen gloves should be used for hot object handling. You need no helmets but proper head-wear for health reasons is required. Use of a proper mask will be essential while frying food as well as hygiene reasons. Fire precaution & prevention measures & familiarization are surely essential too.

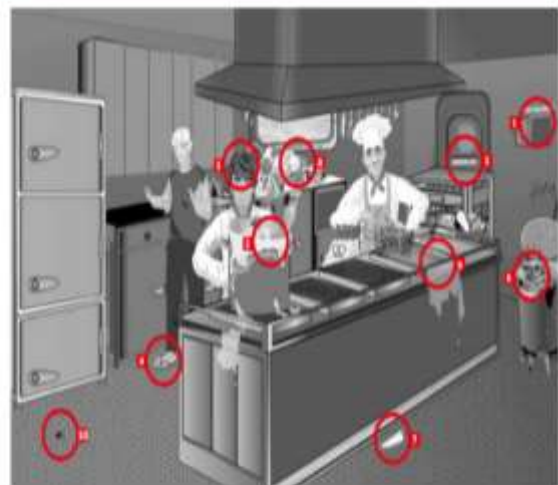
GALLEY

1 Empty fire blanket holder on the wall
Missing the fighting equipment poses a grave risk to the safety of the ship and crew.

2 Steaming pot on stove with liquid splashing over
Overfilled cooking pots pose the risk of burns to crew members working in the galley.

3 No hair covering for one of the cooks
The missing hair net increases the likelihood that biological matter may contaminate the crew's food.

4 One chef wearing flip flops
Flip flops offer no protection against burns in the event of a spillage or from a weighty sharp object dropped onto the foot.



5 Emergency exit blocked with stacked bread trays
This is a serious hazard which may impede the escape of the crew in an emergency situation such as a fire.

6 Overflowing bin with flies around it
Flies and the presence of rubbish and hygiene hazards in the galley will attract insects such as cockroaches.

7 Knife on the floor
Sharp objects should always be secured. In this case, the knife on the floor is a safety hazard, particularly for the crew member in flip flops.

8 High, badly stacked dirty dishes
The dishes may fall, causing injury, and should be stacked in an orderly fashion and not too high. Dirty dishes should be cleaned as soon as possible to ensure proper hygiene and to keep insects away.

9 One chef using a very full deep fryer
The hot oil in a deep fryer is a major hazard and should be kept at an appropriate level to avoid any possibility of spillage or injury.

10 Cockroach on floor near fridge
The presence of insects in the galley is an indication of unsanitary conditions and a threat to hygiene standards.

5.2. Safe behavior in the galley

In many work environments, such as working outside or around a maritime installation or vessel, it is easy for crewmembers to recognize potentially dangerous situations that could

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cause injuries. Wind, waves, heavy deck equipment, rigging and hazardous cargoes are just some of these apparent hazards.

However, for food service personnel and crewmembers who prepare food in the galley, it is far more difficult to immediately recognize hazards that can lead to serious injuries or illness. In order to prevent back injuries, cuts, burns and fires, food service workers need to be trained in proper safe work practices.

Proper Grooming and Behavior

While working in the galley, clean clothes or uniforms should always be worn to prevent the spread of food borne illness.

Hair restraints, such as hats, hairnets and beard restraints should be worn to prevent loose hair from contaminating food.

Loose clothing such as shirttails and sleeves should be tucked in and all jewelry removed in order that they do not get caught in machinery.

Shoes should be equipped with a leather upper and a high traction sole design in order to help prevent burns from hot liquids and slips, trips and falls.

Working around sharp knives, hot objects and hazardous chemicals is no place for practical jokes. They may seem like harmless fun but it could end up causing a permanent debilitating injury to a fellow co-worker.

- Back safety

Working in the galley often means lifting heavy supplies, therefore it's important to know how to lift boxes and containers properly. Position yourself as close as possible to the object.

- Align the spinal column so that it is vertical but retains its natural bowed in arch
- Tighten the abdominal muscles
- Bend at the knees
- Lift slowly with the large muscles in the legs. Never jerk
- After lifting the object, if you need to turn, rotate your entire body by turning your feet to avoid stresses on the spine.

- Slips, trips and falls
 - Keep aisles and stairs clear of boxes and containers
 - Wipe up spills on floors immediately



- Use non-slip floor mats where grease or water might spill
- Place a hand towel dispenser within close proximity to the sink
- Post caution signs whenever the galley floor area is wet
- Never leave unwound electrical cords or hoses in a work area. Wind them up after use.

- Proper housekeeping
 - Avoid overloading racks and shelves.
 - Don't place heavy items on hard to reach top shelves
 - Mop and scrub the floor often. This is best accomplished when the galley area is not busy.
 - Rubber mats should be utilized and removed and cleaned frequently to prevent grease and dirt build-up.
 - Continuously strive to sterilize work surfaces.
 - Read instructions and use caution when working with chemical cleaning products.
 - Store chemicals away from food preparation areas
 - Move trash containers if they obstruct work areas.
 - When trash containers are full make sure the trash is removed from the work area
 - Trash containers should be sanitized on a regular basis.

- Preventing cuts and scratches

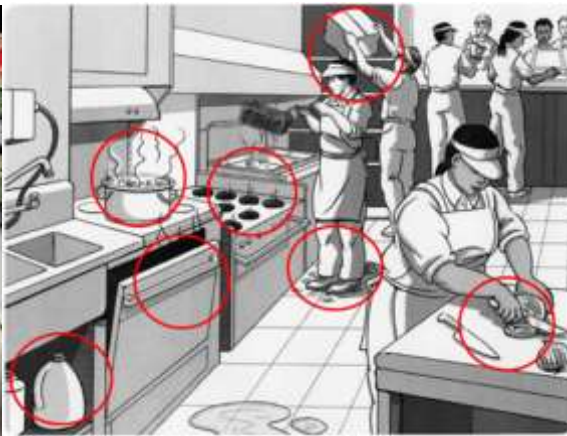
Working with knives, meat slicers, can openers, mixers and choppers on a daily basis may seem routine, however these same tools can easily cause great bodily harm to flesh and bone when used carelessly.

- Don't try to cut meat that is frozen
 - Select the proper knife for the job at hand
 - Keep knife blades sharp and handles clean and dry
 - Always discard sharp-edged can lids immediately
 - When using cutters or slicers always keep guards in place
 - Before cleaning a cutting machine make sure it's unplugged
 - If you suffer a cut or scratch, inspect the area for possible blood contamination and immediately clean and disinfect.
 - Don't leave a knife near the edge of a counter where it might fall off
-
- Preventing burns

Burns are the primary safety concern when food is moved back and forth from the preparation area to the stove.



- Make sure foods are well drained and dried before placing in hot oil.
- Long sleeved shirts, thick jackets and aprons protect the body from burns
- Always use a thick cloth or kitchen mitt to handle hot pots and pans.
- When pouring hot liquids through a strainer wear safety glasses.
- Do not overfill containers hot liquids that could cause scalding burns
- While carrying hot food keep the container away from contact with the body
- Never leave hot cookware unattended in areas where it might normally be expected to be cool
- When lifting covers from cookware, position yourself away from the steam and slowly bleed it off.





WHAT'S WRONG WITH THIS PHOTO?

5.3. Risk assessment

A risk assessment is a systematic review, with a critical look at work processes and issues in the galley.

There are three risk factors that can have an impact on food safety:

- Microbiological

Bacteria, mould and mildew, viruses and parasites. Viruses cause vomiting and diarrhoea. Dangerous bacteria give the same symptoms and can cause even severe life-long effects and mould can develop toxins in food.

Chemical

Detergents that contaminate food, oxidized metal, chemicals (phthalates) to soften plastics and chemical sprays that come in contact with food can transfer substances that are damaging to health, pesticide residues from surface treatments, chemical substances formed during production, naturally arising toxins, for example in dried fruit – there are risks in all of these.

- Physical

Shards from chipped china (bowls and glasses), plastic from packaging, bits of metal or plastic from worn equipment, dirty condensate from the cooker hood, mouldy wood in the galley – all these can be hidden reasons for broken teeth, bad stomachs or unhygienic cookery.



A risk analysis has seven stages:

1. Identify the risks

What can go wrong when receiving goods, loading stores, keep them in stock, prepare food and cleaning in the galley?

2. Identify the CCP's

How can I manage behaviour or take measurements to reduce the risks so that things do not go wrong?

3. Define the critical limits

What is the limit between not being acceptable and not going wrong?

4. Monitoring

How and how often should I write things down?

5. Corrective action

What should I do if something goes wrong?

6. Documentation

How can I make my monitoring manageable in writing and what did I do when something went wrong?

7. Revision

How should I match the self-assessment programme to daily routines in the galley?



A risk assessment ensures that meals do not become a health risk for the crew's well-being, health and fitness to work.

5.4. Basic knowledge of MLC, 2006

The Maritime Labour Convention (MLC) is an International Labour Organization convention established in 2006 as the fourth pillar of international maritime law and embodies "all up-to-date standards of existing international maritime labour Conventions and Recommendations, as well as the fundamental principles to be found in other international labour Conventions". The other "pillars are the SOLAS, STCW and MARPOL. The treaties applies to all ships entering the harbours of parties to the treaty (port states), as well as to all states flying the flag of state party (flag states, as of 2013: 50 per cent).

The convention entered into force on 20 August 2013, one year after registering 30 ratifications of countries representing over 33 per cent of the world gross tonnage of ships. Already after five ratifications the ratifying countries (Bahamas, Norway, Liberia, Marshall Islands, and Panama) represented over 43 per cent of the gross world tonnage (which is over 33 per cent; the second requirement for entry into force). As of November 2016, the convention has been ratified by 80 states representing over 87 per cent of global shipping.

Although the Convention has not been ratified worldwide, it has widespread effect because vessels from non-signatory states that attempt to enter ports of signatory states may face arrest and penalties for non-compliance with the MLC.

Content and organization

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The convention consists of the sixteen articles containing general provisions as well as the Code. The Code consists of five Titles in which specific provisions are grouped by standard (or in Title 5: mode of enforcement):

Title 1: Minimum requirements for seafarers to work on a ship

Title 2: Conditions of employment

Title 3: Accommodation, recreational facilities, food and catering

Title 4: Health protection, medical care, welfare and social security protection

Title 5: Compliance and enforcement

For Each Title, there are general Standards, which are further specified in mandatory Regulations (list A) as well as Guidelines (List B). Guidelines generally form a form of implementation of a Regulation according to the requirements, but States are free to have different implementation measures. Regulations should in principle be implemented fully, but a country can implement a "substantially equivalent" regulation, which it should declare upon ratification.

Some seafarers criticise the convention, saying that it lacks teeth, does not address real issues, and skirts important seafarer needs such as decent sized cabins, cupboards in cabins, shore leave, and rest hours by including them into Guidelines (List B) of the convention—or worse, by not addressing them at all.

Title 1: Minimum requirements for seafarers to work on a ship

The minimum requirements set out in this section of the code are divided in 4 parts and are summarised below:

Minimum age requirements: the minimum age is 16 years (18 for night work and work in hazardous areas).

Medical fitness: workers should be medically fit for the duties they are performing. Countries should issue medical certificates as defined in the STCW (or use a similar standard).

Training: Seafarers should be trained for their duties as well as have had a personal safety training.

Recruitment/placement services located in member states or for ships flying the flag of member states should have (amongst others) proper placement procedures, registration, complaint procedures and compensation if the recruitment fails

Title 2: Employment conditions

The Title on employment conditions lists conditions of the contract and payments, as well as the working conditions on ships.

Contracts: the contract should be clear, legally enforceable and incorporate collective bargaining agreements (if existent).

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Payments: Wages should be paid at least every month, and should be transferrable regularly to family if so desired.

Rest hours: rest hours should be implemented in national legislation. The maximum hours of work in that legislation should not exceed 14 hours in any 24-hour period and 72 hours in any seven-day period, or: at least ten hours of rest in any 24-hour period and 77 hours (rest) in any seven-day period. Furthermore, the daily hours of rest may not be divided into more than two periods and, at least six hours of rest should be given consecutively in one of those two periods.

Leave: Seafarers have a right to annual leave as well as shore leave.

Repatriation: Returning to their country of residence should be free

Loss: If a ship is lost or foundered, the seafarers have a right to an unemployment payments.

Manning: Every ship should have a sufficient manning level

Title 3: Accommodation, Recreational Facilities, Food and Catering

The title specifies rules detailed rules for accommodation and recreational facilities, as well as food and catering.

Accommodation: Accommodation for living and/or working should be "promoting the seafarers' health and well-being". Detailed provisions (in rules and guidelines) give minimum requirements for various types of rooms (mess rooms, recreational rooms, dorms etc.).

Food and Catering: Both food quality and quantity, including water should be regulated in the flag state. Furthermore, cooks should have proper training.

Title 4: Health Protection, Medical Care, Welfare and Social Security Protection

Title 4 consists of 5 regulations about Health, Liability, Medical care, Welfare and Social security.

Medical care on board ship and ashore: Seafarers should be covered for and have access to medical care while on board; in principle at no cost and of a quality comparable to the standards of health care on shore. Countries through which territory a ship is passing should guarantee treatment on shore in serious cases.

Shipowners' liability: Seafarers should be protected from the financial effects of "sickness, injury or death occurring in connection with their employment". This includes at least 16 weeks of payment of wages after start of sickness.

Health and safety protection and accident prevention: A safe and hygienic environment should be provided to seafarers both during working and resting hours and measures should be taken to take reasonable safety measures.

Access to shore-based welfare facilities: Port states should provide "welfare, cultural, recreational and information facilities and services" and to provide easy access to these

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services. The access to these facilities should be open to all seafarers irrespective of race, sex, religion or political opinion.

Social security: Social security coverage should be available to seafarers (and in case it is customary in the flag state: their relatives).

Title 5: Compliance and Enforcement

Title 5 sets standards to ensure compliance with the convention. The title distinguishes requirements for flag states and port states.

Flag states: Flag states (the state under which flag the ship operates) are responsible for ensuring implementation of the rules on the ships that fly its flag. Detailed inspections result in the issue of a "Certificate of Maritime Compliance", which should always be present (and valid) on a ship. Ships are required to have decent complaints procedures in place for its crew and should institute investigations in case of casualties.

Port States: The inspection in ports depends on whether a Certificate of Maritime Compliance is present (and thus a flag is flown of a country which has ratified the convention). If the Certificate is present, compliance is to be assumed in principle, and further investigations only take place if the certificate is not in order or there are indications of non-compliance. For ships that don't have the certificate, inspections are much more detailed and should ensure -according to a "no more favorable treatment principle" that the ship has complied with the provisions of the convention. The convention is thus -indirectly- also valid for ships of non-member countries if they plan to call to ports of a member state.

Labour agencies: Agencies supplying on maritime workers to ships should also be inspected to ensure that they apply the convention (amongst others the regulations regarding to social security).

5.5. Knowledge of Chapter IX of the SOLAS Convention 1974, as amended.

The Chapter makes mandatory the International Safety Management (ISM) Code, which requires a safety management system to be established by the shipowner or any person who has assumed responsibility for the ship (the "Company"), for more reference see section 5.6.

5.6. Basic Knowledge of the IGS Code and of the security management systems

The purpose of this Code is to provide an international standard for the safe management and operation of ships and for pollution prevention.

The Code establishes safety-management objectives and requires a safety management system (SMS) to be established by "the Company", which is defined as the shipowner or any person, such as the manager or bareboat charterer, who has assumed responsibility for operating the ship.

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The Company is then required to establish and implement a policy for achieving these objectives. This includes providing the necessary resources and shore-based support.

Every company is expected "to designate a person or persons ashore having direct access to the highest level of management".

The procedures required by the Code should be documented and compiled in a Safety Management Manual, a copy of which should be kept on board.

The ISM Code establishes safety management objectives which are:

- to provide for safe practices in ship operation and a safe working environment;
- to establish safeguards against all identified risks;
- to continuously improve safety management skills of personnel, including preparing for emergencies.

The SMS in turn should include a number of functional requirements:

- a safety and environmental protection policy; instructions and procedures to ensure safety and environmental protection;
- defined levels of authority and lines of communication between and amongst shore and shipboard personnel;
- procedures for reporting accidents, etc.;
- procedures for responding to emergencies;
- procedures for internal audits and management review.

The Company is then required to establish and implement a policy for achieving these objectives. This includes providing the necessary resources and shore-based support. Every company is expected "to designate a person or persons ashore having direct access to the highest level of management".

The Code then goes on to outline the responsibility and authority of the master of the ship. It states that the SMS should make it clear that "the master has the overriding authority and the responsibility to make decisions ..." The Code then deals with other seagoing personnel and emphasizes the importance of training.

Companies are required to prepare plans and instructions for key shipboard operations and to make preparations for dealing with any emergencies which might arise. The importance of maintenance is stressed and companies are required to ensure that regular inspections are held and corrective measures taken where necessary.

The procedures required by the Code should be documented and compiled in a Safety Management Manual, a copy of which should be kept on board. Regular checks and audits should be held by the company to ensure that the SMS is being complied with and the system itself should be reviewed periodically to evaluate its efficiency.

After outlining the responsibilities of the company, the Code then stresses that the responsibility for ensuring that the Code is complied with rests with the Government.

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Companies which comply with the Code should be issued with a document of compliance, a copy of which should be kept on board. Administrations should also issue a Safety Management Certificate to indicate that the company operates in accordance with the SMS and periodic checks should be carried out to verify that the ship's SMS is functioning properly.

The Chapter entered into force under the tacit acceptance procedure on 1 July 1998. It will apply to passenger ships, oil and chemical tankers, bulk carriers, gas carriers and cargo high speed craft of 500 gross tonnage and above not later than that date and to other cargo ships and mobile offshore drilling units of 500 gross tonnage and above not later than 1 July 2002.

5.7. Reporting occupational injuries

The importance of reporting near misses

When near misses occur, reporting them to your employer can go a long way in preventing future incidents. The importance of reporting near misses

Near misses in the workplace are cases where an injury, accident or other damage had the potential to occur, but didn't. Reporting them can help prevent future accidents.

Near misses in the workplace are cases where an injury, accident, illness or other damage had the potential to occur, but didn't.

Examples of these occurrences include, but are not limited to, the following:

- Employees forgetting to wear the proper personal protective equipment (PPE)
- Employees ignoring procedures or work practices
- A slip or fall that doesn't result in an injury
- Tools or other items dropping from height without striking a worker
- Nearly striking pipes or power lines during drilling procedures

When near misses like the ones listed above occur, reporting them to your employer can go a long way in preventing future incidents. Despite this fact, near misses are often dismissed as lucky breaks and go unaddressed.

5.8. First aid in the galley

Ship's cook should be able to provide first aid, manage injuries on board that occur in the galley, until further medical or rescue assistance arrives

Will recommend that every well-equipped ship's galley will have a first aid kit and the ship's cook will know what is in it and be familiar with how to use it.

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A ship-shape first aid kit should be contained in a waterproof positively buoyant container and beside the normal material found in one, its contents should reflect the sort of injuries that you might expect nearby - disinfectants, gauze and other burn related materials as well as bandages for cuts and abrasions for the galley kit as an example.

5.9. Firefighting in the galley

For galley fires, immediately turn off the propane switch, then:

- Fire in a pan - put a lid on it
- Fire in the oven - close the door
- Fire on the stove/surrounds - smother with baking soda or the fire blanket which is kept readily available near the galley
- Do not use water on grease fires
- If necessary, use a fire extinguisher

Use a fire extinguisher as follows:

- The goal is to contain the fire, gradually reduce its area, and then smother it.
- Remove the extinguisher from its bracket, pull the pin out of the extinguisher, and hold the unit upright. Stand about 6' back from the flames.
- Squeeze the lever and aim at base of flames, working around the edges. Back the fire into a corner if you can. Then try to smother it. The extinguisher will only go for about 30 seconds before it is spent. Get other crew to bring remaining fire extinguishers, water buckets if appropriate, and the fire blanket.
- If you can't contain it, get out and abandon ship.

Galley hot equipment, electrical connections, cooking oils, cleaning chemicals and paper products—have all the ingredients for a fire to flame out of control.

Preventative maintenance

- Install an automatic fire-suppression system in the kitchen. These systems automatically dispense chemicals to suppress the flames and also have a manual switch. Activating the system automatically shuts down the fuel or electric supply to nearby cooking equipment. Have your fire-suppression system professionally inspected semiannually. The manufacturer can refer you to an authorized distributor for inspection and maintenance.
- Keep portable fire extinguishers as a backup. You'll need Class K extinguishers for kitchen fires involving grease, fats and oils that burn at high temperatures. Class K fire extinguishers are only intended to be used after the activation of a built-in hood suppression system. Keep Class ABC extinguishers elsewhere for all other fires (paper, wood, plastic, electrical, etc.).

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- Schedule regular maintenance on electrical equipment, and watch for hazards like frayed cords or wiring, cracked or broken switch plates and combustible items near power sources.

Staff training

Train your staff to:

- Clean up the grease. Cleaning exhaust hoods is especially important, since grease buildup can restrict air flow. Be sure to also clean walls and work surfaces; ranges, fryers, broilers, grills and convection ovens; vents and filters.
- Never throw water on a grease fire. Water tossed into grease will cause grease to splatter, spread and likely erupt into a larger fire.
- Make sure cigarettes are out before dumping them in a trash receptacle. Never smoke in or near storage areas.
- Store flammable liquids properly. Keep them in their original containers or puncture-resistant, tightly sealed containers. Store containers in well-ventilated areas away from supplies, food, food-preparation areas or any source of flames.
- Tidy up to avoid fire hazards. Store paper products, linens, boxes and food away from heat and cooking sources. Properly dispose of soiled rags, trash, cardboard boxes and wooden pallets at least once a day.
- Use chemical solutions properly. Use chemicals in well-ventilated areas, and never mix chemicals unless directions call for mixing. Immediately clean up chemical spills.

Be prepared: Have an emergency plan

- Be prepared to power down. Train at least one worker per shift how to shut off gas and electrical power in case of emergency.
- Have an evacuation plan. Ensure your staff know where the closest exits.
- Offer emergency training. Teach new employees about evacuation procedures and the usage of fire-safety equipment.

5.10. MARPOL Annex V concerning Prevention of pollution by garbage from ships.

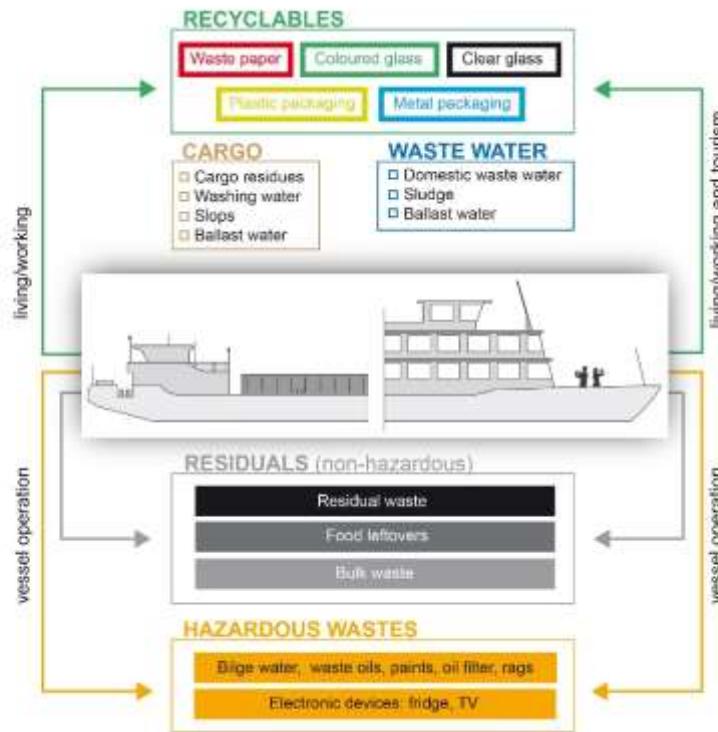
5.10.1. Waste

Characteristic for ship waste is the fact that many different types occur in a relatively small area. Waste can arise from the operation and maintenance of the vessel (especially oily and greasy waste from engines), the people on-board or related to the cargo. Furthermore hazardous wastes (e.g. bilge water, paints and varnish) also originate on board. Besides liquid and solid waste, also CO₂ and other gases are emitted by the vessels engines.

Depending whether it is a cargo or a passenger vessel, amounts and composition of produced waste significantly differ. While cargo vessels are normally operated by only a few



people, internationally cruising cabin vessels can carry several hundred people. Subsequently, the amounts of domestic waste waters, sewage and domestic refuse can be exceptionally higher.



5.10.2. Wastage, hygiene and safety

Food wastes and refuse readily attract rodents and vermin, particularly flies and cockroaches. The proper retention, storage and disposal of such wastes on board, ashore and overboard where shore areas will not be affected will prevent the creation of health hazards and public nuisances.

All ships must be equipped with facilities for safe storage of food refuse.

All food refuse must be received and stored in watertight, non-absorbent and easily cleaned containers, fitted with tight covers that should be closed during food preparation and serving and cleaning operations in food handling spaces. These containers must be placed in waste storage spaces, specifically constructed and used for this purpose, or on open decks when necessary. After emptying, each container must be thoroughly scrubbed, washed and treated with disinfectant, if necessary, to prevent odors and to minimize the attraction of rodents, flies and cockroaches. Containers should not be left uncovered except during the necessary food handling and cleanup procedures.

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It is important to characterize the waste stream and the amount of wastes produced in galleys and related areas to provide a basis for planning to prevent environmental contamination. People in charge of waste collection should use personal protection equipment, including special disposable gloves, face masks and/or protective eyewear, safety boots and appropriate protective clothing.

5.10.3. Waste collection

Procedures for collecting garbage generated on board should be based on the consideration of what is permitted and what is not permitted to be discharged into the sea while en route, and whether a particular garbage type can be discharged to port facilities for recycling or reuse. The details of these procedures should be written in the garbage management plan.

To reduce or avoid the need for sorting after collection and to facilitate recycling, it is recommended that distinctively marked garbage receptacles be provided on board the ship to receive garbage as it is generated. Receptacles on board can be in the form of drums, metal bins, cans, container bags, or wheelie bins. Any receptacles on deck areas, poop decks or areas exposed to the weather should be secured on the ship and have lids that are tight and securely fixed. All garbage receptacles should be secured to prevent loss, spillage, or loss of any garbage that is deposited in the receptacles. Receptacles should be clearly marked and distinguishable by graphics shape, size, or location. Receptacles should be placed in appropriate spaces throughout the ship (e.g. the engine-room, mess deck, wardroom, galley, and other living or working spaces) and all crew members and passengers should be advised of what garbage should and should not be placed in them.

The recommended garbage types that should be separated are:

- non-recyclable plastics and plastics mixed with non-plastic garbage;
- rags;
- recyclable material:
 - cooking oil;
 - glass;
 - aluminium cans;
 - paper, cardboard, corrugated board;
 - wood;
 - metal;
 - plastics; (including styrofoam or other similar plastic material); and
- garbage that might present a hazard to the ship or crew (e.g. oily rags, light bulbs, acids, chemical, batteries, etc.).



Crew responsibilities should be assigned for collecting or emptying these receptacles and taking the garbage to the appropriate processing or storage location. Use of such a system facilitates subsequent shipboard processing and minimizes the amount of garbage which must be stored on board ship for return to port.

Food wastes

Some governments have regulations for controlling human, plant, and animal diseases that may be carried by foreign food wastes and materials that have been associated with them (e.g. food packing and disposable eating utensils, etc.). These regulations may require incinerating, sterilizing, double bagging or other special treatment of garbage to destroy possible pest and disease organisms. This type of garbage should be kept separate from other garbage and preferably retained for discharge at port reception facilities in accordance with the laws of the receiving country. Governments are reminded of their obligation to ensure the provision of adequate reception facilities. Precautions must be taken to ensure that plastics contaminated by food wastes (e.g. plastic food wrappers) are not discharged into the sea with other food wastes.

5.10.4. Waste storage

Garbage collected from throughout the ship should be delivered to designated processing or storage locations. Garbage that must be returned to port for discharge at port reception facilities may require storage until arrangements can be made to discharge it ashore for appropriate processing. In all cases, garbage should be stored in a manner which avoids

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health and safety hazards. The following points should be considered when selecting procedures for storing garbage:

- sufficient storage space and equipment (e.g. cans, drums, bags or other containers) should be provided. Where storage space is limited, ship operators are encouraged to consider the installation of compactors or incinerators. To the extent possible, all processed and unprocessed garbage stored for any length of time should be in tight, securely covered containers in order to prevent the unintentional discharge of stored garbage;
- food wastes and other garbage to be returned to port and which may carry diseases or pests should be stored in tightly covered containers and be kept separate from garbage which does not contain such food wastes. Quarantine arrangements in some countries may require double bagging of this type of waste. Both types of garbage should be stored in separate clearly marked containers to avoid incorrect discharge and facilitate proper handling and treatment on land; and
- cleaning and disinfecting are both preventative and remedial pest control methods that should be applied regularly in garbage storage areas.

5.10.5. Waste disposal

Food waste must not be kept in a room where food is stored.

Daily routines that follow the shipowners/ship's waste procedures must ensure that waste is removed and stored during the day. As a minimum, waste must be removed from the galley at the end of the working day.

A waste disposal plan can also be helpful for sorting waste at source. If there is enough room, waste can be sorted into food remnants, plastic, metal, paper/cardboard and other flammable items.

Waste in the galley should be placed in bins with lids and should be of a suitable size. They must be kept in good condition and be easy to clean and disinfect.

Large pedal bins are recommended since otherwise you have to touch the lid of the waste bin with your hands. Waste bins can be a serious source of contamination.

Bins used for storing waste must have lids. When removing the waste bags, it should be possible to tie the tops to prevent pests.

Bags should be placed in plastic bins or in some other way raised from the deck to prevent them standing directly on it.

Garbage facilities must be constructed and run in such a way that they can be kept clean and prevent access by pests.

This is to protect against contamination of food, drinking water, equipment and rooms. The areas for indoor storage of waste, for example on long tours, must be in a separate closed room and not located close to where new stores are typically loaded. Waste can also be stored outside the accommodation in containers with lids and not at the same place as where

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stores are hoisted aboard. There must be access to a hose for washing down the garbage store.

A kitchen sink waste grinder should only be used for food waste that is suitable for being ground and washed out with the waste water. Some food wastes are not suitable for being ground, for example tendons from meat, large pieces of fish skin from skinning fish and vegetables/fruit with long fibres such as banana skins and green waste from fresh leeks. It must be safe to use the grinder so there cannot be an accident; for example a wooden tamper can be used to prevent fingers coming close to the grinder's rotor blades.

6. Nutrition and health

6.1. Health and nutrition

Nutrition is the intake of food, considered in relation to the body's dietary needs. Good nutrition – an adequate, well balanced diet combined with regular physical activity – is a cornerstone of good health. Poor nutrition can lead to reduced immunity, increased susceptibility to disease, impaired physical and mental development, and reduced productivity.

6.1.1. Understanding nutrition

Nutrients are chemical compounds that are present in foods and that fulfill one or more of the following functions:

- Supply energy for body functions.
- Build and replace cells that make up body tissues.
- Regulate body processes.

There are six categories of nutrients:

- Carbohydrates
- Vitamins
- Fats
- Minerals
- Proteins
- Water

Calories

The calorie is a unit of measurement of energy. It is defined as the amount of heat needed to raise the temperature of 1 kilogram water by 1°C.

Remember that one of the functions of nutrients is to supply energy to the body. The calorie is used to measure how much energy certain foods supply for these functions. In our overfed society, calories have come to be viewed as something to be avoided. Nevertheless, without sufficient food energy, we could not live.



Carbohydrates, proteins, and fats can be used by the body to supply energy.

- 1 gram carbohydrate supplies 4 calories
- 1 gram protein supplies 4 calories
- 1 gram fat supplies 9 calories

There is a direct connection between calorie intake, physical activity, and weight gain.

Simply put, if you consume more calories than you burn, you gain weight. If you consume fewer calories than you burn, you lose weight. All the diet schemes and fashions in the world—at least the ones that are medically sound—can be reduced to this. In other words, losing weight is possible only by eating fewer calories, by burning more calories through exercise, or, preferably, by both.

In order to lose weight while maintaining good nutrition and health, one should avoid empty calories as much as possible and eat primarily foods of high nutrient density. Empty calorie foods are those that provide few nutrients per calorie. Refined sugars and starches are examples of empty calories. Foods of high nutrient density are those that provide relatively many nutrients per calorie. Fruits, vegetables, and whole grains are examples of foods with high nutrient density.

Kinds of Nutrients and Their Importance

Each of the nutrients listed has certain characteristics and functions in the body. These are discussed in general terms. For a summary of individual nutrients and the foods in which they are found.

Many fad diets emphasize either the good or the bad qualities of a single nutrient. For example, a particular weight loss diet may advise eating mostly protein foods and eliminating carbohydrates as much as possible. However, because all nutrients are essential, such diets can lead to nutritional imbalances. Thus, it is necessary to understand the function and importance of all nutrients.

The amount of each nutrient needed daily varies from person to person, depending on such factors as age, sex, general health, and level of activity.

- Carbohydrates

Carbohydrates are compounds consisting of carbon, hydrogen, and oxygen atoms bound together in chains of varying lengths.

Sugars are simple carbohydrates. Simple sugars, such as glucose, are small compounds containing 6 carbon atoms. Table sugar, or sucrose, is a larger sugar molecule with 12 carbon atoms. Sugars are found in sweets and, to a lesser extent, in fruits and vegetables.



Starches are complex carbohydrates consisting of long chains of simple sugars bound together. They are found in such foods as grains, bread, peas and beans, and many vegetables and fruits.

Carbohydrates are the body's most important source of food energy. Fats and proteins can also be burned for energy, but the body uses carbohydrates first. If no carbohydrates are available, the body then burns fat. However, if fats are burned with no carbohydrates present, Toxic compounds called ketone bodies are produced. If too many ketone bodies accumulate, a condition called ketosis develops, and the blood becomes unable to carry oxygen properly.

The result can be fatal. Thus, one of the important functions of carbohydrates is to help the body burn fat properly. About 50 to 100 grams carbohydrate are needed every day to prevent ketosis.

Most authorities believe complex carbohydrates, especially those from whole grains and unrefined foods, are better for you than simple carbohydrates. This is partly because starchy foods also have many other nutrients, while sweets have few other nutrients. Also, there is some evidence that a lot of sugar in the diet may contribute to heart and circulatory diseases.

Simple sugars and refined starches are primary sources of empty calories.

Another reason carbohydrates from whole grains and unrefined foods are preferable to those from refined sugars and starches is that these unrefined foods are sources of fiber. The term fiber refers to a group of carbohydrates that cannot be absorbed and used by the body.

Therefore, fiber supplies no food energy. However, it is important for the proper functioning of the intestinal tract and the elimination of body waste. In addition, there is evidence that sufficient dietary fiber helps prevent some kinds of cancers and helps decrease cholesterol in the blood. Fruits and vegetables, especially raw, and whole grains supply dietary fiber.

Fiber can be classified as either soluble or insoluble. Soluble fiber absorbs water and forms a kind of gel. It is found inside and between plant cells. Insoluble fiber also absorbs water, but less, and forms bulk in the intestines. It is found in cell walls and other structural parts of plants.

- **Fats**

Fats supply energy to the body in highly concentrated form. Also, some fatty acids are necessary for regulating certain body functions. Third, fats act as carriers of fat-soluble vitamins (vitamins A, D, E, and K). Because of these important functions, it is necessary to have some fats in the diet.

Fats may be classified as saturated, monounsaturated, or polyunsaturated. These terms reflect chemical differences in the composition of fats. Cooks do not need to know the chemical structure of fats, but they should understand their nutritional characteristics and

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the foods in which they are found. Many foods contain a combination of these three types, with one type predominating.

Saturated fats are solid at room temperature. Animal products—meats, poultry, fish, eggs, dairy products—and solid shortenings are the major source of saturated fats. Tropical oils such as coconut oil and palm kernel oil are also rich in saturated fats. Health experts believe these fats contribute significantly to heart disease and other health problems.

Polyunsaturated fats and monounsaturated fats are liquid at room temperature.

Although too much of any kind of fat is unhealthy, these fats are considered more healthful than saturated fats. Polyunsaturated fats are found in vegetable oils such as corn oil, safflower oil, sunflower oil, and cottonseed oil. High levels of monounsaturated fats are found in olive oil and canola oil. Both kinds of unsaturated fats are found in other plant products as well, including whole grains, nuts, and some fruits and vegetables.

One group of saturated fats of special concern is trans fats. These fats occur naturally in small amounts only. Most of the trans fats in our diet are from manufactured fats subjected to a process called hydrogenation. Hydrogenated fats are fats changed from liquid to solid by adding hydrogen atoms to the fat molecules. This is the process used to make products such as solid shortening and margarine. Trans fats are of concern because they limit the body's ability to rid itself of cholesterol that builds up on the walls of arteries.

Fats are members of a group of compounds called lipids. Another lipid found in the body is cholesterol, a fatty substance closely linked with heart disease because it collects on the walls of arteries and blocks the flow of blood to the heart and other vital organs. It is found only in animal products and is especially high in egg yolks, butterfat, and organ meats such as liver and brains. The human body also manufactures its own cholesterol, so not all the cholesterol in the blood is necessarily from foods. Although some cholesterol is necessary for body functions, it is not considered a nutrient because the body is able to manufacture all the cholesterol it needs. Experts generally agree it is best to keep the cholesterol in the diet as low as possible.

Recent research has suggested that monounsaturated fat may actually lower the levels of the most harmful kinds of cholesterol in the body. This may explain the relatively low incidence of heart disease in Mediterranean regions, where olive oil is the most widely used fat. This research has helped popularize the use of olive oil in other parts of the world, especially in North America.

Remember, however, that too much fat of any kind is bad for the health. Do not make the mistake of thinking monounsaturated fats are good for you and can be used in excess.

PROTEINS

Proteins are known as the building blocks of the body. They are essential for growth, for building body tissues, and for basic body functions. They can also be used for energy if the diet does not contain enough carbohydrate and fat.



Proteins consist of substances called amino acids. The body is able to manufacture many of them, but there are nine amino acids it cannot manufacture and must get from foods.

A food protein that contains all nine essential amino acids is called a complete protein.

Meats, poultry, fish, eggs, and dairy products contain complete proteins.

Proteins that lack one or more of these essential amino acids are called incomplete proteins. Foods high in incomplete proteins include nuts, grains, and dried beans and other legumes. Foods that, if eaten together, supply all the amino acids are called complementary proteins. For example, cornmeal tortillas topped with chili beans supply complete protein because the corn supplies the amino acids lacking in the beans. Beans and rice is another example of a food combination supplying complementary proteins.

VITAMINS

Vitamins are present in foods in extremely small quantities, but they are essential for regulating body functions. Unlike proteins, fats, and carbohydrates, they supply no energy, but some of them must be present in order for energy to be utilized in the body. Also, lack of certain vitamins causes deficiency diseases.

Vitamins are classified as water-soluble and fat-soluble. The water-soluble vitamins (the

B vitamins and vitamin C) are not stored in the body and must be eaten every day. Foods containing these vitamins should be handled so the vitamins are not dissolved into the cooking water and lost.

Fat-soluble vitamins (A, D, E, and K) can be stored in the body, so they do not need to be eaten every day as long as the total amount eaten over time is sufficient. Consuming too much of a fat-soluble vitamin daily, as sometimes happens when people take too many vitamin supplements, can result in toxic levels of the vitamin stored in the tissues.

MINERALS

Minerals, like vitamins, are consumed in very small quantities and are essential for regulating certain body processes. Minerals that must be consumed in relatively large amounts—more than 100 milligrams daily—are called major minerals. These include calcium, chloride, magnesium, phosphorus, sulfur, sodium, and potassium. Minerals that must be present in smaller amounts are called trace minerals. These include chromium, copper, fluoride, iodine, iron, manganese, molybdenum, selenium, and zinc. Less is known about the functions of some of the trace minerals. It is important to understand, however, that although small quantities are needed by the body, too much of any of them can be harmful.

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Sodium, a component of table salt, is well known as a health problem. Too much sodium is thought to contribute to high blood pressure. Health authorities try to convince people to reduce the sodium in their diets, primarily by salting foods less.

WATER

The adult human body is 50 to 60 percent water by weight. Water plays a role in all the body's functions, including metabolism and other cell functions, digestion, delivery of nutrients, removal of waste, temperature regulation, and lubrication and cushioning of joints and tissues.

Water forms a large part of most of the food we eat and all the beverages we drink. The body is good at regulating its own water content and tells us when we need more by making us feel thirsty. This signal should not be ignored. Even better is to drink enough fluids to prevent feeling thirsty. Required daily water intake varies greatly from person to person, depending on age, level of activity, and environmental factors such as heat. The common recommendation of 8 glasses of water a day is not enough for some people, such as athletes and others who exercise strenuously, and is too much for others, such as older, sedentary adults.

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NUTRIENT	MAJOR DIETARY SOURCES		FUNCTIONS IN THE BODY
Carbohydrates	Grains (including breads and pasta) Dried beans	Potatoes Corn Sugar	Major source of energy (calories) for all body functions. Necessary for proper utilization of fats. Unrefined carbohydrates supply fiber, important for proper waste elimination.
Fats	Meats, poultry, and fish Dairy products Eggs	Cooking fats and shortening Salad dressings	Supply food energy (calories). Supply essential fatty acids. Carry fat-soluble vitamins.
Proteins	Meats, poultry, and fish Milk and cheese Eggs	Dried beans and peas Nuts	Major building material of all body tissues. Supply food energy (calories). Help make up enzymes and hormones, which regulate body functions.
Vitamin A	Liver Butter and cream Egg yolks	Green and yellow vegetables and fruits	Helps skin and mucous membranes resist infection. Promotes healthy eyes and makes night vision possible.
Thiamin (vitamin B ₁)	Pork Whole grains and fortified grains	Nuts Legumes Green vegetables	Needed for utilization of carbohydrates for energy. Promotes normal appetite and healthy nervous system. Prevents beriberi.
Riboflavin (vitamin B ₂)	Organ meats Milk products	Whole grains and fortified grains	Needed for utilization of carbohydrates and other nutrients. Promotes healthy skin and eyes.
Niacin (a B vitamin)	Liver Meat, poultry, and fish	Legumes	Needed for utilization of energy foods. Promotes healthy nervous system, skin, and digestion. Prevents pellagra.
Vitamin B ₁₂	Most animal and dairy products		Promotes healthy blood and nervous system.
Vitamin C (ascorbic acid)	Citrus fruits Tomatoes Potatoes Dark green leafy vegetables	Peppers, cabbage, and broccoli Cantaloupe Berries	Strengthens body tissues. Promotes healing and resistance to infection. Prevents scurvy.
Vitamin D	Fortified milk products	Formed in skin when exposed to sunlight	Necessary for utilization of calcium and phosphorus to promote healthy bones, teeth, and muscle tissue.
Vitamin E	Unsaturated fats (vegetable oils, nuts, whole grains, etc.)		Protects other nutrients.
Calcium	Milk products Leafy vegetables	Canned fish with bones	Forms bones and teeth. Necessary for healthy muscles and nerves.
Iron	Liver and red meat Raisins and prunes Egg yolks	Leafy vegetables Dried beans Whole grains	Needed for formation of red blood cells.

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6.1.2. Planning- purchasing and competencies

Cooking competence is important as it affects self-reliability, nutritional knowledge, dietary behaviour and quality, as well as health. It also affects the home meal preparation and consumption process and the way in which a cook is able to handle stressful situations.

Secondly, the possession of cooking knowledge and skills to improve nutritional knowledge and ability to prepare meals, will also affect dietary quality. Cooking competence would enable to prepare and incorporate the vital foods for a healthy diet and would broaden their food selection. This could lead to higher consumption of healthier foods such as fruits, vegetables and grains.

This applies to food hygiene measures, measures to avoid exposure to allergenic ingredients, such as peanuts, and the impact of food perseveration and processing on macro and micro nutrients. ce food consumption as these foods are less healthy.

Lastly, if a non-traditional approach is taken to defining cooking competence as more than just technical skills, one can see how they can be beneficial to the stages of the home food production chain such as planning, storing/handling, preparation, eating, and disposal. For example, planning and organizing skills help with the first stage of the ship food production chain, mechanical and technical skills are used for the preparation stage, and fundamental knowledge of food hygiene is useful throughout the storing/handling, preparation and disposal stages. Therefore, lack of cooking competence may impair one's ability to multi-task in a demanding situation.

The relationship between cooking competence and food purchasing and consumption has several aspects. As mentioned previously, increased cooking competence allows for a broader variety of items to be prepared, increases intentions to buy more fresh produce as well as increases their consumption.

Furthermore, the possession of cooking skills allows the cook to be able to make several types of meals from one food product, thus decreasing food costs.

6.1.3. Food allergy and food intolerances

Food allergies and food intolerances (or sensitivities) can have similar symptoms, but are very different conditions:

- Intolerances, such as lactose intolerance and celiac disease, can cause someone to feel ill.
- Food allergies not only can make someone feel ill, but also can cause a life-threatening reaction (called anaphylaxis).

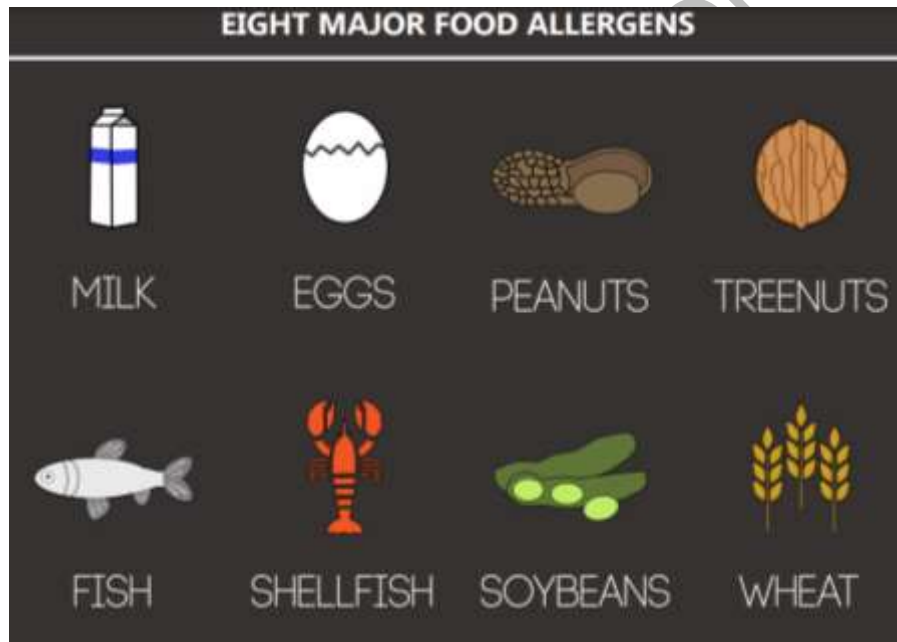
A food intolerance means either the body cannot properly digest the food that is eaten, or that a particular food might irritate the digestive system. Symptoms of food intolerance can include nausea, gas, cramps, abdominal pain, diarrhea, irritability, nervousness, or headaches.



A food allergy happens when the body's immune system, which normally fights infections, sees the food as an invader. This leads to an allergic reaction — a response from the immune system in which chemicals like histamine are released in the body. The reaction can cause symptoms like breathing problems, throat tightness, hoarseness, coughing, vomiting, abdominal pain, hives, swelling, or a drop in blood pressure.

Even if previous reactions have been mild, someone with a food allergy is always at risk of the next reaction being life-threatening. Eating a microscopic amount of the food, or sometimes even touching or inhaling it, could lead to anaphylaxis. So anyone with a food allergy must avoid the problem food(s) entirely and always carry emergency injectable epinephrine.

Many people with food sensitivities, on the other hand, can ingest a small amount of the bothersome food without a problem.





SYMPTOMS

ALLERGIC REACTIONS

SKIN:

hives, eczema, swelling of the lips and face, itching

RESPIRATORY TRACT:

swelling of the throat or mouth; difficulty breathing/shortness of breath; stuffy nose; itchy watery eyes; runny nose; wheezing and re-petitive coughing

GASTROINTESTINAL TRACT:

abdominal cramps, vomiting, & diarrhea
Individuals may have different reactions

ANAPHYLAXIS:

a life-threatening reaction that can include all of the above symptoms of an allergic reaction, plus:

CARDIOVASCULAR SYSTEM:

drop in blood pressure, loss of consciousness, death

FOOD INTOLERANCES

GENERAL:

Nausea, stomach pain, gas, cramps or bloating, vomiting, heartburn, diarrhea, headaches, irritability, or nervousness.

LACTOSE:

(found in milk and dairy products) is the most common food intolerance, which affects about 10% of Americans whose bodies don't have enough of the enzyme lactase to break down the milk sugar lactose. Bacteria in the digestive tract use the undigested lactose, producing gas, which results in bloating, abdominal pain, and often diarrhea.

GLUTEN INTOLERANCE:

or Celiac Sprue, is caused by the body's inability to break down gluten. If not treated by modified diets, this specific intolerance can cause severe intestinal damage and loss of ability to absorb nutrients. Individuals with gluten intolerance must avoid the following products - wheat, barley, rye, and oats.

OTHER COMMON FOOD INTOLERANCES:

include various dyes, sulfites in foods or beverages, such as red wine, and salicylates - a group of naturally occurring plant chemicals.

Kitchen production procedures:

To begin food production, use the "Start Fresh" approach:

START FRESH: Wash hands thoroughly; making certain to wash between fingers, under & around fingernails, & wrists

START FRESH: Put on a new pair of 'single-task' gloves or simply just use tongs – separate tongs - as a barrier

START FRESH: Wash (with soap and clean water), rinse, and sanitize (with fresh Quat) all surfaces that may come in contact with food – equipment, tables, chairs, or utensils

- Use separate fryers and separate cooking oils when frying food.

START FRESH: Cross-contact: shared pans, fryers, grills, counters, dishes, slicers, trays, blenders, processors, chopping boards, utensils and spills or splattering while cooking.

Special Orders

- Use new utensils for "special orders" (knives, tongs, spoons, spatulas, scoops)



- Special orders” need to be easily and quickly distinguished from regular menu items (Separate, designated “Allergy Zone” and Different colored plate)

Shared utensils or accidental mixing at salad bars or steamtables

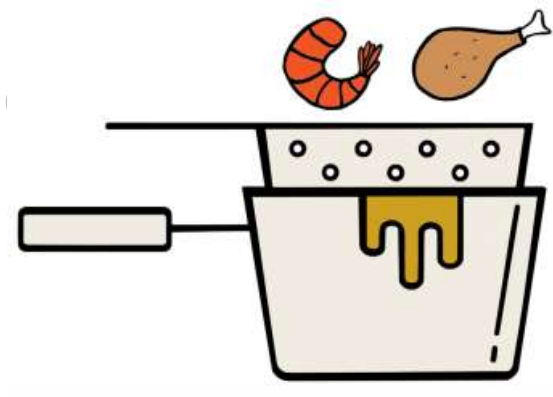
START FRESH: Prep food for crew, with food allergies in a separate area from other food

- If a food does not have a label or if you are unsure about the ingredients, DO NOT GUESS.
 - Review the Recipe in Food Allergen Recipe Notebook
 - Review the Processed Foods Component List



CROSS-CONTACT

Do not use the same fryer to cook different types of food that contain allergens:



Prevent placing food on surfaces that have touched allergens (cutting boards, bowls, containers, hotel pans, knives, pots & pans, slicers, mixers, all utensils, gloves)



Alternatives that can be used instead of foods that cause allergy or intolerances

Looking for ways to make delicious meals and treats that are allergy-friendly? Try some of the substitutions for common allergens below.

Milk

Fortunately, milk is one of the easiest ingredients to substitute in baking and cooking. It can be substituted, in equal amounts, with water or fruit juice. (For example, substitute 1 cup milk with 1 cup water.)

Eggs

For each egg, substitute one of the following in recipes. These substitutes work well when baking from scratch and substituting 1 to 3 eggs.

1 tsp. baking powder, 1 T. liquid, 1 T. vinegar

1 tsp. yeast dissolved in 1/4 cup warm water

1 1/2 T. water, 1 1/2 T. oil, 1 tsp. baking powder

1 packet gelatin, 2 T. warm water. Do not mix until ready to use.

Wheat

When baking with wheat-free flours, a combination of flours usually works best. Experiment with different blends to find one that will give you the texture you are trying to achieve.

Try substituting 1 cup wheat flour with one of the following:

7/8 cup rice flour



5/8 cup potato starch flour

1 cup soy flour plus 1/4 cup potato starch flour

1 cup corn flour

To start cooking delicious meals that meet everyone's health needs, simply set up your profile to include the health conditions, food allergies or food dislikes for you and your crew members. The Meal Planner automatically generates meal plans and recipes that meet everyone's health needs. It's that easy!

6.1.4. Awareness of the importance of nutrition for combating lifestyle disease

The importance of proper nutrition and physical activity in reducing rates of disease and death from chronic diseases has been well established.¹⁻³ Poor diet and physical inactivity cause 310,000 to 580,000 deaths per year and are major contributors to disabilities that result from diabetes, osteoporosis, obesity, and stroke.





Healthy diets and physical activity are key to good nutrition and necessary for a long and healthy life. Eating nutrient dense foods and balancing energy intake with the necessary physical activity to maintain a healthy weight is essential at all stages of life. Unbalanced consumption of foods high in energy (sugar, starch and/or fat) and low in essential nutrients contributes to energy excess, overweight and obesity. The amount of the energy consumed in relation to physical activity and the quality of food are key determinants of nutrition related chronic disease.

Not all fats are the same, it pays to know the difference. The scientific complexities of these issues should not obscure the simple messages required to orient and guide consumers. People should eat less high-calorie foods, especially foods high in saturated or trans fats and sugar, be physically active, prefer unsaturated fat and use less salt; enjoy fruits, vegetables and legumes; and select foods of plant and marine origin. This consumption pattern is not only healthier but more favourable to the environment and sustainable development.

The provision of nutritious food and adequate water are important components of healthy living for every working seafarer.

The most important foodstuffs are meat and meat products, fish, potatoes, milk and milk products, rice, vegetables, pulses, farinaceous products, sugar, flaked oats and other grains to achieve a tasteful variety of meals. Progress in food science and technology has introduced into marine catering an over-increasing range of convenience foods, capable of quick preparation. With the growth in this kind of fare, it is even more important to ensure that provisions are capable of providing a well balanced diet containing sufficient nutrients to sustain good health. Good eating habits based on moderation and variety can keep the seafarer healthy and even improve his health. Because of the monotony of long voyages, and in the absence of other stimulation, crew members will become unreasonably interested



in food and high quality food is thus very important in maintaining morale and in elevating the stresses.

Highly concentrated food with high nutritive value is often poor in bulk, which can lead to chronic constipation, which is a common disorder of some seafarers. Hence the seafarer's diet should contain sufficient fibre, which not only helps in fighting against constipation but also promotes health by facilitating normal elimination of waste products, providing satiety and helping to control cholesterol levels. It is also advised that seafarers take vegetable and fruit in their diet.

Drinking water must be fresh, clear and without taint. Potable water tanks, filters, hosepipes and service lines should be maintained and thoroughly clean.

Tips for Adopting a Healthy Eating Regime

Encourage and stimulate the crew members to eat healthily. Pay attention to healthy food in meetings, at medical check-ups etc.

Use a broad approach to inform and motivate the seafarers onboard. Offer variation in food. A healthy menu is not necessarily more expensive than an unhealthy one.

The whole vessel has to be behind the programme: captain and officers have to show their commitment.

It takes time to implement a healthy food programme onboard. Behavioural changes take several months and benefits may take even longer to become measurable.

Make a systematic plan of what you want to achieve in respect to healthy food and eating onboard and over what period of time. Involve key persons like the cook and ship chandler and establish a company policy on health.

Budget for the programme, make sure the activities adopted are evaluated and be prepared to adapt the plan if some initiatives are not as successful as others.

Announce the plan and the changes, organise an event to celebrate the start of the plan such as a special menu or distribute apples or other fruit.

Ensure the menu of the coming week is on display and remember to stress the healthy alternatives.

Provide healthy drinks and snacks. Also provide information (posters or leaflets) on healthy food in every place where food is available onboard.

Ask crew members to fill out questionnaires to assess the success and strengths of the plan. Give crew members the possibility to suggest and try new recipes.