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Introductory Chapter: The Role of Nuts and Nut Products in Human Health and Disease

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1. Introduction

Consumption of nuts dates back to the prehistoric times. Nuts were an important part of the diet of early humans. Since then, humans have shown continued interest in the consumption of nuts and more recently in nut products as well, both for their taste and for their nutritional quality and health benefits. Mediterranean diets that are associated with lower incidence of several chronic diseases in particular, contain significant amounts of nuts [1–3]. Several epidemiological and human intervention studies since then have provided evidence for the association between the consumption of nuts and reduced risk in the incidence of several chronic diseases such as cancer, cardiovascular diseases, diabetes mellitus, obesity and high blood pressure just to name a few [4–6]. These observations encouraged scientific search to investigate the reasons as to why nuts are considered to promote health. This introductory chapter will look into the diversity of nuts that are consumed by humans and their nutritional and phytochemical composition. It will also discuss briefly the scientific evidence supporting the health beneficial properties of nuts. Chapters that follow this introductory one are authored by internationally known researchers and will cover various aspects of tree nuts and peanuts.

Common use of the term nuts is somewhat confusing. Nuts are in reality fruits. A common definition is that ‘they are single-seeded fruits that have high oil content’. Wikipedia defines a nut ‘as a fruit composed of an inedible hard shell and a seed which is generally edible’. However, in its general usage a wide variety of dried seeds are referred to as tree nuts. In a botanical context, nuts are strictly a particular kind of dry fruit that has a single seed, a hard shell, and a protective husk [2]. In the context of this chapter, a more general term ‘Tree nuts and peanuts’ will be used, although peanuts are strictly not nuts but are legumes.

In general nuts have a similar macronutrient content with an average energy content of 2,900 kJ. However, their micronutrient content including vitamins and mineral may differ to some extent.

Table 1 provides a list of tree nuts and peanuts that are commonly consumed by humans and their macronutrient nutrient content.

Fatty acid composition of the commonly consumed nuts is shown in **Table 2**.

As shown in **Tables 1** and **2**, nuts in general are high fat, energy dense and fiber rich food products. Their fats are composed mainly of monounsaturated and polyunsaturated fatty acids with very low saturated fats and no cholesterol. They are also good sources of linoleic and alpha linoleic fatty acids [7, 8]. In addition to the heart and health friendly lipid profiles of nuts, they are also good sources of plant sterols and other beneficial phytochemicals with significant antioxidant properties [9]. They are rich in vitamins such as pyridoxine and folate. With respect to minerals, they are

Nuts	Energy (kJ)	Fat (g)	Protein (g)	Fiber (g)
Almonds	2418	50.6	21.3	8.8
Brazil nuts (dried)	2743	66.4	14.3	8.5
Cashews	2314	46.4	18.2	5.9
Hazelnuts	2629	60.8	15.0	10.4
Macadamia nuts	3004	75.8	7.9	6.0
Peanuts	2220	49.2	25.8	8.5
Pecans	2889	72.0	9.2	8.4
Pine nuts (dried)	2816	68.4	13.7	3.7
Pistachios	2332	44.4	20.6	9.0
Walnuts	2738	65.2	15.2	6.4

Source: US Department of Agriculture Nutrient Data base at: http://www.nal.usda.gov/fnic/cgi-bin/nut_search.pl [7].
Ros E. 2010. *Health Benefits of Nut Consumption*. *Nutrients*: 2, 652–682 [8].

Table 1.
Macronutrient composition of some common nuts and peanuts (per 100 grams).

Nuts	Short chain fatty acids	Monounsaturated fatty acids	Polyunsaturated fatty acids	Linoleic acid	Alpha linoleic acid	Plant sterols
Almonds	3.9	32.2	12.2	12.2	0.00	120
Brazil nuts (dried)	15.1	24.5	20.6	20.5	0.05	—
Cashews	9.2	27.3	7.8	7.7	0.15	158
Hazelnuts	4.5	45.7	7.9	7.8	0.09	96
Macadamia nuts	12.1	58.9	1.5	1.3	0.21	116
Peanuts	6.8	24.4	15.6	15.6	0.00	220
Pecans	6.2	40.8	21.6	20.6	1.00	102
Pine nuts (dried)	4.9	18.8	34.1	33.2	0.16	141
Pistachios	5.4	23.3	13.5	13.2	0.25	214
Walnuts	6.1	8.9	47.2	38.1	9.08	72

Source: US Department of Agriculture Nutrient Data base at: http://www.nal.usda.gov/fnic/cgi-bin/nut_search.pl [7].
Ros E. 2010. *Health Benefits of Nut Consumption*. *Nutrients*: 2, 652–682 [8].

Table 2.
Fatty acid and plant sterol content of common nuts and peanuts (per 100 grams).

significant dietary sources of calcium, iron, phosphorus, zinc, copper and selenium. In addition to the lipids, nuts are also a good source of proteins and essential amino acids such as arginine that promote good health [3]. Overall, when consumed on a regular basis they provide significant amount to the daily requirements of nutrients essential to lower the risk of chronic diseases and maintain good health.

In view of the potential positive nutritional characteristics of nuts, they have been studied extensively over the years for their role in preventing several human chronic diseases and maintaining good health [10]. **Table 3** shows some of the

Atherosclerosis and other endothelial disorders
Brian health – Alzheimer
Coronary arterial diseases (CAD)
Diverticulitis
Hypertension
Inflammation
Kidney disorders – Gallstone related diseases
Type 2 diabetes and other glycemic related disorders

Table 3.
Examples of health benefits of consuming nuts as part of a healthy diet and life style.

health benefits, based on research conducted over the years, of consuming nuts as part of a healthy diet and a life style. It should be pointed out that the health benefits shown in the table are only a few examples. However, the research to evaluate the health benefits of consuming nuts continues and new information as to the prevention of diseases, their mechanism of action and recommendation are published regularly.

It should be pointed out that there are a few concerns of consuming nuts and nut products such as bodyweight, allergic reactions for some individuals and the possibility of adverse effects associated with fungal contamination of nuts, have to be kept in mind.

2. Conclusion


In conclusion it should be pointed out that consuming nuts including peanuts can play a significant role in the prevention and treatment of human diseases and benefiting human health. Following chapters, authored by well-known international researchers will contribute significantly to our understanding of the role of nuts and nut products in human health.

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