

## 8. PROSPECTS OF FOOD LEGUMES IN PAKISTAN

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### Introduction

According to Pakistan statistical year book for 1968, the expected population could be 53,513,892 souls by 1970–71 in West Pakistan. The population estimate from 1951 to 1970 computed on the basis of constant geometric rate of growth of population then in West Pakistan was 2.3555% per annum in contrast with that of 6% in 10 years in Western Europe. Moreover modern medicines, improved sanitation and to some extent better nutrition, general education in Pakistan has resulted rapid rise in survival rate and increased the pressure of population. Especially population of children under 15 years is about 45% of the total population. Area under various crops, is 35,779,000 acres as per Agriculture census of 67–68. Area under pulses, peas gram, beans and other food legumes is 4,508,465 acres. Most of the pulses and beans find place in the human diet, whereas gram, peas and a few more legumes are consumed by farm animals. However protein from other sources like milk and Ghee (Butter fat) the annual production of which is 4,296,533 and 82,300 tons respectively. Annual fish production is 16,400 tons. Annual meat production figures are Mutton 27,333. Beef 99,600 Buffalo 35,533 and goats 2,310 tons respectively. Similarly annual production of fowl meat is 11,500 tons. The annual egg production of hens, ducks and other is 31,307,000; 15,300 and 1,173,000 dozens respectively. The above figures are quoted from the book "Food and Agriculture Statistics, 1959". Since then some increase in the production of meat, poultry, milk and fish protein might have occurred.

### Present Situation and Future Problems of Production of Food Legumes

Pakistan needs more protein and of good qualities too, with adequate processing of food legumes. Today over two-third Children of Pakistan are in dire need of quality protein food and similarly two-third adults are in need of more food to provide energy for increased productivity and better life. Pakistan has vast areas and sound irrigation system. Ecologically Pakistan has many promising zones for growing all types of food legumes. Since independence various irrigation projects have been envisaged in the private as well as in the public sector and more water had been made available for Agriculture. The conventional starch producing crops are being replaced by protein producing crops. The change over to food legumes has been mostly for cash returns to the farmers and benefits of protein food to the consumers. Area under food legumes is 4,508,455 acres and the yield potentials of food legumes on the average of dry grain is about a half ton per acre. Annual production of food legumes as a diet is hardly 2,254,232 tons which is much below than the requirements of the population. The situation suggest for increased production of food legumes, especially when the protein production from meat, milk, fish and poultry is limited and costly for the low income group, which forms a major part of the population. Future problems are not only to bridge up the present protein gap but to keep pace of protein production with the geometric growth of the population. Food legumes can be grown under irrigated and un-irrigated condi-

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tions suggesting a wide range of adoptability. Consequently Central as well as Provincial Governments have organized research programme to develop food legumes of short duration, hardy to abnormal environmental conditions and resistant to outbreak of plant epidemics with high yields and superior qualities. This work is likely to improve quality and quantity of food legumes significantly. Endeavours are being made to increase and improve irrigation system by excavating new canals, constructing dams, lining of channels, setting up of tube wells, persian wheels, construction of delay action dams, conservation of soil moisture and many other such programmes. This will increase area under crop plants and naturally area under food legumes should increase proportionately. There is a scope of converting some area of rice, sorghum wheat, rapeseed and other crops competing with food legumes, of course with certain incentives and persuasions. The present situation of low yield potentials of food legumes in Pakistan are the future problems to be tackled vigorously by providing superior cultivars, adequate fertilization facilities, prompt plant protection measures and superior agronomical techniques in a well planned manner.

The other alarming situation in Pakistan is of fodder for farm animals. Vast areas are under dry farmings, depending absolutely on rains. Grazing has been done, so much in some parts that natural vegetation has depleted, therefore animals population has decreased to a great extent resulting in short fall of animal protein and fat. The situation may become more serious in the future to come. Also the soil erosion through wind has occurred in some pockets of Pakistan, with the result that soil fertility has decreased and sand dunes movement has started. After winter rains wheat/barley is sown under dry farming conditions over an area of 1,000,000 acres in Baluchistan annually. The yield vary from 80 pound to 400 pound per acre, depending on various eco-geographical conditions. Research work has confirmed that when Egyptian clover is grown as a companion crop with Wheat/Barley and the clover left over in the fields after harvest can thrive during summer and fall months. This can be source of extra fodder. The only investment is of seed which is \$2/-. Two extra sheeps can be maintained for eight months on one acre of clover, thus extra sheeps can be 2,000,000. Beside this, it will improve soil fertility. The Province of Baluchistan offers great prospects in this respect.

Soybean is an important food legumes because of its high contents of oils and proteins of good nutritive values and essential amino acids over other lentils. Soybean flour is an ideal protein to supplement commonly used cereals. However soybean could not become popular beyond the production of hydrogenated fat. Pakistan can encourage cultivation of soybean as a source of edible oil and protein provided the project is assisted by some concerned International Agency. The future problems of productions of food legumes confronting Pakistan can be summarized as under:-

1. To increase area under food legumes either by putting new areas or by diverting areas of other crops.
2. To increase yield and to improve quality of food legumes by adopting appropriate inputs.
3. In order to breed superior varieties of food legumes establishment of Food Legumes Introduction Centres are essentially needed for gene-pool. There is a pressing need of breeding varieties having uniform maturity of pods.
4. A comprehensive training programme in food legumes production, utilization and processing should be formulated for the young research workers, now engaged at the various Agricultural Research Institutes in Pakistan.
5. Pakistanies are by and large meat/starch eaters, so much that some people would not eat legumes for vanity sake. So far meat had been cheaper and easily available, the use of food legumes as human diet could not become popular.

However with the growth of Urban population and higher cost of meat, food legumes are now finding place in human diet. This is a social problem coupled with taste and traditions which need to be solved through extension techniques covering socio-economic aspects of the problem.

6. Majority of the population resides in rural areas and suffers from Nutrition Edema because people are forced to subsist for longer period on starch feed of low caloric values and of sub normal proteins. This causes fall in the concentration of plasma and along with other health complications causes death. In order to cure such patients feeding of protein hydrolyzate on large scale has now become inevitable.

### **Present Situation and Future Problems of Utilization and Processing of Food Legumes**

According to FAO survey report about Near East (including West Pakistan) the calorie intake, total proteins and animal protein per capita per day are 2,470 calories, 76 grams and 14 grams respectively as compared to 3,120 calories, 93 grams and 66 grams of North American.

Due to rapid growth of Urbanization in Pakistan there is urgent need for the introduction of food legumes utilization and processing programme so as to enable the Urban population to have adequate food stuffs of food legumes at all times of the year at reasonable price. Application of Food technology science may make direct contribution. So far processing and preservation of food legumes and their transportation had not been satisfactory. A sizeable portion of food legumes is either destroyed in transportation or in shops or in storage. By way of developing food industries, we will be needing more and more facilities of storage, the basic know how to our present industries and improvement in our traditional methods of food legumes processing with a view of promoting proper utilization of food legumes in the rural areas. Again nutrition education programme should be spread and sustained at all levels of population by all possible means of mass communication. Similarly a well, formulated programme of family planning may go a long way in bridging the protein gap.

Prevailing situation of utilization of food legumes in Pakistan is that they are not much used in meals and in the absence of Biochemical laboratories and Agro-Industrial complex the processing of vegetable protein into various amino-acids and medicinal products can not be manufactured on large scale in the country. There are no registered feed makers and nutrition testing laboratories in the country, with the result that the values of food products prepared from food legumes and their utilization remained in the primitive stage. In short food legumes utilization work is to be organized from the beginning in the light of experience of advanced countries. Pakistan therefore expects special attention towards this problems.

At present there are very few food processing factories in the country. As such food legumes processing work will have to be started afresh because it is very important that food legumes should pass through certain mechanical and chemical processing before they are certified to be fit for human health. For this purpose a Food Legume Act may be needed which shall provide for certain standardizations and rules etc. Machines will have to be imported for the preparation of certain end products. For chemical analysis of food legumes biochemistry science may be added to the existing Agricultural Research Institutes. Products of high protein contents can be made in Pakistan out of cotton seed flour with soybean or fish flour at cheaper rates for low income group. FAO can help and assist Pakistan in this connection. Apart from food legumes, new sources of proteins in Pakistan can be many other vegetables, oils

seeds, cotton seed, ground nuts, sunflower and also there are scopes of production of proteins from leaves of banana and sugarcane. However a careful control of the process of these new sources is essential in order to retain maximum protein biological values. Vigorous approach is also needed in the utilization of new materials like crude oils which could be converted by fermentation process utilizing yeast and other micro organisms. It is therefore quite likely that refineries in Pakistan may have food production plants, if assisted suitably by the FAO in the near future on following points:-

1. Increased production of food legumes in Pakistan, which is still inadequate due to social and technical difficulties.
2. To bring about improvement in the techniques of preservation and conservation of food stuffs prepared from food legumes.
3. To endeavour more exhaustive studies on technological methods of production and development of new types of food stuffs from food legumes.
4. A comprehensive nutritional survey for assessing dietary standards and the state of nutrition of the population in Pakistan.
5. Comprehensive biochemical and physiological studies of nutritional problems in the context of local conditions.

### **Research Development of Food Legumes**

The most effective solution lies in the faster expansion of general education and scientific research because no economic growth is feasible without high standard of educational and of scientific research. Research development in food legumes can be of multi purpose. The following research divisions of the country which are already existing at the research institutes may be strengthened, so as to work more effectively for increased production, utilization and processing of food legumes.

1. Division of crop production.
2. Division of soil science.
3. Division of Plant protection.
4. Division of food technology.
5. Division of Extension Service.

The above quoted divisions of the Agriculture Department are fully capable to conduct research work on any problems of food legumes. Qualified staff and well equipped laboratories and fields are available. However some facilities on agro-industrial research and on Plant Biochemistry may be needed.

### **Research Work on Beans**

Vegetable Section at Quetta conducted research work on beans and peas with the objective of selecting superior varieties. Research work remained restricted to introduction, acclimatization and selection of superior varieties, through improved agronomical practices.

Nineteen varieties of beans were introduced from other sources and subjected to various tests of chemical fertilizers, irrigation, periodical sowing, along with three top local strains of beans. Data on germination, stand, Vine-habits, flowering, pod and seed was collected. Other characteristics like tolerance to drought diseases, pests and shedding of grains etc.: were also recorded. Experiments continued for three years. Out of nineteen introductions, three varieties namely Slain Green, Blue Lake Prima Pak and Blue Lake FMI-K yielded 14,924 Lbs, 10,660 Lbs and 10,250 Lbs respectively, against 721 lbs of green pods of local variety per acre. 100% increased yield was obtained from Slain Green variety over local strains.

Similar work was conducted on peas. Eleven varieties were introduced from other sources and three local strains of peas are included for periodical sowings, response to

chemical fertilizer, tolerance to drought and resistance to diseases etc. Data was recorded on germination stand, vine character, flowers, pods and seed in detail. Experiments on beans and peas were randomized and layout was according to Biometrical recommendations. The data was statistically analysed. Simla Farshi and Green Feast varieties of peas out yielded the local strains by 50% in green pod yield. However Green Feast was on the top in respect of yield and other economic characters.

**Phaseolus:** (mung) is a common food legume of the poor and rich, and is grown on large scale under dry and irrigated conditions and also as a companion crop with Sorghum. The local strains in Baluchistan were giving low yields. A search was made for superior varieties, of short duration. Nine strains of mung were introduced at Quetta and compared with local strains. A variety No. 6066 from Lyallpur proved superior and out yielded the local strains.

The seeds of the above quoted varieties of beans, peas and mung are now being multiplied by the Vegetable Section at Quetta for distribution to the registered growers as commercial varieties under the "Saluchistan Vegetable Seed Act 1971". These results reflect on the scope of food legumes in Pakistan for future planning and development.

In short the protein gap in Pakistan is very wide with the result that human health especially of children is in danger. To avert this situation the following programme will be of great significance.

#### (1) **School lunch**

It will be appreciated if a programme of feeding children in mosque schools, public schools and even in vocational schools, workshops, of private sector with one meal rich in protein under a well organized manner throughout the country with immediate effect and subsequently be extended to children working on the farms with their families.

#### (2) **Child and mother welfare centres**

These may be organized throughout the length and breadth of the country and adequate provisions of protein meals may be made available in these centres for improving health of child and the mother. This large scale process of protein feeding may be continued till the end of lactation.

#### (3) **Food preparation**

About 75% of the population of Pakistan is addicted to tea drinking and some take tea four times a day. It will be in the interest of human health if protein, vitamins and other essential minerals are added in the tea packets. Similarly most of the population is bread eater, arrangement can be made to add the essential proteins, minerals and vitamins to the flour of wheat. Also rice and sorghum flour, which is a staple food of low income group, can be treated in the same manner.

#### (4) **Protein purification**

Protein get contaminated more easily than carbohydrates by micro organisms, therefore precautions are to be made and devices are to be invented for keeping protein products in good condition for longer times. This will save lot of protein now being wasted for want of such facilities.

### **Discussion**

**K. Saio, Japan:** What kinds of vegetable protein foods are available in the current market of Pakistan? Or what kinds of protein foods are prospected as supplemental foods, mostly in the future? Do you think that soybean milk is acceptable to Pakistan people?

**Answer:** 1) Vegetable protein foods are from beans, peas, grams and many other lentils in the form of curries, baked grains etc.

2) The acceptability of soybean milk to the taste and traditions of Pakistanies is matter for the posterity to decide. However, the easy availability, comparatively low cost for production and excellent nutritive value will be requested for the acceptance by the people. Really, socio-economic problems can be solved by introducing this new product among their masses. The product will be hopeful if it is hygienic and fit for human health, especially for children upto the age of 15 years.