



# **TRINITY COLLEGE FOR WOMEN NAMAKKAL**

**DEPARTMENT OF NUTRITION AND DIETETICS**

**FOOD SCIENCE**

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**Presented by**

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# Pulses

- Pulses are the edible fruits or seeds of pod bearing plants belonging to the family of Leguminosae and are widely grown throughout the world.
- They have 20–40% of protein and this makes them important in human food from point the point of view of nutrition.
- Pulses are the poor man's meat.
- The per capita availability of pulses has declined from 64 g per day(1951–56) to less than 40 g per day as against the FAO/WHO's recommendation of 80 g of protein per day.



# Composition

- The chemical composition of edible pulse seeds depends upon the species.
- In general, their protein content is high and is commonly more than twice that of cereal grains, usually constituting about 20% of the dry weight of seeds.
- The protein content of some legumes like soyabean is high as 40%.

## **Pulse Proteins**

- Pulse are chiefly globulins but albumins are also present in a few species.
- Pulse proteins are deficient in sulphur- containing amino acids, particularly in methionine and in tryptophan.
- Only soya-bean has tryptophan levels equal to the FAO pattern.
- All pulses contain sufficient amounts of leucine and phenylalanine.
- Lysine and threonine contents are low only groundnuts.
- A majority of pulse proteins have high molecular weights and are very compact molecules, and this reduces the digestibility of the native protein.
- Proteins also form complexes with phytin and polyphenols present in pulses, contributing to their low digestibility.

# Carbohydrates

- Food pulses contain about 55–60% of total carbohydrates, including starch, soluble sugars, fibre and unavailable carbohydrates.
- Starch accounts for the major proportion of carbohydrates in legumes.
- The unavailable sugars in pulses include include substantial levels of oligosaccharides of the raffinose family of sugars which cause flatulence production in man and animals.
- These escape digestion, when they are ingested, due to the lack of alpha-galactosidase activity in mammalian mucosa.

- Oligosaccharides are not absorbed in the blood and are digested by the microflora of inner intestinal tract, resulting in production of carbon dioxide, hydrogen and small amount of methane.
- Germination, soaking, cooking, autoclaving and fermentation reduces considerable amount of oligosaccharides.

# Lipids

- Lipids form about 1.5 % of dry matter in pulses except in groundnut, soyabean and winged bean.
- Most of the pulse lipids contains poly-unsaturated acids. They undergo rancidity during storage resulting in undesirable changes, such as loss of protein solubility, off flavor development and loss of nutritive quality.

## vitamins.

- Pulses contain small amount of carotene, the provitamin A.
- Many Pulses contain 50–300 IU of Vitamin A per 100g.
- Thiamine content of pulses is approximately equal to exceeds whole of cereals, the average value of thaimin being 0.4 –0.5 mg per 100 g of pulses.
- Pulses are rich in niacin.
- Poor in riboflavin.



# Minerals

- Pulses are important sources of calcium, magnesium, zinc, iron, potassium and phosphorus.
- 80% of phosphorus in many pulses is present as phytate phosphorus.
- Phytin complexes with proteins and minerals and renders them biologically unavailable to human beings and animals.
- Processing can reduce the phytin levels.

## Importance in human nutrition - Health benefits

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- Association between consumption of pulses and reduced risk of obesity, diabetes mellitus, cardiovascular disease, components of metabolic syndrome and cancer;
- Pulses may help to increase satiety and weight loss (fibres, trypsin inhibitors and lectins may reduce food intake by facilitating and prolonging cholecystokinin secretion)
- Fibre and resistant starch of pulses have been shown to alter energy expenditure, substrate trafficking and fat oxidation as well as visceral adipose deposition
- The high amounts of insoluble fibre found in pulses has shown to improve colon health, helping to prevent colon-rectal cancer
- Phytonutrients, including antioxidants, found in pulses may have anti-cancer properties;

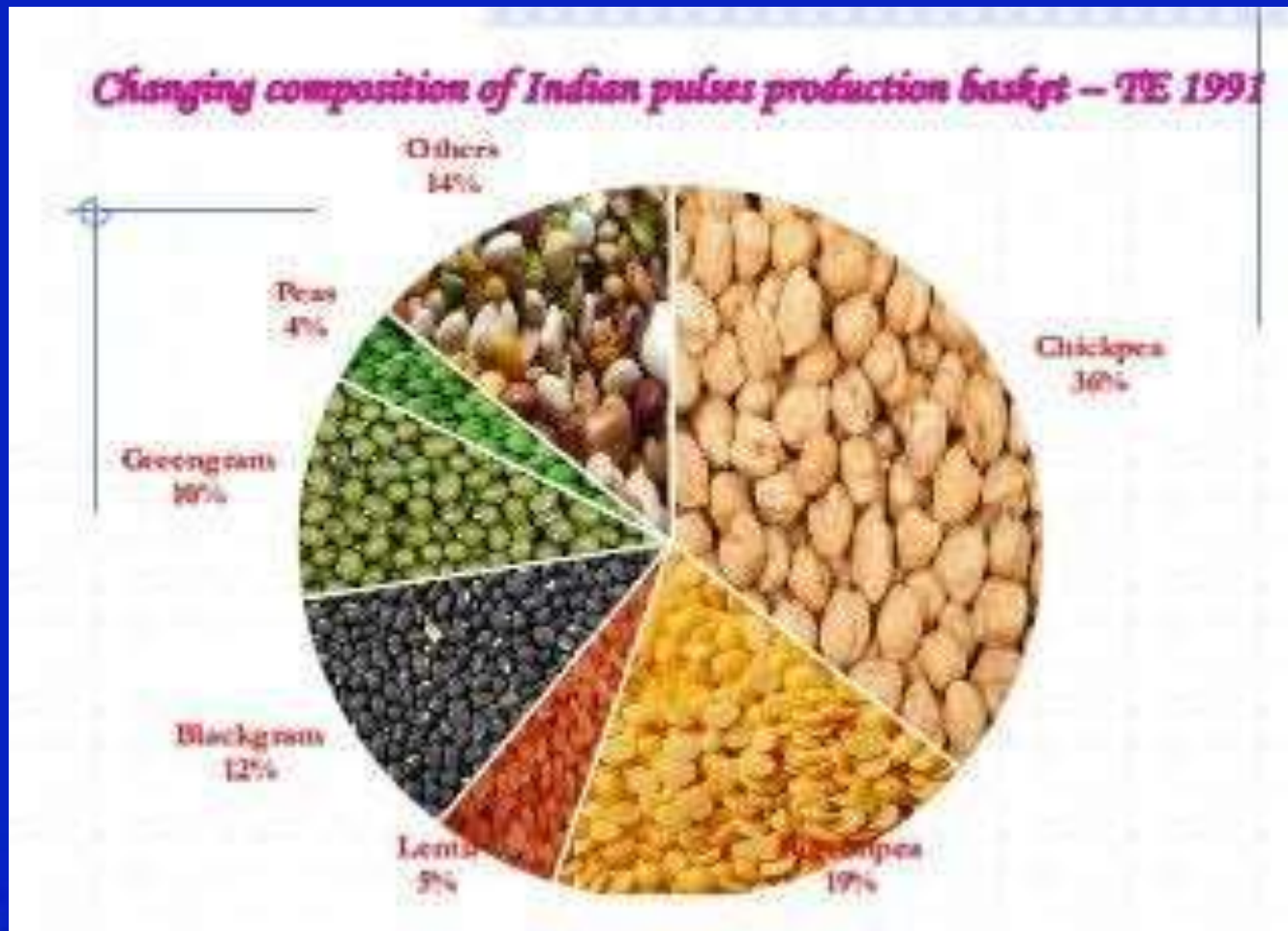
## Nutrient profile (per 100g EP)

Pulse	Energy (kcal) kJ	Protein (g)	Fat (g)	CHO (g)	Fiber (g)	Fe (mg)	Zn (mg)	Folate(mcg)
Lentils, dried, raw	(297)1240	25.4	1.8	29.4	30.5	7.0	3.9	295
Beans, white, dried	(335)1420	22.1	1.5	47.1	16.7	5.7	3.8	395
Cowpea, dried, raw	(316)1340	21.2	1.3	47.2	15.3	7.3	4.6	417
Chickpeas, mature seeds, raw	(378)1580	20.5	6.0	62.9	12.2	4.3	2.8	557
Beans, pinto, mature seeds, raw	(347)1340	21.4	1.2	62.5	15.5	5.1	2.3	525
Bean, carioca, raw	(329)1377	20.0	1.3	61.2	18.4	8.0	2.9	-

Source: West African Food Composition Table, 2012; USDA, 2014; TACO, 2011.

## Common Pulses

Pulses are the dried seeds of the legume plants. A different varieties of pulses are grown around in india.



## 10 reasons to use pulses

1. Excellent source of fiber
2. Good source of protein
3. Low-fat
4. Low-sodium
5. Good source of iron
6. Excellent source of folate
7. Good source of potassium
8. Low glycemic index
9. Gluten-free
10. Cholesterol-free

**THANK YOU**

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