

**NATIONAL NUTRITION WEEK 2016:
“Love your beans – eat dry beans, peas and lentils!”**

October 2016

ANNEXURE I

USEFUL FACTS AND REFERENCES

- Legumes provide a valuable and cost-effective source of protein and other nutrients. A review of different foods found that beans were among the top 5 classes of food having the highest micronutrient to price ratio, therefore providing ‘exceptional nutritional value for money’¹.
- The protein content of most beans (uncooked) averages 20 – 25% according to weight, whereas the protein content of soy is approximately 36% according to weight². Legumes are considered to be incomplete proteins (except soy) because they contain relatively low quantities of the essential sulphur containing amino acids (which are found in higher amounts in grain). Grains such as maize meal and wheat contain limited amounts of lysine and a combination of legumes and grains improve the protein quality³.
- Legumes are rich in low glycaemic index carbohydrates, resistant starch, oligosaccharides and fibre⁴. The resistant starch, oligosaccharides and fibre pass undigested through the stomach and small intestine until they reach the colon, where they act as prebiotics of food for the probiotic or beneficial bacteria residing in the colon. Their bacterial fermentation leads to the formation of short-chain fatty acids, such as butyrate, which may improve colon health by promoting a healthier gut microbiome, thus reducing the risk of cancer⁵.
- Some people experience bloating and gas as a result of eating beans and this is often said to be a reason why people do not consume beans more often. Evidence shows that people may develop a tolerance to flatulence produced or gastrointestinal symptoms associated with

¹ Drenowski A, The nutrient rich foods index to help identify healthy, affordable foods. *Am J Clin Nutr.* 2010; 91: S1095 – 101.

² Langenhoven ML, Kruger M, Faber M. *MRC food composition tables.* 3rd ed. Parow Valley: Medical Research Council; 1991.

³ Kouris-Blazos A, Belski, R. Health benefits of legumes and pulses with a focus on Australian sweet lupins. *Asia Pac J Clin Nutr.* 2016; 25 (1) 1 – 17.

⁴ McCrory MA, Hamaker BR, Lovejoy JC, Eichelsdoerfer. Pulse consumption, satiety, and weight management. *Adv Nutr (Bethesda).* 2010; 1:17-30. doi: 10.3945/ an.110.1006.

⁵ Slaving J. Fiber and Prebiotics: mechanisms and health benefits. *Nutrients.* 2013; 5: 1417 – 1435. doi:10.3390/nu5041417

consumption of pulses. In those who consumed pulses for a period of 8 weeks, study participants did not perceive significant changes in the severity of flatulence.⁶ Similar findings were reported in another study where only a small percentage of participants (19%) reported increased flatulence⁷.

- Legumes are low in sodium and a good source of B vitamins, iron, zinc, calcium, magnesium, selenium, phosphorus, copper and potassium, but are a poor source of fat soluble vitamins and vitamin C. They are generally low in fat and have no cholesterol. Soybeans and peanuts are the exception, with significant levels of mostly mono- and polyunsaturated fatty acids⁸.
- The nutritional quality of legumes may be affected by anti-nutritional factors which they contain that reduce the digestion and absorption of nutrients or interfere with their action. Some can also be toxic. Anti-nutritional factors can decrease palatability, diminish protein digestibility and mineral bioavailability⁹. Therefore legumes (except sweet lupin) should not be eaten raw. Traditional food preparation techniques such as soaking, boiling, sprouting and fermenting not only improve flavour and palatability of legumes but also increase the bioavailability of nutrients, by deactivating anti-nutritional factors¹⁰.
- Epidemiological studies over the last 20 years have confirmed that eating legumes regularly can prevent chronic disease, including cardiovascular disease, diabetes, cancer and overweight, as well as improving gut health.^{11,12,13} A review of 21 trials showed modest weight loss with dietary pulse intake¹⁴.

⁶ Veenstra JM, Duncan AM, Cryne CN, et al. Effect of pulse consumption on perceived flatulence and gastrointestinal function in healthy males. *Food Res Int.* 2009;43(2):553-559.

⁷ Winham DM, Hutchins AM. Perceptions of flatulence from bean consumption among adults in 3 feeding studies. *Nutr J.* 2011;10:128.

⁸ Langenhoven ML, Kruger M, Faber M. *MRC food composition tables.* 3rd ed. Parow Valley: Medical Research Council; 1991

⁹ Kouris-Blazos A, Belski, R. Health benefits of legumes and pulses with a focus on Australian sweet lupins. *Asia Pac J Clin Nutr.* 2016; 25 (1) 1 – 17.

¹⁰ Xu B, Chang SKC. Effect of soaking, boiling, and steaming on total phenolic content and antioxidant activities of cool season food legumes. *Food Chem.* 2008; 110:1-13. doi: 10.1016/j.foodchem.2008.01.045

¹¹ Kushi LH, Meyer KA, Jacobs JrDR. Cereals, legumes, and chronic disease risk reduction: evidence from epidemiologic studies. *Am J Clin Nutr.* 1999;70:451S-8S

¹² Curran J. The nutritional value and health benefits of pulses in relation to obesity, diabetes, heart disease and cancer. *Br J Nut.* 2012;108:S1-S2. doi: 10.1017/S0007114512003534

¹³ Afshim A, Micha R, Khahibzadeh S, Mozzafarian D. Consumption of nuts and legumes and risk of incident ischemic heart disease, stroke and diabetes: a systemic review and meta-analysis. *Am J Clin Nutr.* 2014; 100: 279 – 288.

¹⁴ Kim SJ, de Souza RJ, Choo VL, et al. Effects of dietary pulse consumption on body weight: a systematic review and meta-analysis of randomized controlled trials. *Am J Clin Nutr;* 2016; 103:1213 – 1223.

- A study of older people from different cultures has shown that every 20 g increase in daily legume intake reduced the risk of death by 8%¹⁵. A study on the Mediterranean diet, which promotes higher legume intake, has also found a 14% lower mortality¹⁶. The Japan Collaborative Cohort (JACC) Study found that the highest bean intake (4.5 servings per week) was associated with a 16% reduction in total cardiovascular risk and a 10% reduction in mortality¹⁷.
- Legumes are among the foods that are least consumed in South Africa. The percentage of South Africans consuming legumes daily is 15.23%¹⁸. An average daily per capita pulse consumption of 35.66 g was estimated from secondary dietary analyses¹⁹.
- The Australian Grains & Legumes CouncilTM recommends eating legumes 2-3 times a week to reduce risk of heart disease and help manage blood glucose levels. The top three reasons reported for not eating legumes were: lack of knowledge of how to prepare them, a poor understanding of the health benefits and concern over side effects such as bloating and flatulence²⁰.

¹⁵ Darmadi-Blackberry I, Wahlqvist M, Kouris-Blazos A, et al. Legumes: The most important predictor of survival in older people of different ethnicities. *Asia Pac J Clin Nutr.* 2004; 13(2): 217 – 220.

¹⁶ Trichopoulos A, Bamia C, Trichopoulos D. Anatomy of the health effects of the Mediterranean diet: Greek EPIC prospective cohort study. *BMJ.* 2009;338:b2337.

¹⁷ Nagura J, Iso H, Watanabe Y, et al. Fruit, vegetable and bean intake among Japanese men and women: the JACC study. *Br J Nutr.* 2009; 102 (2): 285 – 292.

¹⁸ Steyn NP, Bradshaw D, Norman R, et al. Dietary changes and health transition in South Africa: implications for health policy. Cape Town: MRC; 2003.

¹⁹ Steyn NP, Nel JH, Casey A. Secondary data analysis of dietary surveys undertaken in South Africa to determine usual food consumption of the population. *Public Health Nutr.* 2003; 6(7):631-644.

²⁰ Go Grains Health & Nutrition. The Grains and Legumes Health Report. North Sydney NSW, Australia: Go Grains Health & Nutrition Ltd; 2010