

Abstract

Humanity has undergone many changes throughout its history, with one of the most significant being the change in our diet, particularly in the composition and quantity of products consumed. An increase in the amount of carbohydrate-dominated foods has been typical, which, combined with a lack of exercise, has led to the development of obesity and related to civilisation diseases. Affected individuals also experience a significant reduction in life expectancy and quality of life. In addition, as the number of individuals suffering from civilisation disease increases, so do the costs of healthcare. The state and some sections of society are aware of these dire consequences and are trying to educate people on these issues through various support and education programmes. However, these efforts are counteracted by the policies of industrial companies whose commercial interest is to sell highly processed food. They provide us with food products that usually have an appealing taste but a completely inappropriate nutritional composition. This may be a major factor contributing to the unhealthy eating habits of a significant proportion of the population. A person who has received good education in the field and who understands the basic processes of the human body can make right decisions about his or her own diet and is not easily swayed by manipulation or advertising slogans. Therefore, it is important to impart an understanding and appreciation of the relationship between diet and people's health and their quality of life, with links to chemistry, biology and health education. All of this is very essential for the rising younger generation to understand the basic principles before they start making their own decisions about their diet and food purchases, while forming their own (hopefully better) eating habits.

The rules of proper dietary composition and its influence on health are dealt with in the subject of Health Education in secondary school, which is partly directed towards the basics of medicine, but is often not taught in schools and its content should be integrated into other subjects. Most commonly these subjects are Biology, Chemistry and Physical Education. However, in these subjects there is usually not enough time for more detailed explanations, so the link with nutrition is often only marginally addressed. In relation to carbohydrates, the teaching in most high schools tends to focus on carbohydrate systematics and subsequent metabolic processes, without emphasising their importance in relation to diet and disease.

This thesis seeks to contribute to the integration of dietary issues with carbohydrate education. It explores the current state of teaching in schools through an analysis of school curricula, secondary school chemistry textbooks, selected university qualifying papers and freely available internet resources focusing on this topic. Based on these results, teaching

materials will be developed to support the teaching of carbohydrates and their importance in diet and disease from a biochemistry perspective in a simple and illustrative way.

Keywords: Biochemistry, nutrition, educational materials, interactive 3D visualization of molecules, carbohydrates, importance of carbohydrates in the diet.