

AN ABSTRACT OF THE THESIS OF

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Title: BENEFITS TO CEREBRAL PALSIED CHILDREN FROM
TEACHING NUTRITION AND FEEDING SKILL
DEVELOPMENT TO THEIR MOTHERS

Abstract approved: Elizabeth W. Johnson

Seven cerebral palsied children living in the home and their mothers were involved in this study. The mothers attended eight weekly sessions and were instructed in basic nutrition and feeding skill development. A Food and Nutrition Education Curriculum was developed for this instruction. Each of the eight lessons in the curriculum included discussions of nutrition based on the Basic Four Food Groups and the development of a feeding skill.

Certain measurements were made before and after the nutrition education intervention to determine the benefits to the cerebral palsied children. These included a 24-hour dietary recall, food frequency check, height and weight measurements and a feeding evaluation. The mothers' nutrition knowledge was determined before and after the nutrition classes by way of a practical nutrition quiz.

Nutrient intakes were compared to the 1974 Recommended Dietary Allowances (RDA). Intakes above 67% of the RDA were

considered adequate. Energy intakes were compared to a suggested requirement based on height in centimeters. Height and weight measurements were plotted on the National Center for Health Statistics (NCHS) Growth Charts (1976).

Five subjects, three girls and two boys fell below the 5th percentile on the NCHS Growth Charts.

Intakes of five subjects exceeded two-thirds of the RDA for protein, calcium, iron, thiamin, riboflavin, niacin and ascorbic acid both before and after the nutrition education classes for their mothers. Protein and vitamin A intakes exceeded 100% of the RDA in many cases.

The feeding evaluation was divided into three categories: gross motor skills, oral skills and eye-hand coordination. All seven subjects made improvements in the post test. The group as a whole made significant improvements ($P < .05$) in gross motor skills.

Significant improvements ($P < .05$) were made by the mothers as a group in the practical nutrition quiz post test.

Benefits to Cerebral Palsied Children
From Teaching Nutrition and Feeding Skill
Development to Their Mothers

by

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to my parents

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BENEFITS TO CEREBRAL PALSIED CHILDREN FROM TEACHING NUTRITION AND FEEDING SKILLS TO THEIR MOTHERS

INTRODUCTION

It has been estimated that an infant with a serious birth defect will be born every two minutes in the United States. This means that approximately 250,000 children with birth defects are born each year and of these it has been estimated that 15,000 infants will have cerebral palsy (Apgar, 1973, United Cerebral Palsy Association, 1973).

Cerebral palsy is a general term applied to

a group of permanently disabling symptoms resulting from damage to the developing brain that may occur before, during or after birth and that results in loss or impairment of control over voluntary muscles (United Cerebral Palsy Association, 1973, p. 1).

Many of the handicaps of individuals with cerebral palsy can influence their eating habits. Physical limitations may result in poor occlusion, increased dental caries, inability to chew properly, difficulty in swallowing and all of these can understandably result in poor appetite (Phelps, 1951).

Feeding problems are a common finding among the cerebral palsied child population. These include a limited intake, strong food dislikes, long feeding periods or the child's inability to feed himself.

Many cerebral palsied children remain in the home rather than an institution. The parents or guardian are then directly responsible

for providing nutriture in a suitable form for their cerebral palsied child. This can be a very difficult and exasperating task. The parent, usually the mother, can easily fall into a monotonous pattern of meal preparation for her child and thereby may miss the child's signals of readiness to accept a greater variety of foods.

The nutritional status of cerebral palsied children has not been frequently studied. Of the studies evaluating the food intakes of these children (Peeks, 1951; Leamy, 1953; Karle, 1961; Hammond, 1966) none examined the benefits of a nutrition education program for the mothers of the cerebral palsied child.

The purpose of this study was to determine if the food and nutrient intake of a cerebral palsied child would improve if the mother participated in small group sessions on nutrition education and feeding skill development.

REVIEW OF LITERATURE

Causes and Types of Cerebral Palsy

In the human organism the motor nervous system is comprised of the motor cortex, the corticospinal tract (pyramidal system), the cerebellum, the extracortical tract (extra-pyramidal system), reticular formation, vestibular nuclei and the spinal cord (Cruikshank, 1955). The impaired motor involvement associated with cerebral palsy results when there is damage to the corticospinal (pyramidal) or the extra-cortical (extra-pyramidal) mechanisms or in cases when the lower motor neuron is involved (Stephen and Hawks, 1975).

There are six major types of cerebral palsy. These are spasticity, athetosis, ataxia, tremors, rigidity and mixed (United Cerebral Palsy Association, 1973).

Spastics are typified by muscle spasms which are the most frequently occurring motor symptom of cerebral palsy. The chief characteristic of spastic paralysis is an increase in the stretch reflex which inhibits the normal action of the voluntary muscle movements (Phelps, 1951). This response is a result of damage to the corticospinal system (Stephen and Hawks, 1975).

Athetosis is characterized by slow, constant, involuntary writhing movements of the extremities (Phelps, 1951). This condition is the result of damage to the extra-cortical system

(Stephen and Hawks, 1975). Kernicterus from neonatal hyperbilirubinemia has also been recognized as a cause of athetosis (Low, 1972).

Ataxia is a condition characterized by a disturbance of balance as a result of uncoordinated muscles (Phelps, 1951; Stephen and Hawks, 1975).

Involuntary trembling or quivering is characteristic of the tremors type of cerebral palsy. Rigidity is typified by overall stiffness. The mixed type of cerebral palsy is diagnosed when there is a combination of two or more of the other five types (Phelps, 1951; United Cerebral Palsy Association, 1973).

The motor difficulty experienced in any type may involve all four limbs or it may be limited to just one. The most common type known as hemiplegia occurs when the arm and leg of one side of the body are affected. Quadraplegia denotes an involvement of all four limbs and paraplegia results when just the legs are involved (Stephen and Hawks, 1975).

Although the cause is undetermined in one-third of the individuals, many factors have been identified which can lead to cerebral palsy. Leading causes of cerebral palsy as listed by the United Cerebral Palsy Association (1973) are prematurity, multiple births, anoxia in the neonate, complications of labor or delivery, neonate jaundice due to Rh or other blood incompatibility, infections to the

brain from meningitis or encephalitis, heavy metal or drug poisonings and accidents which result in head trauma. Marasmus and dehydration followed by venous thrombosis are occasional factors in causing cerebral palsy as well (Low, 1972).

Children who fall within the definition of having cerebral palsy often have additional syndromes. The most common of these are mental retardation and seizures. Approximately 25-35% of cerebral palsied children have epilepsy (Low, 1972, p. 885). The management of seizures requires the daily use of anti-convulsants.

Anticonvulsant Therapy

The use of anticonvulsants has been found to pose certain nutritional problems. Phenobarbitol has been found to cause a vitamin D deficiency in some individuals (Stamp, 1974). This deficiency has been attributed to the accelerated conversion of vitamin D and its active metabolite, 25-hydroxycholecalciferol to inactive derivatives by drug induction of hepatic microsomal enzymes (Roe, 1976, p. 138). Several researchers found lower serum calcium and phosphorus levels and higher serum alkaline phosphatase activity in institutionalized children receiving long-term anticonvulsant therapy (Richens and Rowe, 1970; DeLuca and Masotti, 1971; Lifshitz and MacLaren, 1973). The presence of hypocalcemia resulting from vitamin D deficiency in epileptics on anticonvulsants may increase the frequency of seizures

(Stamp, 1974).

Stamp (1974) found that in three epileptics who developed vitamin D deficiency while on anticonvulsants, resistance to vitamin D therapy and a rapid response to ultraviolet light therapy was shown. Roe (1976) reports that 25-hydroxycholecalciferol or exposure to sunlight is the treatment of choice in such cases.

Clonopin is another drug used to control seizures. It is not structurally related to phenobarbitol nor are there any known anti-nutritional factors to this date (Block, 1977, personal communication).

Non-Medical Factors

A child with a severe handicap greatly affects the entire family. Often the child may require partial or total life-time care. This in itself is a tremendous responsibility for the family, both emotionally and financially. Families may require counseling and guidance to help them adjust to their situation. Parents should be made aware of the services available for the handicapped in their community such as social and recreational programs, special education facilities and vocational guidance and counseling. The United Cerebral Palsy Association (1973) suggests such an interdisciplinary approach in the management of cerebral palsied individuals. Active participation from both the parent and child in the treatment is encouraged.

Feeding problems are prevalent in cerebral palsied children and

must be dealt with early. Frequently parents will find it easier to continue to feed these children themselves rather than working to change any undesirable feeding habits (Holser-Beuhler, 1973). It is understandable that parents would want to alleviate any obstacles for their child but often times more harm than good is done by perpetuating infantile eating habits. Offering strained or baby foods is easier for both the feeder and the cerebral palsied child but they do not stimulate the development of the eating mechanisms. Ideally parents should help their child develop to his fullest capacity within the limits of his basic handicap.

Development of Feeding Skills

An understanding of the organs and mechanisms normally involved in eating are paramount to working effectively with this type of child. The sucking mechanism involves the lips, tongue and face muscles. Inasmuch as sucking and swallowing require voluntary muscle control they are believed to be innate in most individuals (Phelps, 1951). However, for the brain damaged child these reflexes must be learned.

The swallowing mechanism is complicated and involves three stages (Cruickshank, 1955; Guyton, p. 855, 1976 ; Larson, 1973; Illingworth, 1969). The first stage, termed the buccalpharyngeal stage, involves the tongue voluntarily pushing the bolus of food

posteriorly into the pharynx. The second and third stage, the esophageal and cardiogastric stages respectively, are involuntary and present little problem to the cerebral palsied child.

In such individuals there is often the presence of a reversed swallowing wave in which the food is forced out of the mouth by the tongue thrust commonly seen in cerebral palsied children (Phelps, 1951). It is possible to train the tongue by using foods like peanut butter which must be licked from various areas within the mouth (Bosley, 1966).

The tongue movements are most complex and difficult when learning to chew (Bosley, 1966). The chewing reflex is brought about by the presence of a bolus of food in the mouth which causes a reflex inhibition of the muscles of mastication. This reflex inhibition allows the lower jaw to drop which in turn initiates a stretch reflex of the jaw muscles which causes a rebound contraction. The jaw is then automatically closed compressing the bolus. The presence of the bolus inhibits the jaw muscles and the process is repeated (Guyton, p. 855, 1976). The tongue is necessary to push the bolus laterally to the molars to be chewed. This movement combined with a rotating jaw movement is referred to as lateral-rotary chewing and is the desired or most mature form of chewing.

An average child will first show signs of biting and chewing around the age of 6 to 9 months by vertical movements of the

mandible (Illingworth, 1972; Papalia, 1975). Illingworth (1964) stresses the need for introducing solid foods at the critical or sensitive period for chewing. After this period passes, the child becomes less willing to accept solid foods. In the child with brain damage this period occurs later, if at all (Illingworth, 1972). It is important that the parent be alert to readiness signs for chewing in order to help the child to progress in this skill.

Based on the physiological changes during feeding, certain recommendations are made by workers in the field. Palmer (1947) describes a hard food orientation program to teach the motor-impaired child to chew. Carrots, celery, turnip and potato slices have been suggested as providing audible motivation to the parent and the child who is learning to chew (Bosley, 1966).

Holser-Beuhler (1973) feels that in many cerebral palsied children with involvement of the oral musculature there is a tendency for a delayed acceptance or ability to tolerate solid foods. This may be due to a hypersensitivity of the oral nervous tissue. She describes a technique to normalize the child's eating habits by massaging the mouth and gums prior to presenting food as well as various exercises for the tongue. She stresses not overfeeding the child at any one meal so he will be hungry for the next meal. Feeding can easily become a stressful situation and it is important to realize that the feeding experience can meet the child's emotional as well as physical

needs. This requires a particular consideration on the part of the feeder (Rabinovitch, 1952).

The Blanchard spoon-feeding method as described by Holser-Beuhler (1966) has been shown to be successful in increasing the basic reflex use of the oral musculature and thereby increase the intake of solid foods.

Leibowitz (1974) suggests using a food which is strongly liked as a primary reinforcer in a feeding program to incorporate more textures into a child's diet. Foods with more variety and consistency can be incorporated in this way.

In addition to the involvement of the feeding mechanisms, a major factor leading to feeding problems in these individuals is the lack of head and trunk control (Finnie, 1968; Morris, 1974). Many professionals in the field agree that the erect, supported posture with the head tilted slightly forward is the most conducive to eating (Abel, 1950; Blanchard, 1963, 1966; Finnie, 1968; Larsen, 1973; Morris, 1974).

Nutrient Intake Studies

Peeks (1951) described the dietary practices of 29 cerebral palsied children aged 1 to 15 years. Dietary interviews with parents were conducted and the intake evaluation was compared to the 1948 Recommended Dietary Allowances (RDA, FNB, 1948, Appendix I).

She compared the subjects receiving 90% or more of the RDA to those receiving less and found that the majority received sufficient vitamin A, thiamin and riboflavin to meet the standard; half the subjects were consuming enough ascorbic acid, iron and protein to meet the criterion and less than half had an intake of calcium and calories equal to 90% of the RDA.

Leamy (1953) studied the food intake of 21 institutionalized children with cerebral palsy aged 4 to 20 years. She investigated their caloric needs based on their developmental level as expressed by chronological age and skeletal development as determined by X-rays of the hand-wrist area. The skeletal age was used because it would indicate the degree of skeletal retardation and allow them to compare the intakes to the lower ages. By comparing their nutrient intake to 100% of the RDA (FNB, 1948), she found inadequacies in protein, calcium, iron, thiamin, niacin and ascorbic acid intakes and particularly the children's caloric consumption. Even when comparing their caloric intake to the lower allowances based on skeletal age, there were deficiencies in calories for most of the children.

Karle et al. (1961) studied the nutritional status of 12 cerebral palsied children aged 2 to 10 years in residence at a hospital school. Dietary histories were obtained from their parents and two- to three-day dietary intake records provided the data necessary for comparison to the 1958 RDA (Appendix I). In ten of the cases, iron intakes did not

meet the RDA. All children ate fewer calories than recommended for their age group. However, the investigators in this study did not recommend an increase in calories for all cerebral palsied children because of the difficulty they experience in ambulation. Biochemical analysis of hemoglobin, serum carotene and ascorbic acid were performed and the results were in the range of normal values for that age group.

Hammon et al. (1966) studied 31 cerebral palsied children aged 7 to 16 years. Dietary histories and 6-day dietary records, nutrient intakes, biochemical analyses of hemoglobin, calcium, protein and albumin, carotene and vitamin A and height and weight measures were used to assess the children's nutritional status. Hemoglobin, serum vitamin A, carotene, protein and albumin were in the range of accepted values. However, the authors stated that in 15 of the subjects the serum calcium values were below 9 mg./100 ml.

Analysis of dietaries revealed that nutrient intakes for all but three individuals were greater than two-thirds of the 1958 RDA for all nutrients examined.

Culley and Middleton (1969) evaluated the caloric intake of 31 mentally-retarded children 5 to 12 years of age with and without motor dysfunction. They stated that calories per centimeter of

body height was a good basis for calculating caloric needs of these children. The ambulatory children with motor dysfunction consumed a mean of 13.9 calories per centimeter. The type, location and severity of the dysfunction did not significantly affect the caloric needs. The non-ambulatory children with motor dysfunction consumed a mean of 11.1 calories per centimeter. These subjects : consumed a mean of 59% of the recommended calorie allowances for children of comparable ages.

Energy Intake and Expenditure

Phelps (1951) has stated that the spastic and the athetoid child require particular attention to calorie intake. Due to the inactivity of the spastics their calorie requirement is much lower than normal, whereas, the athetoid who is generally in constant motion, requires a very high number of calories. In one study it was not found that athetoids consumed a greater amount of calories than the spastics (Leamy, 1953).

Eddy et al. (1965) studied the dietary intakes and energy expenditures of five cerebral palsied children, 13-16 years old, in a boarding school. Basal metabolism was measured. Heat expenditure

was measured during various activities with a Wolfe integrating motor pneumotachograph. The authors reported that this apparatus proved to be too heavy for the subjects to carry for more than an hour and it was not possible to measure respiration for long periods of time. The authors felt that although the calorie intakes and energy expenditures were low they were comparable to those of normal children the same size; however, their actual physical accomplishment was much less.

Dietary studies of the five subjects were evaluated for energy, ascorbic acid, iron and calcium and compared to the British Medical Association recommended allowances. The values were low but within two-thirds of the recommended allowances for ascorbic acid and iron and half of the recommended allowance for calcium. The authors advised that for such individuals on a lower energy intake special attention should be given to the nutritional content of the diet.

Wakoh et al. (1965) studied the energy metabolism of 11 male spastic children 2-10 years old. They found that there was a tendency toward a decreased metabolic rate as compared to the average child. Two of the subjects showed an increased metabolism. All of the patients were retarded in weight and all but one were retarded in height.

The boys were spoon- or bottle-fed an adequate diet with the majority of calories provided by carbohydrates.

The authors expected to find an increased metabolism in the fasting states because of the spastic condition but did so in only two cases. Their explanation for the hypometabolism was that there was too little combustible material available in the body and a state of adaptive starvation occurred.

Berg (1970) studied the energy expenditure of 10 subjects by monitoring heart rates and recording a 24-hour oxygen uptake. They compared oxygen uptake per kg body cell mass rather than body weight because these children tended to have excess extra-cellular mass.

The authors found a good relationship between energy expenditures and calorie intake in that those who expended more calories than they consumed showed small fat deposits and vice versa.

Growth in Cerebral Palsied Children

Sterling (1960) studied the heights and weights of 100 cerebral palsied patients. He found that at least 73 subjects fell below the 30th percentile for height and weight when compared to the Boston Anthropometric charts. At least 62 fell below the 10th percentile for both height and weight. There was a positive relationship between early acquired brain damage and greater growth deficits.

Ruby and Matheny (1962) compared the growth curves of cerebral palsied children to the Iowa growth norms. The growth patterns followed normal curves: but, the boys were 12 to 15 months below the 16th percentile curve and the girls were approximately 18 months below this. They felt the growth lag was related to food intake inasmuch as there were usually feeding problems present. From their investigation they concluded that athetoids are generally smaller than spastics in stature suggesting a greater calorie need for the athetoid. They stressed the importance of the protein requirement being met regardless of the type of cerebral palsy because of the concern with muscle development.

Tobis et al. (1961) measured the heights and weights of 86 cerebral palsied children and compared them to those of 86 non-handicapped children of the same age, sex and ethnic origin. Forty-five children were found to be greater than two standard deviations below the mean. The authors found a significant correlation between the depression of heights and severity of involvement, the ability to self-feed and ambulate. Such factors as central nervous system disability, nutritional intake and lack of normal motor activity and muscle tone were discussed as possible causes affecting growth in cerebral palsied children.

Berg and Isaksson (1970) measured the body composition of 33 institutionalized cerebral palsied children by measuring body

weight, total exchangeable potassium and total body water. These were determined by isotope dilution methods. The predicted body composition was based on individual heights compared to the norms of healthy children. The results revealed that the body composition of these children was a mean of 85% of the predicted values. These values should be expected due to the retarded muscle development of these children. They found that the children, in general, were shorter in stature and generally lighter than the norms for their age group. However, they felt the weights were normal when compared to their heights.

Low physical activity and malnutrition were suggested as possible causes of abnormal body compositions.

PROCEDURE

Selection of the Study Group

The criteria for selection of the children were as follows:

1) the condition and type of cerebral palsy had been diagnosed by a physician, 2) the age of the child was 1 to 10 years, 3) there was some type of feeding problem present, and 4) the mothers were willing to participate in the weekly teaching sessions with the investigator.

The mothers were initially contacted by their child's special education teacher if the child was in school or by Rosemary Ayres, a speech therapist employed by the Mental Health Offices, Benton County, Oregon. The mothers that were interested in participating were then contacted in person by the investigator. Those that agreed to participate in the study signed an informed consent form which also authorized the use of any pertinent data collected (Appendix II).

Description of Subjects

The study group was composed of seven cerebral palsied children; two spastics, one athetoid and four mixed of whom four were girls and three were boys. All seven subjects were quadraplegic. Ages ranged from 1 1/2 to 10 years. The participants were classified according to type and location of motor dysfunction, and ambulatory or nonambulatory status (Table 1). Children who could walk unassisted

Table 1. Age, growth measurements and type and location of impairment for seven cerebral palsied children.

Subject	Sex	Age		Height (cm)	Height percentile ^a	Weight (kg)	Weight percentile ^a	Motor dysfunction	Location
		Yr.	Mo.						
1*	F	6	6	101.5	< 5th	15.5	< 5th	mixed	quadraplegia
2	M	4	1	103.5	50th	15.0	25th	athetoid	"
3	M	6	2	104.25	< 5th	11.4	< 5th	mixed	"
4	M	3	0	83.5	< 5th	10.0	< 5th	mixed	"
5*	F	10	10	150.0	90th	41.5	75th	spastic	"
6	F	6	6	96.5	< 5th	11.8	< 5th	spastic	"
7	F	1	6	73.5	5th	6.7	< 5th	mixed	"

^a National Center for Health Statistics (NCHS) Growth Charts, 1976.

*ambulatory

were classified as ambulatory.

All the subjects lived at home and six children were attending special classes in the public school system. At the time of this study one subject was receiving no special guidance other than parental care. Five children were from Benton County and two were from Lincoln County which necessitated incorporating another area. The number of children from each county was solely dependent on the number of families that agreed to participate in the study. The Corvallis group of mothers were all natural parents while the two mothers in Newport were foster parents. The education levels of the mothers ranged from completion of the 8th grade to a college degree. Two mothers had earned college degrees, one in physical education and one in medical technology.

Subject 1 was a 6 year old female. She weighed 15.5 kg and was 101.5 cm tall. She was ataxic-mixed and microcephalic. The ataxia was manifested by lack of balance which caused her to stagger and weave with many falls. Her walking took a great deal of effort. The microcephaly resulted in severe mental retardation. She had limited communicative skills which included grunts and various other sounds. She fed herself but was considered a dependent feeder as she could not prepare or get any food for herself. She had few food dislikes.

Subject 2 was a 4 year old male. He weighed 15 kg and was 103.5 cm in length. He was an athetoid with severe involvement and

was non-ambulatory. His movements ranged from mild wriggling and moving his head to being very active in all four limbs. This activity increased with excitement. The child made sounds but his communicative skills were negligible. He had no self-feeding skills and could not handle many textures. He was spoon-fed. Phenobarbitol and Clonopin were administered to control seizures.

Subject 3 was a 6 year old male. He weighed 11.4 kg and was 104.25 cm in length. His cerebral palsy was of the mixed type. He was floppy with some spasticity and was non-ambulatory. There did not seem to be much mental retardation but his verbal communication was limited to yes and no sounds and facial expressions to indicate pleasure, disapproval, surprise, unhappiness and other emotions. He had very expressive eyes and often manipulated people in this way. He could feed himself in a limited fashion at home but due to the time factor at school the teacher fed him. Most textures were tolerated but he had many dislikes which limited his diet.

Subject 4 was a 3 year old male. He weighed 10 kg and was 83.5 cm in length. His cerebral palsy was the mixed type with severe involvement and he was non-ambulatory. He had delayed language development but it was expected that it would mature as he developed. He had some words which were clearly understood and had specific meanings. His self-feeding skills were limited to occasional finger-feeding.

Subject 5 was a 10 year old female. She weighed 41.5 kg and was 150 cm tall. She was moderately spastic. She walked with apparent spasticity and spoke slowly and with some difficulty. She was attending a normal fourth grade class with additional help from the speech therapist. Self-feeding was well developed but with some spasticity in her hands and fingers. She was an independent feeder in that she could get her own food if she liked. She had a good appetite and liked to eat. Her mother had stated that drooling was a problem. She was taking phenobarbitol to control seizures.

Subject 6 was a 6 year old female. She weighed 11.8 kg and was 96.5 cm in length. She was a spastic with severe involvement. Her communicative skills were fairly well developed in that she had sounds and words that had specific meanings each time they were used. She could finger-feed but her spasticity occasionally caused her to drop food before it reached her mouth. She was working on improving her self-feeding skills by using a bent spoon and a tipped bowl. She was ambulatory in the sense that she could pull herself along the floor with her hands and arms. At other times she was in some type of adaptive chair. Phenobarbitol was administered to control seizures.

Subject 7 was a 1 1/2 year old female with mixed cerebral palsy and an undetermined degree of deafness. She weighed 6.7 kg and was 73.5 cm in length and was non-ambulatory. She had no self-feeding skills and although she had the developmental skills for

hand-to-mouth feeding she showed little interest in or awareness of the feeding experience. She was maintained on infant formula with a food supplement and homemade babyfood was occasionally offered. Her communicative skills were limited to pleasure and displeasure and other basic emotional responses. She had no language and was kept supine or in an infant carrier all day. She was taking Clonopin to control seizures.

Development of Food and Nutrition Education Curriculum

The informal instruction consisted of eight weekly two-hour sessions with two groups of mothers. The lessons were developed with the concept of the parent as the student. The group meetings were planned to permit the mothers to interact and share ideas with one another. The hypothesis was that the child would receive better or more confident care from his/her parents as a result of such a program. An attempt was made to integrate teaching nutrition with feeding techniques which would promote success in achieving a more varied and adequate intake of food for the cerebral palsied child. The lessons were presented in a systematic way, such as working on a child's sucking behavior before helping him learn to chew.

The nutrition component of the curriculum was based on the Basic Four Food Groups. The first lesson was an overview of the four food groups and lessons II through V dealt with each group

separately. Each food group was chosen to be combined with a particular feeding skill which would allow a child to handle that food more adequately (e. g. , milk products and the development of sucking behavior). Lessons VI through VIII dealt with the development of self-sufficiency skills and weight control and were not food group specific.

Each lesson included a planned time in which foods were served that provided experience with a specific objective of that lesson. This was referred to as the Nutrition Break and was planned for the middle of the two-hour session. Discussions following the break were directed toward the foods, nutrients and benefits for the child with a feeding problem.

The leaflets, Nutrition and Feeding Techniques for Handicapped Children by Denise Sofka were distributed along with the lesson as indicated. These leaflets had many helpful suggestions not repeated in the content of the lessons which could help parents deal with their child's feeding problems.

The format of the lesson plans can be seen in Appendix III. The Learning Experiences provided the activity or means by which the Desired Outcomes were achieved for each lesson. The Newport group consisted of two mothers and the Corvallis group consisted of five mothers. There was often more time for the activities and discussion during the Newport group sessions because of fewer group members.

A brief description of the lessons follows.

The purpose of the nutrition component of Lesson I was to give the mothers a review of the Basic Four Food groups and to introduce them to those lessons that would follow. The Desired Outcomes for this section were to identify the food groups and place selected food models into the appropriate groups. Misconceptions, such as, butter belonging in the Meats and Protein group and eggs in a Dairy group led to group discussion of other foods.

Posters were presented in order to have the mothers identify correct and incorrect positioning during feeding. Coincidentally, a child was brought to each group's first lesson so the investigator used the children to demonstrate feeding positions rather than the floppy doll she had planned to use.

Lesson II was based on milk products and the development of sucking behavior. The sucking skill is important for articulation as well as ingesting food. Due to the consistency of many of the milk products they are easily sucked and swallowed with little or no chewing required.

In Lesson III the Bread and Cereals group was combined with the development of the swallowing skill. None of the children lacked the swallowing skill but the mothers still found the discussion helpful. Discussions included the value of breads and cereals in the diet and each mother reported which of these foods her child could manage.

Lesson IV included the development of chewing and the Fruits

and Vegetables group. Chewing skills were weak in most of these children. Suggestions were made to partially cook carrots and apple slices before presenting them as finger food. In this way these foods were firm but not as crisp as the raw food so they required some chewing skill.

Lesson V included a discussion of the Meat Group and suggestions of ways to help the child eat more solid foods. The suggested refreshment for the nutrition break was changed to Peanut Butter Chews because it was Halloween and the mothers asked for something nutritious to serve. These were an example of combining incomplete proteins since the recipe contained peanut butter, and soy protein isolate as well as the complete protein nonfat dried milk powder.

Lesson VI combined a discussion of snacks and the improvement of self-feeding skills. Most of the children could not communicate when they were hungry so it was felt that this lesson served as a reminder for the mothers that snacks should be offered which were nutritious and geared for the child's feeding skills.

The content of Lesson VII included a discussion of fluids and the development of the self-drinking skill. The mothers kept a record of their child's fluid intake during the week prior to this lesson. This permitted them to calculate their child's fluid intake and compare this with the recommended amount of calories.

Lesson VIII considered the cerebral palsied child with a weight

problem. Five children were under the 5th percentile for height and weight on the National Center for Health Statistics (NCHS) growth charts (1976). None were overweight. Suggestions were given to increase the calorie content of the diet without appreciably increasing the volume.

Plan of the Study

The study itself included ten weeks. The first and last week were used for pertinent data collecting. An additional 24-hour food intake and food frequency check was conducted two months after the 10-week period. This was done to note any changes in intake.

During the first week, a visit to the home was made. A nutrition quiz was given to the mother to be completed and returned to the investigator during the first group session. It was developed from one obtained from Johanna Dwyer.¹ Thirty-five questions were chosen to be representative of the topics covered in the eight lessons and to test a practical knowledge of nutrition (Appendix IV).

Anthropometric measurements were also taken during the first visit. The children dressed in light indoor clothing, without shoes, were weighed sitting or standing on the scales or in the investigator's arms. If the child needed to be held while being weighed the adult's

¹ Director Francis Sterns Nutrition Center, Tufts New England Medical Center; Boston, Massachusetts.

weight was then subtracted. The same set of scales was used throughout the study. The height measurements were taken with the subjects standing against a wall or if unable to stand, lying supine on a table. If recumbent length was used then two people were needed: one to hold the knees and shoulders flat and the other to take the measurement. The height and weight percentiles were determined according to the NCHS Growth Charts (NCHS, 1976).

The subject's mother or foster mother was interviewed during the first home visit to obtain dietary and feeding-related information. The 24-hour recall and a food frequency check were used to determine the child's food intake. Feeding evaluation was done by a certified speech therapist. This feeding evaluation was developed by Paula Schmidt, O. T. R. (1976) at the University of Washington Child Development and Mental Retardation Center. This tool was chosen because it used a point system for scoring which allowed comparison of the child's feeding skills before and after the nutrition education intervention. The forms for the dietary history, 24-hour recall, food frequency and feeding evaluation can be found in Appendix IV.

A biweekly visit was made to observe the child during the noon meal, in most cases at school. This, in addition to information from the feeding evaluation, enabled the investigator to evaluate the child's needs in feeding skill development.

During the tenth week another home visit was made in order to

repeat the 24-hour recall, food frequency check, feeding evaluation, anthropometric measurements, and quiz for the mother. This was the same nutrition quiz as given earlier, the results of which had not been discussed with the mothers.

Interpretation of Data

The dietary intake data were coded based on Home and Garden Bulletin No. 72 (USDA, 1971), keypunched and calculated by the computer for their nutrient content. The intakes of energy, protein, iron, calcium, vitamin A, thiamin, niacin and ascorbic acid were tabulated and compared to the 1974 Recommended Dietary Allowances (FNB, 1974). Intakes of any of the eight nutrients were considered satisfactory if they were greater than 67% of the 1974 RDA.

Experimental Approval

A proposal for this study was submitted to the Human Subjects Committee and was approved September, 1976.

RESULTS AND DISCUSSION

Height and Weight Measurements

Depressed growth and low energy intakes are reported here. Five children, three girls and two boys fell below the 5th percentile for both height and weight for their age group. Height and weight measurements and growth percentiles for the subjects can also be found in Table 1. These are plotted on Growth Charts 1-7 (Appendix V). In interpreting the plotted measurements on the charts it is assumed that those between the 25th and 75th percentiles represent normal growth (Hamill and Moore, 1976). It has been recommended that measurements below the 5th and above the 95th percentiles be checked for accuracy because referral for medical evaluation may be indicated.

As stated in the Review of Literature, Tobis (1961) found a significant correlation between the depression of heights and the severity of involvement measured by the number of extremities affected and the ability to self-feed and ambulate. All five children below the 5th percentile were quadraplegic. Two did not self-feed and none could walk. One subject, however, could pull herself along the floor with her arms.

The results obtained in this study agree with those obtained by others who found low energy intakes and depressed growth

measurements for cerebral palsied children based on age (Peeks, 1951; Leamy, 1953; Karle, 1961; Eddy, 1965; Wakoh, 1965; Culley, 1969; Berg, 1970).

Energy Intakes

The energy requirements of four children (subjects 1, 3, 5, 6) are based on height in centimeters (11.1 kcal/cm for non-ambulatory, 13.9 kcal/cm for ambulatory). The energy intakes of subjects 2, 4 and 7 are compared to the suggested allowance calculated for weight in kilograms (100 kcal/kg) because there were no data for kcal/cm for children in this age group.

The suggested energy requirements based on height in centimeters (Culley, 1969) or weight in kilograms (FNB, 1974) are found in Table 2.

The energy values for day 2 are compared to those calculated for day 1. Twenty-four-hour diet recalls were taken before and after the instruction period and are identified as day 1 and 2. Day 3 refers to the 24-hour diet recall taken two months after the period of instruction.

The energy intakes for subjects 1, 4 and 6 fell below the suggested requirement on day 1. The energy intake for subject 1 increased but remained below the suggested requirement on day 2. The values for subjects 4 and 6 exceeded the suggested requirement

Table 2. Energy and nutrient intakes of seven cerebral palsied children.

	Energy kcal	Protein g	Fat g	Carbo- hydrate g	Calcium mg	Iron mg	Vit A I. U.	Thiamin mg	Ribo- flavin mg	Niacin mg	Ascorbic acid mg
<u>Subject 1 6 yrs ♀ 101.5 cm ambulatory</u>											
Day 1 ^a	900	50	30	120	800	7.0	7400	0.7	1.8	8.0	100
Day 2 ^a	1200	70	40	160	760	9.0	5300	0.9	1.5	13.0	100
Day 3 ^a	900	60	30	100	840	8.0	8000	0.8	1.8	9.0	120
<u>Recommended cal.</u>											
<u>based on cm^b</u>	1400										
RDA ^c		30			800	10.0	2500	0.9	1.1	12.0	40
<u>Subject 2 4 yrs ♂ 103.5 cm non-ambulatory - very active</u>											
Day 1	1800	80	60	240	1140	10.0	7800	1.4	2.6	12.0	180
Day 2	1500	50	60	200	940	9.0	6600	1.6	2.3	14.0	160
Day 3	1500	70	50	180	1080	9.0	11300	1.4	2.4	15.0	100
<u>Recommended cal.</u>											
<u>based on kg^d</u>	1500										
RDA		30			800	10.0	2500	0.9	1.1	12.0	40
<u>Subject 3 6 yrs ♂ 104.25 cm non-ambulatory</u>											
Day 1	1400	60	70	140	920	12.0	2900	1.0	2.1	15.0	40
Day 2	1200	80	40	140	540	11.0	2000	1.0	1.6	14.0	20*
Day 3	1600	70	80	140	660	10.0	1900	0.8	1.3	11.0	10*
<u>Recommended cal.</u>											
<u>based on cm</u>	1200										
RDA		30			800	10.0	2500	0.9	1.1	12.0	40
<u>Subject 4 3 yrs ♂ 83.5 cm non-ambulatory</u>											
Day 1	800	30	30	120	460*	7.0*	5900	0.3*	0.8	6.0	50
Day 2	1200	60	40	160	940	9.0*	5500	0.7	1.4	10.0	90
Day 3	1000	60	40	100	820	8.0*	5000	0.6	1.6	7.0	20*
<u>Recommended cal.</u>											
<u>based on kg</u>	1000										
RDA		23			800	15.0	2000	0.7	0.8	9.0	40

Table 2. (Continued)

	Energy kcal	Protein g	Fat g	Carbo- hydrate g	Calcium mg	Iron mg	Vit A I. V.	Thiamin mg	Ribo- flavin mg	Niacin mg	Ascorbic acid mg
<u>Subject 5 10 yrs ♀ 150 cm ambulatory</u>											
Day 1	3200	120	140	400	2260	32	11000	3.0	5.6	40.0	120
Day 2	2200	120	80	280	1780	23.0	8400	2.2	4.1	41.0	100
Day 3	1800	80	80	220	1260	17.0	5400	1.3	2.8	20.0	60
<u>Recommended cal.</u>											
<u>based on cm</u>	3000										
RDA		36			800	10.0	3300	1.2	1.2	16.0	40
<u>Subject 6 6 yrs ♀ 96.5 cm non-ambulatory very active</u>											
Day 1	1100	50	40	140	880	6.0*	2000	0.7	1.5	8.0	80
Day 2	1400	60	70	160	1500	6.0*	5300	0.8	2.2	8.0	70
Day 3	1400	70	60	140	780	10.0	5800	0.6	1.7	13.0	30
<u>Recommended cal.</u>											
<u>based on cm</u>	1300										
RDA		30			800	10.0	2500	0.9	1.1	12.0	40
<u>Subject 7 1 1/2 yrs 73.5 cm non-ambulatory</u>											
Day 1	900	50	30	100	1360	23.0	14000	2.0	2.4	22.0	100
Day 2	1100	40	40	120	1040	13.0	9200	1.0	2.3	11.0	40
Day 3	700	30	20	100	580	8.0*	9100	0.6	1.3	11.0	30
<u>Recommended cal.</u>											
<u>based on kg</u>	700										
RDA		23			800	15.0	2000	0.7	0.8	9.0	40

^a day 1 is before the 8 week period of instruction, day 2 is after the period of instruction and day 3 is 8 weeks after day 2.

^b based on figures of 13.9 kcal/cm for ambulatory child and 11.1 kcal/cm for non-ambulatory child 5 to 12 years, Culley, W. J. and T. O. Middleton, 1969.

^c Recommended Dietary Allowances, FNB, 1974

^d based on figures of 100 kcal/kg, FNB, 1974

*less than 5% of the RDA

on day 2. The values for subjects 4 and 6 exceeded the suggested requirement on day 2. This was interpreted as a positive result of the instruction the mothers received.

The energy intakes for subjects 2, 3, 5 and 7 exceeded the suggested requirement on both days 1 and 2.

On day 3 the energy intakes for subjects 2, 3, 4, 6 and 7 were equal to or exceeded the suggested requirement. Subjects 1 and 5 fell below the suggested requirement on day 3.

Nutrient Intakes

The nutrient intakes and the Recommended Dietary Allowances (RDA, FNB, 1974) for the subjects are listed in Table 2.

Subjects 1, 2, 5, 6 and 7 consumed at least two-thirds of the RDA for protein, calcium, vitamin A, thiamin, riboflavin, niacin and ascorbic acid on all 3 days. Subject 3 did not meet two-thirds of the RDA for ascorbic acid on days 2 and 3. Subject 4 did not consume two-thirds of the RDA for calcium on day 1 but his intake on day 2 increased to greater than the RDA and remained high on day 3. His intake of ascorbic acid was lower than two-thirds of the RDA on day 3.

Low ascorbic acid intakes for subject 3 may be accounted for by a lack of citrus fruits or juices in the diet and a very low consumption of fruits and vegetables. Over half of the ascorbic acid intake

was from a presweetened enriched cereal which he typically consumed for breakfast.

In three subjects the ascorbic acid requirement was met by orange juice for breakfast and snack. For the remaining subjects (4, 5, and 7) the mothers reported that their children showed a dislike for citrus fruits. For these children ascorbic acid needs were met with such foods as V-8 juice, tomatoes, vitamin C fortified grape juice, cantaloupe, presweetened enriched cereals and the food supplement Meritene.

Iron values were above two-thirds of the RDA for subjects 1, 2, 3, and 5, on all three days. The iron intake for subject 4 was less than 67% on all three days. This may be due to an intake of only 1,000 kilocalories in addition to a low intake of iron-containing foods.

The iron intakes for subject 6 were low on days 1 and 2. She was the only child who did not consume enriched cereals for breakfast or snack.

Subject 7 had a high iron intake on days 1 and 2 due to the fact that she was being fed iron-fortified infant formula and a food supplement. On day 3 her iron intake fell to less than two-thirds of the RDA because she was only drinking whole milk in combination with pureed table foods. Her mother had been encouraged to include more iron-containing foods in her diet. This child had a very low daily food intake which prevented the mother from offering a wide variety of

foods each day.

Subject 5 had high nutrient intakes. These are the result of the intake of a large quantity of a presweetened enriched cereal with whole milk for breakfast or snack. Her iron intake on day 1 was over 300% of the RDA. This child typically consumed a varied diet, so without the cereal her iron intake was still 90% of the RDA. On days 2 and 3 her cereal consumption decreased from 5 cups to 3 cups and 2 cups respectively. Her calcium levels were high because of the additional milk consumed with the cereal.

Vitamin A intakes for the subjects, in general, were high. In all but three cases (subjects 3 on days 2 and 3, and subject 6 on day 1) the intake of vitamin A exceeded the RDA for this nutrient. High values were due to the eating of such foods as vitamin A-fortified low-fat and skim milk, enriched cereals, and vitamin A-rich vegetables.

All the children consumed milk or milk products regularly three times a day. Foods in this group are easily tolerated by cerebral palsied children because of the liquid or semi-liquid consistency. The discussion of milk products in Lesson II may account for increased calcium, riboflavin and protein in many of the subjects. Two

of the mothers (4 and 6) increased their use of nonfat dried milk by adding it to other foods in order to fortify their child's intake.

The intake of protein exceeded the RDA for all subjects. In many this amounted to 200-300% of the RDA for each child. Condit (1976) also found high protein intakes in Oregon preschool children.

Feeding Evaluations

Table 3 contains the scores for the subjects' feeding evaluation before and after the nutrition education intervention and the paired t value for the group's combined scores. The feeding evaluation (Appendix IV) contains three parts: gross motor skills, oral skills, and eye-hand coordination.

The trend for all seven subjects was for an improved score. The paired t value reveals that the group made significant improvements in gross motor skills and oral skills in the post-test. Gross motor skills evaluated were primarily sitting position and head position during feeding. It is not surprising that significant changes occurred in this category as it simply required making changes in the child's feeding position.

The fact that there was any improvement at all over this short

Table 3. Feeding evaluation scores and paired t values for combined group score before and after nutrition education intervention.

Subjects	Before			After						
	Gross motor skills	Oral skills	Eye-hand coordination	Gross motor skills	Change in score	Oral skills	Change in score	Eye-hand coordination	Change in score	Total change in score
1	20	69	83	20	0	74	+5	86	+3	+8
2	5	33	44	16	+11	42	+9	33	-11	+ 9
3	18	62	41	20	+2	71	+9	44	+3	+14
4	12	71	73	20	+8	66	-5	85	+12	+15
5	20	67	90	20	0	76	+9	91	+1	+10
6	12	63	59	17	+5	76	+13	76	+17	+35
7	1	28	40	16	+15	59	+31	49	+9	+52
Total possible score	20	88	93	20		88		93		
Paired t statistic				2,691**		2,479**		1,42		

**significant at the .05 level.

period of time is important. In handicapped children changes usually take a long period of time. Often therapist-patient sessions occur only weekly or monthly. However, in this case the parents were instructed in ways to improve feeding skills. This offered the child constant reinforcement of new skills.

The feeding assessment was performed by one individual who did not see the tabulated results of either evaluation. However, she was aware which evaluation was the pre-test and which was the post-test.

In most cases the children were evaluated at the school during the noon meal to eliminate any negative behaviors which might have developed with the mother present.

Many other variables which could not realistically be eliminated such as the child's mood, temperament, appetite, interest in the feeding experience and the food served for that day could have affected the results.

All seven subjects improved in all areas except for subjects 1 and 5 who remained the same in the gross motor skills category and subject 2 whose score fell in the eye-hand coordination category for the the post-test. The lower score for subject 2 may have been due in part to the child's lack of interest in the feeding experience and a general low mood on the day this assessment was made.

Mothers' Nutrition Knowledge

Table 4 contains the scores the mothers received on the nutrition quizzes. Paired t values were determined for the group's scores. The mothers were identified by the same number as their child.

The paired t value for the nutrition quiz scores indicate that there was a significant ($P < .05$) improvement in nutrition knowledge for the group of mothers. All subjects, except 2 and 6, improved their scores and these two subjects' scores remained the same. Subjects 3 and 4 made the most improvements for post-test scores with a 22% and a 17% difference, respectively. Subjects 1 and 2, who both had two relatively high scores had a more scientific-related background.

Comparison of frequently missed questions on the quiz revealed common misconceptions held by many. These were that pineapple juice was a citrus fruit juice, a teaspoon of sugar contained more calories than a teaspoon of fat and foods high in vitamin A should be eaten every day.

Table 4. Mothers' Nutrition Quiz scores and paired t value before and after nutrition education intervention

Subjects	Percent scores for nutrition quizzes	
	Before	After
1	86	95
2	96	96
3	58	80
4	78	95
5	88	93
6	89	88
7	70	79
Paired t statistic		2.725**

**significant at .05 level.

Children's Food Variety

It is thought by many investigators (Abel, 1950; Matheny and Ruby, 1963; Endres, 1969) that increased variety of foods for these children is an optimum objective. The intake of food for most of these children followed a general pattern which remained the same even after the nutrition education intervention.

Most of the children did consume a wide variety of foods. Analysis of the 24-hour dietary recalls and the Basic Four Food Group checklists from Lesson I (Appendix II) showed that in most cases foods from the Basic Four Food Groups were eaten.

In general, these children consumed foods similar to those which other children ate. Often, however, the consistency or texture was different in that it might have been pureed or cooked until very soft, and the quantity or volume of the food was less.

Breakfasts were usually the same for the subjects during the weekdays. Subject 1 usually had an egg, toast, dry cereal, skim milk and orange juice. Subject 2 ate bran cereal, infant oatmeal, whole milk, and orange juice, banana and applesauce. Subject 3 ate pre-sweetened enriched cereal and milk. Breakfast foods for subject 4 varied from enriched cereal and milk to toast and an egg. He usually had one-fourth to one-half cup of iron-fortified infant formula also. Subject 5 always had the same presweetened enriched cereal and

whole milk. Subject 6 usually had a citrus fruit or juice, whole wheat toast, an egg and cocoa or milk. Subject 7 was fed a mixture of iron fortified infant formula and a food supplement or infant cereal.

During the school week subjects 1, 2 and 4 brought lunches and subjects 3, 5 and 6 usually bought the hot lunches. Subject 7 was fed at home as she was not attending school.

Subject 1 usually had a serving of canned fruit, one-half of a sandwich (liverwurst was common), one-half cup of undiluted vegetable soup and skim milk. This child was learning to spoon feed and the fruit and undiluted soup were helpful for this training because of their viscosity.

Subject 2 was fed pureed mixtures which his mother prepared and sent to school. Food which the teachers didn't have time to feed to him was sent home and his mother fed it to him. Common foods were a cottage cheese and tomato mixture, yogurt, hard cooked egg and orange juice.

Subject 3 was fed the school hot lunch by his teacher. She usually encouraged him to eat at least the entree and milk. He was reluctant to eat any vegetables but occasionally had at least a bite. On the three days studied he had taco filling, chili and a hamburger patty, respectively, as the entrees.

Subject 4 took a lunch to school also. These usually included one-half of a peanut butter and jelly sandwich, an orange, chocolate

milk or juice and a cookie. If the foods were torn up into bite size pieces he could self-feed fairly well.

Subject 5 usually bought the hot lunch served at the school. Most of the time she ate all the food on her tray as she had few dislikes and could feed herself fairly well. Foods she ate included tacos or a hamburger, peanuts, or french fries, buttered corn and milk.

Subject 6 also bought the hot school lunches. Her teacher usually cut her food into bite size pieces so she could finger-feed. She used a spoon when encouraged to do so with those foods which were not as likely to fall off as others. Her oral skills were such that she could manage most foods once she got them into her mouth.

Subject 7 was usually fed a jar of infant cereal, undiluted vegetable soup and whole milk.

The evening meals for all of the children were the same as their families' except for subject 7 whose supper was very similar to her lunch.

Mothers' Evaluation of Curriculum

Following Lesson VIII evaluation forms were distributed to each mother. They were asked to indicate if they and their child had benefited from the nutrition education intervention and explain how. They were asked which of the lessons were the most beneficial and whether they had gained confidence in their care of their child.

The teachers of the six children attending special education classes also commented on changes they had seen in their classrooms due to this study.

Four mothers felt that both they and their child benefitted very much. The remaining three felt that both they and their child benefitted somewhat from the curriculum.

Of the three that felt they had benefitted somewhat, two were college graduates. They commented that they felt they had a good understanding of the concept of Basic Four Food Groups prior to the intervention program. They both stated that the lessons on snacks and fluid intake were most beneficial in providing new knowledge.

All the mothers expressed that they gained a great deal from interacting with other mothers of handicapped children. Two of the mothers of the younger children commented that now they could help other mothers of handicapped children.

All said their knowledge of nutrition and confidence in that knowledge increased. Four mothers felt their families benefitted from their attending the nutrition education classes because of the changes in their meal preparations. One mother commented that previously she used ten pounds of sugar a month and has reduced that to five pounds simply by baking less desserts. All said they felt that attending the nutrition education classes was a very practical use of their time because of newly gained or reinforced nutrition knowledge

and guidelines for feeding skill development.

The mothers agreed that the earlier the intervention the more beneficial such a program would be. The mother of the youngest subject said that she was much more confident in her care and was no longer afraid that her child would choke when she fed her.

The teachers commented that feeding skills for subject 4 greatly improved. They said they became more aware of the fluid needs of subject 2 as he could not communicate this need and usually gave him something to drink mid-morning. They noted an increased awareness of nutrition by the mothers as shown by the snacks they sent for parties and the lunches they sent for their children.

Modifications

The eight lesson plans covered general nutrition based on the concept of the Basic Four Food groups. For two of the mothers this aspect of the curriculum was not as stimulating as a more in depth discussion would have been. For this reason, in future nutrition education classes, detailed reading material should be provided for those group members interested. Group members should be given the opportunity to make simple pertinent presentations to the group to increase their interest in the topics covered.

It would be valuable to visit the child and his family during a meal when everyone ate together to observe the family interaction

with the motor-impaired child.

Future studies might examine energy expenditures in various activities for cerebral palsied children in the home. To more clearly evaluate the nutritional status of these children certain biochemical assays would be helpful. This might include determinations of hemoglobin or hematocrits, as well as serum calcium, phosphorus and alkaline phosphatase levels of those children receiving anticonvulsants to determine if vitamin D metabolism had been impaired.

This study was a practical and useful means of investigating a minority of the population of a community. It was learned that cerebral palsied children living in the home are, in general, well nourished and well cared for.

SUMMARY

The benefits to seven cerebral palsied children living in the home by teaching nutrition and feeding skill development to their mothers were studied over a period of ten weeks.

The children in the study group consisted of four females and three males ranging from 1 1/2 to 10 years. Two children were spastic, one was athetoid and four were of the mixed type of cerebral palsy. All seven were quadraplegic.

Eight lessons were developed and taught weekly to the mothers. The lessons included information about the Basic Four Food Groups along with ways to use these foods to help develop certain feeding skills, such as sucking, chewing, swallowing, positioning and the use of adaptive utensils.

Pertinent data was gathered before and after the eight lessons. In this way, the subjects served as their own controls. A 24-hour dietary recall supplied information about the child's food intake. Height and weight measurements, a feeding evaluation of the child and a nutrition quiz for the mother also permitted the investigator objective means by which to determine any benefits to the child.

The energy intakes for the subjects were near the suggested requirements. Five of the subjects fell below the 5th percentile for both height and weight on the National Center for Health Statistics

Growth Charts (1976).

For most of the children nutrient intakes were greater than two-thirds of the RDA except for iron and ascorbic acid which were less than two-thirds of the RDA for three subjects and two subjects, respectively. Protein, vitamin A, and riboflavin intakes were greater than 100% of the RDA for five subjects.

The scores for the feeding evaluations remained the same or improved for all subjects except one in one category. Significant ($P < .05$) improvements occurred in the category of gross motor skills and oral skills for the group as a whole in the post evaluation.

The mothers' nutrition knowledge improved for all. As a group, the improved score for the post-quiz was significant ($P < .05$).

From this study it was learned that cerebral palsied children and their mothers could benefit from a nutrition and feeding skill development education program. The investigator and the mothers felt that the earlier such an intervention program occurred, the more helpful it would be to the child.

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APPENDICES

APPENDIX I
RECOMMENDED DIETARY ALLOWANCES
1948, 1958, 1974

RECOMMENDED DAILY DIETARY ALLOWANCES¹

REVISED 1948

Food and Nutrition Board, National Research Council

	Calories ²	Protein, gm.	Calcium, gm.	Iron, mg.	Vitamin A, ³ I.U.	Thiamine, ⁴ mg.	Ribofla- vin, ⁴ mg.	Niacin (Nicotinic acid), ⁴ mg.	Ascorbic acid, mg.	Vitamin C, I.U.
Man (154 lb., 70 kg.)										
Sedentary.....	2400	70	1.0	12 ⁵	5000	1.2	1.8	12	75	*
Physically active.....	3000	70	1.0	12 ⁵	5000	1.5	1.8	15	75	*
With heavy work.....	4500	70	1.0	12 ⁵	5000	1.8	1.8	18	75	*
Woman (123 lb., 56 kg.)										
Sedentary.....	2000	60	1.0	12	5000	1.0	1.5	10	70	*
Moderately active.....	2400	60	1.0	12	5000	1.2	1.5	12	70	*
Very active.....	3000	60	1.0	12	5000	1.5	1.5	15	70	*
Pregnancy (latter half).....	2400 ⁷	85	1.5	15	6000	1.5	2.5	15	100	400
Lactation.....	3000	100	2.0	15	8000	1.5	3.0	15	150	400
Children up to 12 yrs. ⁸										
Under 1 yr. ⁹	110/2.2 lb. (1 kg.)	3.5/2.2 lb. (1 kg.)	1.0	6	1500	0.4	0.6	4	30	400
1-3 yrs. (27 lb., 12 kg.).....	1200	40	1.0	7	2000	0.6	0.9	6	35	400
4-6 yrs. (42 lb., 19 kg.).....	1600	50	1.0	8	2500	0.8	1.2	8	50	400
7-9 yrs. (58 lb., 26 kg.).....	2000	60	1.0	10	3500	1.0	1.5	10	60	400
10-12 yrs. (78 lb., 35 kg.).....	2500	70	1.2	12	4500	1.2	1.8	12	75	400
Children over 12 yrs. ⁶										
Girls, 13-15 yrs. (108 lb., 49 kg.).....	2600	80	1.3	15	5000	1.3	2.0	13	80	400
16-20 yrs. (122 lb., 55 kg.).....	2400	75	1.0	15	5000	1.2	1.8	12	80	400
Boys, 13-15 yrs. (108 lb., 49 kg.).....	3200	85	1.4	15	5000	1.5	2.0	15	90	400
16-20 yrs. (141 lb., 64 kg.).....	3800	100	1.4	15	6000	1.7	2.5	17	100	400

¹ Objectives toward which to aim in planning practical dietaries: The recommended allowances can be attained with a good variety of common foods which will also provide other minerals and vitamins for which requirements are less well known.

² Calorie allowances must be adjusted up or down to meet specific needs. The calorie values in the table are therefore not applicable to all individuals but rather represent group averages. The proper calorie allowance is that which over an extended period will maintain body weight or rate of growth at the level most conducive to well-being.

³ The allowance depends on the relative amounts of vitamin A and carotene. The allowances of the table are based on the premise that

approximately two-thirds of the vitamin A value of the average diet in this country is contributed by carotene and that carotene has half or less than half the value of vitamin A.

⁴ For adults (except pregnant and lactating women) receiving diets supplying 2000 calories or less, such as reducing diets, the allowances of thiamine and niacin may be 1 mg. and 10 mg. respectively. The fact that figures are given for different calorie levels for thiamine and niacin does not imply that we can estimate the requirement of these factors within 500 calories, but they are added merely for simplicity of calculation. In the present revision, riboflavin allowances are based on body weight rather than caloric levels. Other members of the B complex also are required, though no values can be given.

**FOOD AND NUTRITION BOARD, NATIONAL RESEARCH COUNCIL
RECOMMENDED DAILY DIETARY ALLOWANCES¹, REVISED 1958**

DESIGNED FOR THE MAINTENANCE OF GOOD NUTRITION OF HEALTHY PERSONS IN THE U.S.A.

(Allowances are intended for persons normally active in a temperate climate)

	Age Years	Weight kg. (lb.)	Height cm. (in.)	Calories	Protein gm.	Calcium gm.	Iron mg.	Vitamin A I.U.	Thiam. mg.	Ribo. mg.	Niacin ² mg. equiv.	Asc. Acid mg.	Vitamin D I.U.
Men	25	70 (154)	175 (69)	3200 ³	70	0.8	10	5000	1.6	1.8	21	75	
	45	70 (154)	175 (69)	3000	70	0.8	10	5000	1.5	1.8	20	75	
	65	70 (154)	175 (69)	2550	70	0.8	10	5000	1.3	1.8	18	75	
Women ..	25	58 (128)	163 (64)	2300	58	0.8	12	5000	1.2	1.5	17	70	
	45	58 (128)	163 (64)	2200	58	0.8	12	5000	1.1	1.5	17	70	
	65	58 (128)	163 (64)	1800	58	0.8	12	5000	1.0	1.5	17	70	
	Pregnant (second half)			+300	+20	1.5	15	6000	1.3	2.0	+3	100	400
	Lactating (850 ml. daily)			+1000	+40	2.0	15	8000	1.7	2.5	+2	150	400
Infants ⁴ ..	0-1/12 ⁴				See Footnote 4	0.6	5	1500	0.4	0.5	6	30	400
	2/12-6/12	6 (13)	60 (24)	kg.x120		0.8	7	1500	0.5	0.8	7	30	400
	7/12-12/12	9 (20)	70 (28)	kg.x100									
Children ..	1 - 3	12 (27)	87 (34)	1300	40	1.0	7	2000	0.7	1.0	8	35	400
	4 - 6	18 (40)	109 (43)	1700	50	1.0	8	2500	0.9	1.3	11	50	400
	7 - 9	27 (60)	129 (51)	2100	60	1.0	10	3500	1.1	1.5	14	60	400
	10-12	36 (79)	144 (57)	2500	70	1.2	12	4500	1.3	1.8	17	75	400
Boys.....	13-15	49 (108)	163 (64)	3100	85	1.4	15	5000	1.6	2.1	21	90	400
	16-19	63 (139)	175 (69)	3600	100	1.4	15	5000	1.8	2.5	25	100	400
Girls.....	13-15	49 (108)	160 (63)	2600	80	1.3	15	5000	1.3	2.0	17	80	400
	16-19	54 (120)	162 (64)	2400	75	1.3	15	5000	1.2	1.9	16	80	400

¹ The allowance levels are intended to cover individual variations among most normal persons as they live in the United States under usual environmental stresses. The recommended allowances can be attained with a variety of common foods, providing other nutrients for which human requirements have been less well defined. See text for more detailed discussion of allowances and of nutrients not tabulated.

² Niacin equivalents include dietary sources of the preformed vitamin and the precursor, tryptophan. 60 milligrams tryptophan equals 1 milligram niacin.

³ Calorie allowances apply to individuals usually engaged in moderate physical activity (page 2). For office workers or others in sedentary occupations they

are excessive. Adjustments must be made for variations in body size, age, physical activity, and environmental temperature.

⁴ See text for discussion of infant allowances. The Board recognizes that human milk is the natural food for infants and feels that breast feeding is the best and desired procedure for meeting nutrient requirements in the first months of life. No allowances are stated for the first month of life. Breast feeding is particularly indicated during the first month when infants show handicaps in homeostasis due to different rates of maturation of digestive, excretory, and endocrine functions. Recommendations as listed pertain to nutrient intake as afforded by cow's milk formulas and supplementary foods given the infant when breast feeding is terminated. Allowances are not given for protein during infancy.

**FOOD AND NUTRITION BOARD, NATIONAL ACADEMY OF SCIENCES-NATIONAL RESEARCH COUNCIL
RECOMMENDED DAILY DIETARY ALLOWANCES,* Revised 1974**

Designed for the maintenance of good nutrition of practically all healthy people in the U.S.A.

	Nutrient Requirements																							
	General							Fat-Soluble Vitamins				Water-Soluble Vitamins							Minerals					
	Age	Weight		Height		Energy	Protein	Vita- min A Activity		Vita- min D	Vita- min E Activity*	Ascor- bic Acid	Fola- cin†	Nia- cin*	Ribo- flavin	Thia- min	Vita- min B ₆	Vita- min B ₁₂	Cal- cium	Phos- phorus	Iodine	Iron	Mag- nesium	Zinc
	(years)	(kg)	(lbs)	(cm)	(in)	(kcal)*	(g)	(μ E)*	(IU)	(IU)	(IU)	(mg)	(μ g)	(mg)	(mg)	(mg)	(mg)	(μ g)	(mg)	(mg)	(μ g)	(mg)	(mg)	(mg)
Infants	0.0-0.5	6	14	60	24	kg \times 117	kg \times 2.2	420 [‡]	1,400	400	4	35	50	5	0.4	0.3	0.3	0.3	360	240	35	10	60	3
	0.5-1.0	9	20	71	28	kg \times 108	kg \times 2.0	400	2,000	400	3	35	50	8	0.6	0.5	0.4	0.3	540	400	45	13	70	5
Children	1-3	13	28	86	34	1,300	23	400	2,000	400	7	40	100	9	0.8	0.7	0.6	1.0	800	800	60	15	150	10
	4-6	20	44	110	44	1,800	30	500	2,500	400	9	40	200	12	1.1	0.9	0.9	1.5	800	800	80	10	200	10
	7-10	30	66	135	54	2,400	36	700	3,300	400	10	40	300	16	1.2	1.2	1.2	2.0	800	800	110	10	250	10
Males	11-14	44	97	158	63	2,800	44	1,000	5,000	400	12	45	400	18	1.5	1.4	1.6	3.0	1,200	1,200	130	18	350	15
	15-18	61	134	172	69	3,000	54	1,000	5,000	400	15	45	400	20	1.8	1.5	2.0	3.0	1,200	1,200	150	18	400	15
	19-22	67	147	172	69	3,000	54	1,000	5,000	400	15	45	400	20	1.8	1.5	2.0	3.0	800	800	140	10	350	13
	23-50	70	154	172	69	2,700	56	1,000	5,000		15	45	400	18	1.6	1.4	2.0	3.0	800	800	130	10	350	13
	51+	70	154	172	69	2,400	56	1,000	5,000		15	45	400	16	1.5	1.2	2.0	3.0	800	800	110	10	350	13
Females	11-14	44	97	155	62	2,400	44	800	4,000	400	12	45	400	16	1.3	1.2	1.6	3.0	1,200	1,200	115	18	300	13
	15-18	54	119	162	65	2,100	48	800	4,000	400	12	45	400	14	1.4	1.1	2.0	3.0	1,200	1,200	115	18	300	13
	19-22	58	128	162	65	2,100	46	800	4,000	400	12	45	400	14	1.4	1.1	2.0	3.0	800	800	100	18	300	13
	23-50	58	128	162	65	2,000	46	800	4,000		12	45	400	13	1.2	1.0	2.0	3.0	800	800	100	18	300	13
	51+	58	128	162	65	1,800	46	800	4,000		12	45	400	12	1.1	1.0	2.0	3.0	800	800	80	10	300	13
Pregnant						+300	+30	1,000	5,000	400	15	60	800	+2	+0.3	+0.3	2.5	4.0	1,200	1,200	125	18+	450	20
Lactating						+500	+20	1,200	6,000	400	15	80	600	+4	+0.5	+0.3	2.5	4.0	1,200	1,200	150	18	450	25

* The allowances are intended to provide for individual variations among most normal persons as they live in the United States under usual environmental stresses. Diets should be based on a variety of common foods in order to provide other nutrients for which human requirements have been less well defined. See text for more detailed discussion of allowances and of nutrients not tabulated. See Table 1 (p. 6) for weights and heights by individual year of age.

[†] Kilojoules (kJ) = 4.2 \times kcal.

[‡] Retinol equivalents.

[§] Assumed to be all as retinol in milk during the first six months of life. All subsequent intakes are assumed to be half as retinol and half as β -carotene when calculated from international

units. As retinol equivalents, three fourths are as retinol and one fourth as β -carotene.

* Total vitamin E activity, estimated to be 80 percent as α -tocopherol and 20 percent other tocopherols. See text for variation in allowances.

[†] The folacin allowances refer to dietary sources as determined by *Lactobacillus casei* assay. Pure forms of folacin may be effective in doses less than one fourth of the recommended dietary allowance.

* Although allowances are expressed as niacin, it is recognized that on the average 1 mg of niacin is derived from each 60 mg of dietary tryptophan.

[§] This increased requirement cannot be met by ordinary diets; therefore, the use of supplemental iron is recommended.

APPENDIX II

Informed Consent Form

I understand that my child and I will be part of a project involved in studying the benefits to children with cerebral palsy by teaching nutrition to their mothers. I have been informed of the procedures that will be used and know that if I have any questions regarding these procedures they will be answered freely. I agree to attend the eight weekly nutrition education sessions from Sept. 28 to Nov. 18, 1976. I have been ensured anonymity for myself and my child and therefore give my consent to allow the use of any data collected by the procedures in this research project. I have consulted my physician and he/she agrees that this is not in conflict with any of his/her prescribed treatments for my child.

Signed _____ Date _____

APPENDIX III
FOOD AND NUTRITION EDUCATION CURRICULUM

Lesson 1 Feeding positions, good eating habits and the Basic Four Food Groups

Rationale:

Learning good eating habits can improve a child's mealtime behavior and provide a positive emotional environment for learning the necessary eating skills. The child's position while eating will greatly affect his ability to benefit from a feeding program.

The nutrition component of this lesson is presented using the concept of the Basic Four Food Groups. An overview of the Four Food Groups is given to introduce the general function and foods of each group.

Lesson I Feeding positions, good eating habits and the Basic Four Food groups.

Desired Outcomes	Content	Learning Experiences	References and Resources
<p>The mothers:</p> <p>Will be able to name each member in the group and tell one (or 2) things about one person.</p>	<p>Introduction</p> <p>A. Getting acquainted</p>	<p>Introductions:</p> <ol style="list-style-type: none"> 1. Form groups of two (dyads); pair up with someone new. The leader should pair up with one of the members if there is an odd number. 2. Each member will proceed to interview one another, allow 15-20 min. Directions to mothers <ol style="list-style-type: none"> a) find 3 unique things about the other person to tell the rest of the group (actions, characteristics or experiences that set this person apart from other people). b) find out about family size, occupation, child's name who is in the study and the child's specific handicapping condition. c) use the name of the person instead of "she". 3. After interviewing is complete, bring the group together and proceed around the circle making introductions until everyone has been introduced. Allow 5 minutes for each introduction. 	<p>Adler, R. and N. Towne, <u>Looking out/Looking in</u> San Francisco: Holt Rinehart and Winston, 1975.</p>

Lesson I (Continued)

Desired Outcomes	Content	Learning Experiences	References and Resources
Will describe the importance of the development of good eating habits.	<p>Reasons why it is important for children to learn good eating habits:</p> <ul style="list-style-type: none"> A. Contributes to child's nutritional health. B. Increases child self-esteem. C. Improves mealtime atmosphere. D. Helps to socialize child E. Easier for parents 	<p>Group Discussion</p> <p>Leader may want to ask parents what their reasons are for teaching good eating habits. After sufficient time for everyone to offer something to the discussion, go over the points in the outline explaining where necessary.</p>	<p>Sofka, D. Helping Your Child Learn Good Eating Habits</p>
Will recall three factors which might help a child learn good eating habits.	<p>The family can help the handicapped child learn good eating habits</p> <ul style="list-style-type: none"> A. Make mealtime a pleasant experience <ul style="list-style-type: none"> 1. In a manner acceptable to family lifestyle 2. Allow adequate time for the child to eat <ul style="list-style-type: none"> a) If the child takes a long time to eat then start him/her eating earlier than the rest of the family 	<p>Go over points listed in Helping Your Child Form Good Eating Habits</p> <p>Ask Parents what has helped them make mealtime a more pleasant experience for their child and family.</p>	<p>Ibid.</p>

Lesson I (Continued)

Desired Outcomes	Content	Learning Experiences	References and Resources
	<p>b) The eating period will be different for each child but the goal should be about the same length of time as the rest of the family</p> <p>B. Reinforce the child for positive behavior</p> <ol style="list-style-type: none"> 1. For expressing his/her needs in an acceptable manner. 2. For managing a new more difficult task or texture. <ol style="list-style-type: none"> a) trying a new food which the child could not manage previously. b) trying to use a new utensil c) trying to feed himself <p>C. Give the child sufficient attention so he does not resort to attention-getting behavior not appropriate for mealtime.</p> <p>D. Offer a variety of foods that the child can manage.</p>		
Will select the best eating position for a specific handicapping condition.	<p>Suggested eating positions to encourage good eating habits</p> <p>A. Positions thought to be optimal for most children but depend on child's abilities</p> <ol style="list-style-type: none"> 1. Knees raised, feet on flat surface 	<p>Display pictures on wall or board and ask mothers to decide which position is best for :</p> <ol style="list-style-type: none"> a) a rigid child b) a floppy baby c) one who throws his head back 	<p>Sofka, <u>Helping Your Child with Correct Eating Position</u></p> <p>Finnie, <u>Handling the Young Cerebral Palsied at Home</u>, p. 122.</p> <p>pictures, end of lesson</p>

Lesson 1 (Continued)

Desired Outcomes	Content	Learning Experiences	References and Resources
	2. Knees and hip joints at right angles 3. Back straight 4. Head slightly forward in midline with body and arms forward	<p>Discuss the various positions the children in the group assume during mealtime.</p> <p>Nutrition Break Suggested refreshment: A tray of snacks representing the Four Food Groups; i. e. , fruits, vegetables and dip, cheese, Garbanzo Bean Puree (recipe can be distributed) and crackers and Armenian pocket bread. The food should be arranged in an attractive manner.</p>	<p>Garbanzo Bean Puree recipe end of lesson</p>
Will be able to describe the four basic food groups and the foods which fit into each.	<p>Food Groups Plan for Balanced Nutrition</p> <p>A. Following the Basic Four Food Guide helps to achieve good health</p> <p>1. Milk Group</p> <p>a) main source of calcium in foods b) also contributes high quality protein, riboflavin, vitamin A and other important nutrients</p>	<p>The leader may want to begin the discussion of the Four Food Groups toward the end of the break and use some of the foods as visual aids.</p> <p>Distribute Basic Four Food Guide to Good Eating mini-poster.</p> <p>Read and discuss the description on the back of this mini-poster. Suggest that the mothers keep the mini-poster on the wall in the kitchen to provide a guideline during meal planning.</p>	<p>National Dairy Council, Chicago, Ill. , 1972.</p>

Lesson I (Continued)

Desired Outcomes	Content	Learning Experience	References and Resources
Will place selected food models into appropriate food groups	2. Meat and Protein Group		
	a) meat, especially liver is excellent source for iron		
	b) animal protein is of high biological value for tissue maintenance and repair		
	3. Vegetables and Fruit Group	Sorting food models into food groups.	
	a) include dark green or deep yellow vegetable 3-4 times/week for vitamin A.	Give mothers a random assortment of food models (including butter, beans, eggs, and potatoes) and ask them to sort them into appropriate food groups. This activity should give the leader an opportunity to reinforce the lesson.	
	b) a good source of Vitamin C every day		
	4. Breads and Cereal group	Assignment during week:	
	a) use whole grain or enriched products	Keep daily checklist of the number of food groups per meal the child eats. This can be done at the end of the day; mother may want to make comments on quantities as well. This exercise is designed to provide a picture of the variety of foods the child is eating.	end of lesson
	b) these foods supply protein, iron, vitamins and food energy		

Lesson I Feeding positions, good eating habits and the Basic Four Food Groups

Materials:

One for each member and the leader:

- Helping Your Child Form Good Eating Habits
- Helping Your Child with Correct Positioning
- Guide to Good Eating
- Food Group Checklist (end of lesson)
- Garbanzo Bean Dip recipe (end of lesson)
- pencils and paper

Equipment:

- 4 posters of various eating positions (these may be enlarged from the 8 1/2 x 11 size at the end of lesson)
- Food Models
- coffee maker
- serving tray, bowl and spoon
- cups, spoons, napkins and paper plates

Supplies:

Amounts depend on size of the group

- Garbanzo Bean Dip
 - cooked garbanzo beans, 4 cups
 - seasoned soy sauce, 3 tablespoons
 - olive oil, 2 tablespoons
 - dried parsley, 1 tablespoon
 - garlic salt
- vegetable slices, (zucchini, cucumber, carrots, cauliflower, etc.)
- apple slices and orange sections, grapes or other seasonal fruit
- swiss and cheddar cheese cubes
- crackers and pocket bread torn into small pieces
- coffee, tea, cream and sugar

Lesson I Nutrition Break

Pureed Garbanzo Beans

4 cup cooked garbanzo beans (1 1/3 cup dry)

3 tbsp. seasoned soy sauce (Tamari)

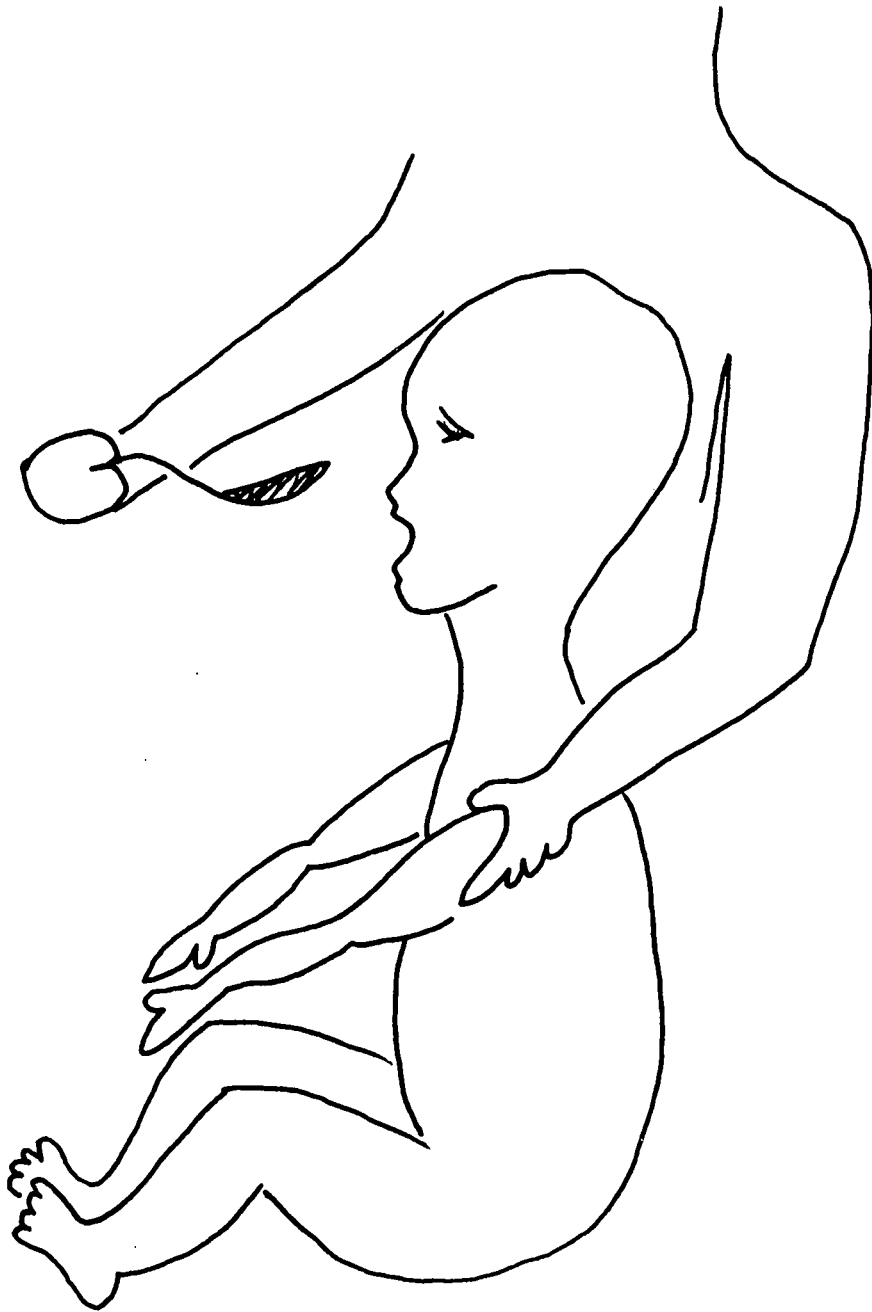
2 tbsp. olive oil

1 tbsp. dry parsley

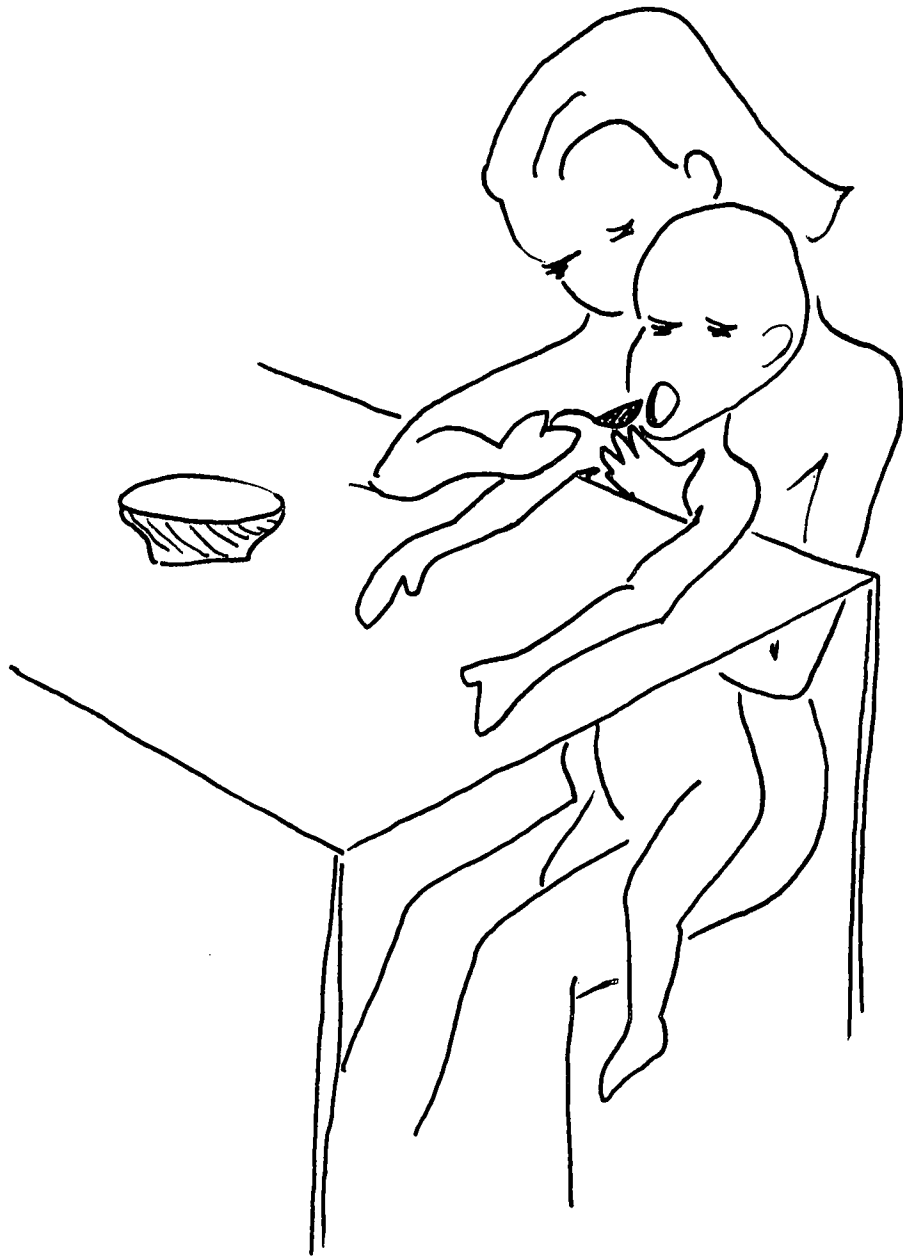
garlic salt to taste

Mash the beans to a smooth consistency.

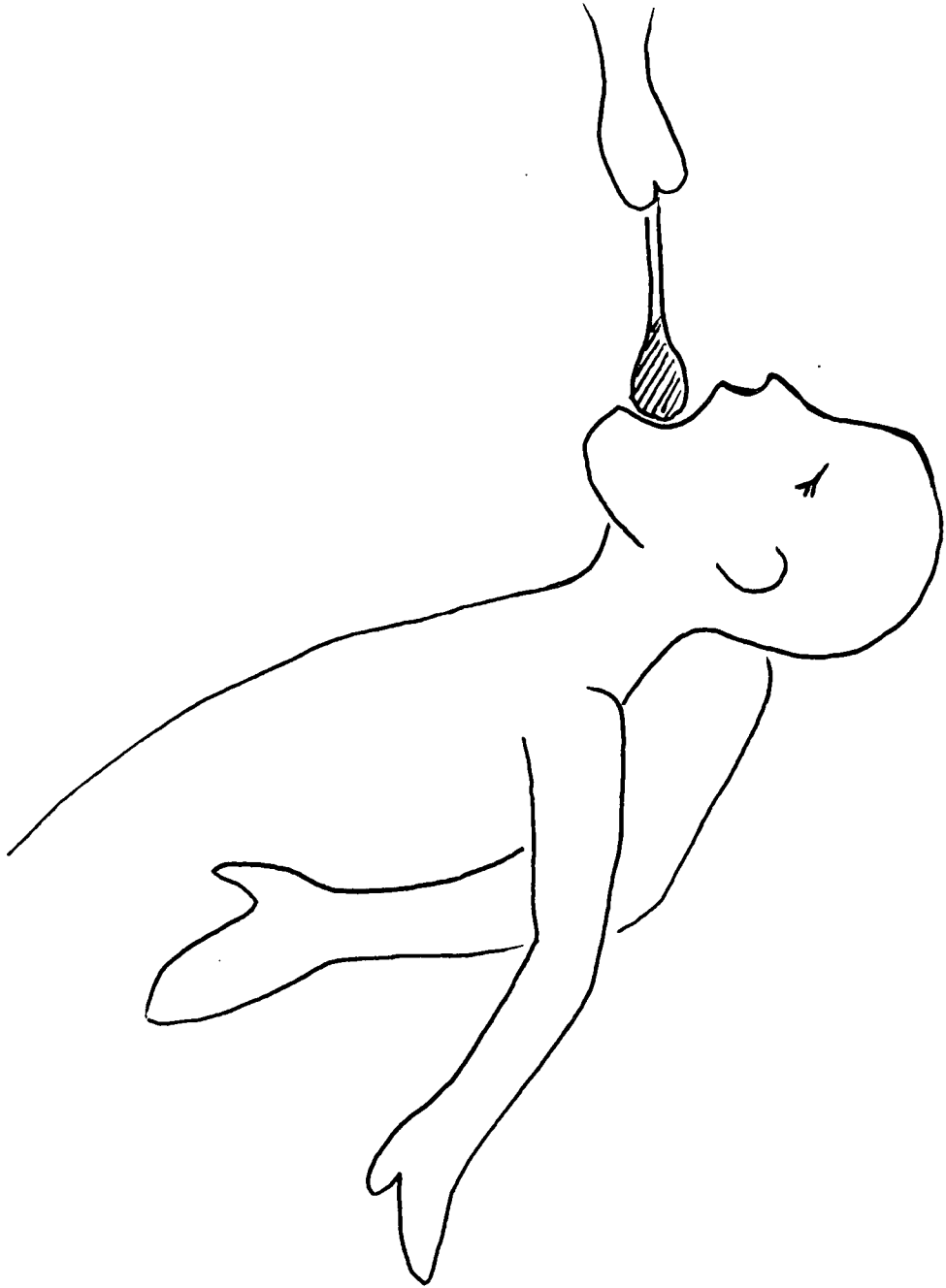
Add the rest of the ingredients and blend well. Heat til warm.



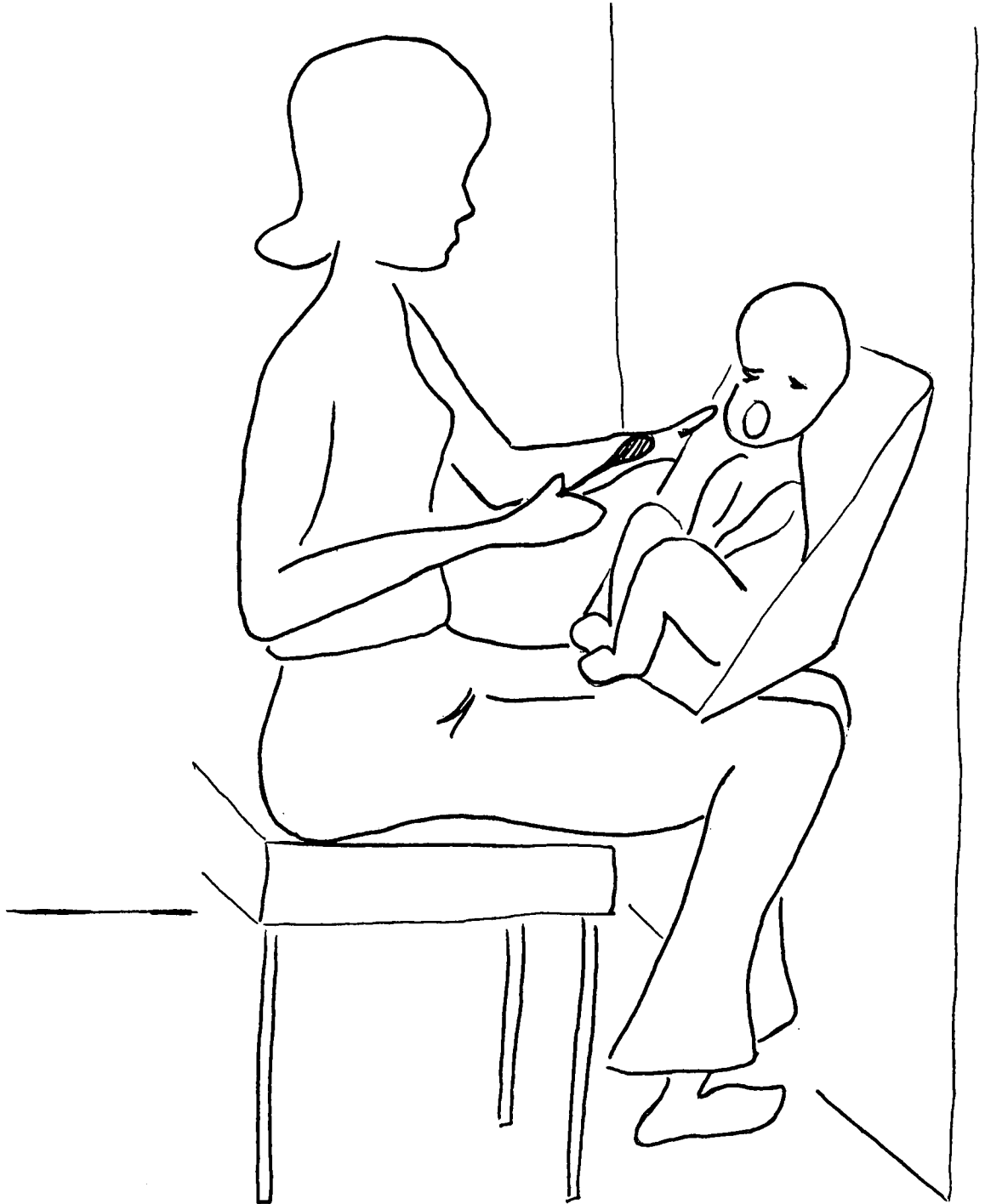
SITTING WITH THE BACK OF THE HEAD
SUPPORTED WITH THE TOP OF
THE FEEDER'S ARM



SITTING ASTRIDE THE FEEDER'S KNEE WITH
A HIGHTABLE SUPPORTING OUTSTRETCHED
ARMS. THE FEEDER CAN USE FREE
ARM TO SUPPORT CHILD'S HEAD AND JAW



BIRD FEEDING: PUTTING THE FOOD INTO
THE CHILD'S MOUTH WHILE THE HEAD,
SHOULDERS AND ARMS REMAIN BACK



















































































































SITTING ON FEEDER'S LAP WITH CUSHION
OR INFANT CARRIER AGAINST A WALL

Food Group Checklist

Name _____

Date _____

To _____

	Meal 1 Time:		Meal 2 Time:		Meal 3 Time:		Snacks Time:	
Monday								
								
Tuesday								
								
Wednesday								
								
Thursday								
								
Friday								
								
Saturday								
								
Sunday								
								

GENERAL CHECKLIST

Child's Name _____ Date _____ to _____

Task Assignment _____

Directions: When applicable, mark "X" for success and "0" for unsuccessful attempt. It will always be helpful to make comments in the space provided.

	MEAL 1	MEAL 2	MEAL 3	SNACKS
MONDAY				
TUESDAY				
WEDNESDAY				
THURSDAY				
FRIDAY				
SATURDAY				
SUNDAY				



HELPING YOUR CHILD FORM GOOD EATING HABITS

Eating will be more fun for you and your child if she has good eating habits. Children usually imitate their parents, so set a good example for your child.

There may be days when she doesn't feel like eating, and she will like some foods better than others, just as you do. Respect her wishes. Don't force her to eat something she doesn't like or stand over her to see that she eats everything on her plate. If you fuss over her, she may form a habit of refusing because she enjoys being the center of attention. Mealtime, then, becomes a time of pleading, begging, and threatening. If you offer her good food in a matter-of-fact way and maintain a pleasant, relaxed attitude, both of you will enjoy the meal.

Emotional upsets during mealtime may make chewing and swallowing more difficult for your child. If, occasionally, you have feelings of anger and resentment while feeding your child, realize that this is a natural reaction. Recognition will not do away with your feelings, but will make it easier for you to accept them as natural when an unpleasant event occurs. For children, food means love and to be fed means to be loved. The mealtime should be a pleasant social occasion for both you and your child.

An unpleasant experience such as choking or gagging may cause a child to dislike or refuse to eat a particular food. For the same reason unfamiliar foods may be feared and rejected. Many children need to be encouraged to accept new foods or they will continue to eat only those which are familiar and easily swallowed.

To introduce a new food, serve a very small amount along with a favorite food. Offer something new only when the child is hungry and in a good humor. Do not introduce more than one unfamiliar food at a time. Gradually she will learn to accept and to like a varied diet.

A plate heaped with more food than your child can possibly eat is likely to spoil her appetite for the entire meal. Give her small servings at first and encourage her to ask for second helpings.

Points to remember in feeding your child

Make mealtime a happy and pleasant experience.

Chewing and swallowing are easier if your child is relaxed.

Do not rush your child through her meal, as it will upset her and make it more difficult for her to eat.

Do not force her to eat something she does not like.

The amount of time she needs will depend on the kind of food eaten and her age, development, and appetite. If feeding is very difficult, five or six meals may be advisable instead of the usual three.

Encourage your child to feed herself so that she will become more independent.

Use utensils which make self-feeding easier.

Serve the meals attractively.

Serve nourishing foods which can be easily eaten.

Praise your child when she succeeds.

Avoid scolding her if she spills her food or if it falls out of her mouth.

Allow her to pick up food with her fingers. Table manners will come later.

Good care of your child's teeth is important to assist her in eating. Help her learn to take care of her teeth.

Help your child to develop good eating habits.

Recommendations:

Revised: Nutrition and Feeding Techniques for Handicapped Children

Prepared by: Denise Sofka, Nutritionist
Developmental Disabilities Program, Room 892
California State Department of Health
744 P Street
Sacramento, California 95814



HELPING YOUR CHILD WITH THE CORRECT EATING POSITION

A good eating position for your child is important to a successful eating program. A good guideline seems to be to find the best position for eating in which he can do the most for himself. The correct sitting position is as follows:

1. Knees raised, feet flat on surface;
2. Knees and hip joints at right angle;
3. Back straight;
4. Head slightly forward in midline with body and arms forward.

An upright position should be the goal.

If your child is small enough to hold, he should be held in your arms while you are feeding him. A position as near to sitting as possible is recommended. As soon as he has developed good body balance and control of his head, feed him sitting on a chair. When he is sitting on a chair beside or opposite you, be sure you are level with, or a little lower than he is. If not, he may want to look up at you and push back his head.

If he lacks muscle tone (floppy child), you may place him on your lap with his legs wrapped around your waist, facing you with the pillow propped on the edge of a table. Sit comfortably so he is as upright as possible with his head flexed (bent slightly forward). In this position you will have good control. Place the food on a table at your side so that you can feed him with one hand and hold him with the other. Or he may need to be propped in the chair or placed in an inclined seat, like an infant seat. Be sure it is secure. He may need to have the back of a chair tilted to give added head control or support. The edges of the chair may need to be padded to protect the back of his knees. The chair should fit his body size. His feet should be firmly on the floor or supported, so they do not dangle.

If your child pushes his head and body backward and is rigid or stiff with handling, positioning him properly will make feeding easier. He should be positioned so he bends more at the hips and knees. You may use the method with a pillow described above, but give additional attention to bending his head and legs more.

If your child has good head control, he may be fed in a high chair with a foam rubber wedge placed under him — the thickest part of the wedge should be under his knees.

If your child startles easily, feed him in a quiet setting away from noises. Handle him slowly, firmly, and gently.

Each handicapped child is different, even though they may have the same kind of disability. Therefore, activities that help your child may not benefit another child. One mother's success may not help your child.

Your physician, therapist, nurse or nutritionist will be able to help you with finding a good eating position for your child.

Recommendations:

Revised: Nutrition and Feeding Techniques for Handicapped Children

Prepared by: Denise Sofka, Nutritionist
Developmental Disabilities Program, Room 892
California State Department of Health
744 P Street
Sacramento, California 95814

Lesson 11 Foods in the Milk Group are helpful in the development of sucking behavior

Rationale:

Many professionals feel that the ability to suck effectively will improve one's articulatory skills due to the fact that there is similar muscular coordination involved. Sucking is considered a reflex skill. However, in many cerebral palsied children the skill must be learned due to the motor involvement and delayed development. Sucking provides exercise and stimulation for the tongue which should benefit the development of swallowing and chewing as well as later speech development.

Milk products can be used effectively in teaching how to suck. These foods are available in many consistencies besides liquid such as milk shakes, yogurt and ice cream which can be used to strengthen the sucking behavior and provide essentially the same nutrients.

Lesson 11 Foods in the Milk Group are helpful in the development of sucking behavior

[illegible]

Lesson II. (Continued)

Desired Outcome	Content	Learning Experience	References and Resources
	4. Use a baby cup with sucking spout.	<p>Show samples of equipment</p> <ul style="list-style-type: none"> - variety of straws - spoons - plastic water bottle - nipples - covered cup with sucking spout <p>Nutrition Break</p> <p>Suggested refreshment and activity:</p> <p>Preparing Orange Chiller or Make-Your-Own Cocoa Mix. Distribute Carnation, Co. leaflet containing these recipes and others. Divide the tasks among group members and follow the recipe. The group leader is responsible for providing the supplies. (When using non-fat dried milk to drink it is advised that it be prepared and chilled a few hours before it is to be served.)</p>	<p>Morris, S. E., <u>Program Guidelines for Children with Feeding Problems</u></p>
Will describe 2 new ways to use nonfat dried milk in the menu.			
	The Milk Group	Show filmstrip, <u>Food for Life: the Milk Group</u>	Tupperware Educational Services
Will learn to estimate serving sizes.	<p>A. Many foods in the milk group will work well in teaching a child how to suck. It is easier to learn with thicker substances such as:</p> <ol style="list-style-type: none"> 1. Yogurt (it is thinner at room temperature) 2. Milk shakes and egg nogs 3. Ice cream 	<p>Provide dry macaroni and have the mothers pour out what they feel is a 1/4 cup and a 1/2 cup serving size using a serving spoon. Then measure these amounts to learn if they overestimated or underestimated the amounts.</p>	<p><u>Feeding the Child with a Handicap</u> Public. No. 2091, DHEW</p>

Lesson II (Continued)

Desired Outcomes	Content	Learning Experience	References and Resources
	4. Blenderized cottage cheese		
	5. Cooked cereal with milk		
	B. Why milk is important in the diet		
	1. Protein		
	2. Energy		
Will compare the calcium equivalents in various milk products.	a) Compare calories in whole low-fat milk and non-fat milk.	Display Calcium equivalents using food or Food Models and Comparison Cards	Food Models and Comparison Cards, National Dairy Council
Will recognize the value of milk in a child's diet by listing 3 important nutrients milk offers children.	3. Water	a. glass of milk (1 cup) card #4	
	4. Vitamins	b. cottage cheese (1 1/2 cups) card #2	
	a) A, D, Riboflavin and Thiamin	c. cheddar cheese (1 1/3 ounces) card #1	
	5. Minerals	d. ice cream (2 cups) card #3	
	a) Calcium and phosphorus and bony structure development	e. yogurt (1 cup) card #8	
	6. Interrelationship of vitamin D and calcium absorption.		
	7. Fortification of milk with vitamins A and D.	When looking at the Comparison Cards for the foods listed above (displayed on a felt board or the wall) discuss the relative calcium value, caloric content and protein content.	

Lesson II Foods in the Milk Group are helpful in the development of sucking behavior

Materials:

One for each member and the leader:

Helping Your Child Learn to Suck
19 New Beverages with Nonfat Milk
Buttermilk Factsheet
Cottage Factsheet
Milk Factsheet
General Checklist forms (end of lesson)
pencils and paper

Equipment:

Food for Life: the Milk Group, filmstrip and cassette
filmstrip projector
cassette player
extension cord
Comparison Cards
variety of empty cartons of fortified and non-fortified milk
blender and blender container
spatula and measuring cups and measuring spoon
coffee maker
cups, spoon napkins
paper cups (4 ounce) for the Orange Cooler
paper towels

Supplies:

Amounts depend on size of the group

reconstituted nonfat milk, 5 cups chilled overnight
frozen orange juice, 1 6-ounce can
sugar, 3 tablespoons
dry macaroni, 1 pound
coffee, tea, cream and sugar



HELPING YOUR CHILD LEARN TO SUCK

If your child sucks weakly, you can help her develop a stronger sucking motion.

It is best to hold your child in a cuddling position on your lap when bottle feeding. For an older child or one who moves a great deal, it might be necessary to use an infant seat, but be sure it is securely stabilized.

Sweet cold substances have been found most helpful in stimulating the sucking response. Some other suggestions are:

1. Offer cold water sweetened with honey.
2. Dip a Q-tip in fruit, then rub the gums and tongue with it.
3. Place honey or pureed fruit on a pacifier.
4. Offer a cloth soaked in milk or cold water for her to suck.
5. Briefly rub a cold substance, such as ice, around the lips.

There are various types of nipples with different shapes and sizes of holes that can be used on nursing bottles. Children differ, so experiment to find out which type suits and meets her present needs. Be sure the flow is not too fast, causing her to choke. The size of the nipple hole should ideally allow a liquid, such as milk, to drop at the rate of approximately 21 drops a minute when held upside down. Either your nurse, physician, therapist or nutritionist can help you.

A good sucking pattern is an important step towards good speech patterns which will come later. If your child has difficulty in sucking, three or four small holes may be made in the nipple with a fine heated needle. As your child begins to improve her sucking response, replace these nipples with smaller-holed, new ones so she will learn to suck strongly.

Be sure to cuddle and talk to your child. She should be dry, rested, and warm during her feeding.

Recommendations:

Revised: Nutrition and Feeding Techniques for Handicapped
Children

Prepared by: Denise Sofka, Nutritionist
Developmental Disabilities Program, Room 892
California State Department of Health
744 P Street
Sacramento, California 95814

Lesson III Breads and cereals can be used effectively in a swallowing program

Rationale:

Swallowing is an involved and difficult task. Cerebral palsied individuals typically have trouble using the tongue to push the food from the back of the mouth to pass down the esophagus. The tongue plays an important role in the degree of ease with which swallowing occurs.

The presence of swallowing behavior permits an individual to ingest foods in the typical manner and enjoy the flavors and textures of a variety of foods which wouldn't be possible with a nasogastric tube.

A thicker food rather than a soupy one is more desirable when learning to swallow. Foods from the Bread and Cereal group can be used to thicken soups and other liquid foods and cooked cereals can be prepared to varying viscosities.

The Nutrition Break is designed to be a learning experience for the mothers by serving a variety of breads and crackers and evaluating the ease with which they can be swallowed without chewing as well as contributing to the child's diet.

Lesson III Breads and cereals can be used effectively in a swallowing program

Desired Outcome	Content	Learning Experience	References and Resources
The mothers:			
Will review last week's lesson and share experiences which may help others.	Review of previous lesson in helping a child learn to suck.	Group discussion	
	A. Any changes observed in sucking behavior.		
	B. Any changes in the intake of milk products		
	1. quantity 2. types of milk products		
	Swallowing involves three stages:		Larsen, G. L., Conservative Mgmt. for Incomplete Dysphagia Paralytica
	A. The voluntary part of swallowing usually presents a problem to cerebral palsied children. This involves using the tongue to push the food back to the throat.		
	B. Techniques which might be helpful in training the tongue:	Distribute and discuss Helping Your Child Learn to Swallow	Sofka, Helping Your Child Learn to Swallow
	1. place peanut butter on the upper side gums to be removed by the tongue.		
	2. place food in the back of the mouth to encourage using the tongue to get the food to the throat.		

Lesson III (Continued)

Desired Outcome	Content	Learning Experience	References and Resources
Will describe a technique or a condition which might help the child learn to swallow.	3. "walking down" the tongue a. using a plastic coated spoon or spatula to inch down the tongue applying pressure to make it <u>less</u> sensitive to pressure.		Finnie, N., <u>Handling the Young Cerebral Palsied at Home</u> , p. 124.
	C. Other techniques helpful in learning to swallow 1. flex the neck forward and tilt the body slightly forward 2. Child should be told to hold his breath while swallowing. 3. tell the child to "think swallow" 4. swabbing the gums with lemon juice may initiate the swallow response 5. swallowing should occur if mouth is opened and closed a few times	Leader can demonstrate or group can practice feeding techniques for helping someone learn to swallow. Group will break up into dyads and decide between themselves, a technique described in the lesson or in Sofka's leaflet to demonstrate on their partner or using floppy doll representing a handicapped child how to help the child learn to swallow.	Paula Schmidt, Workshop on Feeding Skill Development, Billings, Montana June 1976.
		Nutrition Break Suggested refreshment and activity: Assorted breads, breadsticks, crackers, tortilla chips, etc., Coffee, tea, juice Discuss the ease with which each is swallowed with little or no chewing as well as the contribution to the child's diet.	

Lesson III (Continued)

Desired Outcome	Content	Learning Experience	References and Resources
Will list four ways of including the foods from the Breads and Cereals group in the child's diet.	<p>The Breads and Cereals Group</p> <p>A. Thicker foods are easier to swallow.</p> <ol style="list-style-type: none"> 1. crackers, breads or wheat germ can be used to thicken soupy foods. 2. hot cereals. 3. noodles are easy to swallow and require little or no chewing. 	<p>Show filmstrip, <u>Food for Life; The Breads and Cereals Group</u>, Tupperware Educational Services</p> <p>Display Food Models of various foods in this group. The leader could set these up during the discussion of the nutrient contribution of Breads and Cereals to the diet.</p>	<p>Feeding the Child with a Handicap</p> <p>Food Models, National Dairy Council.</p>
Will relate the concept of combining incomplete proteins	<p>B. Nutrients in Bread and Cereal Group</p> <ol style="list-style-type: none"> 1. Protein <ol style="list-style-type: none"> a) somewhat inferior to animal sources as lysine is a limiting amino acid in wheat, rice and corn. b) tryptophan and threonine are limiting in corn and rice respectively c) when combined with small amount of animal protein an economical protein intake of high biological value results. 	<p>Using colored wood-beads representing the eight essential amino acids, demonstrate why all of these amino acids must be present in the meal at the same time.</p> <p>Discuss incomplete proteins and combinations of foods to make complete proteins.</p> <p>Tortilla and beans Rice and beans Macaroni and Cheese Peanut butter and bread Bread made with milk Pea soup made with milk etc.</p>	<p>Lewis, Margaret, 1975. Extension Nutrition Specialist, Oregon State University.</p> <p>Bogert, <u>Nutrition and Physical Fitness</u></p> <p>Lappe, F. <u>Diet for a Small Planet</u></p>

Lesson III (Continued)

Desired Outcomes	Content	Learning Experiences	References and Resources
Will compare the nutritive value in various cereal products	2. Energy value	Show food models to demonstrate average serving sizes. Weight out 1 ounce, each puffed, flaked, and heavier (Grape Nuts, Concentrate) prepared cereals.	Food Models, National Dairy Council
	a) primary source of energy for most of the world's population		
	b) average serving furnishes 75 to 100 calories		
	3. Vitamins		
	a) thiamin, niacin and riboflavin occur in the bran and germ of the grain but are lost in the milling. Refined cereals and breads are enriched with these vitamins.	Distribute and discuss, <u>Food is more than just something to eat.</u> Display comparison cards for wh. grain bread (#36) white enriched bread (#35) macaroni noodles graham crackers saltines rice (#38) corn flakes (#37)	<u>Food is more than just something to eat</u> , DHEW. Comparison Cards, National Dairy Council
	4. Minerals		
	a) calcium	Discuss relative value of each including the similarities and differences between these nutrients represented on the Comparison Cards.	Robinson, <u>Normal and Therapeutic Nutrition</u> , pp. 104-109.
	1) cereal grains are poor sources of calcium, however many commercial breads are made with 4% nonfat milk which improves calcium content.		
	2) cereals can be served with milk which is a major contributor to calcium in the diet.		

Lesson III (Continued)

Desired Outcomes	Content	Learning Experience	References and Resources
	b) iron	Home assignment:	
	1) cereal grains are a source of iron. Iron is lost when the whole grain is milled. Commercial flours and products are enriched to slightly higher than the original grain.	Keep a record on general checklist form of incomplete protein combinations served to their children during the week.	end of lesson 1
Will become aware of what an enriched cereal is.	2) many products like cream-of-wheat, Total, 40% bran, etc. are fortified with a greater amount of iron than other cereal products.	Have the group read the labels of various prepared cereals and discuss the different amounts of vitamin and mineral enrichment. Rice chex Puffed wheat Wheat chex Grape Nuts Special K Concentrate	

Lesson 111 Breads and cereals can be used effectively in a swallowing program

Materials:

One for each member and the leader:

Helping Your Child Learn to Swallow
Food is More Than Just Something to Eat
General Checklist forms (end of lesson)
pencils and paper

Equipment:

Food for Life; the Breads and Cereals Group filmstrip and cassette
filmstrip projector
cassette player
Comparison cards
Food Models
floppy doll (e. g. , 24" Raggedy Ann)
coffee maker
spoons, cups and napkins
wood beads
cereals
scale to weigh cereals

Supplies:

Amounts depend on size of group

breadsticks
pretzels
tortilla chips (or tortillas)
assorted crackers, etc.



HELPING YOUR CHILD LEARN TO SWALLOW AND TO EAT PROPERLY

If your child has trouble swallowing, you can help him learn to swallow properly.

As your child learns to suck better, his swallowing usually improves. Often difficulty in swallowing is caused by the position of your child's tongue or his use of the tongue. He should take the food off the spoon with his upper lip and he should have his mouth closed to swallow. The tongue is used to work the food or liquid to the back of the mouth. Tilting your child's head back may seem to help, but then your child will never learn to use his tongue correctly for swallowing properly.

When feeding him, remember the following steps:

1. Your child should be in a comfortable, upright, well-supported position. His feet should be resting on a solid surface and his head should be slightly forward.
2. Present the spoon to the center of his mouth. Touch his lips lightly with the spoon, and wait until he opens his mouth. If he does not open it, lightly stroke around his lips several times with your fingers and wait for him to open his mouth. Perhaps he can imitate you opening your mouth.
3. Teach him how to take food off the spoon with his upper lip. Don't push food into his mouth. Place a small amount of food on the spoon.
4. If your child needs help with eating or swallowing you may need to use jaw control. Do the following:
 - a. Place the length of your middle finger under his chin just behind the bone to close the jaw.
 - b. Place your thumb on his chin, just below his lower lip. This will help to open his mouth.
 - c. Place your index finger just below his cheek bone. This will help you get better control.

5. Jaw control may also be done from a side position. Do the following:
 - a. Stand next to your child who is seated comfortably.
 - b. Place your arm around the back of your child's head, with your arm touching his neck.
 - c. Place your middle finger under his chin, just behind the bone.
 - d. Place your index finger lengthwise on his chin.
 - e. Use this for control of opening and closing his mouth. (Refer to cover picture.)
6. His mouth should not be more than half open when you present food to him. When there is food around his mouth, don't remove the food with the spoon after he has taken a bite. Wait until you present the next bite, so you can have the pattern of an open mouth when presenting a spoon with food.
7. If he does not take the food off the spoon with his upper lip or if he has a tongue thrust, place spoon in center of mouth and press gently but firmly on center of the tongue. Be sure his tongue is not over the teeth. Put the spoon behind his teeth. Take the spoon straight out of his mouth. DO NOT rake spoon off upper teeth.
8. Avoid unnecessary contact with the lips.
9. Close his jaw gently using jaw control, as described in number 4. Wait for his swallow.
10. You may gently stroke his throat upward under his chin to help the tongue start the swallowing movement.
11. You may find that gently stroking on the side of the face from the ear to the corner of the mouth also helps start the swallowing movement.

12. When your child is drinking from a cup you should encourage him to take short sips and swallow immediately.
13. Don't present the next bite of food until he swallows.

There are many ideas about teaching correct eating techniques. One approach is to let him feel the correct movements of swallowing and explain the procedures to him while he is eating. Another approach is to let him feel the correct movements of swallowing, but talk to him about other things. In this way, it is felt, he will learn to have good eating habits spontaneously.

If your child can't control his swallowing and can't close his mouth, he may drool a great deal. You can protect his clothing with a large plastic bib. Do not offer him too much food with each bite so he has difficulty in swallowing. Also, by working on correct movements of the lips and tongue in swallowing and chewing patterns, the drooling should be reduced.

You must be patient and praise him often.

Recommendations:

Revised:	Nutrition and Feeding Techniques for Handicapped Children
Prepared by:	Denise Sofka, Nutritionist with assistance from Miriam Lowry, Occupational Therapist
Available from:	Developmental Disabilities Program, Room 892 California State Department of Health 744 P Street Sacramento, California 95814

Lesson IV Fruits and vegetables and the promotion of the chewing skill

Rationale:

The chewing behavior requires an up and down, back and forth (lateral-rotary) coordination of the upper and lower jaw. This is important for the development of speech, promoting healthy gums and teeth and increasing the variety of foods in the diet.

Most fruits and vegetables require some degree of chewing when served in the typical manner. A discussion of the nutrient and fiber contribution to the diet follows the Nutrition Break of raw vegetables and dip. Fresh fruits and vegetables provide important nutrients in the diet which many cerebral palsied children may not be receiving. Therefore it is important to discuss and experience ways of incorporating these foods in the child's diet.

Lesson IV Fruits and vegetables and the promotion of the chewing skill

Desired Outcome	Content	Learning Experience	References and Resources
The mothers:			
Will review last week's lesson and share experiences which may help others.	Review of previous lesson on learning to swallow	Group discussion and review the checklists kept by parents for incomplete protein combinations.	
	A. Any changes observed in swallowing behavior? B. Any changes in the intake of breads and cereal products?		
	Chewing	Distribute and discuss leaflet by Sofka	Sofka, Helping Your Child Learn to Chew
	A. Biting is the first stage of chewing		
	1. Foods which can be bitten and require little chewing are:		
	a) pieces of banana		
	b) canned peaches (any fruit)		
	c) cooked pieces of carrots, potatoes, turnips, apples, etc.		
	d) pieces of ripe pears		
	e) soft crackers, zwieback		
	f) small slices of soft cheese		
	B. Chewing is stimulated by the presence of solids and semi-solids		
	1. Foods selected to stimulate chewing should be chewy, gummy, or crisp. These might include:		
	a) pieces of dried fruit or vegetables		Morris, S. E., Selection of food and equipment for effective feeding therapy
	b) small pieces of fresh fruits and vegetables		

Lesson IV. (Continued)

Desired Outcome	Content	Learning Experience	References and Resources
Will identify 3 foods which stimulate chewing	c) strips of rare beef d) thin crackers, dried cereal and potato chips e) foods which remain in solid masses after being chewed 1) chicken 2) roast beef 3) sandwiches	Have mothers identify those foods in child's previous day's menu which most stimulated chewing Nutrition Break Suggested refreshment and activity; Assorted sliced vegetables and Curry Dip and/or Ranch House Dressing Dip. Discuss the nutritional contributions these foods make to the child's diet as well as the degree of skill in biting and chewing required	
	Raw and properly cooked fruits and vegetables incorporate important vitamins and minerals to the diet. A. Protein 1. protein concentrations in these foods range from less than or equal to 2%, i. e., not major contributors to the protein content of the diet.	Show filmstrip, <u>Foods for Life; Fruits and Vegetable Group</u>	Tupperware Educational Services Bogert, <u>Nutrition and Physical Fitness</u>

Lesson IV (Continued)

Desired Outcome	Content	Learning Experience	References and Resources
Will select fruits and vegetable food models high in nutritive value.	<p>B. Energy value</p> <ol style="list-style-type: none"> 1. extremely low in fat with the exception of avocados and olives 2. the carbohydrate value ranges from 3-5% for most vegetables like squash, greens, tomatoes and fresh and dried fruits are somewhat higher. 3. Not major contributors to the caloric value of the diet. Potatoes, lima beans, fresh corn and bananas are slightly under 100 cal. per serving which is somewhat higher than the other foods. 	<p>Comparison card display</p> <p>apple (#18) grapefruit (#24) banana (#19) carrot (#21) green beans (#20) green peas (#29) baked potato (#30)</p> <p>Discuss relative value of each in comparison to one another Have mothers choose those foods highest in calories; vitamins; minerals and protein.</p>	Comparison Cards, National Dairy Council
Will compare the vitamin, mineral and fiber contribution to the diet of various fruits and vegetables.	<p>C. Vitamins</p> <ol style="list-style-type: none"> 1. vitamin C (ascorbic acid) <ol style="list-style-type: none"> a. citrus fruits, strawberries, cantaloupe, broccoli and dark green leafy vegetables b. the principal function is the formation of collagen. It is important to maintain this function for wound healing and the ability to withstand the stresses of infection and injury. 	<p>Display food or food models of various fruits and vegetables and ask the mothers to identify the major contribution (i. e., vitamin, mineral and/or fiber) to the diet.</p>	<p>Robinson, C. <u>Normal and Therapeutic Nutrition</u> Food Models, National Dairy Council</p>

Lesson IV (Continued)

Desired Outcome	Content	Learning Experience	References and Resources
	c. the RDA for children is 40 mg.	Display Food Models of foods which will meet the child's daily allowance for vitamin C.	Food Models, National Dairy Council
	d. Foods enriched with vitamin C		
	1) many juices contain other nutrients in addition to being enriched with vitamin C	Orange juice, 1/2 C. 56 mg	
		Cantaloupe, 1/4 med. 32 mg	
	2) Kool-aid and fruit drinks enriched with Vitamin C are no more than sugar, water and flavoring containing vitamin C	Strawberries, 1/2 C. 44 mg	
		Grapefruit 1/2 45 mg	
		Orange, 1 med. 66 mg	
		Broccoli, 1 stalk 70 mg	
		Before the amounts of vitamin C in each food are given, have the mothers list them in order of most to least.	
		Encourage a discussion if some of the group members are surprised at the results.	
	2. vitamin A		
	a. dark green leafy vegetables and deep yellow vegetables are excellent sources of carotene which is converted to vitamin A in the body.	Display Food Models which will meet a child's daily allowance for vitamin A.	Food Models, National Dairy Council
		Greens, 1/2 C. 5306 IU	
		Carrots, 1/2 C. 7613 IU	
		Broccoli, 1/2 C. 1938 IU	
		Cantaloupe, 1/4 med. 3273 IU	
	b. vitamin A is related to the maintenance of normal vision in dim light as well as normal skeletal and tooth development.	Repeat the same activity as above listing in order of most to least vitamin A.	
	c. the RDA for children age 1-10 is 2000-3300 IU.		

Lesson IV (Continued)

Desired Outcome	Content	Learning Experience	References and Resources
	<p>3. Minerals</p> <p>a. turnip greens, mustard greens, collards, kale and broccoli are excellent sources of calcium</p> <p>b. dark green leafy vegetables fresh and dried apricots, raisins, dates, prunes, figs, peaches and berries are fair-to-good sources of iron.</p>		
Will describe three ways of incorporating foods with more texture in the diet.	<p>4. Fiber</p> <p>a. fruits and vegetables have a high amount of indigestible fiber which contribute to the maintenance of normal G. I. function. Fiber has a water drawing capacity as well as providing bulk which may prevent constipation.</p>	<p>Discuss ways to include fiber in the diet</p> <p>Finely grated carrot and raisin salad</p> <p>Cole slaw</p> <p>Adding finely chopped fruits to fruit cocktail, etc.</p> <p>Home assignment</p> <p>Incorporate different raw fruits or vegetables in child's menu in small quantities the child can tolerate.</p> <p>Keep a daily record of frequency and kind of fruit or vegetable added for the week.</p>	<p>Bogert, <u>Nutrition and Physical Fitness</u></p> <p>end of lesson I</p>

Lesson IV Fruits and vegetables and the promotion of the chewing skill

Materials:

One for each member and the leader:

Helping Your Child Learn to Chew
General Checklists forms (see end of lesson)
pencils and paper

Equipment:

Food for Life: The Fruits and Vegetable Group, filmstrip and cassette
filmstrip projector, cassette player
extension cord
Comparison Cards
Food Models
coffee maker
cups, spoons, paper plates and napkins

Supplies:

Amounts depend on the size of the group

Ranch House or Uncle Dan's dressing dip prepared the night before
(or use Curry Dip, end of lesson VIII)
dressing mix, 1 envelope
buttermilk, 1 cup
mayonnaise, 1 cup
sliced vegetables (zucchini, cucumbers, carrots, cauliflower, green onions, cherry tomatoes, etc.)
coffee, tea, cream and sugar



HELPING YOUR CHILD LEARN TO CHEW

You can do many things to help your child learn to chew. This will take time and practice, but it will be rewarding to watch your child eat and enjoy a family meal. Chewing also is important to the development of speech and promoting a healthy mouth.

Your child is ready to begin chewing when she has her main teeth and she is able to move her tongue. The teeth grind the food and the tongue mixes the food with the saliva. But the absence of teeth should not prevent an attempt at chewing. She can gum such foods as crackers, zwieback, chopped cooked vegetables or cooked potato.

If your child does not chew, check with your physician and your dentist to be sure there is no physical cause for this condition.

Your child should be in a comfortable, upright, well-supported position. Her feet should be resting on a solid surface.

When your child has her primary teeth, place a small piece of food between the back teeth and move the lower jaw up and down. Show her how you chew. Place the food on alternate sides so your child becomes accustomed to chewing on both sides.

If she tries to force the food out with her tongue, move the food back farther on her teeth. You also may use jaw control. Do the following:

- a. Place the length of your middle finger under her chin just behind the bone to close the jaw.
- b. Place your thumb on her chin just below her lower lip. This will help to open her mouth.
- c. Place your index finger just below her cheek bone. This will help you get better control. (Refer to cover picture.)

Jaw control may also be done from a side position. Do the following:

- a. Stand next to your child who is seated comfortably.
- b. Place your arm around the back of her head, with your arm touching her neck.
- c. Place your middle finger under her chin, just behind the bone.
- d. Place your index finger lengthwise on her chin.
- e. Use this for control of opening and closing her mouth.

Give your child bite sizes of food to start. Some suggested practice foods are:

1. Small pieces of day-old French bread, cooked potato, diced cooked vegetables, as carrots, or green beans, and cheddar cheese;
2. Zwieback, crackers, cereals, animal cookies, bacon bits;
3. Stewed meat, meat loaf, beef jerky, macaroni salad, fruit cocktail, chopped dried prunes and apricots. Other more textured foods may be offered later.
4. Introduce lumpy foods gradually. It will be harder for the older child who has only eaten pureed foods to learn to chew. You can sprinkle graham cracker pieces on her pudding, animal cookie pieces in her cereal or cracker pieces in her soup. Cook her cereal and pudding with lumps. Use foods that she likes. For children that do not like lumpy foods, try offering them finger foods.

Your child also needs the opportunity to bite foods. Some suggestions are: banana, lightly cooked green beans, and soft pretzel sticks.

Some hints to help your child become aware of her mouth, tongue and teeth are as follows:

1. Look in the mirror with her.
2. Play games, pointing out the parts of her mouth.
3. Do exercises with mouth and tongue in front of mirror, such as yawning, kissing, blowing.
4. Move tongue up to touch upper lip, chin, and cheeks. Place peanut butter or honey on the outer upper and lower lip and at the right and left corners of the lips. This procedure will reward your child when she uses the proper tongue movements.
5. Massage gums gently with index finger.

Work on this either at the beginning of the meal or between meals.

During mealtime:

1. Let your child feel your jaw when you chew. Then let her feel herself chew.

2. Use jaw control if needed.
3. Eat with her.
4. Let her observe other family members chewing.

This may be a messy time. Put papers or a sheet around the chair and table, and use an adequate bib to catch spilled food.

Give your child enough time between bites. She needs time to practice and experiment.

To allow her to continue on soft foods or strained baby foods too long will slow her development.

Praise her well for her efforts.

Recommendations:

Revised	Nutrition and Feeding Techniques for Handicapped Children
Prepared by:	Denise Sofka, Nutritionist, with assistance from Miriam Lowry, Occupational Therapist
Available From:	Developmental Disabilities Program, Room 892 California State Department of Health 744 P Street Sacramento, California 95814

Lesson V Solid foods are often introduced in the diet by the use of meats and protein foods.

Rationale:

The introduction of solid foods in any child's diet incorporates both exercise for the oral musculature as well as requiring less mealtime preparation for the family. A child may gain more self esteem when he feels he is functioning in a more typical manner.

Meat and other protein foods provide protein, energy and other nutrients and require a higher degree of skill and coordination in sucking, chewing and swallowing.

To reinforce the concept of incomplete protein combinations the mothers will prepare during the nutrition break beans and cheese burritos. At this time the leader could review the concept of combining incomplete protein to achieve a balanced amino acid ratio (or a complete protein).

Lesson V Solid foods are often introduced in the diet by the use of meats and protein foods

Desired Outcome	Content	Learning Experience	References and Resources
<p>The mothers:</p> <p>Will discuss checklists of fresh fruits and vegetables in the child's diet and determine if there were any changes</p>	<p>Review and discuss previous lesson on helping a child learn to chew.</p> <p>A. any changes in</p> <ol style="list-style-type: none"> 1. chewing behavior 2. variety of foods <p>Solid foods in the diet:</p> <p>A. provide exercise for sucking, swallowing and chewing.</p> <p>B. reduce the need for extra meal preparation.</p> <p>C. should be added gradually to the child's diet.</p> <ol style="list-style-type: none"> 1. there are many ways of increasing texture gradually <ol style="list-style-type: none"> a. protein foods which add texture but require little chewing are <ol style="list-style-type: none"> 1) chopped fish, chicken, liver sausage, spam, etc. 2) beans, eggs b. meat cut in bitesize pieces 	<p>Group discussion of check lists on increasing the variety of fresh fruits and vegetables in the menu.</p> <p>Distribute and discuss the leaflet by Sofka</p> <p>Nutrition Break</p> <p>Suggested refreshment:</p> <p>Prepare small bean burritos and discuss combining incomplete proteins to make complete proteins. A small amount of cheese (complete protein) may also be added.</p> <p>Distribute recipes.</p>	<p>Sofka, <u>Helping Your Child learn to Eat Solid Foods.</u></p> <p>Finnie, <u>Handling the Young Cerebral Palsied at Home</u></p> <p>Morris, <u>Program Guidelines for Children with Feeding Problems.</u></p>

Lesson V. (Continued)

Desired Outcome	Content	Learning Experience	References and Resources
The mothers:			
Will list major nutrients and function of the meat and protein foods group.	<p>The Meat and Protein Food Group</p> <p>A. Major contribution to the diet</p> <ol style="list-style-type: none"> 1. Protein is needed for <ol style="list-style-type: none"> a. tissue maintenance and repair b. formation of antibodies and the immune system and enzymes 2. Iron <ol style="list-style-type: none"> a. a necessary constituent of hemoglobin, the principal component of red blood cells. b. absorption is governed by <ol style="list-style-type: none"> 1) body's need for iron 2) existing conditions in the intestinal lumen 3) the food mixture fed 3. Vitamins <ol style="list-style-type: none"> a. thiamin <ol style="list-style-type: none"> 1) pork, liver, organ meats and legumes are excellent sources b. niacin <ol style="list-style-type: none"> 1) poultry, veal, peas and peanuts are rich sources c. vitamin B12 <ol style="list-style-type: none"> 1) organ and muscle meats and eggs supply this vitamin. 	<p>Show filmstrip, <u>Food for Life; the Meat and Protein Foods Group</u></p> <p>Display Food Models of foods in this group, particularly those of non-animal sources.</p>	<p>Tupperware Educational Services</p> <p>Robinson, <u>Normal and Therapeutic Nutrition</u> p. 199</p> <p>Food Models, National Dairy Council.</p>

Lesson V (Continued)

Desired Outcomes	Content	Learning Experience	References and Resources
The mothers:	d) vitamin A 1) liver is an excellent source of vitamin A as well as other organ meats and egg yolks		
Will describe 2 metabolic functions of protein.	B. The function of protein in the body 1. provides structural framework for animals. a. skin, hair, nails, cartilage, tendons and muscles are made up of fibrous protein. b. needed for growth in children. c. needed for replacement of tissue which is continuously breaking down and hair and nail growth in adults. 2. enzymes and most hormones are made up of proteins. 3. regulates body water balance. 4. necessary for antibody formation.	Review the concept of combining incomplete proteins with complete proteins from Lesson III Demonstrate using plastic toy beads representing the different amino acids why it is important to have complete protein foods at each meal.	Bogert, <u>Nutrition and Physical Fitness</u> Margaret Lewis, 1975 Extension Nutrition specialist, Oregon State University
Will explain how the protein need can be met by using non-animal sources.	D. Review concept of combining incomplete proteins to achieve a complete protein. 1. legumes in combination with other foods to adjust for the limiting amino acid.	Distribute recipes depicting such combinations from <u>Diet for a Small Planet</u> . Home assignment: Keep daily record of quantity and types of solid foods in the child's menu.	Lappe, <u>Diet for a Small Planet</u> . p. 133-262.

Lesson V Solid foods are often introduced in the diet by the use of meats and protein foods

Materials:

One for each member and the leader:

Helping Your Child Learn to Eat Solid Foods
General Checklist forms (see end of lesson I)
recipes from Diet for a Small Planet, F. Lappe

Equipment:

Food for Life; the Meats and Protein Food Group, filmstrip and cassette
filmstrip projector
cassette player
extension cord
Food Models
coffee maker
cups, spoons, paper plates and napkins
sauce pan, 1 quart
wooden spoon

Supplies:

Amounts depend on size of group

refried beans, 1 14-ounce can
small flour tortillas
grated cheese, 1 pound
chopped green onions, 1/2 cup
juice (e. g. , tomato, orange, etc.)
coffee, tea, cream and sugar



HELPING YOUR CHILD LEARN TO EAT SOLID FOODS

Eating should be a pleasant experience for all children. A hungry child likes to eat and will enjoy his meals if the surroundings are pleasant and relaxed. Food is more than just nourishment. The atmosphere in which it is served and eaten will affect your child's associations with food as much as the food itself.

The amount he eats will depend on his size, age, rate of growth and activity. Some children need to eat five smaller meals per day rather than the usual three meals. In proportion to size, a child's food needs are greater than those of an adult. Both need food to supply energy, repair worn-out tissues and maintain health, but, in addition, the child needs food for growth.

Some children with a physical handicap find sucking, chewing and swallowing difficult. Although self-feeding is a goal to strive for, the initial step often is to see that they eat enough to provide for proper growth and development. Remember, it is better to offer small servings and encourage them to ask for second helpings. Other children with much uncontrolled motion require extra nourishment to compensate for their activity. Some children experience no problem in eating but put on excess weight due to limited activity. Any of these problems complicate progress in overcoming the handicap. The underweight child may not have the strength or energy to carry out the muscular activity needed to improve his condition. The overweight child has the burden of extra pounds which keep him from progressing as rapidly as he could. If your child has one of these problems, see your nutritionist or physician about adjusting his food intake to meet his actual needs.

Learning to eat solid foods will help your child to learn to use his tongue, lips, and throat, which he will use in speaking. More textured foods will also add fiber to the diet which is needed for a normal bowel pattern.

Pureed or strained foods may be necessary at first, but make the change to coarser textures as soon as possible. A younger child seems to accept these new and strange lumps better than an older child. When he can control his throat, tongue, and mouth muscles, chopped foods, and later, solid foods should be added to the diet. If the change is gradual, he will become accustomed to the coarser textures, and with practice, learn how to handle these foods.

The pureed or strained infant foods and junior chopped foods are costly and many have a high salt and sugar content. The dinners (combination preparations) are low in protein, fat, and calories. You should use table foods, that is, foods that the family is eating, to serve your child when he is ready for coarser textured foods.

A Guide for Adding More Textured Foods

Milk

Fresh milk, powdered milk, custard, milk puddings, cottage cheese, and cheddar cheese chunks are fine. (Artificial and filled milks do not meet your child's nutritive needs.) Milk and cheese supply protein, calcium, Vitamins A and D, and riboflavin.

Cereals

Continue with infant cereals and Instant Cream of Wheat to assure a good source of iron. You may add cooked raisins or cooked chopped dates to the cereal for additional iron. Add finger foods such as dry toast, graham crackers, tortilla, zwieback, Cheerios. This food group will supply some protein, the B-Vitamins, and iron. Use whole-grain or enriched products only.

Vegetables

Give coarsely chopped table vegetables, including baked, or boiled potatoes or whole pieces of cooked carrots, string beans, and peas as finger foods. Vegetables are rich sources of Vitamins A and C. Many also supply some iron and B-Vitamins.

Fruits

Add peeled, raw, ripe fruits such as apple, pear or peach slices, orange and grapefruit sections, and banana. Include all fruit juices and Vitamin-C rich fruit or juice such as citrus or tomato juice each day. Dried prunes, apricots, and raisins may be cut in small pieces and cooked. They supply iron to the diet.

Eggs, Meat, and Beans

Eggs and finely ground meat should replace strained meats. Strips of cooked liver, tender lean meat or chicken and ground meat patties may be given to suck and chew. Peanut butter and mashed beans should also be used often. These foods supply protein, iron and many of the other minerals and vitamins which your child needs.

Food and Its Relation to the Teeth

An excess of foods containing starch and sugar, such as candy, soft drinks, pastries, cookies, sugar coated cereals cause tooth decay. These foods stick between the teeth or cling to the tooth surfaces where they are rapidly turned into acid by bacteria in the mouth. This acid, which can dissolve tooth structure, is largely responsible for tooth decay.

The limiting of sweets and sticky foods and good tooth brushing help to prevent dental decay.

Recommendations:

Revised: Nutrition and Feeding Techniques for Handicapped Children

Prepared by: Denise Sofka, Nutritionist
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California State Department of Health
744 P Street
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Lesson VI. Snacks - a nutritious and practical means of teaching self-feeding.

Rationale:

Learning to self-feed is one of the first steps for any child in becoming more independent. Acquiring this skill can improve a child's self esteem as well as relieving some of the time consuming responsibilities of the feeder or care-giver.

Snacks are discussed because these foods might be the first ones a child may use in trying to learn self-feeding. Snacks are often offered at a time when mealtime manners are not a major concern thus permitting the child more opportunities to handle and play with his foods. Snacks from each of the Four Food Groups are discussed and sampled during the Nutrition Break.

Lesson VI Snacks - a nutritious and practical means of teaching self-feeding

Desired Outcomes	Content	Learning Experience	References and Resources
The mothers:			
Will relate patterns in their child's consumption of solid foods.	<p>Review of previous lesson on learning to eat solid foods</p> <p>A. Any changes in variety of textures of foods consumed</p> <p>B. Was the child more likely to take solids at any particular meal?</p>	Discuss checklists of quantity and quality of solid foods in the child's diet.	
Will list three self-feeding readiness signs.	<p>Self-feeding readiness signs</p> <p>The child should:</p> <p>A. Be able to swallow food without choking</p> <p>B. Be able to grasp and release things from his hand.</p> <p>C. Be able to move hand from plate to mouth.</p> <p>D. Have sitting balance and head control.</p> <p>E. Begins to show interest in feeding utensils</p> <p>1) plays with spoon, cup, etc</p> <p>Beginning a self-feeding instruction program in the home</p> <p>A. Set aside a certain period of a meal to be used as a learning time.</p>	<p>Distribute and discuss leaflets by Sofka</p> <p>After having read the leaflets by Sofka and discussed the content, ask the mothers to orally list three self-feeding readiness signs.</p>	Sofka, D. Helping Your Child Learn to Finger Feed and Helping Your Child Learn to Self Spoon-feed.

Lesson VI (Continued)

Desired Outcomes	Content	Learning Experience	References and Resources
<p>The mothers:</p> <p>Will do a task analysis of the feeding experience for their child.</p>	<p>B. Analyze the feeding experiences and break it down into tasks and begin working on primary points.</p> <p>C. Always praise the child for efforts and successes</p> <ol style="list-style-type: none"> 1. during mealtime 2. during play or activity when child is exercising skills which can be used to self-feed. 	<p>Have the mothers do a task analysis of the feeding experience for their own child by listing in order, which skill comes first, e. g.,</p> <ol style="list-style-type: none"> 1. sitting 2. head control 3. eye contact with food 4. scooping or grasping food 5. hand to mouth movement 6. taking food into mouth 7. sucking, gumming or chewing food 8. swallowing food 	<p>Erikson, Marcene, Workshop on Nutrition and Feeding Skill Development, 1976, Billings, Montana.</p>
<p>Will describe a game to teach their child which will strengthen a skill needed in self-feeding.</p>	<p>D. Activities to strengthen the reach-grasp-release skills</p> <ol style="list-style-type: none"> 1. playing with blocks 2. passing beanbag or ball 3. coloring large outlines 4. pouring sand, rice or water 	<p>Have rice or sand on hand in a shoe box or a similar container for mothers to pour from small cups so that they will appreciate all the skills involved in this activity. Encourage the mothers to try this or another such activity with their children.</p>	<p>Sofka, D. Helping Your Child to Finger Feed and Helping Your Child Learn Spoon Self-feeding</p>

Lesson VI (Continued)

Desired Outcomes	Content	Learning Experience	References and Resources
The mothers:		Nutrition Break	
		Suggested refreshment:	
		Assorted snack foods cut in shapes which a child could handle when learning to finger-feed, e. g., cheese cubes, pretzels, breadsticks, pickles, pieces of toast, carrot sticks, nuts, cherries, etc.	
Will list one ideal snack for their child from each of the four food groups.	<p>Snack foods are ideal for teaching a child to finger-feed.</p> <p>A. These foods:</p> <ol style="list-style-type: none"> 1. can be cut into shapes which the child can hold onto 2. can be very nutritious and tasty 3. can be served in a more relaxed manner than during mealtime 	<p>Distribute the leaflet, <u>Snacks, snacks, snacks . . .</u></p>	<u>Snacks, snacks, snacks . . .</u> , Oregon State Health Division
Will be able to describe three nutritious snacks for an underweight child.	<p>Goal for snack foods</p> <p>A. If a child is underweight and needs between meal feedings to meet calorie and nutrient requirement</p> <ol style="list-style-type: none"> 1. these foods should be concentrated forms of energy and very nutritious, thereby not interfering with the child's appetite for the next meal <ol style="list-style-type: none"> a) hard cooked or deviled eggs b) yogurt c) nuts and nutbutters 	<p>Using Comparison Cards try the Mystery Card Game by covering the label of the food and ask such questions as: Would this be a good snack food? Can you guess what it is?, etc.</p>	Comparison Cards, National Dairy Council

Lesson VI (Continued)

Desired Outcomes	Content	Learning Experience	References and Resources
The mothers:	d) cheese cubes e) hot dogs and lunch meats f) enriched cereal with milk g) pieces of chicken or turkey meat h) olives i) avocado slices on toast	Suggested Mystery Cards Baked Potato Greens Macaroni and cheese Cheese Pizza Liver Gelatin Dessert Popcorn Soft Drink Butter Banana Sugar Cookie	
Will describe three nutritious snacks for an overweight child	B. If the child is overweight and must cut down on calories but still needs between meal feedings 1. low calorie and nutritious foods 2. filling, so as not to want more than one serving a) berries b) melon slices c) a few saltines d) a breadstick or pretzel e) dried cereal f) carrot sticks g) raw summer squash slices	Home Assignment: Ask the mothers to keep a record, using the general checklist form, of the type and amount of snack foods and the fluid intake for the child was given during the week.	end of lesson I

Lesson VI Snacks - a nutritious and practical means of teaching self-feeding

Materials:

One for each member and the leader:

Helping Your Child Learn to Finger Feed
Helping Your Child Learn to Self-feed
Snacks, snacks, snacks . . .
General Checklist forms (end of lesson I)
pencils and paper

Equipment:

shoe box full of sand
measuring cups or plastic cups
measuring cups or plastic cups
coffee maker
cups, spoons, paper plates and napkins

Supplies:

Amounts depend on size of group:

cheese cubes
pretzel breadsticks
pickle chunks
carrot sticks
pieces of fruit
nuts
dried cereal
coffee, tea, cream and sugar



HELPING YOUR CHILD LEARN TO FINGER FEED

Your child is ready to begin finger feeding when he

1. Is able to pick up objects with his thumb and fingers;
2. Is putting toys and his hands in his mouth;
3. Is able to bite food, chew and swallow.

Make sure the setting is calm and cheerful. Good posture is essential. He should be sitting upright with his head slightly forward, and both his body and his feet supported. He should have a table or a high chair tray with edges, at a comfortable height in front of him.

Place small amounts of food which can be easily picked up on a tray before him. If he does not pick it up and chew on it, show him how to do it. You can work on this hand-mouth movement between meals.

To begin with, you may try putting apple sauce, peanut butter or honey on his finger and guide his hand to his mouth. This will give him a reward to start and encourage him to try again. Stand behind him to guide his hand. This will help to keep him looking at his hands and the food you want him to eat. If he is continually looking behind, it might be better to sit in front of him.

If your child uses one hand more often, this is the hand you will want to work with, because he will be able to do a better job and will learn easier. Never try to change the handedness of your child.

As he learns the movements, help him less. Remember, offer help as long as needed but no longer than needed.

If his ability to grasp or reach seems weak or uncoordinated, think of activities at nonfeeding times to strengthen and improve coordination. Some examples are:

1. Pouring sand, rice, cornmeal or water;
2. Picking up and releasing blocks in a container;

3. Passing a beanbag or rubber ball;
4. Coloring large, outlined pictures;
5. Pushing and pulling push toys;
6. Playing with both small and large toys, squeeze toys, peg boards;
7. Helping with his toothbrushing;
8. Swinging and raising arms as part of "dancing" to music;
9. Sandbox play with spoon and pail;
10. Playing games in front of a mirror pointing out the parts of his face and mouth.

Foods to begin using for finger feeding are dry cereals as Cheerios, graham crackers, animal cookies, zweiback, lightly cooked stringbeans or carrots, bananas, hard scrambled eggs, meatballs, crumbly cheese. Later you can introduce peeled apple slices, crisp bacon, chicken leg, small nourishingly filled sandwiches, such as peanut butter, chicken salad (tiny pieces of chicken with mayonnaise).

Your child needs the opportunity to bite foods, so offer him such foods as: graham crackers, zweiback, lightly cooked stringbeans or carrots, bananas, cheese, soft pretzel sticks.

Don't be concerned about cleanliness or good table manners at this time. Self-feeding is a messy process at whatever age it is started. Use a large bib or diaper to cover him. A sheet of plastic or newspaper on the floor will help the "clean-up."

Praise your child often for his efforts.

Recommendations:

Revised: Nutrition and Feeding Techniques for Handicapped Children

Prepared by: Denise Sofka, Nutritionist
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HELPING YOUR CHILD LEARN SPOON SELF-FEEDING

A normal and very important part of any child's development is his need to be independent. It is natural for you to want to help your child as much as possible, but there is real danger in "overprotecting" a handicapped child. He will learn faster if he is not too dependent upon you. He also will be delighted to learn a new skill and some independence.

Encourage self-feeding as soon as your child is able and shows a desire to help himself. Look for the following:

1. He should be able to swallow liquids and solids without choking.
2. He should be able to hold and lift his hand from the plate to his mouth.
3. He should have sitting balance and ability to control his head movements.

Set aside a regular period for each meal. It is best to choose a time when the child is not tired and you are free from other duties.

He should be in a comfortable, upright, well-supported position. His feet should be resting on a solid surface.

Sit behind him and tap the spoon on the table and pause to see if he will reach out and grasp it. If not, place your hand over his hand and help him grasp the spoon, and bring it to the bowl of food. Use a container which has high sides so that food can be scooped against the sides. Clay, masking tape, velcro, suction cups or a wet wash cloth can be used to stabilize the bowl.

Help him scoop food into the spoon and bring it to his mouth. Use simple words of direction, such as "hold spoon," "let go spoon." Also name each food as he eats it. As he brings the spoon to his mouth, praise him with a pat or "good boy" or whatever else he responds to. The food will also be a reward.

As he learns the movements, help him less. Stop placing your hand over his hand and only support his hand at the wrist. Then apply support to his elbow only. The next step is to withdraw all help and support.

He may need more help scooping the food into the spoon -- this is the hardest part. Remember, offer help as long as needed but no longer than needed.

Sometimes it is a good idea to feed him every other spoonful to allow him to rest between his own attempts. With practice, he will progress to the stage where he can feed himself without your help, and you will need to help him only when he is tired. When he has mastered self-feeding he will feel more independent and secure.

If his ability to grasp or reach seems weak or uncoordinated, think of activities at non-feeding times to strengthen and improve coordination. Some examples are:

1. Pouring sand, rice, cornmeal or water;
2. Picking up and releasing blocks in a container;
3. Passing a beanbag or rubber ball;
4. Coloring large outlined pictures;
5. Pushing and pulling push toys;
6. Playing with both small and large toys; squeeze toys; peg boards;
7. Helping with his toothbrushing;
8. Swinging and raising arms as part of "dancing" to music;
9. Sandbox play with spoon and pail.

When he is learning to eat he cannot be expected to be tidy. Learning to feed himself is more important than neatness. Occasional spillings are to be expected so be prepared for them. Place his chair and table on a floor that can be easily cleaned or put a covering on the floor, such as newspapers, an old sheet or a shower curtain. Cover him with a large bib or apron. Encourage him to eat, regardless of his mistakes. Neatness and good manners will come with practice. Also allow him the opportunity to use his fingers when eating.

In preparing foods for a child who is learning self-feeding, the following points may be helpful:

1. Use foods that are of a thick consistency. Creamed dishes, such as beef or chicken, cottage cheese, cream cheese colored and flavored to suit

your child's taste, cooked cereals, custards, puddings, cooked vegetables such as mashed squash or mashed sweet potatoes, and cooked fruits which are chopped or mashed, are easy to eat because they stick to a spoon.

Thin soups, slippery peaches, and rolling peas are very difficult to scoop up with a spoon until control improves.

2. Finger foods, such as small pieces of meat loaf, beef patties, small chicken leg, cooked vegetables, and sections of peeled fruit, are easily handled.
3. Offer small servings and encourage your child to ask for second helpings.

Praise your child often. Make sure the setting is calm and cheerful. If he is resistant don't force him. Also, don't scold if he doesn't do what you would like him to do. Try again in a few days.

Recommendations:

Revised: Nutrition and Feeding Techniques for Handicapped Children

Prepared by: Denise Sofka, Nutritionist
Developmental Disabilities Program, Room 892
California State Department of Health
744 P Street
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Lesson VII The value of fluids in the diet and encouraging self-drinking behavior

Rationale:

Any individual will learn more easily if he has tools adapted to his specific needs. Utensils adapted for self-drinking are of particular value for increasing the child's feeling of self sufficiency as well as allowing him to satisfy his thirst when necessary rather than when the care-giver wishes.

The importance of water and other fluids in the diet is discussed. Using juices for the nutrition break demonstrates various consistencies of fluids as well as providing good nutrition for the child.

Lesson VII The value of fluids in the diet and encouraging self-drinking behavior

Desired Outcomes	Content	Learning Experience	References and Resources
<p>The mothers:</p> <p>Will describe three snack foods appropriate for her child's likes and needs.</p>	<p>Review of previous lesson on self-feeding and snacks</p> <p>A. Were there any changes in skills related to self-feeding</p> <ol style="list-style-type: none"> 1. grasp and release 2. hand to mouth movement 3. show more interest in the feeding period <p>B. Did the type or amount of snack foods change</p> <p>Self-drinking readiness signs</p> <p>The child:</p> <ol style="list-style-type: none"> A. Can swallow liquids without choking B. Has fairly defined lip closure C. Can hold a cup with one or both hands D. Shows an interest in holding the cup E. Has upright sitting position and good head control F. Is fairly skilled at straw sucking 	<p>Discuss checklists of type and amounts of snack foods for the child.</p> <p>Are the foods appropriate for her child's needs in:</p> <ol style="list-style-type: none"> 1. improving skills in chewing, sucking, etc. 2. energy 3. nutrients <p>Distribute and discuss leaflets by Sofka.</p> <p>Distribute <u>Feeding the Child With a Handicap</u></p> <p>Distribute Readiness Signs for Certain Self-feeding Skills and ask mothers to correctly identify those skills for self-drinking or follow directions at top of page.</p>	<p>Sofka, D. Helping Your Child Learn Self Drinking and Helping Your Child Learn to Use Tools for Eating</p> <p>Feeding the Child with a Handicap, DHEW</p> <p>end of lesson</p>

Lesson VII (Continued)

Desired Outcomes	Content	Learning Experience	References and Resources
The mothers:	Adaptations for eating utensils to help child learn to use them	Show the catalog of equipment to mothers and discuss how items they already have can be similarly adapted.	Sammons, <u>Be OK Self-help Aids</u> , 1976 catalog, pp. 12-21.
Will describe an economical way to adapt equipment to be used as a self-feeding utensil.	<p>A. Built-up spoon handles</p> <ol style="list-style-type: none"> 1. with sponges 2. with wash cloths 3. commercially available adapted utensils 	<p>Provide a box of assorted materials and ask the mothers to design ways these materials can be used to adapt equipment in the home.</p> <p>Suggested materials:</p> <p>Sponges, foam curlers, plastic and styrofoam cups, wash cloths, rubber coated spoons, ice tea spoons, bleach bottle, plaster of paris, rubber bands, velcro, exacto knives.</p> <p>If the mothers missed any ideas, show them those described in <u>Eating With a Spoon</u>, and <u>Feeding Handicapped Child</u></p> <p>Nutrition Break</p> <p>Suggested refreshment:</p> <p>Assorted beverages of various consistencies., e.g., orange juice, V-8 juice, apricot nectar (fortified with vitamin C)</p> <p>Provide small paper cups for each beverage for each mother and discuss the relative ease with which they are swallowed.</p>	<p>Bowman, M. <u>et al.</u>, <u>Eating With a Spoon</u>, 1975, Ohio State University, pp. 36-41 and pp. 50-53.</p> <p>Smith, M. <u>Feeding the Handicapped Child</u>, 1972, Univ. Tennessee, pp. 55-63.</p>

Lesson VII (Continued)

Desired Outcome	Content	Learning Experience	References and Resources
The mothers:			
Will relate the value of water (fluids) in the child's diet.	<p>The value of the liquid component of the diet</p> <p>A. Water</p> <ol style="list-style-type: none"> 1. The body's need for water is second only to oxygen 2. The function of water in the body <ol style="list-style-type: none"> a. cushion for all the cells b. medium of all body fluids <ol style="list-style-type: none"> 1) digestive juices, lymph, blood, urine, perspiration 2) provides a medium for nutrients and other products of digestion to pass through intestinal walls to bloodstream c. regulates body temperature <ol style="list-style-type: none"> 1) evaporation from lungs and skin d. body lubricant <ol style="list-style-type: none"> 1) saliva 2) mucous of gastrointestinal tract 3) fluids which surrounds joints 3. Sources of water to the body <ol style="list-style-type: none"> a. ingestion of water and beverages b. water is principal constituent by weight of almost all foods (sugars and fats excluded) c. oxidation of foods 	<p>Display a clear plastic model of the human body showing all the organs and structures or a poster depicting the same features.</p> <p>Ask the mothers, in a round table discussion, to identify all the body's needs for and functions of water they can think of.</p>	<p>Robinson, C. <u>Normal and Therapeutic Nutrition</u>, pp. 125-127.</p> <p><u>World Book Encyclopedia</u> Field Enterprises Educational Corporation Chicago, 1972, V. 9, p. 378.</p>

Lesson VII (Continued)

Desired Outcome	Content	Learning Experience	References and Resources
The mothers:	<p>4. Requirements</p> <ol style="list-style-type: none"> varies according to the amount that replaces losses by kidneys, lungs, skin and bowel ordinarily, thirst is an accurate guide based on conditions such as climate, activity and size 1 ml per calorie consumed 		<p><u>Recommended Dietary Allowances</u>, 1974 National Academy of Sciences</p>
Will evaluate child's fluid needs and intake		<p>Calculate energy needs for each child: ambulatory, 13.9 cal/cm height non-ambulatory, 11.1 cal/cm height</p> <p>If the children are getting this number of calories then they should be getting this many milliliters of fluid.</p> <p>Calculate fluid intake from records kept previous week (33.3 ml = 1 oz)</p> <p>If necessary calculate water from foodstuff using handbook No. 8.</p>	<p>Culley, Middleton, Calorie requirement of mentally retarded children with and without motor dysfunction.</p> <p>Watt, Merrill, <u>Composition of Foods</u>, Ag. Handbook No. 8, 1973, USDA</p>

Lesson VII Readiness Signs for Certain Self-feeding Skills

Identify the readiness sign which corresponds to the feeding skill by marking S-D for Self-drinking and S-F for Self-feeding. Are there any which are not readiness signs for feeding skills?

The child:

- _____ a) can bring lips together and make a fairly tight seal
- _____ b) shows no interest in eating utensils
- _____ c) has little or no tongue control
- _____ d) can suck liquids from a straw
- _____ e) enjoys playing with eating utensils
- _____ f) is able to sit upright and control head without support
- _____ g) can swallow liquids without choking
- _____ h) has an up and down chewing motion
- _____ i) has little control of jaw movements
- _____ j) has good hand to mouth movements
- _____ k) can release as well as grasp things

Lesson VII The value of fluids in the diet and encouraging self-drinking behavior

Materials:

One for each member and the leader:

- Helping Your Child Learn Self-drinking
- Helping Your Child Learn to Use Tools for Eating
- Readiness Signs for Certain Self-feeding Skills (end of lesson)
- Be OK Self Help Aids catalog (1 or 2)
- General Checklist forms (end of lesson I)
- pencils and paper

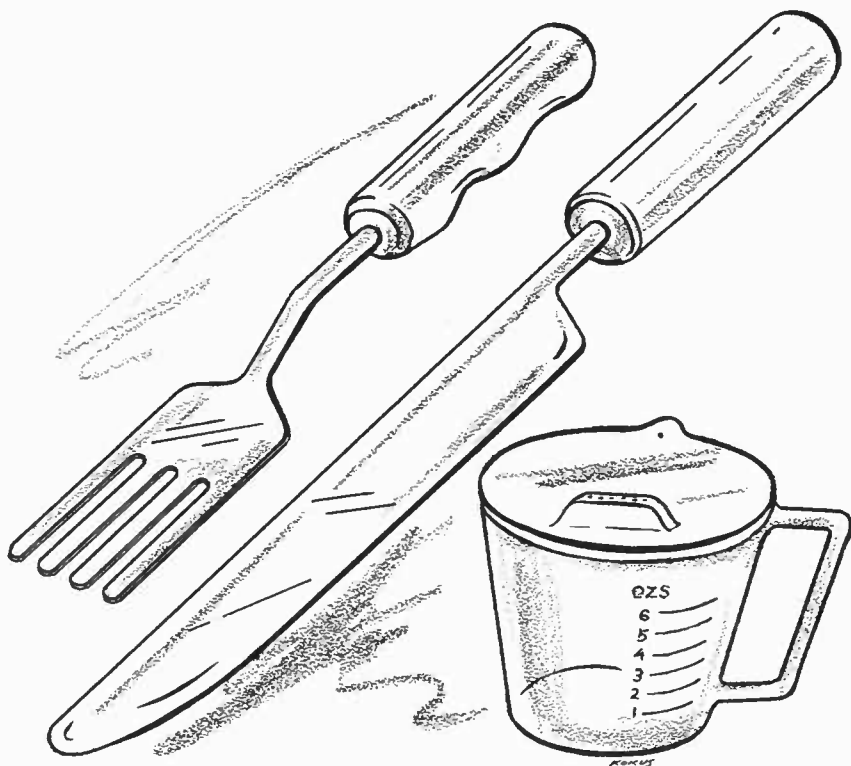
Equipment:

- Food Models
- box of equipment for making eating tools, such as:
 - rubber coated spoon, ice tea spoons, sponges
 - foam curlers, rubber bands, wash cloths, top of bleach bottle, etc.
- blender and blender container
- rubber spatula
- can opener
- coffee maker
- cups, spoons and napkins

Supplies:

Amounts depend on size of group

- Assorted juices (purchase those fortified with vitamin C)
 - V-8, orange juice, apricot nectar, cranberry, etc.



HELPING YOUR CHILD LEARN TO USE TOOLS FOR EATING

Your child will learn to feed himself with less effort if he has suitable eating utensils. Instructions for making or improvising special feeding equipment may be obtained from your physician, occupational or physical therapist, nurse or nutritionist.

The following are suggestions that can help a child develop eating skills. It is recommended that these be used only with guidance from your physician, occupational or physical therapist, nurse or nutritionist. Spoons, forks, knives, and cups may need to be built-up or padded to be held more easily. For example, foam curlers, or bicycle handles may be used. These are especially valuable for children who find it hard to grasp tightly. The handles may be bent to make it easier for the child to reach his mouth. After he has learned to use the special equipment, encourage him to use regular silverware and utensils. If he has good hand and arm movement, he should be able to use a fork. Otherwise, spoons are safer and easier to handle.

Long-handled cups are helpful because the entire fist can be used for grasping. A cup with a weighted base may be helpful in controlling motion.

Drinking straws may be of value if your child is unable to lift a glass or cup. Paper, plastic or cellophane straws should always be used rather than glass.

Rubber coated spoons may be helpful if your child bites the spoon.

Plastic dishes are practical and economical since they do not break easily. Your child may find it easier to eat from a plate with built-up sides. He will feel more secure in feeding himself if his dishes do not slide around. To hold them in place use rubber mats, suction cups, clay, masking tape or a wet washcloth on the underside of dishes. Plates and cups with a suction cup base may be purchased.

If your child is comfortable and relaxed during mealtime, he is more apt to enjoy his food and will probably eat a larger quantity. Make sure his chair is comfortable. A section cut out of the table allows him to be close without losing the correct sitting position. Also, be sure his feet are firmly on the floor or supported so they do not dangle. Should his chair need adjustments to give him support, consult your physician, nurse, or an occupational or physical therapist.

Recommendations:

Revised: Nutrition and Feeding Techniques for Handicapped
Children

Prepared by: Denise Sofka, Nutritionist
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HELPING YOUR CHILD LEARN SELF-DRINKING

Your child is ready for cup or glass self-drinking when

1. She sips and swallows, not sucks, liquids;
2. She can drink continuously four to five swallows or more; and
3. She can grasp the cup with both hands by herself or with some help.

Good posture is essential. She should be sitting upright with her head slightly forward, and both her body and her feet supported. She should have a table or a high chair tray with edges, at a comfortable height in front of her.

Start the training when your child is thirsty and rested. Begin with a liquid she likes. Sit to the side and, depending on your child's handedness, either to the right or to the left. Guide her hand and arm in a correct pattern to bring the cup to the mouth, and then tip it slightly. She may hold the cup in her hand alone or you may place your hand over her hand so both of you are holding it. Emphasize to your child the importance of not tilting the cup too much because it will spill.

For proper cup drinking, you should do the following:

1. Have your child seal the cup with her lips.
2. Place the cup on her lower lips and not on the teeth.
3. Pour a little fluid at a time, encouraging proper lip closure.

If your child cannot open or close her lips properly, the jaw control procedure should be used. It is as follows:

1. Stand next to your child who is seated comfortably.
2. Place your arm around the back of her head, with your arm touching her neck.
3. Place your middle finger under her chin, just behind the bone.
4. Place your index finger lengthwise on her chin.
5. Use this for control of opening and closing her mouth.

Special Helps

A cup with one or more of the following features may be better for your child:

1. A lid and small spout to regulate the flow and prevent spills.
2. Long handles so that the entire fist may be used for grasping.
3. A clear soft plastic cup is best so she can see the liquid.
4. If grasp is weak, handles may be built up with foam rubber.
5. Double handles, one on each side, if her arms are weak or coordination is poor, so she can use both hands.
6. A weighted base is good because it reduces tipping and may help to stabilize movements when coordination is poor or there are extraneous movements.
7. It might help to have a cup top with a smaller opening.

Reward your child with a smile, encouragement and praise when she succeeds. Try to overlook any spills.

Straw Drinking

Your child is ready for straw drinking when she can drink well from a cup. Straws, plastic tubing, or rubber tubing may be used. The best size to use for teaching is 4-6 inches long. Paper or cellophane straws, which bend at the proper angle and are disposable, may be used. Plastic or rubber tubing will withstand the child's biting or chewing better than the others. Never use glass straws.

Straw drinking reinforces closing the lips, using the tongue and using other mouth movements necessary to the development of speech.

If your child does not appear to be learning to use a straw, place the straw or tube in her favorite liquid. By placing your finger over the top of the straw, you can keep the liquid in the straw. Next put the other end of the straw in the child's mouth. Then gently close her lips around the straw and let the liquid drip into her

mouth. By lifting your finger, you can control the liquid flow. The liquid is the reward, so your child will learn to suck or draw on the straw to get it. Placing honey on the top of the straw may encourage her to keep the straw in her mouth. Also encourage her to close her lips, and not her teeth around the straw. Say "close your lips."

Have your child drink many different liquids through straws. Gradually increase the consistency of the liquids so that a stronger sucking is necessary.

Learning to drink from a straw can be fun. Work between mealtimes and at a time when both you and your child are happy and relaxed.

Recommendations:

Revised:	Nutrition and Feeding Techniques for Handicapped Children
Prepared by:	Denise Sofka, Nutritionist, with assistance from Miriam Lowry, Occupational Therapist
Available From:	Developmental Disabilities Program, Room 892 California State Department of Health 744 P Street Sacramento, California 95814

Lesson VIII Helping the Child with a Weight Problem

Rationale:

Weight problems are caused by many factors both psychological and physiological. Some children with cerebral palsy often have difficulty managing foods which results in a dislike for food and eating. These children are often very thin and underweight for their size. There are also other children with cerebral palsy whose ambulation is impaired and have decreased activity levels and yet enjoy food and eating which tends to result in a child being overweight.

The nutrition component deals with nutritious between meal feedings for children with a weight problem. The Nutrition Break has been planned as a low calorie refreshment.

Lesson VIII Helping the Child with a Weight Problem

Desired Outcomes	Content	Learning Experience	References and Resources
The mothers:	Review of previous lesson on self-drinking, the use of eating utensils and the importance of fluids.	Group discussion	
	<p>A. Ask if there were any changes in the ability or interest in self-drinking</p> <p>B. What was the average amount of fluid consumed per day</p>		<p><u>Recommended Dietary Allowances, 1974</u> National Academy of Sciences</p>
	Helping a child control weight		
	<p>A. If the child is underweight</p> <p>1. Add high calorie nutritious foods to other foods</p> <p>a. add 5 Tbsp. nonfat dried milk powder to foods before cooking or to drinks</p> <p>b. add whole eggs to foods which will be cooked</p> <p>c. add butter or margarine or sauces to vegetables, potatoes, etc.</p> <p>d. serve high calorie snacks</p> <p>1) nuts</p> <p>2) cheese cubes</p> <p>3) hot dogs, lunch meat</p>	<p>Distribute and discuss leaflets by Sofka.</p> <p>Ask mothers to make a list of foods to which nonfat dried milk powder can be added besides those listed by Sofka. Present a bar chart on the Comparison Card format demonstrating the nutrients and calories 5 tablespoons nonfat dried milk powder will add to the diet.</p> <p>Give the mothers the Group of Food Models and ask each of them to choose three foods which are high in calories, nutritious and the child will tolerate.</p>	<p>Sofka, D., Helping Your Child to Gain Weight and Helping Your Child to Lose Weight</p> <p>Comparison Cards, National Dairy Council.</p> <p>Food Models, National Dairy Council</p>
Will be able to choose three foods from a group of Food Models which are nutritious, caloric and tolerated by the child.			

Lesson VIII (Continued)

Desired Outcomes	Content	Learning Experience	References and Resources
The mothers:			
	B. If the child is overweight <ol style="list-style-type: none"> 1. If possible, increase his activity 2. Discourage the consumption of foods which offer little else than calories, for example <ol style="list-style-type: none"> a. soft drinks b. cakes and cookies c. fats d. jams and jellies 		
Will demonstrate how to adapt the regular family menu by decreasing the calorie count of a sample menu.	3. Use low calorie means of preparing foods <ol style="list-style-type: none"> a. use of herbs and spices to flavor vegetables b. baking, broiling, boiling and stewing meats c. trim off all visible fats from meats d. use nonfat or low-fat milk e. serve juices low in sugar such as vegetable juices 	Prepare a menu or follow the suggested plan below using Food Models. Arrange a breakfast, lunch and dinner. Use the food models to add butter, dressing, sugar, etc. Plan a menu with many hidden calories. Ask the mothers to make changes in the menu to decrease the calories. Changes may include changing the means of food preparation or eliminating the hidden calories. Sample Menu: Breakfast: fried egg grapefruit w/sugar whole milk cereal w/ sugar buttered toast	Adapted from a plan by Karla Nachtwey. Calculations for menu found at end of lesson. Sample menu found at end of lesson

Lesson VIII (Continued)

Desired Outcomes	Content	Learning Experience	References and Resources
		<p>Lunch:</p> <p>tuna sandwich w/ butter and 1 tablespoon mayonnaise peach halves in heavy syrup chocolate milk</p> <p>Dinner:</p> <p>fried chicken buttered peas lettuce w/ dressing buttered roll whole milk</p> <p>Nutrition Break</p> <p>Suggested refreshment:</p> <p>Prepare a tray of sliced vegetables and Curry Dip and assorted relishes. Serve a basket of Melba toast along with the vegetables and dip. Coffee, tea or juice</p> <p>The leader may want to point out that snacks and refreshments can be tasty without being high in calories</p>	<p>recipe for Curry Dip found at end of lesson</p>
	<p>Energy needs are based on:</p> <p>A. Individual differences in:</p> <ol style="list-style-type: none"> 1. sex <ol style="list-style-type: none"> a. women typically have lower needs than men 		<p>Robinson, C. <u>Normal and Therapeutic Nutrition</u>. pp. 91-103.</p>

Lesson VIII (Continued)

Desired Outcomes	Content	Learning Experiences	References and Resources
Will describe factors which influence an individual's energy needs.	2. age <ul style="list-style-type: none"> a. needs are highest during the first two years of life declining to adolescence with an increase during this growth spurt followed by steady decline b. in later years, reduction in muscle mass decreases needs 3. rate of growth <ul style="list-style-type: none"> a. rapid growth rate in early childhood accounts for high proportion of energy needs in relation to body size 4. size <ul style="list-style-type: none"> a. heat loss is in proportion to body size, therefore the greater body size the greater the energy requirement 	Following a round-table discussion of energy needs, ask the mothers to list conditions for each factor they identify which determines an individual's energy needs.	
Will be able to describe two ways to increase her child's activity level.	5. activity level <ul style="list-style-type: none"> a. calorie needs are in proportion to activity level, as it requires calories (energy) to produce or exert energy. 	In group discussion identify other factors besides physiological which determine food consumption or the types of meals she prepares for her child. What factors contribute to a sedentary life for an individual? If the child's handicap limits his ambulation, think of other ways to increase his activity.	

Curry Dip for Vegetables

1/2 C. mayonnaise (not miracle whip)

1/2 C. plain yogurt

1 tsp. curry

1/2 tsp. turmeric

1/4 tsp. chili powder

1/4 tsp. ginger

1/4 tsp. paprika

salt

few grains of cayenne pepper

Mix and chill at least an hour, preferably overnight.

Yield: 1 cup

Lesson VIII Helping Your Child to Control Weight

Materials:

One for each member and the leader:

Helping Your Child to Gain Weight
Helping Your Child to Lose Weight
Curry Dip recipe (see end of lesson)
evaluation sheets (see end of lesson)
pencils and paper

Equipment:

Food Models
Comparison Cards
coffee maker
cups, spoons, paper plates and napkins

Supplies:

Amounts depend on size of group

Curry Dip
mayonnaise, 1/2 cup
plain yogurt, 1/2 cup
curry, 1 teaspoon
turmeric, 1/4 teaspoon
chili powder, 1/4 teaspoon
ginger, 1/4 teaspoon
paprika, 1/4 teaspoon
cayenne, few grains
salt
vegetable slices (zucchini, cucumber, carrots, cauliflower, etc.)
melba toast
coffee, tea, cream and sugar
juice, e. g. , V-8, tomato, apple fortified with vitamin C

Lesson VIII Helping Your Child to Control Weight

Menu for Calorie Elimination Activity

<u>Breakfast:</u>	<u>Cal.</u>
fried egg	108
grapefruit	48
with sugar	20
whole milk, 8 oz.	145
corn flakes	72
with sugar	20
toast, 1 slice	61
with butter	36

<u>Lunch:</u>	
tuna, 1 oz.	56
bread, 2 slices	122
mayonnaise, 1 Tbsp.	101
peach slices, 1/2 cup	39
with heavy syrup	20
chocolate milk, 8 oz.	213

<u>Dinner:</u>	
fried chicken, 1 piece	100
peas, 1/4 cup	27
with butter	36
lettuce	10
with 1 Tbsp. French	
dressing	66
roll	68
with butter	36
whole milk, 8 oz.	145

Total 1400

Menu with Reduced Calories

poached egg	80
grapefruit	48
skim milk, 8 oz.	90
corn flakes, 1 oz.	72
toast, 1 slice	61

tuna, 1 oz.	56
bread, 2 slices	122
peach slices, 1/2 cup	25
heavy syrup removed	
skim milk, 8 oz	90

fried chicken, 1 piece	100
peas, 1/4 cup	27
lettuce	10
roll	68
with butter	36
skim milk, 8 oz.	90

Total 1001



HELPING YOUR CHILD TO GAIN WEIGHT

If your child is underweight, you can help her to gain weight.

Protein foods, as eggs, meats, poultry, fish, beans and milk are essential for your child. To help her get more protein and calories, try some of these suggestions.

1. One-fourth ($\frac{1}{4}$) cup powdered nonfat milk may be added to the following:
 - 1 cup fluid milk
 - 1 cup cereal before cooking
 - 2 cups mashed potatoes
 - 1 pound ground meat
 - 2 cups flour in tortillas, corn bread, biscuits, pancakes, cookies, etc.
 - 2 cups liquid in gravy, cream sauces, cream soups, puddings, etc.
 - Malted milks, milk shakes, eggnog
 - Juice drinks, Kool-Aid.
2. Whole egg:

May be added raw to foods that are to be cooked, such as ground meats, puddings, macaroni and cheese. Mix beaten raw egg in mixture before cooking.

May be added cooked to sandwich spreads, casseroles, mashed potatoes.
3. Unflavored gelatin may be added to soups and juices.
4. Instant Breakfast or Sustacal made with milk may be used.
5. Dried peas and beans, cooked soft may be mashed with cheese and milk.
6. Peanut butter or soft meat sandwich spreads, as liverwurst, deviled meats or egg salad may be used on crackers or bread.
7. Serve creamed vegetables, as creamed carrots, peas, spinach, potatoes. Or serve vegetables with cheese sauces.

You may increase calories by adding:

1. Fats such as margarine, butter or oil in gravies, meats, vegetables, soups, hot cereals, cooked desserts, hot breads.
2. Fats such as mayonnaise, oil dressings or sour cream to cold vegetables, sandwiches, meat or mixed fruit salads.
3. Fats such as cream, peanut butter or ice cream.
4. Fats such as salt pork or bacon in gravies, stews, vegetables, soups.

Fats have a longer lasting quality. If your child's appetite is poor, fats should be used mainly in the last meal of the day and evening snack.

Three meals a day may not be enough for a child who has greater energy needs, so between meal snacks should be provided. Make sure the snacks are not so large that they spoil her appetite. Some snack suggestions are as follows:

1. Fruit with cream and wheat germ.
2. Jello with fruit slices and ice cream.
3. Malted milk or milk shake with extra ice cream added.
4. Peanut butter with wheat germ and honey on crackers.
5. Cream cheese with wheat germ and honey on crackers.
6. Yogurt with fruit and unflavored gelatin.
7. Granola with honey and cream.
8. Cheese pizza.
9. Tortilla with butter.

If your child has a poor appetite, an extra meal may need to be added, rather than a snack.

Make mealtime and snacktime a happy and pleasant experience. Praise her well for her efforts.

Recommendations:

Revised: Nutrition and Feeding Techniques for Handicapped Children

Prepared by: Denise Sofka, Nutritionist
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744 P Street
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(Adapted from form prepared by
Iris Crump, Nutritionist.)



HELPING YOUR CHILD TO LOSE WEIGHT

If your child is overweight, you can help him lose weight. But remember, before starting any reduction diet, be sure your child has a medical examination to be certain he should lose weight.

Overweight may be due to many causes, such as overeating, inactivity, limited movement, and/or a medical problem. Some children get fat because they are taught to eat more than they need even as infants. Many parents feel more food is good for their child, but this can be harmful. Excess weight affects your child's appearance and oftentimes his feelings about himself and others. If he uses crutches or braces, he will have more difficulty moving. He also may have more serious medical problems.

To prevent your child from gaining too much weight, you should follow a good family meal plan which provides all of the "protective" foods such as milk, meat, fish, poultry, beans, eggs, whole grain products, fruits and vegetables. Discourage him from taking large amounts of foods that provide calories but little else — such as cakes, cookies, pies, sugar, soft drinks, candy, jams, jellies, fats and oils. Fresh fruits or canned fruits in light syrup are better choices for desserts. Fruits canned in heavy syrup may be rinsed off in cold water to remove the syrup.

Use seasonings that contain very few calories such as spices, herbs, and fruit juices, instead of using rich sauces, mayonnaise, gravies, butter, or margarine for seasoning. For example, use nutmeg on mashed carrots or squash, lemon on fish, orange juice on pork, vinegar and onions on green beans.

Boil, bake, stew or broil foods without adding fat. If fried foods are served, use a pan in which little or no fat is needed. Also, trim off all visible fat from the meat.

Use nonfat powdered skim milk or fluid skim milk for cooking and drinking. If your child does not like skim milk, mix 1/2 cup whole milk with 1/2 cup skim milk. He will have the flavor of whole milk, but the calories will be less. Low fat milk may also be used. Dried skim milk powder is more economical to use than fresh skim milk. It is not wise to omit milk to lose weight, but try to avoid using ice cream, milk shakes, malted milks, and sweetened chocolate milk because they contain more calories than plain milk.

A low calorie salad dressing may be made simply by using tomato juice, lemon, salt, pepper, and chopped onion or green pepper or celery.

For snacks choose foods such as fresh fruit, raw vegetables, nonfat milk, toast with low calorie jelly or fruit juice, instead of soft drinks, potato chips, and candy. You can freeze orange juice, unsweetened grapefruit juice or unsweetened pineapple juice in an ice cube tray; then for example, you can add one or two frozen orange juice cubes to unsweetened pineapple juice. Serve vegetable juices hot or cold. A cup of hot tomato juice flavored with lemon, chopped chives, and a dash of tobasco sauce is a treat on a cold day. For a warm day, freeze low calorie sodas in an ice cube tray and make popsicles. Or flavor nonfat milk with vanilla, spices, fruit or instant coffee (if your child is older). Add three ice cubes, blend for about one minute in the blender, and you have a frothy milk shake.

FOODS LOW IN CALORIES (0-25 calories)

Bean sprouts	Iced tea with lemon
Bouillon	Lemon juice or slices
Broccoli	Lettuce
Cabbage	Lime juice or slices
Carrots, ½ cup	Melba toast, 1 slice
Cauliflower	Parsley
Celery	Peppers, red or green
Cherry tomatoes, 4	Pickles
Cucumbers	Pickled onions
D-Zerta gelatin	Radishes
Dill Pickles	Rye wafer, 1 double square
Endive	Sauerkraut
Escarole	Spinach
Fresca	Thin wheat wafer, 1
Greens, Mustard, Turnip or Beet	Tomato juice, ½ cup
Jams (low calorie)	Watercress

A good raw vegetable dip recipe is as follows:

1 pint small curd, low fat cottage cheese
1 teaspoon instant minced onion
1/4 teaspoon salt

Mix ingredients to a smooth consistency in blender or with rotary beater. Chill several hours. For variety add two tablespoons chopped parsley, pimento or chives. Makes approximately 2 cups.

If your child carries a lunch, it is possible to offer him a variety of lower calorie foods. The same kind of sandwich every day is tiresome. Vary the kind of bread, filling, and spread.

Try relish, catsup, mustard or sour half and half as a spread in place of mayonnaise, butter or margarine. Sliced roast meats, cheese, fish, eggs, and beans offer countless possibilities for fillers.

Try a thin spread of applesauce with sliced chicken on whole grain wheat bread or finely chopped ham with sweet pickle relish and sliced tomatoes on rye bread.

Remember to use thinly sliced bread for sandwiches. Offer your child a fruit dessert and raw vegetables such as celery and carrot sticks, cucumber and green pepper strips, cauliflower buds, lettuce wedges, and tomato slices.

Activity of any kind burns up calories. Standing uses more than sitting. Walking takes more calories than standing.

If a special reduction diet is needed for your child, the nutritionist will help plan this diet for him.

Recommendations:

Revised: Nutrition and Feeding Techniques for Handicapped Children

Prepared by: Denise Sofka, Nutritionist
Developmental Disabilities Program, Room 892
California State Department of Health
744 P Street
Sacramento, California 95814

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APPENDIX IV
MEASUREMENT TOOLS

APPENDIX IV-A

Adapted from Screening
Children for Nutritional
Status, 1973, DHEW Public
Health Service.

24-Hour Recall

Name _____ Sex _____ Age _____ Ht _____ Wt _____

Dysfunction _____ Date & time of interview _____

Length of interview _____ Date and day of week of recall _____

"I would like you to tell me about everything your child ate and drank from the time he/she got up in the morning until the time he/she went to bed at night and what he/she ate during the night. Be sure to include everything he/she ate or drank at home, at school and away from home. Include snacks and drinks of all kinds and everything else he/she put in his/her mouth and swallowed. I also need to know where he/she ate the food, but now let us begin."

What time did he get up yesterday? _____

Was it the usual time? _____

What was the first time he ate or had anything to drink yesterday morning? (list on the form that follows)

Where did he eat? with whom? (list on the form that follows)

Now tell me what he had to eat and how much. (Occasionally the interviewer will need to ask: When did he eat again? or, Is there anything else? Did he have anything unusual to eat or drink during the night?)

Was the intake unusual in any way? _____ If yes, Why? _____
In what way _____

Did he eat anything not considered food? _____

What time did he go to bed last night? _____

Does he take any vitamin and/or mineral supplements? _____ If, yes, how many per day? _____ per week? _____ How long has he been taking vitamins? (months) _____ Brand name if known _____

Multivitamins _____ Ascorbic Acid _____

Vitamins A and/or D _____ Iron _____ others _____

Does he take any other medications? _____ Laxatives? _____

Would you describe his appetite as good? _____ fair? _____ poor? _____

What time of the day does he seem most hungry? _____

Early Feeding History

indicate duration

Breast _____ Iron-fortified formula _____ other formula
other milk-specify _____

- 2 -

Introduction of Semi-solids andUse of Feeding UtensilsTime

Cereal

Fruit

Finger foods

Table foods

Drinking from a cup

Using a spoon

Using a fork

Using a knife

Parents' perception of feeding problem _____

Preferences: _____

Specific foods _____

Textures _____

Dislikes: _____

Specific foods _____

Textures _____

Allergies _____

What are the child's physical accomplishments? (sitting, walking, running, fine and gross motor skills) _____

Would you describe your child as active? quiet? inactive? _____

What type of environmental stimulation does he receive? _____

Does your child have trouble managing certain types of foods? _____

Do you use iodized salt? _____ Does your child drink raw milk? _____

Number of persons eating together: B _____ L _____ D _____

Meal prepared by: B _____ L _____ D _____

Frequency with which meals are eaten outside the home _____

Child's name _____ Date _____

Food	Kind	Frequency	Amount
CEREAL AND GRAIN PRODUCTS:			
W.G. or enr. bread (including sandwiches), toast, rolls, etc.)		0 1 2 3 4 5 6 7 >7	
Enr. macaroni, spaghetti, rice or noodles		0 1 2 3 4 5 6 7 >7	
W.G. or enr. cereal, dry, or cooked		0 1 2 3 4 5 6 7 >7	
Pancakes, waffles, sweet-rolls or doughnuts		0 1 2 3 4 5 6 7 >7	
Unenriched bread, cereals, matzos, crackers, pretzels, -		0 1 2 3 4 5 6 7 >7	
MISCELLANEOUS:			
Cookies, pies, cake		0 1 2 3 4 5 6 7 >7	
Potato chips or other chips, popcorn		0 1 2 3 4 5 6 7 >7	
Fruit nectars		0 1 2 3 4 5 6 7 >7	
Fruit ades, punches, drinks		0 1 2 3 4 5 6 7 >7	
Jello		0 1 2 3 4 5 6 7 >7	
Candy		0 1 2 3 4 5 6 7 >7	
Soft drinks, popsicles, Koolaid		0 1 2 3 4 5 6 7 >7	
Sugar, honey, syrup, jam or jelly		0 1 2 3 4 5 6 7 >7	
Butter, oil, lard, margarine		0 1 2 3 4 5 6 7 >7	
Coffec or tea		0 1 2 3 4 5 6 7 >7	
		0 1 2 3 4 5 6 7 >7	
Beer		0 1 2 3 4 5 6 7 >7	
Gravy		0 1 2 3 4 5 6 7 >7	
Soup		0 1 2 3 4 5 6 7 >7	
Other		0 1 2 3 4 5 6 7 >7	

APPENDIX IV-C

Information about the Respondent

Date _____

Relation of Respondent to Registrant (*Ask respondent, "Are you the child's mother (father)?"*)

- ☐ Mother
☐ Foster mother
☐ Grandmother
☐ Registrant
☐ Father
☐ Older brother or sister
☐ Other (specify) _____

Information about the Family

Family Name _____

Date _____

☐ Father _____ Mother ☐
 or _____ or _____
☐ Father surrogate _____ Mother surrogate ☐

_____ Age (years) _____

☐ _____ WHITE _____ ☐
Check if applicable
☐ _____ Mexican-American _____ ☐
☐ _____ Puerto Rican _____ ☐
☐ _____ BLACK _____ ☐
☐ _____ OTHER _____ ☐
Check if applicable
☐ _____ American Indian _____ ☐
☐ _____ Hawaiian _____ ☐
☐ _____ Asian _____ ☐
☐ _____ Usually lives with family _____ ☐
☐ _____ Speaks English _____ ☐
*Speaks other language (specify)*Adapted from Screening Children for Nutritional Status, 1973, DHEW

Education

Highest grade completed

- ☐ 0 ☐
- ☐ 1-3 ☐
- ☐ 4-6 ☐
- ☐ 7-8 ☐
- ☐ 9-11 ☐
- ☐ High School graduate ☐
- ☐ Attended College ☐
- ☐ College graduate ☐
- ☐ Don't know ☐

Before taxes, which group (below) do you think your family income fell into last year? check one

- | | |
|---|---|
| <input type="checkbox"/> Less than \$1,000 | <input type="checkbox"/> \$7,000 to \$7,999 |
| <input type="checkbox"/> \$1,000 to \$1,999 | <input type="checkbox"/> \$8,000 to \$8,999 |
| <input type="checkbox"/> \$2,000 to \$2,999 | <input type="checkbox"/> \$9,000 to \$9,999 |
| <input type="checkbox"/> \$3,000 to \$3,999 | <input type="checkbox"/> \$10,000 to \$14,999 |
| <input type="checkbox"/> \$4,000 to \$4,999 | <input type="checkbox"/> \$15,000 to \$19,999 |
| <input type="checkbox"/> \$5,000 to \$5,999 | <input type="checkbox"/> \$20,000 and over |
| <input type="checkbox"/> \$6,000 to \$6,999 | |

Be sure to include income from all sources such as:

- | | |
|--------------------|---|
| Wages and salaries | Pensions |
| Social Security | Support from others |
| Welfare payments | Income after expenses from business and farming |
| Insurance payments | |
| Veterans benefits | |

Total number of persons supported by this income _____.

Number of children less than 9 years of age supported by this income _____ ages _____

Is family (or any family member)

- ☐ Receiving donated foods
- ☐ Participating in Food Stamp Program
- ☐ Participating in Supplemental Food Program
- ☐ Receiving free ☐ or reduced cost ☐ lunch, and/or breakfast in school, day care or Head Start program

Who prepares the meals? _____

Who is responsible for feeding the child? _____

Does the home have a working stove? ☐ Yes ☐ NoOven? ☐ Yes ☐ NoDoes the home have a refrigerator? ☐ Yes ☐ No

Home Location?

- ☐ Urban ☐ Suburban ☐ Rural nonfarm ☐ Farm ☐ Other

Does the family do any of the following to obtain part of its food supply?

- ☐ Have a vegetable garden ☐ Keep a cow

Information about the Child

Date of Evaluation _____

Name _____

Address _____

Sex: ☐ Male
☐ Female

Birth date _____

Birth weight _____

Birth order _____

Multiple birth ☐ Yes ☐ No

Immunizations

- ☐ DPT primary series
- ☐ DPT, DT, or tetanus booster
- ☐ Smallpox vaccine
- ☐ Oral polio vaccine
- ☐ Measles vaccine
- ☐ German measles (rubella) vaccine
- ☐ Mumps vaccine

Walked alone at _____ months

Serious illnesses:

Hospitalizations (give age, time hospitalized, and nature of illness):

☐ Ill now? If ill, indicate nature of illness:

APPENDIX IV-D

PRACTICAL NUTRITION QUIZ

Please circle your answer to the following questions.

T = true F = false If not sure, circle "don't know."

1. Milk contains all the substances we need for good health.
T F Don't know
2. Meat does not contain all the substances we need each day for health.
T F Don't know
3. Vegetarians or people who don't eat meat are bound to be in poor health.
T F Don't know
4. Some plant foods, like lima beans, baked beans and peanuts are good sources of protein.
T F Don't know
5. Food like potatoes and bread supply only energy to the body.
T F Don't know
6. Circle all of the following which are "nutrients" in foods.
 a. carbohydrates d. proteins
 b. minerals e. vitamins
 c. fats f. none of the above
7. Milk can be substituted for fruits or vegetables in the diet, and the nutritional value of the diet will remain the same.
T F Don't know
8. A normal, healthy person can get all the vitamins he/she needs each day from foods and does not need to take vitamin pills.
T F Don't know
9. Is this a well-balanced menu for the day for a child?
(Assume the portions are served in restaurant-sized portions.)

Breakfast

orange
scrambled eggs
enriched toast
margarine

Lunch

hamburger
enriched bun
tomatoes
lettuce
french fries
lemonade
banana

Dinner

meat stew with vegetables
cole slaw
biscuit
jam
tea
apple pie

Yes _____ No _____ Don't know _____ If you checked 'no',
what do you think is missing? _____

10. What are the "Basic 4"?
- the 4 vitamins and minerals which are needed each day as a basis for health.
 - the 4 food groups which are recommended for inclusion in meal planning each day.
 - the 4 proteins which are basic for growth.
 - the 4 nutrients needed for health; protein, fats carbohydrates and vitamins.
 - don't know
11. Please write the "Basic 4" below, if you can:
- _____
 - _____
 - _____
 - _____
12. Some people develop iron-deficiency anemia because they eat a diet that has too little: (circle the correct answer)
- meat, eggs and leafy vegetables
 - citrus fruits
 - milk and cheese
 - none of the above
 - don't know
13. Write in two foods which you could substitute for milk in the diet
- _____
 - _____
14. Circle all of the following which are citrus fruits or citrus fruit juices.
- | | |
|----------------|--------------------|
| a. oranges | f. orange soda |
| b. lemons | g. Kool-aid |
| c. apples | h. orange juice |
| d. grapefruits | i. don't know |
| e. peaches | j. pineapple juice |
15. Circle all of the following which are dark green or deep yellow-orange vegetables rich in vitamin A value.
- | | |
|-------------------|------------------|
| a. carrots | e. spinach |
| b. cauliflower | f. turnip greens |
| c. sweet potatoes | g. corn |
| d. winter squash | h. don't know |
16. Circle all of the following which are good substitutes for bread, with respect to nutritional value.
- | | |
|------------------------------------|----------------------|
| a. potatoes | e. sugar cookies |
| b. enriched macaroni and spaghetti | f. pie |
| c. muffins | g. none of the above |
| d. breakfast cereal | h. don't know |

17. What is a calorie? (Circle the letter of the correct answer.)
- a. a measurement of the energy value in foods and the energy used up by work.
 - b. the substance found in foods which causes weight gain
 - c. the way of measuring body fatness
 - d. don't know
18. Circle all of the following which require calories:
- a. keeping our heart and other organs working
 - b. moving our body and other objects around
 - c. growth
 - d. none of the above
 - e. don't know
19. Carbohydrates (like starches and sweets) are a good source of energy.
- T F Don't know
20. A teaspoon of sugar furnishes more calories than a teaspoon of butter.
- T F Don't know
21. A pound of sugar or sweets furnishes more calories than a pound of any other food.
- T F Don't know
22. You can lose weight by eating food providing fewer calories or by exercising more than usual or by doing both.
- T F Don't know
23. Which of these foods furnishes the largest number of calories? (Circle the correct answer.)
- a. a medium-sized potato
 - b. an average slice of bread
 - c. $\frac{1}{2}$ head of lettuce
 - d. a cup of whole milk
 - e. don't know
24. How many servings of milk and milk products are usually recommended for a child each day?
- a. 1 serving
 - b. 2 servings
 - c. 3 servings
 - d. 4 servings
 - e. don't know
25. Circle all of the following which are good sources of protein and therefore are included in the meat group.
- a. lima beans
 - b. eggs
 - c. gravy
 - d. peanut butter
 - e. baked beans
 - f. none of the above
 - g. don't know

26. How many servings of fruits and vegetables should a child have each day?
- a. 1 serving
 - b. 2 servings
 - c. 3 servings
 - d. 4 servings
 - e. don't know
27. How many servings of deep yellow and leafy green vegetables are recommended for a child?
- a. two servings each day
 - b. one serving each day
 - c. one serving every other day
 - d. one serving each week
 - e. don't know
28. The term "enriched" on bread labels means the bread is made out of white flour to which has been added back:
- a. milk, butter, and eggs
 - b. iron and certain vitamins
 - c. protein, roughage and fat
 - d. phosphorus, vitamin C and sugar
 - e. don't know
29. Pasteurization is done primarily because it:
- a. destroys all the bacteria in the milk.
 - b. improves the taste of the milk.
 - c. mixes the fat through the milk by homogenizing it.
 - d. kills any harmful disease-producing organisms present.
 - e. don't know
30. The term "fortified" margarine means margarine to which has been added:
- a. vitamin A
 - b. polyunsaturated fats
 - c. iron and calcium
 - d. none of the above
 - e. don't know
31. Frozen orange juice is not as nutritious as fresh bottled orange juice because it has been processed.
- T F Don't know
32. Nonfat dried milk is not as good a source of minerals and protein as fresh skim milk.
- T F Don't know
33. Many different combinations of food can lead to a nutritionally satisfactory diet.
- T F Don't know

34. All foods have the same nutritional value.

T F Don't know

35. If you eat $\frac{1}{2}$ cup (4 ounces) of each of the Basic 4 food groups each day, you will get all the proteins, vitamins and minerals you need.

T F Don't know

Name _____

APPENDIX IV-E

FORM E - FEEDING ASSESSMENT

Child Development & Mental Retardation Center, April 1976
University of Washington
(Paula Schmidt, O.T.R.)

The individual items on this assessment tool are worded in a positive way, so that a high score is always the ultimate goal. Whether a total score in each sub-group will be helpful is not really known at this time. If a child is under one year of age, chronologically or developmentally, some of the items may be inappropriate, and therefore a low score on those items would not be of concern.

Any signs of abnormal patterns or abnormal muscle tone, should be described in the column to the right of each item. If the child has a neuromuscular problem, that should be thoroughly assessed prior to the feeding evaluation by a neurologist and a physical or occupational therapist with specific training in neurodevelopment. The description column may indicate need for partial assistance, pillows or straps or special chairs, special utensils, etc.

An alternative scoring system than the one of the chart, and which does not use numbers, may be desired. The following code has been used on a similar developmental skills measurement tool.¹

NT - not tested
NA - not applicable
AB - absent behavior
PA - passed with assistance
PI - passed independently
R - resist
D - delay, slow response

CAUTION: Use of this feeding assessment should be attempted only with the understanding that this is a rough draft and the tool is in the process of being tested.

¹ COMMUNICATION PROJECT, John Hay School, 411 Boston, Seattle, WA 98109

Child's Name _____
 Date of Birth _____
 Diagnosis _____
 Date of Interview _____

RATING SCALE:

0 = never
 1 = rarely 0-30%
 2 = occasionally 30-60%
 3 = frequently 60-90%
 4 = consistently 90&up

I. Gross motor skills, posture during feeding

- _____ 1. Child sits on some type of chair
- _____ 2. Symmetrical sitting posture
- _____ 3. Upright trunk
- _____ 4. Upright head (not tilted laterally nor too far forward or back)
- _____ 5. Stays in chair w/o slipping

II. Oral skills

- _____ 6. Absence of drooling at non-feeding times
- _____ 7. Mouth closed at non-feeding times (when not talking, not congested;
not a consistent mouth breather)
- _____ 8. Normal gag reflex (present and not hypersensitive)
- _____ 9. Does not vomit after a meal
- _____ 10. Brings head forward to food held in front of mouth
- _____ 11. Opens jaw only as much as necessary
- _____ 12. Keeps tongue in mouth when food inserted
- _____ 13. Tolerates tactile stimulation outside mouth w/o indication of
discomfort
- _____ 14. Tolerates tactile stimulation inside mouth w/o discomfort
(Note condition gums and teeth)
- _____ 15. Can be fed with spoon or self feeds with spoon (Indicate type
of spoon)
- _____ 16. Cleans spoon with lips
- _____ 17. Lips closed while chewing
- _____ 18. Food stays in mouth
- _____ 19. Drinks from cup with good oral patterns
- _____ 20. Can drink using straw
- _____ 21. Liquid stays in mouth before swallowing
- _____ 22. Bites off piece w/o increasing muscle tone
- _____ 23. Lateralizes tongue to get food between teeth (No inappropriate
sucking movement of tongue; palate doesn't collect food)
- _____ 24. Chews on solid foods: a) up and down (Munching); b) side to side
(lateral rotary)

- _____ 25. Swallows liquids without choking
- _____ 26. Swallows solids without choking - swallows: a) head back; b) head down;
c) head straight
- _____ 27. Cleans food off lips with lips and tongue

III. Eye-hand coordination

- _____ 28. Brings hand to mouth spontaneously without food
- _____ 29. Sucks on fingers without reflex biting (ouch!)
- _____ 30. Volitional grasp and maintenance
- _____ 31. Mouths toys, etc. (Score 5 if beyond that stage)
- _____ 32. Holds food while sucking, chewing on it
- _____ 33. Volitional release of grasp
- _____ 34. Attempts to assist when being fed (reaches for food, spoon)
- _____ 35. Self feeds finger foods
- _____ 36. Places appropriate amount of food in mouth
- _____ 37. Holds bottle to drink
- _____ 38. Hands on cup, drinking with assistance (5, if beyond this stage)
- _____ 39. Independent cup drinking, seldom spills
- _____ 40. Self-spoon feeding
- _____ 41. Cooperation, interest in eating
- _____ 42. Feeding behavior and environment
- _____ 43. Good appetite, usually
- _____ 44. Appropriate weight gain (growth grid)
- _____ 45. Consumes variety of food, most foods acceptable
- _____ 46. Regularly scheduled mealtimes
- _____ 47. Good imitative models available at mealtimes (not fed separately)
- _____ 48. Calm feeding environment
- _____ 49. Meal finished in reasonable length of time (30-45 minutes)

Time:	B. start	_____	finish	_____
	L. start	_____	finish	_____
	D. start	_____	finish	_____
- _____ 50. Appropriate social behavior (no food throwing, etc)
- _____ 51. Normal muscle tone with approach of food

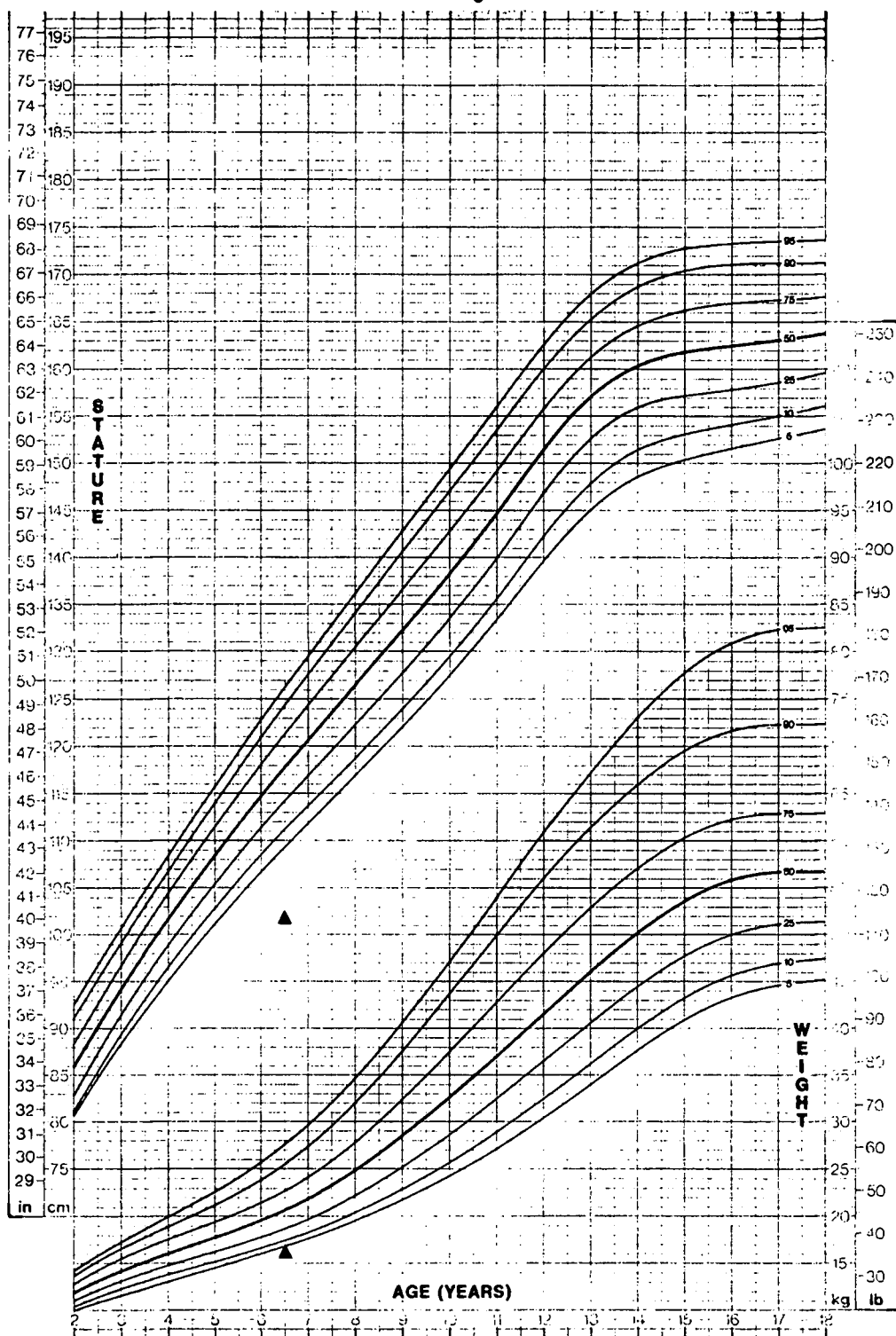
V. Other

- _____ 52. Caregiver perceives problems
- _____ 53. Caregiver desires changes
- _____ 54. Evaluator perceives need for intervention

APPENDIX V
GROWTH CHARTS 1-7

GROWTH CHART 1

GIRLS: 2 TO 18 YEARS
PHYSICAL GROWTH
NCHS PERCENTILES*

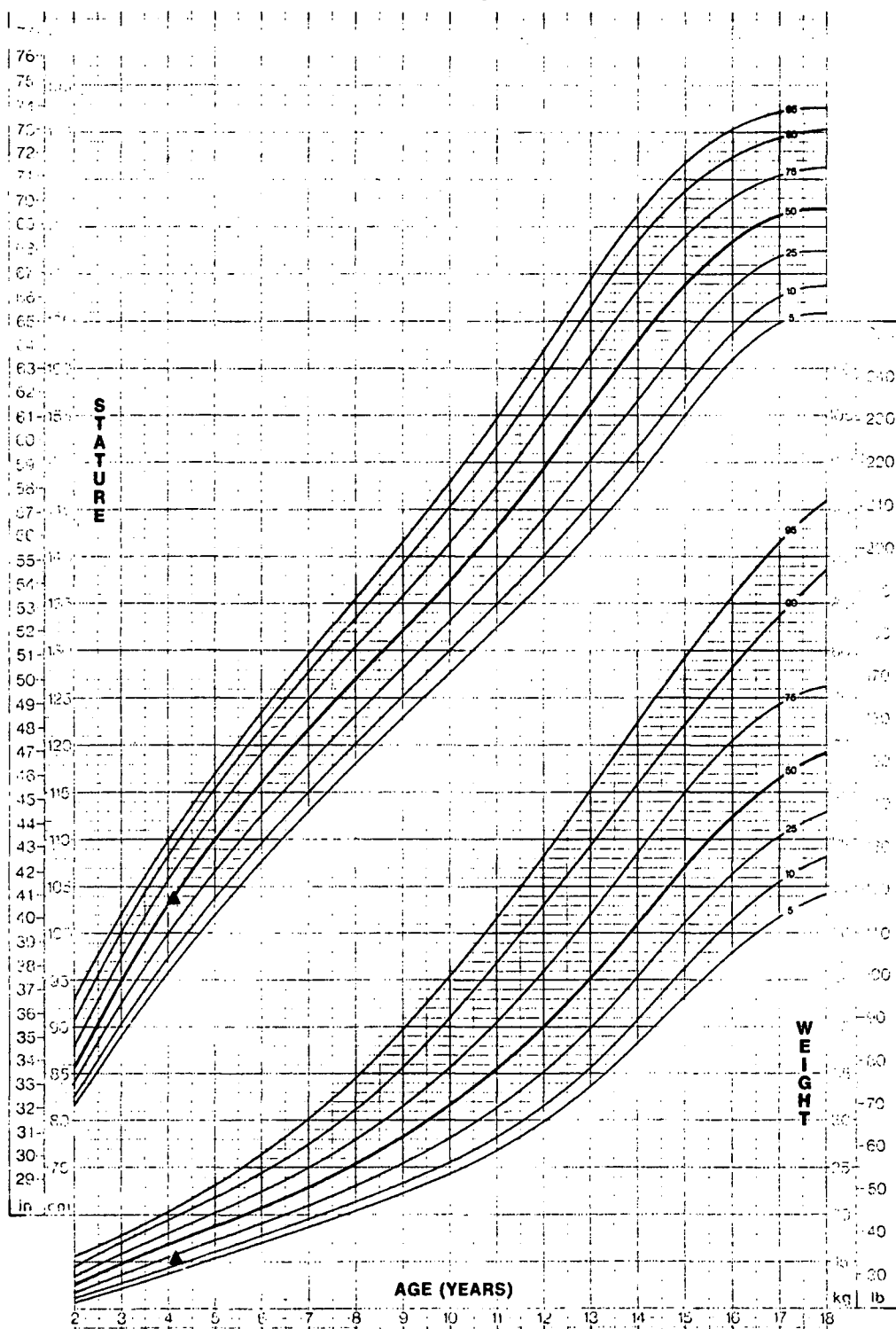
NAME Subject 1

* Adapted from: National Center for Health Statistics, "The Growth Chart for 1976: Monthly Vital Statistics Report, Vol. 25, No. 3, 1976 (FHSR) 76-1120. Health Resources Administration, Rockville, Maryland, June, 1976. Data from the National Center for Health Statistics.
 © 1975 ROSS LABORATORIES

GROWTH CHART 2

BOYS: 2 TO 18 YEARS
PHYSICAL GROWTH
NCHS PERCENTILES*

NAME Subject 2

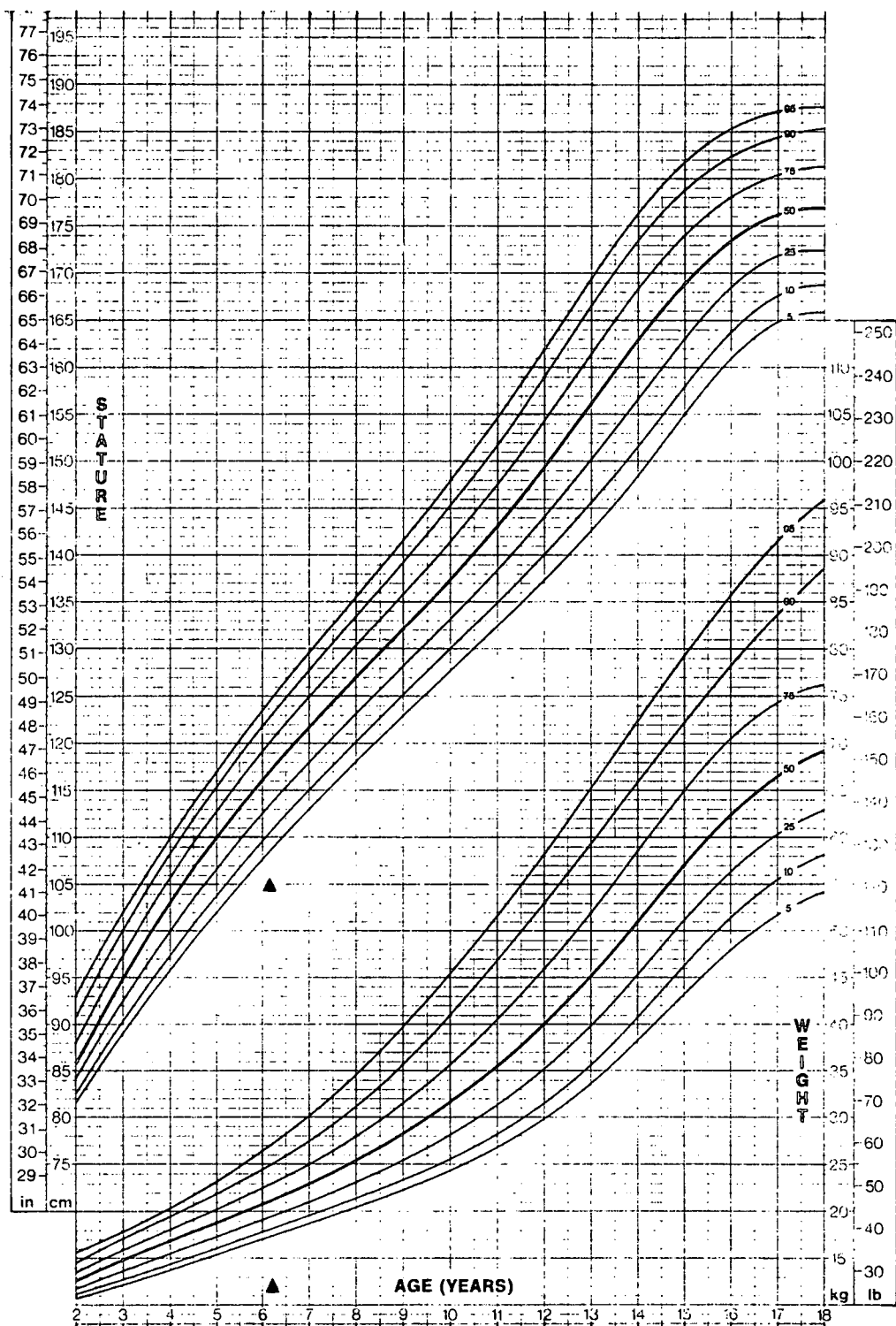


* Adapted from Flegal, et al. Center for Health Statistics, NCHS Growth Charts: 1977, 1978, 1979, and 1980. Reproduced by permission of the National Center for Health Statistics, Department of Health and Human Services, Washington, D.C. 20201.

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GROWTH CHART 3

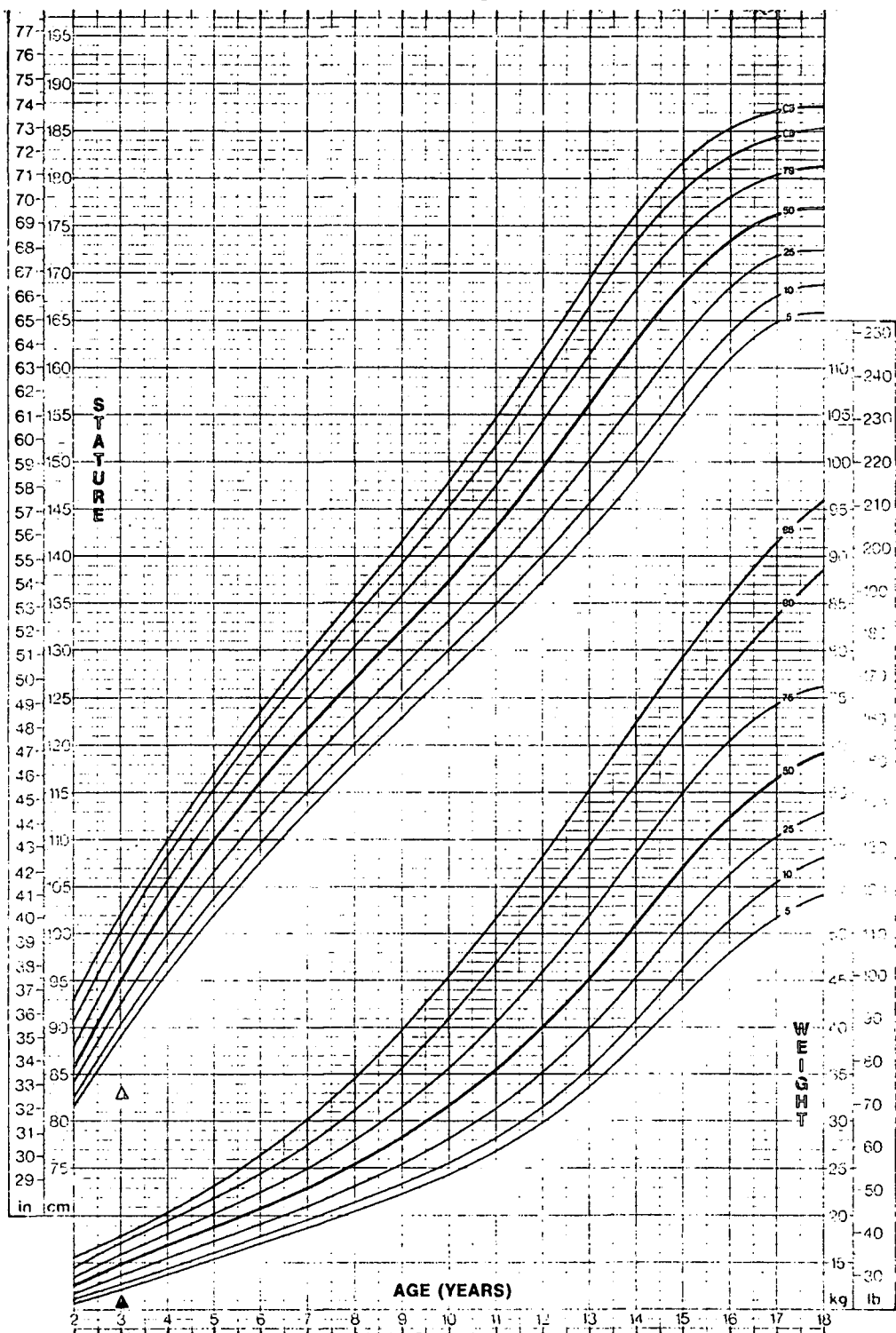
BOYS: 2 TO 18 YEARS
PHYSICAL GROWTH
NCHS PERCENTILES*

NAME Subject 3

* Adapted from: National Center for Health Statistics: NCHS Growth Charts, 1976. Monthly Vital Statistics Report, Vol. 25, No. 3, Suppl. (1976), 1-120.
 Health Resources Administration, Rockville, Maryland, June, 1976.
 Data from the National Center for Health Statistics.
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GROWTH CHART 4

BOYS: 2 TO 18 YEARS
 PHYSICAL GROWTH
 NCHS PERCENTILES*

NAME Subject 4

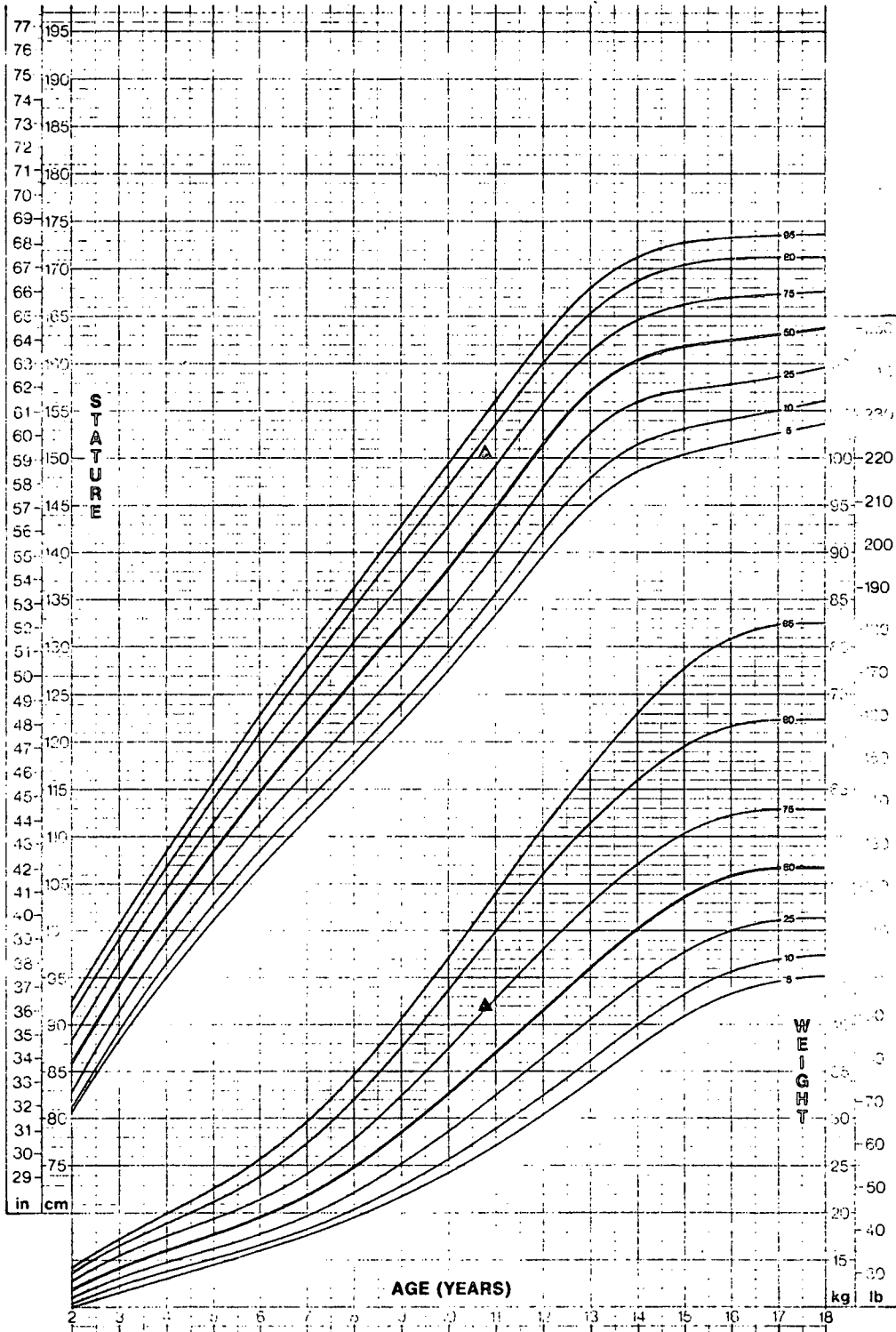
* Adapted from: National Center for Health Statistics, NCHS Growth Charts, 1976, Family Vital Statistics Report, Vol. 25, No. 3, Supp. (HSA 76-1120).
 Health Research Administration, Rockville, Maryland, June, 1976.
 Data from the National Center for Health Statistics.

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GROWTH CHART 5

GIRLS: 2 TO 18 YEARS
PHYSICAL GROWTH
NCHS PERCENTILES*

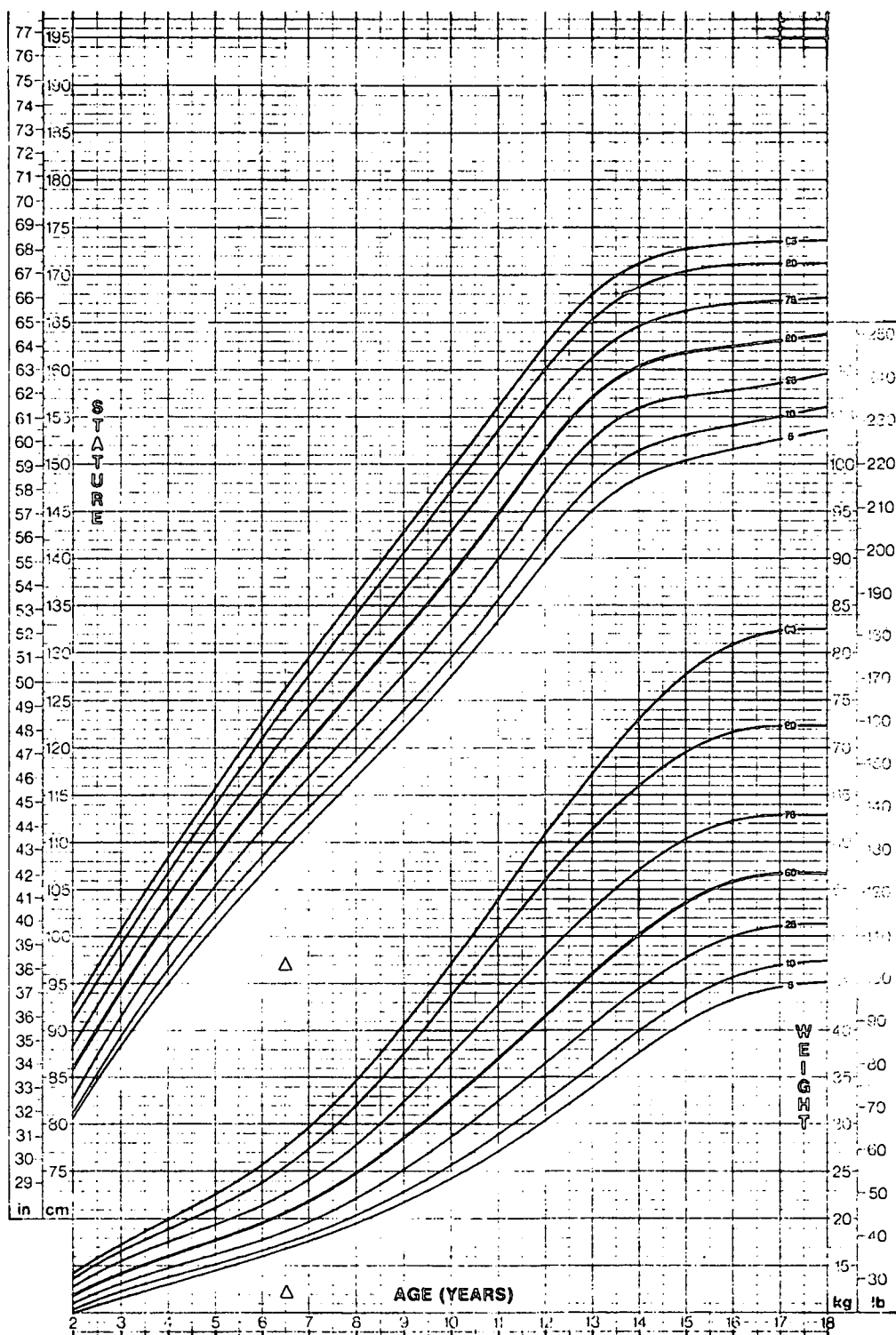
NAME Subject 5



* Adapted from: National Center for Human Growth Research, "Physical Growth of Children: Charts from the National Center for Human Growth Research, 1966, *Journal of the American Medical Association*, 216:1122. Health & Sources Administration, Rockville, Maryland, 1966, 12-6. Data from the National Center for Human Growth Research.

GROWTH CHART 6

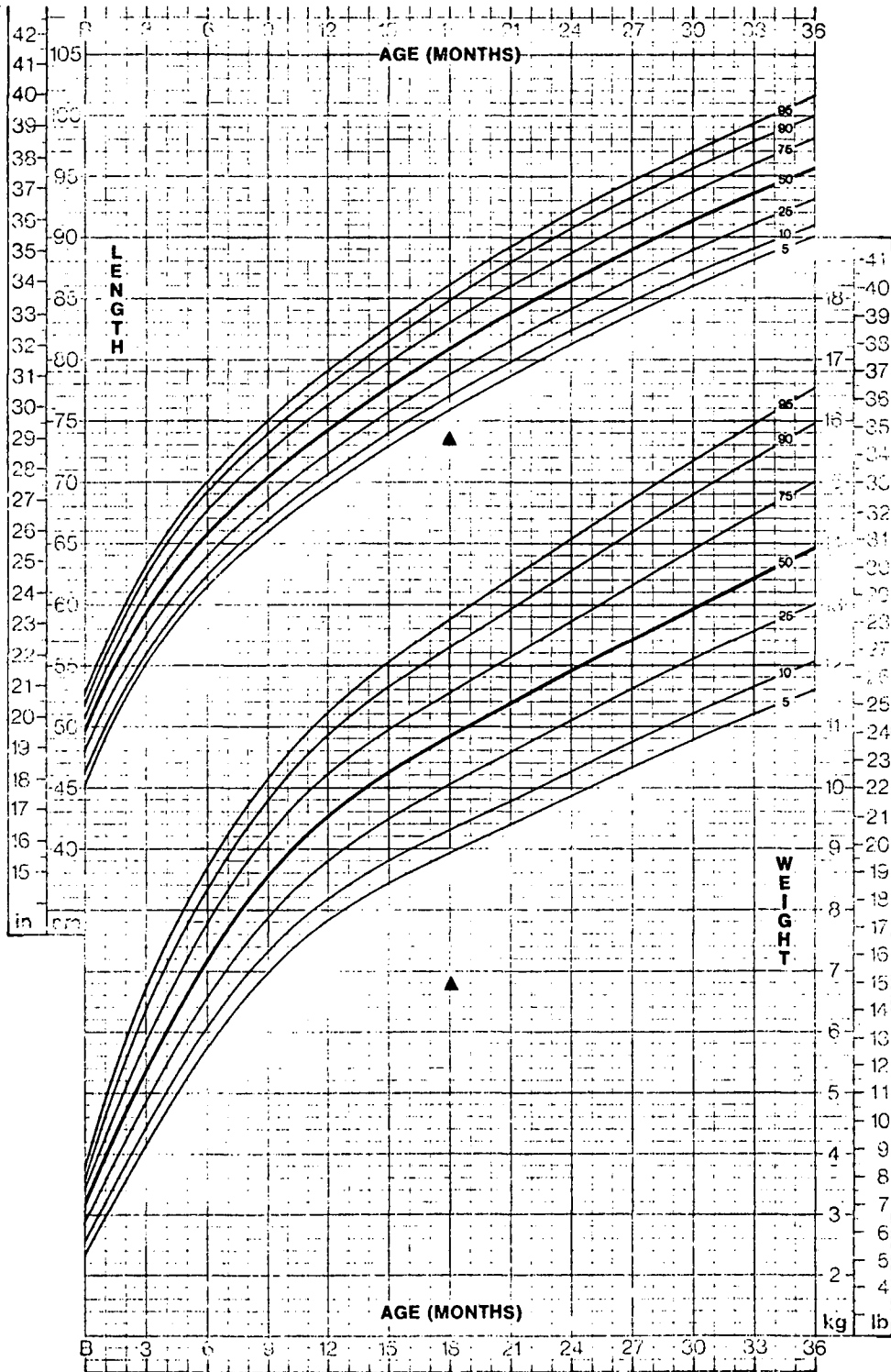
GIRLS: 2 TO 18 YEARS
PHYSICAL GROWTH
NCHS PERCENTILES*

NAME Subject 6

* Adapted from: National Center for Health Statistics, *1976 Growth Charts*, 1976, Monthly Vital Statistics Report, Vol. 25, No. 3, Suppl. (HRA) 75-1120. Health Resources Administration, Rockville, Maryland, June, 1976. Data from the National Center for Health Statistics.

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GIRLS: BIRTH TO 36 MONTHS
PHYSICAL GROWTH
NCHS PERCENTILES*

NAME Subject 7

*Adapted from: National Center for Health Statistics, NCHS Growth Charts, 1976, Monthly Vital Statistics Report, Vol. 25, No. 1, Supp. (PHS 176-1170).
 Health Resources Administration, Rockville, Maryland, Jan. 5, 1976.
 Data from: The Fels Research Institute, Yellow Springs, Ohio.
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