Frequently asked questions (FAQ)

1. **What factors determines the population of microbes in food.**

The numbers and typesof microorganisms in food are largely determined by:

- Environment from which the food is sourced.
- Microbiological quality of the food in its raw or unprocessed state (intrinsic factors).
- Sanitation during handling and processing.
- Effectiveness of packaging, handling and storage conditions in restricting microbial growth (extrinsic factors).

2. **What are aflatoxins.**

Aflatoxins are a type of mycotoxin produced by *Aspergillus* species of fungi, such as *A. flavus* and *A. parasiticus*. The term aflatoxin refers to four different types of mycotoxins produced, which are B_1, B_2, G_1, and G_2. Aflatoxin B_1, is a potent carcinogen and has been directly correlated to adverse health effects, such as liver cancer, in many animal species. Aflatoxins are largely associated with commodities produced in the tropics and subtropics, such as cotton, ground nuts, spices, pistachios, and maize.

3. **Describe Foodborne intoxication.**

Foodborne intoxicationis caused by ingesting food containing toxins formed by microbes. An intoxication results when a person eats food containing toxins that cause illness. Toxins are produced by harmful microorganisms, the result of a chemical contamination, or are naturally part of a plant or seafood.

4. **Describe Foodborne infection.**

Foodborne infectionis caused by the ingestion of food containing live bacteria which grow and establish themselves in the human intestinal tract. Some bacteria, viruses, and parasites cause foodborne illness via infection.

5. **What are spoilage defects in foods?**

Microbes which colonised the food cause spoilage. The spoilage may be by changing the physical appearance of the food or flavour and taste (Chemical quality). The spoilage is not only by degradation of foods, but also by synthesis of various products like pigments and polysaccharides leading to discolorations and formation of slimes.

6. **Explain thermophiles**

Organisms with an optimum temperature between about 45 degrees and 70 degrees are thermophiles e.g, *Bacillus, Clostridium* etc. Some archaebacteria with an optimum temperature of 80 degrees or higher and a maximum temperature as high as 115 degrees, are referred to as extreme thermophiles or hyperthermophiles.

7. Based on the pH required for growth, how are microbes classified.

Microorganisms which grow at an optimum pH below 7.0 are called acidophiles. Those which grow best at neutral pH are called neutrophiles and those that grow best under alkaline conditions are called alkalophiles.

8. Name the Intrinsic factors which affect the growth of a microorganism in food.

Intrinsic factors within the food are pH, water activity (a_W), oxidation-reduction potential (Eh), nutrient content, antimicrobial constituents and biological structures play a major role in food spoilage.

9. Name the Extrinsic factors which affect the growth of a microorganism in food.

Extrinsic or environmental parameters affect both foods as well as microorganisms these parameters include temperature of storage, relative humidity of storage environment and concentration of gases in environment.

10. Give examples of natural toxins

Toxins naturally present in foods are toxic mushrooms, toxins in sea foods, red kidney bean poisoning, biological amines in cheese and fermented meats etc.

11. What is the pH requirement for the growth of microbes?

Bacteria grow well in the pH range of 6.0- 8.0, yeasts 4.5-6.5 and filamentous fungi 3.5-6.8.

12. Give some examples of foodborne bacteria that cause infection.

The foodborne bacteria that cause infection are*Salmonella* spp., *Listeria monocytogenes, Campylobacter jejuni, Vibrio parahaemolyticus, Vibrio vulnificus,* and *Yersinia enterocolitica*.

13. What is the relationship between relative humidity and water activity?

Relative humidity and water activity are interrelated. When foods with low a_W are stored in environment of high humidity, water will transfer from the gas phase to the food and thus increasing the a_W of the food leading to spoilage. The general thumb rule is that, at higher temperature, lower is the relative humidity and vice-versa.

14. What is citrinin

Citrinin is a toxin from *Penicilliumcitrinum*, but produced by most of the species of *Penicillium* and several species of *Aspergillus*. Citrininacts as a nephrotoxin.

15. According to WHO how many different borne disease are described.

The World Health Organization (WHO) estimates that 1.5 billion cases of food-borne illnesses cause about 3 million deaths each year. More than 250 different food borne diseases have been described.