Nutritional and Health Benefits of Pulses: A Chemistry Perspective

Introduction

A. General Discussion of Benefits of Pulses


- Pulses have a very low glycemic index, which is a measure of how much blood glucose levels change after consuming a given food.
- Foods with low glycemic indices have myriad health benefits, including significant impacts on cardiovascular disease, diabetes, and obesity.


- A pulse is the edible seed produced by the legume family of plants.
- Legumes are types of plants that grow their seeds in pods.


- Pulses are great sources of protein and fiber, with lower fat content than meat
- Producing 1 kg of legumes yields 0.5 kg of CO₂, while 1 kg of beef yields 9.5 kg of CO₂

• Low energy density: 1.3 kcal/g; source of carbohydrates and protein

• Enhances micronutrient intake: thiamin, vitamin B6, folate, iron, magnesium, phosphorus, and zinc

• Reduces cancer risk, cardiovascular disease, weight gain and diabetes


<http://pubs.acs.org/doi/pdf/10.1021/jf071704w> (accessed 1/31/2016)

• With such large amounts of starch, amylose is high in individuals with pulses in their diet, which leads to high incidence of colorectal cancer. This un-metabolized starch is called **Resistant Starch**.

• Pulses lower bad cholesterol and raise good **cholesterol**.

• High in **isoflavins**, which studies have found to reduce osteoporosis, cancers (inhibit tumor genesis- interesting details in paper), and CVD.

• Relieves menopause symptoms

• Many other bioactive aspects


• High in carbohydrates, one major drawback is high in oligosaccharides, which are known to cause discomfort during digestion

• Two main phytochemicals are Phenolic Compounds and Phytates.

• Beneficial ratio of intake and to satiety. Help control hunger
B. General Discussion of Beneficial Phytochemicals


- Phytochemicals are compounds found in plants that provide no nutritional value but are believed to deliver many health benefits
- A group of phytochemicals known as flavonoids have been linked to a decrease in heart attacks
- Phytochemicals are found in many fruits, vegetables, beans, tea and wines


- Phytochemicals have been linked to having anticarcinogenic properties, therefore preventing or delaying specific cancers


- Health benefits from phytochemicals depend directly on their chemical structure
• Benefits other than anticarcinogenic properties include cardiovascular protection, anti-viral action, increased bone functions, and prevention of obesity.

C. Statement of Need and Outline of Approach

Materials and Methods

Results

Discussion

Conclusion

References