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NUTRITIONAL PROBLEMS IN THE WEANING PERIOD

by

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It is becoming increasingly clear that the first period of life, from birth to school age, is decisive for the further development of the individual and indeed for his whole life. This makes it imperative to ensure optimal environmental conditions for every child during these formative early years. In many industrialized countries this goal is not far away from being realized, at least as far as bodily growth and development are concerned. But for the children of developing countries this goal is often still as remote as it was centuries ago. At a time when the awareness of social responsibility is daily growing stronger, not only among neighbours but also among the nations of the world, it is becoming increasingly harder to accept the fact that hundreds of millions of children live under conditions which must be regarded as extremely unsatisfactory; they are thus the victims of innumerable threats from the environment, almost all of which are of a character that can rightly be called preventable.

Even if much of the plight of the children of developing countries can be alleviated only through radical changes in the present structure of the societies in which they live, it is nevertheless true that organizations such as the World

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Health Organization can play a very great role both as regards assistance to the present generations and defining the goals for the future. It is most gratifying that among its manifold activities are also seminars like this one, devoted entirely to the problems of the young child.

At the University of Uppsala, where I work, we celebrated a few years ago the 200th anniversary of a famous textbook on paediatrics: The Diseases of children and their remedies, by Professor Rosén von Rosenstein. I read the original work during a relaxed week-end at Lake Awassa in the SW part of this beautiful country of Ethiopia. It was indeed striking how many of the problems of the rural areas of this and many other African countries are similar to those prevailing in my own country in those past time

And now let us go into the realities of today.. The child in its early years is wholly dependent on the family as regards protection against disease and trauma and the safeguarding of its minimal nutritional requirements. Disease may afflict it because of inadequate resources in either respect but is more often due to ignorance as to how to protect it in the best possible way.

Nutritional deficiencies afflict the yound child much more severely than the older child or adult and much more frequently with drastic and often permanent sequelae. This is one good reason why special attention should be focused on this age group.

In times of real famine most people can recognize the intimate connection between lack of nutritious food and the appearance of gross bodily disfunction. But at other times when older children and adults are reasonably well fed or at least do not manifest signs of acute starvation it is much harder to make it clear that the yound child can nevertheless suffer serious damage due to grossly inadequate nutrition.

No presentation of this kind should start without stressing emphatically the paramount importance of <u>breast feeding</u>. Indeed for large population groups in the developing countries of our world breast feeding, or lack of it, means life or death to the child, especially during the first year of life. The fact

that artificial feeding today in the industrialized countries and among the small wealthy and well educated population groups in the developing countries can be quite successful does not in any way invalidate this contention. Everyone should know, what everyone working in the field of MCH knows, namely that artificial feeding in developing countries usually means a feeding grossly inadequate in major, or often all, essential nutrients and one that is also highly dangerous, because of microbial contamination. This situation arises from the fact that parents lack suitable raw material to prepare an artificial formula, have insufficient money to buy such food regularly and in sufficient amounts, lack knowledge of how to use it and the babies' needs and finally, lack understanding of how an improperly handled food functions as an ideal broth for the cultivation of potentially harmful microorganisms.

The sad effects of early introduction of artificial feeding are manifest every day and everywhere. Unfortunately the tendency to early weaning, especially in urban populations of developing countries today, is mainly or wholly an effect of the development in the affluent countries. This is an impact which soon may prove more detrimental than the often quoted effects of alcohol and venerial diseases on adults.

I shall limit myself to illustrate the above with one single example. At a conference sponsored by the International Union of Nutrition Sciences last October the well known nutrition research worker, Professor Mönckeberg of Santiago, presented statistical figures from Chile showing that during the last fifteen years, in parallel to a very marked improvement in the health supervision of children, there had been a drastic reduction of the mortality figures for children between one and four years of age, whereas the figures for infants under one year old remained unchanged and very high. He could find no other explanation for this than that the effects of an enormous improvement in baby welfare supervision had been completely neutralized by the ill effects of the trend towards early artificial feeding.

I can think of few technical assistance programmes in the field of nutrition which could be as valuable as one which restored the belief in the biological

role of breast feeding. If it is an Utopian delusion to believe that the present trend away from breast feeding in the industrial countries can be reversed, it should not be an Utopian ideal to suggest that the wealthy and educated mothers of the developing nations, be they daughters of their countries or citizens from abroad, should go ahead and set the example of breast feeding as Nature has intended.

The tendency to early, often extremely early, weaning in the affluent societies has nothing to do with a change in ability to nurse. Today, as ever, at least 80-90 percent of all mothers could nurse their babies for six months or more if only they were fully convinced of the importance of such an action. And when I say nurse I mean full nursing so that nothing else is needed. It if another proof of the wisdom of Nature that even under very unfavourable conditions, with mothers diseased and undernourished, the flow of breast milk may continue and the quality of the milk remain essentially unchanged.

It has often been said, and rightly, that in population groups where breast-feeding is traditional, e.g. in rural areas, the less the health personnel intervene and discuss the procedure the better, since mothers know by tradition how to behave and too much talk could have an opposite effect to the one intended.

But in urban areas under Western influence, both as regards the bad example of early weaning and the unfavourable effect of unrestricted advertising of commercial food formulas, it becomes highly important to teach the mothers of the "life or death" importance of continued breast-feeding. This should be one of the major tasks not only for MCH personnel but for everyone concerned with education of mothers.

The term breast-feeding is often used glibly. We have to define it more closely. A baby one month old needs something like 600 cc, at three months 700 cc and at six months 800 cc per day. A very active and fretting baby may need more, a quiet one less. In my part of the world it is very easy to control

how much of her mother's milk the baby gets. Since it is put to the breast at well spaced periods, usually 4-5 times a day, you can just weigh the baby before and after each meal and sum all the differences. This is not possible, of course, if the baby is carried around by her mother and nibbles at short intervals during most of the day. Fortunately, if a breast fed baby is thriving and growing steadily all the time this is proof enough that the milk is satisfactory in amount. And, as I have just said, the quality is, almost without exception, good.

For how long should breast-feeding be continued? In the Western world it is recommended that breast-feeding alone go on for about six months, to be then substituted by increasing amounts of milk formula during the ensuing 1-2 months, complete weaning being reached at the age of 7-8 months. Long before that solid foods have been progressively introduced in increasing amounts and varieties. How does this apply to the situation in a developing country? There is not much similarity. Even if the breast milk after the baby has passed six months of age is not covering its nutritional needs in all aspects, e.g, with respect to iron, it is nevertheless almost always far better than any artificial substitutes which can be offered. Thus breast feeding should by all means be encouraged up to at least twelve months of age and as an additional source of food much longer than that, e.g. to 18-24 months or more. Solid foods should be introduced with great caution and only after six months of age.

And what about the possibility that the nursing baby gets only part of its real need covered from her mother because of low breast milk yield? Firstly this should not be suspected every time a baby does not appear satisfied - there are so many other reasons for such reactions. But even if a breast fed and otherwise healthy baby by unsatisfactory weight gain indicates underfeeding it is, at least within reasonable limits, much better for a baby to be slightly under-nourished at the breast than to be introduced too early to highly dangerous formula food types as supplements.

The real problem comes if the mother, for one reason or another, has a definitely unsatisfactory yield of milk and especially so if this situation emerges already before six months of age. What should then be done? Often the first and the best alternative is if the baby can, at least partially, be wet nursed by relatives, be it an aunt or even a grandmother. It is amazing how milk production, at least to a certain extent, can be restored even after many years without demand.

In a country like my own today the prerequisites for ample and optimal feeding of infants and young children are so good that in every single case of malnutrition the first question asked is whether this is due to some underlying disease rather than faulty nutrition. In a developing country a malnourished baby will evoke quite a different question: is the condition due to poor feeding alone or to a combination of poor feeding and disease?

I have elaborated on the situation during the first year of life at some length. There is a good reason for this. Research work during the last decade originating from many parts of the world including Ethiopia has demonstrated in a convincing way that it is especially during the first and to some extent also during the second year of life that malnutrition, more often than not combined with massive infection, may cause, not only temporary, at the worst fatal effects, but also permanent sequelae, in the form of stunted growth and development. Much of the so called racial differences in adult size are obviously late effects of unfavourable effects of the evironment during the first period of life. The possibility that the same unfavourable environment may also impede the development of the central nervous system with ensuring lowering of mental capacity can no longer be denied.

The term "weaning period" needs a clear definition. Basically it means a period during which the nutrition of the baby changes from complete provision by its mother's milk to reasonable adjustment to the adult food. This should ideally not start earlier than at about six months of life and be completed at 2-3-years.

In industrialized countries the term weaning period is often used to delineate the age period from about six months and immediately thereafter. However, what really happens under these circumstances is more often an adaptation from bottle feeding to spoon feeding and more solid food. The weaning in its proper meaning may have started already long before six months of age, may be already in the newborn period, with the introduction of artificial formulas. Dr. Mellander has used the terms "physiological" and "unphysiological" weaning to stress the differences in these two situations. It is obvious that the latter carries even greater risks for the baby since between birth and six months of age the infant is extremely susceptible both to malnutrition and to infection.

And now to the manifold nutritional problems which can arise during the weaning period. Let us first ask why the young child is so susceptible to disease. The rapid growth is a major reason. From six months to two years the baby should normally increase its weight by almost 100 percent and its height by 30 percent. You can easily imagine what the nutritional demands of an adult would be if he suddenly started to grow that much in one and a half years. Another reason for the great susceptibility to disease during the weaning period is the exposure to different infections. This is true even under favourable environmental conditions but it is infinitely worse under the poor sanitary conditions prevailing in the majority of families in developing countries. Both air, soil, food and fluids are under these conditions often severely contaminated and may cause severe diseases, among which the diarrhoeas are outstanding. And these infections alone are often sufficient to lead to severe nutritional disturbances.

The most simple way to diagnose a nutritional disturbance in a child is to follow the weight curve. In a healthy baby there is a steady increase over months and years, whereas the nutritionally disturbed baby shows an irregular and slow weight gain, a standstill or even a falling off in weight which may eventually have a fatal outcome.

Two types of severe malnutrition in early childhood have been discussed extensively in recent years: marasmus and kwashiorkor. The disease picture in these two conditions has become appallingly familiar also to laymen nowadays. I will therefore limit myself to a cursory description.

Marasmus: Starts early, often already before six months of life, gain in weight is slow and eventually comes to a standstill with finally a loss in weight, and successively severe wasting of fat tissues, muscles and glandular organs, with the vital functions on a bare survival level. Death may ensure after months of retarded growth. The cause of the disease lies often in a combination of protein and calorie malnutrition and accumulated infections.

Kwashiorkor: Starts usually somewhat later, between six and eighteen months of life. Weight gain may continue but it is often irregular and much of the gain is due to abnormal accumulation of fluid which eventually becomes manifest as overt oedema. The fat tissues remain and these may even be an abnormal increase of fat in the liver and other glandular organs. The muscles also in this case show progressive wasting. Typical skin and hair changes appear. Signs of vitamin deficiencies are common. The child is miserable, at the end apathetic also to eating.

The major cause of the disease is an unbalanced diet with protein starvation, often in the midst of an otherwise adequate caloric intake. Also in kwashiorkor infections play an important role, they may accompany the whole course of the disease or precipitate the fatal change for the worse in the already chronically sick child.

There is a serious vicious circle between malnutrition and infections. The role of the former has long been underestimated. In a study by the INCAP group in Guatemala, it emerged that no less than 40 percent of all deaths among children 1-4 years old were due to severe malnutrition. In the civil register from the same population group founded on reports from layman the same figure was given at 1 percent, which meant that practically every fatality was erroneously attributed to infection or parasitosis alone.

It has been debated which is the more common of the two types of severe malnutrition mentioned above. Obviously there are great geographical differences and furthermore there is a whole pattern of transitory forms between the reasonably well defined extremes. It seems fair to assume that on a world basis the marasmic children are more numerous than those with kwashiorkor. It should always be borne in mind that the frank and severe cases of marasmus and kwashiorkor only represent "the top of the iceberg". For each such child there may be 10-20 or more others which are all in various stages of mild to moderate malnutrition.

The widespread nutritional deficiencies seen in the developing countries are often a natural and a direct consequence of the way of living. Let us take the example of iron deficiency anaemia. The mechanism of such an anaemia may be an insufficient supply of easily available iron in the food or an increased demand through rapid growth, or there may be abnormal losses of iron from the body, usually in the form of bleeding. Very often there is a combination of some or all of these factors. A typical example may be a child in the weaning period. It is born from a mother whose iron stores are exahausted through multiple pregnancies. The child, therefore, starts life with a suboptimal iron content. The food during the first year of life is almost always under these conditions very poor in iron, and the same may be true also for the following years. Growth is rapid and the iron need is therefore relatively very high in this age period. In many parts of the world hook worm infestation causes an iron drain from the body. No wonder, then, that in many developing countries iron deficiency anaemia, often of a severe degree, is more the rule than the exception. In Ceylon, for example, de Silva has reported that 80% of all children attending a municipal child welfare clinic were markedly anaemic.

Another mineral deficiency which is widespread in many mountinous countries of the world, is that of iodine. Goitre due to iodine deficiency is very common, for example, in Ethiopia, and makes its appearance already in children of preschool age. We cannot exclude the possibility that this deficiency also has other unfavourable consequences for the growing child, although little is known in this respect at present. In contrast to iron deficiency for which

it is very hard to find practical mass programmes for prevention, iodine deficiency often lends itself very well to preventive methods which are both inexpensive and efficient. This is true, for example, for a country like Ethiopia where the major part of the salt comes from a few large producers. It is a pity, therefore, that so far no serious attempt has been made to tackle this problem.

Among nutritional deficiencies of other types the developing countries unfortunately give ample examples of practically all kinds. Sometimes unexpectedly so, for example, as when rickets is found to be very prevalent in Ethiopia, the country with "sunshine thirteen months of the year" or scurvy appearing in the midst of plentiful fruit regions as I have seen it in South East Asian countries. It does not need any elaboration to this audience to explain why this is so and how the situation could be ameliorated by proper education.

Among the vitamin deficiencies, that due to lack of vitamin A has rightly received special attention in recent years. It is true that in many areas of the world other vitamin deficiencies such as scurvy due to lack of vitamin C and beri beri due to lack of vitamin B1 are more common and not rarely lead to death. But none of them is crippling in the same sense as vitamin A deficiency, which leaves a great many victims blind for life. Again the risk of such a severe effect is most pronounced during the weaning period.

Thus we see that there is an accumulation of nutritional deficiencies in that very age which we are discussing today, the weaning period. In a large number of children they are also the major causes of death. Among the survivors they may give lifelong sequelae, be it in a stunting of growth and diminished fitness or through chronic disease of the liver or other organs.

The whole field of malnutrition in early life is certainly a great challenge to the health authorities of all countries concerned as well as to the international organizations. The health of the children today decides the well-being and the capacity for efficient work of the adults of tomorrow.

What can be done to alleviate the miseries endured by countless children in the present world? It would be highly presumptous to try to present any new and original proposals to this audience. It is quite clear that the attack must be carried on the broadest possible basis, involving combined combat against both malnutrition and infection, and furthermore that it must engage extremely large groups of people with often very modest knowledge in the field of health and nutrition.

I shall limit myself to point out four problems which I hope will be thoroughly discussed during the conference:

1. The need for improved education of all professional groups involved of the special nutritional needs of the young child and the ways in which these needs can be best covered by the humble resources available to the farmers and the villagers and to the poor strata of the urban populations.

2. The necessity of improving very greatly the knowledge of basic practical nutrition for the large groups of professional personnel belonging to the MCH organization.

3. The urgency of speeding up mass campaigns of immunization at an early age against those infectious diseases which are known to be great killers and for which highly efficient immunizing agents are available, e.g. TB, whooping cough and measles.

4. The urgent need of introducing into the training of the doctors and, also into the training of other professional gr ups, the concept of the paramount importance of preventive aspects in all situations when dealing with human being. And among the many preventive measures those related to nutrition, especially nutrition in children and pregnant mothers, are just as important as for example, those geared to the prevention of infectious diseases by improved sanitation and immunization.

ad. 1 Man is often very ingenious when exploring ways and means of securing nutrition even under difficult conditions. However, in many cases it is mainly a question of finding food with enough calories to neutralize the compelling

signals from the appetite centra of the brain stem. But more calories are not enough and this is more evident for the young child than at any other age period.

In every country you will find a great many traditional, home made dishes intended especially for the weaning child. Some of them are nutritious and valuable but many more are not, often to the extent that they are practically void of any nutritious value. It was the same in Europe as late as in the 19th century. But there the scene has changed completely, first through education about the preparation of better food in the homes and then later through the intervention of the food industry. Today in Sweden more than 95 percent of all formula foods consumed are produced by industry and the sale of baby foods in jars is in the order of 400 units per child and year. All this has happened in less than two decades. There is no question that food industry could and should come also to the support of the people of the developing nations with products especially adapted to their needs, traditions and economy. It would be a tragic mistake, however, to believe that such products could become of decisive importance for the vast majority of the people already in the near future. Thus it remains to pursue with the greatest energy both the development of better programmes for home-made weaning foods and the development of sound programmes for nutritious, inexpensive industrial products for young children. And there must be a complete understanding and integration between these two programmes with only one goal in sight: The improvement of the nowadays often appalingly unsatisfactory feeding conditions for the young children.

Somebody might ask: is really very much to be gained in the way of improving home-made weaning foods, and, if so, is this field not already covered by professionals working close to the grass root level? Our experience from work in Ethiopia has thoroughly convinced us that a great deal can be gained but at the same time that here is a need for much more concerted effort by skilled personnel than has hitherto usually existed. As a matter of fact the CNU project has more and more come to look upon this matter as one of the really

major problems in the field of nutrition which should be pursued with the same energy as the project has devoted over the last few years to the production and launching of the commercial baby food Faffa.

Indeed this is not an original idea of ours. Many individual workers representing national and international organizations have been ardent advocators of the same ideas for a long time. But it is only in recent years that the problem of the home-made weaning food has been brought up for discussion at high level conferences of UNICEF, FAO and WHO. As an example of an individual contribution I would like to mention the recent laudable monograph of Professor D.B. Jelliffe on "Child Nutrition in Developing Countries".

Since there is no other age group where the problem of protein supply is crucial to the same extent as in the weaning period it is obvious that the question of weaning food, both home-made, and of commercial origin, must be of the greatest concern for the Protein Advisory Group. One of the background papers at the 1965 meeting was written by Dr. Teply, UNICEF, with the title of "The combat against protein-calorie deficiency disease through local food production an consumption". Following, the meeting of 1968 the task of reviewing the topic "Feeding the Pre-school Child" was given to me as the paediatrician.

It is foreseable that an ad hoc group on feeding the pre-school child will be formed at the 1969 meeting and if so certainly the home-made weaning foods will get their proper share of attention.

What could be done in this field by the individual nations represented at this meeting? Every action must be preceded by an analysis of the prevailing situation. If it is true that for feeding habits in general the pattern varies greatly from one country to another, and often from one region to another in the same country, it is even more true for the home-made weaning foods. Certain basic principles can be more generally applied but otherwise each action programme must be based on a thorough knowledge of the existing patterns. As always in the field of nutrition, experts from various fields should cooperate, but even more than with other age groups it is imperative

that in this case representatives of the medical profession should also be engaged.

It is my hope that this seminar will conclude with specific recommendations as to how the individual nations within the region should approach the problems related to home-made weaning foods.

ad 2. As a second point I should like to comment on the need for improving the knowledge in nutrition of MCH personnel. In all coordinated applied nutrition programmes focused especially on young children, MCH personnel must always be looked upon as key people. For one thing they are the experts who should have special training in the subject of the growing child in health and disease. But more than that, if you include in the MCH group all those professionals who are trained as doctors, health officers, midwives, nurses, auxiliary nurses etc. you will easily find out that numerically they outnumber all other groups of professionals who are likely to get in close touch with young children and their mothers. It is true that also the number of MCH personnel, taken in the wider sense of the word, in most developing countries is apallingly insufficient and that in the future, enormous efforts must be made to introduce large groups of voluntary workers. But even so, the MCH people will retain the role as key people working both in direct contact with the families and as supervisors of the voluntary workers.

It is necessary that the MCH personnel become well acquainted with the staple foods of the region and their values and deficiencies as components of the diet of young children. And furthermore that they have access to locally adapted recipes for weaning-food in which the best use in made of available resources. Thus the MCH personnel should learn a little bit of agriculture and dietetics just as it is necessary that agriculturalists and dietiticians should know the basic facts of human nutrition.

From what has been said it also follows that there should be very intimate cooperation between experts in MCH on one hand and in various fields of nutrition on the other, and this on all levels within the national and international organizations. As always it means that there should be a mutual

knowledge and understanding of basic problems to promote smoother inter-communication.

ad. 3. There is a vicious circle between infection and malnutrition. Thus measures taken to combat infection usually also pay off in improved nutrition. The worst offenders are the diarrhoeas, and unfortunately they are in a way also the disorders which are most difficult to control. But there are other infections for which the perspective is not so gloomy since safe and efficient immunization procedures are at hand. Smallpox is mostly under control reasonably well. In many developing countries today both BCG immunization and immunization with combined vaccines against whooping cough, diphtheria and tetanus have proven their efficiency. Likewise polio vaccines have been tried and more recently also measles vaccination. Unfortunately many of the vaccine campaigns have been limited in time and area. And for measles the campaigns have hardly more than begun. It is of the greatest importance, also as a weapon against malnutrition, that vaccination programmes of this kind, also including immunization against measles, are carried out among children with the same energy as, for example, programmes against malaria have been carried out for a good many years.

ad. 4. For too long the work of the doctor has been focused mainly on the healing of disease. This fact has been reflected in the character of the medical curricula. Today the idea of prevention has come more and more into the foreground and in many countries the medical curricula include a good deal of preventive and social medicine. But it is still not enough and in the developing countries the heavy case load of disease will often make it very difficult to find time enough to carry out preventive work. And still this has got to be done. The effect of the work of an MCH officer or a paediatrician who uses at least part of his time for prevention, for example initiating nutritional education and immunization campaigns, will be much greater. In my country both hospital doctors, district medical officers and private practicioners cooperate in programmes of prevention and this has meant a lot for the improvement of the health situation especially where children are concerned. In some of the Eastern

European countries the line of preventive health work among children has been pursued even more energetically.

I have attempted in this presentation to outline the major nutritional problems of the weaning period. Only if they are realized to their full extent and if the consequences, both as regards the mortality and the sequelae among the survivors, are appreciated to the full extent by professionals working in the field of health and by politicians alike, can we expect a more rapid progress. We all hope that the deliberations of this seminar and the ensuing report will mean an important step in this direction.