

FOOD STORAGE PROPERTIES

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Abstract. This article will present a modern understanding of the various processes that lead to food spoilage during storage. Physical, chemical, biochemical, microbiological and biological processes will be considered.

Keywords: Process, food, reaction.

Storage processes.

Most of the processes occurring in food products cause changes that lead to partial or complete loss of their quantitative and / or qualitative characteristics. Depending on the nature of the changes, all processes can be divided into the following groups: physical, chemical, physicochemical, microbiological and biological.

1. Physical processes are the processes occurring under the influence of external factors: temperature, humidity, mechanical, etc. These include water evaporation (shrinkage), moisture, temperature changes (heating, freezing, cooling), deformation (crushing, breaking, acquiring an unusual shape); sorption of volatile substances.

2. Chemical processes are the processes that cause changes in chemical substances and their properties under the influence of external factors (air oxygen, water, light) and internal reactions.

Rancidity of fats, melanoidin formation, chemical reaction of acids of products with packaging metals (metal cans) are most common in food products.

Rancidity of fats is a reaction of oxidation of unsaturated fatty acids with atmospheric oxygen. The resulting peroxides and hydro-peroxides contain free radicals that create a predisposition to carcinogenic diseases. Moreover, they give fat-containing foods an unpleasant rancid odor and taste.

Melanoidin formation is the process of interaction of reducing sugars with amino acids or proteins to form polymers - dark-colored compounds of melanoidins.

The interaction of food acids with packaging metals can occur in canned food in metal containers if the protective coating of the metal surface of the can is broken or insufficiently complete with semi-dry or special food varnishes, as well as when food products are stored in metal utensils without protective coatings (for example, in enamelware with chipped enamel).

3. Biochemical processes are the processes that cause changes in chemicals with the participation of enzymes. These processes, in turn, are subdivided into hydrolytic, redox and synthetic processes. The first two are the most common.

Hydrolytic processes are the processes of decomposition (hydrolysis) of complex substances with

the participation of water and hydrolase enzymes to simple ones, which affects the taste (for example, the hydrolysis of starch to simple sugars leads to the appearance of a sweet taste) or consistency (during the hydrolysis of protopectin fruits and vegetables soften). In addition, the digestibility of food products improves, since the resulting simple substances are more easily absorbed by the human body. During hydrolysis, starch decomposes with the participation of amylases to dextrins, and then maltose and glucose; sucrose, lactose and maltose - to monosaccharides; proteins - to proteins and amino acids under the action of proteases; fats - to fatty acids and glycerol under the action of lipases.

Redox processes are the processes of oxidation or reduction of substances by atmospheric oxygen or other oxidizing agents with the participation of redox enzymes.

These processes lead to the formation of oxidized substances, which can be broken down further to simpler compounds. For example, the oxidized form of vitamin C - dehydroascorbic acid is easily destroyed, as a result of which the vitamin value of the product is lost. Some oxidized substances can polymerize to form larger molecules. An example is the oxidation of tannins to bioflavones - dark-colored compounds that give a dark color to black tea, dried fruits and vegetables, etc. Enzymatic oxidation of fats with the participation of lipoxygenase causes the formation of peroxides and hydroperoxides in the same way as in non-enzymatic rancidity fats.

Synthetic processes are the processes of synthesis of complex substances intended for the formation of new tissues or to ensure the vital activity of biosystems. These processes are inherent only to living organisms. These include the resynthesis of starch in potato tubers at high storage temperatures, the accumulation of suberin and cutin in integumentary tissues, protein synthesis in the tissues of live fish, vegetative vegetables during germination.

4. Microbiological processes are the processes occurring with the participation of microorganisms. Depending on the class of microorganisms, bacterial and fungal processes are distinguished. Fermentations are more likely to cause spoilage of liquid products that do not contain preservatives or with a low amount of preservatives. For example, spoilage of natural wines, beer, soft drinks, milk occurs under the influence of lactic acid and acetic acid (except milk) fermentation. Fermentation of solid products, including dry ones (for example, dried fruits), occurs only when moistened. Alcoholic fermentation can cause spoilage of jam, juices, honey, dried fruits, and butyric fermentation can cause spoilage of cheeses, pickled vegetables, wines, etc.

Rotting is most typical for products containing proteins and an increased amount of water (meat, fish, cottage cheese, cheese, fresh fruits and vegetables).

Mold can be exposed to any food in the presence of a significant amount of water and the absence of preservatives (alcohol, high concentrations, salt, etc.).

Mucus is observed in pickled vegetables, cheeses, meat, fish and products of their processing. Botulism causes spoilage of non-acidic canned food, meat, fish, dairy products, salmonella - meat, especially poultry, and their processed products, less often curd products; staphylococcus - cakes and pastries with custards.

5. Biological processes are the processes caused by pests: insects, rodents and birds. Pests can damage almost all food products and/or their packaging, with the exception of metal and glass containers. The harm caused by them is because they eat food products, pollute them with the products of their vital activity (excrement, feces), and cause mechanical damage, facilitating access to the product for microorganisms.

Bibliography:

1. [https://mydocx.ru/4-18059.html/Food Storage Properties](https://mydocx.ru/4-18059.html/Food%20Storage%20Properties).