

Assignment #2

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IB-066

1 - Differentiate between Food Additives and Food Preservation

Food Additives:

"Food additives are substances that become part of a food product when they are added during the processing or making of that food"

There are two types of food additives:

1) Natural Food Additives

2) Artificial or Man made Additives

(1) Natural Food Additives:

• These include herbs or spices to add flavour to food.

• Vinegar for pickling foods.

• Salt to preserve meats.

(2) Man-made Food additives:

• Anti-Caking Agents: Stops ingredients from sticking together and forming lumps.

• Antioxidants: Slow or Prevent the oxidative deterioration of foods.

• Artificial sweetness: Increases the sweetness

- of food without adding a lot of sugar.
- Bulking Agents: Increases the volume of food without majorly changing its available energy.
- Colors: Add or restores colors to foods.
- Foaming Agents: Maintain the even dispersion of gas in aerated foods.
- Gelling Agents: Change the texture of food via gel formation.
- Mineral salts: Enhance the texture and flavour of foods.

Food Preservatives

Food preservatives are the substances that are added to the food to prevent decomposition by microbial growth or by undesirable chemical changes.

Food preservatives are divided into four types:

- 1) Natural food preservatives
- 2) Chemical food preservatives
- 3) Artificial food preservatives
- 4) Harmful food preservatives.

1) Natural food preservatives:

These includes salt, sugar, alcohol

vinegar etc. It is the traditional method that is used in houses to preserve food.

2) Chemical food preservatives:

These include Benzoates, Nitrates, Sulphites, Sorbates etc. It is the efficient and fool proof method to preserve food for a longer time.

3) Artificial food preservatives:

These include the substances that stops or delayed the growth of bacteria, spoilage and its discoloration, such as: Antimicrobial agents, Antioxidants, chelating agents etc.

4) Harmful food preservatives:

Benzoates, Butylates, BHA and Caramel are considered as harmful food preservatives.

They causes different disorders such as asthma, liver diseases, rashes, allergies or even can cause cancer.

Food Preservation Methods

Here are some methods, that can be followed to preserve food:

1) Salting: Drawing out moisture through osmosis, making it difficult for bacteria to thrive.

2) Drying: Removing moisture to prevent the growth of bacteria, yeasts and molds.

3) Freezing: Lowering the temperature to slow down bacterial growth and enzyme activity.

4) Pickling: Using vinegar, brine or oil mixed with salt to create an acidic environment that inhibits microbial growth.

5) Canning: Sealing food in airtight containers after heating to kill bacteria.

6) Vacuum Sealing: Removing air from packaging to prevent oxidation and slow down spoilage.

7) Fermentation: Allowing natural bacteria to convert sugars into acids or alcohol, preserving the food.

Food Adulteration and Food Contamination

1) Food Adulteration:

Food adulteration refers to the deliberate addition of inferior

or harmful substances to food, or the removal of valuable ingredients to increase the quantity or to reduce the costs, often for financial gain. Examples include mixing of water into milk or adding synthetic dyes to enhance color.

Food Contamination:

Food contamination occurs when harmful substances like bacteria, chemicals or foreign objects incidently enter food, making it unsafe for consumption. This can happen during production, processing, or handling. Common contaminations include pesticides, bacteria like Salmonella and allergens.

- While adulteration is intentional whereas, contamination is unintentional.
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Assignment No. 3

— Write definitions, symptoms, causes, causal agents, treatment and prevention of the following diseases.

— (A) Polio —

Definition:

Polio is highly infectious viral disease caused by the poliovirus. It primarily affects the nerves system, potentially leading to paralysis, muscle weakness and in severe cases causes death.

Symptoms: Fever, fatigue, headache, nausea, sore throat, and vomiting. Other

severe symptoms include muscle weakness, paralysis, difficulty in breathing and permanent disability.

Causes: Polio is caused by poliovirus which spreads through person to person contact, direct contact with infected saliva or mucus.

Causal Agent: Poliovirus is the causal agent in polio disease, a highly contagious virus from the Enterovirus genus.

Treatment: There is no complete treatment to cure polio. However, treatment focuses on alleviating symptoms and preventing complications such as pain relievers, physical therapy to reduce muscle atrophy and breathing support for patients with respiratory difficulties.

Prevention: The best way to prevent one from polio is vaccination, i.e. Inactivated Polio Vaccine (IPV) which is given through injection. Some other preventions include Good Hygiene, i.e. washing hands with anti-bacterial soap and consuming clean water.

(2) Malaria

Definition: Malaria is a life-threatening disease caused by parasites that are transmitted to humans through the bites of infected female "Anopheles mosquitoes". It primarily affects red blood cells, leading to fever, chills and anemia.

Symptoms: Common symptoms include fever, chills, headache, fatigue, muscle pain,

nausea, sweating, vomiting, abdominal pain and even disturbance of respiratory system.

Causes: Malaria is caused by the bites of infected female Anopheles mosquito carrying the parasite.

Causal Agents: This disease is caused by Plasmodium parasites, with five main species affecting humans: Plasmodium falciparum, Plasmodium vivax, Plasmodium ovale, Plasmodium malariae and Plasmodium knowlesi.

Treatment: An antimalarial drug can be used as a treatment, however treatment also depends upon the type of parasite and the region where the infection was occurred, such as Chloroquine, Artemisinin-based combination therapies (ACTs) and Primaquine.

Prevention: Preventing mosquito bites and controlling mosquito population are keys to prevent malaria. Some other measures that can also be taken to prevent from this disease includes; insecticide-treated bed nets, indoor residual spraying, antimalarial

medications, wearing protective clothes, using insect repellents and most importantly vaccine.

(3) Hepatitis

Definition: Hepatitis is an inflammation of the liver, often caused by viral infections, though other factors such as toxins, autoimmune diseases, and alcohol abuse.

Symptoms: Its early symptoms include fatigue, vomiting, loss of appetite, low grade fever and joint pain. Jaundice:

Yellowing of skin and eyes, dark urine and pale stools. Some other symptoms

include abdominal pain, especially in upper right side, itching and muscle pain.

Causes: Hepatitis is a viral infection usually caused by alcohol abuse, drug-induced liver injury, toxins and autoimmune diseases. There are five main hepatitis viruses, such as A, B, C, D and E.

Causal Agents: Hepatitis A virus: spreads through contaminated food or water.

• Hepatitis B: spreads through contact with infected blood, semen or other body fluids.

- Hepatitis C: Mainly spread through blood-to-blood contact. e.g. sharing needle.
- Hepatitis D: Also spreads from body fluids when contacted with other body.
- Hepatitis E: Transmitted through contaminated water, mainly in developing regions.

Treatment: In severe cases or liver damage, liver transplantation may be required. However, Hepatitis A and E usually resolve on their own through proper supportive care i.e. hydration and rest. Whereas B and C requires Antiviral medications and regular monitoring and long term treatments. Hepatitis D can be treated with antiviral drugs like Pegylated interferon.

Prevention: Avoiding toxic substances including drugs and other harmful chemicals. Maintaining good hygiene i.e. washing hands, drinking clean water and avoid sharing needles or razors. Other important practices includes the screening of blood before transfusion and proper vaccination.

(4)

Dengue

Definition: Dengue is a viral infection transmitted by the bite of infected "Aedes mosquito".

Symptoms: (1) High fever (upto 104°F or 40°C)
(2) Severe Headache (3) Pain behind eyes
(4) Joint and muscle pain (5) Vomiting
(6) Skin rash (7) Severe abdominal pain
(8) Sudden drop in blood pressure
(9) Difficulty in breathing.

Causes: Dengue is caused by dengue virus (DENV), which has four different serotypes DENV-1, DENV-2, DENV-3 and DENV-4.

Casual Agents: Dengue virus (DENV), a member of Flavivirus genus, transmitted by the bites of mosquito primarily Aedes aegypti and Aedes albopictus.

Treatment: No specific antiviral treatment exists, however management focuses on supportive care which includes, hydration, pain relevers, hospitalization and blood

transfusion (in case of severe bleeding from gums and teeth)

Preventions: A number of preventions can take place to tackle this disease such as: Eliminating standing water where mosquitos breed, use insecticides, wear protective clothing, install window and door screens to keep mosquitos away. Furthermore, vaccination and community health measures can also help to overcome this virus.

(5) Diarrhea

Definition:

Diarrhea is the condition of having loose, watery stools three or more times a day. It can be acute, lasting for few days or can be chronic lasting two to four weeks. It can lead to dehydration, especially in children and the elderly and some times it can be life threatening.

Symptoms:

- Frequent loose or watery stools.
- Abdominal cramps or pain.
- Bloating
- Nausea or vomiting
- Fever
- Dehydration.

Causes:

Diarrhea can be caused by a variety of factors including; infections through bacteria, viruses or Pesticides. Antibiotics, loose or intolerance of food, digestive disorders and contaminated food or water.

Causal Agents: Common agents, causing diarrhea are; Bacterial infections, Viral infections, Parasitic infections and Toxins.

Treatment: The primary and important treatment carried out in diarrhea is rehydration to replace lost fluids and electrolytes. i.e. ORS, a mixture of salt, sugar and water. Other treatments include antidiarrheal medications, in some bacterial cases antibiotics and probiotics, to

help to restore the balance of good bacteria in the gut.

Preventions: There are some preventions that can be taken to remain safe. These are as following.

(1) Drinking clean water.

(2) Ensure access to proper sanitation.

(3) Washing hands regularly before eating food.

(4) Proper handling of food, i.e. fresh and well cooked.

(5) Avoid contaminated food and water.
