Nutrition Section

LEGUMES ALL THE WAY ! (Pulses and Legumes for Diabetics)

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The nutritional significance of the pulses or legumes is known since ancient times. By tradition all sections of our people have been using pulses in their diets. The total production of pulses in India is 13 million tons with 15-16 million tons target for the next five year plan. Grams cover 34% of total area under pulse growth in U.P., Rajasthan, Haryana, Punjab and Madhya Pradesh, Red gram in Maharashtra, Madhya Pradesh and U.P, Black gram, green and lentils in M.P. and Maharashtra.

Composition of Commonly used pulses/100g

	Calories	Proteins (g)	Fibre (g)	G.I. (%)
Bengal gram whole	360	17.1	3.9	47
Green gram whole	334	24.0	4-1	48
Lentils	343	25.1	0.7	33
Rajmah	346	22.9	4.8	29
Lobia	323	24.0	3.8	33
Soybeans	432	43.2	3.7	43

Pulses can be described as potentially the most valuable naturally occuring sources of food in our country. It has traditionally been the richest source of protein for the economically deprived population. In addition its significance in improvement of the protein quality of our predominantly cereal based diets has been well recognised. Other than proteins they are a rich source of vitamin B and on germination also become a rich source of vitamin C. Whole pulses and grame have a large amounts of dietary fibre or a very high proportion of complex carbohydrates leading to a low "glycaemic Index".

Legumes and pulses have a low quality proteins since they lack an essential amino acid methoinine, how ever they are rich in lysine, hence they can supplement proteins of cereals and the quality of proteins from a mixture of cereals and pulses is superior in biological value. The most efficient combinations is that of 4 parts of cereal protein+1 part of pulse protein. Therefore all food items involving combination of cereal+pulse are recommended, e.g. Khichri, Idly, Dosa, Dhokle etc.

Low glycaemic index (blood glucose responce of foods) of pulses not only helps in glycaemic control, but also helps in decreasing cholesterol and triglycerides. Recently Jenkins and co-workers have shown that both mean peak rise in blood glucose and total area under the glucose curve were at least 40% lower when normal volunteers consumed legumes than when they consumed grains, cereals or tuberous vegetables. There are several studies to show that addition of leguminous fibre to the diet of diabetics reduces glycosuria. It has been suggested that highly branched amylopectins were digested more rapidly and since legumes contain a high percentage of amylase, digestibi-

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lity of legume starch is less thus showing lower glycaemic response.

The mechanism of low glycaemic response is that leguminous seeds are a rich source of dietary fibre in the form of galactomanuans which is more viscous than the fibre of rice and wheat. The reduction in blood sugar has a direct correlation with viscosity and the viscous substance delays the gastric emptying time thus delaying glucose absorption. The gel forming polysaccharides also increase the viscosity of the fluid film surrounding the intestinal mucosa, thus reducing the glucose transport across the intestinal mucosa.

How much to eat ?

On an average 2 exchanges of legumes/day is recommended.

Legume exchange

Each exchange contains 15 g of carbohydrate and 5 g of proteins i.e. 80 calories.

Quantity	Raw wt (g)	Cooked wt (g)
Bengal gram whole	25 g	125 g
Greengram whole	25 g	"
Lentils	25 g	1 medium
Rajmah	25 g	sized bowl
Lobia	25 g	"
Soya beans	20 g	"

Preparation of some of our traditional dishes calls for soaking of whole pulses in water over night, softening them for cooking or for germination. Germination has several beneficial effects. It activates the enzyme system in the grain increasing the content of folic acid, B group of vitamins and vitamin C. Germination also modifies the starch component thus improving the digestibility.

Roesting and puffing are two more conventional methods of pulse preparation particularly for bengal gram and green gram. These processes destroy antinutrients by the heat and food stuffs acquire a desireable flavour and taste.

In many Indian states fermentation of pulses in the form of Idly, Dosa, Dhokla or Vada are common preparations. In this vitamin B also goes up; substances like phytates are broken down into simple forms and those which hinder action of trypsin are inactivated. Diabetics are recommended to make all these preparations from whole dais along with the fibre of the whole grain.

Keeping the above given factors legumes/ grams are highly recommended for diabetis, not only as a good source of proteins, but also because of their low glycaemic and hypolipidemic effect.

Book Review

A.B.C. OF DIABETES

Watkins PJ

Publishers : British Medical Journal, British Medical Association House, Tavistock Square, London WC IH 9 JR, Edition : March 1988, Price UK £ 4.95; USA $ 11.00; other countries £ 6.50 (including postage; by air)

This booklet is based on series of articles that were published in BMJ in 1987. The present issue is the second edition.

It has the background of experience at King's College Hospital, London, which has pioneered the case of diabetes in U.K. right from days of **R.D.** Lawrence-contemporary of E.J- Joslin, Founder of Joslin Clinic in Boston, U.S.A.

Peter J. Watkins has presented in a very simplest manner saga of diabetes mellitus, right from definition to clinical presentation, management to the practical living situation. J.C. Pickup has contributed present experience based on the use of continuous subcutaneous insulin infusion and cautioned on the new technology only to be applied by centres which have enough experience, equipment and staff to provide the necessary education and supervision of the patient.

The main presentations in the book have practical applications. Somehow mention of large vessel disease especially cardiovascular system, has escaped reasonable coverage. There are profuse illustrations to substantiate the learning resource material.

Treatment strategies indicated in diabetic complications are most recent and effective, exception there being any mention of use of aldose reductase for neuropathy or captopril for nephropathy.

This book will be of great value for the non-specialist physicians who take care of diabetics and give them update in the understanding and management of diabetes.