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NUTRITION MANUAL

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July 1979

WEEK I. MORNING I.

A WORKSHOP IN SEARCH OF PROBLEMS AND SOLUTIONS FOR NUTRITION PLANNERS IN AFRICA

Objectives

Malnutrition has come to be recognized as one of the major scourges of the developing world and as a threat to the future of Arica and Asia. Yet in spite of this recognition, and in spite of intensive efforts by national governments and international agencies, the numbers of the malnourished continue to rise and will continue to do so in the foreseeable future. One reason for this is that at present the causes of malnutrition are only imperfectly understood and that solutions to its many complex problems are hard to define and even more difficult to implement.

One objective of this course is to allow participants to gain a deeper understanding of the problems involved and to help them develop causal, multi-sectoral models relevant to the needs of their countries. A second objective will be to develop models that reflect causal analysis but that are organizational and include the economic, social, and political realities of African countries. Such models will be designed by participants to suggest policy implementation as well as nutrition macro and micro planning strategies.

Purpose

The purpose of this seminar is to 1) provide participants with an overview of the factors causing malnutrition; 2) to raise

some of the major controversies in the field of nutrition planning so that participants can weigh the evidence and arrive at their own conclusions, on the basis of objective analysis; 3) to provide participants with some of the necessary skills of data collection, analysis and to develop coherent and logical planning models; and 4) to permit participants to make use of their own country experience in order to make planning exercises meaningful to themselves and relevant to the needs of their countries. One important aspect of this will be the sharing of ideas among participants to reveal both the diversity of regional and local problems as well as the shared characteristics of overarching factors leading to malnutrition in Africa.

Concepts

1. The fundamental concept of nutrition planning of this seminar is that man is rational and that progress, while not easy, is possible. Planning for a better future and for the elimination of the causes of malnutrition implies a faith in the ability of man to exploit his environment in such a way as to provide for the basic human needs of the populations; moreover, it has come to include a faith in the rights of man to the satisfaction of these needs and thus in certain principles of equity. Thus nutrition planning is based on the assumption that the seemingly irrational forces of disease and malnutrition among the poor can be broken, controlled and that the vicious cycle of poverty, hunger and mortality can be broken.

2. This seminar emphasizes the use of models in nutrition planning. It is important for participants to remember that models are heuristic devices, conceptual toys as well as tools and not be confused with reality. Models permit us to reduce the scale of reality to manageable size by reducing the complexity of factors and events and to work out alternative solutions to possible problems and events; while they can be powerful explanatory devices they can be dangerously misleading.

3. Another major concept of this seminar is that of inter-sectoral planning. The so-called global approach to

planning is based on the assumption (and observation) that the causes of malnutrition are multifactoral and need to be attacked across a broad spectrum of concerns which include the health sector, income and income distribution, agricultural production and productivity, marketing, consumption patterns, and education. Other factors, such as the organizational structure of intervention efforts or the social structure cultural beliefs of target groups are often included in models that try to show the causes of malnutrition, but are relegated to the backburner in operational models. Thus to be meaningful, the concept of intersectoral planning must deal with concrete and specific data and must take account of the structural properties of sectors such as agriculture or health in certain countries. This will involve participants in a study of specifics - eg. what is the organization of the ministry of Health, of the traditional median in a village and the family structure.

4. It is difficult to classify 'vulnerable groups' or 'populations at risk' as concepts. However, the need to define those most affected by malnutrition as target groups which demand the first and foremost attention of the nutrition planner must be emphasized. Limited resources at the disposal of national governments and agencies, and the special needs of such groups demand that programs are targeted specifically to the needs of the malnourished and

specifically to those most at risk within that population. The obvious failure, underlined by writers such as Schlomo Reutlinger, of earlier national developmental programs to reach these groups, and in particular the failure of policies that raise the GNP to ameliorate the nutritional status of the poor makes the targeting of intervention programs a priority. This seminar will therefore spend a good deal of its time zeroing in on the needs of the most needy - women and infants, and discuss the various indicators that help us isolate them within the population.

5. Last, but not least, I wish to stress here a concept that has not been specifically raised in the readings, but that is central to the planning effort. This concept has been referred to as 'bottom up process'. It means that planners, nutrition planners as well as others, should not see their task as planning for the people but with the people. African participants surely know from experience that programs fail unless those in need are included in the decision-making process which involves their fate. The ancient values and beliefs of the people must be given a chance to be heard by planners and policy makers, and must be permitted a meaningful input at the beginning of the intervention process. The many failures of programs and projects carefully planned without the participation of those

at whom they were aimed serve as a warning to reform the planning process itself by seeking to incorporate the advice and consent of the populations for whom we work before the decisions are made.

Dr. Hans Guggenheim

Dr. Hans Guggenheim

READINGS. WEEK I. MORNING 1.

INTRODUCTION

1. The language of nutrition planning

James M. Pines. Food and Nutrition (Rome), 3 (3) :19-21, 1977.

In many nations intersectoral nutrition planning is difficult because the interdependence of nutritional status and its major determinants is not sufficiently recognized by many governments and institutions. A wide communication gap exists between experts from varying fields.

In this article Pines moves towards identifying some of the components of professional and governmental insulation that create this communication gap. He also introduces the reader to the nutrition planning vocabulary.

2. Nutrition and development: the view of the planner

Alan Berg and Robert Muscat. American Journal of Clinical Nutrition, 25: 186-209, 1972.

Nutrition and health professionals have concentrated on generating knowledge of severe states of malnutrition. Much less is known about mild nutritional stress which affects the majority of the malnourished. Yet, enough information is available, to justify major resource allocations to nutrition oriented programs. A thorough review of the nutrition problem and its impact on individuals and national economy and related to the general objectives of human welfare and of national development. An early key paper directed towards an understanding of the role of nutrition and nutrition planning in national development.

3. Nutrition and poverty in the LDC's

Phillips Foster. In: Agricultural Policies and Rural Malnutrition. USAID Economics and Sector Planning Division. Occasional Paper No. 7, pp. 1-5, 1978.

A concise review of the dimensions of malnutrition a poverty on a global basis, and their interrelationship.

4. Planning to reduce nutritional deprivation

Leonard J. Joy. Food and Nutrition (Rome), 1 (4): 10-17, 1975.

A well known article attempting to reformulate development objectives from a production and investment oriented perspective to one which places major emphasis on the sustained reduction of deprivation. A first important step in this direction is the elimination of intervention measures that will aggravate or neglect existing malnutrition and inequities in the society. The real challenge, however, is to raise production through new technologies in order to reduce deprivation for the many rather than to increase the wealth of the few.

5. The soft underbelly of applied knowledge

John O. Field. Food Policy, pp. 228-239, Aug. 1977.

Field deals with several conceptual and operational problems of nutrition planning. He seeks to temper some of the optimism surrounding nutrition planning, as a way of mastering the process of ending malnutrition.

5. (continued).....

He also warns of the inherent dangers in restructuring and creating new nutrition planning units. The article concludes with a general proposition concerning nutrition planning and an attempt to place the nutrition planner in a politico-ideological context.

6. Beyond economics and nutrition: the complex basis of food policy.

Johanna T. Dwyer and Jean Mayer. In: Food: Politics, Economics, Nutrition and Research, ed. Philip H. Abelson. American Association for the Advancement of Science, pp. 74-78, 1975.

This article calls for the fusion of medicine, economy, and nutrition in order to develop a joint strategy for nutrition planning. Written by two prominent nutritionists, it also lists the frustrations a nutritionist may encounter in trying to cooperate with planners and economists. The points made are relevant to multisectorial planning problems.

7. The holistic approach to the causation of hunger and malnutrition, and the identification of general goals for their prevention

Ivan Beghin. Excerpts from a paper presented at the Workshop on Goals, Processes and Indicators for Food and Nutrition Policy and Planning, M.I.T., Cambridge, Mass., 26-29 Mar., '979.

Beghin advocates a global approach to nutrition planning and traces the resistance to its implementation. In

7. (continued).....

order to make global planning operational, he calls for models to express causal relationships based on appropriate indicators. Beghin presents a model which he developed and used in Guatemala. He cautions the use of the same model in another country and emphasizes that the process of building the model represented an advance in nutrition planning. He claims that the model played a major role in furthering the understanding of the global approach among all the participants and in motivating the team. In spite of time constraints and lack of data the Beghin approach suggests itself as an excercise in model construction for the workshop. (P.G.)

Afternoon Program Outline

WEEK 1 - DAY 1

INTRODUCTION: COUNTRY PRESENTATIONS

I. PERFORMANCE OBJECTIVES

A. In order to establish communications, the participants should familiarize one another with the general problems of nutrition in their countries and their own professional expertise.

B. Develop skill in problem analysis and categorization.

II. CONTENT

Participants' experience and knowledge.

III. SUGGESTED ACTIVITIES

Participants will be asked to describe the nutritional needs of their countries and of the populations with which they are familiar. Presentations should include a general description of the countries with which other participants may not be familiar. These presentations should be prepared before participants arrive and could include maps and graphs as well as other visual materials (slides). Presentations should not exceed 5-7 minutes.

A brainstorming session will attempt to define the concept of 'adequate nutritional status.'

Brainstorming session will generate as many causes of malnutrition and factors impinging on nutritional status as possible. Most workshop audiences will come up with over one hundred listings. The factors mentioned should be recorded on large sheets by the facilitators.

The group should now break up and be organized into smaller working parties. These may wish to elect a discussion leader as well as a reporter. Membership in working parties need not be permanent and positions should rotate among group members.

Example for Brainstorming Session

Facilitator lists all suggestions made by participants for factors influencing nutritional status on large sheets of paper.

INCOME LEVEL

FAMILY SIZE

HEALTH CARE PROGAMS

Economic conditions

ECOLOGICAL FACTORS

PRODUCTION METHODS

CASH CROPPING

SCHOOL LUNCH PROGRAMS

FOOD UTILIZATION

CONSUMPTION PATTERNS

SOCIAL STATUS

PRODUCTION INCENTIVES

RELIGOUS BELIEFS

CROPPING PATTERNS

UNEMPLOYMENT

POTABLE WATER

SEASONAL CHANGES IN AVAILABILITY OF FOOD

GOVERNMENT INTERVENTION POLICY

VARIETY OF FOODS PRODUCED

FISCAL POLICY

MARKETING PATTERNS

TAXES

FOOD LOSSES

SUBSIDIES

EDUCATION

STORAGE METHODS

POTABLE WATER

RURAL-URBAN MIGRATION

INFECTIOUS DISEASES

CULTURAL BELIEFS FOOD TABOOS

NUTRITIONAL STATUS

Week 1 - Morning 2

Human Nutritional Needs

OBJECTIVES

. Participants should become thoroughly familiar with the basic vocabulary of Nutrition as a scientific discipline.

. A subject of fundamental importance for the nutrition policy planner is the problem of protein adequacy vs. calorie adequacy. Participants should understand the fundamental nutritional and policy issues involved.

CONCEPTS

. Energy, Protein, Vitamins, Micro-Nutrients

. The Protein adequacy vs. Caloric Adequacy

CONTENT

Issue papers written for seminar and readings

DISCUSSION

The quality-quantity questions raised in the materials, and specifically the calorie-protein problem cannot be resolved in a morning session, and will continue to be addressed throughout the following weeks. Participants and facilitators should treat the materials presented this morning as building blocks for the rest of the course.

READINGS. WEEK I. MORNING 2.

HUMAN NUTRITIONAL NEEDS

1. Protein adequacy vs. caloric adequacy

James E.Austin (Study Dir.) et al. Urban Malnutrition. Problem Assessment & Intervention Guidelines. Cambridge, Mass. Paper submitted to the World Bank by Harvard University. pp 405-410, 1976.

The protein versus calorie controversy is addressed on two levels. The information suggests that protein needs are generally met when sufficient calories are supplied. The emphasis placed on the "protein gap" in the 1960's is questioned. For most practical purposes caloric adequacy may therefore be used as a reasonable proxy for protein adequacy. The use of calories alone as a nutritional indicator for other nutrients than protein has not been investigated. The authors stress the tentativness of this information and its dependence on currently used recommendations for human requirements.

2. From the macro perspective

James E. Austin (Study Dir.)et al. 1976, ibid. p. 305.

Presents the IBRD estimates of the magnitude of global caloric deficits on a regional basis.

3. The controversy over the quality vs. the quantity of food.

Phillips Foster. In: Agricultural Policies and Rural Malnutrition. USAID Economics and Sector Planning Division Occasional Papers No. 7, 1978.

3. (continued).....

High income people usually enjoy better health than low income people and nutritionists came to assume that their diets were better than that of low income people. It now appears that a fully adequate diet, with the exception of Vit. B^{12} which must come from animal products, can be derived from an unrefined diet of pulses and cereals. However, the proportionately much larger protein needs of children are stressed and amino acid requirements for children and adults compared. The author recommends a careful embracing of the concept that protein is sufficient if calories are supplied.

4. <u>The value of the Ghanaian traditional diet in relation to the energy needs of young children</u>

Jennifer A. Woolfe, <u>et al.</u> Ecology of Food and Nutrition, 6:175-181, 1977.

A research paper presenting the results of a study measuring the energy densities of traditional foods in Ghana and the energy intake at individual meals by 1 to 3 year olds. The research was carried out as a response to the "bulk argument", which claims that the low nutrient density in tuber or cereal based diets is so low as to make it difficult or impossible for a young child to consume sufficient food to supply its energy needs. The researchers conculde that a wide range of combinations of traditional foods in Ghana can satisfy calorie needs for this age group. Therefore, the most important part of nutrition education, they suggest, is frequent feedings, the active encouragement of the child to eat, and teaching the value of fats in the diet.

5. <u>Composition of some African foods per 100 grammes edible portion</u>.

..Jean S. Ritchie. Manual on Child Development Family Life Nutrition. The African Train ing and Research Center for women of the Economic Commission for Africa and the Food and Agriculture Organization of the U.N.

Addis Ababa, U.N.

Tables for the evaluation of the nutrient content in some common African foods.

NOTES ON ENERGY FOR WORKSHOP PARTICIPANTS

All life depends on energy. All energy on earth comes from the sun. Although we can neither smell, see, hear or taste energy, we can measure its effect.

Energy measurements: the calorie

Since all energy comes from the sun, it is only natural to measure energy as heat equivalents. One such measure is the calorie. A calorie is defined as the amount of heat required to raise the temperature of one g of water from 14.5 to 15.5^{o} C. Because this is a very small unit, the kilocalorie equivalent to 1000 calories is used to describe energy values of food. A kilocalorie is then the amount of heat required to raise the temperature in 1 liter of water 1° C. To be correct kilocalorie should be abreviated k cal or Cal (with a capital C), but this rule is not strictly followed. In the context of food and body energy the word calorie is generally understood to mean kilocalorie.

In comparison, the energy in a peanut is enough to heat one gallon of water 1° C.

The energy value of a food is determined by placing it in a bomb calorimeter, which is immersed in a carefully measured amount of water. The food is then ignited and burned in the presence of oxygen. The caloric value of the energy released is obtained from measuring the temperature increase in the water.

Energy measurement: the joule

In the metric system the unit for energy is joule, which is also the unit used in the International System of Units (SI). The conversion factor for changing calories (i.e. kilocalories) to joules is 4.184 KJ. For most practical purposes it is sufficient to calculate that 1 calorie equals 4.2 joules. Conversely, 1 KJ = 0.239 K cal. A slice of bread has an energy value of about 520 KJ.

Daily diets are often expressed in megajoules (MJ), or 1000 KJ. One MJ is consequently equal to 239 k cal. The joule is becoming more and more frequently used because it can be used for all sciences in the metric system.

Food Energy

Plants have the capacity to bind and utilize energy from the sun through the process called photosynthesis. With the aid of the green pigment chlorophyll the plants transform water, carbon dioxide and energy from the sun to food storage forms such as the carbohydrate starch. The human body lacks this capacity and must get all its energy from foods.

Of course, the major source of energy in African foods comes from grain. Perhaps it is significant that African traditions have understood this long before the calorie was discovered by Western scholars. One African tradition (Dogon) relates how the universe was created by the explosion of the smallest and heaviest object that existed: a grain of millet. It was so charged with energy that its explosion caused the creation of all aspects of life.

Today, the energy (calorie) component of foods is considered so important that nutritional standards for large populations are usually measured in terms of available energy or calories available in the diet. Calorie requirements can be determined with reasonable precision for specified populations. The extreme result of calorie-deficient diets on individuals brings on marasmus and death. Grave deficiencies affect the mental and physical health and the ability to productively engage in normal life.

Energy forms and usage in the human body

Energy exists in four basic forms in the human body: chemical, electrical, mechanical and thermal. Chemical energy, as present in foods, is used for the synthesis of compounds in the body. The basic energy resource in the body is the sugar glucose. When glucose is oxidized (burned) in the cells, energy is released and gets trapped in high energy compounds called ATP (adenosins-

triphosphate). The other end products of oxidation are water and carbon dioxide. Energy, in the form of ATP, may be converted into electrical energy for brain and nerve activity or into mechanical energy for the contraction of muscles. Thermal energy is used for the regulation of body temperature.

The transformation of chemical energy in foods to ATP is never complete. The process captures about 40 per cent of the energy, the rest dissipates as heat. Cell maintenance and the internal work of the body requires ATP. More energy is lost as heat in this part of the process. The body's ability to convert food energy to mechanical work thus only amounts to 20 to 25 per cent of the total available energy. The process is summarized in the picture below.

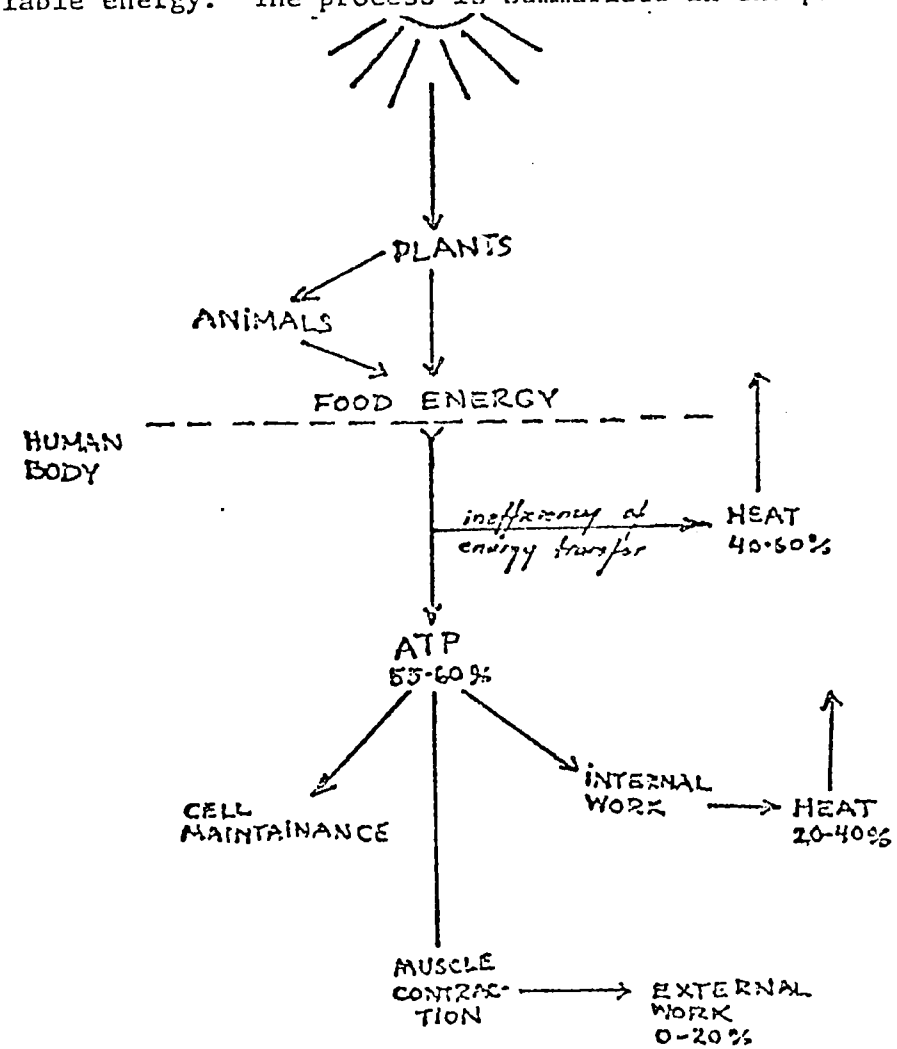

Fig. Transformation of energy from its primary source, the sun, for various usages in the human body. All food energy introduced into the human body is accounted for either as heat eliminated from, or work performed by, the body. Adapted from Ruth L. Pike and Myrtle L. Brown, Nutrition: An Integrated Approach. 2nd ed. John Wiley & Sons, Inc., New York, 1975, p. 824.

Human Energy Needs

The process of transforming chemical energy to other forms of energy for the body is called energy metabolism. The body requires energy for breathing, digestion, heartbeat and circulation as well as for cellular metabolism. All this constitutes involuntary actions by the body mechanism. The work we do, the bending and stretching of muscles is called voluntary actions.

Many factors affect the body's use of energy. Scientists have also found many different ways of measuring and presenting these effects. To be able to utilize information and research on energy, it is therefore necessary to be aware of all the particulars that influence the body's energy needs. The basic components are involuntary, but necessary energy expenditures.

Basal Metabolism

The expenditure of energy for the maintenance of these essential body activities by cellular metabolism is defined as the Basal Metabolism The degree of cellular metabolic activity can be measured under specific conditions and is called the Basic Metabolic Rate (BMR). The measurement requires that the individual tested is lying down and is completely relaxed. Since mastication, digestion and absorption all require energy, the tested person must not have eaten for 12 hours. Sweating, or shuddering from cold, also take energy, so the person must find a comfortable environmental temperature during measurement of BMR. Age and sex influence the metabolic rate. BMR is highest during the first one and one-half to two years of age. The BMR increases during puberty, but then declines steadily throughout life. After the first few years of life male BMR is slightly higher than female BMR on the average.

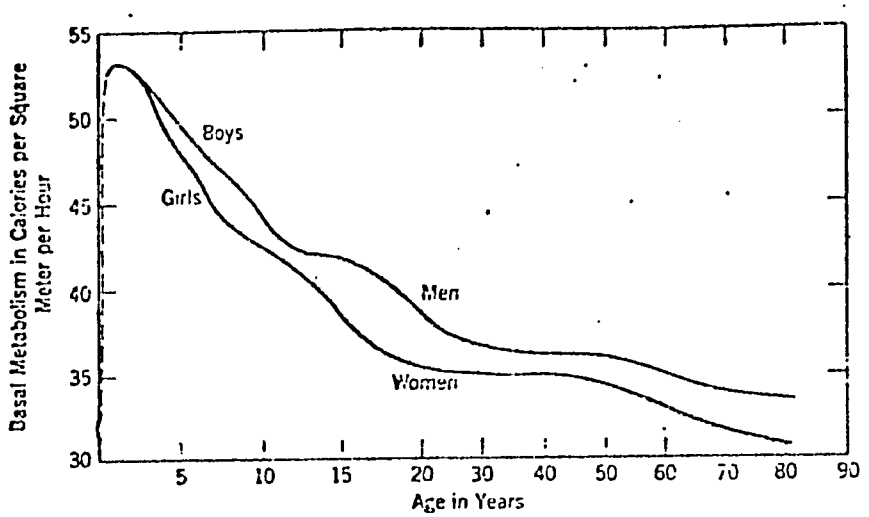

Fig. Effect of age on basal metabolism. From H.H. Mitchell, Comparative Nutrition of Man and Domestic Animals, Vol. 1, Academinc Press, N.Y., 1962, p. 43.

Specific dynamic action

Food consumption is followed by an elevation in body heat. This is generally referred to as the specific dynamic action (SDA) of food. Although it might appear that the work of digestion could account for this extra energy, it occurs only during metabolism. The inclusion or failure of including SDA can sometimes account for seeming discrepancies between results from different researchers. For this reason statistics sometimes have to be recalculated to be comparable.

Body size and composition

The energy needed to perform a certain task and the BMR are both influenced by the body size and composition of a person. The amount of adipose tissue (fat), for example, affects the person's total activity pattern. It takes more energy for a big or fat person to raise his arms than it does for a small person. Fat people are often less active than slender people.

Climates

People in tropical climates have long been observed to eat less. Since people in different climates also have different foods and live in different environ-

ments, there are so many variables that it is difficult to isolate and qualify climate from the rest. WHO has therefore chosen not to recommend any correction of energy values on the basis of climate.

Energy expenditure versus requirements

The 1971 FAO/WHO committee that defined energy requirements used a different approach from that used to define protein requirements. This difference is due to a difference in calorie and protein intake. It is believed that individuals tend to consume energy in proportion to their own needs, if no limiting factors exist in the environment. However, no such regulatory mechanism is known to control protein intake. On the other hand, excess caloric intake results in obesity, whereas no adverse physiological effects of excess protein intake have been proven.

As a result, although individual variability exists in that some persons need more and others fewer calories, differences of surpluses and deficits cancel out in a large enough population. Thus the FAO/WHO committee defined energy requirement as that energy intake that is considered adequate to meet the energy expenditure (needs) of the average healthy person in a specified age/sex category. This average person is called the 'reference man' or 'reference woman'.

The international reference person

Populations vary greatly in size and structure. Among African peoples. The Luo and the Dinka are tall and skinny, but the people of the Kalahari are small and short.

In order to deal with the statistical complications of human variation the international organizations have constructed a 'reference man' and a 'reference

woman'. They are both between 20 and 39 years of age. They are healthy and physically fit individuals. Each person spends 8 hours a day at work that involves moderate activity. Two (2) hours a day are spent walking and 4-6 hours are spent sitting or moving around under very light activity. The reference person spends the remaining 8 hours resting.

These reference persons are not to be taken as goals or even as average or normal persons, but as a statistical construct.

Normal energy expenditure

According to WHO, the normal energy expenditure during a 24-hour period for the reference man is 46 k cal (0.19 MJ) per kilogram of body weight and 40 k cal (0.17 MJ) for the reference woman.

Activity

Activity is the most variable factor affecting the total energy requirement. Body movements require additional energy. This extra energy is needed not only for the voluntary movement itself, but also for the accompanying elevation of the internal metabolic rate.

While lying down resting the energy expended approximates the basic metabolic rate (BMR) - for the reference man a little over 1 k cal/min, for the reference woman a little less than a k cal/min. According to WHO the rate of metabolism increases by about one-half when sitting and using arms at light work. It is doubled when standing and moving about slowly, and quadruppled when walking at a brisk pace.[1]

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1. WHO, 1974, ibid.

Energy expenditure in agricultural work

Energy expenditure in agricultural work for males in West Africa has been analyzed. Planting groundnuts requires an energy expenditure of 114 k cal/hour. The heavier work of bush clearing takes 342 k cal/hour. Felling trees is the most demanding task reported, requiring 485 k cal/hour.[1] For energy expenditure values of other agricultural tasks, see Table 3.1.a. Although much agricultural work in Africa is carried out by women, adequate comparative data for women are lacking.

Most persons do not work a whole hour in a stretch without resting. (See Table 3.1.b.)

The energy demand in agricultural work is therefore also related to the length of time worked at the same task. The ridging of groundnuts is a moderately heavy work. In a study by Fox in the Gambia (1953) the operation required 8 k cal/kg body wt./hour. Of a total of slightly more than 5 hours spent in the fields on the average only about half was spent in active work. See Table 3.2.

Energy requirements of adults

As a dietary standard the energy requirement is defined as "the energy intake that is considered adequate to meet the energy needs of the average healthy person in a specified category."[2]

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1. Cleave, John H., African Farmers: Labor Use in the Development of Smallholder Agriculture, Praeger Publishers, New York, 1974.

2. FAO/WHO, Energy and Protein Requirements, WHO Technical Report Series, No. 522, 1973, p. 25.

Energy needs of vulnerable groups

Pregnant and lactating women and growing children have increased caloric requirements.

A child under the age of one year, for example, requires 820 k cal (3.4 MJ) per day and the adult reference man needs 3000 k cal (12.6 MJ) per day. If the caloric need is instead considered in relation to body weight, the needs of the child are proportionately very high. The under one year old needs 112 k cal (470 KJ) energy per kg per day while 46 k cal (192 KJ) per kg per day suffices for the adult man. For other age-groups see Table 3.5.

During pregnancy extra energy is needed to meet the needs for the growth of the foetus and other maternal tissues, as well as for an increase in basal metabolism (BMR) during the latest trimester. The increased energy needs amount to about 150 extra k cal (0.9 MJ) per day under the first trimester and 350 k cal (1.5 MJ) per day during the second and third trimesters, according to WHO. During lactation the additional energy requirement is 550 k cal (2.3 MJ) per day.[1]

Regional caloric values has been established by FAO. FAO assigns 2360 k cal as an adequate measure for the adult African man. FAO has also calculated an average world requirement for energy taking age distribution and other factors into account and arrived at a figure of 2350 k cal as the average per capita food consumption in the world. Applying this world average to aggregate data of food consumption in Africa (Table 3.6) it becomes apparent that most African countries wrestle with a total caloric deficit for their populations. According

1. WHO, (1974), ibid.

Afternoon Program Outline

WEEK 1 - DAY 2

Techniques of Modeling and System Design Applied to Problems of Nutrition

I. PERFORMANCE OBJECTIVE

Develop skill in drawing representational models. Link the causal factors collected on previous day to nutritional status and to human nutritional needs.

II. CONCEPTS

Models and systems.

III. CONTENT

Introduction to Modeling. (Project Guggenheim Paper, H.G.)
Concepts and Content of Nutrition, D.S. McLaren

IV. SUGGESTED ACTIVITIES

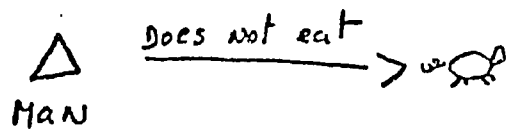
Develop models relating various factors to the nutritional status of individuals and groups.

The concept of 'model'

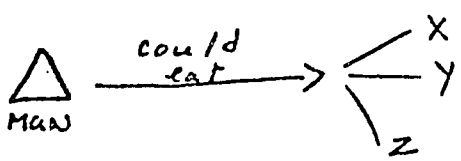
Concerning the use of 'models' in the social sciences, there have been, and still are, a great many muddles. The first of these concerns the meaning of the term. 'Model' is taken by some to be an ideal to be followed. This is not the way it is used in the social sciences.

Conceptual models as used by researchers and planners are artificial constructs that are built to fit the 'real world' in some specified form. Such models may be 'mechanical,' that is to say the scale of the model is that of the phenomena, or they may be statistical, that is to say the elements of the model and of the phenomena are on a different scale (Levi Strauss 1959).

Two examples will illustrate the point:
Food taboos and prohibitions against eating pork or fish can be understood as a mechanical model by which we can specify precisely what people do not eat on a 1:1 scale.



On the other hand the model does not allow us to specify what he may eat. This then becomes a statistical model. What he will eat can only



be represented in probabilities. Another example could be as follows: we could present the hypothesis that at certain income levels people will not eat certain foods. It will be difficult to specify for people with incomes above 10,000 what they may or may not eat. The selection of food can best be represented as a statistical model based on probabilities.

While all individuals and societies live by models, that is to say by imaginary constructs of what reality is or should be, we are not always conscious of the models their purpose. Unconscious models may have a strong hold on people. Models of eating behavior--when and with whom, how much and waht to eat are often clung to with particular tenacity.

Such models are 'explained' by participants in a culture, but these explanations often hide the real meaning and structural significance of the model. Constructing models of these hidden structural elements of society as well as of human behavior, allows us to study and to understand the observed realities. Such models play a heuristic and explanatory function. This process needs to be distinguished from yet another sense in which models are used. Models can be constructed for purposes of experimentation, in order to predict behaviour of systems under changing conditions, to predict the behaviour of actors or of different components within the system as well as the behaviour of the systems themselves.

What does a model look like?

There exist a great many different kinds of models, yet all of them share certain properties in common. Games, such as monopoly, are models; chemical or physics notations of molecules and atoms are models; Ibeji twin carvings are models; and organizational charts as well; kinship charts, as well as algebraic equations may be models. Political philosophies can be models. All such models typically: (1) Change the scale between reality and the model either by miniturization or by enlargement. (2) Change the medium in which an event (or system) is represented. (3) Summarize outside phenomena and use indicators to allow us to deal with a complex reality in a more economic way than we otherwise.

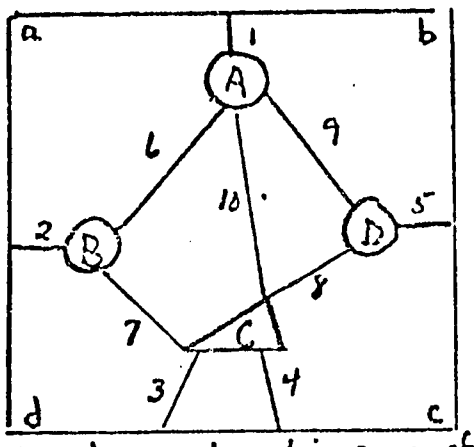
Models can help us make decisions about reality as long as we are aware that we are dealing with models and not with the realities themselves. The danger of models is that we may confuse them with reality and in our passion forget that models are games and aids to the human imagination, that we can use to expand our options, but that do not compel our actions. They can be changed at will leaving the reality completely untouched. Finally, models can be false and deceptive--for example, Trowgridge illustrates zones of potential negative and potential positive diagnoisis of acute malnutrition in comparing two scales: the Gomez grade with the Waterlow criteria (Trowbridge, page 765, Supplemental Readings). By comparing the two models of ordering data it becomes possible to define the most appropriate anthropometric measures under different conditions and for different objectives.

Modeling a system

A basic idea held by social scientists regarding the nature of social systems is that (1) the parts and properties of a system are interdependent, (2) systems change because their environments change, (3) adaptation is

often cited as the general mechanism which articualtes social systems with their enfironments. McLaren, figure 4, Man and His Food, illustrates a system in relationship to an environment; McLaren, Figures 1 and 2b illustrate a model showing an articulation of the system with its environment. Although it is often dangerous to use the models of the natural sciences and to apply them to the social sciences (e.g. the model of society as a tree has been used to assert that the lower classes function to sustain the crown of the tree, the upper classes, and are therefore well placed) a simple mechanical example developed by a Harvard physiologist illustrates a system model by means of a simple mechanical example:

figure 1



Henderson's diagram of a system - Henderson p.14

figure 2

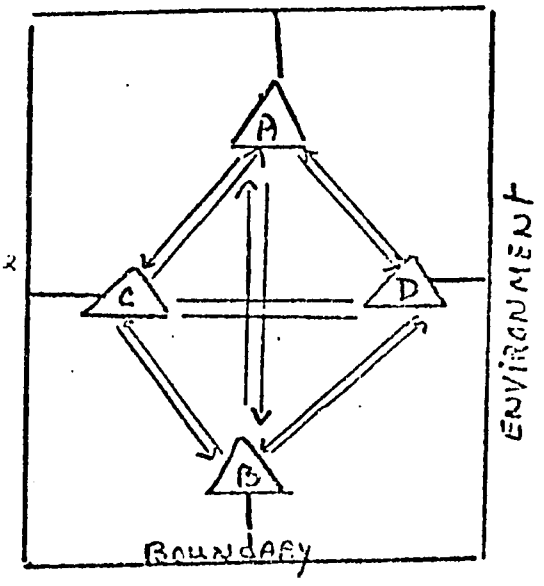


Diagram of the model of a small group

Henderson says about figure 1:

"The four rigid bodies A,B,C, and D, are fastened to a framework...by the elastic bands 1,2,3,4 and 5, A, B,C, and D are joined one to another by the elastic bands 6,7,8,9, and 10...

Now imagine the point of attachment of 5 on the frame to be moving toward b, all other points of attachment remaining unchanged. What will happen? Consider A. There will be action on A by the path 5,9, by the path 5,8,10, and by the path 5,8,7,6. But in each case these actions do not cease at A, just as they do not previously cease at D. The first, for example, continues along the path 10,8, and so back to 5.[1]

---

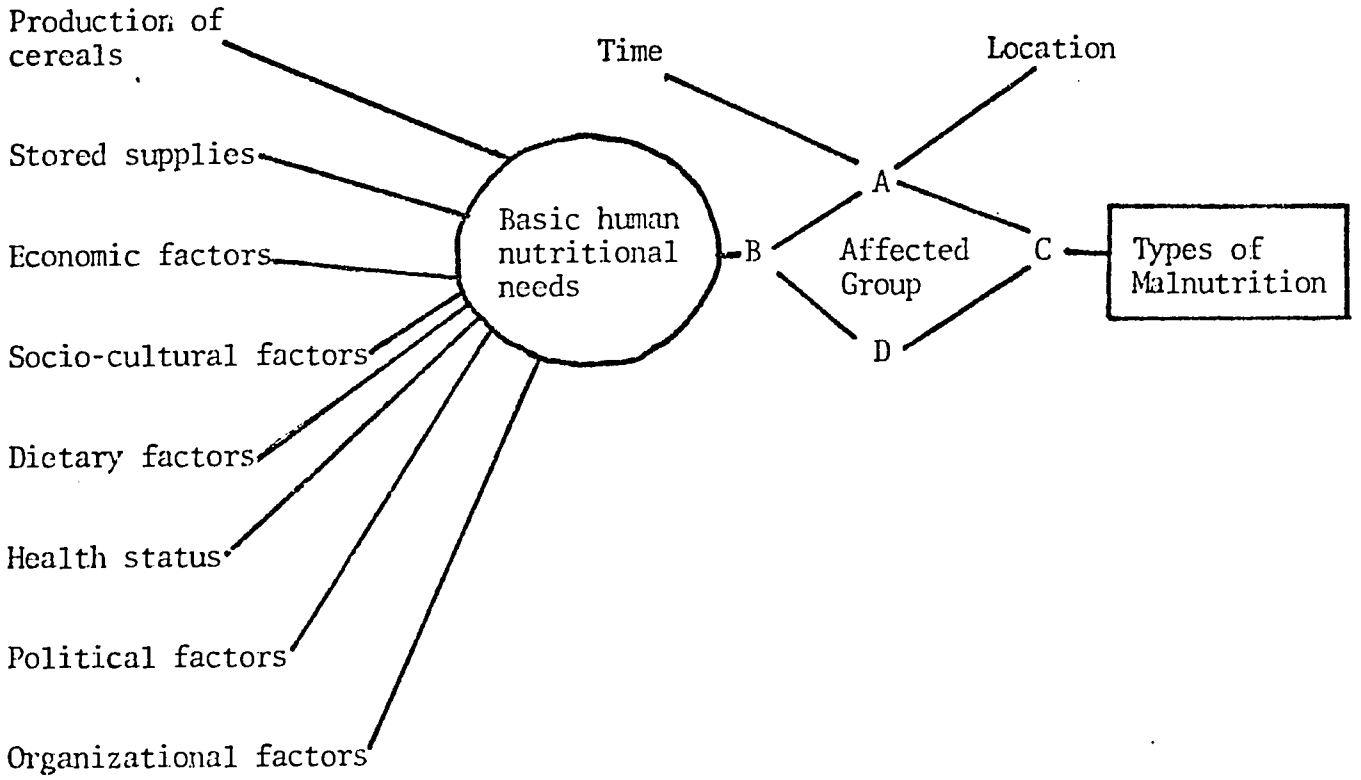
[1]Mathilda White Riley: 1963 Sociological Research.I: A Case Approach. New York. Harcourt, Brace and Word Inc.

*

(figure 2)

Let us translate this model of a system into an example in which we assign the letters ABCD of Henderson's model to the roles of group members as part of a food sharing system. The frame then becomes the boundary that sets off the ABCD group from its environment and the rubber band becomes the actions and attitudes the members direct toward one another and toward other persons and objects in their environment. The roles the individuals play as members of the group are identifiable, so that each has a distinguishable pattern of actions and attitudes. (The properties) Let A be the father, B the mother, D the oldest child, and C the youngest sibling. Together, the group forms a system that allocates its resources, e.g. food in a particular way. A disturbance from outside the system that affects A--the loss of his job would affect each of the other's roles and, in turn, react upon the role of A himself. The same process would occur if D developed marasmus, although the adaptation of the group to this event might be different.

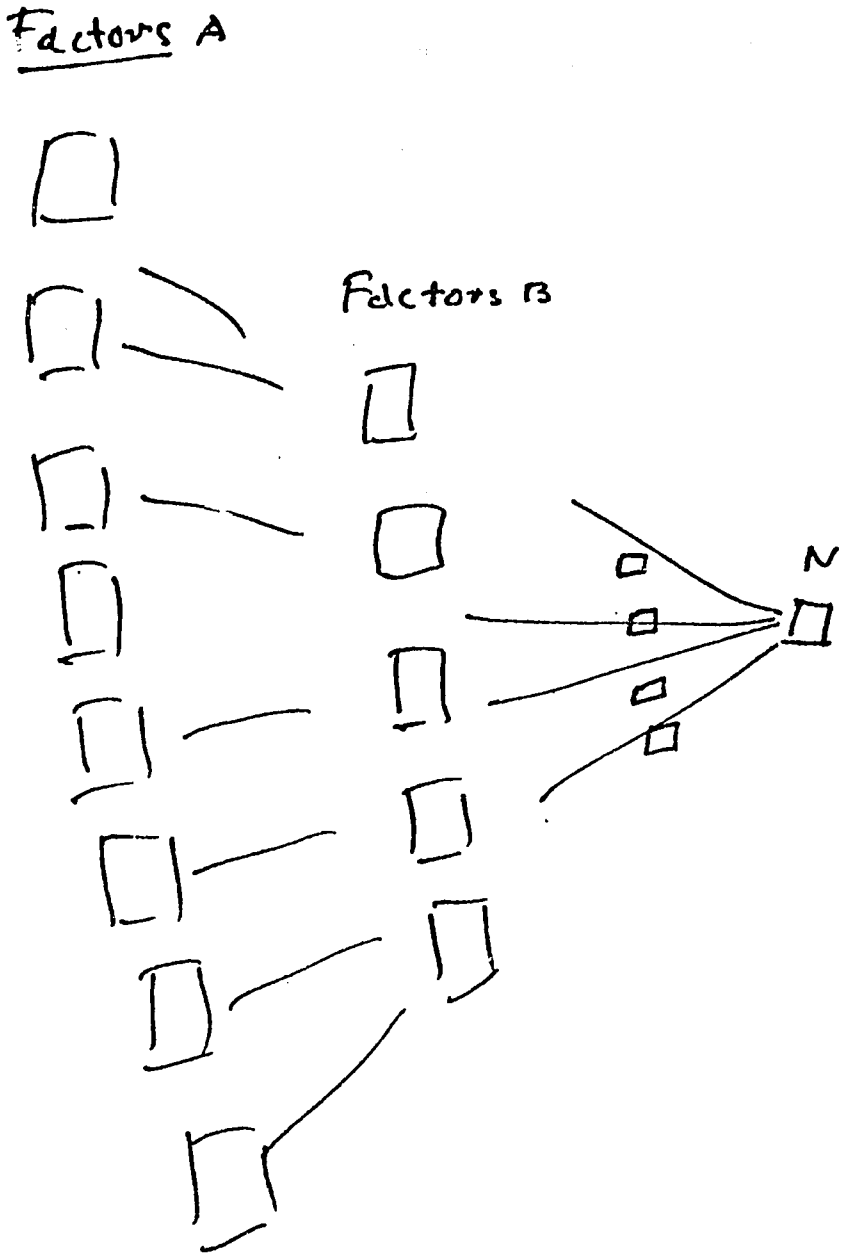
Causal Factors



The model shown in Fig.1 expands the number of factors that might be causally related to the nutritional status of the individuals in our little group. It also indicates that the elements outside of the boundary affect the system of the group as well as the individuals that make up the system.

Activity

Participants can now arrange the factors they had listed the previous day and, by treating them as factors enviornmental to a given social system, model their possible effect on the nutritional status of the group under conditions of equilibrium or change. It would be better at this time not to treat the causal factors in the environment as part of a system that is connected, but to treat them as distinct entities. This is not possible in the real world, but illustrates the advantage of working with models.
It is suggested that participants break up the category 'Human Nutritional Needs' and develop models for energy needs, protein requirements, and micro-nutrients. Using the information provided in the reading materials (and supplementary reading materials as data), the subgroups should be able to generate a large variety of models dealing with specific relationships.



Suggestion: Try to organize data into primary and secondary causal factors (A and B) so that all A's control all B's, which are in closer contact with N.

Decide on what kinds of intervention would be most effective, and under what circumstances.

~~Use participant suggestions to~~

Rank key factors affecting food availability, food consumption and their impact on nutritional status:

eg.

- variety of foods produced
- income levels
- nutrition information

INCOME LEVEL

HEALTH CARE PROGRAMS

ECOLOGICAL FACTORS

Production methods

Family size

CASH CROPPING

INFECTIOUS DISEASES

storage methods

UNEMPLOYMENT

Food utilization

Education

SCHOOL FEEDING PROGRAMS

CONSUMPTION PATTERNS

Social status

PRODUCTION INCENTIVES

MARKETING POLICIES

etc.

CROPPING PATTERNS

RELIGOUS BELIEFS

GOVERNMENT INTERVENTION POLICY

SEASONAL CHANGES IN FOOD AVAILABILITY

POTABLE WATER

HYGENE

etc:

etc.

FOOD LOSSES

NUTRITIONAL STATUS

WEEK 1 - MORNING 3

THE ETIOLOGY OF MALNUTRITION

OBJECTIVE:

To examine the interaction of malnutrition and infectious diseases as well as parasitic diseases.

CONCEPTS:

One way to represent interaction between malnutrition and infectious diseases. For examples refer to the figures shown in the following articles provided in the readings: Nutrition In the Management of Diarrheal Disease (Figure 1, page 9); Malnutrition and Impaired Immune Response to Infection (Page 263). Additional examples are included in the other readings.

CONTENT:

. Materials on the relationship between malnutrition and infectious diseases as well as parasitic diseases.

. The importance of potable water, hygienic practices and immunization programs are discussed in additional articles.

DISCUSSION:

Participants should participate by discussing the most prevalent diseases in their respective countries and propose strategies for breaking the vicious circle between malnutrition and infectious diseases. The comparative merits of immunication campaigns, hygiene programs and nutrition intervention targeted to vulnerable groups can be compared in terms of regional and local conditions know to participants. They might also suggest ways for villagers to recognize malnutrition--infectious diseases cycle.

FOOD SHORTAGE AND INFECTIOUS DISEASES

Food shortage, malnutrition and infectious disease commonly occur together and their respective contributions to mortality are difficult to separate. African populations in which tuberculosis, whooping cough or schistosomiasis are common to those in which malnutrition is rampant and it is often difficult to determine to what extent the illness results from malnutrition or increased exposure. The WHO World Health Statistics Annual presents data on the most prevalent infections in African countries in three tables:

1. annual figures for morbidity by countries
2. seasonal breakdown for cases, by months
3. sex and age

Table 1

I. Epidemic diseases
When micro-organisms spread to a new host, in the period of adaptation there may be sickness of death or parasite before equilibrium is established.

II. Chronic endemic infections
When induced disease assists the spread of the organism. Examples are diaherrea associated with cholera or coughing with tuberculosis, both of which led to the spread of the disease.

In the case of epidemic infections, where the organism is encountered for the first time or after an interval, infection rates are largely independent of nutrition, although survival rates among those infected may be strongly influenced by the nutritional status.

In the case of chronic endemic infections such as tuberculosis, measles or dysentery, the relationship between poor nutritional state and morality is strong.

Interaction between disease and nutritional state can be classified as follows:

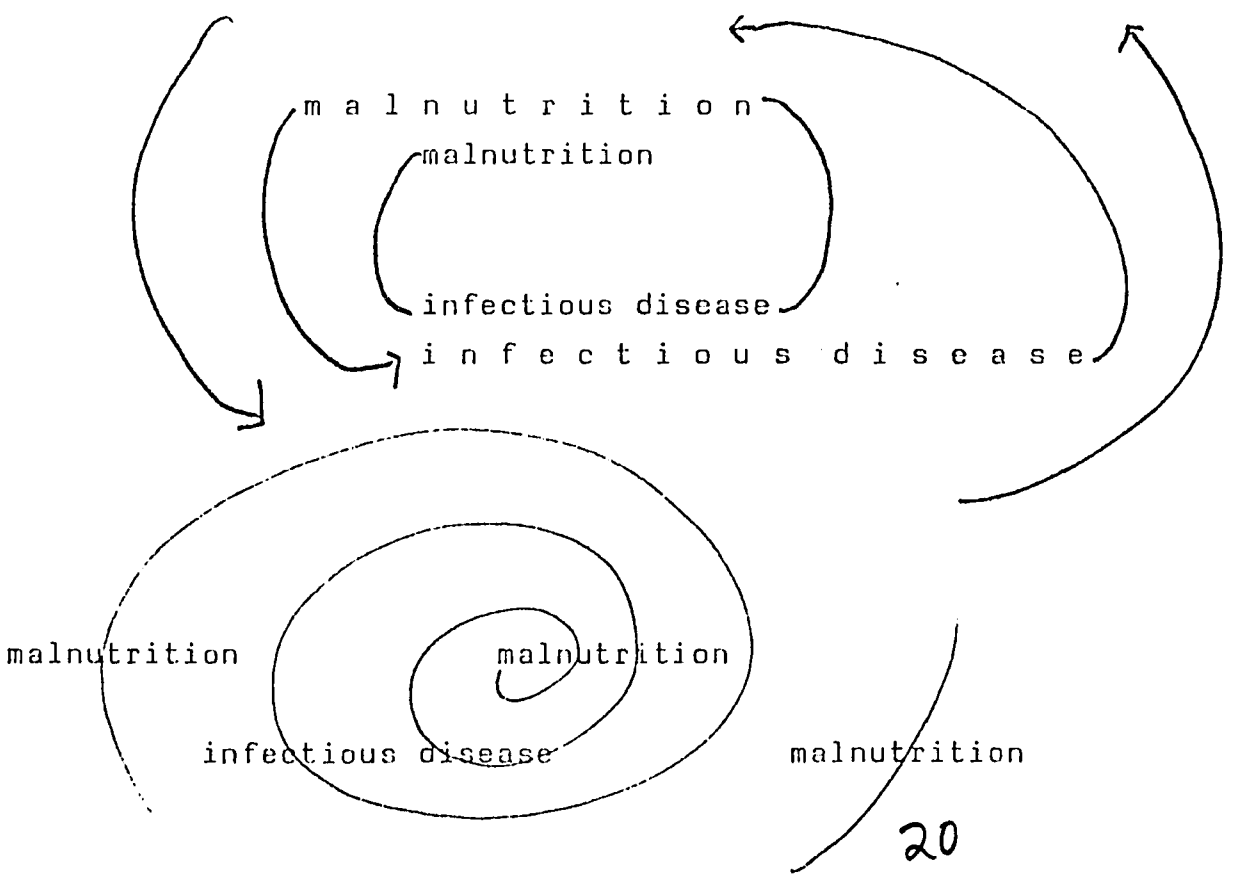
I. <u>Synergistic relationship between man and infection</u>

Together, malnutrition and infection can worsen the consequenses of the other. Instead of a merely additive relationship, the combination of an infection and malnutrition in the same individual causes the effects to be amplified. The consequences for the person are therefore more severe than of each separate factor. This relationship is illustrated in the diagram below.

<u>severity of infection</u> <u>severity of malnutrition</u> <u>combination</u>

Thus synergistic relationship implies that the sum is greater than the combination of its parts.

Thus, in a synergistic relationship, malnutrition and infection amplify the effect of the other. An infectious disease causes the degree of malnutrition to worsen and malnutrition lowers the persons resistance to infectious diseases. The best way to illustrate the problem is to visualize it as a viscious cycle but as a superviscious spiral:



II. Antagonism

This expression characterizes a relationship in which the effect of infection or malnutrition are lessened by the other. An association of this type is rarely seen in clinical practice and is not responsible for any significant decrease in the severity of either the infectious disease or malnutrition.

III. Age specific responses to malnutrition and diseases

eg. measles or schistosomiasis

Certain diseases are of particular severity in early childhood and, combined with malnutrition can lead to high mortality rates or to serious effects on growth and development. Combined with infection, protein malnutrition in particular may lead to slow recovery, retardation in growth or death.

Proper maternal nutrition is essential in reducing the infection rate among new borns and during lactation. This is of particular importance for policy makers concerned with the controversial issue of breast-feeding vs. imported milk products.

Tetanus is a particular danger to newborn children, accounting for a large percentage of infant mortality as are diarrheal diseases. Venereal diseases, syphilis (which is common among nomadic groups) and gonococcal infections strike adults and become more severe for persons who have a poor nutritional status.

It has been noted that pre-school children are the most vulnerable group, but that the highest death rates between ages 1 and 4 years are in the second year - among children who are over one and under two years.

Diarrhea

Relatively mild childhood diseases of industrial countries associated with malnutrition are measles, rubella, whooping cough, mumps and chichken pox and are often lethal to African children as can be seen by the WHO statistics. Moreover, these infections often lead to complications such as diarrheal disease or in extreme cases to marasmus and kwashiorkor.

Infection and its effects on malnutrition

Infection worsens the individual's nutritional status by:

a. causing a loss of appetite (anorexia) and thus lowering food intake.

b. creating a tendency towards lower intake of solid foods (with high animal protein content) and thus increasing the metabolic losses of nitrogen.

c. when infections involve gastrointestinal tract, nitrogen absorption is decreased.

d. increase urinary nitrogen execretion which can precipitate a kwashiorkor like syndrome. (W.R. Beisel, "Malnutrition as a consequence of stress" in R.M. Suskind (ed) Malnutrition and the Immune Response, Raven Press, N.Y., 1977).

e. causes social responses that may not be appropriate to the physiological needs of the individual. Thus customs may dictate that food provided to a child during diarrhea is reduced to a minimum and that the child not be given solid, protein rich food which, as we have seen, reduced the ability of the body to fight the infection and exposes it to secondary infections.

Infection, the immune response and malnutrition

The Latin word 'immunis' meaning safety is the root of the term 'immune' used by Western medicine to describe the body's response system to infections. Because of its extreme importance to the welfare of the individual, we propose that the term be translated into African languages so that patients can learn the fundamental concepts of the bodies defense system. This

is particularly important in societies such as the Cewa of Northern Zimbabwe or the Lugbara of Western Uganda who explain death and infection predominatly in terms of outside forces - acts of sorcers, marilineage spirits, vengeance for sorcery by non-sorcers etc. and mystical evil doers such as the nfiti who make use of magical substances (mankhwala) that include Western medicines as well as nail parings, bodily excretions etc. It is not suggested here to explain to villagers the complex immune response system of the body that includes the cell mediate human response antibody production, phagocyte and killing functions of the leukocytes and the compliment system, but it may well be possible to make them understand that malnutrition weakens the defense system of the body against outside attacks.

Cell-mediated immunity

The thymus dependent lymphocytes play a major role in the body's defense against viruses, microbacteria and fungi. (R. Edelman, in Suskind and all) Those so-called T cells are present in the peripheral blood, thymus, spleen and peripheral lymph nodes. Children with severe protein-calorie malnutrition (PCM) have fewer T cells, which reduces their ability to respond to infectious agents, but nutritional recovery helps improve this condition.

The depressed cell-mediated immune response illustrates the interdependence between infectious disease and malnutrition. It may be secondary to deficiencies of protein, calories, vitamins or minerals or may be due to the supressive effect of the super imposed infection. These nutritional factors interact with the cell-mediated response immune system, leading to increased vulnerability to infections the system could normally handle. (Howard and Herbold)

Humoral Immunity-Immunoglobim and Antibody Response

One important source of antibodies against various microorganisms is found in breast milk (in colostrum - breast milk transferred to the infant during the first 10-14 days and which may contain 10 percent protein as opposed to the 1 percent found in the nature milk). These antibodies protect the infant against invasion of bacteria from the birth canal and help provide protection against viruses or bacteria although they are not absorbed in any significant numbers in the intestines. Breast milk also promotes the growth of certain types of protective bacteria, such as Lactobacillus bifidus, which dominates in the infant's interior in the early weeks of after birth. These bacteria produce acids from lactose, making the stool acid and provide a hostile environment for different types of seriously infective bacteria and parasites. Infants fed on cows milk and preparations have neutral or alkaline stools and lack this protection...However, the level of immunoglobulins in maternal milk decreases rapidly after birth and malnurished African mothers are found to have less immunoglobulins. Human milk also has a high content of lysozome, an enzyme that acts with antibodies against bacteria by breaking down certain of those that might be harmful. Cow's milk has a much lower lysozyme content.

It is also thought that during the first two weeks after birth, large numbers of white blood cells may carry anti-infective properties from the mother to the infant (Manual on Feeding Infants).

Complement System

The complement system comprises several protein fractions, known as complement components, which are involved in defending the host against viruses, bacteria and fungi. Children with PCM are found to have reduced complementary activity and even to have anticomplementary activity in their serum.

MALNUTRION - The Effect on INFECTION

Malnutrition can severly reduce a persons resistance to infection and the body's ability for recovery. This, as has been discussed, is of particular significance for children so that relatively mild childhood diseases become viscious killers. Changes in the immune system due to PCM are too complex to be discussed here, but a table summarizing the effects conveys the seriousness of the problem.

Changes in the Immune System in Protein-Calorie Malnutrition

Cell-mediated immunity (T-cell mediated)	Depressed
Humoral immunity (B-cell mediated)	
1. Serum immunogloblins	Normal or elevated
2. Antibody response	Depressed or negative
3. Secretory immunoglobulins	Depressed
Polymorphonuclear leukocyte response	
Complement system	
1. Complement proteins	Depressed
2. Hemolytic complement activity	Depressed
Polymorphonuclear leukocyte response	
1. in vivo	
2. in vitro	

Clinical appraisals

Historical evaluation of dietary and medical experience.
Anthropometric measurement of growth, development and fattness.
Physical examination for signs consistent with deficiencies.
Biochemical assessment.

1. Dietary Survey

The usual aim of a dietary survey is to determine the foods and quantities eaten by members of a target population as well as the factors which influence their availability and consumption. The gathering of dietary information often includes socio-cultural data and is one of the most demanding aspects of a nutrition survey. The results of dietary surveys may be interpreted in terms of international or national guidelines developed by agencies in various countries...AFRICA.

2. Anthropometric Evaluation

Retardation of growth and development is one of the tragic consequences of malnutrition and constitutes a hallmark of nutritional deprivation. Numerous anthropometric measures such as height (or length), weight and skinfold thickness have been recommended as indicators. In children, head, chest, and arm circumference measures have been found useful and new and simple techniques which can be handled by mothers in villages to assess the growth and nutritional status of the children are now being introduced in African environments. It must be kept in mind however that the measures are non-specific when findings are interpreted and that other factors may cause retardation, particularly the combined effects of malnutrition and infectious diseases.

3. Laboratory Assessment of Nutritional Status

Not all African countries have the laboratory facilities needed to support a large scale nutrition survey, nor the trained personel to carry out such work. Laboratory work

more than clinical work, can often show a more positive relationship with dietary intake because laboratory abnormalities become evident before physical effects can be seen. For all practical purposes, laboratory techniques for assessing caloric intake , or protein status are inadequate. However Iron deficiency anemia, inadequate levels of vitamin D can be ascertained through laboratory techniques in national nutrition surveys.

4. Laboratories are also important in verifying possible toxic substance foods such as imported milk products, which could have a deletrious impact on the nutritional status.

5. Physical Examination

Physical examination has been called the least sensitive of the techniques for the clinical evaluation of nutritional deficiencies. This does not mean that such examinations are without value, since the presence of physical abnormalities consistent with nutritional deficiencies is a likely indicator that many individuals with 'subclinical' symptoms which are non-specific and based on nutritional deficiencies may exist in the population. Among the manifestations of dietary deficiency to be detected by physical examination are cutaneous lesions (skin lesions, eg. pellagra), ocular lesions (eye lesions - blindness due to lack of vitamin A), oral lesions (eg. Edema, accompanied by cracking of the lips, often found as a result of riboflavin deficiency), thyroid enlargements, frequent in some parts of Africa, which are caused by lack of iodine and edema of the legs which may be an indicator of severe protein deprivation.

INCIDENCE OF INFECTIOUS DISEASES

tuberculosis, measles and dysentery, parasite diseases such as malaria, hookworm and schistosomiasis.....

For example measles, which does not constitute a major danger in well nourished populations exacerbates underlying protein-calorie malnutrition and becomes a major factor in infantile mortality. A second example is hookworm and iron deficiency anemia. These infectious diseases are a particular menage to the populations at high risk, mothers and infants.

Populations at risk

POPULATION SAMPLING

Finally, some may accept the proposition that reducing the number of variables from three to four presents an advantage in manipulating data - especially when large numbers of factors are involoved.

NOTES ON MEASLES AND MALNUTRITION

Measles is a disease recognized and feared through much of Africa. In Gambia it is known as "fusiba" among the Mandinka and attributed to the effects of a wind from the North. It is recognized by its fever, rash and concommitant diarrhea, and feared for it as a killer of children and for the high incidence of ophthamalic (eye) complications. The latter are considered due to "the rash entering the eyes". In India, measles are thought to be sent by a goddess Matta, and parents will hide children in the back of their hut to prevent a doctor from seeing it. Europeans held a different set of beliefs for a thousand years when measles was the scourge of Europe: it was attributed to the bad blood of menstruation, which was thought to dissappear during pregnancy, enter the fetus, and reappear after the birth of the child in the form of measles. (Morley,74) Such beliefs not only attest to the significance of measles in traditional societies, but are important to be understood if we wish to effectively combat it.

In Nigeria and other West African countries measles continues to be a serious infectious disease with high mortality and morbidity in infancy and early childhood. Reported in patient mortalities and overall have ranged from 2.2-18 .6 percent and 12.3-46.6 percent respectively. Apart from low income, overcrowding and poor hygene, the most critical factor accounting for the severity of the disease is malnutrition. (Efflong,75)

CHILD MORTALITY DURING EPIDEMIC

An example of a measles epidemic is recorded from Gambia in 1961. It was introduced to Kenaba by an eight year old child returning from a village in which measles was prevalent at the time. This child died on Feb. 12th. From there it spread to a neighboring village, Jali where the first death occurred on February 12th. In Kenaba thirty five (15.22 percent) of two hundred and thirty children died and in Jali, twenty nine (14.01%) of the children died. All children were under ten years of age. For children 7-10 months of age mortality was 24.42 percent. No cases of measles was seen in the village by the author during the preceeding 12 years.

MEASLES PRECIPITATING MALNUTRITION

Analysis of a large number of growth charts of children in West Africa has shown that no other disease of childhood was followed by such consistent and so much weight loss as measles. (Morley,74) In a number of countries a third of all children with kwashiorkor have had measles and there has been a reduction in the incidence of kwashiorkor following measles vaccine campaigns. In kwashiorkor following measles, all the skin may be affected which distinguishes it from other forms of kwashiorkor. During a longitudinal study carried out in Nigeria (Iem Imesi) the weights of children before, during and after measles were recorded.

One in 4 of the children lost more than 10 percent of their former weight as a result of the infection. 15 percent of the children took more than three months to recover this weight add. Among children with diarrhea the recovery period was almost twice as long.

XEROTHALMIA

In the management of measles an additional intake of vitamin A is also recommended since it may reduce the possible effects of eye problems, which may be a consequence of the infection.

VACCINATION-GHANA

It has been recommended that vaccination immunization against measles be given between the ages from 5 to 6 months and immunization against measles in West Africa be provided to children between the ages of 5 and 6 months, in order to achieve maximum benefits (Effong,75).

Notes on the importance of water to nutritional status

The Dogon of Mali who live out of the cliffs of Bandiagara distinguish between two kinds of water: the water of the Nommo, the God of water who brought man grain and technology -- these are clear waters of rain that make the millet grow and that can be consumed without fear. These waters are the nommo and signify his sacrifice in the sky for the benefit of man and his decent to earth, as well as his ressurrection in the growing plants and the mist that rises from the ground into the sky; and the second kind of water belongs to Yourougou, the fox. These are the waters of death and darkness, to be found in the shallow pools after the rainy season. They bring disease and death and are to be feared and avoided. This tradition, as well as those of other African people, show a clear awareness of the need for water for human survival, as well as of its potential danger.

The World Health Organization (WHO) stresses the lack of 'reasonable access to safe water supply and adequate means of waste disposal' in Africa and the developing world as a whole. By 'reasonable access' WHO means household connections, public fountains or standposts for urban areas, and for rural areas a distance between households and water resource that will allow family members to fetch water without excessive investment in time and energy. By 'safe' is simply meant an uncontaminated source. But although there have been changes in absolute figures over the last 9 years it is doubtful that the percentages have changed in any meaningful way. People with reasonable access to water supply in urban areas appears to have declined in some countries due to rapid urban growth.

The second element in the WHO statement, the lack of adequate waste disposal, is as relevant to our concerns as nutrition planners as is water consumption as such.

Human waste is part of the food cycle and interfaces with epidimological events of infectious diseases such as dysentery, cholera, or with parasitic diseases such as hookworm (ascaris) or schistosomiasis. That has an impact on nutritional status. Thus while the quantity of water both for agricultural production and for household comsumption sets limits on the size to which a population can grow, quality of water may be on of the most powerful factors affecting mortality rates.

It thus appears that no more than a fifth of the population of Africa has an adequate water supply, although the statistics are open to question and definitions of adequate may mean totally different things for urban and rural consumers.

To the Sahelian subsistance farmers, as well as to other populations in dry areas, the problem of water is the problem of nutrition. Rain is the limiting factor of food production, even (or especially) with modern inputs. Under subsistant conditions food production sets a limit to the number of people a family can support and to the potential growth of a community.

People who have access to water easily ignore that without water, one may not eat. A fact that no one that has starved in a Sahelian village where there was grain, but no water, will easily forget.

Indeed, distance to the water source and the difficulty of terrain over which the water has to be carried to the home can be regarded as a nutritional factor, and the caloric cost of supplying the household with water can be calculated. This expenditure of calories to fetch water is an important element in the total energy balance for women in many African villages.

The quantity of water -- to satisfy both minimal physiological needs and general consumption needs -- has been estimated to 1.8 - 3 liter daily for the tropics and general consumption needs to 18 - 20 liter per day and capita. Together with water to sustain an adequate level of agricultural production it constitutes a basic requirement that must be assured. Thus, for populations in the arid regions of Africa, quantity of water, and easy access to water resources have a higher priority than water quality.

The third problem, water quality, as we have seen above, is not ignored by traditional societies. The impact of water-born and water related diseases on nutrition and mortality is extremely important to the welfare of African populations and to the planner. The links between water quality and many diseases such as diarrhea, however, are not yet fully understood by either the affected populations or modern science.

At a nutrition workshop in 1978, Sahelian delegates were unanimous in their opinion that water quantity, water accessibility, and water quality constitute a priority for nutrition planners. We will therefore discuss water as a single topic to emphasize its relevance to nutrition policy.

I. Water - basic physiological needs for survival.

Each individual loses a certain amount of water in interaction with the environment, and through activity through the following mechanisms:

a. inhalation and exhalation of air involves changes of temperature for the moisture content, and a loss of water during the exhaling process, especially in dry air.

b. perspiration through the permeable human skin results in water losses, particularly during exertion.

Water is needed to help excrete sodium from the body as well as other metabolic waste products. Physiologists have estimated a lower limit of 700 milliliters of urine loss for an adult. This appears to create risks for the body in water deficient areas. Under normal (e.g. water sufficient) circumstances, people pass on the average 1,500 milliliters of urine daily.

d. fecal water - due to the metabolic process, and the heat loss from the body surface through sweat, large quantities of water are lost from the body. Hard work in the sun for eight hours daily is said to double the water requirements between temperatures of 18 and 30 C. With consideration of work patterns, diet, and climatic data a table for water loss in East Africa has been compiled as follows:

	Water loss (Milliliters)
Respiratory loss	400
Insensible perspiration	600
Urine	1,500
Feces	100
	2,600

To this figure a variable amount of sweat has to be added. Studies for West Africa have been used as a basis for correcting these estimates. There are indications that 'West African subjects have a lower ability to concentrate solutes than some

other groups, which means that the minimal urine volume cannot be reduced greatly below 1,500 milliliters, though their low protein diet will minimize the quantity of solutes needing excretion. Respiratory loss falls in high humidity areas. The fecal loss among East African subjects can rarely be below 100 milliliters and may often be near twice this amount.' (Ladell, 1965, pp. 242 ff.) The minimum for survival in tropical areas can therefore be regarded in the range of 1.8 - 3.0 liters daily.

WATER INTAKE

Water consumption is determined by cultural preferences as well as by physiological needs. The Masai pastoralists, and Peul, Maures and other pastoral groups tend to have a diet based largely on milk and blood and have been estimated to consume as much as 5 liters of water in their food while obtaining their basic calorie requirements. Some African populations, such as the Maures and Peul drink much of their water as tea, while agricultural groups consume it in their millet porridge. When available, the men in many groups obtain their water needs in the form of beer made of sorghum, millet or other cereals. These practices may help to reduce the incidence of infection because the water is boiled. The most vulnerable groups, the women and children, tend to drink water which has been stored in various containers in the home, and therefore are more exposed to the risk of water - borne diseases. Fruits and other foods may contain water, but most African populations in rural areas will drink water taken from wells and other sources.

WATER CONSUMPTION: The Health Risk

Water Quality

Diseases related to deficiency in water supply or sanitation have been classified into five groups: waterborne diseases, water washed diseases, water based diseases, water related vectors, fecal disposal diseases. These general categories are not necessarily mutually exclusive, and in some cases, such as in diaherrheal diseases, there is some question as to the dominant causes. However, even if the etiology of the disease cannot be changed by improvements in water supply and water quality alone, there is evidence that the diseases produce malabsorption of nutrients and so impact on the nutritional status and the tissue of those affected.

Waterborne diseases

Disease carriers are absorbed orally, usually with water, and include cholera, typhoid, amobeiasis (in some cases) and infectious hepatitis. Carriers tend to leave man by way of feces water pollution. For these diseases, improvements in water quality and hygenic practices appear more critical than water quantity.

Water-washed diseases

Lack of proper human wast disposal, of proper personal hygiene, and of water in sufficiently large quantities create conditions favorable to the spread of these diseases. These water-washed diseases can be separated into two classes: diseases in which the infecting agent enters through the skin (cutaneous) e.g. scabies, leprosy, skin sepsis, and trachoma; and two, those in which the infectious agents enter orally; bacillary dyssentary, salmonellosis, ascariasis, paratyphoid, etc.

Water based diseases

The infectious agent spends a part of its life cycle in an aquatic animal, another part in humans. The most widespread of these diseases is schistosomiasis, both schistosomiasis mansoni (rectal) and schistosomiasis haematobium. The vectors for these diseases are transmitted through human waste so fast that schistosomiasis has been called a man-made disease. The effect of schisto on human nutrition is discussed in the supplementary reading. Another water based disease is dranculosis (guinea worm). This scourge of village life can enter the human body either orally or through contact with the skin, and presents a major problem for many villages. Although the worm does not directly affect nutritional intake, it prevents villagers from working during the most critical period of the agricultural cycle, and reduces productivity and therefore the food supply.

Water related vectors

Ascarsis - a detailed study on Ascarsis is included in the readings.
Several of the water-related diseases are transmitted by mosquitoes, such as malaria, onchocerciasis, yellow fever and sleeping sickness. Because all infectious diseases interact with malnutrition, they are of grave concern to nutrition planners and the elimination of these diseases must be taken into account in an intersectoral approach to nutrition.

Calories and the cost of water

We have noted above that macro-nutrition planning is often based on the caloric needs on a regional or national basis. The energy cost of water carrying in African rural areas can thus be related to an overall perspective on calorie requirements. Although one might assume that such costs are higher in drought prone areas such as the Sahel, this is not necessarily the case. For example, in Ghana around Lake Volta, a water rich region, women have to work hard to fetch water since a deep

embankment separates them from the lake and installed pumps are often broken or inoperative. Thus severe water shortages can appear within sight of plenty.

An East African survey estimated that for 80 percent of the water carriers, 240 calories or less was enough to obtain daily water needs, but that requirements varied from site to site. One extreme case was cited for one woman from Mukaa who walks for nearly three hours on steep hills and uses 1,930 calories. A Shilluk woman is said to walk 5 miles to the Nile to obtain daily water supply. Among the Dogon, walks of miles are not unusual, and the often extrememly difficult climbs must involve a much higher energy expenditure than is indicated by the slopes on table

The normal quantity of water carried by women throughout African has been estimated at 20 ltr. Thus there are obvious limits as to the amount of water that can be brought to the house by one individual, and to the amount of water that is available for consumption. A Dogon case study describes in detail (Guggenheim, '77 readings) the water use pattern for a rural household. In the Dogon area migration is often due to water shortage rather than food shortage. Often the moves are from pressure from women who are the water carriers. Thus water becomes a limiting factor to population size and affects food production and nutrition in yet another way. When able bodied and young people leave the village, the water shortage becomes even more acute, since the effort to fetch water is too much for the old men and women. Thus water shortage increases, together with the risk of infectious diseases as food is not cooked sufficiently, so there are increasing risks to health and a complex impact on the nutritional status of the most vulnerable people.

READINGS WEEK I - DAY 3

THE ETIOLOGY OF MALNUTRITION

1. Protein-calorie malnutrtion

David M. Hegstead. American Scientist, 66, Jan-Feb: 61-65, 1978.

The finding that prematurity (related to maternal nutrition) and malnutrition is the cause or underlying factor in a majority of deaths among preschool children in large parts of the Third World stresses the need for nutrition considerations in national planning and policy making. Hegstead examines the "protein hypothesis" and the opposite position leading to a conclusion that the solution of Third World nutrition problems can be found in "more of the same" foods. He finds them both wanting. Hegstead instead proposes a reorientation in research focus on those individuals, regions and nations within the disadvantaged groups who somehow do a much better job nutritionally. Such a positive research focus can guide the development of more effective intervention programs.

2. Nutrition and infection in National Development

Michael C. Latham. In: Food: Politics, Economics and Research, ed. Philip Abelson. American Association for the Advancement of Science, pp. 69-73.

Most malnutrition in the Third World is due simply to the inadequate intake of foods according to Latham. Commercial production of relative expensive protein foods, the amino acid fortification of ceral grains, the production of single cell proteins as well as the genetic improvement of protein content of cereals are only able to contribute to a very small degree to the reduction of PCM. Instead the increase in production of foods and an increase in consumption of cereals,

legumes and vegetables by children and the control of infectious disease will greatly reduce the prevalence of PCM. Recommends a coordination of programs to control infectious disease, improve nutrition and make family planning services widely available, with the use of auxilliary personnel.

3. Effect of infection on nutritional status

Nevin S. Scrimshaw, Carl E. Taylor and John E. Gordon. In: Interactions of Nutrition and Infection. Geneva. WHO Monograph Series No. 57, pp. 24-36, 1968.

Written by some of the world's foremost experts on protein nutrition, the article summarizes knowledge of the effects of infection on malnutrition at the end of the 1960's. A detailed and rather clinical account on the effect of each infectious or parasitic agent on the nutritional state of the host. It should be cautioned, that the authors of this article are also the major spokesmen for the "protein gap" theory.

4. Malnutrition and impaired immune response to infection

Hylton McFarlane. Proceedings of the Nutrition Society (London), 35:263-272, 1976.

Malnutrition, infection and impaired immune response are always found together. McFarlane details the influence of various infectious agents on the immune response and on nutritional status. Quite usually the African child encounters some form of infection already in utero, and impaired immune response in the early years frequently results in repeat infectious invasion. Impaired immune response may be repaired relatively soon in children over one year of age, but infection in younger children deserves serious concern.

5. Data on the effect of infection on nutrition

James E. Austin, (Study Dir.), et al. Urban Malnutrition Problem Assessment & Intervention Guidelines. Cambridge, Mass. Paper submitted to the World Bank by Harvard University, pp. 158-174.

The effect of gastrointestinal infection and diarrhea are twofold. They lead to food wastage and economic loss in all age groups, and in young children, pushes marginal malnutrition into severe cases. It becomes clear that health and economic losses are substantial and policy makers should take into account that nutrition and infection are intimately connected and interventions have to deal with these concerns in a holistic manner. The authors attempt to estimate the quantitative effect of infection on nutritional status based on catabolic losses, overt malabsorption and subclinical losses.

6. Taking Science Where the Diarrhoea is

Jon Eliot Rhode and Robert S. Northrup. In: Acute Diarrhoea in Childhood. Ciba Foundation Symposium 42 (new series) Amsterdam. Elsevier. Excerpta Medica North Holland, 1976. (synopsis to come!)

7. Water and other environmental interventions - the minimum investment concept

Kazuyoshi Kawata. American Journal of Clinical Nutrition, 31:2114-2123.

Water is by many considered as life itself. Yet, nearly

two-thirds of the world's population does not have access to safe and ample water supply. While aggregate data suggest a much lower rate of infection in areas with access to water, benefits from new water supply systems is not "automatic". But a safe supply of water may act as a pre-condition for improvement of health and nutrition in large segments of the Third World population. It needs to be coupled with major sanitation efforts such as safe excreta disposal and fly control. Kawata concludes that there is a need for change in focus on treatment of infectious disease from the host to the environment.

Afternoon - WEEK I - DAY 3

Design of Feedback-models of Malnutrition and Disease

PERFORMANCE OBJECTIVE

Develop feedback loop models.

CONCEPT

Viscious circle of malnutrition - poverty - infectious disease.

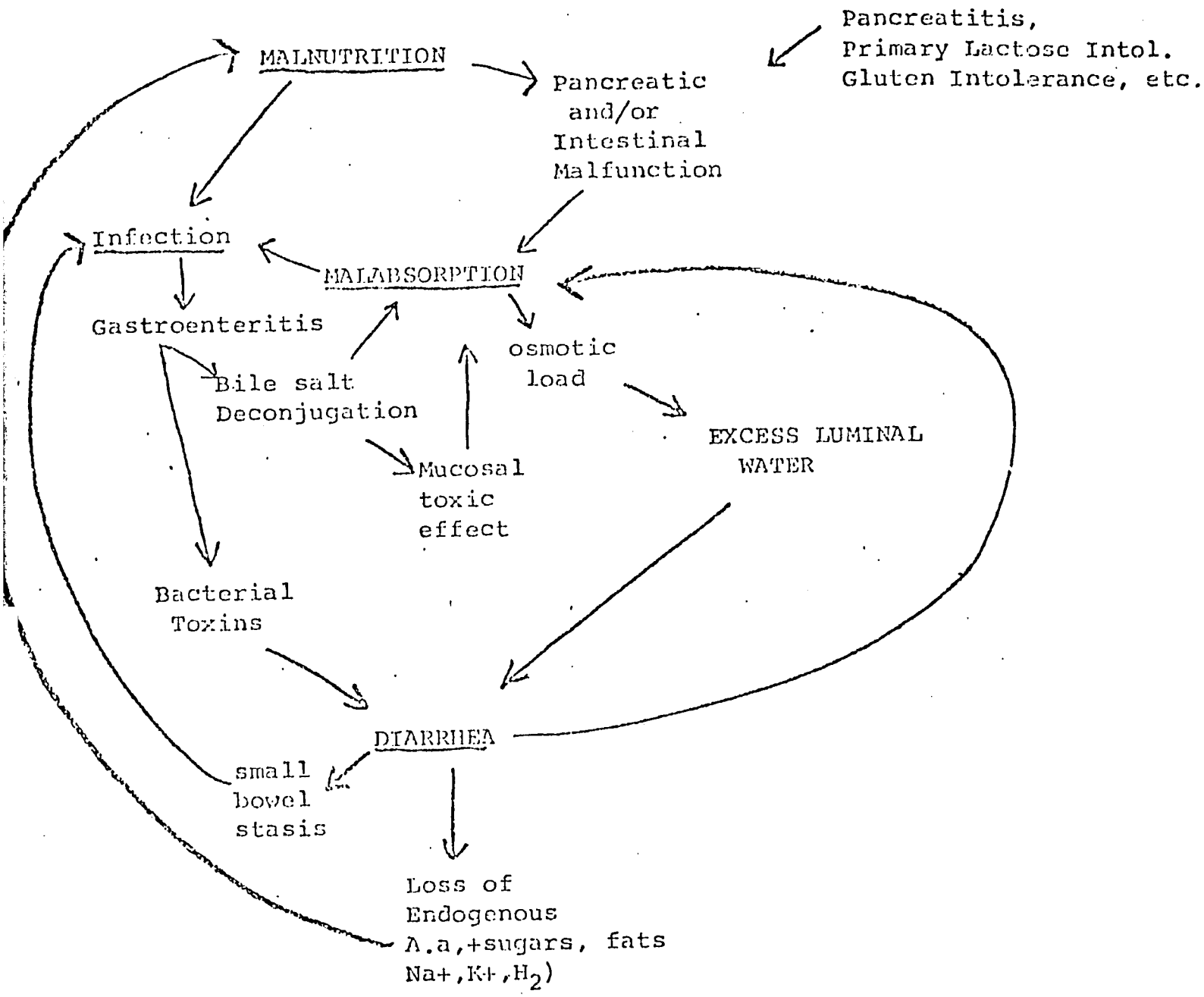
CONTENT

Data on food shortage and infectious disease presented in morning session, readings

SUGGESTED ACTIVITY

Design feedback models for Measles - Malnutrition, Malnutrition - Schistosomiasis, etc.

Design model for village indicating the effect on nutritional status of a new potable water source. Show how such a water supply might affect health, economic activities, etc. BE CAREFUL not to ascribe positive results to the intervention without including in your model methods of maintenance of the new facilities, means of verification of results, extension services, etc.



THE VICIOUS CYCLE OF DIARRHEA

FIGURE 1

Solimano, Giorgio and Sally Ann Lederman. Nutrition in the Management of Diarrheal Disease. Draft Paper, 1976 National Research Council. National Academy of Sciences.

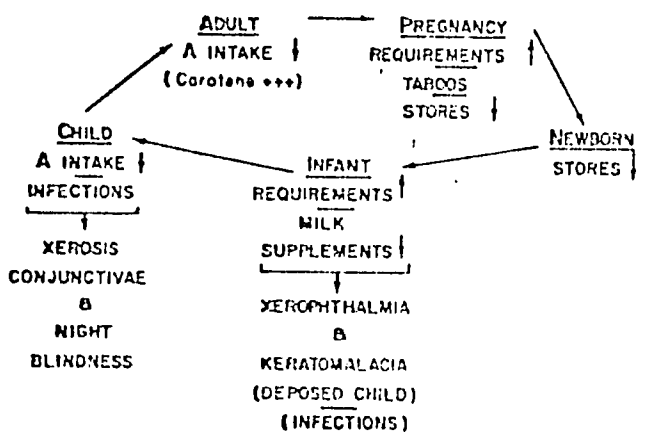
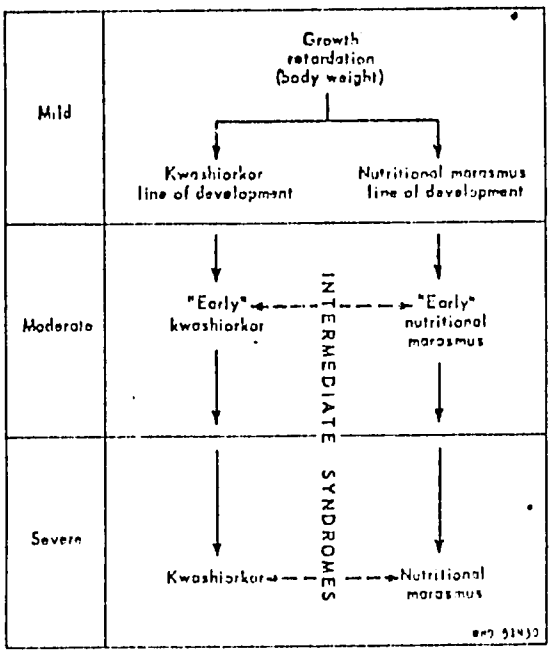


Figure 1. Vitamin-A-deficiency cycle.

McLaren, D.S. 1966. The Prevention of Xerophtahalmia. In: Preschool Child Malnutrition. Primary Deterrent to Human Progress. Washington D.C. National Academy of Science. p. 98

FIG. 55. LINES OF DEVELOPMENT IN PROTEIN-CALORIE MALNUTRITION OF EARLY CHILDHOOD



The diagram is a schematic attempt to correlate the development of mild, moderate and severe protein-calorie malnutrition in the two main lines of development—i.e., leading to kwashiorkor and to nutritional marasmus as well as to indeterminate, atypical, intermediate syndromes. The dotted lines stress the potential convertibility from one line of development to the other (Jelliffe & Welbourn, 1963).

Jelliffe, Derrick B. 1966. The Assessement of the Nutritional Status of the Community. Geneva, WHO. p. 189

WEEK 1 - MORNING 4

VULNERABLE GROUPS - POPULATIONS AT RISK I.

OBJECTIVES:

To evaluate indicators for populations at risk and to recognize the need for special programming for vulnerable groups.

CONCEPTS:

a) The multifactorial character, the effect of malnutrition on women and children

b) Given the scarcity of means to ameliorate the status of large populations in a reasonably short time, emphasis on helping the populations at greatest risk is the only human and scientifically valid strategy at our disposal.

CONTENT:

The criteria used for identifying women and children at risk can be found in the readings.

DISCUSSION:

The participants are invited to discuss the validity of the above concepts in light of the reading material and their own experiences.

Reasons for Considering Pregnant Woman "At Risk" and in Need of Special Care to Prevent Foetal Malnutrion

A pregnant woman is "at risk" when one of the following factors apply:

1. a. If she weighs 38 kgs or less before pregnancy;
   b. If she weighs 42 kgs or less at 34th week of pregnancy;
   c. If she gains less than 1 kg a month after the 5th month of pregnancy;
2. If she is less than 145 cms tall;
3. If, when she has her first baby, she is below 18 or above 30 years old;
4. If she is 35 years old or above at the time of pregnancy;
5. If she has a history of abortion or still-birth during a previous pregnancy;
6. If, during a previous pregnancy, she lost her child within a month;
7. If her previous delivery was a caesarean;
8. If it's her 5th or more child;
9. If she had swollen legs while pregnant or has swelling now;
10. Or bleeding;
11. Or jaundice;
12. If, during her pregnancy there was a doubt about her having twins;
13. If she has got high blood pressure;
14. If a child from the previous delivery had a birth weight of 2 kgs or less.

Austin, James E. (Study Dir.) et al. 1976. Urban malnutrition. Problem Assessement & Intervention Guidelines. Submitted to the World Bank by Harvard University. pp. 176-177.

Reasons for Considering Children "At Risk" and in Need of Special Care

A child is considered "at risk" if one or more of the following factors apply:

1. He or she happens to be a twin;
2. He weighs less than 1.5 kgs.;
3. If, when less than 6 months old, he is not breast fed and comes from a poor family;
4. If he has no surviving parents;
5. If he is looked after by his siblings while his mother is away at work;
6. If, during the first 3 months, he gained less than 1/2 kg a month or between 4 and 6 months failed to gain more than 1/4 kg a month;
7. Whether he lost more than one of his brother or sisters during their infancy;
8. If he has chronic diarrhea, whooping cough or measles;
9. If he is the 4th child or above in number;
10. If his weight is below 65% of the Harvard Standard;
11. If he was born after his parents had been married many years;
12. If he was born of parents who had been operated on for family planning;
13. If he has a step-mother.

FOOD REQUIREMENTS - SPECIAL CONSIDERATIONS

The student should be able to:

2.3 Discuss factors affecting nutrient requirements of individuals

2.4 Identify nutritionally vulnerable groups in a population

A nutritionally adequate diet is one in which all nutrients are present in sufficient amounts for the body's needs. These amounts are influenced by:

Stage of development

The rate of growth is most rapid during the first five years of life and creates a high demand for all nutrients. Malnutrition during this period may affect long-term physical and possibly mental development.

A human baby doubles its birthweight in the first six months of life.

Nutrient requirements/kg bodyweight are higher at this time than in later life.

Refer to Fig. 3.1 (energy needs/kg/day) Energy needs/kg bodyweight are highest in infants and gradually decrease as age increases.

Pregnancy

Pregnancy increases the mother's need for food by about 10%. If the mother is malnourished before and during pregnancy, then she is likely to produce a baby of low birth-weight with increased risk of mortality. If her diet is inadequate in pregnancy only, her baby may be of normal birth-weight but she herself is likely to be in low nutritional status. This may increase the risks at childbirth and may well affect the success of lactation.

FAO. Food, Nutrition and Agriculture. Guidelines for Curriculum Content in Agricultural Training. FAO [illegible]

Lactation

To produce sufficient breastmilk without reducing her own body reserves, a mother needs to increase her food intake by about 30%. Extra fluid is also important for successful lactation.

If the belief is commonly held that a pregnant woman's milk is "sour" or "poisonous", discuss with students why this belief has arisen.

Physical activity

The more active a person is, the more energy he needs. In a rural subsistence community, there may be marked differences in energy expenditure at different times of the year. When land is being cleared and prepared for planting, energy expenditure is high. This may also be a time of low food availability (the "hungry" season).

Refer to Table No. 1 under "Practical Activities". This shows energy requirements for different activities. Point out that brainwork does not noticeably increase the need for energy or protein.

Body size

A large person requires a higher food intake to carry out the same activities as a smaller person, though fat people are often less active than slim people and so need less food.

Sickness and convalescence

Infection increases the need for nutrients and yet appetite is often lost during a period of sickness. If the previous dietary history has been poor, serious malnutrition can result. Measles, for example, is often a precursor of kwashiorkor. Repeated attacks of diarrhoea in an already malnourished child can lead to marasmus. Diarrhoea also results in water loss from the body. Dehydration occurs easily in infants and can result in death if not properly treated.

Demonstrate the preparation of sugar-salt-solution for use in the home treatment of diarrhoea. (2 tsps sugar + 1 pinch of salt to 1 cup water).

A good diet in convalescence is important in order to replenish any nutrient stores depleted during an illness.

Factors which influence nutrient requirements, together with factors influencing food utilization, allow us to identify groups within a population which are more in danger of dietary inadequacy than others.

These nutritionally vulnerable groups are:

1. INFANTS
2. PRE-SCHOOL AND SCHOOL-AGE CHILDREN
3. PREGNANT AND LACTATING WOMEN
4. THE SICK AND CONVALESCENT

These groups are nutritionally vulnerable not only because of their special needs for food, but also because of social customs, such as:

- taboos, limiting the use of certain foods by children and pregnant women
- adult men having first choice of food
- the treatment of sickness by withholding food

In some societies, particularly where no extended family system exists, the elderly are also at risk. Physical and mental deterioration together with low economic status expose this group to the risk of dietary inadequacy.

READINGS. WEEK I. MORNING 4.

VULNERABLE GROUPS I: POPULATIONS AT RISK

1. Malnutrition in early childhood and some of its later effects at individual and community levels

J. Cravioto and E.R. Delicardie. Food and Nutrition (Rome), 2 (4): 2-11, 1976.

The authors consider malnutrition as a man-made disorder, particularly with regards to protein-calorie malnutrition. They take the reader through a stepwise construction of an ecological model of associative relationships affecting the growth of infants and young children. The second part of the paper deals with consequences of malnutrition: higher death-risks, economic loss and impaired learning ability.

2. Maternal nutrition - its effect on infant growth and development and birthspacing

Hernan Delgado, et al. In: Nutritional Impacts on Women Throughout Life with Emphasis on Reproduction. eds. Kamran S. Moghissi and Tommy Evans. Hagerstown, Md., Harper & Row, Ch. 11, pp. 133-150, 1977.

Partial results from a bench-mark study of nutrition intervention in 4 Guatemalan (South America) villages. The study investigated the results of two different food supplements and encompassed all children 7 years old and under and all pregnant and lactating women in these villages. On the basis of the study and published material, the authors conclude that an improvement in the nutritional status of pregnant and lactating women is associated with a decline in infant mortality and in growth retardation of children under 6 months of age. (see afternoon)

3. Nutrition, maternal and child health services in Tanzania

T.N. Maletnlema. In: Nutrition Planning in the Developing World. eds. Mary Ann Anderson and Tina Greval. Bogota, Columbia. CARE, 1976.

Small-at-birth infants (2.5 kg) were long considered premature. However, this study in Tanzania found that approximately half of such children were full-term infants.

In a study of 700 pregnant women in Kisawaré, growth failure during gestation was linked to the mother's socioeconomic group and staple diet. Mothers from the lower-status cassava-eating group had lower birth-weight infants and their children grew more slowly during their first year of life than infants born to mothers whose diet was not cassava-based. Possibly in response to this study, Tanzania's government decided that mother and child care had to be tackled as a single problem with nutrition as a major component of the intervention programs.

THE USE OF INDICATORS FOR POPULATIONS AT RISK

Performance objective

Develop models for intervention based on lists of indicators examined during morning.
Develop skill in establishing criteria for examining the relative importance of indicators for program design.

Concepts

Indicators, weighing of indicators
Independent and dependent variables in model design

Content

In studying the effects of malnutrition on infant growth, Delgado et al (Readings) challenge the precision of indicators used in earlier studies and stress the lack of information that could have led to alternative explanations of the impact of malnutrition on child development.

Suggested activities

Extract indicators of malnutrition from Delgado and other readings.

Classify indicators as 'direct and indirect'

Thinking of 'indicators' as variables, suggest which might be dependent and which might be independent variables.

Using the concept of synergystic effect draw a model illustrating the impact of malnutrition on infant growth, mortality, learning capability etc. Use indicators suggested by Austin (in folder) as well as others. BE CAREFUL to remember that you model is no better than your indictors; some studies eg. Jerome Kagan's work in Guatamala, suggest that malnutrition in infants may save no long term effects on mental development at all.

Factors affecting vulnerable groups in Africa

VULNERABLE GROUPS	SOUTH AFRICA	EAST AFRICA	WEST AFRICA	NORTH AFRICA AND THE NEAR EAST
1. Pre-lactal foods	Fine maize gruel or milk curds when available	Some foods are given immediately after birth for reasons such as ritual purpose, preparing infants stomach for mother's milk,	Sometimes various mixtures of herbs given when colostrum is withheld	-
2. Breast-feeding				
a) prevalence	Universally practices in poor urban & rural areas	Universally prevalent in rural areas	Universally practiced in poor urban & rural areas	Universally present in rural areas
3. Colostrum	Colostrum is withheld due to the belief that it is harmful to the infant	Colostrum withheld in some areas due to the belief that it causes illness	Sometimes colostrum is not given due to the belief that it is harmful to the infant	Sometimes colostrum is considered unclean and withheld from the infan
4. Length of breastfeeding	Usually longer breastfeeding periods (24mos.) with longer lactation periods in rural than urban areas	Longer breastfeeding periods (18-24mos.) Educated urban women wean earlier than rural women	Prolonged breastfeeding averaging 12 months with shorter breastfeeding periods in urban areas	Breastfeeding upto 2 years sanctioned by Moslem religion. Shorter lactation periods in urban areas; high education correlated with decreased breastfeeding periods

From: Vemury, Merlyn and Howard Levine. Beliefs and Practices that Affect Food Habits in Developing Countries. A literature review. CARE, Inc., New York, 1978.

VULNERABLE GROUPS	SOUTH AFRICA	EAST AFRICA	WEST AFRICA	NORTH AFRICA AND THE NEAR EAST
5. Weaning				
a) Abrupt & gradual	Usually abrupt	Usually abrupt	Usually gradual & sometimes abrupt	Gradual & abrupt weaning
b) Reasons for weaning	Usually occurance of new pregnancy, working mother, or more	Usually new pregnancy due to the belief that a pregnant mother's milk is harmful to the infant, contraceptive effect of nursing, lack of milk, child cries or child is too big	New pregnancy, intensive work periods, childs refuses breast or child is big	New pregnancy due to the belief that milk of the pregnant mother is harmful to the child
c) Method	Child is separated from mother; applying bitter substances on the breasts; mocking the child	Applying bitter substances on the breast, or child is sent away	The child is separated from the mother, withholding the breast	Sometimes applying bitter substances on the breasts
• Commercial formula	Increased use in urban areas. The high cost causing overdilution & poor sanitation increases morbidity rates	Increased use in urban areas. High cost causing overdilution & Poor sanitation increases morbidity rates	Commercial formula becoming prevalent in urban areas	Commercial infants' foods becoming popular in urban areas
Milk substitutes	Any food that is whitish in color is classified as milk	-	-	Tea often substitutes for milk at weaning

VULNERABLE GROUPS	SOUTH AFRICA	EAST AFRICA	WEST AFRICA	NORTH AFRICA AND THE NEAR EAST
8. Supplementation	Delayed supplementation in rural areas	Supplementary foods given vary	Introduction of supplementary foods 4-6 months	Supplements introduced early in the diet
9. Causes for restrictions in preschoolers diet	Fear of disease, sterility	Fear of retardation, physical development, speech, illness	Fear of speech retardation, illness, thievery, disrespect, dumbness & physical development	Fear of harmful effects, illness
10. Sex differentiation made in feeding patterns	-	Male children fed first & in greater quantities than female children; females maybe weaned earlier than males in some areas	-	Male children are suckled longer than female children
11. Source of advice infant feeding practices	-		-	Advice from elders and tradition
12. Adolescent restrictions	In some areas, taboos against certain foods of animal origin exist	Fear of sterility & other beliefs result in restrictions of certain foods of animal origin	Fear of sterility & certain other beliefs impose some restrictions on the adolescent diet	

VULNERABLE GROUPS	SOUTH AFRICA	EAST AFRICA	WEST AFRICA	NORTH AFRICA AND THE NEAR EAST
13. Pregnancy				
a) diet restrictions/ additions	No special addition, some foods may be restricted	Restrictions may vary & are mainly imposed for fear of causing abortions, indigestion, cause harm to the fetus, affect its growth, make the fetus too large & result in difficult delivery	Food restrictions usually involve protein foods of animal origin with some exceptions. Fear of causing abortions, harm befalling the mother, fetus & newborn & difficult delivery impose the restrictions on the diet	There is some improvement in diet during pregnancy in certain sections of the region. Food restrictions are still prevalent for fear of abortions, causing harmful effects, overlarge fetus & difficult delivery
b) 'earth eating' or 'clay eating'		Prevalent in specific areas		Clay eating attributed some therapeutic value
14. Lactation				
a) Diet	Diet is usually directed toward improving milk production	Directed toward improving health & strength of mother & allow for good milk flow	Few restrictions apparent	Diet is directed toward ensuring adequate milk supply. Certain foods are considered beneficial during postpartum. Foods that are difficult to digest & cause gas are restricted

VULNERABLE GROUPS	SOUTH AFRICA	EAST AFRICA	WEST AFRICA	NORTH AFRICA AND THE NEAR EAST
b) Effect of diet on breastmilk		Few foods may be restricted in mother's diet because they are believed to be harmful to the infant via the breast-milk	In some areas, few foods may be restricted in mothers diet because they are believed to be harmful to the infant via the breastmilk	Certain foods in the maternal diet are believed to be harm-ful to the infant via the breastmilk
15. Rest period	Sometimes a rest period is prescribed after delivery	A rest period is prescribed to the mother to help her regain her strength and ensure adequate milk flow		Prevalent in some areas

WEEK 1 - MORNING 5

VULNERABLE GROUPS II - Issues in Child Feeding

OBJECTIVE:

The question affecting the two most vulnerable groups--women and children--is that of breast feeding vs. artificial feeding.

With the lives of mothers and children at risk, it is natural that an emotional controversy has developed regarding the risks and benefits of nursing.

The objective of this morning's seminar will be to discover as many facts as possible to allow participants to arrive at their own conclusions and to bring them to bear on their own experience.

CONCEPTS:

1. Breast feeding is superior for biological, nutritional, cultural and social reasons.		Malnurished mothers provide infants with inferior milk causing malnutrition in children.
2. Artificial feeding is often harmful.	vs.	Nursing causes economic hardships and prevents mothers from working at urban jobs.
3. Advocacy in favor of artificial feeding is a neo-colonialist conspiracy by multinationals.		Adequate nutritional stages of infants can be assured by regular supplies of artificial milk with the help of trained nutritionists.

Looking at facts in terms of specific situations should lead participants to formulate their own concepts and discover solutions to help alleviate the problems.

CONTENT:

The reading material includes a position paper outlinging the arguments that have been made on the breast feeding vs. artificial feeding problems. The other readings included further defined various positions on the subject.

DISCUSSION:

Discuss the concepts listed above in light of the readings. It is suggested that the group organize itself into three teams to defend the three points of view listed above. The groups should marshall as many facts as possible in their arguments. The task of the workshop is to formulate a single plan of intervention to be presented to their ministry thus either overcoming their differences by compromise or winning by persuasion.

READINGS. WEEK I. MORNING 5.

VULNERABLE GROUPS II: ISSUES IN CHILD FEEDING

1. The contribution of new food mixtures to the relief of malnutrition.

Elizabeth Orr. Food and Nutrition (Rome) 3 (2): 2-10, 1977.

A follow-up study to The Use of Protein Rich Foods in the Relief of Malnutrition published by the Tropical Institute in London five years earlier. Gives the historical overview of the use of new food mixes as supplementary foods and follows the fate of such food mixtrues in production before 1972, in Latin America, Africa and Asia. This second look confirms the limited role of new food mixtures in infant feeding. Few of the products have stood up to expectations and kept up production. Fewer yet have managed to obtain any useful size of retail trade and/or record of reaching the low-income target population. Perhaps as a result, international organizations have turned away from industrially processed weaning foods and towards homebased weaning foods.

2. The crisis of infant feeding practices

Alan Berg. In: The Nutrition Factor. Washington, D.C. The Brookings Institution. Ch. 7 pp. 89-106.

Berg suggests that the decline of a major natural resource, human milk, may well be likened to the oil crisis. Yet, it has gone almost unnoticed by policy planners. The decline in breast feeding in both the developed and the underdeveloped world is documented and reasons for the decline are discussed in detail. The importance of breast feeding is delineated in economic terms, directed at the planner. Berg advocates

2. (continued).....

an interventionist position where government conservation policies to encourage breast feeding should be based on improved understanding of its importance for the individual and the nation, regulation of sales advertising and promotion and by influencing and educating the health professionals.

3. Maternal nutrition

Derrick B. Jelliffe and E.F. Patrice Jelliffe. In: Human Milk in the Modern World. Oxford, Engl., Oxford University Press, Ch. 4 pp. 59-83, 1978.

A comprehensive review on the effect of maternal nutrition on the quality and quantity of breast milk. Present knowledge is discussed in relation to methodological problems of research. The article goes beyond nutritional adequacy in discussing physiological and practical efficacy of supplementing maternal and infant diet. In assessing infant feeding practices an ecological and multi-sectorial approach is stressed. The health consequences in preventing diarrheal disease, and the contaceptive effect of breastfeeding must be taken together with economic and agronomic considerations in comparison with nutritional, economic and hygienic circumstances of formula feeding.

4. Breastfeeding isn't a cure for poverty

Dana Raphael. CNI Weekly Report. Washington, D.C. Community Nutrition Institute, pp. 4-5, May 25, 1978.

Excerpts from a worldwide anthropological study on infant feeding practices. Contrary to other observers, the investigation led by Raphael has found no decline in

4. (continued).....

breastfeeding on a global basis. She asserts that most cultures recognize milk from other mammals as the next best food for infants. On this ground she critisizes the curtailment of aid shipments of powdered milk to less developed countries. She concludes that breastfeeding has been underemphasized by nutritionists in the past, but now the pendulum has swung too far in the other direction with an overemphasis on breastfeeding.

Afternoon Program Outline

WEEK I - DAY 5

OBJECTIVE DATA ANALYSIS AND THE INFANT FEEDING CONTROVERSY

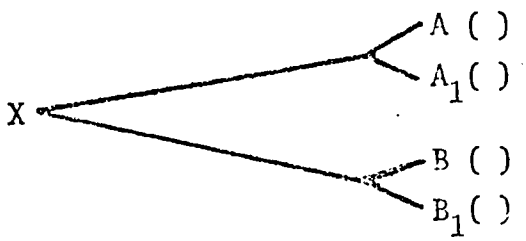
PERFORMANCE OBJECTIVE

Participants should be able to select and evaluate evidence on its merits:

1. Make an objective presentation about an emotionally charged issue
2. Prepare an advocacy statement and defend your thesis with evidence
3. Present planning options for decision makers without showing bias

CONCEPT

Introduction to decision-making trees as a means of clarifying options for oneself and for others.



CONTENT

Readings on breastfeeding controversy; suggested variables for discussion

SUGGESTED ACTIVITY

1. Define the risks to infants and mothers for both breastfeeding and artificial feeding under different socio-economic and cultural conditions
2. Describe indicators to measure risks and suggest ways for quantifying results in order to weight indicators
3. Develop a decision-making tree in order to define policy options that could:

   Increase breastfeeding and increase artificial feeding

   A. At national level (Ministry of Health)

   B. Village level

   C. Family level

      1. urban family

      2. rural family

Suggested variables for discussion on mother's milk vs. artifical milk controversy

1. Nutritional quality of mother's milk and artifical milk
2. Health of mother under birth situation - breastfeeding and artificial feeding
3. Contraceptive values
4. Mortality rates
5. Growth rates
6. Development of child
7. Intestinal illness
8. Hygiene
9. Time - convenience
10. Cost
11. Education of mothers
12. Psychosocial factors; comfort, satisfaction, security, nurturing
13. Occupation of mothers and other family members
14. Economics - relationship between malnutrition - illness - medical costs
15. Availibility of locally produced nutritional resources
16. Availibility of personnel resources for education, treatment , etc. under both systems - nutrition vs. prevention
17. Political indicators - priorities
18. Cultural taboos and traditions
19. Logistics
    1. Operational barriers for program implementation
    2. External resources vs. local indigneous resources

WEEK II - MORNING 1

CAUSAL AND CONDITIONING FACTORS - INCOME AND SOCIO ECONOMIC CONSTRAINTS OF MALNUTRITION : I. Income

OBJECTIVES:

Participants should;

a) be able to evaluate income as an indicator of nutritional status at different socio economic levels.

b) be able to evaluate policies for raising incomes in order to raise the level of nutritional status or implementing more direct nutrition based programs for ameliorating malnutrition among target groups.

CONCEPTS:

(As stated by Reutlinger and Selowsky in the Anatomy of Hunger.)

Malnutrition is but one of many manifestations of poverty, yet its effects as well as the policy instruments available to improve the nutritional status of populations, have distinctive features that deserve separate analysis.

First, nutrition is one of the main determinants of health and health is now regarded as a desirable end in itself and distinct from the general objective of improving economic welfare. In this view, the allocation of food and other health preserving measures need not conform to the criteria normally used for allocating income and wealth in general. A society may have no minimum standard for income yet strive for minimum standards for health and nutrition for all its citizens. Similarly a society may generally respect the sovereignty of family units over the allocation of their earnings but still take deliberate measures to bias allocations in favor of better nutrition for all or some members of the family.

Second, health and nutritional interventions have an impact on human capital formation, with implications for the future earnings of individuals and the growth in gross national product. The nutritional status of infants is perhaps the most important policy-induced determination of the individual's initial physical condition, which in turn determines the effectiveness of further investment in human capital. Certain types of malnutrition during the working years appear to have a crucial influence on the individual's level of productivity.

CONTENT:

1. An overview of the discussion regarding income and food consumption elasticities in rural and urban areas (see footnote).
2. Readings that support different conclusions regarding the impact of income changes in changing food consumption patterns.

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DISCUSSION:

Discuss Reutlinger's position in light of the different readings.

Causal and conditioning factors

Income and malnutrition

We begin by considering a deeply disturbing contradiction: throughout Africa and the developing world, it is apparent that low income correlates with low nutritional status, and the lowest income with the worst nutritional status. Yet the assumption that national economic growth or increased income for individuals alone leads to better nutritional status, has been questioned. Alan Berg has summarized the problem in terms of four 'questionable assumptions.'

- A national increase in per capita income means an increase large and rapid enough in the income of the poor to be of nutritional significance.
- Increased income of the poor leads to an immediate and automatic increase in the amount the family spends on food.
- Increases in food expenditures by the poor family lead to an improvement in nutrition.
- Improved nutrition in the family means an improvement for the nutritionally vulnerable members of the family.

1. Skewed distribution of income and assets in rural areas and the disparity between the average income of farmers and that of employed workers in the urban and industrial sectors, have been linked to the depressed level of income in agriculture in most African countries. The combined effect of both is synergistic and reduces the incentive for improvement in farming, accentuates rural poverty and increases malnutrition. In turn, such events encourage primary and secondary school leavers to migrate to the urban areas resulting in unemployment and poverty. A rise in national income, due to the exploitation of rare resources such as oil or uranium may not result in rises of income for the poorest and nutritionally most vulnerable sector of the population or resolve inequities.

It has been shown that the nutritional standards of urban migrants is the worst of all, since new arrivals are not aware of how to balance their diets in the new environment and are often unable to obtain traditional supplements to their cereal or yam staple diet

a. as income increases, the proportion of income spent on food decreases, although the absolute expenditure on food may increase.
   example: a farmer may have other priorities: medicaments the purchase of a bicycle and a wristwatch, shoes, a new metal roof for the house

b. as income increases, the proportion of calories supplied by cereals and starchy staples decreases.
   example: a family may spend more money on meat for special occasions (chicken, goat, or, for that matter, beer).

c. as income increases, food expenditures come to include a greater variety of processed foods -
   example: sugar, carbonated beverages, polished rice.

d. as migrants move into towns, their expenditures increase and they may be forced to change their diets. Thus they loose access to many of the free wild foods of their villages such as leaves, fruits, vegetables, insects, small game seeds and berries. A study of Congolese farmers who had moved to Brazzaville showed that they spent much of their new income on their traditional cassave food, but developed pellagra because they could not purchase the niacin rich cassava leaves with which they supplemented their diet in the village. Rice eating? Senegalese villagers were found to develop Beriberi when they moved to Dakar.

Improved nutrition leads to nutritional improvement for the most vulnerable members of the family

The nutritional state of infants may go down as family income increases. This can be the case if increased income is achieved in part through the mother's occupation with the sacrifice of breastfeeding. Replacement of the equivalent nutrients has been calculated in some instances to come to 50% of the mother's earnings. An FAO/WHO report indicates that as income increases sugar consumption may rise to 20 percent of the diet. An example is that of a chef d'arondissment in Mali who told us that a major part of his income was now being spent on sugar for his 8 children who refused to eat their bouille (millet porridge) without it. Clearly, infant malnutrition may increase rather than decrease with higher per capita income, although other factors must be taken into consideration. One of these concerns the supply or proper water and the reduction of waterborn and water related diseases.

Increased income and effect of a westernized refined carbohydrate diet

Increasing income appears to correlate with a rise in consumption of sugar which stores well and is a cheap source of calories. Consumption of refined sugar has risen to 60 - 70 g/day in rural areas and to more in urban areas. (Heaton, p.59) which not only leads to an increase in dental caries, but, combined with a shift to fibre - depleted starchy foods, is thought to lead to an increase in diabetes, obesity and other nutrion related diseases.

Food demand
increases

Unemployed, better
educated and young,
leave rural areas

City
grows

URBAN CENTER
Higher income
greater demand for
food

lowered
productivity
on farms

Urban growth coupled with the migration of the better educated from the rural areas has the effect of reducing the productivity of the agricultural sector while at the same time, increasing the demand for food in the cities. With per capita food supply growing at present rate to support the increased demand for food generated by income growth, the total calorie deficit for most African countries could remain unchanged. If per capita income in all income groups were to rise at approximately the same rate as at present, the proportion of the malnourished in relation to the whole population would decline, but their absolute numbers would increase by 1990, under such conditions malnutrition in Africa may shift from a predominantly rural to a predominantly urban problem as has been the case in other developing areas. Because adequate nutritional standards are now seen as a desirable goal by most nations independent of a redistribution of income, target-group oriented programs must be designed to provide rural and urban low income groups to achieve minimal standards of nutrition. A recent FAO panel has demanded a positive "discrimination" in favor of agriculture in order to raise relative distribution of income in rural areas and to correct inequities of income distribution. Within the panel recommends a series of measures.

These include:

control of urban wage increases

improvement of rural-urban terms of trade through appropriate price policy

poverty - oriented rural development focused on increasing productivity of small farmers

employment of landless workers and other rural poor

development of infrastructure in the rural areas

a far-sighted population policy to go beyond family planning as part of an income and 'basic need policy'

Such strategies may help to increase the income of the rural poor, will they improve their nutritional standard? A number of 'laws' have been postulated to describe the relation between income and nutritional practices as severe or more severe than in rural areas.

The land use decree of Nigeria (1978) is given as an example of such a policy.

Although in many African countries south of the Sahara population pressure is not yet as severe as in cities in other developing countries. African cities are experiencing extremely high rates of growth and malnutrition could worsen if steps are not taken now to provide new and existing urban settlements with basic services, facilities, and employment opportunities (U.MN.,p. 375). The seriousness of the potential threat can be seen by looking at data from W. and E. Pakistan and India which indicates that low income groups have lower per capita caloric consumption in urban than in rural areas, with differences as high as 30%-50%. A Food Balance sheet for Thailand (1972) showed an average caloric intake on 1821 for rural residents and 1504 for urban residents living in Bangkok slum areas. The most alarming aspect of the study was that it showed a much higher proportion of children with protein-calorie malnutritional in the 0-5 month and 6-11 month group when compared to the rural popluation. (350).

A 1974 study in Kinshasa showed to what extent poverty must be considered the basic cause for malnutrition. Consumption in the three lowest income groups were found to be largely rational in the light of prices and calorie-protein content, although other variables (such as storability of cassava bread) were found to be important. Basic needs, however could only be met by increasing consumption, which, for Kinshasa, would mean by more available income. Using the basic minimum requirements level of FAO as a standard, the U. MN. report calculated the following:

Table 3.38

Kinshasa : Nutrient Consumption

Income Group	% of total households	CALORIES		PROTEIN	
		consumption	minimum	consumption(gm)	minimum
1	23.2	1279	343.2	41.6	54.5
2	16.9	1740	58.8	52.1	68.3
3	17.1	1843	62.3	57.4	75.2

The literature (Austin 78, Poynor 77) suggests that the lower the income group the more rational consumption in terms of prices and calories. As income rises, consumption habits become more erratic in terms of calorie-protein content. High income groups consume a disproportionate amount of protein in order to get their calories.

READINGS. WEEK II. MORNING 1.

CASUAL AND CONDITIONING FACTORS: I. INCOME

1. Poverty: Its meaning and measurement
Jan Drewnowski. Development and Change 8:183-208, 1977.

A reasoned approach to the concept of poverty, its definition and measurement (see afternoon exercises).

2. Economic implications of malnutrition
Phillips Foster. Agricultural Policies and Rural Malnutrition. Washington D.C., U.S. AID Economics and Sector Planning Division. Occasional Papers No. 7, pp. 6-9, 1978.

A review of some of the economic consequences of malnutrition as they relate to individual and national development. Emphasis is placed on the effect of malnutrition on the capacity to learn and to do work.

3. The anatomy of hunger
Shlomo Reutlinger and Marcelo Selowsky. World Bank Staff Occasional Papers No. 23, Baltimore, Md., John Hopkins University Press, 1976.

A summary of the classical World Bank essay Malnutrition and Poverty by Reutlinger and Selowsky. The magnitude of malnutrition on a worldwide basis is assessed in relation to poverty, and the cost-effectivness of different intervention options discussed.

4. Analysis of the cost of buying and producing nutrients in the D.R. George V. Poynor and Sukin. Unpublished paper. Silver Spring, Md. Poynor International, 1977.

Example of a methodology to calculate the minimum cost of obtaining adequate calories and protein from the local diet in the Dominican REpublic. The same principles may be utilized for determining the minimum cost of an adequate diet in African countries.

5. Through a glass darkly: discerning the practical implications of human dietary protein-energy interrelationships
Nevin S. Scrimshaw. The W.O. Atwater Memotial Lecture. Nutrition Reviews 35(12), 1977.

One of the world's foremost authorities in the area addressed himself to the effect of income on consumption of protein and energy.

6. Some economic aspects of planning health interventions among malnourished populations
Barry M. Popkin. American Journal of Clinical Nutrition 31:2314-2323, 1978.

Afternoon Program Outline

WEEK II - DAY 1

QUANTATIVE MODEL AND MEASUREMENTS RELATING LEVELS OF INCOME TO COMSUMPTION PATTERNS

PERFORMANCE OBJECTIVE

Participants should be able to work with statistical models relating income to protein and calorie consumption, in order to define specific policy objectives for different target populations.

CONCEPT

Trutlinger and Selowdky (see readings) have attempted to measure the gap or deficit between the intake and the physiological requirements of calories by reference to income groups. Poynor and Sukin readings have shown responsiveness of diet change related to income for a Central American country using the proportion of food in the consumption pattern in African countries as indicators. Drenowski's models of poverty (fig. 4, 5, 6) (readings) should be examined to define target populations in urban African environments.

CONTENT

Readings, morning discussion and Kinshasa case study (see readings, week II morning 5)

SUGGESTED ACTIVITY

Construct models (based on Drenowski, figures 7, 8) including the following factors:

1. Level of calorie consumption
2. Level of protein consumption
3. Level of income
4. Poverty points for each indicator
5. Poverty depth for each indicator

WEEK II - MORNING 2

CAUSAL AND CONDITIONING FACTORS - SOCIO CULTURAL ASPECTS OF MALNUTRITION II

OBJECTIVE:

Participants should recognize the validity of the concept of culture as a major tool in understanding human nature and in planning food intervention strategies.

CONCEPTS:

The concept of culture defines the meaning which man gives to the world around h[illegible] is history and his future.
Cultural ideas powerfully determine our way of defining our relations to other human beings. For example: one culture may include one's ancestors as important members of the family that still influence the behavior of the living while another culture does not. One culture may define certain foods as edible while another culture may determine these to be impure and dangerous to one's welfare and to the welfare of the society.

The object of this morning's discussion will be to determine the importance of cultural beliefs and social practices as independent variables influencing food consumption patterns.
It is equally important to comprehend the role of culture as a creative force in helping people to adapt to new conditions and to prepare them for new ideas as it is to help them to preserve particular practices and aspects of their culture.

CONTENT:

More than anyone else, participants at the seminar will be aware of the cultural beliefs and practices of their own communities. This awareness will be the primary resource for our work.
In addition to this data we have collected a series of articles that describe attitudes to different foods as well as practices in different countries regarding food consumption.
Finally, the supplementary readings present techniques for the analysis of cultural beliefs and of the structural significance of such beliefs in different societies. The participants should be alerted that the readings represented in the supplementary materials are often difficult and challenging because they try to reveal the unconscious matrix of human behavior.
Development planners have found that cultural factors rather than economic factors or techniques have been the underlying cause for many program and project failures.

DISCUSSION:

Participants are invited to comment.

READINGS. WEEK II. MORNING 2.

CASUAL AND CONDITIONING FACTORS. II SOCIOCULTURAL ASPECTS

1. Taboo, tradition and malnutrition
Patricia Appel. UNICEF News pp. 22-25, May 1968.

A general overview of traditions and taboos impairing adequate dietary standards. On the basis of the complex social restrictions influencing food intake found in the study, the author concludes with an approach in attempting to bring about practices for improved nutrition.

2. Table over general food beliefs in Africa
Merlyn Vemury and Howard Levine. Beliefs and Practices that Affect Food Habits in Developing Countries. New York, CARE, Inc. pp. 156-158, 1978.

The table lists by region different forms of food restrictions and perceived effects of certain foods and other factors influencing dietary patterns in Africa.

3. Table, the social role of food in Africa
Merlyn Vemury and Howard Levine. Ibid. p. 159, 1978.

A generalized tabulation of the prestige value of foods, the distribution of meat, food symbolism, and the social role of food at festive occasions, presented on a regional basis for Africa.

4. Table over common harmful food and health beliefs
James E. Austin, et al. Nutrition Intervention Assessment and Guidelines. Cambridge, Mass. HIID. Paper submitted to the United Nations ACC Subcommittee on Nutrition, pp. 88-93, 1978.

The table summarizes dietary beliefs and practices from a situational viewpoint and in relation to particular foods. The beneficial implications as well as the harmful effects are listed. The table also indicates geographical distribution of these norms.

5. Rejection of fish as a human food in Africa: a problem in history and ecology
Fredrick J. Simoons. Ecology of Food and Nutrition 3:89-105, 1973.

Simoons presents an hypothesis for the origins of avoidance of fish as a food among different African populations. The historical diffusion of the practice is traced with reference to current distribution and manifestations of dietary avoidance of fish in Africa.

6. Human versus animal nutrition: a "development" project among Fulani
Joel Mathless Teitelbaum. In: Nutrition and Anthropology in Action ed. Thomas Fitzgerald. Assen/Amsterdam, Van Gorcum pp. 125-140, 1977.

Teitelbaum levels severe criticism against a proposed large-scale cattle ranching project in Sahelian Senegal, predicting that it will distrub the precarious balance of interaction of human groups, land, and cattle. He suggests several modifications towards gradual change and calls for the inclusion of nutritional surveillance as well as some form of indexing to record the loss of food crop acrage to cash crop.

7. <u>Educating for better nutrition</u>

Alan Berg. The Nutrition Factor. Washington D.C. The Brookings Institution. Ch. 6 pp. 74-88, 1973.

Traditional assumptions on the benefits of nutrition education are challenged by Alan Berg. He concludes that this form of nutrition intervention has failed to bring about massive changes in dietary habits and that strict evaluation of cost-effectiveness and time-frames should be applied. He states that nutrition education is most useful as a part of an overall nutrition strategy, and suggests a conceptual re-orientation so that nutrition education could be considered more as an educational problem.

Afternoon Program Outline

WEEK II - DAY 2

ANTHROPOLOGICAL AND SOCIOLOGICAL METHODS FOR THE ANALYSIS OF SOCIAL AND CULTURAL FACTORS

Performance Objective

Develop skills in modeling social roles and structures

CONCEPT

That which is illustrated by the 4 square models and the Kinship diagrams

CONTENT

1. Morning discussions and readings
2. 4 square analysis exercise
3. Article on Kinship

SUGGESTED ACTIVITIES

1. Participants should draw a Kinship diagram for groups with which they are familiar.

2. Participants should decide on the specific roles played by family members (eg. production, consumption, food preparation) and design squares which will measure the relationships between the members.

3. If data is available, use quantitative measures of possible. Construct a Guttman scale on the basis of hypothetical data.

4. Discuss the cultural basis for Kinship roles (eg. mother's brother, mother's brother's daughter, father's elder brother, etc.) to the behavior that could be expected from individuals playing these roles.

   Remember that not all individuals in a society conform to the ideal role behavior of the society. Execptions are the rule.

WEEK II - MORNING 3

ASSESSMENT OF NUTRITIONAL STATUS

OBJECTIVES:

a) to understand the need for assessment of nutritional needs in target populations prior to planning interventions

b) to understand that assessment methodologies may be biased in certain directions and thus influence findings and intervention policy.

CONCEPT:

a) the role of nutrition assessment is to monitor the nutritional status of target groups, in particular populations at high risk, in order to plan and implement short and long term interventions.

b) the concept of assessment policy can become controversial if it is argued that enough is known about the needs of a population and that further study only procrastinates action.

CONTENT:

The materials presented in the readings and supplementary readings cover various assessment methodologies ranging from anthropometric, clinical, biochemical, dietary history, economic and cultural indicators.

Both the work of Jelliffe as well as Austin should be carefuly read by the participants. (See readings and supplementary readings.)

DISCUSSION:

1. Which combination of methodologies would you use in order to respond to the following situations?

   a) a drought in the Sahel
   b) a heavy immigration into an urban area
   c) in preparation for a major agricultural development project
   d) in order to develop a 5 year national nutrition plan

2. How would you identify the appropriate personnel for the implementation of different phases of nutritional assessment programs? Describe skills and draft job descriptions.

READINGS. WEEK II. MORNING 3.

Assessment of Nutritional Status

1. Special problems of different groups

Derrick B. Jelliffe. : The Assessement of the Nutritional Status in the Community. Geneva, WHO pp. 176 - 219, 1966.

Written by a widely known pediatrician and nutrition expert this book has for many years remained the standard reference for the assessement of the nutritional status in the community. This chapter provides comprehensive information on the nature and etiology of of malnutrition and methods of direct or indirect assessement of the nutritional staus for different population groups. Standard measurements of nutritional status are discussed in detail. Collection methods and the value of different indicators are discussed as well as the feasibility of obtaining different forms of data. The chapter concludes with valuable information on statistical representation and analysis of nutritional data.

2. Nutritional status indicators

James E. Austin (Study Dir.) et al. Urban Malnutrition. Problem Assessement & Intervention Guidelines. Summary. Submitted to the World Bank by Harvard University. pp. 36 -43, 1976.

Nutritional pathology is carefully defined in this article by Austin et al. Methods for the assessement of the nutritional status in the community and selection of nutritional indicators are discussed in relation to cost, time and personnel required, accuracy of the data obtained and the ultimate usefullness of different data for the planner.

Afternoon Program Guide

WEEK II - DAY 3

Anthropometric Measurement Techniques

PERFORMANCE OBJECTIVE:

Participants should be familiar with all the common anthropometric nutrition indicators, and be able to apply them and assess suitable data collection procedure weighing considerations of time, funds and accuracy in the social context. Participants should also be able to demonstrate ability to plot and read growth charts. They should also be able to discuss the advantage of local vs. international growth standards.

CONCEPTS:

An understanding of the anthropometric measures of age, weight and height, and the difficulties associated with obtaining these data accurately is essential for a clear comprehension of the weight-for-age, weight-for-height, and height-for-age concepts. These concepts may then be systematically applied as in the Gomez-scale and the "Road to Health", and most recently, in the Capone System.

CONTENT:

Readings

SUGGESTED ACTIVITY:

1. Assertain age of 5 preschool age children when birthdate is not known.
2. Weigh several children, on different types of scales, calculate deviation & importance for nutritional assessment. Repeat, but change position of scales.

3. Let several participants measure height of the same children.

   a. by the same method

   b. by method of choice

4. Assess nutritional status of the children on the basis of weight/age and weight/height, as percent of standard and expressed as normal or degree of malnutrition. Plot their position on the Gomez scale supplied in the appendix of Fisher's paper on anthropometric measurements. (Week I - Day 3)

WEEK II - MORNING 4

NUTRITIONAL STATUS AND SURVEILLANCE SYSTEMS: INTERVENTION CONSIDERATIONS AND DESIGN

OBJECTIVES:

Participants should be able to evaluate and conceptualize surveillance systems in terms of the needs of specific nutrition intervention programs.

Familiarization with new and efficient techniques for measuring malnutrition under local conditions without imposing undue burdens on the population should be required of all nutrition planners.

CONCEPTS:

Different conceptual models for surveillance strategies have been developed in response to difficultures encountered in the field, to the limited resources available for such work, and to the need to get rapid information feedback to intervention projects.

CONTENT:

Readings defining the problems and various methodologies are provided. A P.G.P.* is included.

The case study developed by Marion Zeitlin for Upper Volta (in the supplementary readings) is strongly recommended.

DISCUSSION:

1. Several of surveillance systems are described in the readings and supplementary readings. Participants are invited to discuss their respective merits.
2. Participants might consider the following problem:
   Given two different kinds of programs aiming at improving the nutritional status of populations ar risk, what nutrition surveillance system and methodologies would be appropriate?
   a) a food distribution program.
   b) A project aimed at improving agricultural production for auto consumption.

* Project Guggenheim paper

Afternoon Program Outline

WEEK II - DAY 4

SURVEILLANCE SYSTEM DESIGN

Participants should continue the morning's discussion and activities.

SUGGESTED ACTIVITY:

Basing themselves on the FAO model in designing a surveillance system, participants are invited to develop a program that could be used for either urban or rural conditions in their countries. For reference see pp. 44-51 in Methodology of Nutrition Surveillance (WHO Report), included in readings.

WEEK II - MORNING 5

NUTRITION AND INCOME IN URBAN AREAS

OBJECTIVES:

1. The first objective is to provide a critical review of the means of assessing the magnitude and nature of nutritions deficiencies at the urban levels.

2. The final purpose of this session is to present to participants, a framework for formulating interventions in the urban areas.

CONCEPTS:

Malnutrition in urban areas in Africa is recognized as an increasingly serious problem of potentially greater magnitude than malnutrition in rural areas.

In African cities, immigration, inaccessibility of traditional food resources, unemployment, and overcrowding, among other factors, contribute to malnutrition.

Intervention strategies need to be based on an intersectorial strategy which is capable of dealing with this broad range of problems. Planners might consider strategies that include immunizations, potable water systems, and food distribution.

CONTENT:

The materials collected for the seminar are particularly rich. They include a trio of studies by James Austin, Illustrating the Methodology, The Kinshasa Case, and Intervention Guidelines.
A section "Problem Intervention and Guidelines" has been included in the readings. The complete study has been placed on the supplementary reading list.
Global estimates of urban and rural malnutrition are reviewed in detail in appendix A.
A methodology for problem diagnosis and intervention guidelines, and appropriate urban projects are listed in pages 44-67 of the summary.
An illustration of the Methodology, Kinshasa Case, has also been included.

DISCUSSION:

(1) Participants are asked to list in a brainstorming session, the broadest possible range of factors affecting malnutrition in the rural centers of their countries and to discuss possible intervention models. It is likely that these will be different cities of Africa and quite distinct from rural models.

(2) It is suggested that participants try to establish a typology of cities based on the nature of the problems e.g. cities in which a high degree of specific factors such as unemployment, immigration, shift of diets, entrance of mothers in the work force, lack of education and lack of health facilities for target populations can be isolated as the most important factors.

(3) Devise strategies that appear politically and economically feasible to reach taget groups and design surveillance mechanisms for assessing the impact of programs.

(4) Imagine a hypothetical African country in which one section of your Department of Nutrition Planning advocates allocating the major portions of the funds to a nutrition program in the rural sector while you are arguing for funds to develop a nutrition center in the urban sector. What data would you collect in order to prepare arguments to convince your minister to change his priorities? Could you do so with a clear conscience?

READINGS. WEEK II. MORNING 5.

NUTRITION AND INCOME IN URBAN AREAS

1. Nutrition and health in low income urban areas of the Third World
Samir S. Basta. Ecology of Food and Nutrition, 6:113-124, 1977.

The article illustrates the profound difference in nutritional status among urban population groups. in Third World cities. The author demonstrates a larger variation within the urban setting than the urban-rural difference in both nutrition and health.

2. Protein-clorie malnutrition and its relation to urbanisation
J. Assi Adou. J. Trop. Pediat. Environ. Child Health, Feb., 1975, pp. 10-11.

An Ivorian perspective on urban malnutrition with a discussion of remedial and preventive measures.

3. Illustrating the methodology: the Kinshasa case.
James E. Austin (Study Dir.) et al. Urban Malnutrition. Problem Assessement & Intervention Guidelines. Summary. Cambridge, Ma. Paper submitted to the World Bank by Harvard University. Ch. 3:69-95, 1976.

This case study presents the nutritional problems and considerations in the urban environment of Kinshasa, Zaire. Concepts, tools and methodologies are discussed and applied to the analysis of urban nutrition intervention, demonstrating the utility of the urban nutrition planning process. A state-of-the-art study. Highly recommended for reading.

Afternoon Program Outline

WEEK II - DAY 5

SURVEILLIANCE SYSTEM DESIGN CONTINUED-URBAN FOCUS

Participants should continue activities from Day 4 and morning 5 in designing surveillance systems.

WEEK III - MORNING 1

FOOD PRODUCTION, DISTRIBUTION AND CONSUMPTION

OBJECTIVES

One of the major concepts underlying the production decisions of traditional farmers has been said to be aversion to risk. In the traditional production of staple foods at the subsistence level, risk aversion is linked to agricultural strategies such as intercropping, fallowing, and grain storage.

(1) The first goal of this morning's discussion will be to gain an understanding and respect for the wisdom of the traditional African farmer in supplying food for his family.

(2) Risk avoidance is often the basis for a skeptical attitude toward modern innovations.
Some of the new agricultural techniques and innovations introduced into Asian and African agriculture has proven to be destructive to the local environment and justify farmer resistance. Other innovations have led to spectacular increases in productivity and increasing food supplies for the population, but have provided little benefits for the farmer. Participants should discuss criteria to establish guidelines for production decisions that will provide more food for populations while taking the necessary precautions to safeguard the environment.

(3) It has been noted that large increases in food production have frequently had the unanticipated consequence of increasing food shortages in the population. This serious problem will be one topic of today's seminar.

(4) It has also been shown that shifts by traditional farmers from the production of staple crops to cash crops has often had a disastrous impact on the nutritional status of the population. Nevertheless, arguments can be made that increased economic resources provided to farmers and to the national government can be channelled to increase the nutritional status of rural populations. One argument is that greater reliance on money economy among farmers can lead to a more diverse diet that could overcome nutritional deficiencies.
One objective of the following sessions will be to consider these arguments.

(5) Given the tragic shortage of food in the world and specifically Africa and the potential risk of serious food shortages in view of increasing population pressures, higher levels of food production are deemed necessary.
Participants should consider alternative food strategies to achieve these goals by once again looking at the quantity-quality question discussed on day two relating to protein vs. calorie production. Environmental impact, genetic engineering and the allocation of natural resources must be considered.

(6) The most critical resource available for the increase in production is the farmer. Many African farmers are women. Because many of the early improvement strategies have ignored the role of women as food producers, processors, we place a priority on the consideration of women's roles for this day's discussion.

CONCEPTS:

This workshop suggests as a topic for consideration the sometimes contradictory demands of the goals of equity and efficiency to provide criteria for food planning strategies.

At the macro level, the conceptual framework within which production decisions are made is partly political, because such production decisions involve the allocation of natural resources, including human labor and because they bear on the allocation of goods and benefits to various sectors of the society.

Participants coming from various nations may want to view these problems in terms of the political philosophies of their nations.

CONTENT:

Readings provided for this session are particularly challenging. On the one hand we are presenting evidence for genetic engineering strategies to increase the quantities of cereals. On the other hand we are presenting a severe critique of the Green Revolution and its social consequences.

Supplemental readings include detailed studies on various innovations in agriculture and their potential impact on the nutritional status and the environment.

Finally we are including in the readings themselves a comprehensive regional food plan for Africa drawn up by the FAO.

DISCUSSION:

We suggest that participants organize themselves as national delegations from their respective countries, to attend a hypothetical FAO conference in 1985, organized for the purpose of evaluating the outcome of the Arusha Conference of 1978.[1] At this conference, they may wish to consider the validity of the production and consumption projections of the earlier conference, together with the impact of its programs on the population.

[1]See Readings

READINGS WEEK III. MORNING 1

FOOD PRODUCTION, DISTRIBUTION AND CONSUMPTION.

1. Planning and implementing development projects: an introduction.
Dennis A. Rondinelli. In: Planning Development Projects. Stroudsburg, Penn. Dowden, Hutchinson & Ross Inc. Ch. 1, pp. 1-25.

Discusses the multiple roles of development projects, and provides an outline of the project planning and management cycle practiced by major lending agencies. This is followed by a discussion of theoretical models and practical constraints. The chapter concludes with a summary of alternative approaches to project planning.

2. Tables from a study on nutrition in relation to agricultural production and environmental and social factors related to malnutrition
E.U. Ekpo. Field Problems in Nutrition, Medical Implications and in Relation to Crisis, Rehabilitation and Reconstruction in the War-Affected Area of Nigeria. In: Nutrition as a Priority in African Development, Uppsala, Sweden. The Dag Hammarskjold Foundation, 1971.

The tables compare urban and rural diets and changes in urban diets to different socio-economic status in South-East Nigeria.

3. Regional food plan for Africa *[1]

FAO. Tenth FAO Regional Conference for Africa, Arusha, Tanzania, 18-29 Sept., 1978. FAO ARC/78/5.

An assessement of the present food situation and its trends in Africa. It asserts that Africa's food production, on an aggregate level, has lagged behind population growth. The plan calls for major changes in national policies and shifts in the allocation of development resources in favor of agriculture. A substantial increase in the flow of international assistance is asked for as well as a change in intra-African trade patterns of food commodities for Africa to reach the food plan target of a 94 percent self-sufficiency ratio by 1985.

4. Relationships between malnutrition and the nutrient content of staple foods
J.A. Fewster. Journal of Tropical Pediatrics and Environmental Child Health. 21(I): 36-41, 1975

Different approaches to increasing the quantity and enhancing the quality of staple foods are discussed from a Nigerian perspective. Recent breeding and innovative cropping patterns are discussed in terms of maximizing protein yields. Cassava is viewed as the most efficient producer of calories per unit of land in Nigeria.

5. Women in development: dependency and exploitation
June Nash. Development and Change 8: 161-182, 1977

Nash demands that broader social and political implications of development, such as the emphasis on production rather than on the development of the society should be stressed in an assessement of women's role in development. Consequently, she deals with such issues as commercial agriculture, the Green Revolution and co-operative organizations as they relate to women's participation in or exclusion from developmental efforts, and concludes that the position of women has worsened in many parts of the world despite developmental efforts.

6. Women in food production, food handling and nutrition with special emphasis on Africa
PAG Bulletin 7 (3-4):40-49, 1977.

The key position of women in African production systems is stressed and the limited information on how women's work influences the availability of foods and the nutritional level of their family and community is recorded. Priority is given to research concerning expenditures by African women in different occupations; the consideration of pregnant women as a vulnerable group; and socioeconomic and cultural reasons for non-participation in clinics by women.

7. Nature and significance of risk in the exploitation of new technology
Jack R. Anderson. Paper presented at the Workshop on Socioeconomic Constrains to Development of Semi-arid Tropical Agriculture, ICRISAT 19-23 Feb., 1979.

A theoretical and thoughtful paper challenging some of the underlying assumptions of risk aversion among farmers. The limitation of maximizing models that fail to take into account women, children, group pressures, and inter-generational problems in the preference functions is discussed.

Afternoon Program Outline

WEEK III - DAY 1

MODELING OF WOMENS ROLE IN FOOD PRODUCTION, DISTRIBUTION, PROCESSING AND CONSUMPTION.

PERFORMANCE OBJECTIVE:

The objective here is to indicate the linkages between food and nutritional status and the various aspects of women's roles in food production, using information from research in nutrition and the social sciences.

CONCEPT:

Readings.

SUGGESTED ACTIVITY:

1. Develop a model showing the place of women in agricultural production, food processing, food marketing and food consumption.
2. Treating women as the independent variable, show possible effect of changing the social and economic position of women on food systems.
3. Treating women as the dependent variable shows the effect on women of modernizing production, processing and marketing sectors.
4. Develop a multi-factorial causal model showing possible impact of a nutritional project aimed at women on their social and economic roles.

WEEK III - MORNING 2

STORAGE AND PREVENTION OF FOOD LOSSES

It is suggested that this topic be treated in two different sessions. Storage in the morning session and Marketing in the afternoon session.

OBJECTIVE

Food losses in general and more specifically in Africa have been unacceptably high and are calculated to range from a minimum of three to seven percent to 30 percent of production. FAO goals call for national activities that will lead to a 50 percent reduction of post harvest losses. In many instances, the reduction of losses is seen as a more efficient and more economic strategy than increasing production. FAO, USAID, The National Academy of Science, the World Bank and other regional organizations are currently involved in efforts to develop programs for the prevention of food losses in African countries. Food loss reductions, however, will ultimately have to be achieved by national programs.

The objective of our discussion will be the consideration of various loss reduction strategies appropriate to specific environments and socio-economic conditions. Maintaining our perspectives as nutrition planners we will consider the problem in light of the competition between man, insects, rodents and bacteria, for scarce resources.

CONCEPT

(1) A fundamental problem for food loss experts is that of loss assessments, at various points of the complex road from harvest to consumption. The losses can occur at different levels of storage: farm level, village collecting points, central storage, trader storage, and finally consumer storage. Losses can also occur during transport or transfers from one owner to the next. Thus loss estimates have to be cumulative and data difficult to obtain for the entire process. Earlier reports from Africa indicated high losses at the farm and village level and this data seemed to support efforts to build up intermediate and centralized storage schemes. However, recent evidence appears to indicate that farm and village level storage losses in dry zones are relatively low—three to ten percent while centralized storage often shows enormous losses. One of the questions thus raised is whether additional storage could not become a base for a more viable loss prevention strategy?

(2) Traditional African farmers have regarded their storage as a means of reducing risks as well as a means for accumulating capital. Local control of their own food may be the best strategy for reducing risk of malnutrition in rural areas.

The problem for many nations is to effect an equitable distribution of food to assure the well being of the urban population as well as to assure lower grain prices.

This is why one of the major issues of food storage placement is aimed at distribution in marketing.

Another question revolves around the issue of emergency food supplies during shortages. Here the problem is once again multi-factorial: distance, transport and life expectancy of stored produce, storage process, management and other factors are involved. Alternative strategies depending on a viable transport and distribution system for emergency food supplies from the outside are advocated under certain circumstances.

(3) Finally, storage technologies and loss prevention techniques must be designated to be cost effective and appropriate to the environment.

An education effort to convince officials and populations that losses must and can be reduced is urgently needed.

CONTENT:

A field study, Of Millet, Mice and Men, may give participants more insights into storage problems at the farm-government levels. A general FAO paper defining policies is also included (1978 FAO Action Program For The Prevention of Food Losses).

Supplementary readings include an excellent and highly recommended technical outlook by the Academy of Science on food preservation.

DISCUSSION:

Using the available data from FAO and other sources; and assessing the possibilities for reducing post harvest losses, the participants are invited to consider (a) the option of shifting resources from production to prevention, and (b) the option of storage at local rather than at intermediate or central levels.

READINGS. WEEK III. MORNING 2.

Storage and Prevention of Food Losses

1. Guggenheim, Hans. 1978. Of Millet, Mice and Men: Traditional and Invisible Technology Solutions to Post-Harvest Losses in Mali: In: World Food, Pest Losses, and the Environment: ed. ed. David Pimentel. American Association for the Advancement of Science. West view Press. Ch 7. pp. 109-162.

Inadequate farm and village level storage is often blamed for post-harvest crop losses 20-40% according to statistics for Sub-Saharan Africa. Guggenheim's research on post-harvest damage to millet in traditional Dogon granaries in Mali, indicates average losses of only 2-4% annually, but reveals high losses in warehouses operated by the government marketing board. Suggestion for upgrading the position of the traditional granary in the overall marketing and storage system of the country are made in this and other papers by the author.

2. Berg, Elliot. 1979. Reforming Grain Marketing Systems in West Africa: A Case Study of Mali. Paper presented at the Workshop on Socioeconomic Constraints to Development of Semi-Arid Tropical Agriculture, ICRISAT, 19-23 Feb.

An examination of food-grain marketing, price, policy and storage problems of the West African Republic of Mali. The author concludes that in any successful storage reform a state grain agency will have to play a major role - even under minimalist, assumptions about the States's role in grain marketing - and that major improvements will result from indirect measures such as improvement and extension of feeder roads networks, better information about crops and marketing, better dissemination of such information and closer attention to relaxing production constraints on foodgrains.
This paper is an example of intersectoral policy planning, although nutrition itself is not considered a focal element.

3. Hodder, B.W. and Roger Lee. 1974. Market Centers. In: Economic Geography. New York, St. Martin's Press. pp. 135-147.

The authors conclude that "Marketing studies provide a suitable focus for geographies of consumption, production and cities and link them through a theoretical system. They provide clear illustrations of techniques appropriate to the analysis of markets in Africa.

4. Austin, James E. (Study Dir.) et al. 1976. Price-Altering Food Commodity Programs in Africa. Nutrition Intervention Assessment and Guidelines. Cambridge, Mass. Harvard Institute for International Development. Submitted to: United Nations ACC Sub-Committee on Nutrition. pp. 248-253.

Abstract from a world-wide survey by Austin, focusing on policies in effect in Africa. The table provides a useful supplement to the issues raised by Berg.

WEEK III -. AFTERNOON 2

SKILL DEVELOPMENT FOR ANALYSIS OF GRAIN MARKETING POLICIES, THEIR IMPACT ON PRODUCTION AND NUTRITIONAL STATUS

OBJECTIVES:

It may well be that food marketing strategies rather than production policies are the most critical element in the nutrition status of populations. Thus the purpose of these discussions will be to emphasize the central importance of marketing policies for nutritional planners.

CONCEPT:

In a large number of African countries, a central issue in food distribution revolves around parastatal marketing boards. The powers of these boards ranges from regulatory powers to complete control a sole purchasers and distributors of staple products.

On the other hand many countries have traditional marketing networks which begin at the local level and which move grain from the farm to rural as well as urban centers.

The degree of market controls is a political as well as an economic issue. Generalizations which do not take local conditions and national purposes into consideration are dangerous and specific data is needed for nutritionists to view marketing strategies in a planning context.

An especially difficult problem involves control or decontrol of price for staples. Such policies can have a major impact on the availability of food supplies as well as on the external trade. Food price differentials between urban and rural areas and sometimes in inaccessible parts of the country can constitute a critical factor in assuring sufficient food for less privileged groups.

High prices for staples (eg. sorghum, rice) may induce farmers to produce more food, but to turn away from cash crops. Thus affecting food costs in urban areas and with export balance. Low prices for staples may cause opposite effect and create problems for farmers.

CONTENT:

The readings include a study by Professor A. Berg--Reforming Grain Marketing Systems in West Africa and the supplementary readings include a series on Marketing in the Sahel.

Professor Berg's paper surely will appear controversial to many African readers and has been widely discussed at international conferences. Together with the University of Michigan Survey--Marketing, Price Policy and Storage of Food Grains in the Sahel, it should provide ample opportunity for raising hard questions about marketing policies.

DISCUSSION:

Participants will be asked to provide brief statements describing the macro and micro staple marketing systems in their countries.

The group could try to develop models that indicate the relationship between marketing policies and the nutritional status of different sectors of the population. Models could include the effect of post harvest losses in storage and handling.

WEEK III - MORNING 3

NUTRITION INTERVENTION PROGRAMS: POLICY AND PLANNING

OBJECTIVES:

Participants in the seminar have spent much time looking at the extent and the severity of nutrition problems and have considered the benefits of solving the problems for target populations.

However, it has been suggested that planning take in two considerations:

(1) the feasibility of solving the problem within social, economic and other constraints

(2) program performance data.

The objective of this session is to concentrate on these aspects of the planning.

CONCEPTS:

(1) The basic concept underlying our model for nutrition planning is that of the intersectorial approach to the amelioration of nutrition problems.

(2) Planning is above all a disciplined exercise which requires collection of facts, diagnosis problem, and the definition of goals.

The planning process has been broken down as follows:

Description of the national nutrition systems, quantifying to the extent possible all factors that appear to influence the nutritional status of the population. The description must include at least characteristics of the consumers and their nutrition problems, factors in the areas of food processing, distribution and production that affect consumption, and in other fields such as public health, economic policies and conditions that affect directly or indirectly nutritional status.

Selection of target groups, priority objectives and tentative goals. This step builds on the information gathered and analyzed in the descriptive phase.

Identification of points of intervention within the system already described which will cause a positive change toward the goals.

Comparison of alternative points of intervention and alternative interventions at each point.

Development of implementation plan, including final selection of goals and design of evaluation plans for the interventions selected.

WEEK III - MORNING 3

The underlying concept is that problem diagnosis can lead to intervention and foreseeable beneficial consequences. This concept is fundamental to man's belief in progress, however we may define progress. Without faith in this process and belief in the goal that basic human needs require our effort, planning would be an exercise at futility. It is the underlying concept of this seminar that planning to improve the nutrition status is based on a faith that progress is possible and that planned action has a chance to succeed.

CONTENT

Materials assembled here range from an early but significant analysis of the process of nutrition planning by Martin Foreman 1973 to recent work on developing intervention guidelines by Austin.

Because nutrition planning affects the lives of many people, approaches to planning differ sharply and are conditioned by political views. (Example: paper by Beghin)

The complexities of the planning process involve specific questions such as:

--the targeting of nutrition programs to specific population groups
--role of the professional medical and nutrition communities
--the functions of nutrition councils and coordinating bodies
--the role of universities, nutrition institutes and training
--the uses and abuses of International Aid and advice.
(Beverly Winikoff 1978)

II Other readings include the classical discussion by A. Berg and an evaluation of the political process regarding nutrition by J. Montgomery. Supplemental readings are provided.

DISCUSSION:

It is advised that the discussion should center on organizing the development of the structures within which meaningful nutrition planning can take place and which could lead to the implementation of national policy programs and projects.
A Poynor model reflects the intersectoral approach. These as well as other strategy planning models included in the readings should serve for participants as a basis for constructing operational nutrition planning models applicable to their countries. It is suggested that participants use the realities of their own countries as a realistic basis for such models and consider the feasibility of different approaches as a prime criteria for the quality of their plans.

READINGS WEEK III. MORNING 3

NUTRITION INTERVENTION PROGRAMS: POLICY AND PLANNING

1. Planning national nutrition programs: a suggested approach.
Volume I. Summary of the Methodology. Washington, D.C. Office of Nutrition, U.S. AID. 1973.

An approach to nutrition planning designed to aid nutritionists and national planners in evaluating nutritional implications of current development projects and in formulating new projects to meet specific nutritional needs. The document is intended as a step-by-step guide for the busy national planner, utilizing already available data. The methodology was developed in Ecuador, but has since been reviewed and modified by planners from 16 developing countries.

2. Intervention guidelines
James E. Austin (Study Dir.) et al. Urban Malnutrition. Problem Assessement & Intervention Guidelines. Summary. Paper submitted to the World Bank by Harvard University: pp. 54-67. 1976

The general nutrition planning framework discussing problem diagnosis, design of intervention alternatives and their evaluation, program selection and implementation. Intervention strategies and barriers to their implementation in urban environments are dealt with in detail. Cost for different intervention strategies are ranked by calories delivered to populations.

3. Policy directions and program needs
Alan Berg. The Nutrition Factor. Washington,D.C. The Brookings Institution. Ch. 12 pp. 195-210. 1973

Berg's book, The Nutrition Factor, from which this chapter is taken, has been instrumental in defining malnutrition as a major problem for developing nations. He calls for a broad committment, on the national and international level, towards improving nutritional status.

4. Nutrition and national development planning

Ivan Beghin. Paper presented at the Symposium on Approach to the Solution of Nutrition Problems, Ruschlikon-Zurich, Zwitzerland, 12-14 April, 1978.

A critique of current nutrition planning policy. The problems of underdevelopment, argues Beghin, cannot be solved without an understanding of its causes and the mechanisms by which it is perpetuated. Beghin challenges indicators selected and cut-off-points in defining malnutritional status for populations. The answer to both conceptual and practical problems of nutrition planning can only be found in a social and political context.

5. Nutrition and national policies

John D. Montgommery. In: Nutrition and National Policy, ed. Beverly Winikoff, Cambridge, Mass., M.I.T. Press, Ch. 16 pp. 451-460, 1978.

Montgommery analyzed the concept of nutrition policy and examines its technological, institutional, and motivational elements.

6. Program and policy: some specific questions

Beverly Winikoff. In: Nutrition and National Policy, Cambridge, Mass., M.I.T. Press, Ch. 20, pp. 423-547. 1978.

Five specific problem areas are explored in this article: 1. the targeting of nutrition programs to specific population groups; 2. the role of medical and nutrition professionals; 3. the functions of nutritional councils and coordinating bodies; 4. the role of universities, nutrition institutes and training, and, finally, 5. the uses and abuses of international aid and advice.

7. Marriage of Agriculture and Nutritions; and Food and Nutrition Policy in Africa.

E.O. Idusogie. Joint FAO/WHO/OAU Regional Food and Nutrition Commission for Africa. Special Paper No. 10. Accra, Ghana, 1977.

A careful inventory of the areas in which agriculture, food production, and nutrition intersect. On the basis of this inventory a number of policy recommendations are formulated.

8. Food Intakes and Nutritional Status - Implications for the Formulation of Development Policies for Zambia.
R.W. Wenlock. Ecology of Food and Nutrition, 7:203-211, 1979.

Results of previous food consumption and nutritional status surveys are combined to assess the major nutritional problems of the rural Zambian population. The results are then discussed in relation to overall development plans for Zambia.

9. Nutrition Planning.
L.I.F.E. Newsletter, Oct. 1978

An easy-to-read summary of the nutrition planning methodology suggested in (1) Planning National Nutrition Programs.

10. Food, Nutrition and Agricultural Policies in West Africa. A New Orientation.
Food and Nutrition Bulletin 1 (2) : 27-28, 1979.

A summary of the main recommendations from a workshop organized by the International Institute of Tropical Agriculture and the Department of Nutrition, University of Ibadan, in Cooperation with the World Hunger Program and the United Nations University, Ibadan, Nigeria, Dec. 1976.

11. An Analysis of an Integrated Approach to Education for Community Development..
Noreen M. Clark. In: Teaching Nutrition in Developing Countries or the Joys of Eating Dark Green Leaves. Meals for Millions Foundation pp. 14-23, 1977.

The success of an integrated, holistic educational program in Ethiopia is attributed to six guiding principles which lead to a merging of planner perceived needs with what learners themselves consider important.

AFTERNOON PROGRAM OUTLINE

WEEK 3 - DAY 3

TRANSLATING CAUSAL POLICY MODELS INTO OPERATIONAL INTERSECTORAL INTERVENTION MODELS

I. PERFORMANCE OBJECTIVES:

Take a causal model of nutritional status, either one developed by the group or the poynor model (see folder Week 1 - Day 1) and translate it into an operational model suggesting line of interaction between ministries, agencies and nutrition planning cells.

II. CONCEPTS:

Participants will notice that the requirements of an operational model differs from that of the causal model. Lines of decision making and authority as well as flow of information have to be taken into consideration. Established interest groups cannot be wished away in a realistic operational mode. That takes a concrete situation as a starting point. As a result participants using the political, economic and social realities of their countries as a starting point will find that the operational models may differ considerably from hypothetical causal constructs.

III. CONTENT:

Poynor and other models in the readings: Organizational structure of ministries and agencies in different countries.

IV. SUGGESTED ACTIVITIES:

Small groups representing various ministries and social groups should try to negotiate a hypothetical structure that could implement a nutrition policy

WEEK III - MORNING 4

NUTRITION INTERVENTION PROGRAMS: IMPLEMENTATION AND EVALUATION

OBJECTIVES:

In the words of M. Zeitlin, program evaluations are feedback procedures for monitoring and improving consciously controlled systems. Emphasis in this statement is on the words "consciously controlled systems". Obviously the degree of control will vary in accordance with the size of a project, programs, or national policy plan, and evaluation procedures would have to change accordingly. However, no matter what the proper dimension of program may be, evaluation procedures need to be an integral part of the initial plans.

The objective of this last workshop session is to study a range of evaluation systems and to determine their respective usefulness for the projects designed by participants.

CONCEPTS:

It is helpful to distinguish two basic types of evaluations:

(1) Evaluation procedures conducted by program participants that monitor proceedings and permit periodic adjustments to changing conditions.
(2) End of project evaluations that evaluate the success or failure of a program. Such evaluations are often difficult to conduct since unanticipated benefits or negative consequences may often develop after a considerable time lapse.
(3) The selection of indicators to measure the results of intervention as well as operational procedures are critical.

CONTENT:

The materials provided include a P.G.P. by Jonathan Fisher as well as the words of Austin and Zeitlin.
Project Evaluation Guidelines developed by AID are not specifically oriented to nutrition programs but should be carefully studied because they provide logical framework of analysis for project evaluations.

DISCUSSION:

Participants should discuss the cost and benefits of different evaluation programs and the cost benefits of evaluation procedures to ongoing projects and on a national level to planners.

WEEK III - MORNING 5

OBJECTIVES:

1. Discussion of the evaluation results from previous day.
2. Develop a framework for continued interaction between the group and members of Meharry College as well as among themselves.

READINGS WEEK III. MORNING 4.

NUTRITION INTERVENTION PROGRAMS: IMPLEMENTATION AND EVALUATION

1. The perilous journey of nutrition evaluation
James E. Austin. American Journal of Clinical Nutrition, 31: 2324-2338, 1978.

Nutrition program evaluations have been insufficient and deficient, leaving planners with inadequate feedback. The barriers to nutrition project evaluation are considerable. Austin analyzes them from a technical, financial, psychological and political point of view. He then poses and answers a series of critical evaluation questions in which he also includes a discussion of performance indicators.

2. Directions for the evaluation of nutrition education
Marian Zeitlin. In: Teaching Nutrition Education in Developing Countries or the Joys of Eating Dark Green Leaves, ed. Kathryn Shack. Meals for Million Foundation, pp. 170-193, 1977.

The main thrust of this article is on special characteristics and procedures for nutrition education evaluation and the use of the KABINS model (Knowledge, Attitudes, Behavior, and Improvement of Nutritional Status).

3. Approaches to appropriate evaluation
L.I.F.E. Newsletter, Dec. 1978.

Brief case studies dicussed in terms of application of a wide range of evaluation methods and how findings helped in readjusting programs.

4. Project evaluation guidelines
3rd edition. Washington, D.C., U.S. AID.

The guidelines for project evaluation utilized by U.S. A.I.D. Project design and evaluation are treated as parts of the same cogical framework. An extensive appendix is included, with a glossary and work sheets for project design, perfonmance analysis and progress review.

6.03 Each of the following sub-sections therefore discusses:

(i) the purposes of evaluation;
(ii) the specific hypotheses to be tested;
(iii) the key indicators;
(iv) the survey and sample characteristics;
(v) the questionnaires to be used;
(vi) the timing and organization of field data gathering;
(vii) the data tabulation, processing and analysis procedures; and
(viii) the reporting of evaluation results.

EVALUATION OF NUTRITIONAL INTERVENTIONS THROUGH RURAL EXTENSION SERVICES

1. The project area has been divided into four sub-areas. Farmers in each sub-area benefit from various intensities of agriculture and social extension services. The different intensities of agriculture and social extension services that are provided to the farmers are shown in Table 1.

TABLE 1

MODELS OF INTERVENTION IN THE SERGIPE PROJECT

Action	Models			
	A	B	C	D
Actions in the sectors of production, marketing, nutrition and health	Yes	Yes	Yes	Yes
Organization of farmers	Yes	Yes	Yes	Yes
Use of ATER - aids	No	Yes	No	Yes
Advance purchase of production	No	No	Yes	Yes

2. The main purpose of the evaluation of this component is to seek to identify cost-effective mixes of agricultural and social extension by careful control and analysis of various extension combinations. Information generated from the test would be used by relevant agencies in planning the deployment of resources for future rural development projects.

3. The specific hypotheses to be tested are: (i) each of the types of assistance has positive effects; (ii) the advance purchase of production reduces the risks to producers (they will be disposed to produce higher quantities for a given set of resources and production potential); and (iii) the use of ATER aids increases the flow of technical and economic information available to producers, thereby improving their consumption and production decisions. The procedures that were developed to test these hypotheses are as follows:

WEEK III - AFTERNOON 4 (continued)

(1) The afternoon session should involve the design of evaluation procedures adapted to programs developed by the participants during the workshop.

(2) Participants are invited to develop a framework for evaluating this workshop with the purpose of modifying and improving its content and procedures for the future. This evaluation should be discussed the following day.