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Chapter

Introductory Chapter: Nutraceuticals as an Alternative to Maintain a Healthy Lifestyle

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1. Introduction

The nutraceutical concept began from a survey conducted in the United Kingdom, Germany, and France, which concluded that consumers gave more importance to diet than to hereditary factors or to exercise to achieve good health. The term nutraceutical was defined by the nutritionist and pharmacist Stephen DeFelice, president of the Foundation of Innovation Medicine, in 1989. According to him, "a nutraceutical is defined as a food, or part of a food, that provides medical or health benefits, including prevention and/or treatment of a disease" [1, 2]. Specifically, nutraceuticals are formed from active compounds obtained from plant foods (such as phytocomplexes) or from foods of animal origin, which are concentrated and provided in the appropriate pharmaceutical form, and also have a pharmacological effect and nutritional value [3]. These can be used effectively to prevent and even cure some diseases when their safety is demonstrated, have a greater bioavailability, and have clinically proven health effects [4]. In the case of Health Canada, it defines the term nutraceutical as "a product prepared from food, but sold in the form of pills, powder or other medicinal forms, which are generally not associated with food" [5].

Before the appearance of nutraceutical concept, the consumption of fruits and vegetables was related in a preventive and protective way with a lower risk of suffering from chronic and degenerative diseases [6]. These discoveries were and are correlated with the diversity of plants and their richness in bioactive compounds, natural substances capable of modulating one or more metabolic processes, thus promoting health conditions [7, 8]. These substances, called phytochemicals, have allowed the discovery and the development of numerous medications especially for the treatment of diseases such as cancer, infectious diseases, cholesterolemia, and immunological disorders among others [9].

In the literature, other terms such as phytochemicals, herbs, spices, botanical medicines, dietary supplements, and secondary metabolites can be found, which can be mistaken for nutraceuticals [10]. In the case of dietary supplements, these are known as "concentrated sources of nutrients or other substances with a physiological or nutritional effect to complement the diet" [11]. Nutraceuticals can be found in various forms (isolated compounds, dietary supplements, or whole foods). Therefore, all nutraceuticals are not dietary supplements, and all dietary supplements are not nutraceuticals [10]. The difference between nutraceuticals and functional food is that the former are bioactive ingredients of natural origin and obtained from different food matrices, while the latter is considered any fresh or processed food that ensures a healthy effect and/or prevents diseases in addition

to having a nutritional function [12]. Therefore, a food is functional when it has nutraceutical ingredients.

One of the examples of nutraceuticals is seaweed. The consumption of seaweed as traditional food and complementary medicine was recorded 10,000 years ago [13]. Traditionally consumed in many Asian countries such as Japan, China, the Philippines, Indonesia, Malaysia, South Korea, and North Korea for centuries, the culinary use of seaweed began in Japan and China. In the case of western countries, its main application has been as a gelling agent and colloid for the food, pharmaceutical, and cosmetic industry. However, recently, in western countries, such as the USA and Europe, among others, the frequent use of seaweed as part of food has begun, especially for its beneficial and functional properties [14]. Currently, the great recognition of the beneficial properties of algae has allowed this ingredient to be introduced as part of food and beverages, making it an important product for the food industry, additives for functional foods, feed supplements, etc. [15].

Algae are a good source of nutrients such as proteins, vitamins, minerals, and dietary fiber; in this regard, the kelp dietary fiber is particularly rich in soluble fraction. If algae are compared with terrestrial vegetables, there are more beneficial components for health, such as ω-3 fatty acids and bioactive molecules. Algae synthesize various secondary metabolites that have antioxidant, anti-inflammatory, anticancer, and antidiabetic activity. Therefore, algae can be considered a natural source of great interest since they contain compounds with numerous biological activities and can be used for the development of nutraceuticals. However, currently many industrial products based on seaweed have not been developed. This is due to the prolonged studies of nutritional intervention in humans required to demonstrate that algae are an excellent ingredient for commercial nutraceuticals [13].

Nutraceuticals can be classified in various ways; however, normally, the chemical nature, the availability of food, and the mechanism of action of the bioactive compound are taken into account [4]. **Figure 1** shows a diagram with the categories and subcategories. Compounds that are acquired from nature directly and are used without change in their form are considered traditional nutraceuticals. These nutraceuticals are divided into (a) phytochemicals, (b) probiotic bacteria, (c) enzymes, (d) chemical compounds, (e) nutrients, and (f) plants.

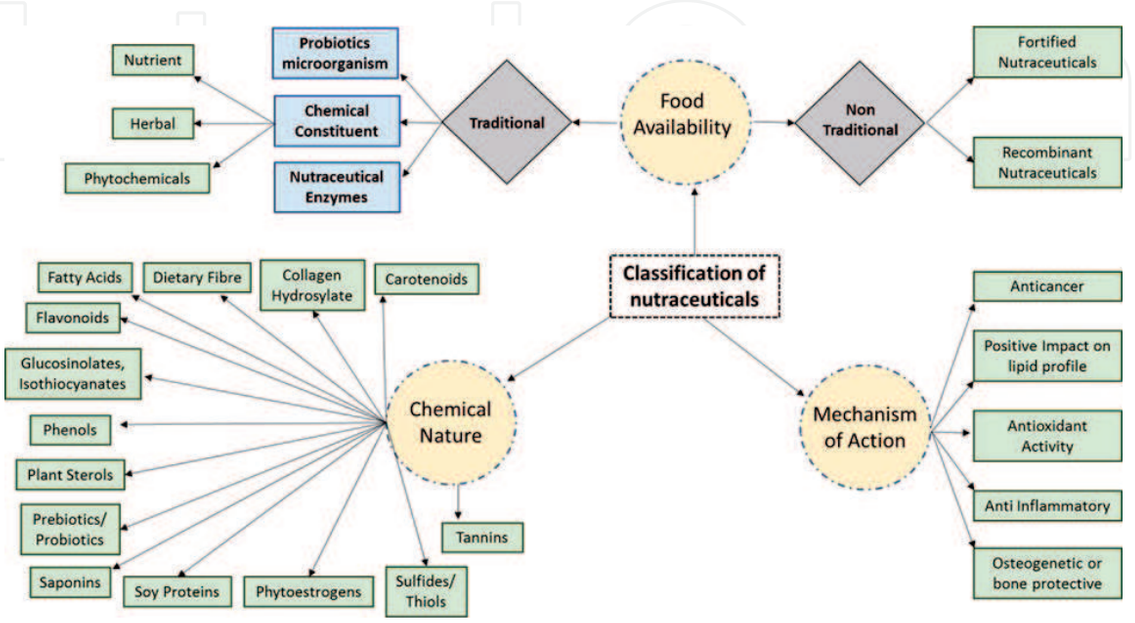


Figure 1.
Nutraceuticals classification [4].

Specifically, the nutraceutical market is a growing and relatively new section of the food industry. This growth has been due to several causes. On the one hand, consumers are increasingly concerned about their health and how it is achieved through food, and there is more and more evidence that relates to diet and health. In addition, more and more consumers want not to have to go to the doctor or not to consume medications; specifically, this fact is marked in the generation of Baby-Boomer. Considering the point of view of the consumers, nutraceuticals have several benefits [5]:

- The consumption of nutraceuticals will increase the health value of the individual's diet.
- An increase in the healthy value of the diet will help increase the lifespan of individuals.
- Nutraceuticals will help avoid particular medical deficiencies.
- They have beneficial psychological effects.
- Traditional medicines are more likely than nutraceuticals to generate harmful effects, so nutraceuticals are considered more natural.
- Nutraceuticals can be a very advantageous alternative for people with specific deficiencies or special needs.

Due above all to the increase in people's life expectancy, it is proposed to maintain a good health and well-being rather than having to treat diseases. Therefore, at present, the importance of preventing disease development is becoming clearer, being even more important than the treatment of diseases. The current progress in the treatment of diseases has been tremendous both in medicine and in drugs. At the same time, public health spending increases at the same rate as the progress of so-called diseases related to bad eating habits, including bad habits in people's lifestyle. In this sense, in recent years the term proactive medicine has appeared; focuses on the prevention of the development of diseases, reducing the cost of long-term chronic disease treatments, allowing an increase in well-being, improving the quality of life and state of people's health. Nutraceuticals are an alternative to help prevent the development of such diseases.

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