

**Question:** In terms of quality of product, what advantages would there be to the New Zealand industry, in farmers changing from the current blue pea type to the Australian dun type?

**Answer:** I would not recommend it because you would be reducing your value. I would prefer to look at possibilities of expanding your production of the blue peas and sending them out in bulk particularly to the Indian sub-continent. I think that the United States will recognise, in the not too distant future, that the old advantage of containerised shipping of blue peas may be in its last days.

**Question:** There's a tail end of the blue pea market that currently goes to stock feed but we can produce a quality product. The blue pea has less value than the dun pea in animal food because of high levels of trypsin inhibitors.

**Answer:** I am not a nutritional specialist but I am surprised to hear that. However, you are only looking at a small percentage of peas in the feed mix any way. We can introduce up to 30%.

**Question:** You can use the white Australian dun pea

like that but in New Zealand we would run into strife if we did it with the blue peas.

**Answer:** I would prefer a nutritionist to comment but perhaps the answer is to grow a white pea where you have got both a food market and a feed market. I think you would be a lot better off that way we are trying to move towards a white pea in Australia, we have too many green ones our current varieties.

**Question:** Do you know what the trypsin inhibitor levels are on local peas?

**Answer:** Medium-high. You get the whole range in tests from very low trypsin levels to very high. There was some work reported on this in a paper by D.C. Johns in the *Journal of Agricultural Science*.

**Comment:** Other grain legumes, lentils and chick peas, often ferment and that's very good stock food. Blue offal are not a good stock food but it's a very good adjunct to the stock food industry. The New Zealand maple has a 30 % stock feed market niche and there are advantages of moving into greater production of maples. Yellow peas, have a substantial market for stock food, but you must get high yield rather than quality.

### 3. UTILIZATION OF LEGUMES: THE PRESENT AND FUTURE

Convenor - G.P. Savage

**Promotion:** Legumes suffer from an image problem, they are not highly valued foods in western diets. The main problem appears to be a general lack of knowledge of how to cook and process them. People who do not attempt to use them often make the comment that it takes a great deal of time to cook them properly.

The presentation of baked beans ready to eat in tin cans is perhaps the most well known legume product on the market. The important feature is that they are presented ready cooked in a tasty sauce. All they need is to be warmed up and they are ready to consume. Variations on baked beans in tomato sauce, such as curried beans and Mexican beans, are beginning to be introduced but they are not regarded by the public as high value foods.

Lentils and beans are widely used commercially to thicken soups and sauces, but this does not use a large quantity of legumes. Growers and producers would like more to be consumed.

As far as western diets are concerned there appear to be a number of good reasons why more legumes should be introduced into the diet. The main reason for their inclusion is to reduce the amount of saturated fat in our diets which is a goal for improving our diet. Legumes also contain useful amounts of dietary fibre which again should be increased in our diet. It is unfortunate that the processing of some legumes, e.g., legumes for human use, involves the removal of the testa which reduces the amount of dietary fibre in, for instance, split lentils. There is evidence emerging that some legumes contain good levels of saponins which tend to reduce blood cholesterol if eaten in sufficient amounts.

A considerable amount of work needs to be done to turn legumes into convenience foods. They need to be presented cooked and processed ready to eat. Their presentation in plastic pouches like the "boil in a bag" foods would greatly enhance their profile. They should be presented with different and exciting sauces.

Another possibility is vacuum packed cooked beans with a range of sauces sold separately - like spaghetti sauces. There appears to be some mechanical processing problems that need to be overcome in developing ready-to-use foods.

It was also suggested that education was needed to promote the use of legumes. The Heart Foundation is a good forum for this type of health education work. The workshop members tasted a number of products containing added ground lentils and chick peas such as bread, cakes and biscuits prepared from household recipes. Although these products were prepared by a dietitian it was clear that they could have been prepared in most homes. All that is needed is to encourage homemakers that legume products are nutritious foods. The development of a coherent education programme would be an important step.

It was also recommended that the development of snack foods using legumes should be encouraged. The development of the existing range of peanut products should be a guide to what may be possible. There are a number of snack foods that are commonly eaten in Indian and Arab speaking lands that use legumes, particularly chick peas and white peas. It is hoped that snack foods based on beans and lentils could be developed which would include extruded lentil flour products.

The recent increase in the use of sprouted legume seeds in our diets should be continued. This is a very good example of adding value to a very basic product. For the producer there is considerable increase in volume and consequently profits. It was thought that if more data was available it might be possible to promote legume sprouts as a nutritious food.

It was noted that New Zealand has developed a useful export market for lentils in a very few years and could produce more for the home market if demand increased. It is technically possible to select more nutritious varieties of various legumes, including lentils. At present this would be a major addition to the current selection criteria for varieties and cultivars based only on suitability to our climate and soils.

Overall, legumes need a new nutritious image before they will be more widely accepted in human diets. It was felt that manufacturers need to develop a vision to

promote new legume based products. The sprouted legume market should be encouraged and should be backed up with good reliable nutritional data.

*The feed industry:* The stock food industry is happy to take up second grade legume seed for use in food compounding but is not prepared to offer high prices for legume protein. The main problem appears to be one of variable supply. The compounding industry would prefer to have reliable supplies of legume products and would prefer to have supplies of products it understands well. The stock food industry would prefer a steady and reliable supply of soya bean meal. This meal has been processed to remove the oil, a valuable commodity in itself, but in the process the many heat labile anti-nutritive factors have been degraded making soya bean meal an easy product to include in many formulations.

Generally speaking, nutritional improvement does not seem to be a high priority although breeding out trypsin inhibitors would seem to be a major task. Though perhaps identifying the trypsin levels in the different cultivars of peas and beans is something that needs to be considered.

*Question:* There appears to be an enormous potential for an easily cooked legume product. There could also be enormous savings on energy not only for New Zealand but perhaps more importantly in developing countries, if some way we could cut down the amount of energy needed to process the product.

*Answer:* Yes, there is an energy problem in developing countries. They are also the countries that are least able to invest in R & D to resolve the problem. In environmental terms, there is an enormous amount of firewood that's cut annually for cooking and obviously technology for easily-prepared legumes, would have pay-offs in this area.

*Comment:* I think 'this problem' is also the thing that makes legumes so attractive as a foodstuff in developing countries. The fact that they are reasonably hard makes them resistant to attack by insects and reduces storage losses. So maybe if you produce one that is very easy to cook, it might then become very easy to be eaten by weevils and other bugs. Although trypsin inhibitors give a certain amount of protection against attack by insects.