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The relation between nutrition and well-being is widely recognized and it is known that the human body cannot function efficiently and adequately in the absence of proper nutrition. This relationship is usually considered in the light of either health or disease physiology or pathology and inevitably as a concurrent event. Thus, if a person eats Diet A he will gain weight; if he eats Diet B he will lose weight. Diet C will cause deficiency disease X. The effects of previous dietary experiences are not always appreciated, and so it is not realized that the future health of a nation may be affected by the nutrition of the present pregnant woman, or the present growing infant and child. For example, there is evidence that the foetus of mammals receiving an imbalance in diet during early pregnancy may not develop milk secretory glands, so that when they themselves bear offspring in the future they will not be able to produce adequate supplies of milk. This failure of lactation is felt two generations after the event that provided it. It is apparent too that the birthweight of the child (which seems to be dependent in part on the maternal diet) is an index of a child's future growth and development. The child born underweight may continue to grow at a lower plane than its companion of normal birthweight, and may never catch up in terms of height and weight. It is not only health and disease which are at stake; work capacity and mental alertness are also related to nutritional status. The hungry

child may be apathetic through malnutrition or despair; however, which factor it is, is of little importance; the practical point is that the child is dull and may therefore be incapable of proper mental concentration. The child's educational development is retarded and it may prove to be an unsatisfactory educational product.

It is often overlooked that there is a considerable financial outlay in a child. First, there is the cost in terms of food consumed, and a child is a consumer of high cost protein food quite out of proportion to its size. Then, there is the cost of clothes and medicine and in addition there is the cost of education, the cost of the mother or father being diverted from productive activity during pregnancy and after delivery. The mother may have contributed directly to family earnings or she may have acted as the water or fuel carrier or laundress. During pregnancy the family may have to hire labour for these tasks at considerable cost. When all these factors are taken into consideration, it can be appreciated that the economic investment in a child may be considerable. The loss of fifty percent of the children, a common occurrence in many countries, is thus a significant economic drain.

To summarize adequate nutrition is essential for the physical well-being of children; a well-nourished child has a good chance of becoming a useful productive adult. Adequate nutrition is essential for mental development, particularly during school life; if this is achieved, there is a good chance that the adult will be useful and productive too. Failure to maintain good nutrition, on the other hand, can result in illness or death at an early age and hence the loss of a considerable capital investment which the family cannot afford.

The question now raised is: how far are the above conclusions recognized by parents? In some countries it is said that when the cow dies the whole family mourns, but when the child dies only the mother feels the loss. Death is looked on in many countries as inevitable but when an economic asset such as a cow dies then there is genuine sorrow based on economic rather than emotional considerations. So far as the human infant

is concerned, there are mostly no economic considerations associated with its death; illness, death, hunger and poverty are accepted as part of life and there is often little or no concept of a life in which these conditions do not exist. It is, therefore, not surprising that there is little motivation for families in under-developed countries to improve their present conditions.

The health and mental well-being of the child, its potential physical and mental performance and its cost are ignored in developing countries. In order to give these factors the attention they deserve and strive to get parents to acknowledge their importance, present attitudes must be changed. The most convenient and possibly the quickest way is to educate the future parents - a process best carried out whilst at school.

School health education services may play a predominant role in this educative process, but it is also necessary to help the child being educated to achieve adequate health and physical and mental development. A child may accept the importance of an adequate diet through formal education at school, but if it is to see for itself and experience good feeding practices the lessons will be learned more easily and the practical benefits accepted and understood. School feeding should thus have a high priority in practical nutrition education programmes.

Most administrations in developing countries are only prepared to invest in services which have an obvious immediate value and which have a reasonable cost. Feeding children is believed to be prohibitive and hence impracticable. It is unfortunate that, in most instances, school feeding projects do involve the governments in enormous expenditure, although this high cost is not always necessary. Where school feeding has been implemented it has tended to be based on the European or North American pattern, involving a school dining-room service with well-equipped kitchens and trained staff preparing and serving a well-balanced diet. There are at the other end of the scale, adequate opportunities for providing a simple snack at minimal cost with minimal facilities yet

which meets home diet deficiencies.¹ This experiment was devised initially to see if a snack could be provided for children who of necessity had to walk several kilometres to school every day and whose home diet was deficient in protein. The food to be supplied had to conform to the following criteria:

1. The food had to be capable of being manufactured in the country from locally available foodstuffs;
2. A single ration of the foodstuffs had to supply at least 25 Grams of protein per child per day;
3. The food had to be capable of preparation on an open fire with the simplest equipment;
4. Its cost was to be no more than three US cents per day;
5. It had to prove palatable over a prolonged period of time.

The effects on the health and physique of the children of the various foodstuffs tested were recorded over the 200-day duration of the trial. The trial indicated foods, whose palatability was not accepted; it showed how easily it is to organize a school snack; and it showed the benefit of feeding in terms of increased height and weight and in improvement of haemoglobin levels no matter what food was given. One of the surprising developments of the trial was that although no child had ever thought of bringing food to eat at school before the trial, as soon as the trial started then pupils brought from their own homes food which supplemented the snack provided by the school, so that a substantial meal was in fact being consumed by the children.

The snack provides a talking point for discussion; the periodic weight and height checks stimulate interest in personal physique and subsidiary health education, such as hand-washing before the meal can be readily introduced.

¹ Lathman, M.C. & Robson, J.R.K., "A trial to evaluate the benefit of different protein rich foods to African School Children", *Nutr. Dieta*, 1965 7: 28-36.

There seems to be little reason why a school snack should not be provided by most countries in this Region, provided the programme is carefully planned.

The periodic recording of height and weight has been mentioned in connection with an experiment. Such recordings are, however, an essential part of any school feeding programme, for not only does physique become of personal interest but the effect of the feeding programme on the child physique can be observed by the child itself, its parents, teachers and administrators alike. Once it become known that supplementation of the home diet has beneficial effects, further interest in food in the home is likely to be aroused. As a long-term measure the child that has benefited from school feeding will wish his own children to be fed similarly and also to receive a diet that will assure their well-being and optimal physical development. Personal physique graphs on which the child's development is recorded have proved to be of great value in stimulating interest and evaluating the school feeding programme and many schools now have a record of the child's physique from the time of joining school.

There is a tendency to consider the school period in isolation, whereas, from the point of view of development, school age is only part of a period of physiological development, the most critical part of which is probably during the pre-school years, a time when the child is largely unprotected by health and social services. It would therefore seem logical that any school feeding programme should make provision for extension of its service to pre-school children as soon as this becomes practicable. Thus, the school health service should be a means of teaching beyond its immediate chronological boundaries to other fields where preparation for school takes place.

In some countries this has been achieved through Parent/Teacher Associations, which have developed, with assistance from the school, a meal service in the villages which may be entirely provided by the

villagers themselves¹. Such programmes have not only the advantage of providing much needed diet supplements, but also have other useful side effects, such as introducing nutritionally desirable foods into the diet, encouraging local food production, educating mothers in better methods of food preparation and stimulating and promoting food hygiene habits. Such programmes having important side effects mean, of course, that the school should exert some supervision over them.

Part of our existing difficulties in promoting a better knowledge of nutrition is attributable to the misconceptions of nutrition as a scientific subject. The popular concept is that it is a subject which studies diets, nutrients, obesity and metabolic disease, often in a theoretical manner. This concept is a product of Western Universities which naturally concern themselves with problems pertaining to their sophisticated mode of life. The concept in Europe and North America is started during school, when the student is introduced to the theory of the physiology and pathology of nutrition but is denied any practical introduction on the application of scientific knowledge of nutrition, which in reality involves subjects as varied as social customs, food and food habits, health economics, trade and legislation.

There is a tendency for the curricula and syllabuses of the Western world to be adopted in educational systems of the developing countries, thus perpetuating a system which does not relate to prevailing problems. It is important to ensure that the science of nutrition in its widest terms be integrated into curricula and teaching in schools in the developing countries. At the end of a school career the student should have been exposed to all the various facets of nutrition and become fully aware of its implication in life. Fortunately, this concept is being increasingly recognized and an important meeting organized by FAO/UNESCO/WHO was convened, which dealt with the teachers' role in nutrition

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WHO Progress Summary Report on Bayambang (Philippines) Applied Nutrition Project, July 1965.

education¹.

One of the difficulties in implementing a nutrition programme is the multi-faceted approach which is so necessary. Several disciplines are involved and when the curricula for nutrition education comes up for consideration, health, agricultural and education interest may in some instances be at variance. There is thus a special need for careful collaborative planning and discussion by educationalists, health authorities and agriculturalists if the teaching of nutrition in schools is to be effective and practical. This has been already done with success and in one country in this Region rural science curricula and senior science curricula have been revised and made most practicable as a result of conjoint action by FAO, UNESCO and WHO representatives. There is little doubt about the potential value of such revised curricula; the main problem now is to promote interest in all countries so that the school graduate of the future has not only a better understanding of the theory of nutrition but also its practical implementations.

¹ Joint FAO/UNESCO/WHO Meeting on The Teachers' Role in Nutrition Education, Report, Paris, 7 - 12 September 1964 (UNESCO/ED/213)