

Summary

Bacteria are prokaryotic minute creatures which cannot be seen without the aid of microscope. These are the simplest of prokaryotes. Bacteria are omni present. It can survive extreme conditions of pH, temperature, oxygen tension, atmospheric pressures and osmotic conditions. It appears in different shapes and sizes. Although bacteria are tiny creatures, they have very complex structure. Some of them have a polysaccharide based capsule around it. Bacteria have cell wall which gives shape to it. Some have filamentous appendages known as fimbriae or pili and flagella. Cell membrane is located below the cell wall. Inside the cell ribosomes, mesosomes, nuclear material, storage granules, photosynthetic apparatus are present in the cytoplasm. Some bacteria accumulate storage granules, which are of three types. Bacteria have plasmids also known as episomes, which are extra-chromosomal genetic units that carry several important genes. Bacterial nuclear material does not have membrane, hence, it is called as nucleolus. To survive extreme conditions and starvation conditions, some of the Gram positive bacteria produce endospores. Fungi belong to eukaryotes and may be unicellular (yeasts) or filamentous (molds) in appearance. They reproduce by either sexually or asexually. Fungi are saprophytic, parasitic or mutualistic in their nutrition requirement. Fungi produce spores by both asexual and sexual process. The spores produced by different fungi differ in their shape, colour and size, hence, these are used for the identification and classification of fungi. Ascospores and basidiospores are produced by sexual reproduction process, whereas, arthrospores and chlamydospores are produced by asexual reproduction. Yeasts are used in many fermentations and also to produce alcohol. The process of budding can be seen only in yeasts. Like in the case of fungal spores, spores of different shapes can be seen in yeasts. Yeasts produce blastospores, arthrospores, ballistospores and chlamydospores. Spores of either bacteria or fungi have several

roles in food processing industry. Bacterial endospores are heat resistant bodies and can escape normal heating temperatures. Some time heating can activate the endospores leading to the vegetative growth of bacteria, some of which can even produce toxins. Fungal spores can easily be transported by wind currents and may enter the foods when they are exposed to open conditions. Most of the fungal spores enter the foods through air. Food being a rich source of nutrients, fungal spores, if entered into foods after processing can grow well in it leading to spoilage of the food. In many foods minerals which are essential for nutrition are in bound form and not available for the consumers. However, fermentation of foods through desirable microorganisms can enhance the bioavailability of several minerals for human and animal nutrition by separating the minerals from anti nutritional factors like phytic acid.