

A RESOURCE UNIT FOR PARENTS ON THE NEED
OF PROTEIN IN THE YOUNG CHILD'S DIET

By

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PREFACE

This study has been of special interest to me due to the fact that so many new and interesting findings have been made in regard to protein in both health and disease. Heretofore, most of the emphasis has been placed on vitamins and minerals but protein is now claiming a place of prominence in the thinking of nutritionists. The discoveries of modern science are making it more and more possible for each individual through health education to live a longer and richer life. As a teacher and also a parent I feel a sense of responsibility to teach health information to all interested parents.

I am grateful to the members of the faculty of Oklahoma Agricultural and Mechanical College who have made the completion of this study a reality. Especially am I indebted to Miss Anna May Johnson, Associate Professor of Home Economics, for her constructive suggestions and guidance of the entire study, to Miss Mary E. Currier, Associate Professor of Household Science, who directed the scientific survey and gave many constructive suggestions, to Dr. Millie V. Pearson, Professor and Head of the Department of Home Economics Education, Assistant Adviser whose encouragement and suggestions made this study a possibility, and also to Dr. Cecil B. Williams, Professor of English, for reading and correcting the manuscript.

H. M. T.

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CHAPTER I

A SURVEY OF SCIENTIFIC STUDIES AND THEIR APPLICATION

The purpose of this resource unit is to bring together scientific facts gained from research studies and to formulate non-technical suggestions and methods that conform to the findings in order that teachers, parents, and lay leaders might use them. Modern parents who are anxious to understand their children, appreciate their abilities and weaknesses, guide their development, and influence their behavior and character need to lay the foundations for well-adjusted personalities.

The preschool child is in a fascinating period of life and is ever changing. He is an individual who does not conform to any set pattern but needs always to be modified in more favorable directions by a responsive home environment in which wholesome development is fostered. Being an individual in a democratic society he deserves to develop into a physically sound, mentally alert, and socially well adjusted child.

Since the pressure of modern living creates tension in children, they need special protection to enable them to withstand the stress. Rest and relaxation are dependent upon three important conditions: nutritional satisfaction, emotional calmness, and environmental serenity. Optimum nutrition provides adequately for the child's growth and maintenance. The modern science of nutrition has shown the effect of the different nutrients on the child, and the conditions necessary for the utilization of them for his well-being. Each food has a definite function but a balance of all nutrients is required for a positive state of health.

This unit will deal with only one phase of the diet, that of protein. The scientific review will be given first and then in non-technical terms suggestions will be given for incorporating the ideas into each day's diet.

The unusual interest today in the role of protein in the diet, coming as it has after more than a decade of exceptional interest in vitamins, is largely the result of a process of catching up on our knowledge of the importance of proteins in nutrition.

Protein is a normal constituent of all animal cells and body fluids. It is an essential component of both the protoplasm and the nucleus of the cell; hence, it exerts a profound influence on growth. McCollum and Becker (1940) say that:

Searching studies of the nature of proteins have shown that they are giant molecules composed of at least twenty-three single substances called amino acids. These are linked together in such a way as to make a fabric structure. During digestion these are taken apart into the simple amino acids, and are absorbed and utilized as the principal building blocks for muscles, liver, kidney, and other body structures.¹

When protein was hydrolyzed it was found that the number of amino acids is twenty-five, but there is adequate experimental evidence to show that only ten of the twenty-five amino acids are indispensable for animal growth, while it is thought that only eight are indispensable for man.² Rose (1946) points out, however, that under the stress of growth or disease two more, histidine and arginine, may become essential to man. An essential amino acid is defined by Rose as "one which cannot be synthesized

¹ E. V. McCollum and J. E. Becker, Food, Nutrition and Health, p. 5.

² S. Z. Levine, "Protein Nutrition in Pediatrics," Journal of American Medical Association, CXXVIII (May, 1945), 283.

for materials in the diet at a speed commensurate with demands for normal growth."³

There are practical reasons for more interest in the study of the essential amino acids and their importance is discussed by Cannon (1948), who has further evidence that in the process of tissue synthesis, there must be adequate amounts of all the essential amino acids available to the synthesizing mechanisms and that they must be available in the proper relationship one to another.⁴

Since amino acids must be available simultaneously both with respect to quantity and mutual proportionalities, the efficiency of protein synthesis may be affected both by amino acid balance of the food and by variations in the rates of absorption of the amino acids.

The exact amount of protein in the diet which would result in best growth, greatest resistance to ailments or disease, and produce the greatest efficiency of the physiological functions of an animal over an extended life span, has not been definitely agreed upon by physiologists and dietitians. Slonaker (1931-1938) worked on this in a series of experiments. His purpose was to determine the effects of continuous feeding of protein levels of from three to thirty per cent in an otherwise well balanced diet. His results indicated that when best growth is considered the amount of protein in the diet should be slightly in excess of fourteen per cent. A deviation of four per cent, less or more, produced no serious physiological disturbance. Slonaker shows further that as the per cent of protein

³ W. C. Rose, "Role of the Amino Acids in Human Nutrition," Science, CV (January, 1946), 15-16.

⁴ Paul Cannon, Some Pathologic Consequences of Protein and Amino Acid Deficiencies, p. 33.

increased beyond the optimum there was a progressive retardation in growth. Similar results would be obtained if the per cent of protein were reduced progressively below the optimum.⁵

Sherman and Ragan (1948) worked on an animal study with the purpose of finding whether or not other factors entered into the results of finding the most desirable protein level in a diet. They found that increasing the riboflavin resulted in increased appetite and growth in a twenty per cent protein diet and also in other diets in which the percentage of protein was less, thus proving that the presence of riboflavin in adequate quantity is essential to efficient utilization of proteins.⁶

Store and Thorn (1943) suggest that from the practical standpoint, the protein requirement of man is definitely related to the amount of carbohydrates and fat in the diet. When sufficient energy-yielding food is available, then protein will not be used appreciably as a source of energy. This will lessen the protein requirement considerably.⁷

Rose and co-workers (1946) suggest the amount of protein required for a man as one gram for each kilogram of body weight,⁸ but Sherman (1947) in

⁵ James R. Slonaker, "The Effects of Different Per Cents of Protein in the Diet of Successive Generations," American Journal of Physiology, XCVI (March, 1931), 547.

⁶ H. C. Sherman and M. S. Ragan, "Effects of Different Protein and Riboflavin Contents of Diet Upon the Chemical Composition of the Body," Proceedings of the National Academy of Science of the United States, XXXIV (August, 1948), 384.

⁷ F. J. Store and G. W. Thorn, "Some Medical Aspects of Protein Foods," American Journal of Public Health, XXXIII (December, 1943), 1444.

⁸ W. C. Rose, A. Borman, T. R. Wood, H. C. Black, E. G. Anderson, "An Essential Amino Acid Study and Its Relationship to Growth," Journal Biological Chemistry, CLXVI (December, 1948), 585.

his summary of protein needs confirms the normal dietary needs as ten to fifteen per cent of the total calories.⁹

Amino acids have other functions in the diet besides the furnishing of nitrogen. Bell, Scheer, and Devel (1948) concluded that the formation of niacin in the organism of the rat is dependent on the intake of tryptophane.¹⁰ Sarett and Goldsmith (1949) in a study on six adults, three women and three men, found evidence to suggest that tryptophane is converted to nicotinic acid compounds by man.¹¹

Store and Thorn (1943) relate that in the general concept of bone growth and nutrition one is apt to think principally of calcium, phosphorous, and vitamin D, and it should be remembered that bones have an extensive protein matrix. The protein matrix is equally necessary for proper bone formation, maintenance, and repair.¹²

Evidence has shown that syndromes have been produced by a single amino acid deficiency, but Store and Thorn (1943) state that since adequate quantity and quality of protein are necessary for all forms of life, the extent of their relation to the problems of health and disease are unknown.¹³

For specific deficiencies a study by Anderson and Nasset (1948) has

⁹ H. C. Sherman, Chemistry of Food and Nutrition, p. 211.

¹⁰ G. H. Bell, B. T. Scheer, and H. J. Devel, "Niacin Excretion in the Rat in Relation to Tryptophane, Pyridoxine, and Protein content of the Diet," Journal of Nutrition, XXXV (February, 1948), 239.

¹¹ H. P. Sarett, and G. A. Goldsmith, "Tryptophane and Nicotinic Acid Studies in Man," Journal of Biological Chemistry, CLSSVII (January, 1949), 461.

¹² F. J. Store and G. W. Thom, "Some Medical Aspects of Protein Foods," American Journal of Public Health, XXXIII (December, 1943), 1444.

¹³ Ibid.

shown that an isolencine-deficient diet causes decrease in the efficiency of energy and nitrogen utilization.¹⁴

Of all the indispensable amino acid deficiencies, tryptophane deficiency probably affords the best example of a possible specific lesion. Totter and Day (1942) found that a tryptophane deficient diet caused the development of cataracts in young rats.¹⁵ Albanese (1945) in an animal study associated tryptophane deficiency with other pathologic consequences, such as corneal vascularization and sterility in both sexes.¹⁶

The influence of lysine deficiency upon growth has been demonstrated in studies on rats by Harris, Neuberger, and Sanger (1943).¹⁷ Albanese and Holt (1941) made a study of lysine deficiency in man. When the subjects were placed on a diet adequate in everything except lysine, they found both a negative balance and such symptoms as nausea, dizziness, and an abnormal sensitivity to noise.¹⁸

Methionine deficiency has become unusually interesting because of the apparent importance of the sulphur-amino acids in liver metabolism. There are conflicting data on the relative parts played with cystine and methionine

¹⁴ J. T. Anderson and E. S. Nasset, "Nitrogen Balance Index and Specific Dynamic Action in Rats Receiving Amino Acid Mixtures Low in Isolencine, Methionine or Valine," Journal of Nutrition, XXXVI (December, 1948), 703.

¹⁵ J. R. Totter and P. L. Day, "Cataract and Other Ocular Changes Resulting from Tryptophane Deficiency," Journal of Nutrition, XXIV (August, 1942), 159.

¹⁶ A. A. Albanese, "Corneal Vascularization in Rats on a Tryptophane Deficient Diet," Science, CI (June, 1945), 619.

¹⁷ H. A. Harris, A. Neuberger, and F. Sanger, "Lysine Deficiency in Young Rats," Journal of Biological Chemistry, CXLVII (June, 1943), 508.

¹⁸ A. A. Albanese, and L. E. Holt, Jr., "Nitrogen Balance in Experimental Lysine Deficiency in Man," Proceedings of the Society of Experimental Biology and Medicine, XLVIII (December, 1941), 728.

in the process of hepatic necrosis, but it is reasonably certain that a deficiency of methionine even in the presence of choline, leads to general symptoms of amino acid deficiency disease, regardless of the hepatic changes. Albanese, Holt, Irby, and Brumback (1946)¹⁹ have shown that hypoproteinemia and anemia are induced in rats on a methionine- and cystine-deficient diet.

It is known that arginine is an indispensable amino acid for animals, as they cannot synthesize it rapidly enough for adequate growth. Also there is marked atrophy of the testicles in young rats fed an arginine-deficient diet.

The question arises: is arginine necessary for human subjects? Rose and co-workers (1946) have found that arginine is not necessary for human adults in maintaining nitrogen equilibrium²⁰ while Holt and his associates (1942) found in a study on three male subjects that an arginine deficiency led to testicular malfunctioning despite the fact that the individuals were all in nitrogen balance.²¹

In animal studies it has been shown that valine deficiency renders rats extremely sensitive to touch and causes lack of coordination in movement. Threonine deficiency induces edema and ascites. These conditions were not noticed in mice which were fed diets deficient in any other essential amino acids.

¹⁹ A. A. Albanese, L. E. Holt, Jr., V. Irby, and J. E. Brumback, Jr., "The Effects of a Methionine and Cystine Deficient Diet on the Blood Plasma of Rats," Journal of Biological Chemistry, CLXV (September, 1946), 179.

²⁰ W. C. Rose, A. Borman, T. R. Wood, H. C. Black, and E. G. Anderson, "An Essential Amino Acid Study and Its Relationship to Growth," Journal of Biological Chemistry, CLXVI (December, 1946), 585.

²¹ L. E. Holt, Jr., A. A. Albanese, L. B. Shettles, C. Kajdi, and D. M. Wangerin, "Studies of Experimental Amino Acid Deficiency in Man," Federation Proceedings of the American Society of Experimental Biology, I (January, 1942), 116.

The science of nutrition as it has developed through the years has presented a constantly changing picture. According to the trend of research and the appeal to the imagination made by the discoveries of the day, first one coloration and then another has dominated the picture. One aspect of the present picture is a greater appreciation of protein. Knowledge of the results of deficiencies and the requirements for various needs all are of importance to us.

From the above evidence it is apparent that there is a need for proportionately larger amounts of proteins in the diets of growing children. Bogert (1943) gives some factors that influence quantity of food protein necessary to meet the body needs as follows: (1) need for building new tissues, (2) size of the body, (3) biological value of the protein eaten, (4) completeness of digestion and absorption.²² It is generally accepted that for children of pre-school age the amount of protein should be about twelve to fifteen per cent of the total calories.

Authorities agree that animal proteins have a greater biologic value than vegetable proteins. Mitchell (1924) defines the biological value of protein as "the sum of the fractions of nitrogen retained in the animal for growth and for maintenance."²³ Since the biological values of different protein vary so widely Bogert (1943) suggests that about two-thirds of the protein in the diet of children should be of animal origin. Milk and eggs should be the chief part of this amount, as they furnish complete protein, the kind most efficient for growth.²⁴

²² Jean Bogert, Nutrition and Physical Fitness, p. 121.

²³ H. H. Mitchell, "Measurement of Biological Value," Journal of Biological Chemistry, LVIII (March, 1924), 875.

²⁴ Jean Bogert, Nutrition and Physical Fitness, p. 121.

The amount of protein in diets in this country, as well as the relative proportions of vegetable and animal protein, varies a great deal. Physicians have followed Sherman's suggested amount of approximately one gram of protein per kilogram of body weight for optimum nutrition in the adult, while in childhood the requirements are much higher in relation to body weight. Melnick (1943) recommends three and four grams of protein daily for each kilogram of body weight.²⁵

The National Research Council suggests that specific quantities of protein be allowed per individual, depending upon the degree of maturity, sex, and physiological state. The protein requirement per day for optimal nutrition according to the recommended standards by the National Research Council are as much as fifty grams for children from four to six years of age.

There is a great need to evaluate the food that children eat and also to consider the problems that enter into the pattern of children's food intake. Fortunately, the protein foodstuffs of animal origin in common usage, milk and milk products, meat, fish, and eggs, supply all the essential amino acids. There is a problem in the eating of meat as the chewing presents a problem. This problem can be taken care of in the preparation of the food. Meat can be ground or cut into bite size; fish can be flaked, but however the food is prepared, it must be in a form easily handled. Mild flavors are most desirable, and servings of a reasonable size are best.

The whole grain cereals, bread, potatoes, and legumes may supply the protein of vegetable origin. These are accepted quite well by children.

²⁵ Daniel Melnick, "The Essential Amino Acids in Human Nutrition," Journal of American Dietetics Association, XIX (July, 1943), 685.

Milk protein is of great value in supporting tissue building; hence, if a child is fed a quart of milk daily, it will be fairly certain to receive a safe surplus of protein in a very desirable form. Egg protein is considered to be very high in biological value, and its supplemental relationship to meat protein or bread protein is very satisfactory.

Since the supplemental relationship of the protein in one food product to that in another is of great importance in human nutrition, it is well to know the biological value of the chief proteins that make up the greater part of a child's diet.

Sahyun (1948) gives the biological value of whole milk as 90; white bread, 45; whole wheat bread, 67; cereals from 53 to 78; legumes, 38 to 75; potatoes, 67; egg albumin, 83; whole egg, 94; pork ham, 74; pork tenderloin, 79.²⁶

The supplemental relationship between the protein in pork and that in eggs and the effectiveness of cystine and methionine in correcting the deficiency in pork were worked out by Hoagland (1947). When pork was given in a diet in the ratio of 10 per cent of the total calories the protein in both fresh and cured hams continued insufficient cystine and methionine for optimum growth, but when the pork protein was supplemented with these amino acids, the growth promoting value was equal to that of protein in egg.²⁷

Hoagland (1948) worked further on the supplemental value for beef protein. When protein constituted ten per cent of the diets the results indicated very clearly that beef protein was deficient in either cystine

²⁶ Melville Sahyun, Proteins and Amino Acids in Nutrition, pp. 58-65.

²⁷ Ralph Hoagland, N. R. Ellis, O. G. Hankins, "Supplemental Relationship Between Pork Protein and Egg Protein," Journal of Nutrition, XXXIV (July, 1947), 43.

or methionine. When beef protein was supplemented with either cystine or methionine, the growth-promoting value of beef protein and egg protein were practically the same.²⁸

Spies (1949) worked with a group of eighty-two children selected from a nutrition clinic to study the effect of milk supplements on their growth. This was a three year study initiated to determine the effect of the daily supplementation of a known amount of either whole milk or non-fat dried milk. The subjects were paired, and the method of study was divided into three phases: (1) premilk phase, (2) a milk phase for twenty months after which one child in a pair was given a supplement of the equivalent of one quart of milk each day, (3) post milk phase which lasted twelve months.

The Wetzel Grid technique was used in the evaluation to measure the changes in growth which occurred in each child during the period of investigation.

The supplement for one child in each pair was either three ounces of non-fat milk powder or four and one-fourth ounces of whole milk powder.

During the milk period thirty-four per cent of the children who received milk supplements showed improved development, while in twenty-two per cent there was no change, and eighteen per cent showed deterioration in physical well being.

In the control group in which supplements were not given only fifteen per cent improved; twenty-seven per cent showed no change; and fifty-nine per cent lost status.

Findings were listed under (1) direction for development, (2) speed of development, (3) quality of growth.

²⁸ Ralph Hoagland, "Supplemental Value of Certain Amino Acids for Beef Protein," Journal of Nutrition, XXXV (February, 1948), 167.

The most extensive improvements in the direction of development occurred in the group receiving whole milk. The rate of development of the great majority was dependent to some extent upon the type of milk, the whole milk proving superior.²⁹

Very few studies have been made on the biological value of proteins where children have served as the experimental subjects. However, a two-year study by Mack (1947) has been made in which approximately two hundred fifty children were studied. The children were divided into two groups for study. Group I received dietaries that contained meat twice weekly with the remaining protein derived from macaroni, legumes, peanuts, and peanut butter. Group II received dietaries that contained meat ten times weekly.

Group I had more leafy vegetables, and the caloric value of each dietary, as well as the nutrient content on a calculation basis, met or exceeded in all respects the recommendations of the National Research Council.

The medical observation showed that Group II was superior to Group I in general condition of the skin, in the skeletal mineralization process, in the weight status for the sex and age, in hemoglobin, in red cell count, in absence of fatigue, in certain serum protein fraction relationships, and in reflexes.

The conclusion of this study was that animal foods are superior to vegetable foods as dietary source of protein. The high protein content of vegetable protein is deceptive in that there is an enormous loss of nitrogen in the course of utilization in digestion or in metabolism.

²⁹ T. D. Spies and Samuel Dreizen, "The Effect of Milk Supplements on the Growth of Children with Nutritive Failure," Journal of Pediatrics, XXXIV (April, 1949), 393.

The conclusion was further drawn that milk, eggs, meat, poultry, fish, and cheese are superior in nutritive efficiency to most vegetable protein.³⁰

There is little information in the literature relative to the amount of protein which children of various ages beyond infancy should be given.

Daniels (1935) made a nitrogen balance study of the protein needs of preschool children.³¹ The study reported one hundred twenty-one nitrogen balances with an observation period from fourteen to twenty-one days on twenty-four normal children.

Table 1 shows the relation between ingestion and retention of nitrogen when protein intake is varied.

The amount of protein given varied from 0.9 to 1.6 grams per pound of body weight, divided evenly among three meals. Nitrogen determinations by the Kjeldahl method were made with aliquots of each of the twenty-four hour urinary excretions, aliquots of the total dried fecal excretions of the entire period, and aliquots of the food given for a given day.

TABLE 1

NITROGEN BALANCE SHOWING RELATION BETWEEN
INGESTION AND RETENTION OF NITROGEN

<u>Amount in Grams Per Kilogram of Body Weight</u> <u>Ingestion</u>	<u>Retention</u>
0.45 - 0.49	0.078 - 0.083
0.06 - 0.064	0.090 - 0.096
0.55 - 0.59	0.121

³⁰ P. B. Mack, "Comparison of Meat and Legumes in a Controlled Feeding Program," Journal of American Dietetics Association, XXIII (June, 1947), 488, 588, 677.

³¹ Amy Daniels, "A Study of the Protein Needs of Preschool Children," Journal of Nutrition, IX (January, 1935), 91-106.

The highest protein intake resulted in the greatest retention.³²

Nitrogen retentions studied from the standpoint of either body weight or muscle development seem to point to the conclusion that children of the pre-school age need more protein than we have hitherto supposed. Instead of one gram per pound, the amount usually considered adequate, approximately 1.5 gram per pound would seem to be more nearly the requirement of the majority of children of preschool age.

Porter (1939) studied nitrogen balance of three normal preschool children. A total of forty-three nitrogen balance studies were made over a period of sixty days.

The subjects' ages ranged from two years, seven months, to five years, six months. The total daily nitrogen intake for the three averaged from 6.42 grams to 7.94 grams, with a nitrogen retention of 1.26 grams and 1.30 grams respectively. This represents a protein consumption of about forty grams per day for the youngest to fifty grams per day for the oldest.

The protein furnished about twelve per cent of the total energy value of the diets. This indicated daily protein consumption average from 2.12 grams per kilogram of body weight for the oldest to 2.68 grams for the youngest.³³

Lew (1946) made a nitrogen metabolism study of eight preschool children over a period of five months.

The protein allowance in the diets was planned to equal or exceed the suggested allowance of the National Research Council, varying from forty-

³² Ibid.

³³ Thelma Porter, "Nitrogen Balance of Normal Preschool Children," Journal of American Dietetics Association, XV (June, 1939), 427-434.

five grams for the three-year-olds to fifty-eight grams for the five-year-olds.

The nitrogen contents of the foods and excreta were determined by using the Hengar semi-micro-Kjeldahl apparatus. The average nitrogen retention values for the eight children of this study fall well within the range of 700 ± 470 milligrams for four-year-olds, and 610 ± 390 milligrams for five-year-olds.³⁴

The protein requirement of children varies inversely with age and is directly proportional to the rate of growth. The recommended daily allowances for protein should expand for the growing period and range from 4.2-2.9 grams per kilogram for the one through three-year-olds and from 3.3-2.5 grams per kilogram for the four through six-year-olds.

Most studies suggest that from 50 per cent to $66 \frac{2}{3}$ per cent should come from animal sources.

With these scientific facts in mind the foregoing studies might be summed up in this manner. The child's protein requirement is proportional to the energy requirement. About twenty per cent of the total calories provided in the diet should be protein, and this protein is best when furnished from animal sources such as eggs, lean meat, fish, and milk. The vegetable proteins are not as easily digested because they contain an excess of fibrous material and they are not as valuable to health.

None of the food nutrients work independently of the others; so the stress needs to be placed on the well-rounded diet with ample protein provided for growth.

³⁴ M. S. Lew, "Nitrogen Metabolism of Preschool Children," Journal of Nutrition, XXXI (June, 1946), 665-672.

There are problems that do frequently arise in feeding the protein foods and it is desired to give help on that phase. For some children meat is a problem. The digestion of meat protein is practically complete, but the period of digestion varies with each food. The method of cooking has a great deal to do with digestion also. Meat that is dried in cooking, fried with fat, or improperly masticated digests more slowly. Hence, the manner of cooking is important. Meat should be ground or cut into bite size and cooked in such a way as to be tender but not highly seasoned. It can be varied by broiling, roasting, hashing, stewing, scalloping, or combining with vegetables.

Similar problems arise relative to the use of eggs. For instance, a fried egg may be objectionable because it is slippery and hard to handle. In some form or other, an egg a day is desirable. Soft boiled, scrambled, poached, custard, whips, egg-nog, and omelettes are all acceptable to most children.

Children need milk, but as a beverage it presents a problem for many. Usually the problem can be solved by including it in cereals, soups, creamed dishes, ice cream, junket, and custards. A child may prefer different drinking containers for variety, and at times vegetable coloring may be added as an attraction.

Seemingly good advice to remember in feeding the preschool child is that appetites vary with activity. A consistent amount need not be eaten. Unwillingness to eat may be due to a variety of causes, such as overfatigue from undesirable home conditions, too strenuous play, physical upset before an illness or from diseased tonsils or teeth, past association with a particular food, influence of an adult dislike, or last, but not at all least, a bid for attention.

It has been said before that good food habits are very important and that the earlier they are formed the better for all involved. Health is a valuable asset to the development of the child and his ability to adjust to his environment. Failure to establish good habits may be the fault of the parent but ultimately it traces to the need for education concerning child development.

CHAPTER II

NATURE AND IMPORTANCE OF THE PROBLEM

Each child is an individual, a growing person with the right to physical health and happiness. Physical health goes hand in hand with mental health and must be recognized as an essential of education. The parent whose task it is to feed the family has a responsibility to be taken seriously. Since one cannot function efficiently without the proper quantity and quality of food or continue to live without food, nutrition is a subject of vital importance. When food is provided in adequate amounts and from the correct sources, optimum growth and health may be realized. A properly nourished person can live a richer life because he has more time, energy, and money available for furthering development in various ways.

Statistics show that there are between forty and forty-five million people in the United States whose efficiency as human beings is impaired because of malnutrition. Although many of these people do not show visual symptoms of abnormalities, the effects of hidden hunger for minerals, vitamins, and other elements of the diet are there. Improper nutrition does not necessarily mean a lack of quantity of food. A child may eat heartily but because of a poorly planned diet miss out on some essential nutrient such as protein which a child needs in large amounts for growth. In general, hidden hunger may be indicated by a lack of vigor and endurance, poor posture, such as flat chest and protruding stomach, irritability, increased susceptibility to disease, or undeveloped physique. Henry C. Sherman in writing on this subject makes this statement:

To a much more important extent than had been supposed we build our own life histories by our daily use of food. The influence

of nutrition upon health and, through health, upon the well being of our life processes begins before birth. It affects both physical and mental growth and development in childhood and youth, and our consequent health, efficiency and life-expectation as adults.¹

By means of wise selection and use of food adults and children's health can be raised to a higher level. One of the major scientific advances of our times has been the knowledge concerning the relation of food to health.

In the last twenty years, America has become vitally interested in its responsibilities to children and youth. The need for this realization was emphasized during the war. Surveys have revealed a state of parenthood that indicated a need for information. Worthy home membership is recognized as one of the seven cardinal principles of secondary education.

The reasons for this parental need of continued education are: (1) Rapid cultural changes have necessitated that lives be adjusted to meet the needs of modern society, domestic traditions are no longer sufficient; (2) Science has made many discoveries in recent years with which parents need to become familiar; (3) Parents must develop a keener realization of the difficulties of childhood in our present culture.² The fact that the standards of living have been advanced remarkably by the growth of American civilization does not mean that every child is well fed.

Parent education should begin before the birth of the child, but again information is very effective when the child is of preschool age. This age represents a time when wise guidance can be extremely significant and

¹ Henry C. Sherman, Food and Health, Preface p. v.

² American Association of School Administrators, Education for Family Life, p. 84.

helpful in the establishing of the total pattern of life.³

Food has been a problem of all races the world over. Naturally, in some sections it is a greater problem than in others. Americans are used to thinking that we have a high level of nutrition, and that is true when we compare our level with that of many other peoples of the world. But the standards set by modern nutrition show that as a nation only one-third of our people are well nourished.⁴ This seems to be a strange happening in a country with such resources as we possess. The malnourished are found not only in the lowest income brackets, but also found in families able to buy almost everything they want.

The fact has been recognized that food habits become firmly fixed and that changes are difficult to make. There is a need for parents to realize that life is a one-way street, and that none leads back. The very best foundation for the health of the child should be desired, as that is the best form of health insurance one can obtain.

The suggestion for this particular study originated on the campus of Ouachita Baptist College at Arkadelphia, Arkansas. Ouachita is a small liberal arts college with an enrollment that ranges from 750 to 900 students. About one-eighth of this enrollment is made up of men studying for the ministry. Approximately another one-eighth of the students are women who plan to do some type of church work or welfare work.

Since the home economics department does not train students for vocational teaching, it is the desire of the administration that the department act as a service institution as much as possible. Therefore, the nursery

³ Carleton Washburne, A Living Philosophy, p. 102.

⁴ D. E. Bradbury and V. V. Drenckhahn, Good Food and Nutrition, p. 301.

school operated by it is organized in such a way as to suggest ideas usable in a church nursery. It is also used by other organizations from time to time, as it is conveniently located next door to the college auditorium.

Some of the married couples living on the campus have realized their need for information on feeding preschool children. They have asked members of the home economics faculty for assistance in obtaining and interpreting reliable information. These people come from two college groups. The situation involving the first group is a permanent one but the other is not likely to continue for more than two or maybe three years.

This first group is composed of wives whose husbands are studying for the ministry. They live in a very attractive little circle of white cottages built on the bluff overlooking the Ouachita River. The building each of these cottages was financed by different Baptist churches in the state which had a special desire to aid ministers in the furthering of their education. When the given church has no ministerial student in school the cottage built by that church is rented to another minister for a small sum. It is considered a privilege to secure one of these cottages as there are not enough to accommodate nearly all of the ministerial students.

Many of these ministerial couples expressed a desire to use their income to an advantage. In doing so they have two aims in mind when seeking information. One is to acquire knowledge that will help them in their own family living, and the other is for information that will enable them to be good counselors on their church fields. These ministers and their wives are attempting in this way to have their churches become forceful agencies in the education of adults for home living.

The second group of parents are from Trailer Village adjoining the college campus. Since this is not likely to be a permanent situation,

there is very little effort made to improve the surroundings, and the space is rather cramped. Most of these families are living on a limited income and their living quarters are equally limited. The number of children in this group present a major problem in many ways. An illness in this situation is a costly experience because of inadequate facilities.

The children attending the college nursery school come from these two groups, and thus the avenue of contact with the parents has proved helpful. The educational background of the different members varies considerably. Some are college students at the different levels of training while others have only high school training. In the past there has been special consideration shown to them in order that their respect and confidence might be obtained. It is with this in mind and a strong feeling of responsibility that this resource unit has been organized.

CHAPTER III

SUGGESTED RESOURCE UNIT

In view of the situation described in the preceding chapter, the general area of this resource unit will involve a number of problems. It is possible for one to have a sound non-technical knowledge of nutrition and thus be able to use wise guidance in the use of food for the promotion of health in the family. Nevertheless, protein has such a prominent role in the promotion of health because of its widespread occurrence in foods and the functioning of it in the body that dissemination of information is needful. Nutrition determines the character of the young child's constitution. His diet may be such as to furnish just enough nutrients to maintain life in a state of chronic malnutrition, or it may be sufficient in every way for optimum growth and development. The diet may be lacking in some important constituent and the symptoms of physical disorder may be indefinite or it is possible to have a completely balanced diet and thus build up body resistance to disease. The character of the tissues of the child can be altered qualitatively according to the type of foods supplied. With these factors in mind objectives are set up for the various areas. Objectives should serve as a guide in the development of a unit and later they can be used as a means of evaluating the teaching of the unit. The major objective in any adult education course should be to help the homemakers meet the everyday problems in family living in such a way as to make home life more satisfying.

Any adult class should be planned and organized according to the needs of the particular group that it is to serve. A desirable program will be

functional, comprehensive, flexible, and a continuously growing process. The members of the class should set up their own objectives under the guidance of the teacher but with a feeling of freedom and informality. The teacher may seek to enrich and broaden the objectives but not to provide them. The following objectives should prove useful in covering the areas suggested.

1. To understand the basic principles which govern the health of the pre-school child.
2. To realize the problems involved in obtaining sufficient protein for the growing child.
3. To acquire knowledge of the various agencies that contribute to child development.
4. To recognize certain possible deficiencies in the pre-school child.
5. To understand practices in combating deficiencies in the pre-school child.
6. To realize that proper planning and modern methods of preparation can help a great deal to promote optimum health in the family.
7. To develop an appreciation of the fact that family attitudes and practices lay the foundation for future health and happiness of their children.
8. To realize that modern science is continuously finding new and additional information related to the problems of nutrition.
9. To be able to evaluate reading material and select the practical information.
10. To be able to appraise radio programs dealing with nutrition.

The setting up of objectives for a program of instruction is important, but there is a need to think in terms of desirable changes in attitudes and understandings. A change in behavior may not take place, or at least it will not be permanent unless the person desires to make the change. The guidance of pupils in the understanding of facts and principles is not of much value unless their attitudes are favorable to the change. In any one group the needs will not be common to all, but some basic understandings would very likely be desirable for all. These basic understandings are important in the reaching of objectives and necessary if the ultimate outcomes are continuous and succeed in reaching other people as well. These understandings would include the following:

1. An improvement of home living can be brought about if a well rounded family nutrition program is practiced.
2. All needed nutrients may be obtained in sufficient amounts if meals are planned by a definite pattern.
3. When a child eats the right food, he has a better chance to live a long, enjoyable life.
4. A knowledge of up-to-date methods of food preparation that keep protein foods tender and easily digested is to be desired.
5. An understanding of ways to introduce new foods to children in order that they might be well accepted is to be desired.
6. A knowledge of ways of preparing foods that are acceptable to children is important.
7. A means of evaluating reading materials as to their real value is necessary if one is to benefit by them.
8. A method of planning meals that would be adequate for the entire family is essential for good family relationship.

9. An understanding of the nutritional needs of the pre-school child will enable parents to be more intelligent in handling the food problems.
10. An appreciation of the psychological aspect in the feeding of children.

These suggestions are intended to serve as a source list of useful experiences, demonstrations, projects, and discussion topics. The list is not intended to give the impression of being exhaustive, but the purpose of it is to be as suggestive as possible. Adults should have and will want to have a part in much of the planning for their own learning, but it will be necessary for any teacher of a group to do certain preliminary planning if the teaching is to be successful. Some plans will be necessary in order to prepare suitable publicity and to secure in advance certain illustrative and reference materials. It is considered wise to have in mind a number of problems in which the class members might be interested and a possible sequence of lessons. The plans nevertheless should be tentative and flexible so that they may be adapted to group interests and needs as they develop.

This plan consists only of a list of possible units with illustrative materials and references. The detailed lesson planning can then be worked out as needed. Each teacher will want to select only the experiences that are appropriate to his purposes, and he will modify them where necessary to meet the needs of his particular group, supplementing with his own teaching materials. The order of experiences should have no bearing on the sequence of the material as it is taught, but the experiences should be lifted here or there as they fit into the needs and requests of the group.

These are the recommended experiences that are suggested as ways of developing the unit.

1. Describe some of the practices that are desirable to use in developing good food habits in the preschool child.
2. Use check lists of desirable and undesirable practices in the feeding of children in order for members to evaluate their own.
3. Distribute pamphlets pertaining to the topics discussed.
4. Show film Enough to Eat, emphasizing dangers of malnutrition and ways of preventing it.
5. Discuss indications of a healthy child. Set up criteria for judging a healthy child.
6. Distribute mimeographed copies of a list of things that are indicative of good health. Discuss those in question.
7. Show and explain pictures of dogs, rats, and children fed poor and good diets.
8. Show film More Life in Living which treats in non-technical terms the value of a balanced diet to health and successful living.
9. Give each member a list of menus planned for one week. These should be especially for preschool children. Point out good points in each day's meals. Help members to decide why the meals are good.
10. Discuss how to know a good diet and the ways to improve meals.
11. Show the Walt Disney production on the seven basic groups vital to health, Something You Didn't Eat. This emphasizes diet selection to insure a sufficient supply of the essential nutrients.

12. Give out menu forms for one week. Have each member keep a check of his child's diet at home and make comparison with diet sheets given. Arrange conferences with members to evaluate the findings if they request help.
13. Conduct a clinic, working with the local doctors and nurses on the campus. Check the children of the class members and encourage the parents to follow up the findings. If diet is a factor needing attention confer with parents on carrying out the recommendations.
14. Plan a trip to the children's ward of the local hospital. Enlist the nurse on duty at the time of the visit to point out the children who are there mainly because of dietary deficiencies.
15. Organize a group discussion composed of the local representatives of the organizations interested in child welfare. Have them discuss the importance of good protein in building a healthy body.
16. Show film Fundamentals of Diet, illustrating with animals the results of a number of food deficiencies.
17. Display wall charts on bulletin boards in the home economics building and in the nursery school showing good meals for the family.
18. Write articles for the local and college papers pertaining to protein as a body builder.
19. Use a question box to obtain special problems that need to be discussed or clarified.

20. Demonstrate meal planning with use of flannel board and food models.
21. Prepare some of the selected menus in the laboratory and serve lunch to the children and parents.
22. Observe children and discuss special happenings or comments made by the children at meal time.
23. Practice meal planning with use of food models.
24. Practice planning low cost meals that are adequate.
25. Calculate cost of meals planned.
26. Discuss and plan wise distribution of the food dollar.
27. Show film Making Ends Meet as a means of demonstrating inexpensive but well-balanced meals attractively prepared.
28. Demonstrate in laboratory ways of preparing meats for the young child.
29. Demonstrate dishes that illustrate ways of incorporating milk in the diet, using powdered milk, evaporated milk, and fresh milk.
30. Demonstrate beverages that are reinforced with eggs and powdered milk.
31. Discuss various ways of preparing eggs.
32. Show film Foods and Nutrition as a study of metabolic processes and the need of all the food groups in their proper amounts.
33. Discuss complete and incomplete proteins and their place in the diet.
34. Visit the grocery stores to become acquainted with important foods that children may not be using in their homes.
35. Make a field trip to the city library and with the cooperation

of the librarian check available source material relating to child feeding.

36. Use film Proof of the Pudding. This color film emphasizes the importance of good nutrition. It explains food requirements of the body and illustrates diets.
37. Use film Way to Good Habits to show how children develop habits that stay with them through life.
38. Prepare with a group of parents a radio skit on nutrition to be given on the weekly radio hour sponsored by the college.
39. Invite a nutrition specialist and plan a radio program on which some members of the group would interview her as to her viewpoint concerning problems of feeding the preschool child.
40. Make a list of radio programs and recommend those worth while hearing.
41. Organize a radio listening group that will hear the programs related to nutrition and later discuss them.

The recommended experiences may be introduced by a check list as a means of getting parents to think clearly and definitely concerning their needs. Many times they are not aware of their errors until their attention is directed specifically to them. It is not intended that this check list be scored; it is to be used only as a method of self-evaluation. It can be used the second time as a way of evaluating progress toward the desired objectives.

A CHECK LIST FOR PARENTS

Check yourself on your practices. In the blank at the left side write "yes" if that statement is your general practice or write "no" if you do not follow that procedure. Do you:

- _____ 1. Offer a complete meal, allowing the child be the judge of how much he will eat.
- _____ 2. Plan in terms of a balanced diet, not a balanced meal.
- _____ 3. Insist on rigidly following a set diet.
- _____ 4. Appear too anxious or too eager when the child is eating.
- _____ 5. Assume that the child is going to eat.
- _____ 6. Allow between-meal piecing.
- _____ 7. Provide 3 to 4 glasses of milk daily.
- _____ 8. Beg and coax if the child doesn't eat his food.
- _____ 9. Serve one egg a day if possible or seven eggs each week.
- _____ 10. Give one or more servings of lean meat, poultry or fish each day.
- _____ 11. Cut down on protein foods when planning lighter summer meals.
- _____ 12. Use milk in cooked food as well as for a beverage.
- _____ 13. Give between-meal soft drinks instead of milk or fruit juice.
- _____ 14. Insist on the child eating everything on his plate.
- _____ 15. Discipline self to remain casual if the child doesn't eat well.
- _____ 16. See that breakfast is a full meal.
- _____ 17. Realize that cost of an adequate diet is not a high price for a sturdy body, sound teeth, and good health.
- _____ 18. Show impatience or be critical in amount of food eaten.
- _____ 19. Use fried foods for a child.
- _____ 20. Confuse a normal cutting down on food of a two-and-a-half to four-year old with loss of appetite.

Another means of getting parents to analyze their children's health and think in terms of needs may be a score card on child health as this is visible to the eye. Every one responsible for the health and well being of children should be familiar with the outward physical manifestations of good nutrition and also with early signs of malnutrition. He should understand that there is no regular pattern into which each individual child should fit but that there are certain indications which point toward normal health. It may be said that a healthy child is likely to have:

1. Bright, clear eyes.
2. Firm, healthy-looking skin.
3. Moderate padding of fat.
4. Strong, well-developed muscles.
5. Sound, well-formed teeth.
6. Regular elimination.
7. Erect posture, symmetrical chest, flat shoulder blades.
8. Firm, light pink gums.
9. Interest in life, and an air of contentment.
10. An ability to sleep soundly and refreshingly.
11. An alert and happy facial expression.
12. A strong, well-built skeleton.
13. A good appetite and good digestion.
14. Agreeable in dealing with others.

After getting the parents to think in terms of child needs it may prove helpful to use practice on setting up good meals that may help to solve the problem in mind. Suggestions may be given as to how sufficient amounts of certain foods can be incorporated in the planning of day to day meals and at the same time have variety which definitely lends interest

to eating. Lists of foods that represent basic food groups might be helpful and a special listing of the foods rich in vitamins and minerals, especially the vitamins A, B, C, and D, and the minerals, iron and calcium. Always it is important to consider the combination of different flavors, and a variety in texture and color. A discussion would be needed to set up principles for planning meals for the preschool child but it can be stated that some general principles that are of value in planning meals for small children are the following:

1. Children should be served foods that are simple in preparation.
2. Some crisp or chewy food should be included in each meal.
3. Food should be in bite size or such that can be easily handled.
4. A variety of foods should be served.
5. The cereals and breads should be whole grain or enriched.
6. Raw and cooked vegetables and fruits are to be generous in amounts.
7. Lean meat, poultry, or fish should be provided daily.
8. Fried foods are not to be included in the child's diet.
9. Highly seasoned foods should not be given to children.
10. Too much fat is not desirable for the preschool child.
11. Rich pastries should not be given to a small child.
12. Strongly flavored foods are not well accepted by the young child.

After discussing and setting up general principles to follow in meal planning it might be helpful to distribute copies of meals that have been planned with these ideas in mind.

The following meals are set up for the preschool child with the foregoing rules in mind.

MEALS FOR PRESCHOOL CHILDREN¹

MONDAY

Breakfast

Orange Slices
Whole Wheat Cereal
Whole Wheat Toast
Milk

Lunch

Beef Patties with
Tomato Sauce
Baked Potatoes
Buttered Peas
Rye Sandwich
Apricots and Custard
Sauce
Milk

Supper

Scrambled Eggs
Crisp Bacon
Buttered Green Beans
Celery Sticks
Whole Wheat Toast
Vanilla Pudding
Milk

TUESDAY

Stewed Prunes
Cream of Wheat
Whole Wheat Toast
Milk

Tuna Patties
Buttered Potatoes
Buttered Beets
Celery Sandwich
Bananas with Lemon,
Raisin Sauce
Milk

Meat Loaf
Buttered Asparagus
Lettuce Leaf
Whole Wheat Sandwich
Baked Custard
Milk

WEDNESDAY

Tomato Juice
Malt-O-Meal
Whole Wheat Toast
Milk

Creamed Ham
Buttered Potatoes
Buttered Carrots
Rye Sandwich
Frozen Custard
Milk

Creamed Chicken on
Toast
Buttered Frozen
Spinach
Whole Wheat Sandwich
Fruit Cup
Graham Crackers
Milk

THURSDAY

Grapefruit Juice
Oatmeal
Poached Egg
Whole Wheat Toast
Milk

Macaroni and Tomato
Casserole
Buttered Green Beans
Lettuce Leaf
Whole Wheat Sandwich
Sliced Peaches
Milk

Beef Stew
Buttered Peas
Whole Wheat Sandwich
Ice Cream
Milk

¹ Menus taken from files of Oklahoma A. and M. College Nursery School File.

FRIDAY

Breakfast

Tomato Juice
Whole Wheat Toast
Whole Wheat Flakes
Milk

Lunch

Stuffed Egg
Mashed Potatoes
Asparagus With
Cheese Sauce
Apple Wedge
Whole Wheat Toast
Chocolate Pudding
Milk

Supper

Spaghetti and Meat
Balls
Buttered Cauliflower
Whole Wheat Sandwich
Fruit Jello
Milk

SATURDAY

Sliced Oranges
Oatmeal
Whole Wheat Toast
Milk

Liver Patties with
Tomato Sauce
Buttered New Potatoes
Creamed String Beans
Apple Wedges
Whole Wheat Sandwiches
Rice Pudding
Milk

Scrambled Eggs With
Cheese
Broiled Tomatoes
Whole Wheat Bread
Apricot Sauce
Graham Crackers
Milk

SUNDAY

Orange Juice
Poached Eggs
Whole Wheat Toast
Milk

Braised Steak
Buttered Spinach
Browned Potatoes
Crisp Lettuce
Whole Wheat Sandwich
Fruit Jello
Milk

Cream of Wheat
Broiled Ham
Buttered Beets
Whole Wheat Sandwiches
Butterscotch Pudding
Milk

Another teaching device that has proved to be very effective is the motion picture. It gives a sound basis for indirect experiencing and it is a means of making the learning experiences more concrete and memorable. The motion picture can teach the bodily processes in extraordinarily vivid fashion. It is ideal for showing process changes over a period of time, and brings background material into the classroom that would otherwise not be available or that would be too expensive.

In the short period of class activities it is not possible to learn all we need to know by doing and for this reason motion pictures can prove an efficient means of enriching experiences. Many of the processes that cannot be seen by the human eye can be shown and particular points and ideas may be developed by animated drawings.

If films are to be used a definite technique is necessary for effective learning. There is just as much necessity for preplanning as in any other teaching device. The teacher should preview the film to see if it will furnish to the pupils the correct experiences and then collect information as to the best way of preparing class members to receive the material offered. In order to be effective presentation of the film should be followed by group discussion and questions should be cleared up for the individuals.

The following table of films gives a complete listing of those available on this study. Local film libraries sometimes offer better and cheaper service but not all the films are always available. There are a few sources of free films or films at a small charge that prove very helpful at times. These may be located through the local county health office, the Agricultural Extension Service, state departments of education, and college film libraries.

Some films listed are produced by or for various business concerns, but use of them is not considered an endorsement of the products of the company. They are not set up with that idea in mind and many of them prove excellent teaching aids. Teachers should investigate these films and use them when possible as they are produced under the guidance of highly trained specialists who have given much time and investigation to the areas of the materials filmed.

TABLE 2

AUDIO-VISUAL AIDS RELATED TO NUTRITION

Audio-Visual Aids	Value	Where Obtained	Cost	Type and Time
A Day in the Life of a Five Year Old	Shows procedures and resources of a modern kindergarten	Teachers College, Columbia University, New York 27, N. Y.		Sound 20 min.
Balanced Way	Discusses the importance of various foods in daily diet and the proper balance of foods for necessary nutrition	Castle Films Division, United World Films Inc, Russ Building, San Francisco 4, California	Loan	Sound 20 min.
Consumption of Foods	A study of food needs and deficiencies of the world's peoples. Standards for caloric intake and a balanced food consumption guide are developed.	Encyclopedia Britannica Films, Inc., 1150 Wilmette Avenue, Wilmette, Ill.	\$2.50	Sound 11 min.
Enough to Eat	Comprehensive Analysis of the dangers of malnutrition and how to select foods for maximum nutritive value	Museum of Modern Art Film Library, 11 West 53rd Street, New York 19, N.Y.	\$4.00	Sound 20 min.
Food and Nutrition	A study of the metabolic processes showing the distribution of carbohydrates, fats, proteins, minerals, and vitamins through the body. Illustrated by diagrammatic drawings and experiments on white mice	Encyclopedia Britannica Films, Inc., 1150 Wilmette Avenue, Wilmette, Ill.	\$2.50	Sound 11 min.

¹ D. E. Cook and K. M. Holder. Educational Film Guide, Annual Edition. New York: The H. W. Wilson Company, (September, 1949).

Audio-Visual Aids	Value	Where Obtained	Cost	Type and Time
Fundamentals of Diet	Experiments with animals illustrate the results of a number of food deficiencies.	Encyclopedia Britannica Films, Inc., 1150 Wilmette Avenue, Wilmette, Ill.	\$2.50	Sound 11 min.
Hidden Hunger	A campaign to improve the eating habits of the Nation.	Swift and Company Public Relations Department, Union Stock Yards, Chicago 9, Ill.	Loan	Sound 30 min.
Life in the Balance	This film portrays effectively the need for and the planning of a balanced meal	New York State Department of Commerce Film Library, 40 Howard Street, Albany 1, N.Y.	Loan	Sound 18 min.
Life with Baby	Reveals the psychological and clinical understanding for the young child.	March of Time Films, 360 Lexington Ave., New York, N.Y.		Sound 18 min.
Magic Food	Larry, a magician, uses the basic foods to do his magic. After each food group has been discussed correct meals are depicted.	General Pictures Productions, Inc., 621 Sixth Ave., Des Moines 9, Iowa	\$27.50	Sound Color 10 min.
Making Ends Meet	This film demonstrates that inexpensive meals attractively prepared and served can do much to improve our health and standard of living.	Dairy Council of St. Louis, 4030 Chauteau Avenue, St. Louis 10, Missouri	Loan	Sound Color 10 min.
More Life in Living	Treats in non-technical terms the value of balanced diet to health and successful living	National Dairy Products Company, 75 East Wacker Drive, Chicago, Ill.	\$75.00	Sound 12 min.

Audio-Visual Aids	Value	Where Obtained	Cost	Type and Time
Proof of the Pudding	This film emphasizes the importance of good nutrition. Food requirements of the body are explained, and results of good and bad diets are illustrated.	Metropolitan Life Insurance Company, Madison Avenue, New York 10, New York		Sound Color 10 min.
Something You Didn't Eat	A Walt Disney production about the seven basic food groups vital to health. Emphasizes diet selection from the food groups to insure sufficient supply of the essential nutrients.	United States Department of Agriculture Motion Picture Service, Office of Information, Washington 25, D. C.	Loan	Sound 9 min.
The Man Who Missed His Breakfast	A story of nutrition built around a man who missed his breakfast.	Castle Films Division, United World Films, Inc., Russ Building, San Francisco 14, California.	\$16.76	Sound 28 min.
Way to Good Habots	Shows how children are developing the habits which they will have throughout their years.	Coronet Films, Coronet Building, Chicago 1, Illinois		1 reel

Every adult class should be evaluated in order to interpret and summarize the results of the program. Evaluation is a complicated process but can nevertheless be used to advantage. The evaluation should be a continuous process throughout the study, as it may reveal points of strength which ought to be continued and points where practices need modifications. Evaluating an adult program in homemaking should have the following objectives:

1. To determine the extent to which the program meets the needs of the group.
2. To reassure leaders and others that the work is worth while.
3. To help the staff clarify their objectives and gain psychological security.
4. To provide information needed in organizing another program.

The evaluation should be in terms of the objectives which should be realized through the learning experiences in the program. These learning experiences may have brought accomplishments in terms of better understandings, new ideals, and stimulated intellects. The satisfaction of achievement for the adults will result if their interests and needs have been supplied.

In an adult program there must be taken into consideration the individual differences, and an understanding of people will be needed if the evaluation is to be successful. The full cooperation of the learner is necessary also if much is to be accomplished. Realization of the objectives cannot be assumed unless there is evidence of change in the individual, in the home, and in the community.

With the suggested objectives in mind the following evidences of anticipated outcomes might be observed:

1. Better family relationship due to happier, better adjusted children.
2. An understanding of food requirements for well-balanced meals as shown in the daily diet.
3. A knowledge of modern methods of food preparation in everyday use.
4. An ability to appreciate healthy children.
5. Money more wisely spent for the welfare of the family.
6. Fewer illnesses in the home.
7. An appreciation of the variety of foods on the market.
8. A knowledge of how to introduce new foods to the children.
9. A knowledge of how to evaluate the vast amount of reading material.
10. An appreciation of child health to such an extent as to strive to develop community interest.

These expected outcomes are made in considering the objectives in the relation to the actual functioning of the individual in using the information in his particular situation. However, there are specific elements involved from time to time in the course of the program that may be used to denote changes in the direction of the objectives states for the course.

Some of the techniques that may be used for this purpose may be obtained through observation, anecdotal records, and statements of the class members. Anecdotal records are a valuable technique for describing behavior and should be a part of the evaluation. A teacher might want to keep cumulative records in order to help the individual members later. Likewise you might help the parent to listen to comments and observe the action of the child as a means of interpreting the results of her feeding

technique. All this would contribute significant information regarding personality development and effectiveness of the materials taught. While they might be only simple statements they may represent definite responses to certain practices. The number and regularity in attendance are indicative of interest as well as the manner in which the members enter into the learning activities of the group and accept materials distributed. An indication of confidence in the instructor can be seen when individuals ask for personal conferences concerning their own needs, and through these conferences it is possible at times to tell if the needs of the members are being met. Requests for additional classes may be evidence of desirable changes as well as comments of the class members and people outside the group.

In successful homemaking programs for adults, learning processes are directed to create a desire for extended learning opportunities. Each teacher will want to measure the educational efficiency of her own particular program thereby discovering what changes need to be made in the curriculum content and in the method of teaching. A natural conclusion to the evaluation of learning is the recognition of accomplishment. A list of questions could be used for the class to write their reactions concerning their own ideas relating to the class. The questions could be set up as follows:

1. In what ways did the class arouse your interest?
2. How did the class meet your needs?
3. How did the class activities help attain the goals?
4. In what specific ways have you been helped as an individual?
5. In what ways have your family members benefited most through the experiences you have had?

6. On what basis could you recommend to others the homemaking program for adults?

These questions and maybe others could help the teacher to evaluate her own program for each individual and at the same time benefit in planning future work.

CHAPTER IV

SUMMARY AND RECOMMENDATIONS

In summarizing this study the writer feels that in preparing it much value has been obtained in gathering what leading authorities in the field of child nutrition have written recently relative to the feeding of pre-school children. It will be beneficial in several ways but in particular it will be a drawing account of knowledge for teachers confronted with questions dealing with the subject of child feeding and problems that arise in connection with acceptance of food. Nutrition and foods classes can be helped to get a better picture of the situation and thereby interpret to others in a better light.

This work is in no sense a complete report on the subject, but in it an effort has been made to give a representative view and from time to time as new material is published and new ideas developed it can be enlarged and improved by others.

Conscientious parents informed in the ways of children and versed in the trends of nutrition can use this knowledge to help their children and protect their future. Many parents are too busy with the day-to-day tasks of routine living to read extensively on child feeding. This material as it is organized may aid those desiring assistance to see the nature of their problems and stimulate them to a wider study of this vital subject. It may offer avenues of assistance and reveal to them possibilities that had not been realized.

It is not intended that the material be used in any way as a means of diagnosing illnesses in children but only as a way of alerting parents to the idea of consulting a physician where the indications appear, and then in preparing them to carry out the physician's advice in a much more efficient manner.

For the leaders in adult education there is much material and many suggestions that might be used as a whole or in part to supplement their own material. A storehouse of materials is very important to have on hand as one can never predict all of the channels which a class may take when interest is aroused. Although this unit deals with only one phase of nutrition it is a very basic and important one.

Another group that could draw on this resource unit would be the college teachers in foods, nutrition, or family relations. For them it may prove very beneficial in interpreting the subject matter to a college group and pave the way for a better understanding in the field of nutrition. Knowledge is acquired in a much more effective manner when the basis for it is practical and easily understood. As interest increases then a more thorough and scientific study can develop.

The organizing of this resource unit has been very beneficial to the writer in helping to bring about a knowledge of the vast amount of materials that are available to teachers. It has been revealing to realize the number of learning experiences that can be used to help parents meet their child feeding problems. Of course these are only suggestions as to how the learning experiences might be carried on for the writer's own situation and much more is included than would be needed for any one class. Each teacher would want to adapt these to her own particular group and work out the techniques that would be best suited for her class. No two adult

classes will follow the same program of work if they are planned according to the democratic procedures in which the class sets up its own objectives in relation to individual needs.

The ultimate outcome of organizing a resource unit such as this has been the realization that there is a definite need for every teacher to have an adequate background of subject matter, an understanding of adults, and a knowledge of her own situation if she is to accomplish anything worth while.

BIBLIOGRAPHY ON TEACHING AIDS

The teaching aids listed are materials related to protein and balanced diets that can be obtained at little or no cost to the teacher. They are in many cases very useful teaching aids as they have been worked out by specialists in the particular field and represent a great deal of study and experimentation. These materials are set up in such a way that lay people can understand their meaning and secure valuable information.

If the material is to be used in a lesson it should be evaluated as it is used. This will create enough interest in the material for the individual to want to read it when he gets home. Otherwise the material should be placed on a convenient rack where those seeking information can obtain the bulletins desired.

- American Association for Health, Physical Education, and Recreation. Visualize the Value of Your Foods. Washington, D. C.: American Association for Health, Physical Education, and Recreation, 1940. 14 pp. (mimeo). Free.
- Blood, Alice. What To Eat and Why. Boston: John Hancock Mutual Life Insurance Company, 1939. 24 pp. Free.
- Bringing Up Baby. The Quaker Oats Company. Chicago. (1947).
- California Fruit Growers Exchange, Educational Division. Feeding the Child for Health. Sunkist Building, Los Angeles, California.
- Carpenter, R. S., in cooperation with the Bureau of Dairy Industry. Milk For the Family. United States Department of Agriculture, Farmers' Bulletin, Number 1705. Washington, D. C.: Government Printing Office, 1933. 29 pp. 5 cents.
- Cereal Institute. A Good Breakfast for a Good Morning. 135 South La Salle Street, Chicago 3, Illinois. Free.
- Children's Bureau, Department of Labor, Washington, D. C. Food for Young Children in Group Care. Publication Number 285. The Healthy, Well-Nourished Child. Folder 18. Well-Nourished Children. Folder 14. Your Child from One to Six, Publication Number 30.
- Current Research in the Science of Nutrition. Published monthly by the Nutrition Foundation Incorporated. Chrysler Building, New York 17, New York.
- Educational Consultant, Department of Public Services, General Mills, Incorporated, Minneapolis 1, Minnesota. Colorful Wall Charts.
1. Mother Hubbard's Cupboard.
 2. A Day With The Wide-Awake.
 3. Whistler and Whiner.
 4. Health is not just Luck.
 5. Booklets
 - a. Eat and Grow.
 - b. Working and Playing.
 - c. Letters to Tony.
 6. Leaflets for parents are the basic seven food groups.
- Elizabeth McCormick Memorial Fund. Nutrition Folders. Chicago: The Fund. 10 cents per set of ten. A set of ten illustrated mimeographed folders designed to teach health to children.
- Food and Nutrition Board, National Research Council. Inadequate Diets and Nutritional Deficiencies in the United States. National Research Council Bulletin 109. Washington, D. C., 1943.
- Logan, Martha. Food News and Views. Swift and Company, Chicago 9, Illinois.

Metropolitan Life Insurance Co. Three Meals A Day. Revised Edition. New York: Metropolitan Life Insurance Company, 1940. 16 pp. Single copy to teachers free.

National Dairy Council, 111 North Canal Street, Chicago 6, Illinois.

1. Milk Around the World. 8 cents.
2. Milk from Farm to Family. 10 cents.
3. Milk, Let's Find Out About It. 6 cents.
4. Cheese, Let's Find Out About It. 6 cents.
5. Ice Cream, Let's Find Out About It. 6 cents.
6. A Guide to Good Eating, Charts in Colors.
7. Questions and Answers About Your Young Child. 6 cents.
8. What a Woman Can Do With Meals. 6 cents.
9. Your Child From One to Six. 10 cents.
10. Food For Young Children.

Nutritional Observatory. Edited by Staff of the Heinz Nutritional Research Division in Mellon Institute. H. J. Heinz Company, Pittsburgh 12, Pennsylvania.

Philadelphia Child Health Society. Food Value Charts. Philadelphia: The Society, 1940. 12 Charts, 50 cents per set.

These charts aim to emphasize food which gives health protection at low cost and also those that are often available as surplus commodities.

Roberts, Lydia J. Food Models. Chicago: University of Chicago Press. 75 cents. Life size pictures of common foods in suitable dishes with calories stated.

Roberts, Lydia J. The Road to Good Nutrition, Publication Number 270, United States Department of Labor, Superintendent of Documents. Government Printing Office, Washington 25, D. C., 1944. 15 cents.

Swift and Company. The Story of Specially Prepared Meats for Babies and Juniors. Research Laboratories, Nutrition Division, Chicago 9, Illinois.

United States Department of Agriculture, Bureau of Home Economics. Nutrition Charts. Washington, D. C.: Government Printing Office, 1941. 50 cents per set.

A set of eleven charts showing the effects upon animals of withholding different essentials of the diet and also the foods that are important sources of each essential.

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Better Homes and Gardens. Meredith Publishing Company, Des Moines 3, Iowa.

Child Study. Child Study Association of America, 221 West 57th Street, New York, New York.

Good Housekeeping. Hearst Magazines, 57th Street at Eighth Avenue, New York 19, New York.

Household. Capper Publications, Topeka, Kansas.

Ladies Home Journal. Curtis Publishing Company, Independence Square, Philadelphia 5, Pennsylvania.

McCall's. McCall's Corporation, 230 Park Avenue, New York 17, New York.

National Parent Teacher. National Congress of Parents and Teachers, 600 South Michigan Boulevard, Chicago 5, Illinois.

Parent's Magazine. 9 East 40th Street, New York, New York.

Reader's Digest. Reader's Digest Association, Pleasantville, New York.

Today's Health. American Medical Association, 535 North Dearborn Street, Chicago 10, Illinois.

Woman's Home Companion. Crowell-Collier Publishing Company, 250 Park Avenue, New York 17, New York.

MAGAZINES FOR TEACHERS

Foods for Health and Enjoyment. Sherman Foods Publishing Company, 373 Fourth Avenue, New York 3, New York.

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Journal of Health and Physical Education. American Association for Health, Physical Education and Recreation, 1201- 16th Street, North West, Washington, D. C.

Journal of Pediatrics. Williams and Wilkins Company, Mount Royal and Guilford Avenues, Baltimore 2, Maryland.

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