

Chapter V: Effect of Transformation on Food Quality

1) Concept of Quality:

Quality is the ability of a product to satisfy its users (AFNOR definition). ISO provides a more comprehensive definition: the set of properties and characteristics of a service or product that gives it the ability to satisfy the expressed or implicit needs of all users.

2) Components of Quality:

The end user of a food product, the consumer, expects several "satisfactions," thus there are several components of food quality: Hygienic, nutritional, organoleptic.

2-1) Hygienic Quality:

It involves verifying the absence of foreign substances that should not be present in the raw material (pesticides, fertilizer residues, natural toxins, etc.). It is then necessary to control the absence of external contamination, especially microbial, during the transformation process.

2-2) Nutritional Quality:

Nutritional quality includes elements that are very different, from the nutrient composition of the food considered to its effect on the consumer's health.

2-3) Organoleptic Quality:

It is simply defined by the set of sensory signals accompanying the food: aroma, texture, color and harmony of colors, taste, and even aftertaste.

3) Effect of Transformation on Food Quality:

Foods are generally consumed after undergoing technological transformation and/or household cooking treatments. These transformations influence food quality, especially nutritionally. Therefore, what is the influence of technological treatments on nutritional quality?

4) Influence of Technological Treatments on Nutritional Quality:

4-1) On Lipids:

Thermal treatments undergone by lipids can significantly affect lipid quality, as seen in the example of frying where the temperature is very high. Thermo-oxidation is responsible for: A)

alteration of polyunsaturated acids (linoleic acid and linolenic acid), B) appearance of new compounds: Volatile compounds responsible for the rancid odor and taste such as ketones and aldehydes, C) appearance of free radicals which, due to their unstable chemical structures, pose a danger to the human body.

4-2) On Proteins:

Generally, foods containing proteins undergo several thermal treatments, but the most commonly used are: Thermal treatments such as sterilization, pasteurization, Reduction of water content such as drying, evaporation, salting, concentration. These treatments can influence the nutritional quality of proteins through their denaturation, resulting in conformational changes, covalent bond formation, modifications of side chains, thus affecting protein digestibility.

4-3) On Vitamins:

The influence of thermal treatments on vitamin content is very significant, especially for heat-sensitive vitamins. For example, in citrus juices, a good portion of vitamin C is oxidized due to pasteurization undergone by the product. Similarly, vitamin B1 in milk is oxidized due to temperature, losing its nutritional value. The thermal treatment can deteriorate up to 40% of the initial vitamin A content.