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Food Systems and Carbohydrates in Food Chemistry

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Perspective

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INTRODUCTION

The chemistry of food: Food chemistry is the study of all biological and non-biological components of foods chemical processes and interactions. Meat, poultry, lettuce, beer, and milk are examples of biological substances. It is similar to biochemistry in that it contains carbohydrates, lipids, and protein, but it also includes water, vitamins, minerals, enzymes, food additives, flavours, and colours. This discipline also includes how products change as a result of certain food processing techniques, as well as ways to improve or prevent this from happening. One way to improve a process is to encourage the fermentation of dairy products with microorganisms that convert lactose to lactic acid; Stopping browning on the surface of freshly cut apples with lemon juice or other acidulated water is an example of preventing a process in food chemistry.

With the attention to agricultural chemistry in the works of J.G. Wallerius, Humphry Davy, and others, the scientific approach to food and nutrition arose. For example, in the United Kingdom, Davy published elements of agricultural chemistry in a course of lectures for the board of agriculture, which would serve as a foundation for the profession worldwide, and is now in its fifth edition. Carl Wilhelm Scheele was the first to isolate malic acid from apples in 1785.

DESCRIPTION

In 1848, Eben Horsford of Lowell, Massachusetts, translated and published some of Liebig's findings on food chemistry.

The society of public analysts was founded in 1874 with the goal of using analytical methods to benefit the public. Its early experiments involved bread, milk, and wine.

It was also motivated by concerns about the quality of the food supply, specifically food adulteration and contamination issues, which began with intentional contamination and progressed to chemical food additives by the 1950's. The growth of colleges and universities around the world, particularly in the United States, would expand food chemistry as well as dietary research substances, most notably the single grain experiment conducted between 1907 and 1911. Additional research at the United States department of agriculture by Harvey W. Wiley in the late nineteenth century would play a key role in the establishment of the United States food and drug administration in 1906. In 1908, the American chemical society established its agricultural and food chemistry division, while the institute of food technologists established its food chemistry division in 1995.

Food chemistry concepts are frequently drawn from rheology, transport phenomena theories, physical and chemical thermodynamics, chemical bonds and interaction forces, quantum mechanics and reaction kinetics, biopolymer science, colloidal interactions, nucleation, glass transitions, and freezing/disordered or non-crystalline solids, and thus food physical chemistry serves as a foundation area.

Water in food systems: Water is a major component of food, accounting for anywhere from 50% in meat products to 95% in lettuce, cabbage, and tomato products. If not properly processed, it is also an ideal environment for bacterial growth and food spoilage. Water activity, which is very important in the shelf life of many foods during processing, is one way this is measured in food. In most cases, one of the keys to food preservation is to reduce the amount of water or change the characteristics of the water to increase shelf-life. Dehydration, freezing, and refrigeration are examples of such methods. This field includes the "physiochemical principles of the reactions and conversions that occur during food manufacturing, handling, and storage."

Carbohydrates: Sucrose is the most common known human carbohydrate, accounting for 75% of the biological world and 80% of all food intakes for human consumption. A monosaccharide is the most basic form of a carbohydrate, containing carbon, hydrogen, and oxygen in a 1:2:1 ratio and having the general formula CnH_2nOn where n is a minimum of 3. Monosaccharides include glucose and fructose. Sucrose, one of the more common sugar products found in plants, is formed when these elements are combined in the manner depicted in the image to the right.

A polysaccharide is formed by a chain of monosaccharides. Pectin, dextran, agar, and xanthan are examples of polysaccharides. Some of these carbohydrate polysaccharides are absorbable by human enzymes. Mainly absorbed in the small Dietary fibre, on the other hand, travels to the large intestine, where some of the polysaccharides are fermented by the gastrointestinal microbiota.

CONCLUSION

Sugar content is commonly measured in degrees intestine, whereas dietary fiber passes to the large intestine, where the gastrointestinal microbiota digests some of these polysaccharides. Sugar content is usually expressed in degrees.