

BEANS

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Summary

Faba bean is an annual plant. It is one of the oldest food legumes, and it is used for both human consumption and animal feed. Green and dried beans are commonly eaten as a vegetable.

The protein content of Faba bean is 20 to 41% depending on cultivars, and the total carbohydrate content 58 to 59%. Anti-nutritional compounds such as protease inhibitors and oligosaccharides are prevalent in Faba beans.

Common beans, or Phaseolus beans originated in Central and South America. A very wide range of different bean varieties, more than 14 000 genotypes are cultivated in the tropics, subtropics and temperate regions of the world. Some bean varieties are cultivated for green pods and are used for human consumption as a vegetable.

The beans for drying are grown till the seeds are large enough and pod begins to dry. The pods are shelled and the seeds are separated. The mature seeds are used also for human nutrition and in some regions for animal feed.

The protein content of beans is 22 to 25%, and a rich source of carbohydrates (more than 60%), vitamins and dietary fibres. Anti-nutritive compounds like protease inhibitors, tannins, oligosaccharides, and phytates are also present in Phaseolus beans.

1. Faba bean (*Vicia faba* L.)

1.1. Introduction

Faba bean (see Figure 1) is also called broad bean, horse bean or tick bean (small types), bakela (Ethiopia), Boby kurmouvje (in former USSR), faveira (Portugal), Ful masri (Sudan), feve (French) and Yeshil Bakla (Turkey). The beans are harvested fresh for human consumption or used for canning or freezing. Dry seeds are used also for animal feeding.



Figure 1. Faba bean, *Vicia faba*

1.2. History, Taxonomy and Distribution

History

Faba bean is one of the oldest food legumes and has been cultivated since antiquity, mainly for human consumption. This crop was probably first domesticated in the Near East, and its subsequent dissemination was known in the West via the Mediterranean Basin to Europe and North Africa, and in the East to China and Japan (Kogure et al., 1992).

Taxonomy

Vicia faba is an annual plant. The *Vicia* genus comprises 146 wild and cultivated species in the world, mainly in temperate climate region, and has a wide morphological diversity. Only five species are cultivated for their seeds as human food or animal feeds (Carrouée, 1989). On the basis of the seed size, two subspecies are distinguished, namely paucijuga and faba. The faba type is divided into *var.minor* with small rounded seeds (1 cm long), *var. equina* with medium seed size (1.5 cm) and *var.major* with large broad flat seeds (2.5 cm).

Distribution

Faba bean production is concentrated in North Europe, the Mediterranean region, North Africa, East and Central Asia, Oceania, North and Latin America. A wide diversity of genotypes and uses is found within the EU—the objectives and methods of breeding vary in different countries. The most common species grown for their seeds are as follows: *Vicia faba* (cultivated worldwide on nearly three million ha), *Vicia sativa* (frequently cultivated in Spain and Australia), *Vicia ervilla* and *Vicia montana* (grown in France and Spain for human consumption) and *Vicia narbonensis* (looks like faba bean and cultivated in Australia).

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Biographical Sketch

Dr. Ildikó Schuster-Gajzágó was born in 1942 in Budapest, Hungary. He is married with one child. From 1961 to 1966 he attended the Eötvös Lóránd University of Sciences in Budapest, attaining an MSc in Biology. In 1985 he was awarded a University Doctoral Degree and in 1997 a PhD in Biology. From 1967 to 1986 he was a Research Worker at Department of Enzymology at the Central Food Research Institute. From 1986 he was a Research Worker in the Department of Technology at Central Food Research Institute, and from 1997 a Senior Research Worker.

His research activities have focused on the following:

1967-1972. Basic and applied research of enzymes (glucose oxidase, milkclotting enzyme of microbial origin, cellulase).

1972-1986. Study of enzymic browning of fruits (apple, pear, apricot) and establishment of the relationship between PPO activity and endogen substratum content. Study of the inhibition of enzymic browning of fruits. Study of the effect of location and year on polyphenoloxidase-polyphenol content of apple.

1986-1998. Enzymic modification of plant protein. Study of the effect of animal and microbial origin protease enzyme on the colloid properties of modified plant protein. (This program was supported by the EU Copernicus project). Study of antinutritional compounds of legume seed (protease inhibitors and oligosaccharides).

1998-present. Study of health protecting compounds such as glucosinolates and polyphenols of legume seeds and mustard. Determination of polyphenol content and composition as well as antioxidant properties of mustard varieties.