

Food Poisoning From The Microbiological Aspect

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Food poisoning is a common condition which occurs when contaminated food or drink is consumed. It can cause diarrhoea, vomiting, nausea, intoxication, fever and abdominal cramps. This includes foodborne and waterborne diseases. For a healthy individual, the illness is easily cured. However, for sensitive groups (young children and infants, pregnant women, the elderly), and immunocompromised individuals (high risk groups), the disease can cause further complication and sometimes can be fatal. Food poisoning can strike at any time. Therefore, it is compulsory for those individuals pursuing in the food processing and handling arena, to have the necessary knowledge about food safety. This is because every activity involving food at the canteen, restaurant or food factory, is considered as high risk if it is not managed correctly. The consequences can be serious. It would not only cause agony to the victim but the food outlet will lose its reputation. The agencies responsible for ensuring food safety will proceed with their investigation from time to time on the food handler and the premises. If unlucky, the premise will be shut down and the licence suspended.

Why it occurs ?

Among the factors, which contributes to the incidence of food poisoning are listed below.

1. Lack of general hygiene practice in the food processing activities of small or medium food entrepreneurs.
2. Ineffective temperature control during storage and distribution of end product.
3. Insufficient time during reheating of foods.
4. Improper storage and preparation of foods which is bought in bulk, in particular frozen foods.
5. Changes in work culture and attitude of society caused by rapid developments in the economy, has indirectly give rise to the trend of "eating out".

This is why, if food contamination occurs, a large number of consumers will be involved.

Food contamination.

Ingestion of food contaminated with toxin(s) or poison, or food contaminated with live organisms i.e. infection, are sources of food poisoning.

Toxins can be produced by microorganisms (bacteria or viruses), or produced naturally in plants, animals and fungi, or in chemical substances used by man. Food infection occurs due to attack by live microorganisms on the human body system,



Temperature control during distribution using polystyrene box lined with pack ice (thermal freeze) to lengthen its shelf-life and ensure safety of finish product.

particularly the gastrointestinal or GI tract, which then causes disease. Among these are the viruses, bacteria, parasitic protozoa and worms. The attack can be caused by toxin production or attack directly on the GI tract and the body system.

Nowadays, developments in the food processing industry and food preparation outlets are very encouraging. In the food industry, improper handling and transport of raw materials or final product could result in contamination. The contamination process is rapid and it can be estimated that bacteria can increase their numbers in 30 minutes under optimum growth conditions.

Organisms causing food poisoning.

• Bacteria

This group has been the major cause of food poisoning. There are various different types of bacteria, which causes food poisoning. Bacteria are living cells, which are very tiny, and can only be seen under the microscope.

Bacteria causes food poisoning via two means, that is by intoxication or poisoning (production of toxins in food) such as *Staphylococcus aureus* and *Clostridium botulinum*, and by infection (direct attack on body cells) such as *Salmonella spp.*, *E. coli* O 157 : H 7, *Vibrio cholerae spp.* and others.

Among the ways of preventing bacteria from contaminating food are effective temperature control for high risk foods, awareness in personal hygiene and sanitation and avoid cross-contamination by separating raw or uncooked from cooked foods.

• Viruses

Viruses are minute particles - even smaller than bacteria. They can only be identified using the electron microscope. Viruses differ from bacteria because they only grow in live cells or tissue. Hence, they would not be able to grow in food. Their function as a causative agent of food poisoning is not well understood. However, it is involved with other food-related diseases, for example, Hepatitis A (jaundice). Among the factors which causes viral infection are poor personal hygiene, seafood obtained from waters polluted with sewage, food which was handled by an infected person and foods which are not reheated long enough. Despite of these factors, majority of the ways to avoid bacterial contamination also aids in reducing the risks of viral infection.

• Fungi (Moulds)

Fungi have been known to give many benefits to humans. It is used in manufacture of antibiotics, fermented food products such as soy sauce, *tempe*, *tapai*, and other uses. Nevertheless, there are fungi, which produces toxins known as mycotoxins. Mycotoxins are toxic metabolites of fungi, which causes food poisoning, and they are stable at all stages of food processing. There are several types of mycotoxins and the prominent among the others is aflatoxin, produced by the family of moulds named *Aspergillus*. Aflatoxin had already been detected in different agricultural commodities such as groundnuts and corn. Mycotoxin contamination will occur if conditions of storage after post harvest is damp and within temperature of 15°C to 25°C. Therefore, dried raw food materials such as flour and nuts needs to be stored in a dry place.