



Food and Agriculture  
Organization of the  
United Nations



# HEALTH BENEFITS OF PULSES

## TOP 10 REASONS TO EAT PULSES

-  LOW-FAT

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-  LOW-SODIUM

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-  GOOD SOURCE OF IRON

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-  GOOD SOURCE OF PROTEIN

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-  EXCELLENT SUPPLIER OF FIBRE

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-  EXCELLENT SOURCE OF FOLATE

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-  GOOD SUPPLIER OF POTASSIUM

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-  LOW GLYCEMIC INDEX

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-  CHOLESTEROL-FREE

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-  GLUTEN-FREE

Diet is an important contributor to health, and to disease. Most countries face nutritional problems, from undernutrition and micronutrient deficiencies to obesity and diet-related diseases (such as type II diabetes and certain types of cancer), or a mix of these.

**PULSES HAVE BEEN USED WIDELY IN CUISINE THROUGHOUT THE WORLD, PARTICULARLY IN INDIA, PAKISTAN, THE MEDITERRANEAN REGION AND THE NEAR EAST. NOT ONLY ARE PULSES EASY TO PREPARE, BUT THEY ALSO CAN SERVE AS A MEAT ALTERNATIVE.**

Pulses such as lentils, dried beans, peas and chickpeas have been staple foods for many civilizations. Yet today, their nutritional benefits are often greatly underestimated. In some cultures pulses have a stigma of being a 'poor man's food' and are replaced by meat once people can afford meat.

The reasons why pulses are underestimated have been widely discussed: 1) the length of cooking time (much longer than vegetables); 2) some beans can cause flatulence because they contain oligosaccharides, a carbohydrate that is difficult to digest; 3) raw pulses contain high levels of 'anti nutrients' such as phytate, tannin and phenol, which can limit the body's absorption of minerals, such as iron and zinc.

FAO advocates for increased research in breeding strains of pulses that contain lower quantities of phytate so that iron and zinc can be better absorbed by the body.



PAINTED PONY BEAN (PHASEOLUS VULGARIS)

## SOAKING FOR ADDED HEALTH AND NUTRITION

Many pulses are soaked in water from 4 to 8 hours – a practice that will dramatically reduce their phytate content and cooking time and their propensity to cause flatulence. Soaking ensures that pulses can be more easily digested and their nutrients better

absorbed by the body. In fact, soaking dried pulses for several hours brings them back to life, activating their enzymes. Soaking in sodium bicarbonate solutions is more effective to reduce anti-nutrients than soaking in water alone.

### BOOSTING THE NUTRITIONAL VALUE OF THE VELVET BEAN

*Mucuna pruriens* (Leguminosae) is commonly known as velvet bean and includes approximately hundreds of varieties of annual and perennial legumes. Soaking mucuna seeds is an efficient process to reduce heat-stable antinutritional compounds such

as tannins, phytic acid, raffinose, stachyose and verbascose. Therefore, soaking increases the nutritional benefits of pulses. The treatment also vastly improves the protein digestibility of both white and black velvet bean seeds without affecting their nutritional quality. Additional autoclaving (a pressure chamber to sterilize products by steaming at a high pressure for a period of time), which can be done at industrial level for bean products has shown an additional reduction of other anti-nutrients (e.g. trypsin or

amylase inhibitors). The seeds of velvet bean, a South Indian underutilized pulse, have been reported to contain higher levels of protein and other nutrients than other crops. However, many Indians were reluctant to eat them because the bean had a high concentration of various anti-nutritional compounds. The promotion of soaking velvet beans in sodium bicarbonate solution to reduce anti-nutrients could lead to an increased consumption of these beans.<sup>1</sup>

## PULSES ARE PACKED WITH HEALTHY NUTRIENTS

Incredibly rich in their nutritional value, pulses are small but densely packed with proteins – double that found in wheat and three times that of rice. Unlike animal food sources of protein such as beef or milk, pulses do not contain residues of hormones or antibiotics used in animal production, but may contain residues of pesticides depending on the production method.

Pulses are also rich in complex carbohydrates, micronutrients, protein and B-vitamins, which are vital parts of a healthy diet. Low in fat and rich in fibre, pulses are excellent for managing cholesterol, digestive health and regulating energy levels. Pulses are also particularly rich in folate, iron, calcium, magnesium, zinc and potassium.

Fe

Ca

Mg

Zn

K



CHICKPEAS (CEER, ARACHINDU)

## A TONIC FOR THE BODY

While pulses are low in calories (260-360 kcal/100 g dried pulses), they are high in complex carbohydrates and fibre, which means they are slowly digested and give a feeling of satiety. Pulses promote a steady, slow-burning energy while their iron content helps transporting oxygen throughout the body, which boosts energy production and metabolism. The fibre in pulses are not generally absorbed by the body and thus increase stool volume and transit. The fibre also serves to bind toxins and cholesterol in the gut so these substances can be removed from the body. This improves heart health and lowers blood cholesterol.

FULL OF ANTIOXIDANTS,  
PHYTONUTRIENTS  
& FIBRE

BINDS TOXINS  
AND CHOLESTEROL  
IN THE GUT

BETTER  
OVERALL HEALTH  
& HEALTHY  
WEIGHT CONTROL

PROMOTES GOOD  
BACTERIA & LEADS  
TO PROPER  
BOWEL FUNCTION



COMMON BEANS  
(PHASEOLUS VULGARIS)

## SPROUTING TO BREAKDOWN ANTI-NUTRIENTS

Sprouting is another term for germinating and results in a partially-grown young plant. It involves soaking and draining the pulses every 4 to 8 hours and this process usually takes 1 to 5 days. Sprouting pulses is vital to render them edible in a raw state and make them more easily digestible. Interestingly, sprouted pulses can significantly diminish polyphenols and tannins, and the protein, carbohydrates and fats begin to break down into a pre-digested form, leading to an easier and better digestion and making for better overall digestion.<sup>2</sup>

### SOURCES:

<sup>1</sup> V. Vadivel and M. Pugalenti. (2009). Effect of soaking in sodium bicarbonate solution followed by autoclaving on the nutritional and antinutritional properties of velvet bean seeds. *Journal of food processing and preservation* 33, 60-73.

<sup>2</sup> Khandelwal et al, 2010, Ghumman et al, 2016 and Shweta Khandelwal, Shobha A. Udipi, Padmini Ghugre. (2010). Polyphenols and tannins in Indian pulses: Effect of soaking, germination and pressure cooking. *Food Research International* 43 (2010) 526-530

## A PERFECT PAIRING: PULSES WITH GRAINS

The protein of pulses is high in lysine and low in sulfur-containing amino acids. Grains' protein is low in lysine but high in sulfur-containing amino acids. Combining them provides a higher protein quality. This means that the body needs less protein to fulfil its protein needs, which improves nutrition, especially in low-income communities, where the availability of other sources of protein such as animal protein are limited. The combination also contributes to a balanced diet.



PAINTED PONY BEAN (PHASEOLUS VULGARIS)

RICE

## GLOBAL EXAMPLES OF COMMON PAIRINGS OF BEANS AND GRAINS

Rice is well-known as a staple crop across **Asia**, so it comes as no surprise that many traditional Asian recipes have variations of rice and beans. Traditional **African** cuisine makes great use of a wide variety of beans, chickpeas and grains. Beans, especially black beans, are served with rice in various combinations throughout **Latin America**.



**ITALY**  
*Pasta e fagioli* is a soup with pasta, beans, and vegetables.

**EGYPT**  
*Kochari* is a typical dish made from lentils and rice.

**NEPAL**  
*Kwati* is a traditional Nepalese dish which is a thick stew of kidney beans, black-eyed peas, chickpeas, soyabean, mung bean, green bean, black bean and white beans. *Kwati* is mainly eaten during Janai Purnima/Rakshya Bhandan at the end of August.

**CHINA**  
Rice sometimes is cooked into a thick porridge called congee, and often is paired with sugar and mung beans or red beans.

**BRAZIL**  
*Feijoada*, a black bean stew served with rice, is a national dish of Brazil.

**COLOMBIA**  
*Calentado Paisa* is a traditional rice and bean dish.

**MEXICO AND VENEZUELA**  
*Tortillas* and their close cousin, *arepas*, found in Venezuela, are both corn-based flatbreads that often are filled with beans and vegetables.

**TURKEY**  
*Mercimek Köftesi* are vegetarian meatballs made from lentils, fine bulgur wheat and Baklali Enginar - a dish of peeled artichokes (fried with flour), dressed in oil and lemon juice and served in summer with beans and parsley.

**MOROCCO AND ALGERIA**  
*Garbanzo* beans are paired with whole wheat couscous and chicken for a delicious exotic stew.

**GHANA**  
A popular dish is *Waakye*, made by boiling rice and beans together.

**ETHIOPIA**  
Bean stews are served with *injera* bread, a pancake like bread made from the teff grain.

**ZAMBIA**  
*Nshima*, a staple food in Zambia is made from ground corn served with beans and vegetables.

**PAKISTAN**  
An important source of protein for the population, chickpeas, lentils, mung beans are used widely in spicy recipes with grains and chicken, from baby food to delicacies.

**INDIA**  
*Congee* often is prepared from other grains as well such as millet and served with a variety of cooked pulses. The people of Kerala also call this preparation of rice in a watery state *kanji*, and eat it as a porridge with green lentils or chutney.

**VIETNAM**  
Rice congee is sometimes cooked with Asian mung bean and is a food for times of famine and hardship.

For inspiring pulses-based recipes spanning several countries and continents, check out the recipes section on the official IYP site: [www.fao.org/pulses-2016/recipes/](http://www.fao.org/pulses-2016/recipes/)

