

Sowing the seeds of good health

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Plant-based diets are receiving increasing attention, and research shows their potential for disease-prevention. Much has been said about the importance of fruits and vegetables, but what is known about ready-to-eat dried seeds?

Seeds, the end point of plant reproduction, are plant embryos enclosed within a seed coat. The three main parts of the seed are the germ (embryo), the endosperm (nutrient store for the germ to grow) and the seed coat. Every seed has the potential to germinate and grow into a mature adult plant.

Seeds in the diet

Many common food sources including grains and legumes are actually seeds. For example, barley, oats, rice and legumes (such as beans and soybeans) are crops which are harvested for their edible seeds. Also, much of what we consider as nuts, such as pistachio nuts and cashew nuts, are technically seeds.

Seeds in human consumption are very versatile and certain types can be pressed to make oils (e.g. sunflower oil) or sprouted for human consumption (e.g. watercress). Other seeds are eaten whole, for example as a snack, on breakfast cereal, oatmeal or baked goods, or mixed into smoothies and yoghurt. In this article, we will discuss these types of ready-to-eat dried seeds (e.g. linseeds, poppy, pumpkin) regardless of their true botanical category.

Nutrients in seeds

The nutritional composition of seeds reflects the role of nourishment and protection for the developing seedling. The germ and the outer layer are rich in vitamins, minerals and bioactive compounds. The endosperm is the principal energy store, containing carbohydrates, proteins and fats needed for the seed to grow. The nutrient content of seeds is variable, but most are high in unsaturated fatty acids. The protein content contains most of the essential amino acids, but vegetable sources of protein typically have a lower biological value than protein from animal sources. The carbohydrate content is relatively low. Seeds contain a range of different vitamins and minerals. Some seeds, such as linseeds, must be ground or blended before eating, to release their nutrients for absorption; otherwise they would pass undigested through the body. The table below shows the nutritional content (per 100 g) of several types of seeds. Seeds also contain a range of bioactive components, including polyphenols and phytosterols, which are needed to build the cell membrane and protect the seedling and its DNA from damage.

Intake of seeds

Dietary surveys tend to group nuts and seeds together. The European Prospective Investigation into Cancer (EPIC) study shows that there is wide variation in the intake of nuts and seeds. Total intake of tree nuts,

peanuts and seeds ranges from 1 to 300 g/day with a lower average intake in Northern European countries (15 g/day in Sweden compared with 35 g/day in Spain). The EPIC study showed that around 75% of the European population eats tree nuts, peanuts and seeds, with the Netherlands having the highest (94%).¹

However, in general, dried ready-to-eat seeds are eaten in low amounts, and as such are a small contributor to dietary intake of micronutrients and phytonutrients.

Seeds and health

Few studies have singled out seeds in the diet, and it is not possible to directly link dried ready-to-eat seeds with health outcomes. Nevertheless a recent review concluded that there is substantial evidence that greater consumption of seeds (including whole grains, nuts, legumes, cocoa products, and coffee) is linked with lower risk of type 2 diabetes and cardiovascular disease risk factors.² In addition, consumption of nuts as part of a Mediterranean diet has been shown to reduce major cardiovascular complications (heart attack, stroke and death).³ The EPIC study found that women who consumed the highest amount of seeds and nuts had a lower risk of colorectal cancer.⁴

Dietary advice

Ready-to-eat seeds can provide a range of nutrients and a source of energy and should be eaten in moderation as part of a balanced diet. A small number of people have an allergy to seeds. In the EU, if foods contain sesame seeds (or products thereof), or any of the other allergens that are on the regulatory list such as nuts, then these must be mentioned on the food label.

References

1. Jenab M, et al. (2006). Consumption and portion sizes of tree nuts, peanuts and seeds in the EPIC cohorts from 10 European countries. *British Journal of Nutrition* 96:s12-s23.
2. [Ros E & Hu F \(2013\). Consumption of plant seeds and cardiovascular health. *Circulation* 128:553-565.](#)
3. [Estruch R, et al. \(2013\). Primary prevention of cardiovascular disease with a Mediterranean diet. *The New England Journal of Medicine* 368\(14\):1279-1290.](#)
4. [Jenab M, et al. \(2004\). Association of nut and seed intake with colorectal cancer risk in the European Prospective Investigation into Cancer and Nutrition. *Cancer Epidemiology, Biomarkers and Prevention* 13:1595-1603.](#)

Table. Nutritional content of a few examples of types of seeds, per 100g (rounded to 0.5).

	Linseeds (also known as flaxseeds)	Poppy seeds	Pumpkin seeds	Sesame seeds	Sunflowe r seeds	Pistachio s	Cashew nuts	Walnuts

Energy (kcal)	477	455	574	629	647	592	615	708
Total carbohydrate (g)	13	2	3	6	13	11	21	6.5
Total fat(g)	31	36	47	55	54	48.5	49	68
Saturated fatty acids (g)	3	4	11	8	7	5.5	9	6
Mono-unsaturated fatty acids (g)	6	6.5	10	21	12	27.5	30.5	13
Omega-3 fatty acids (g)	17	0	0	0	0	0	0	8
Omega-6 fatty acids (g)	4	22	24	24	35	13	8	37
Total protein(g)	19	19	30	26	18	24	21	16
Vitamin E (mg)	1	--	--	2.5	38	5	2	3
Calcium (mg)	260	1740	42	670	79	131	44	117
Phosphorus(mg)	660	932	1124	778	640	598	607	521
Magnesium (mg)	181	449	535	370	363	136	269	196
Iron (mg)	0	9	8	8	5	4.5	6.5	3.5
Copper (mg)	--	2	0	1.5	2	1	1.5	1.1
Selenium (ug)	--	18	7	--	49	20	37	12
Zinc (mg)	8	5	8	5	5	3	6	3.5

Source: <http://nevo-online.rivm.nl/>