Food sanitation

Food sanitation

- It included all practices involved in protecting food from risk of contamination, harmful bacteria, poisons and foreign bodies, preventing any bacteria from multiplying to an extent which would result in an illness of consumers; and destroying any harmful bacteria in the food by thorough cooking or processing.

- The primary tenet of food-service sanitation is absolute cleanliness
- It begins with personal hygiene, the safe handling of foods during preparation, and clean utensils, equipment, appliances, storage facilities, kitchen and dining room.

Definition of terms

- *Food – Any substance whether simple, mixed or compounded that is used as* food, drink, confectionery or condiments.
- *Safety – is overall quality of food fit for consumption.*

- *Sanitation – is a health of being clean and conducive to health.*
- *Cleanliness – is the absence of visible soil or dirt and is not necessarily sanitized.*

- *Microbiology - the branch of biology that deals with microorganisms and their effect on other microorganisms.*
- *Microorganisms - organism of microscopic or submicroscopic*

- *Food Infection - microbial infection resulting from ingestion of contaminated foods.*
- *Food Intoxication - type of illness caused by toxins. Under favorable condition certain bacteria produce chemical compounds called toxins*

- *Food Spoilage - means the original nutritional value, texture, flavor of the food are damaged, the food become harmful to people and unsuitable to eat.*
- *Foodborne Illness – A disease carried or transmitted to people by food.*

Food Safety : A Top Priority

- Food safety is the responsibility in every person who is involve in food service. Serving safe food is the top priority for every food service employee.

Dangers of food borne illness

- Individual – Food borne illness are the greatest danger to food safety. It could result to illness or diseases to an individual that would affect their overall health, work and personal lives.

- Loss of family income
- Increased insurance
- Medical expenses
- Cost of special dietary needs
- Loss of productivity, leisure and travel opportunities
- Death or funeral expense

- Establishment – Food borne illness outbreak can cost an establishment thousands of pesos, it can even be the reason an establishment is forced to closed.

- Loss of customers and sales
- Loss of prestige and reputation
- Lawsuits
- Increase insurance premiums
- Lowered employee morale
- Employee absenteeism
- Increase employee turn over
- Embarrassment

Types of Food Contaminants

- Biological Contaminants
- Physical Contaminants
- Chemical Contaminant

- Biological Contaminant – A microbial contaminant that may cause a food borne illness (bacteria, viruses, fungi, parasites, biological toxins)
- Examples:
- Sea food toxins
- Mushroom toxins
- Clostridium Botulinum
- Salmonella bacteria

Preventing Biological contaminant:

- Purchase foods only on reputable supplier
- Do not use wild mushrooms
- Maintain good personal hygiene
- Observe proper hand washing
- Clean and sanitize equipment
- Maintain clean and sanitize facilities
- Control pests

- Physical Contaminant – any foreign object that accidentally find its way into food
- Examples:
- Hair
- Staple wire
- Dust

Preventing Physical Contaminants:

- Wear hair restraint
- Avoid wearing jewelry when preparing, cooking and holding foods (ring, earrings)
- Do not carry pencil or pen
- Do not wear nail polish or artificial nails when working with foods
- Clean can openers regularly
- Remove staple wire in the receiving area
- Place shields on lights

- Chemical Contaminant – a chemical substance that can cause food borne illness. Substances normally found in restaurant
- Examples:
- Toxic metals
- Pesticides
- Cleaning product
- Sanitizers

Preventing Chemical Contaminants:

- Teach employees how to use chemicals
- Store chemicals in original containers to prevent accidental misuse, as well as leakage into food
- Make sure labels are clearly identify chemical contents of chemical containers
- Always chemical according to chemical recommendation
- Always test sanitizing solution
- Wash hands thoroughly after working with chemicals
- Wash foods in cold running water
- Monitor pest control operator and make sure chemicals do not contaminate foods

Main Causes of Food Borne Illness

- 1. Cross- Contamination
- 2. Time-Temperature Abuse
- 3. Poor Personal Hygiene

- **Cross Contamination - occurs when microorganisms are transferred from one surface or food to another.**
- The bacteria can transfer from:

- Hand to food Contamination - Occurs when contaminated hands handle cooked or ready to eat foods.
- *How to prevent hand to food contamination?*
- □ Wash hands properly
- □ Cover cuts, sores and wounds
- □ Keep fingernails short, unpolished & clean
- □ Avoid wearing jewelry, except for plain ring

When to wash hands?

- Before:
- 1) Beginning food preparation
- 2) Putting on disposable gloves
- 3) Serving customers

- After:
- 1) Arriving at work and after break
- 2) Using the restroom, washing sinks
- 3) Eating, drinking, smoking, chewing tobacco and gums
- 4) Using the telephone
- 5) Using handkerchief or tissue
- 6) Handling inventory
- 7) Handling raw foods
- 8) Touching or scratching a part of the body
- 9) Coughing, sneezing
- 10) Handling garbage
- 11) Touching dirty surfaces

How to Wash Hands?

- 1) Use the hand washing sink with running at approximately 100°F and liquid soap.
- 2) Lather hands and exposed arms
- 3) Rub hands for at least 20 seconds
- 4) Wash hands thoroughly, paying attention to fingernails
- 5) Rinse in clean running water. Turn off the faucet with paper towel in your hands
- 6) Dry hands using paper towel or air dryer. Not cloth or apron

- Food to Food Contamination - When harmful organisms from one food contaminate other foods. (raw meats, thawing meat on top of the shelf where it can drip on the other foods)

How to prevent Food-Food Contamination

- Store cooked foods that will not be cooked in the refrigerator on a higher shelf than raw foods.
- Best to practice mix left over foods with fresh foods
- Wash fruits & veg, in a cold running water
- Do not let raw meat and raw vegetables be prepared on the same surface at the same time

Equipment to Food Contamination How to prevent:

- Use separate cutting boards for different foods (meat- veg)
- Prepare raw foods in separate area from fresh and ready to eat foods
- Clean & sanitize equipment, work surfaces & utensils after preparing each foods
- Use specific containers for various food products.
- Make sure cloth and paper towel use for wiping spills are not used for any other purposes

- TIME TEMPERATURE ABUSE – happens when the food is exposed to Temperature Danger Zone (41°F - 140°F) for more than 4 hrs.

- Time Temperature Abuse occur when:
- □ Food is not stored, prepared or held at a required temperature
- □ Food is not cooked or reheated to temperature high enough to kill harmful microorganisms
- □ Food is not cooled low enough fast
- □ Food is prepared in advance and not set to a safe required internal temperature while the food is on hold

- Preventing Time Temp. Abuse
- Never expose the food to Temperature danger zone: 41°F - 140°F

- Not to exceed 4 hours, except cool-down
- Document temperatures & time
- Includes receiving, storage, preparation, holding, serving, cooling, and reheating
- Pass food through danger zone quickly

- POOR PERSONAL HYGIENE – Food handlers are carriers of disease causing bacteria. Food service personnel can contaminate food.

Basics of Good Personal Hygiene:

- Stay home if someone is suffering from this illnesses:

Hepatitis A

Shigella

E-Coli Infection

Salmonella

- Medicines should be kept inside the locker and away from foods
- Clean and cover cuts and wounds

- Never use bare hands when handling ready to eat foods
- Disposable gloves should be used once
- Take a bath everyday
- Wear appropriate attire
- Refrain from wearing jewelry, make ups, and nail polish
- Observe proper hand washing procedures at all times

UNDERSTANDING MICROORGANISMS

1. *Pathogens - are disease causing microorganisms (bacteria, viruses, parasite and fungi)*
2. *Bacteria - single celled living micro organisms responsible for the decay of many plant and animal diseases.*
3. *Virus - The smallest of the microbial food contaminants, viruses rely on a living host to reproduce.*

- 4. *Parasite - An organism that needs a living host to survive.*
- 5. *Fungi - can be single celled or multi cellular microorganisms can that can cause food spoilage and lives by absorbing nutrients from organic matter*

- *pH - – potential of Hydrogen. A measure of the acidity or alkalinity of a solution, numerically equal to 7 for neutral solutions, with increasing alkalinity and decreasing with increasing acidity. The pH scale commonly in use ranges from 0 to 14.*

- *Spore - The spore is formed by some bacteria, thickens walls to protect from adverse condition such as extreme acidity and temperature*

- *Vegetative Stage - is a condition favorable for bacteria to grow and multiply rapidly.*
- *Budding Reproduction - – a form of asexual reproduction where in new bud or bump is formed from the mother cell.*
- 10. *Water Activity – The amount of moisture available in food for microorganisms to grow.*

BACTERIA

- All bacteria exist in a vegetative stage
- -Some bacteria has the ability to form a spore where they can survive in an adverse or extreme conditions “**spore forming bacteria**”

Classification of bacteria

- Spoilage Bacteria – where they breakdown foods so they look, taste and smell bad. Thus, food is undesirable to eat and unacceptable.

- Shapes of bacteria:
- 1. Coccus or Cocci – spherical shaped bacteria
- 2. Bacillus or bacilli – rod shaped bacteria
- 3. Spirilla - spiral shaped bacteria

Bacterial Shapes

Spirilla

Bacilli

Cocci

4 Phases of Growth of Bacteria:

- Lag Phase –bacteria adapt themselves to growth conditions. It is the period where the individual bacteria are maturing and not yet able to divide.

4 Phases of Growth of Bacteria:

- The **log phase** (sometimes called the logarithmic phase or the *exponential phase*) is a period characterized by cell doubling

4 Phases of Growth of Bacteria:

- Stationary Phase - the growth rate slows as a result of nutrient depletion and accumulation of toxic products. This phase is reached as the bacteria begin to exhaust the resources that are available to them.

4 Phases of Growth of Bacteria:

- Death or Decline Phase - bacteria run out of nutrients and die

Conditions Bacteria Needs to Grow and Multiply

1. **Food**
2. **Acidity**
3. **Temperature**
4. **Time**
5. **Oxygen**
6. **Moisture**

Food:

 Bacteria feed on Protein and Carbohydrates. Foods that contain these items can support the growth of microorganisms

 Potentially Hazardous Foods have the potential for contamination, they have the characteristics to allow microorganisms to grow and multiply.

How to Control the Growth of Bacteria in Food

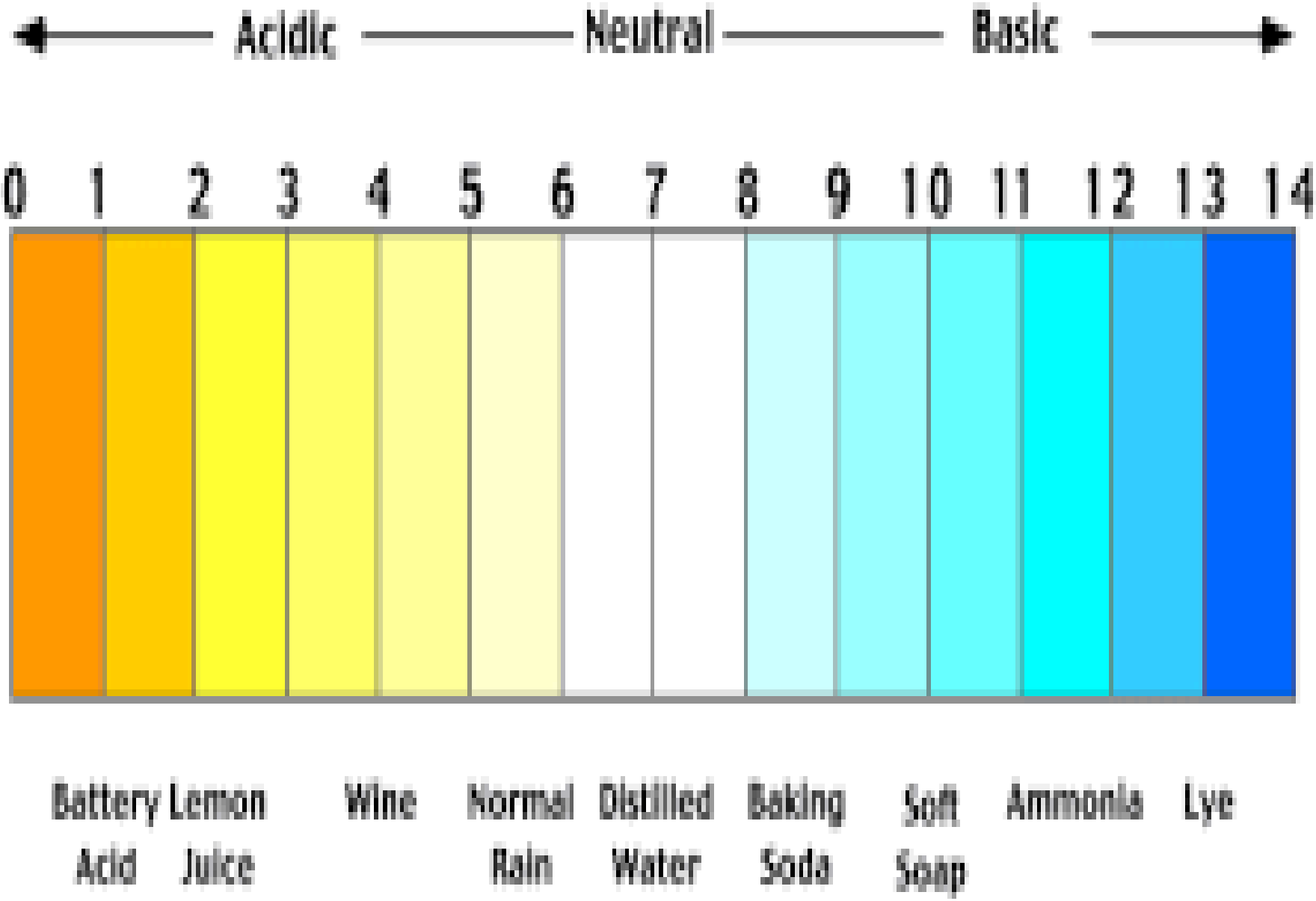
1. Purchase from reputable suppliers
2. Avoid cross-contamination of food
3. Cook food to safe internal temperature and test with food thermometer

Acidity:

- Bacteria grows best at a slightly acidic and slightly neutral environment (pH 4.6 to 7.5)
- Some bacteria can develop a “spore” such as **acidophilic bacteria, where it could grow**

And multiply in an acidic environment

- Bacteria such as E-Coli can grow in unpasteurized apple that has a pH value of 4.0


Acidic
Neutral
Basic
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
Battery Acid
Lemon Juice
Wine
Normal Rain
Distilled Water
Baking Soda
Soft Soap
Ammonia
Lye

If the pH is: Below 4.6 Bacteria will not grow

Between 4.6 to 7.0 Bacteria will thrive

Between 7.0 to 9.0 Bacteria may survive

Temperature

- Temperature Danger Zone - temp. range 41F-140F (5C-60C). Food borne bacteria grow and reproduce.
- • Temperature Abuse –foods that have not been to a safe temperature or kept at the proper temperature
- • Psychrophilic bacteria – grow within the temperature range of
- 32°F(0°C) – 70°F (21°C) (spoilage organisms)
- • Mesophilic bacteria – grow at temp. 70°F(21°C) – 110°F(43°C)
- • Thermophilic bacteria – grows best above 110°F (43° C)

How to Control Temperature To Control The Growth of Bacteria

1. Cold foods, must be stored 41^{o}F or below
2. Hot foods, must be held at 140^{o}F (60^{o}C) and above
3. Control the temperature of food during storing, preparing, cooking, holding, re-heating, serving.
4. Check internal temperature regularly
5. Cook foods at a required internal temperature with a food thermometer
6. Keep foods out of Temperature Danger Zone

Oxygen

Bacteria differ in their oxygen requirement.

Anaerobic bacteria – cannot survive when oxygen is present bec. it is toxic to them.

Anaerobic bacteria grow well in vacuum packaged foods or canned foods where
oxygen is not available.

Aerobic bacteria – need oxygen to grow

Facultative anaerobic bacteria – can grow with or without free oxygen but have a preference

Microaerophilic organisms – can survive in a very little amount oxygen

How to Control Oxygen to Control the Growth of Microorganism

1.Bacteria grow in different oxygen requirement, it is difficult to control this condition.

2. Bacteria such as Clostridium Botulinum and Clostridium Perfringens live without

The presence of oxygen, it is important to cool foods in a shallow pan.

Moisture

Moisture is important factor in bacterial growth. The amount of water available for bacterial activity.

- *Water Activity level – is the measure of the amount of water that is not available for bacterial to grow. (0- 10)*
- *Potentially hazardous foods (PHF) – foods that have a water activity level of .85 or higher*

How to Control Moisture to Control the Growth of Microorganism

1.Lower the amount of moisture in food through freezing, dehydrating, adding sugar or salt.

VIRUSES

- • Microbes are single-celled organisms that can perform the basic functions of life — metabolism, reproduction, and adaptation.
- • Except viruses.
- • Viruses can’t metabolize nutrients, produce and excrete wastes, move around on their own, or even reproduce unless they are inside another organism’s cells.
- • They aren’t even cells.

VIRUSES

- Viruses are the simplest and tiniest of microbes; they can be as much as 10,000 times smaller than bacteria.
- • Viruses comes in many sizes and shapes
- • Viruses consist of a small collection of genetic material (DNA or RNA) encased in a protective protein coat called a **capsid**.
- • Some may survive in freezing and cooking

PARASITE

- • A parasite is an organism that lives by feeding upon another organism. Parasites living in the human body feed on our cells, our energy, our blood, the food we eat and even the supplements we take.
- • There are several types of parasites: protozoa are single celled organisms that are only visible under a microscope, while worms come in all sizes from threadworms, that measure less than one centimeter, to tapeworms that grow up to 12 meters in length.

PARASITE

- • They grow naturally in many animals such as pigs, cats and rodents
- • They can be killed by proper cooking or freezing

How can I get a Parasite?

- Contaminated or unfiltered water
- Contaminated soil
- Contaminated fruits and vegetables
- Raw or rare meat
- Pets Mosquitoes Contact with feces
- Contact with someone with parasites

FUNGI

- Fungi are a group of organisms and micro-organisms that are classified within their own kingdom, the fungal kingdom, as they are neither plant nor animal.
- Fungi draw their nutrition from decaying organic matter, living plants and even animals.
- Many play an important role in the natural cycle as decomposers and return nutrients to the soil, they are not all destructive.

FUNGI

- Examples of Fungi are:
- 1) Mold
- Ø Mold cause spoilage in food and could cause illnesses
- Ø They grow under almost any conditions, but grow well in sweet, acidic food with low water activity.
- Ø Freezing temperatures prevent or reduce the growth of molds, but not destroyed
- Ø Some molds produce called “aflatoxins”

FUNGI

- 2) Yeasts
- Ø Yeast also cause food spoilage
- Ø Yeast spoilage produce a smell or taste of alcohol. They appear in pink color discoloration
- They also grown well in sweet, acidic foods with low water activity level
- Such as jellies, honey and fruit juices