

IMPORTANT NUTRITION CONCEPTS AND THEIR RELEVANCE TO AGRICULTURE EDUCATION

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As you well know there is controversy among international agencies concerning the total number of undernourished people in the world, due to the different methods by which data are collected, analyzed, and interpreted. However, all agencies agree that malnutrition is increasing. This presentation will deal with FAO calculations, since their estimates are usually conservative. Ten years ago that agency estimated the under-nourished people in developing countries at something over 400 million. By 1975 this number had increased to over 450 million (1). FAO predicts that this number will exceed 600 million by 1985 (2). The sad part of this fact is that malnutrition continues to grow even though, for the most part, food production in developing countries is increasing. Even per caput food production is increasing, though very slowly. Annually the gap in developing countries between total production and per caput food production widens. Equally tragic is the fact that the increase in malnutrition among those groups of the population who have traditionally been the most vulnerable ones:

Pre-school children,
Pregnant and lactating women,
The sick, convalescent, handicapped, and elderly, and most
especially these groups among
The rural landless poor

continues to increase at a higher rate of incidence than is true for malnutrition generally.

Freedom from hunger is a basic human right. What will we do about it?

Increased food production by itself will not solve the problem. In general, hunger and malnutrition are bound up with poverty and with lack of social development as well as lack of economic development. In developing countries where much of the economy is based on agriculture and agricultural development, the way agriculture develops is the key to national progress and well being. In Thailand, 76% of the economically active population is engaged in agriculture; in Indonesia farming is the livelihood of 60% of the economically active people; in Malaysia this figure is 49%; in the Philippines, 48% (3).

The problems of malnutrition all too often have been viewed as health problems only and thus considered the sole responsibility of Ministries of Health. When other ministries have been included they have usually been those agencies dealing with elementary education and home economics or home technology. In addition to these groups, all other agencies and organizations involved in food production, distribution, marketing, preparation, consumption and acceptance need to become involved. Solving the problems related to food and malnutrition will require an improvement in the whole complex of economic, social and cultural conditions impinging on communities - especially on rural communities.

Hunger and malnutrition will impede the progress of any nation in agriculture and in all other spheres of development. Since agriculture is so intimately involved in progress at both community and national levels, agriculturists have a major role to play in alleviating malnutrition. They have the responsibility not only to:

1. Accelerate economic development by increasing agricultural production to the optimum, but also to
2. Contribute to needed parallel social development by insuring that the benefits of increased production improve the quality of life for all members of the rural community.

To what extent are agriculturists in Southeast Asia being educated to accept these two-pronged responsibilities: human development as well as economic development? From what I have observed and studied, most agricultural curricula include a fairly intensive preparation in agricultural production, including the place of agriculture in national economic development. But how much emphasis is placed on the impact agriculture can make on human development, in particular on the solution of hunger and malnutrition? Again, from what I have observed, there is not very much - certainly not enough - emphasis placed on this vital component of agricultural education.

This lack of emphasis on social development and rural well-being in the educational preparation of many agriculturists in developing countries is aggravated by additional factors such as:

1. Low levels of general education;
2. Lack of a general understanding of nutritional requirements;
3. Lack of adequate educational media;
4. Low food productivity;
5. Lack of variety in food production; and
6. Low income levels which prohibit purchasing food available in the community.

The planning of balanced food supplies and the provision of adequate diets for all people of a nation is one of the most important problems facing agriculturists in developing countries today. Any other approach to agricultural economic stability is a false one.

Since planning balanced food supplies at community and national levels is critical to national development and human well-being, one of the highest priorities in agricultural education should be to provide students with the tools of learning whereby they will be able to handle this problem effectively and expeditiously before the magnitude of the world situation in regard to hunger and malnutrition accelerates even further. The period between now and the year 2,000 is particularly critical for food production and agriculture in Southeast Asia if hunger and malnutrition in this part of the world are to be eliminated (1). And until this goal is reached, other goals of development are meaningless.

In carrying out the responsibility of helping plan, produce and equitably distribute food supplies, the agriculturist in Southeast Asia should begin with the farm population with whom he works, namely the rural poor. He needs to start and achieve success here for two reasons:

First, because such a large percentage of the people in the developing countries of Southeast Asia live and work in rural areas; and

Second, because the relationship between food production and malnutrition breeds a vicious cycle of escalating poverty, reduction in work capacity, inadequate food production and increasing malnutrition.

When nutrition content is introduced into the agricultural curriculum, the intention should not be to make nutritionists out of prospective agriculturists. The objectives should rather be to help future agriculturists who will be working in close contact with farming communities to:

1. Become aware of the food and nutrition problems facing the rural communities in which they work;
2. Appreciate the role of agriculture in solving these problems; and
3. Function more effectively in the total process of rural development by learning how to work with other rural-development workers to improve the quality of life for rural people, with special emphasis on food production and distribution to provide food adequate in amount and variety to meet nutritional needs.

The guidelines for the introduction of nutrition content into programmes of education in agriculture as originally developed were intended for use in two- or three-year post-secondary programmes of study leading to a certificate or diploma in agriculture. The target groups for whom the guidelines were planned were those students who, upon completion of the course of study, would likely be employed at village, community or district levels as:

1. Agricultural teachers of local schools;
2. Agricultural extension agents; or
3. Agriculturists of some other capacity working in close contact with farming communities.

In some of the countries in Southeast Asia, agriculturists employed in village, community or district programmes receive their educational preparation in two- or three-year post-secondary programmes; in others, graduation from a baccalaureate programme is a job-entrance requirement. These differences in educational requirements need to be taken into consideration as the guidelines are reviewed and modified.

Two alternatives for presentation of subject-matter content in nutrition have also been suggested in the preliminary draft of the guidelines. They are:

1. A clearly defined course in food economics and human nutrition to be introduced into the agricultural curriculum; or
2. The introduction of the nutrition concepts agreed upon into already existing courses and experimental learning situations in the agricultural curriculum at appropriate times and places.

The purpose of this workshop and the refinement of the guidelines we will review are to:

1. Suggest ways whereby the education of agriculturists can be modified to enable them to make a significant contribution to the attack on the hunger and malnutrition found in rural communities in Southeast Asia; and
2. Draw attention to the implications for government agencies and educational institutions in this region of the world as they plan for and are engaged in agricultural education, both formal and informal.

As we work on the guidelines we should keep in mind:

1. That the learner's concerns and points of view will determine the response to the content; and
2. The way that the learner visualizes the nutrition message will help him make his goal of becoming an effective agriculturist more attainable will, in large part, decide the future and effectiveness of our deliberations.

As we work together this week, in addition to the consideration of what we know to be basic nutrition content, we need to look at this content as much as possible through the eyes of

1. Agricultural students; and
2. The rural poor with whom they will ultimately work.

For our results from this week's endeavor to be beneficial and long lasting, from the beginning the student must understand and appreciate WHAT IS TAUGHT and WHY IT IS TAUGHT. We need to keep these two questions before us constantly. He must also be responsive to HOW IT IS TAUGHT and be able to transfer what he learns into PRACTICAL APPLICATION AT THE GRASS ROOTS LEVEL. In my country we have an old proverb that goes something like this. "The proof of the pudding is not in the making but in the eating." The proof of the quality of the education of the agriculturist in nutrition content is how well he will integrate these learnings into the community programmes with which he works,

The nutrition content included in the preliminary guidelines has been divided into 11 units, the presentations of each one usually consisting of a one-hour lecture and a 3-hour period of practical activities. In our deliberations this week we are not committed to accept the 11-unit approach; neither are we bound by the one-hour lecture/three-hour practical experience plan suggested. But we need to keep in mind, whatever we wish to include in the nutrition content outline, that most agricultural curricula are already overloaded. Thus in order to prevent students from having to accept an even heavier load of work, the introduction of additional content must be relevant and concise. Only that content that will really make a difference in the education and performance of an agriculturist should be required. When possible, additional course content should be substituted for extraneous or overlapping curriculum materials that may be identified in present offerings.

The nutrition content included in the present guidelines has been clustered around four areas considered important to the goals of agriculture in developing countries. They are:

1. The relationship between agriculture, food and nutrition;
2. The relationship between the nutritional qualities found in foods (with emphasis on the food composition of local diets), the nutrition requirements of population groups in the various periods and circumstances of life, and the effects of malnutrition;
3. The relationship of farm diversification to food processing and food supply systems and the impact of these systems on nutritional well-being at the community level; and
4. The role of agriculturists in nutrition education, planning, implementation and evaluation of programmes at community levels.

When introducing the agricultural student to:

1. The relationship between agriculture, food and nutrition, he will already have an understanding of the framework of the discipline of agriculture. He will, however, need to be introduced to the concept of nutrition as it applies to human nutrition and become familiar with the general framework of the discipline of human nutrition. That the nutrition-content materials developed need to be presented from the viewpoint of the agriculturist has been mentioned. However, if an agriculturist functions effectively in improving the nutritional status of the people with whom he works, just as the nutritionist looks at the situation from the viewpoint of the agriculturist, the agricultural student will, in some cases, need to learn to look through the eyes of a human nutritionist and understand nutritional terminology in the same way that it is used by nutrition practitioners. Even though we may speak the same language, the words we use do not always have the same meaning from one discipline to another or from one country to another.

There needs to be a blending of understandings of terminology, goals and objectives between the discipline of agriculture and that of human nutrition for this joint endeavor to be successful. For example, the agriculturist will need to become familiar with the language used by the nutritionists and public health professors; the nutritionist, likewise, will need to understand the terminology and perspective of agriculturists.

The most common terminology used in applied nutrition that the agriculturist will need to deal with are: food, staple food, food intake, diet, nutrients, recommended dietary allowance, nutrition, nutritional status, under-nutrition, over-nutrition and malnutrition. Some of these terms are interpreted in the same manner in both agricultural and nutritional circles; others are not.

In looking at the relationship between agriculture, food and nutrition, the agricultural student will also need to be introduced to the idea that he can influence the health and nutritional status of the people with whom he works through helping them increase food production both in amount and variety. This implies a special obligation to those groups most vulnerable to malnutrition; usually women, young children and the rural poor.

An equally important concept for him to appreciate in this relationship between agriculture, food and nutrition is an understanding, of the many factors affecting food production and availability. When this concept is coupled with an understanding of basic nutrition principles and the socio-cultural practices governing the distribution and eating-practices within a family and a community, the agriculturist is in a strategic position to help improve the nutritional status of the population with whom he works.

The amount and variety of foods farmers produce, their income levels, and their knowledge of nutrition will make a difference in the nutritional status of their families. When the agriculturist is aware of the socio-cultural patterns of food distribution and eating habits within the family and community style of life, he can help to make an even greater difference by helping farmers provide adequate food in keeping with socio-cultural practices. Adequate food production is the first step toward good nutrition in a rural community. The agriculturist therefore has a central role to play in community-based nutrition programmes.

2. The relationship between the nutritional qualities of the foods people eat, the nutritive requirements of individuals at different stages of life cycle, and the effects of malnutrition on all facets of human behavior, he needs to develop an understanding of the general functions and relationships of different nutrients in the human body, the nutritive contributions locally available foods make to the health and well-being of community members, and how to improve the nutritional situation when deficiencies exist.

The agriculturist who works at the community or district level needs to be able to assess the usual nutritional deficiencies in the community, understand the causes and overt signs of malnutrition occurring locally and predict malnutrition in relation to food production. He needs to learn how to make recommendations concerning food production, storage, and distribution to overcome and prevent the conditions that cause malnutrition. For the most part, malnutrition occurs because there is not enough total food to eat rather than malnutrition being produced from a deficiency of one specific nutrient. For example, when protein-energy-malnutrition (PEM) exists, usually it is from a low level of food intake depressing both calorie and protein consumption rather than from reduced protein intake. When enough food is consumed to provide for adequate calories, the protein intake is usually adequate also. However, a protein deficiency can occur when energy intake is adequate if the staple food consumed is of low protein content such as cassava or banana (plantain) or if the diet of young children consists primarily of porridge or gruel without the supplement of a protein-rich food. Also, very often when the calorie content of the diet is decidedly deficient, in addition to inadequate protein intake, iron and vitamin A intake are also low. Being able to recognize obvious indications of malnutrition, to know enough about the nutritional content of the foods commonly used in the community to establish relationships, and understand the extra quantitative food needs of those groups of individuals most vulnerable to malnutrition will stand the agriculturist in good stead as he helps farmers plan for food production quotas.

3. The relationship of farm diversification systems to food processing and food supply and their impact on nutritional well-being at the community level, he needs to understand how the various farm production systems affect food processing and food supply. He also needs to be well versed in local methods of food processing and possible means of improving them to protect food value. He needs to be able to use simple indicators to relate food production available from the different farming systems to the nutritional requirements of the population and, where feasible, suggest possible improvements in crop and animal production to provide the food needed at the community level as well as cash crops to go into the larger agricultural economic system.
4. The role of agriculturists in nutrition education, planning, implementation, and evaluation of programmes at the community level, he needs to learn how to plan and manage agricultural programmes designed to improve the nutritional status of the community and be able to monitor and evaluate these programmes. When necessary, he needs also to know how to redesign his programmes of work to meet changing needs and conditions in the community. This demands a sound educational background, an understanding of community-programme work, a great deal of creativity, and the courage to attempt change.

He needs to learn how to work with other rural development personnel available at the community level to improve the quality of life for rural people, with special emphasis on food production and distribution which will provide food adequate in amount and variety to meet nutritional needs.

Further, he needs to be truly committed to the concept that agriculture can make a difference in human development as well as economic development at the community level. He needs to KNOW FOR A FACT that nobody can make a greater contribution to the health, nutrition, and economic levels of rural people than the team of which he is a member.

This presentation began with a re-enforcement of the well known fact (but not the well-applied principle) that FREEDOM FROM HUNGER IS A BASIC HUMAN RIGHT and the question of "What will we do about it?"

There is much we can do to insure this right to people in Southeast Asia, beginning with this week's deliberations. Human nutrition is an essential link in the chain beginning with agricultural production and ending with the consumption of a balanced diet, a link which so often is a weak one or one completely omitted. A disjointed chain or one without all its essential links will not be effective in joining together agricultural production and nutritional well-being of people. Agriculturists, working with nutritionists, can strengthen this chain considerably through the introduction of nutrition content into agricultural education.

With an understanding of essential nutrition concepts and their relationships to:

1. Food production,
2. Food availability,
3. Food distribution, and
4. Planning and implementing community-based agricultural programs

agriculturists can in a very dramatic way help guarantee humankind's basic right to freedom from hunger.

Successful introduction of a nutrition component into agricultural curricula, as exciting and important as the idea is, faces several sizeable challenges. Some of the constraints which must be overcome are:

1. The colleges, universities, and ministries involved in planning and implementing pre-service and in-service agricultural education may, for very good reasons, have other priorities. The group assembled here will need to help these agencies see the advantage of giving nutrition a high priority in their agricultural education schemes.

The first step required to assure the adoption of nutrition content into agricultural education will be to obtain the cooperation of the educational and government agencies involved in agriculture, education,

or both. In order to secure cooperation and commitments from these agencies and organizations, careful study needs to be made of their goals, objectives, and targets. They will need to see how the incorporation of nutrition content into agricultural education will help them meet their purposes, goals, and obligations.

2. There is a dearth of agricultural teaching faculty adequately trained in nutrition, especially in the social aspects and implications of human nutrition. If they do not contain programmes of home economics, home technology, or human ecology, few agricultural colleges and universities employ human nutritionists as faculty members. Likewise, few human nutritionists have backgrounds in agriculture. Consideration needs to be given to providing faculty who indicate interest in this undertaking of introducing nutrition into agricultural curricula with opportunities to develop expertise in this interdisciplinary endeavor.

Wherever possible, a human nutritionist should be employed or "borrowed" for this undertaking. This approach very likely will also require additional opportunities for development. The nutritionist will need to become familiar with the content of the total agricultural programme and particularly with those subject-matter areas in agriculture impinging on human nutrition such as:

- Agricultural economics and management;
- Agronomy;
- Animal Science;
- Animal Nutrition;
- Extension methodology;
- Horticulture; and
- Rural sociology.

3. The lack of text books and teaching materials will be critical. One of the urgent and early needs for the success of this programme will be the development of a text dealing with the agricultural and agro-economic aspects of human nutrition, using an interdisciplinary, integrative, community-development approach. Equal consideration needs to be given to providing an appropriate range of teaching materials, including:
 1. Teaching manuals for the various levels of pre-service and in-service education models;
 2. Audio visual materials, case-studies, etc. and
 3. Manuals directed to both student and programme evaluation.

One of the very important aspects of the development of auxiliary teaching materials will be development of a manual dealing with practical, problem-solving learning experiences with special emphasis on how to incorporate and evaluate supervised student experiences in community-based agricultural programmes. Such experiences are an integral part of agricultural programmes of study directed toward community work.

4. There is also a need for faculty to carry out joint agriculture/nutrition research programmes oriented toward improvement of human nutrition and the quality of food production/processing/distribution. This type of research will bring confidence to students; they will know they can expect continued professional support when they need advice on changing problems and situations. Nutrition/agriculture inter-disciplinary research will also provide cooperation and understanding among scientists, technologists, and other professionals. The results of this collaboration of scientists and other professionals should lead to better planning and development of model systems at the national level to analyze the efficiency of food resources locally, regionally, and nationally. Such evaluation should lead to more effective agricultural programmes which, in turn, should:
 - a. Improve the health and well-being of the people; and
 - b. Increase economic benefits to the farmers.

The task we are undertaking this week is not an easy one. However, the benefits that we have listed far outweigh the constraints. In fact, the constraints presented also serve as professional opportunities for development in agriculture and human development. I am excited about being a member of this team. I know you are, also.

FREEDOM FROM HUNGER IS A BASIC HUMAN RIGHT. What will we do about it? We will attack the problems involved and help insure that the benefits of increased agricultural production will, in fact, improve the quality of life for all people in Southeast Asia.

- (1) F.A.O. The State of Food and Agriculture 1978. FAO Agriculture Series No. 9. Food and Agricultural Organization of the United Nations, Rome, 1979.
- (2) U.N. World Food Conference, 1974: Extracts of papers. Represented in Food and Nutrition, Vol. No. 1, 1975, Rome, FAO.
- (3) Key Indicators of Developing Member Countries of the Asia Development Bank. Vol. XI, No. 1, Economic Office, Asian Development Bank, April, 1980.