II. Developing the Region's Root Crops, Fruits and Vegetables

The papers were discussed with particular reference to identifying the constraints to the Region's root crop, fruit and vegetable production and processing and to finding probable solutions to these constraints.

The following constraints and probable solutions were identified:

Production

Agricultural planning: In many of the Caribbean countries there is no clearly defined development programme for the Agricultural Sector that is accepted by the policy-makers as a whole and then transmitted to staff members and the people of the country. This factor, it is felt, has led to a lack of direction and dynamism in the performance of duties by staff members and affects even ongoing programmes. Further, the output of fruits, vegetables and root crops is disorganised since there is no planning for developing institutions such as marketing, finance, extension, etc., which are presently inadequate. There is also the problem of a large proportion of agricultural land remaining used, a situation which within the context of good planning, could be alleviated by setting up a producer authority or by imposing heavy taxes on unproductive agricultural land.

Root crops: The production of root crops is being restricted mainly by low yields, the high cost of the number of man-hours utilised in the production system, seasonality of production and storage problems. Low yields could be improved by:

(i) upgrading the genetic material used and this method was rated as good for sweet potatoes and Irish potatoes, and fair for yams, aroids and cassava. It was felt, however, that due to the high costs of breeding programmes and the good possibilities for increased efficiency in other areas, that programmes of breeding should have a low priority;

(ii) improvement in management practice which was identified as the greatest limiting factor in raising the level of yields. In this area yams, sweet potatoes, Irish potatoes, aroids and cassava were singled out as crops whose yields showed good potential for increase if better management practices were used; and

(iii) reducing the incidence of pests and disease attacks particularly with respect to Irish potato.

The operations of land preparation, planting, weeding, staking (yams only) and harvesting were identified as the operations requiring large labour inputs. The prospects for reducing labour inputs appeared good for sweet potato and Irish potato and fair for yams, aroids and cassava. It was pointed out, however, that the mechanisation of root crop production in the Caribbean is still in its infancy since implements for mechanical planting and harvesting of root crops, and chemicals for weed control were now being developed and/or introduced into the production systems. It was recommended that careful consideration should be given to the feasibility of setting up of highly mechanised root crop farms, perhaps on a demonstration basis.

The problem of seasonality of production was discussed and it was agreed that this problem could be solved by selecting the correct cultivars

for the particular season of the year and that where rainfall was the limiting factor production could take place at different times in different countries.

In terms of storage of root crops, the method of curing root crops by exposing them to high temperatures and humidity was recommended for extending storage life.

Fruits and Vegetables: The development and conservation of water resources coupled with limited distribution capability was cited as a major factor impeding vegetable production. Infrastructural facilities particularly transport, handling and marketing were also found to be limiting fruit and vegetable production. In addition, cultural practices were found to be very poor because the extension efforts were not getting through to farmers.

Marketing

Inefficient marketing and distribution were found to cause wastage of 20-30 per cent of local food production because of poor facilities for purchasing, storage, processing, packaging and distribution of locally produced foods. Marketing Boards were identified as being very inefficient through the ambivalence of public officials towards the Boards and the fact that the Boards were buyers of last resort. Also, the contract system which is based on minimum guaranteed prices was not adopted to the needs of the production systems presently in use. This was so because the minimum prices used were based on costs of production studies which are inadequate and the flow of information between the Boards and the farmer and vice versa were minimal.

It was also noted that the food distribution trade was controlled by a small number of distributors which makes indiscriminate price increases and *artificial* shortages very possible. This situation also made the farmer relatively powerless when placed side by side with the commercial group. It was felt that farmers should be involved in the decision-making and control in the areas of input supply, marketing, planning and processing. The closer linking of production and marketing and the development of a rational and regular pricing system were suggested as other solutions to the marketing problems.

Processing

In the Caribbean there was little processing done except for citrus products since little resources were allocated to food technology. However, the potential existed for the processing of tropical foods but in the areas of fruits this could not be done on any extensive scale until fruit orchards producing various fruits were established. A number of products, namely juices, dried and crystalline fruit, nectars and jellies, could be produced from tropical fruits.

Some processing of vegetables was done in the Region but 80 per cent of the raw materials was imported. The University of the West Indies had demonstrated the processing potential of bodie beans, chrystophine, and pigeon peas for which a sheller had been developed but this had only reached design stage due to a lack of finance.

The potential of root crops for processing was discussed and it was found that yams, sweet potatoes, Irish potatoes and cassava showed good potential for use as processed foods, while cassava had a good potential for industrial use and as a livestock feed input.

The processing of yams and bananas had the problem that the skin was a high proportion of fruit and there was the need to develop peelers for these commodities unlike breadfruit and sweet potatoes which could be processed with the skin on. The canning of sweet potatoes and yams was found to have the problems of leaching of starch and the costs of the cans. The use of bananas as a processing input was thought to be limited since the skin was 40 per cent of fruit weight and moisture was another 40 per cent and therefore when these were removed only 20 per cent edible matter was left. It was recommended that reject bananas could however be used in animal feeds since the skin had a high protein content.

A number of constraints to the development of processing industries were identified. The supply of raw material was found to be a limiting constraint which could only be removed by developing fruit orchards. The limited resources available for developing technology for use in processing industries was also slowly showing progress and it was recommended that there was need for U.W.I. to reallocate some of its resources into this area.

There was also a lack of integration between the processors and farmers. This was due to the nature of ownership and control of the processing plants most of which were branch plants of foreign corporations. Farmers therefore had little input in the decision-making in processing plants operations. It was recommended that the farmer must have a greater interplay with the processing sector. The mechanism of farmer/processor co-ops was recommended as being the most likely solution to this problem.

The existence of many organizations in the field of processing research working in isolation from each other resulted in the wastage of resources. The rationalization of these organizations was recommended for urgent action.

Trade

Trade in the Region was found to be limiting due to the similarity of local economies and the attraction of extra-regional goods and services. Shipping volume was found to be limiting for intra-regional trade and the lack of cooling facilities was also a constraint.

Credit

In the area of credit the quantity of money available, the limited security available to small farmers because of insecurity of tenure and limited land holding were identified as constraints. The provision of inputs on credit in lieu of payment on purchase of output is the mechanism suggested for the solution of this problem. It was also pointed out that farmers needed to be trained in the use of credit.

Protein Quality

The following points relevant to the protein quality of agricultural products in the Region were made.

1. Increase in protein content of cereals and legumes leads to decrease in protein quality.
2. Choices must therefore be made between the quantity and quality of protein in programmes for improvement of crop in the Caribbean Region.
3. The importance of lysine in the diets of children and the relatively low lysine contents of cereal protein were pointed out.
4. However the relatively high lysine content of fish (protein food) and rice (carbohydrate food), protein were mentioned and these products recommended for inclusion in diets.
5. Because of the expense involved in amino acid profile analysis, using an amino acid analyser - NH_2 group analysis was suggested for use as a method for estimating approximate lysine contents of cereal food items. The problems of S-amino acid contents analysis were not discussed.
6. It was emphasized that improper amino acid balance of food intake, leading to limiting amino acid levels, results in reduction of the utilization of non-limiting dietary amino acids ingested.

It is recommended, therefore, that both from points of view of

(a) economics of food production; and

(b) nutritive value of foods, protein quality should be given more serious attention in the development of Caribbean Food strategies.

Chairman: *L. Wilson*

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