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Central Issues in Nutrition Policy and Programmes

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CURRENT NUTRITION PROGRAMMES

Combating malnutrition is essentially a multidisciplinary effort. On one hand, the root cause of malnutrition, namely poverty, has to be tackled on many fronts. On the other, to alleviate the severe effects of malnutrition, particularly on the vulnerable groups, certain intervention measures have to be taken so that in the interim period when the fight against poverty goes on, children who form the future generation do not suffer irreparable damage. Some of the Nutrition Intervention Programmes currently being undertaken by the government may be briefly reviewed.

Supplementary Nutrition Programme

In order to provide supplementary nutrition to pre-school children, pregnant women and nursing mothers belonging to the weaker sections of the society, a Central Sector Special Nutrition Programme was launched in 1970–71. By the end of 1973–74, the programme covered nearly 37 lakh beneficiaries in urban slums, tribal areas and other backward rural areas where the programme was implemented. There was an addition of about 32 lakh beneficiaries by the end of March 1979. The coverage at present exceeds 70 lakh beneficiaries.

Under this programme, a daily intake of 300 calories and 10 grams of protein per child and 500 calories and 25 grams of protein per mother is provided for 250–300 days a year. During the Fifth Five Year Plan, the Special Nutrition Programme was transferred to the State Sector and the States were required to maintain the level achieved in 1973–74 from their non-plan resources. However, Plan Provision was made for expansion under the Minimum Needs Programme. There is a provision of approximately Rs. 13.00 crores for the expansion of the programme during the current year, besides the non-plan expenditure by the State/UTs., which is of the order of about Rs. 34.00 crores.

Balwadi (Day-care Centres) Nutrition Programme

Balwadi Nutrition Programme, also started in 1970–71, is implemented through voluntary organisations. The Central Social Welfare Board and national level voluntary organisations, viz. Indian Council for Child Welfare, Bharatiya Adimjati Sevak Sangh and Harijan Sevak Sangh are implementing the programme with grant-in-aid given by the Ministry of Social Welfare. These organisations distribute the grant to voluntary organisations through their State units. Under the programme, assistance is provided for the salary of balsevika and honorarium to helper as well as supplementary food to children. The programme covers 2.3 lakh children in the age group 3–5 years, attending balwadis run by these organisations.

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REVIEWS AND COMMENTS

Pulses and Legumes Lower Blood Cholesterol

Ever since Ignatowski's studies at the turn of this century, the hypocholesterolaemic and antiatherogenic action of vegetable foods has come to be widely accepted. K.S. Mathur and co-workers, leading workers in this field in India, have demonstrated the hypocholesterolaemic action of Bengal gram (chickpea) in rats (J. Nutr. 84:201, 1964), rabbits (J. Assn. Physi. India, 13: 923, 1965) and human subjects (Brit. Med. J. 1:30, 1968). M. Madhavan *et al* showed (Indian J. Med. Sci. 25:771, 1971) that even small amounts of the pulse, amounts close to those generally eaten all over India, have a similar effect.

In addition to Bengal gram, various other pulses and legumes such as black gram, red gram, horse gram (K. Saraswati Devi and P.A. Kurup, Atherosclerosis, 11:479, 1970) and Soyabean (R.E. Olson *et al.* Amer. J. Clin. Nutr. 6: 111, 1958) have also been found, in varying degrees, to be hypocholesterolaemic.

The high fibre content, the carbohydrate or the protein fraction of these foods have been variously considered to be responsible for this action. The active principle(s) has however not been identified.

It has been suggested that biochanin A and formononetin, two isoflavones, may be the causative factors (M.T. Siddiqui and M. Siddiqui, Lipids 11: 243, 1976; M. Madhavan, Indian J. Med. Res. 64: 1504, 1976). Isoflavones belong to the flavonoid group of aromatic compounds which are widely distributed in the plant kingdom. They are exclusively of vegetable origin and are believed to be the most widely distributed secondary plant products ingested by man (J. Kuchnau, Wld. Rev. Nutr. Diet. 24:117, 1976). R.D. Sharma recently (Lipids 14:535,

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Nutrition Policy and Programmes (contd.)

Supplementary nutrition consisting of 300 calories and 10 grams of protein per day per child is provided for nearly 250 days in a year. Besides providing supplementary food to children, balwadis look after the overall development of the child.

Integrated Child Development Services Scheme

The scheme of Integrated Child Development Services (ICDS) recognises the importance of early childhood services as the initial step in building up human resources so vital to the social and economic progress of the country. It aims at integrated delivery of a package of health, nutrition and educational services to children below Six years of age and pregnant women and nursing mothers. The services include supplementary nutrition, immunization, health check up, referral services, nutrition and health education and non-formal pre-school education. Convergence of supportive services of drinking water supply and applied nutrition is also envisaged. The scheme was started in 1975–76 in 33 blocks in the country on an experimental basis and has further been expanded to cover 67 more projects in 1978-79. Fifty more projects were sanctioned this year and preparatory steps are being taken to launch additional 50 projects next year, bringing the total to 200 projects by the year 1980-81, all over the country.

Mid-day Meal Programme

The programme is presently carried out with food commodities supplied by CARE as well as with indigenous food commodities out of State Governments' own resources. During 1979–80, it is proposed to cover 110 lakh beneficiaries. Under the programme, meals are provided to school children for about 200 days in a year and about 38 lbs. of food is given per child per year. Although the aim of any feeding programme is to meet the nutritional deficiency in children, mid-day meal programme for primary school children helps in attracting and retaining them in the schools. This has been established by a few studies conducted by way of evaluating the usefulness of the school feeding programme.

IMPROVING CURRENT PROGRAMMES— SOME SUGGESTIONS

The following aspects should receive urgent attention for strengthening the quality of services under the nutrition programme.

Health Inputs

It is essential that, besides the food supplement, beneficiaries under these programmes are provided with the services of health check up, immunization and safe drinking water in the same package.

Health Departments have to work hand in hand with Social Welfare Departments to provide basic health services. Health and nutrition establishments like medical institutions, home science colleges, etc., should also participate in such programmes.

For the control of diarrhoea and prevention of dehydration, which is a major cause of death among undernourished children below the age of three years, the mother should be taught to personally prepare and administer orally appropriate sugar and slat solutions in such cases. Vitamin A and iron folic acid supplementation should also become part of the overall programme.

As it is not feasible to create separate infrastructures for providing health inputs in the feeding programmes, better results can be achieved by ensuring coordination among the health, social welfare and other concerned

Pulses Lower Cholesterol (contd.)

1979) isolated four isoflavones, namely, biochanin A, formononetin, diadzein and pratensein from germinated Bengal gram and demonstrated that crude extracts containing biochanin A and formononetin lower serum cholesterol in rats.

In a more recent study (Atherosclerosis 33: 375, 1979) he confirmed these findings by feeding the pure compounds to the animals. His studies also show that pratensein, another isoflavone, as well as p-coumaric acid also have similar effects. Flavonoids such as flavones and flavonones are not destroyed by the usual cooking processes and food processing. They, however, undergo extensive degradation in the body, particularly in the intestines, and it is not known whether the observed biological effects are due to the parent compound or the degraded product (Kuhnau, loc. cit.).

The demonstration of the cholesterol-lowering effect of isoflavones does not necessarily rule out the presence of other constituents with similar effect in vegetable foods. One such factor is protein. The consensus today is that animal protein is more atherogenic than vegetable protein. In a recent review, David Kritchevsky (J. Am. Oil. Chem. Soc. 56: 135, 1979) suggests that the ratio of arginine to lysine in the food may be an important factor. He argues that lysine inhibits liver arginase activity and thus more arginine is made available for the synthesis of arginine-rich apolipoprotein, which is atherogenic to rabbits.

He also suggests that rather than the ratio, the absolute level of lysine in the diet could also be the determining factor. The lysine content and the lysine-arginine ratio of some foods of topical interest are shown in the Table. Should the amino acid composition be an important determinant, the data in the Table would indicate that the lysine-arginine ratio rather than the total lysine content may perhaps be more important.

Compared to many other sciences Nutrition is but a fledgling. Whatever knowledge has been gained in the past few decades appears only to be superficial. The depths have yet to be explored. While we do understand the deficiencies in traditional diets, we perhaps do not have sufficient knowledge about their good points. Under the circumstances, the benefits vis-a-vis the damages caused by modern food processing cannot be discerned. This area therefore needs greater attention. Till then, it is perhaps better that fortification of conventional foods and alterations in traditional dietary practices are not indiscriminately advocated.

—Kamala S. Jaya Rao, Hyderabad

Lysine Content and Ratio of Lysine to Arginine in some Foods

	Lysine mg/g nitrogen	L/A ratio
Casein	504	2.00
Egg	417	1.04
Mutton	581	1.22
Rice	263	0.53
Wheat	194	0.58
Bengal gram	440	0.77
Black gram	400	0.77
Soyabean	391	0.91

Sources: (1) Food Composition Table for use in East Asia, FAO, 1972, Rome. (2) Nutritive Value of Indian Foods, Natl. Inst. Nutr., 1971, Hyderabad

departments, particularly at the district, block and village levels. Community health worker (CHW) and the organiser of the feeding centre should work side by side to ensure that all the beneficiaries receive the benefit of health services and if the CHW is willing to undertake the responsibility for managing the feeding centre, it may be entrusted to him.

Delivery of Nutrition Services

It will be realistic to adopt a selective approach in identification and coverage of beneficiaries and directing our attention to the high risk target groups, viz. severely malnourished children, especially children between 4–36 months, expectant women in the last trimester, and nursing mothers for the first six months after child birth. There may be continuous screening of beneficiaries to ensure that children who reach normalcy are gently elbowed out of the programme and at the same time fresh deserving beneficiaries enrolled.

There should be separate functionaries for looking after the feeding programmes at all levels, to the extent possible, so that they can pay undivided attention. These functionaries should be given adequate training and orientation. There should be coordination committees in association with Mahila Mandals (Women's Associations) to ensure convergence of other supportive services for nutrition intervention, particularly health and safe drinking water.

Some Conclusions

The conclusions which have emerged from the studies and evaluations conducted in the feeding programme in the country are somewhat mixed. Children below three years and expectant and nursing mothers are more vulnerable and belong to higher priority groups, but there has been some difficulty in reaching them through feeding "on the spot". While "on the the spot feeding" ensures that the food is actually consumed by the children suffering from malnutrition, this is practical only for children between three and six years who are, relatively speaking, not as much affected as the children below three years. The better course for delivery of food to the target group might be to have "on the spot feeding" for children between three and six years and "take-home" method for children between six months and three years. Nutrition education of mothers should ensure that they can prepare the food at home and ensure that it is consumed by the malnourished child.

Suitable fortified food mixes should be readily available for feeding programmes to combat calorie-protein malnutrition along with such necessities as common salt and kerosene. Food supplement should be increasingly based on locally available foods, the food selected should be palatable, acceptable to the local people, easily digestible especially by the young children, inexpensive and should have the minimum number of ingredients. Suitable recipes should be developed in each State according to the food habits of the people and these should be made available to the programme organisers. Wherever possible, ready-to-eat food or pre-cooked food should also be developed and utilised.

Progressively, special types of weaning foods, based on seasonal and locally available food commodities, should be produced which would be particularly useful for feeding children below three years of age, as these will have less chances of being shared by other family members. There is also urgent need for giving "therapeutic diet" to rehabilitate malnourished children, who may require hospitalisation.

Health and Nutrition Education

The component of health and nutrition education is fundamental to any health and nutrition feeding programmes. Health and nutrition education has not been built into the major feeding programme that we have today. The parents, particularly the mothers, need to be made aware, as a part of the adult education campaign, of the overall development and well-being of children by teaching them how to make best use of food available, better child care, the importance of environmental sanitation and the use of safe drinking water. We should try to evolve and propagate simple and relevant health messages through and among Mahila Mandals. Existing grassroot level agencies such as primary schools, Mahila Mandals, Youth Clubs, agricultural extension workers, ANMS, multipurpose health workers and balsevikas should be mobilised for the delivery of health and nutrition education under the feeding programmes. To achieve this objective, health and nutrition education should be incorporated in the National Adult Education Programme.

For the success of feeding programmes, community support and participation are imperative. Whatever inputs go in the feeding programmes from the government funds cannot suffice. With a view to evolve a sense of participation among the beneficiaries of these programmes, it is essential that some contribution, however small it may be, should come from the beneficiaries themselves. Communities can contribute by way of providing a place for cooking and feeding the beneficiaries, fuel, utensils, vegetables, fruits, etc. and during the harvesting season they could contribute foodgrains which can be stored and processed for nutritional needs. They can also help in organising health and nutrition education for mothers. Involvement of Mahila Mandals in implementing the feeding programmes, will enable their young members to gain experiences in child health, hygiene and cleanliness which will be useful to them in future.

Training and Orientation of Functionaries

The lack of perception and training of organisers and supervisors about the objectives of feeding programme, health and nutrition factors involved in the programme, lack of benefit-utilisation by eligible beneficiaries and lack of community participation in the organisation and management of feeding centres, are some of the weak points which have been noticed in the current supplementary nutrition programme. Short duration training camps, at block levels, should be organised for the functionaries of the feeding programmes and they must be given a basic orientation of the task that they are required to handle, particularly relating to health, nutrition, immunization and referral services for the target group. Organisers must be told how to survey and identify the beneficiaries, enlist community support and achieve coordination with the grassroot workers of the Health Department and other functionaries.

Monitoring and Evaluation

Last but not least, a system of monitoring and evaluation has to be built into the feeding programme as an essential component. Such a system will have to be developed at the field level, keeping in view such factors as resource inputs, of men and materials, operational needs, training and development of instructional material. A manual of operations for every programme should clearly specify the objectives of the programme so that its impact can be evaluated at regular intervals.

FROM OUR INSTITUTES

The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) was established in 1972 at Hyderabad, India. The main objective of ICRISAT is to sharply focus attention on research on sorghum, pearl millet, pigeonpea, chickpea and groundnut, which are the important crops of the semi-arid tropics (SAT) and form the staple diet of more than 600 million people in 49 SAT countries. These crops, often referred to as "poorman's crops", are cultivated under erratic rainfed conditions by the majority of small farmers with poor resources and low monetary inputs. As a result, the yields are low and production is unstable. Moreover, the excess of leucine and deficiency of lysine in sorghum and pearl millet cause nutritional imbalances in the people using them as a staple diet. One of the classical nutritional deficiency diseases, pellagra is well known.

India contributes over 90 per cent of pigeonpea and 75 per cent of chickpea to the world production and both these pulses supplement the cereal-based diet by providing protein and making up the deficiency of lysine of the population of the country. However, they are deficient in certain essential amino acids such as methionine, cystine and tryptophan, and it is essential to improve their amino acids content.

Groundnut is an important cash crop in India. It is a major source of vegetable oil. Although it is considered a nutritious food, it is deficient in some of the essential amino acids. Research efforts to increase the oil content and improve the protein quality of the groundnut would be extremely beneficial.

A major objective of ICRISAT research programme is to serve as a world centre to improve the genetic potential for grain yield and nutritional quality of sorghum, pearl millet, pigeonpea chickpea and groundnut. Grain quality in general and nutritional quality in particular receive high consideration in the breeding programmes of the Institute. Genetic engineering is considered to be the cheapest and the most effective way of improving the quality of grain, and ICRISAT breeders pay full attention to this aspect. The ICRISAT programmes are geared to improve potential and achieve stable yield of the above mentioned five crops under various types of stresses.

The research in grain quality and biochemistry has four main objectives—(1) to develop and standardise techniques for rapid screening for protein, lysine, and other constituents which could be used as index of quality; (2) to prepare an inventory of quality of world genetic resources of the five crops included in ICRISAT programme; (3) to screen advanced breeding material for protein, lysine and other constituents and help the breeders to improve the quality of the grain; and (4) to determine the quality of product developed from different genotypes of cereals and pulses and assess their acceptability to consumers. In case of sorghum and millet, chapati is the most common product in India, the characteristics of which are used to determine the quality of grain in the laboratory.

Inventory of Quality of Grain

The Genetic Resources Unit of ICRISAT has in its accession more than 50,000 accessions of sorghum, pearl millet, chickpea, pigeonpea and groundnut. The Unit is adding more lines to its stocks. The analysis of this available resource material has produced an excellent fund of information for the breeders and other scientists.

There is a wide range in protein content of sorghum (4.4–20.1 per cent) but narrow range in lysine content (1.24–3.64 per cent). A variety which on cooking provides fragrance like Basmati rice, has been discovered in Madhya Pradesh. It contains 9.6 per cent protein and 2.1 per cent lysine. In pigeonpea the protein ranges from 15.1 to 31.5 per cent and in chickpea 10.6 to 31.1 per cent. The range of various sulphur bearing amino acids in these pulses is also narrow, indicating the poor prospects of genetically imporving the sulphur-bearing amino acids. Some high protein sources exist in the wild species and there is also an indication of possibility of upgrading the protein content in inter-specific crosses. However, it is doubtful, if these crosses would be agronomically useful. The germplasm of groundnut has not yet been analysed and this work is proposed to be taken up soon.

Service to the Breeders

With the object of upgrading the lysine and protein content in sorghum, two high-lysine and high-protein lines from Ethiopia (IS 11758 and IS 11167) and another high-lysine mutant, P-721, from Purdue University, USA., have been tried in the breeding programmes. The lysine content in these lines ranged from 2.8 to 3.2 g/100g of protein. But the attempts to incorporate this character of high lysine into the agronomically desirable background has not been successful because of the strong negative correlation of high protein and high lysine with the grain yield and poor appearance of the resultant grain. It appears that there may be a limited scope for producing agronomically good types, containing high lysine, and useful for special purposes such as for weaning children and feeding animals. So far as pearl millet is concerned, weak negative correlation between yield and protein is obtained ($r = -0.26$). Thus there seems to be a fair possibility of increasing protein content without sacrificing yield potential.

It may, however, be reiterated that to feed the millions with more calories and more nutritious cereals and pulses, the ICRISAT research programmes give first priority to increasing yield potential and stability, consistent with possible improvement in grain quality.

Dr. J.S. Kanwar, Associate Director.

NUTRITION NEWS

The annual meeting of the Nutrition Society of India was held at the National Institute of Nutrition, Hyderabad, on the 23rd and 24th of February. The highlights of the meeting were the Gopalan Oration by Dr. M.S. Swaminathan, "Green Power And Freedom From Hunger", a Symposium on Nutrition And Fertility, and two Sessions of Free Communications where several papers on different aspects of nutrition were presented. Dr. Ashok Mitra, President of the Nutrition Society, in his Presidential address drew attention to the need for incorporating adequate emphasis on nutrition in the 20-point Programme and the Food for Work Programme.

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