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The Many Nutritional Benefits of Pulses

Pulses may significantly improve global nutrition, help eradicate hunger and tackle many chronic health conditions, such as obesity and diabetes. However, they are often overlooked in our diets. With over 800 million people globally suffering from acute or chronic undernourishment and a rising tide of health problems linked to poor diets, the United Nations has declared 2016 the International Year of Pulses in order to demonstrate the integral role these nutrient-dense foods have in global food security and nutrition and to promote how and why pulses will help developing and developed countries alike improve their population's health and well-being every day.

How Pulses Improve Nutrition

Pulses are the edible seeds of plants in the legume family, such as dry beans and peas, chickpeas and lentils. This diverse group of staple foods has been cultivated by civilizations across the globe for over 10,000 years. They are high in protein, fibre, various vitamins and amino acids. They are hearty crops that serve as key ingredients in many traditional cuisines. Because of their nutritional values, pulses are also part of the 'food basket' used by the World Food Programme in food assistance strategies.

As nutrient-dense foods, pulses offer a wide range of health benefits. They are:

- **High in dietary fibre**, with approximately 8 grams of dietary fibre per 1/2 cup and a low Glycemic Index (GI), meaning that our bodies convert them to blood sugar more slowly and evenly;
- **A low-fat high protein source**, comprised of 23% protein and only 1% fat with only about 125 calories per 1/2 cup;
- **Packed with essential micronutrients**, such as iron, potassium, magnesium, zinc and B vitamins including folate, thiamin and niacin.

Research into pulse breeding can increase these natural nutritional benefits. For instance, HarvestPlus is growing iron-biofortified beans in the Democratic Republic of Congo and Rwanda. These beans have an even higher nutritional level than commonly grown bean varieties, providing up to 45% of a person's daily iron needs in regions where anemia impacts around one-third of the population.¹

In addition to being delicious and easy to cook, pulses may help with:

- **Diabetes prevention and control**²
- **Reduced risk of heart disease**
- **Certain cancers**³ as part of a healthy diet⁴
- **Cholesterol reduction**⁵
- **Increased dietary intake of iron**
- **Weight management through improved satiety**

A "Nutrient Powerhouse" for the Developing World

The availability of food pulses across the developing world varies and is highest in sub-Saharan Africa, Latin America and the Caribbean, South Asia and the Middle East and North Africa, as the graph below indicates.

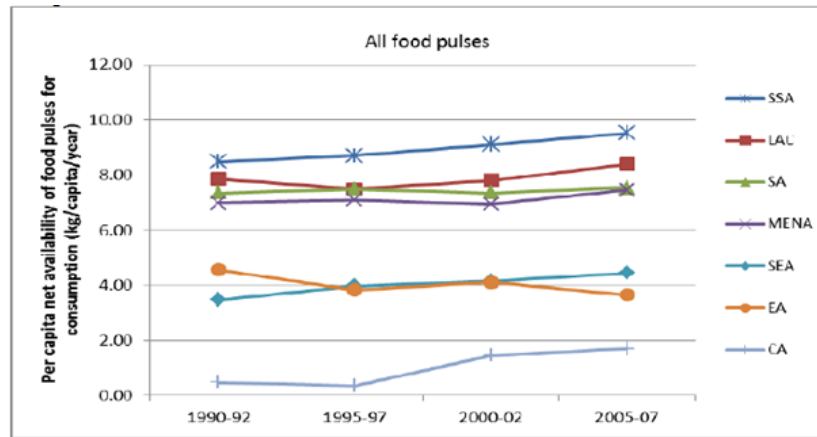
¹ <http://www.ipsnews.net/2014/04/biofortified-beans-fight-hidden-hunger-rwanda/>

² <http://www.helpguide.org/articles/diet-weight-loss/diabetes-diet-and-food-tips.htm>

³ <http://www.ars.usda.gov/Research/docs.htm?docid=10817>

⁴ <http://www.aicr.org/foods-that-fight-cancer/legumes.html#research>

⁵ <http://journals.cambridge.org/action/displayAbstract?fromPage=online&aid=909096&fileId=S0007114502002519>



(SSA= sub-Saharan Africa; LAC= Latin America and the Caribbean; SA= South Asia; MENA= Middle East and North Africa; SEA= Southeast Asia; EA= East Asia; CA= Central Asia)

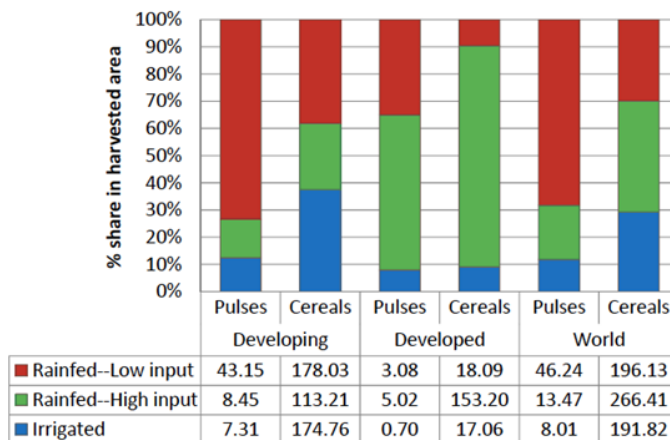
Source: <http://impact.cgiar.org/sites/default/files/images/Legumetrends2.pdf>

Professor Mywish Maredia of Michigan State University has argued that pulses are “uniquely positioned” as a commodity group to tackle the many competing challenges facing the developing world – including adequate nutrition and health and also addressing environmental resource constraints and access issues.⁷

For instance, pulses represent an affordable and accessible source of protein. Pulses are easy to store and keep, and their availability makes them affordable. For instance, in sub-Saharan Africa, pulses represent only 4% of total calorie intake, yet they are responsible for more than 10% of protein intake, according to the UN Food and Agriculture Organisation. In Burundi, pulses represent an impressive 55% of total protein intake.

Further, pulses are complementary to cereals, with respect to protein quality, when eaten together, due to each providing amino acids the other is low in. The micronutrient content of pulses may reduce anemia levels of the very poor who often rely primarily on starchy foods as the staples of their diets.⁸

Pulses are also more often grown in regions without access to irrigation or poor access to inputs (seeds, fertilizers, crop protection products, machinery), which means they can provide nutritional benefits to those who may not be able to grow other types of crops with similar benefits.



Source: HarvestChoice (SPAM database circa 2000) as cited in:

<http://legumelab.msu.edu/uploads/files/Maredia%20Presentation%20-%20Global%20Pulse%20Production%20and%20Consumption%20Trends.pdf>

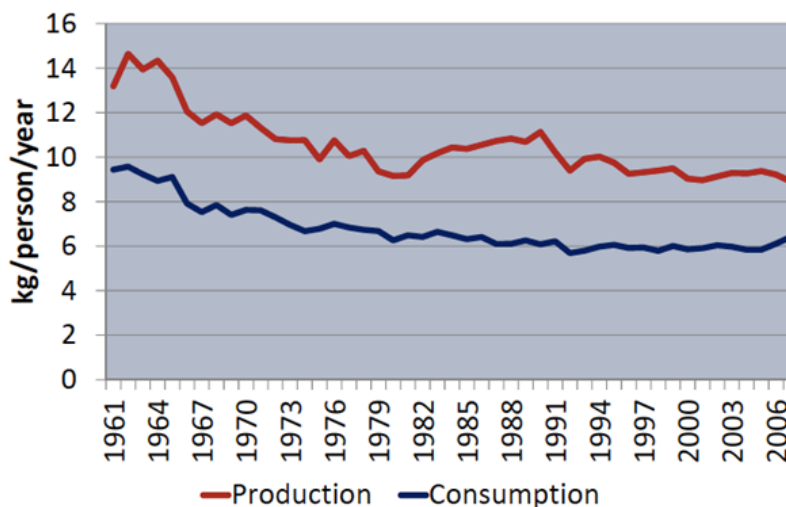
⁷ <http://legumelab.msu.edu/uploads/files/Maredia%20Presentation%20-%20Global%20Pulse%20Production%20and%20Consumption%20Trends.pdf>

⁸ <http://www.cgiar.org/our-strategy/cgiar-research-programs/cgiar-research-program-on-grain-legumes/>



Getting Pulses on our Plates

Despite the many nutritional benefits of pulses, per capita consumption has been in decline since the 1960s. Only in the last decade have we started to see a rise in pulse consumption.



Source: FAO, as cited in:

<http://legumelab.msu.edu/uploads/files/Maredia%20Presentation%20-%20Global%20Pulse%20Production%20and%20Consumption%20Trends.pdf>

For pulses to have the full nutritional impact which they deserve, more research into pulse breeds needs to be done both to increase productivity and resilience but also on market access and trade. As the CGIAR Research Program on Grain Legumes notes:

About 50% to 75% of the national research funds in developing countries are allocated to rice and wheat alone. Poor government support, low productivity of new cultivars and biotic and abiotic constraints due to marginalization of pulse crops are the main factors of low production of legumes in Asia and Africa. In India, the high post-harvest costs (marketing margins) are eating up the profits. Additionally, the poor yields impede the realization of high market prices relative to cereals.⁹

This research can help ensure that pulses receive the full attention they deserve as a “nutrient powerhouse”.

Please consult the other factsheet on “orphan crops” to know more about the pulse breeding challenge.

⁹ <http://grainlegumes.cgiar.org/new-publication-grain-legumes-production-consumption-and-trade-trends-in-developing-countries/>



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Further Resources:

International Year of Pulses 2016

(www.iyp2016.org)

This website is hosted by the Global Pulse Confederation in celebration of the UN's announcement of the International Year of Pulses in 2016. It provides resources, key events and themes as well as up-to-date news about pulses.

Pulse Canada

(www.pulsecanada.com/food-health)

Pulse Canada is the national industry association that represents growers, processors and traders of pulse crops in Canada, and its website has many resources on pulses' nutritional benefits to human health as well as a diverse range of pulse recipes.

CGIAR Research Program on Grain Legumes

(<http://grainlegumes.cgiar.org>)

The CGIAR Research Program on Grain Legumes focuses on improving chickpea, common bean, cowpea, groundnut (or peanut), faba bean, lentil, pigeonpea and soybean crops grown by poor smallholder families in five regions (in order of production area and numbers of poor): South and Southeast Asia, Western and Central Africa, Eastern and Southern Africa, Latin America and the Caribbean, and Central and Western Asia and North Africa. The Program aims to benefit 300 million poor by the end of its first 10-year cycle.

Legume Innovation Lab at Michigan State University

(<http://legumelab.msu.edu>)

The Feed the Future Innovation Lab for Collaborative Research on Grain Legumes (Legume Innovation Lab) contributes to economic growth and food and nutrition security through knowledge and technology generation that strengthens grain legume (e.g., bean, cowpea, tepary beans, etc.) value chains and enhances the capacity and sustainability of agriculture research institutions that serve grain legume sectors in developing countries of Sub-Saharan Africa and Latin America.

Indian Institute of Pulses Research (IIPR)

(<http://www.iipr.res.in>)

Indian Institute of Pulses Research (IIPR) was established as national Institute by the Indian Council of Agricultural Research (ICAR) for basic, strategic and applied research on major pulse crops. The Institute is involved in generation of basic information, development of high yielding varieties and appropriate production and protection technologies, production of breeder seeds, demonstration and transfer of technologies, and strategic coordination of pulses research through wide network of testing centres across the country.