

Microbial biodeterioration of food.

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Description

Biodeterioration is the process that converts hygiene food into unhygienic by the vital activities of microorganisms. Bacteria, archaea, fungi, and lichens, as well as insect pests, frequently cause complications in the preservation of cultural heritage because of their biodeterioration potential. It is the main cause of food-borne illnesses, food poisoning, and food spoilage. Light, oxygen, heat, humidity, and temperature are the main factors that lead to food spoilage.

Processed foods can be preserved by various treatments: drying, smoking, addition of salts or sugars, pickling, heat pasteurization or sterilization, freezing, use of chemical preservatives, etc. However, for stored organic foods, biodeterioration is mostly restricted to control the immediate storage environment by refrigeration or by using inert gases and, in recent times, by irradiation. Post-harvest biodeterioration by microorganisms can be unpredictable in tropical and subtropical regions. It is largely due to the higher temperatures and moisture levels and often because storage facilities are minor.

Cereals have a vital benefit over crops such as potatoes because they naturally have a low moisture content, which on further dehydrating, allows long days of storage without deterioration. Some microbes are beneficial, for example, the decomposers like fungi, bacteria, invertebrates keep nature clean by helping break down dead plants and animals into organic matter. Storage conditions that are provided are suitable; losses during storage rarely exceed 5%. Losses in quality and quantity are mainly due to fungi. The nature of the microbial damage includes a decrease in viability, discoloration, particularly of the embryo, due to invasion of fungal mycelium, biochemical changes, such as the production of fatty acids, giving awful odor and flavor, loss of mass and the production of mycotoxins. On storage, mostly aero tolerant species of *Aspergillus*, *Fusarium*, and *Penicillium* lead to cereal biodeterioration. They mainly develop from dormant spores on the outside of the grain or dormant mycelium lying under the surrounding pericarp.

The moisture content of the grain, temperature, length of storage time, level of fungal contamination, the quantity of foreign debris (broken seeds, plant fragments, soil etc.), and the activities of insects and mites are all factors that influence fungal growth.

Mycotoxin levels tend to be higher in organic cereals than the other fungicides that have been used, especially in developing countries where storage conditions are less thoroughly controlled. Any mycotoxins produced are not destroyed by cooking or processing, and their concentrations in stored cereals are directly related to levels of fungal growth. Consequently, contaminated cereals should be destroyed and should not be used for animal feed. However, chemical degradation treatment of mycotoxins has been observed in contaminated peanut meals designed for animal feed. Many of these compounds have LD50 values of less than 50 mg/kg. They cause liver damage and are considered toxic. *Fusarium* toxins such as T-2, F-2, and zearalenone are highly toxic. They cause alimentary toxic aleukia (absence or extreme reduction in the number of white blood cells in circulating blood) in humans and oestrogenic syndrome in pigs. The *Penicillium* toxins include the liver-damaging rubrotoxin produced by *Penicillium rubrum* (a species of fungus in the genus *Penicillium* which produces kojic acid, mitorubrin, mitorubrinol, rubratoxin A, rubratoxin B) and penicillin acid, which produces hemorrhagic syndrome in poultry.

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