

PULSES

INTRODUCTION

Peas, beans and lentils are known as pulses. They are the seeds of plants belonging to the family Leguminosae, which gets its name from the characteristic pod or legume that protects the seeds while they are forming and ripening. With approximately 13,000 species, the family Leguminosae is the second largest in the plant kingdom and it is very important economically. Different kinds of legumes provide us with food, medicines, oils, chemicals, timber, dyes and ornamental garden plants. Legume products include carob, senna, gum arabic, balsam, indigo and licorice. Pulses are valuable because they contain a higher percentage of protein than most other plant foods.

ORIGINS

Pulses have been used as food for thousands of years. The lentil was probably one of the first plants ever to be domesticated by humans. Most pulses prefer warm climates but there are varieties which grow in temperate regions. They can be eaten fresh or dried and come in a great number of varieties with a range of colours, flavours, and textures. In spite of its common name, the peanut or groundnut is also a legume rather than a nut .

NUTRITION

All pulses, except for soya beans, are very similar in nutritional content. They are rich in protein, carbohydrate and fibre, and low in fat which is mostly of the unsaturated kind. They are also important sources of some B vitamins. Fresh pulses contain vitamin C, but this declines after harvesting and virtually all is lost from dried pulses. Canned pulses however, retain about half their vitamin C except for canned, processed peas which have been dried before canning. Canning doesn't affect the protein content, eliminates the need for soaking and considerably reduces the cooking time compared with dried pulses. Frozen peas will have also lost about a quarter of their vitamin C content. Pulses are usually eaten for their high protein content. A typical nutritional breakdown is that for haricot beans which are used to make baked beans, contain, per 100g dried beans: 21.4g protein, 1.6g fat, 45.5g carbohydrate, 25.4g fibre, 6.7mg iron and 180mg calcium. The nutritional quality of the soya bean is superior to that of other pulses. It contains more protein and is also a good source of iron and calcium. The nutritional breakdown of soya is per 100g of dried beans: 34.1g protein, 17.7g fat, 28.6g carbohydrate, 8.4mg iron and 226mg calcium. Dried soya beans are lengthy to prepare because they need at least 12 hours soaking and 4 hours cooking time, boiling for the first hour, but nowadays a large number of soya based foods including tofu, tempeh and textured vegetable protein (soya mince or chunks) are available.

STORAGE & COOKING

One advantage of dried pulses is that they will store very well for long periods if kept in a dry, airtight container away from the light. However it is best to eat them as fresh as possible. Pulses toughen on storage and older ones will take longer to cook. Allow about 55g dried weight per person, once soaked and cooked they will at least double in weight. Most dried pulses need soaking for several hours before they can be cooked, exceptions are all lentils, green and yellow split peas, blackeye and mung beans. Soaking times vary from 4-12 hours, it is usually most convenient to soak pulses overnight. Always discard the soaking water, rinse and cook in fresh water without any salt, which toughens the skins and makes for longer cooking. Changing the water will help to reduce the flatulence some people suffer when eating pulses, also reputed to help is the addition of a pinch of aniseeds, caraway, dill or fennel seeds.

TOXINS IN PULSES

Consumers should be aware that it is not safe to eat raw or undercooked kidney and soya beans. There is no need to avoid them as long as they are thoroughly cooked.

Red kidney beans: Incidents of food poisoning have been reported associated with the consumption of raw or undercooked red kidney beans. Symptoms may develop after eating only four raw beans and include nausea, vomiting and abdominal pain followed by diarrhoea. A naturally occurring haemagglutinin is responsible for the illness, but can be destroyed by high temperature cooking, making the beans completely safe to eat. For this reason, kidney beans must not be sprouted. Kidney beans should be soaked for at least 8 hours in enough cold water to keep them covered. After soaking, drain and rinse the beans, discarding the soaking water. Put them into a pan with cold water to cover and bring to the boil. The beans must now boil for 10 minutes to destroy the toxin. After this the beans

should be simmered until cooked (approximately 45-60 minutes) and they should have an even creamy texture throughout - if the centre is still hard and white, they require longer cooking.

Soy beans: Contain an anti-trypsin factor (or trypsin inhibitor) which prevents the assimilation of the amino acid methionine. Soy beans also require careful cooking to ensure destruction of this factor. They should be soaked for at least 12 hours, drained and rinsed then covered with fresh water and brought to the boil. Soy beans should be boiled for the first hour of cooking. They can then be simmered for the remaining 2-3 hours that it takes to cook them.

Soy flour should state heat treated on its packaging. Other soya products (e.g. tofu, tempeh, soy milk, soy sauces and miso) are quite safe to use. Soy beans can be sprouted, but the sprouts should be quickly blanched in boiling water to inactivate the trypsin inhibitor.

Pressure cooking: The temperatures achieved in pressure cooking are adequate to destroy both haemagglutins and the trypsin inhibitor. Pressure cooking also considerably reduces cooking times - kidney beans 10-20 minutes, soy beans 1 hour.

Canning: The temperature achieved in the canning process also renders pulses quite safe.

Slow cookers: Pulses must be soaked and boiled for 10 minutes before being added to a slow cooker, as they do not reach sufficiently high temperatures to destroy the toxins.

As beans and peas are all very similar nutritionally, with the exception of soya, they can be interchanged in most recipes if you want to experiment or have run out of one kind, as long as you take into account the different cooking times. If the beans are likely to need a lot longer to cook than the other ingredients, try pre-cooking them in a separate pan before adding to the other ingredients or using canned beans.

Sprouting : Many whole pulses (e.g. aduki, chickpeas, whole lentils, marrowfat peas, mung and soy beans) can be sprouted which increases their nutritional value.