FOOD SERVICE IN A DIABETIC CAMP

by

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INTRODUCTION

Camps for normal children have been well established in all parts of the United States for many years. Although physicians long have recognized the need for camps for diabetic children, Marble (12) reported that the first such camping facilities were provided in 1925.

Interest and enthusiasm for diabetic camps have increased since that time to such an extent that in 1953 the American Diabetes Association (20) reported sixteen camps in operation in the United States and one in Canada. Tangney (21) estimated that in 1947 there were 40,800 diabetic children in this country. If all diabetic children are to be given the advantages of camp life, there will be need to establish many more similar camps throughout the United States.

Numerous articles have appeared in various medical journals concerning the latest developments in the daily care and treatment of diabetes mellitus during childhood and adolescence. However, little has been written about the organization and management of the dietary department of diabetic camps that would be of value to groups interested in establishing new camps.

The present study was based on the investigator's experience as a dietitian in planning and operating the food service of a newly-established camp for diabetic children in the St. Louis area. This camp was sponsored by the St. Louis Diabetes Association and the Lion's Club of Greater St. Louis.

PART I

The objectives of this part of the study were:

(a) to aid in the adequate control of the diabetes by providing food according to the doctor's prescription.

(b) to plan and supervise the preparation and service of the food for the diabetic children and the staff.

(c) to provide nutrition education that would assist the diabetic child in analyzing and solving some of his or her nutritional problems.

Marble (12) in a review of diabetic camp history reported that the first summer camp under the direction of Dr. Leonard F. C. Wendt was held in Detroit in 1925. Only four campers were housed in a cottage owned by a diabetic patient. Dr. Henry J. John established the second camp in 1929 in Cleveland. Dr. Elliott P. Joslin provided permanent camping facilities for diabetic girls in North Oxford, Massachusetts in 1931. A similar camp was established for boys in Charlton, Massachusetts in 1948 and named the Elliott P. Joslin Camp.

According to a report in "Forecast" published by the American Diabetes Association in May 1953, the following camps were in existence: Camp Whitaker, San Francisco, California; Unibetic Camp, Los Angeles, California; Elliott P. Joslin Camp, Charlton, Massachusetts; Clara Barton Birthplace Camp, North Oxford, Massachusetts; Camp Lake of the Woods, Kansas City, Missouri; Springdale Camp, Nebraska City, Nebraska; Camp Nyda, Burlingham, New York; Camp Ho Mita Koda, Newbury, Ohio; Summer Camp for

Diabetic Children, Defiance, Ohio; The Pennsylvania Camp for Diabetic Children, Spring Mount, Pennsylvania; Tennessee Camp for Diabetic Children, Sequatchie, Tennessee; Sweeney Camp for Diabetic Children, Gainesville, Texas; Camp Banting, Seattle, Washington; Camp Priscilla White, Seattle, Washington; Camp Kno-koma, Charleston, West Virginia; Holiday Home Camp, Lake Geneva, Wisconsin; and Illahee Lodge, Cobourg, Ontario, Canada. The location of these camps is shown in Fig. 1.

Although the camps are located in various parts of the United States, it is quite apparent that all diabetic children in this country would not be within a reasonable distance from a camp. Marble (12) estimated that established camps in 1951 provided facilities for approximately 2000 children, and that 1304 diabetic children attended summer camp.

REVIEW OF LITERATURE

Diabetes Control

Definition. Diabetes Mellitus has been recognized as a chronic disease for many centuries. Joslin (8) stated that symptoms of the disease were recognized and recorded by Celsus (30 B.C.-50 A.D.) and by Aretaeus (30-90 A.D.). According to Cooper et al. (5), the term "diabetes" was derived from the Greek word meaning "to siphon", and the term "mellitus" was derived from the Latin word meaning "honey". Duncan (6) described diabetes mellitus as a disease of metabolism resulting

Fig. 1. Location of present diabetic camps.

(1) San Francisco, California
(2) Los Angeles, California
(3) Charlton, Massachusetts
(4) North Oxford, Massachusetts
(5) Kansas City, Missouri
(6) Nebraska City, Nebraska
(7) Burlingham, New York
(8) Newbury, Ohio
(9) Defiance, Ohio
(10) Spring Mount, Pennsylvania
(11) Sequatchie, Tennessee
(12) Gainesville, Texas
(13) Seattle, Washington
(14) Seattle, Washington
(15) Charleston, West Virginia
(16) Lake Geneva, Wisconsin
(17) Cobourg, Canada

from an insufficient supply of endogenous insulin. Stetten (19) described it as an "error in metabolism".

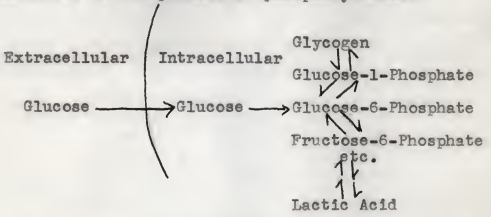
Duncan (6) described diabetes mellitus as an error in metabolism involving primarily a disturbance in the utilization of carbohydrate, but secondarily a disturbance in fat and protein metabolism and electrolyte and water balance. The glucose absorbed from the digested food is secreted by the liver into the blood stream, but glucose utilization in the tissues is impaired so the concentration of sugar in the blood rises above normal (hyperglycemia). When the renal threshold for glucose is exceeded, sugar appears in the urine (glycosuria).

Etiology. Duncan (6) demonstrated that the predisposition to diabetes was inherited and that the incidence of diabetes followed the ratios for a Mendelian trait of the recessive type. Barach (1) reported that the diabetic state was induced by alterations in the flow of hormones from the pituitary, adrenals, thyroid or pancreas with resulting disturbances of sufficient magnitude to disrupt normal functioning of enzyme metabolism. Whatever was responsible for altering the normal functioning of the pancreas disrupted carbohydrate metabolism primarily, and fat metabolism secondarily.

Recent information about the hexokinase reaction, phosphorylation, and pyruvic acid metabolism have led us to a more nearly complete understanding of the disease.

According to Stetten (19):

Insulin affects both glycogenesis and glycolysis, and only two well-defined events occur before the pathways of glycogenesis and glycolysis diverge. These are the entry of glucose into the intracellular compartment and the phosphorylation of glucose by adenosine triphosphate in the presence of hexokinase....The sugar d-galactose is, in the absence of insulin, excluded from certain portions of the body water, but gains free access to all body water when insulin is administered ....The probable function of insulin is to favor the entry of glucose into the intracellular compartment. There is no evidence for phosphorylation of any of the three sugars that have successfully been tested, that this effect is independent of phosphorylation.



Entry of glucose into the cell and its phosphorylation prior to glycogenesis or glycolysis.

The diabetic animal has abundant glucose in its body fluids, but, because of some difficulty in the capture or phosphorylation of this glucose by its cells, it is not able to utilize it to the greatest advantage.

Symptoms. The most common symptoms of uncontrolled diabetes have been general weakness, rapid loss of body weight, excessive appetite (polyphagia), excessive thirst (polydipsia), excessive urination (polyuria), pruritus, and backache.

Diagnosis. Final diagnosis has rested upon laboratory data; however, the patient's symptoms, family history, past history, and physical findings have been an important guide in arousing the physician's suspicions of the presence of the disease. The

same criteria have been used in the diagnosis of diabetes mellitus in childhood as have been used with adults, namely, glycosuria and hyperglycemia. Hyperglycemia has been recognized by a fasting venous blood sugar above 120 mg per 100 ml, a post-prandial value above 160 mg per 100 ml, fasting capillary blood sugar above 120 mg per ml, or a capillary post-prandial value above 190 mg per 100 ml according to Duncan (6).

Prognosis. Duncan (6) has considered the prognosis excellent for the intelligent and cooperative patient providing that the diabetes has been identified early and treated diligently by a physician who has had interest and training in this field of metabolism.

Incidence. Diabetes mellitus has not been considered common during childhood. It has been estimated by Duncan (6) that children comprise 5 percent of the diabetic population. It has been observed that a greater incidence of diabetes in children follows the most rapid periods of growth with the greatest incidence at puberty. The disease has been more apparent among Jewish children than among Gentile children. In studies made by White (26), it was shown that the predisposition to diabetes was inherited in proportion to the number of years that the diabetes was observed. When the diabetes was first discovered, only one child in five had a relative with diabetes, but after having the disease 15 years, one-half of the children had one or more diabetic relatives. After having the disease 20 years, the incidence was three out of five.

Treatment. Most physicians have recognized that diabetes

in childhood and adolescence has been characterized by its acuteness and severity. Up to the present time three schools of thought have existed regarding adequate methods of "controlling diabetes". Sindoni et al. (17) referred to these three schools as the laboratory school, the clinical school, and the compatible school.

The first school as advocated by Wilson et al. (27), Ricketts (15), and Keiding and Root (9) used for criteria of control, laboratory examinations of blood and urine for sugar. The patient was taught that it would be better for him if he maintained a normal fasting blood sugar level of 120 mg. Each diabetic was taught to examine his urine daily for sugar. Keiding and Root (9) studied a series of 451 patients with onset of diabetes under the age of 30 years and with duration of the disease from 0 to 36 years. The results of their study indicated that at all stages of duration of diabetes, the incidence of retinopathy, arterial calcification, and nephropathy was significantly less in patients who had maintained excellent or good control of diabetes. They concluded that only by careful and continuous attempts at control may the late complications of diabetes be prevented or postponed.

Another study conducted by Wilson et al. (27) with 121 patients with severe diabetes of 10 to 34 years duration, with onset between 18 months to 30 years of age supported the concept that continuous, aggressive treatment directed toward maintenance of physiologic conditions has been a better form of management of diabetes than the free diet plan which permits a constantly

disturbed metabolic state, reflected in persistent hyperglycemia and glycosuria. Some of the physicians in this school have felt that a sugar free urine was desirable in controlling the disease and in delaying or preventing the progress of premature vascular degeneration, while others have felt that a trace of sugar in the urine was advisable to guard against insulin hypoglycemic reactions.

Physicians of this laboratory school have recognized that one of the first steps in this method of control was the teaching of proper dieting. The controlled calories have been based upon weight, height, age, or surface area. When weight and age have been used as criteria, the following allowances have been made:

100 Calories per kilogram of body weight in infancy
80 Calories per kilogram of body weight at 5 years
60 Calories per kilogram of body weight at 10 years
40 Calories per kilogram of body weight at 15 years

When calories have been based upon height, 35 calories have been allowed per inch. When calories have been based on age, 1200 calories have been allowed for a child one-year-old and 100 calories added for each additional year. The most widely used criterion has been based on surface area in which the theoretical basal metabolism as calculated by the Wetzel Grid is multiplied by two. Wetzel (25) described the Grid as a direct-reading control chart on the quality of growth and development. The Grid may be used by the physician as a month-to-month visual demonstration of whether growth of the child has or has not been progressing satisfactorily, and of the extent to which it has

progressed. The Grid revealed not only the direction but also the speed of development.

After the caloric requirement had been determined, the distribution of the calories were made on a basis of 15 percent Protein, 35 percent Fat, and 50 percent Carbohydrate or 15 percent Protein, 50 percent Fat, and 35 percent Carbohydrate according to Wetzel (25). The ratios of 20 percent Protein, 40 percent Fat, and 40 percent Carbohydrate have been chosen as ideal by White (26).

The second school of thought, the clinical school as advanced by Tolstoi (22), disregarded the results of the laboratory examination and concentrated upon the physical signs and symptoms of diabetes. Tolstoi (22) believed there was no conclusive evidence to support the theory that the diabetic patient's high blood sugar and glycosuria made him more prone to infection, coma, or vascular disease when he was permitted the free diet than when he was given the more orthodox treatment. Tolstoi concluded that his regimen relieved the patient of the obligation of adhering to numerous rules and burdensome dietary tables. He maintained that the patient need not be concerned with blood sugars and what he termed "gadgets for urine analysis". However, he stressed that the patient should never omit insulin. The free diet as Tolstoi described it permitted the person to choose foods in quality and frequently in quantity which differed in no way from the diet consumed by other members of his family in particular and of society in general. Desserts were included,

but overindulgence in them was not permitted. Tolstoi maintained that the diabetic should not be permitted to overeat, but should be allowed a normal diet consisting of self-chosen, unweighed dishes considered nutritionally adequate.

The third and newest method of control as advocated by Sindoni et al. (17) of Philadelphia combined the first two schools of thought, and the authors termed it the "Compatible School" of guidance. They stabilized their diabetic patients with diet and insulin and aimed to bring the post-prandial blood sugar (one to three hours, generally two hours after meals) to the level most compatible with the total well-being of the individual patient. This level depended upon age, condition of the cardiovascular system, occupation, existing complications, insulin, and activities. In general, a post-prandial blood sugar of 170 to 220 mg per 100 ml with insulin was found to be the most compatible level. The diet prescribed was liberal, adequately balanced, and nearer to that of the normal person's high carbohydrate, high protein, low fat diet. It was also believed that the patients adhered to their diet more closely. The compatible school concluded that compatible post-prandial hyperglycemia had been protective, and that normoglycemia, fasting-blood-sugar levels had been proven to be inadequate evidence of diabetic control.

Nutrition Education

Galdston (7) stated that we have become so preoccupied with

the subject matter that we have forgotten the person to whom the subject relates. This situation has developed in relationship with diabetes. In recent years many psychologists have emphasized the fact that knowledge alone does not assure good food habits. For effectiveness it has been necessary to gear our instructions to the motive forces that govern the child's life.

Adjustment to the disease has been recognized as difficult for adults and especially for children. Brener (2) stated that in many respects the psychological adjustment of the individual to the people around him and to life in general was intimately associated with eating habits which originated in the earliest period of life. Therefore, anything closely related to an individual's pattern of eating, his choice of foods and so on, was charged with tremendous emotional energy. The anxiety of the parents has often been transmitted to the child. The feeling of isolation and self-pity from which many diabetic children have suffered has been partially overcome by association with other diabetics at camp. At camp the children found comfort from seeing other children equally handicapped, facing the same problems.

Galdston (7) advised those associated with nutrition to be mindful of the subject's interests and purposes, of his goals, of the direction of his impulsions, of the momentum he brings with him from the past. Individuals always have a goal toward which they are moving and our duty is to assist the individual in attaining his goal.

In order to improve the food habits of the diabetic children

attending camp, it was recognized that the opinions of various authorities concerning the problem should be considered. Selling and Ferraro (16) attributed the daydreamer type of dawdling to lack of affection and suggested that a survey be made of the total home situation and an effort be made to inject the parents strongly into the life of the child.

Tangney (21) reported that during the first year of the diabetic's disease, the child usually cooperated remarkably well; he thrived on the praise of his elders and experienced a feeling of superiority at his ability to refuse candy and other sweet foods which were offered to him. This period was usually of short duration, however, for such behavior was not typical of childhood.

Selling and Ferraro (16) pointed out that a patient who has had to be subjected to a diet likewise has had his personality changed by that fact. Most adults have experienced restriction in intake. Some have made an effort to take off excess weight, others have tried to stop smoking, and others have fasted during Lent. These experiences have given a better understanding of the problem.

According to Collisi (4) many feeding problems have been exaggerated by pressure from persons who were overly concerned with the nutritional needs and schedules and who lacked an understanding of the dynamics of human behavior.

Successful attempts in changing food habits of children have required a great deal of tact by all concerned. Brener (2) stated that basic honesty and sincerity were important. The

patient should have been able to recognize from the attitude and behavior of the adults by whom he was being guided that he was expected to face his problems realistically without an attempt to minimize the unpleasant aspects of the limitations imposed upon him or to magnify relatively minor considerations.

Kepler and Kesser (10) said, "Remember that helping to plan or prepare encourages appetite and esteem for good food." They also suggested that "no comment" was the best approach for handling the normal child who refused to eat, and that if he got hungry and wanted to eat before the next meal, he should not be allowed snacks. They maintained that it would not hurt a child in good health to miss one, two, or even three meals, providing he received plenty of liquids. When treating the normal child the important factor was what had been eaten over a long period of time. When dealing with a child with diabetes a different technique has been necessary. Diabetes in childhood has been characterized by its severity according to Duncan (6). Severe insulin reactions would have resulted if the diabetic child receiving insulin had been allowed to miss one, two, or three meals. Since severe insulin reactions have been known to cause brain damage, every precaution possible has been made to prevent them.

One of the cardinal rules in child feeding has been "do not force food." Weng (23) reminded us that we were forcing the child to eat when we compared the child unfavorably with another child or when we required him to finish everything on his plate before he had been allowed to eat his dessert.

In a study made by Radke and Caso (14) of food habits in a junior high school, two methods of influencing the food habits of these students were compared. The discussion-decision method and lecture method were used. The discussion-decision method was found to be far superior to the lecture method.

METHODS AND MATERIALS

Diabetes Control

The objective of diabetes control in the St. Louis camp was to aid in the adequate control of the diabetes by providing food according to the doctor's prescription.

The medical director for the diabetic children at Camp Sunrise decided that four diets consisting of 2000, 2400, 2800, and 3200 calories fulfilled the caloric requirements of the children at camp. Camp facilities were such that it was impractical to place each child on an individual diet; therefore, each child was placed on the diet that most nearly fulfilled his requirement. As the activity of the children at camp was increased, this was taken into consideration in determining the diet on which each child was placed.

The distribution of calories was made according to the method used at the St. Louis Children's Hospital. Then the diet outline was planned. To facilitate rapid planning of menus, a diet pattern was then worked out. Daily menus were planned by reference to the menu pattern.

Food Service

The camp facilities were planned around a ten-room house located eight miles from the City of St. Louis, Missouri. The camp was organized for 250 day campers and in addition a few children who lived in the camp for the entire summer. Interested persons believed that the diabetic children in this area needed the advantages of camp life, and the owners of the camp agreed to house and feed the diabetic children with the understanding that medical care, including the services of a physician, nurse, and dietitian would be provided by the Greater St. Louis Lion's Club.

The family-sized kitchen located in the house was used for the preparation of the food for the entire camp. Once the food for the non-diabetic children was prepared it was carried in large pots and containers to the dining room adjoining the house where it was served in cafeteria style.

The menu for the camp was planned for 17 non-diabetic children by the owners of the camp. Foods included in the regular camp menu were inexpensive and required the minimum of preparation. Many of the foods served could not be given to children with diabetes; therefore, food for the diabetic children had to be prepared separately. Most of the food for the diabetic children was prepared in the dining room used by the diabetic children because the kitchen was too small to accommodate all workers. Refrigerators, stoves, and sinks in the kitchen were used only as needed.

Family-sized equipment was provided for the preparation of food. A small two-compartment sink was available for food preparation, dishwashing, and washing of pots and pans. As these facilities were inadequate, paper plates and cups were used in the diabetic dining room.

Nutrition Education

The objective of the nutrition education program was to assist the diabetic child in analyzing and solving some of the nutritional problems which he encountered at camp.

Originally it was planned to conduct daily classes in nutrition. After arriving at camp it was soon realized that the first problem for the dietitian was to see that each child was provided with the proper food at the proper time. Daily classes could not be held due to lack of time. It was then decided to incorporate nutrition education during the service of the meal at which time the child faced his problems. This method enabled the child to apply the knowledge gained and have a broader understanding of his problems. The child was more interested and the nutrition education more effective than it would have been had it been conducted as classes which the child felt were compulsory.

Variations in age, intelligence, education, and family backgrounds were recognized. In order for the nutrition education to be effective these factors had to be considered and the material had to be presented in such a way that it was understandable

to every child in the group.

Problems were handled when they arose and instruction was adjusted to the individual as well as to the situation.

DISCUSSION

Control of Diabetes

Diet History. The medical director had a conference with the parents and children upon arrival. After this conference, a diet history was obtained by the dietitian as shown in the following form.

Diet History

Name of Patient John Doe

Age of Patient 11 years Parent's Name Mrs. J. B. Doe

Address 107 Machir, Columbia, Mo. Telephone 15643

Diet Followed at Home 2260 Calories T.A.G. 259

85 gms Protein; 126 gms Fat; 197 gms CHO

Food Dislikes of Patient Leafy Vegetables

Food Likes of Patient Corn, beans, tomatoes, lima beans

Food Allergies None

Has diet prepared at home been weighed or measured? Weighed

Has child been planning own menus at home? No

Does child know how to plan own menus? No

Does child eat foods not allowed on diet? No

Has child's diet been: a) large enough to satisfy appetite
(Underline)
b) more than the child can eat
c) child is always hungry

Diet Prescribed While at Camp:

2423 Calories; 91 gms Protein; 135 gms Fat;
211 gms CHO; 277 T.A.G.;

To be divided: 30 percent at Breakfast, Lunch and Dinner;
10 percent at 8 P.M.

Between meal feeding at 8 P.M.

Calculation of the Diet Order. The medical director used the Wetzel Grid in determining the caloric needs of each child. Additional calories were added to cover the increased activity of the children. The caloric content of the diets served was 2000, 2400, 2800, and 3200.

The distribution of protein, fat, and carbohydrate was determined by the following method:

15 percent of the total calories came from Protein
50 percent of the total calories came from Fat
35 percent of the total calories came from Carbohydrate

The total available glucose (T.A.G.) was used by the physician in determining the child's glucose to insulin (G. I.) ratio. The T.A.G. was estimated by the following method:

(a) 58 percent of the Protein in grams
(b) 10 percent of the Fat in grams
(c) 100 percent of the Carbohydrate in grams
(d) These figures were added to obtain the T.A.G.

The director of the camp asked that the diets be divided so that 30 percent of the T.A.G. would be received at breakfast, 30 percent at lunch, 30 percent at dinner, and 10 percent at bedtime.

The actual composition of the diets served is shown in Table 1.

Table 1. Composition of the four diet orders.

	Diet #1 (2000 Cal)	Diet #2 (2400 Cal)	Diet #3 (2800 Cal)	Diet #4 (3200 Cal)
Calories	2012	2423	2803	3228
Protein (15% of Cal) gms	75	91	106	121
Fat (50% of Cal) gms	112	135	155	180
CHO (35% of Cal) gms	175	211	246	281
T.A.G.	231	277	323	369
T.A.G. (Breakfast)	70.8	82.2	96.6	110.7
T.A.G. (Lunch)	68.6	83.5	96.6	110.7
T.A.G. (Dinner)	68.6	83.5	96.6	110.7
T.A.G. (8 P.M.)	21.4	26.6	32.2	36.9

Diet Outline. The diet order was then converted into terms of food by the diet outline. The food value charts used in the diet outline are in the Appendix.

Several factors influenced the planning of the diets:

(a) The child's age and average appetite for that age were considered in determining the size of portions for each child.

(b) The food habits of the diabetic children from this

locality were considered in so far as possible.

(c) The camp facilities and budget were of major importance in planning the diet outline.

(d) The diet was planned so that standardized servings of meat, vegetables, and fruits could be served to all children regardless of the caloric content of the diet upon which they were placed. The difference in the caloric content of the diets was made by varying the size of the portions of bread, butter, and milk.

(e) The diet was so arranged that it would provide adequate mineral and vitamin constituents as well as protein, fat, and carbohydrate.

(f) Carbohydrates that were concentrated and readily absorbable were avoided.

The four diet outlines planned are shown in Table 2.

The Menu Pattern. The menu pattern for use in planning the daily menu was constructed so that the T.A.G. would be distributed as shown in Table 1. The menu patterns were arranged as shown in Table 3.

The Diabetic Master Menu. The menus were planned and recipes were calculated so that it would be possible to serve the mixed dishes that appeared on the menu. Knowing that some of the children would be receiving 3200 Calories, the menus were planned with that fact in mind. Foods that were in season were used. Foods that were moderate in cost were incorporated. Variety was introduced not only in the kind of food, but also in the preparation, texture, shape, and flavor.

Table 2. Diet outlines planned at four levels of food energy.

Food energy level	Food	Amount	Protein gms	Fat gms	Carbohydrate gms
2000	Milk	1050 gms	31.5	42.5	52.5
	Fruit	15 gms CHO x 3	--	--	45.0
	Cereal	10 gms	0.8	--	8.6
	Cream	60 gms	1.2	11.4	2.4
	Eggs	one	6.0	5.0	--
	Bread	50 gms	5.0	--	25.0
	Butter	35 gms	--	29.7	--
	Meat	90 gms x 2	30.6	23.4	--
	Vegetable	6 gms CHO x 2	--	--	12.0
	Vegetable	15 gms CHO x 2	--	--	30.0
		Total	75.1	111.5	175.5
2400	Milk	1200 gms	36.0	48.0	60.0
	Fruit	15 gms CHO x 3	--	--	45.0
	Cereal	15 gms	1.2	--	12.9
	Cream	60 gms	1.2	11.4	2.4
	Eggs	two	12.0	10.0	--
	Bread	95 gms	9.5	--	48.5
	Butter	50 gms	--	42.5	--
	Meat	90 gms x 2	30.6	23.4	--
	Vegetable	6 gms CHO x 2	--	--	12.0
	Vegetable	15 gms CHO x 2	--	--	30.0
		Total	90.7	135.3	210.8
2800	Milk	1600 gms	48.0	64.0	80.0
	Fruit	15 gms CHO x 3	--	--	45.0
	Cereal	15 gms	1.2	--	12.9
	Cream	80 gms	1.6	15.2	3.2
	Eggs	two	12.0	10.0	--
	Bread	125 gms	12.5	--	62.5
	Butter	50 gms	--	42.5	--
	Meat	90 gms x 2	30.6	23.4	--
	Vegetable	6 gms CHO x 2	--	--	12.0
	Vegetable	15 gms CHO x 2	--	--	30.0
		Total	105.9	155.1	245.6
3200	Milk	2000 gms	60.0	80.0	100.0
	Fruit	15 gms CHO x 3	--	--	45.0
	Cereal	15 gms	1.2	--	12.9
	Cream	80 gms	1.6	15.2	3.2
	Eggs	two	12.0	10.0	--
	Bread	155 gms	15.5	--	77.5
	Butter	60 gms	--	51.0	--
	Meat	90 gms x 2	30.6	23.4	--
	Vegetable	15 gms CHO x 2	--	--	30.0
	Vegetable	6 gms CHO x 2	--	--	12.0
		Total	120.9	179.6	280.6

Table 3. Menu patterns of the four diets.

Meal	Food	2000 Cal	2400 Cal	2800 Cal	3200 Cal
Breakfast	Fruit	15 gms CHO	15 gms CHO	15 gms CHO	15 gms CHO
	Cereal	10 gms	15 gms	15 gms	15 gms
	Cream	60 gms	60 gms	80 gms	80 gms
	Eggs	one	two	two	two
	Toast	30 gms	45 gms	45 gms	55 gms
	Butter	5 gms	10 gms	10 gms	20 gms
	Milk	300 gms	225 gms	425 gms	500 gms
Lunch and Dinner	Meat	90 gms	90 gms	90 gms	90 gms
	Vegetable	6 gms CHO	6 gms CHO	6 gms CHO	6 gms CHO
	Vegetable	15 gms CHO	15 gms CHO	15 gms CHO	15 gms CHO
	Bread	10 gms	25 gms	35 gms	40 gms
	Butter	15 gms	20 gms	20 gms	20 gms
	Fruit	15 gms CHO	15 gms CHO	15 gms CHO	15 gms CHO
	Milk	225 gms	300 gms	400 gms	500 gms
8 P.M.	Milk	300 gms	375 gms	375 gms	500 gms
	Bread	--	--	10 gms	20 gms

The master menu as first planned is shown in Tables 4 and 5.

The Revised Master Menu. Upon arriving at camp the owners asked that the menus be revised using the canned fruits and vegetables which they had in the storeroom and the meats which they had in storage. Facilities for the preparation and service were limited due to the fact that the small kitchen had to be shared. Food production for 250 day campers, 40 full-time campers, and camp staff had to be done in the same kitchen in which the food for the 17 diabetics was produced. These factors were taken into consideration, and the revised master menu as shown in Tables 6 and 7 was planned.

Table 4. Master menus for week of June 7 to 14 inclusive.

Day	Breakfast	Lunch	Dinner	8 P.M.
Sunday	--	--	Egg Salad Potato Chips Cooked Limabeans Bread-Butter Banana Milk	Milk Graham Crackers
Monday	Orange Juice Oatmeal Soft Cooked Eggs Toast-Butter Milk	Cheese Fondue Boiled Potatoes Stewed Tomatoes Head Lettuce Salad Bread-Butter Unsweetened Apricots Milk	Meat Loaf Whole Kernel Corn Cooked Spinach Radishes and Celery Sticks Bread-Butter D-Zerta with Unsweetened Peaches Milk	Milk Cornflakes
Tuesday	Unsweetened Grapefruit Juice Shredded Ralstons Scrambled Eggs Toast-Butter Cocoa (sweetened with Sucaryl)	Beef Stew Cooked Asparagus Sliced Tomatoes Rolls-Butter Strawberries Milk	Escalloped Ham and Potatoes Green Peas Cooked Cabbage Unsweetened Pineapple Salad Bread-Butter Unsweetened Red Sour Cherries Milk	Milk Cornflakes
Wednesday	Unsweetened Grapefruit and Orange Juice Maltomeal Poached Eggs Toast-Butter Milk	Cream of Potato Soup Tunafish Salad Cooked Beets Carrot Sticks Bread-Butter Ice Cream Milk-Lemonade	Italian Spaghetti with Meat Balls Green Beans Warm Applesauce Bread-Butter Unsweetened Canned Pears Chocolate Milk (sweetened with Sucaryl)	Milk Graham Crackers

Table 4. (concl.)

Day	Breakfast	Lunch	Dinner	8 P.M.
Thursday	Baked Apple (unsweetened) Rice Krispies Scrambled Eggs Toast-Butter Milk	Cold Sliced Ham Loaf Cooked Rice Coleslaw Bread-Butter Unsweetened Canned Peaches Milk	Picnic Hamburgers on toasting stick Baked Potato (in aluminum foil) Whole Raw Tomatoes Hamburger Bun-Butter Bing Cherries Milk	Milk Soda Crackers
Friday	Sliced Banana Cornflakes Sausage Toast-Butter Cocoa (sweetened with Sucaryl)	Deviled Eggs Green Peas Cauliflower Orange and Grapefruit Salad Bread-Butter Diabetic Cookies Milk	Baked Fish Mashed Potatoes Stewed Tomatoes Carrot Sticks Bread-Butter Unsweetened Pineapple Milk	Milk Shredded Ralston
Saturday	Unsweetened Grape Juice Oatmeal Poached Egg Toast-Butter Milk	Tomato Soup-Crackers Frankfurters Limabeans Carrot Sticks Celery Sticks Bread-Butter Apple Milk	Pork Cutlets Mashed Potato Brussel Sprouts Pickled Beet Salad Bread-Butter Sliced Oranges Milk	Milk Graham Crackers
Sunday	Unsweetened Grapefruit Juice Rice Krispies Soft Cooked Eggs Toast-Butter Milk	Baked Chicken Parsley Potatoes Green Beans Unsweetened Apricot Salad Bread-Butter Ice Cream Milk	Cold Sliced Roast Beef Potato Salad Sliced Tomato and Cucumber Salad Bread-Butter Watermelon Milk	Milk Bread-Butter

Table 5. Master menus for week of June 14 to 21 inclusive.

Day	Breakfast	Lunch	Dinner	8 P.M.
Monday	Orange Quarters Oatmeal Scrambled Eggs Toast-Butter Milk	Baked Chicken and Noodles Green Peas Cooked Spinach Unsweetened Peach and Cottage Cheese Salad Bread-Butter Unsweetened Canned Pears Milk	Baked Ham Mashed Potato Cooked Cabbage Lettuce, Cucumber, Celery Salad Bread-Butter Sliced Banana Milk	Milk Soda Crackers
Tuesday	Fresh Pineapple Cornflakes Poached Eggs Toast-Butter Milk	Ham Loaf Baked Potato Cooked Green Beans Pickled Beets Bread-Butter Orange Sections Milk	Cube Steaks Boiled Potato Carrot Sticks Spinach, Tomato, and Celery Salad Unsweetened Apple-sauce Milk	Milk Rice Krispies
Wednesday	Unsweetened Orange and Grapefruit Juice Shredded Ralstons Broiled Ham Toast-Butter Cocoa (sweetened with Sucaryl)	Scrambled Eggs with Bacon Baked Sweet Potatoes Unsweetened Pineapple and Cottage Cheese Salad Bread-Butter D-Zerta with Banana Milk-Lemonade (sweetened with Sucaryl)	Hamburger Summer Squash Carrot Sticks Bread-Butter Unsweetened Apricots Milk	Milk Graham Crackers
Thursday	Sliced Banana Rice Krispies S.C. Eggs Toast-Butter Milk	Macaroni and Cheese Limabeans Cauliflower Celery Curls and Radishes Bread-Butter Unsweetened Pears Cocoa	Baked Liver Mashed Potatoes Stewed Tomatoes Sliced Orange Salad Bread-Butter Strawberries Milk	Milk Soda Crackers

Table 5. (concl.)

Day	Breakfast	Lunch	Dinner	8 P.M.
Friday	Unsweetened Applesauce Maltomeal Poached Eggs Toast-Butter Milk	Deviled Eggs Potato Salad Tomato Wedges Bread-Butter Unsweetened Peaches Milk	Cold Salmon Salad Boiled Potatoes Head Lettuce Salad Bread-Butter Sliced Bananas Milk	Milk Soda Crackers
Saturday	Orange Quarters Cornflakes Scrambled Eggs Toast-Butter Milk	Tomato Soup Cheese Sandwiches Whole Kernel Corn Shredded Carrot Salad Bread-Butter Unsweetened Apricots Milk	Veal Loaf Mashed Potato Spinach Sliced Cucumbers Bread-Butter Apple Wedges Milk	Milk Bread-Butter
Sunday	Orange Juice Oatmeal Soft Cooked Eggs Biscuit-Butter Milk	Roast Beef Mashed Potatoes Green Peas Canned Pineapple Salad (unsweetened) Ice Cream Milk-Lemonade	Veal Loaf Mashed Potato Spinach Sliced Cucumbers Bread-Butter Apple Wedges Milk	Milk Graham Crackers

Table 6. Revised master menus for week of June 7 to 14 inclusive.

Day	Breakfast	Lunch	Dinner	8 P.M.
Sunday	--	--	Egg Salad Potato Chips Corn Bread-Butter Sliced Banana Milk	Bread-Butter Milk
Monday	Grapefruit Juice Cornflakes Soft Cooked Eggs Toast-Butter Milk	Braunsweiger Kidney Beans Beets Bread-Butter Unsweetened Peaches Milk	Roast Beef Mashed Potatoes Stewed Tomatoes Bread-Butter Unsweetened Pineapple Milk	Bread-Butter Milk
Tuesday	Orange Juice Rice Krispies Scrambled Eggs Toast-Butter Milk	Bologna Boiled Potatoes Green Beans Bread-Butter Sliced Oranges Milk	Hamburger Mashed Potatoes Lettuce and Tomato Salad Bread-Butter Raw Apples Milk	Bread-Butter Milk
Wednesday	Orange Juice Cornflakes Soft Cooked Eggs Toast-Butter Milk	Picnic Frankfurters Whole Tomatoes Carrot Sticks Buns-Butter Banana Orange Milk	Cold Sliced Ham Mashed Potato Beets Bread-Butter Unsweetened Peaches Milk	Bread-Butter Milk
Thursday	Orange Juice Rice Krispies Bacon Soft Cooked Eggs Toast-Butter Milk	Braunsweiger Peanut Butter Peas Lettuce and Celery Salad Bread-Butter Unsweetened Pineapple Milk	Hamburger Corn Spinach Bread-Butter Apple Wedges Milk	Bread-Butter Milk

Table 6. (concl.)

Day	Breakfast	Lunch	Dinner	8 P.M.
Friday	Orange Juice Cornflakes Scrambled Eggs Toast-Butter Milk	Sliced Cheese Kidney Beans Cooked Carrots Bread-Butter Unsweetened Peaches Milk Lemonade at 3 P.M.	Baked Fish Baked Potato Sliced Tomatoes Bread-Butter Sliced Oranges Milk Popped Corn at movie in evening	Bread-Butter Milk
Saturday	Orange Juice Rice Krispies Soft Cooked Eggs Toast-Butter Milk	Frankfurters Corn Celery Curls Bread-Butter Unsweetened Apple-sauce Milk Tomato Juice	Baked Liver Baked Potato Coleslaw Bread-Butter Unsweetened Pear Milk	Bread-Butter Milk
Sunday	Orange Juice Cornflakes Scrambled Eggs Toast-Butter Milk	Roast Pork Mashed Potatoes Head Lettuce Salad Bread-Butter Vanilla Ice Cream Milk	Devilled Eggs on Lettuce Leaf Peas Green Beans Bread-Butter Unsweetened Apricots Milk	Bread-Butter Milk

Table 7. Revised master menus for week of June 14 to 21 inclusive.

Day	Breakfast	Lunch	Dinner	8 P.M.
Monday	Orange Juice Oatmeal Soft Cooked Eggs Toast-Butter Milk Cereal Cream	Sliced Luncheon Meat Potato Chips Carrot Sticks Bread-Butter Unsweetened Pineapple Tomato Juice Milk	Roast Beef Baked Potatoes Celery Curls Bread-Butter Raw Apple Milk	Milk Bread-Butter
Tuesday	Orange Juice Rice Krispies Soft Cooked Eggs Toast-Butter Milk Cereal Cream	Frankfurters Corn Sliced Orange Salad Bread-Butter Sliced Banana Milk	Baked Ham Boiled Potatoes Green Beans Bread-Butter W. P. Peaches Milk	Milk Bread-Butter
Wednesday	Orange Juice Cornflakes Fried Eggs Bacon Toast-Butter Milk Cereal Cream	Peanut Butter Peas Unsweetened Pineapple and Cheese Salad Bread-Butter W. P. Pears Milk	Hamburger Mashed Potatoes Stewed Tomatoes Bread-Butter Unsweetened Apple-sauce Milk	Milk Bread-Butter
Thursday	Orange Juice Oatmeal Scrambled Eggs Toast-Butter Milk Cereal Cream	Sliced Luncheon Meat Sandwiches Carrot Sticks Bread-Butter Apple Wedges Milk (above is sack lunch for trip to zoo)	Cube Steaks Baked Potatoes Green Beans Bread-Butter Waterpacked Peaches Milk	Milk Bread-Butter or Peanutbutter Sandwich or Graham Crackers

Table 7. (concl.)

Day	Breakfast	Lunch	Dinner	8 P.M.
Friday	Orange Juice Cornflakes Soft Cooked Eggs Toast-Butter Milk Cereal Cream	Tunafish and Egg Salad Limabeans Head Lettuce Bread-Butter Unsweetened Pineapple Milk	Baked Codfish Mashed Potatoes Sliced Tomatoes Bread-Butter Sliced Oranges Milk	Milk Soda Crackers
Saturday	Orange Juice Rice Krispies Bacon Scrambled Eggs Toast-Butter Milk Cereal Cream	Sliced Cheese Peanut Butter Potato Chips Bread-Butter Sliced Banana Milk Tomato Juice	Hamburgers Boiled Potatoes Green Beans Bread-Butter Unsweetened Apricots Milk Popped Corn at Movie in Evening	Milk Rice Krispies
Sunday	Unsweetened Apricots or sliced Banana Cornflakes Soft Cooked Eggs Toast-Butter Milk	Roast Beef Mashed Potatoes Lettuce- Tomato, and Celery Salad Bread-Butter Vanilla Ice Cream Milk	--	--

The Daily Menu. The daily menus for the diets at the four levels of food energy were planned according to the menu pattern of the various diets and the foods appearing on the master menu. The meats, fruits, and vegetables were chosen from the lists appearing in the Appendix. Menus as planned for June 16, 1953 are shown in Table 8.

Table 8. Daily menu planned for June 16, 1953.

Meal	Food	Fuel value level of diets			
		2000 Cal	2400 Cal	2800 Cal	3200 Cal
		gms			
Breakfast	Orange Juice	125	125	125	125
	Rice Krispies	10	15	15	15
	Cream, Coffee	60	60	80	80
	H.C. & S.C. Eggs	50	100	100	100
	Toast	30	45	45	55
	Butter	5	10	10	20
	Milk	300	225	425	500
Lunch	Frankfurters	90	90	90	90
	Corn	100	100	100	100
	Sliced Orange Salad	100	100	100	100
	Bread	10	25	35	40
	Butter	15	20	20	20
	Sliced Banana	55	55	55	55
	Milk	225	300	400	500
Dinner	Baked Ham	90	90	90	90
	Mashed Potato	100	100	100	100
	Green Beans	100	100	100	100
	Bread	10	25	35	40
	Butter	15	20	20	20
	Waterpacked Peaches	150	150	150	150
	Milk	225	300	400	500
8 P.M.	Milk	300	375	375	500
	Bread	-	-	10	20

The diabetic children participated with non-diabetic children in all activities except the service of meals. Food for the

diabetic child was served in a separate dining room. The two groups compared menus, and the diabetic children consistently thought they received better food and a larger quantity. A more nearly ideal arrangement would be for all children to eat in the dining room and receive the same food with special precautions to see that the diabetic child received the proper amount of food. This would mean that the non-diabetics would not be served as economically, but they would receive a balanced diet and the diabetic child would feel less segregated.

Food Service

Recipes. Special recipes may be constructed using ingredients that are permitted on a diabetic diet. Mixed dishes such as tuna salad, potato salad, and spaghetti with meat balls may be used provided the protein, fat, and carbohydrate content of the entire recipe has been calculated. When the composition of each serving of the recipe has been determined, the foods for which it can be substituted can be calculated.

A sample recipe used at camp is as follows:

Table 9. Sample recipe: Tuna Salad.

Amount	Ingredient	Method
1140 grams	Tunafish	Chop hard cooked eggs and
19	Eggs, hard cooked	tunafish coarsely; add
50 grams	Onion, chopped fine	chopped onion, mayonnaise,
95 grams	Mayonnaise	and salt. Arrange 95
2 teaspoons	Salt	grams of tunafish salad
2 heads	Lettuce	on lettuce leaf. Garnish
½ teaspoon	Paprika	with a dash of paprika.

Size of serving: 95 grams
Number of servings: 19
One serving can be used in place of: 90 grams Meat and 5 grams Butter

Food Cost Records. Daily records of food cost were kept as shown in Table 10.

Table 10. Daily food cost record. Date: Tuesday, June 16, 1953.

Food group		Quantity	Unit cost	Total cost	Total cost for group
Meats, Poultry, and Fish	Weiners	4#	$0.42	$1.68	
	Ham	4#	1.07	4.28	$5.96
Eggs		35	.042	1.47	1.47
Milk, Cream, Ice Cream, Cheese	Cream	1½ qts.	.60	.75	
	Milk	14½/½ gal.	.335	4.86	5.61
Oleomargarine		2# 1 oz.	.26	.53	.53
Fresh Fruits and Vegetables	Oranges	29	.00174	.50	
	Bananas	5#	.15	.75	1.25
Potatoes		5#	.05	.25	.25
Canned Fruits and Vegetables	Orange Juice	2 cns.	.37	.74	
	Corn	1/#10		1.14	
	Green Beans	1/#10		1.08	
	W.P. Peaches	1/#10		.95	3.91
Cereals and Cereal Products	Rice Krispies	2 bx.	.16	.32	
	Bread	3½ lvs.	.17	.55	
	Frank. Buns	2 pkg.	.24	.48	1.35
Fats other than Butter					
Staples					
				Total	$20.33

Table 11. Summary of raw food costs.

Date	Daily total	Number served			Cost per person per day
		B.	L.	D.	
6/7/53	$ 8.91	--	--	18	$ 0.495
6/8/53	21.34	18	18	18	1.185
6/9/53	16.39	19	19	19	.862
6/10/53	20.79	19	19	19	1.094
6/11/53	19.34	19	19	19	1.018
6/12/53	17.75	19	19	19	.934
6/13/53	18.80	18	18	18	1.044
6/14/53	28.32	19	19	19	1.490
6/15/53	22.03	20	20	20	1.101
6/16/53	20.33	20	20	20	1.016
6/17/53	19.52	19	19	19	1.027
6/18/53	17.69	20	20	20	.884
6/19/53	17.79	19	19	19	.936
6/20/53	15.74	19	19	19	.828
6/21/53	16.58	19	19	--	.872
Total	$281.32	267	267	266	$14.786

As indicated in Table 11, raw food costs for the 14-day period totaled $281.32. The average number of persons served was 19. Average raw food cost per person per day was $1.06.

Paper supplies for the two-week period including napkins, paper plates, and paper cups totaled $18.01, with an average cost per person per day of $0.067.

Nutrition Education

Nutrition education was accomplished by the discussion-decision method. Results are presented in terms of individual cases by first stating the situation then explaining the method of approach and results.

Desire to Assist in Food Preparation and Service. J. M., a girl, aged 12 years, asked, "Would you let me weigh some food for you?"

She was taught how to use the scales and was permitted to weigh some of the foods being served at the next meal. It was known that if the children's interest in preparation and service of food could be stimulated they would gain knowledge easily. This was a problem that was welcomed, for it was known that interest and enthusiasm would spread among the other children once they observed another member of their group participating.

The results were encouraging. Facilities were such that all volunteers could not always be permitted to assist, in which case they were told they could help at the next meal. Visits to the kitchen and to the dining room by the children were not discouraged during their free time. Only when they were supposed to be participating in some other activity were they encouraged to join the rest of the group. A conscious effort was made to maintain an atmosphere of friendliness, patience, and understanding so that the children would want to learn.

The girls exhibited the most interest, but during the second week the boys began to think they were missing out on something

and offered their assistance. The children were allowed to develop at their own speed. The younger children were interested primarily in assisting in the preparation of food, weighing the food, serving during meal service, and assisting with the clean-up after the meal service. One girl asked to help with the dishes and was allowed to do so. The oldest boy at camp enjoyed mixing and serving the diabetic soda in the middle of the afternoon.

One of the older girls asked to copy all the menus she had been served at camp. This involved teaching her, as well as her mother, how the menus were planned since she had been receiving a diet that was measured. This same girl became so interested in weighing her food that her parents purchased scales for her to use at home. Generally speaking, the actual mechanics of planning the menu from the diet pattern were not taught except in this one case.

The American Diabetes Association, The American Dietetic Association, and the U. S. Public Health Service have been making an effort to standardize diabetic diets all over the United States. According to Caso (3) considerable progress has been made; however, this method as yet has not been adopted by all physicians and hospitals. If all of the children had attended the St. Louis Children's Hospital Diabetic Clinic, more time could have been spent in teaching the children how to plan their menus. Under the circumstances it was not considered good medical ethics to teach them the camp method of presentation and then to have them return to their own physician who may have used a

different procedure. It not only would make the child question his own physician's techniques in handling diabetes, but it would also confuse the child. When food such as ice cream and popcorn appeared on the menu the children were told in general terms how it had been possible to incorporate the foods in the menu.

Dawdling. C.M., a seven-year-old boy, had a tendency to dawdle and finish eating long after the other children had left the dining room.

The physician decided that C.M's diet for camp had been increased more than necessary, and that the quantity of food had been more than he could eat. His diet was decreased 400 calories, and during the two-week period his weight gain was one pound.

The problem was still present. It was noticed that dawdling was most noticeable when the conversation in the dining room was loudest and most interesting. C.M's interests were wide, and he was a very bright child. Extremely loud talk and laughter was discouraged with the appeal that in order for everyone to enjoy his meal it was necessary to have a group of children happy yet reasonably quiet.

However, when the conversation was dull to C.M. he day-dreamed. It was then decided to remind him of the activity following the short rest period after the meal. This produced an urgent speeding up period with gulping and stuffing two and three mouthfuls of food into his mouth at once. He realized the

importance of eating all of his food for he had been a diabetic for three years.

Part of his dawdling was probably due to the fact that over-emphasis had been placed on his eating at home, and partly due to the fact that his parents were at the time separated. By the end of the two weeks' period he either finished eating at the same time or shortly after the rest had finished. It was felt that if the camp program could have lasted another two weeks, more could have been accomplished, for he did show progress.

Show-Off Attitude. W.S., a ten-year-old boy, was a show-off in all activities; however, his attention-getting mechanism consisting of an adult sized belch was the least tolerable.

The first time this behavior occurred, he received the response of a few giggles from some of the boys, and the staff ignored it thinking this was the best way to handle the situation. There was a repeat performance with disapproval exhibited by some of the girls and boys. It was explained to him that such behavior was not only considered bad manners, but also prevented some of the people at the table from enjoying their meal. He was told that if he considered this behavior necessary, he could excuse himself and go outside. After he had ignored these suggestions several times, he was told he could take his remaining food into the adjoining room in which there was no one eating and complete his meal. There were no recurrences.

Diet Breaking. D.M., an eleven-year-old boy, was about to

throw an egg yolk out the front door when the physician observed him.

The physician told him to come back to the dining room. D.M. had a history of diet breaking. It was explained to him that all people had foods that they liked better than others, but children could learn to eat all foods. D.M was told that it was hoped the children at camp could be helped to learn to like some of the foods they had not liked previously. He was encouraged to make an attempt to eat the food, then if he had difficulty he could talk it over with the dietitian and a substitution would be made for the portion he was unable to eat. D.M. did not make an attempt to hide or throw away food again. He was not forced to eat food he did not like. He always made an attempt and substitutions were given for foods he had difficulty finishing. Some progress was evidenced, for substitutions became less frequent. During the last week of camp, he took pride in showing the dietitian how he had eaten everything on his plate. A special effort was made to encourage him. The last day when he told the dietitian before he went home, "Thank you for all the good food", it seemed that progress had been made.

Foods Not Permitted on Diet. N.V., an eleven-year-old girl, came hurriedly into the kitchen at 3 P.M. with the report that the non-diabetic campers were given the opportunity to buy ice cream, candy, and soda daily at this time.

This was a practice about which we had not been informed.

One box of diabetic lollypops which had been purchased for

prizes to be given to the children when the non-diabetics were given candy or gum, but there were not enough for each child to have one. The situation was explained to the children with the promise that an attempt would be made to see if there were funds available to purchase treats which they could have. Later when diabetic soda, diabetic candy, and diabetic gum were given to the children, a discussion was held regarding the kinds they were permitted to eat, and what they could do in similar situations after they left camp.

Picnics are important occasions in children's lives. These diabetic children were taken to a nearby park on a picnic with non-diabetic children. The menu was planned so that all children received the same food; however, the diabetic children ate at one end of the table so that they would receive the proper amount of food.

A trip to the zoo helped to make the activities at camp complete. Sack lunches were prepared which made it possible for them to attend the elephant show in the morning and the monkey show in the afternoon.

Saturday night was movie night. The non-diabetic campers were given treats at intermission. Small bags of popcorn were given to each diabetic while the other children received cheese covered popcorn. During dinner it had been explained to the children that it was possible to have it by omitting some of the carbohydrate at their evening meal, thus avoiding the impression that it did not contain food value.

Food Dislikes. J.S. was served spinach and he said, "I just can't eat spinach."

J.S. was told that sometimes when we first taste a food, we dislike the flavor or the texture. He was asked if he thought he could taste it this time, then try to eat a little more the next time, then perhaps learn to like it. He co-operated by eating part of it the first time, and the next time it appeared on the menu he ate his whole serving without asking for a substitution.

Insulin Reactions. W.E. came to the kitchen to report that he did not feel well. He appeared exhausted and was perspiring profusely. It was obvious that he was having an insulin reaction.

W.E. was given 100 gms of orange juice with two teaspoons of sugar, his condition improved immediately, and his symptoms disappeared.

Films adapted to the diabetic's dietary problems would have been an effective aid in helping the diabetic child with his nutritional problems. Skits under proper supervision would have provided enjoyment for the participants as well as the audience.

SUMMARY

Diabetes Control

The medical director of the diabetic camp placed each of the diabetic campers on the one of the four diets which most nearly

fulfilled the energy and nutritional requirements of the child.

The diets were calculated so that 15 percent of the total calories came from protein, 50 percent of the total calories came from fat, and 35 percent of the total calories came from carbohydrate. The total available glucose (T.A.G.) was determined by adding 58 percent of the protein, 10 percent of the fat, and 100 percent of the carbohydrate.

The diet outline was so constructed that all children received the same sized portion of meat, fruits, and vegetables. The difference in calories was made in the size of portions of bread, butter, and milk. This not only speeded up service during the meal, but for each child to receive the same size portions of meat, fruit, and vegetable made them more satisfied.

Menus were planned insofar as possible around foods that the non-diabetics received. With the aid of insulin, exercise, and proper diet, the children's diabetes was adequately controlled while they were at camp.

Nutrition Education

Nutrition education was integrated into the meal service of the diabetic children attending camp. The child was able to apply the knowledge gained at the time in which the problem was faced. Information was adjusted to the individual as well as to the situation. It was believed that the discussion-decision method was more effective than a lecture method would have been. Success of this method was evidenced by the following results:

(a) The children were motivated and voluntarily sought information regarding nutrition.

(b) The tendency to dawdle during the meal service was reduced.

(c) Objectionable behavior at the table was eliminated.

(d) Although the children were tempted by foods not permitted on their diet, they learned how to face the problem, and what to do in similar situations at home.

(e) Many of the foods which the children refused at the beginning of the camp were accepted and enjoyed by the time camp was over.

(f) The children who had insulin reactions learned how to recognize the symptoms, and sought relief from symptoms before they had advanced beyond the mild form.

CONCLUSIONS

In a diabetic camp situation such as described in this study it was possible to achieve adequate diabetic control by the use of standardized diets of four caloric levels. In this regimen it was necessary to adjust the insulin to balance the dietary intake against the activity.

Effective nutrition education can be integrated into the meal service by means of informal group discussion.

PART II

The need for more information concerning the physical layout of a camp for diabetic children was recognized by the investigator as a result of experience gained in managing the food service in the camp described in Part I.

The objective of Part II of this study was to propose a physical layout for a food service that could be used for establishing other new camps.

DISCUSSION OF CHECK LIST

A check list was sent to the sixteen diabetic camps in the United States and the one in Canada as listed in Forecast (20). Sixteen of the camps acknowledged the letter and fifteen of the forms were filled out. The questions asked and the answers received were summarized as follows:

1. How many diabetic children attend camp?

(a) 65	(e) 12	(i) 19	(m) 58
(b) 80	(f) 100	(j) 34	(n) 168
(c) 196	(g) 115	(k) 50	(o) 18
(d) 24	(h) 61	(l) 50	

As indicated by the above figures the smallest number of children served at any camp was 12 and the largest number was 168.

2. Does the camp provide facilities for non-diabetic children as well as diabetic children?

Eight camps provided facilities for both diabetic and non-diabetic children; however, some reported that the non-diabetic children attended the camp at a different time. Facilities were provided for diabetic children only in seven camps.

3. Are weighed diets used?

Twelve camps reported that food served the children was weighed and in three camps food was measured.

4. Is the diabetic diet exchange list compiled by the American Diabetes Association and the American Dietetic Association used?

Ten of the camps used the diabetic diet exchange list in planning the children's diets although some reported that a modified form had been used. Four camps did not use the suggested diet exchange list, and one camp did not answer the question.

5. Are meals served cafeteria style? If not, please indicate type of service.

Three camps reported that meals were served cafeteria style, and nine camps did not use this type of service. Those in which family style service was used seated the children at tables according to the diets on which they had been placed, and the food was weighed or measured before being served.

6. What is the raw food cost allowance per child per day? The answers received were as follows:

(a)	$1.00	(f)	$2.15
(b)	0.93	(g)	1.05
(c)	1.70	(h)	1.70
(d)	1.24	(i)	35.00 per 2 weeks
(e)	1.61	(j)	0.26 per day

This question apparently was not interpreted correctly as it would be impossible to serve a diabetic diet for twenty-six cents per day unless the majority of the food had been donated. The camp that reported the raw food cost of $35.00 for two weeks may have been referring to the total camp costs instead of the raw food costs.

7. What is the approximate size of the kitchen?

The following kitchen sizes were listed in Table 12 by those answering the question:

Table 12. Kitchen measurements of camps in study.

Kitchen measurements	Number served	Square feet per person
1. 30' x 35'	65	16.0*
2. 13' x 25'	80	4.0
3. 11' x 34'	196	1.9*
4. 13' x 30'	24	16.0
5. 16' x 30'	100	4.8*
6. 30' x 50'	115	13.0*
7. 20' x 24'	34	14.0*
8. 15' x 25'	50	7.5*
9. 13' x 23'	50	6.0
10. 16' x 18'	58	4.9
11. 11' x 34'	168	2.2*

* Camps providing facilities for diabetic children only.

The standard suggested by West and Wood (24) for school lunchroom kitchens was one to one and one-half square feet per person and for residence hall kitchens three to four square feet per person. Camps used for diabetic children alone in which the allowance was high may not have been operating to the capacity planned. Camps providing facilities for both diabetic and non-diabetic children in which figures were high may have had a much larger attendance during the periods in which it was used for non-diabetics.

8. What is the approximate size of the dining room?

Dining room measurements as follows were listed in Table 13 by those answering the question:

Table 13. Dining room measurements of camps in study.

Dining room measurements	Number served	Square feet per person
1. 12' x 50'	65	9.2*
2. 23' x 59'	196	6.9*
3. 90' x 120'	115	93.9*
4. 56' x 28'	34	46.0*
5. 40' x 60'	50	48.0*
6. 26' x 75'	50	39.0
7. 15' x 32'	58	8.2
8. 23' x 59'	168	8.0

*Camps providing facilities for diabetic children only.

Accepted standards according to West and Wood (24) for school lunchroom dining rooms are 9 square feet per person and 15 square feet per person for residence hall dining rooms. Wide differences in figures reported may be accounted for by the fact

that camp dining rooms may also be used for recreation particularly when weather does not permit the children to play outside.

9. Check the equipment included in your food preparation unit. Restaurant-size range 13; Electric mixer 8; Electric vegetable peeler 3; Dishwashing machine 6.

This information indicates that camps were often poorly equipped which tended to make food preparation and service difficult.

10. If a dishwasher is not used, please describe equipment and the method used.

The methods of washing dishes by hand reported were:

(a) Hand dishwashing in tubs outside the kitchen was done by children who scraped refuse into large garbage cans, then washed dishes in water containing soap and rinsed dishes in water containing a sanitizing powder. Dishes were drained in racks and stacked in cupboards without drying; silverware was dried.

(b) Two units of three tubs were used for washing, sterilizing, and rinsing. Dishes and pans were washed in one unit, glasses and silverware in another unit.

(c) Dishes were washed by hand and rinsed in a sink of boiling water.

(d) Dishes were washed in hot suds, rinsed in scalding water, and further rinsed in highly chlorinated water.

(e) A three-compartment sink was used for dishwashing with an auxiliary heater used for sterilization.

Proud (13) recommended that the steps when dishes were washed by hand at camp be as follows:

Scrape dishes to remove food particles; rinse or pre-flush dishes; stack, separating the glasses, silver, and china. Soak in cold water those utensils that have held eggs, cheese, meats, or starchy foods. Soak utensils which have held fats and sugar or sirup in hot water.

Wash dishes in clean water with a temperature of 120 degrees Fahrenheit. Soap can be used, but a detergent that loosens dish soils more readily is easier to use in hard water. A dishwashing compound will wash clean whether or not it forms a suds. Wash glassware first, then silver and china.

Rinse dishes in clean, warm water.

Sanitize dishes and silver by one of the following methods:

Immerse dishes and silver in a sanitizing solution.

Immerse dishes and silver in clear water maintained at a temperature of from 170 to 180 degrees Fahrenheit.

Place dishes in draining racks. Allow dishes to air-dry if space is available; otherwise, wipe them with clean towels.

Store dishes in clean cupboards or cover them with clean towels.

Wash dishcloths and towels in clean, hot water with soap. Rinse thoroughly, sanitize by the same method used for dishes and hang where they will dry quickly.

11. What method is used in the disposal of garbage?

The following methods of garbage disposal were listed:

In nine of the camps the garbage was placed in metal garbage cans and hauled away daily.

Two of the camps arranged for the garbage to be hauled away

three times a week.

Garbage was dumped at the bear pits near one camp.

Another camp had a limed garbage pit in which the garbage was buried.

One camp disposed of the garbage in an incinerator.

Loper et al. (11) recommended that garbage cans with tight fitting lids be placed in a screened cage for storage of garbage until it could be hauled away. They further recommended that garbage cans should be emptied daily or at least every other day, and after the cans were emptied they should be thoroughly washed and sunned. A hose-bib faucet should be located at the rear of the building to facilitate washing.

12. What major difficulties have you encountered in the management of your camp food service?

Numerous problems were mentioned and they are listed in the order of frequency mentioned:

(a) Some camps had difficulty in keeping weighed portions of hot foods hot and cold foods cold without proper facilities.

(b) Due to the location of camps, food delivery in some cases was not dependable which made it difficult to maintain an adequate supply of meat, fresh fruits, and vegetables. Failure to deliver food at the proper time resulted in many last minute menu changes.

(c) Some camps found it difficult to obtain the services of a dietitian and staff for the short period during which the camps were operated.

(d) The education and orientation of kitchen personnel and

staff to the food requirements of the diabetic child was another problem.

(e) Cook-outs and overnight camping trips presented problems in menu planning for some camps.

(f) A few camps found it difficult to plan menus that pleased the children's appetites.

(g) Altitude cooking problems were encountered at one camp.

13. What recommendations regarding food service would you consider most beneficial to someone organizing a new camp for diabetic children?

Suggestions received were:

(a) Check water supply to assure its safety.

(b) Plan diets with a range in caloric value to meet the needs of the children of different ages.

(c) Suggest that one doctor be responsible for placing each child as he arrives at camp on the diet which will best meet his needs.

(d) Use the American Diabetes Association Exchange system for calculating and planning diets.

(e) Have a clear understanding with every doctor that the child in camp will be on a slightly different diet from that used at home and provide each doctor with a copy of the child's diet when the child leaves camp. This helps to prevent misunderstandings with the doctor and family.

(f) Have an understanding with the staff that they eat the same foods the children eat. If additional foods are eaten, they must be eaten at times when the children are not around.

(g) Make contact with reputable and dependable supply houses to assure prompt delivery of foods.

(h) Order extra canned fruits and vegetables to use when spoilage and non-delivery of fresh produce makes change in plans necessary.

(i) Purchase all water pack fruits and canned vegetables early enough in the spring to insure a large variety.

(j) Make sure that good and adequate refrigeration has been provided. Check temperature of refrigerators frequently to avoid spoilage of food.

(k) Use cafeteria type of food service which aids in teaching the child his dietary requirements.

(l) Employ a hospital dietitian and assistant dietitian.

(m) Hire adequately trained cooks, servers, and dishwashers.

(n) Plan for enough kitchen personnel so that overtime for employees will be unnecessary.

(o) Include a sharp freeze unit in the kitchen plans.

(p) Use plastic dishes for food service.

PROPOSED PHYSICAL LAYOUT FOR A DIABETIC CAMP

Loper et al. (11) stated that the camp buildings and their location were as important to the success of the camp as its program.

The following proposed layout was planned with the intention of assisting groups who were establishing new diabetic camps. The needs of 150 diabetic campers were considered when drawing

the proposed layout. In order that continuous operation during the camping period could be maintained, facilities were so planned that the camp could also be used for non-diabetics.

Dining Room and Recreation Room

The dining room was planned so that it could be used not only for food service, but also as a center for indoor group activity. The dining room measuring 30 feet by 75 feet provided seating capacity for 150 children and a square foot allowance of 15 per person. West and Wood (24) recommended 10 to 15 square feet per dining seat, with dining area adjacent to the kitchen.

Tables constructed with bench seats attached were chosen to facilitate clearing the area for inside group functions, to provide camp atmosphere, and to aid in keeping expenses low. The lift-up panels for the cafeteria counter were included to enable the dining room area to be shut off entirely from the kitchen unit when meal service was not in progress. They would also aid in eliminating kitchen noise. The fireplace at one end of the dining room was planned to provide heat on cold days and for the enjoyment of the campers.

Processing Area

Kitchen. West and Wood (24) stated that the approximate kitchen space allowance was usually one-fourth to one-third that

allotted to the dining room, exclusive of the space needed for activities such as receiving and storage of food, dishwashing, and employee facilities.

In the proposed plan a rectangular kitchen measuring 20 feet by 32 feet provided 640 square feet allowing 4.2 square feet per person.

Cook's Unit. The cook's unit was centralized to eliminate unnecessary steps. It was adjacent to the vegetable preparation unit, the pot and pan unit, the cafeteria counter, and the hand washing sink. A canopy covering the area of the range, ovens, and steamer was planned with one foot extension beyond the area of equipment. Equipment in the cook's unit consisted of a closed top range, open two-burner unit, a self-contained steam cooker, deck ovens, a mixer, and a hand sink.

Salad and Dessert Unit. The salad and dessert unit was planned adjacent to the cook's unit and the vegetable preparation in order to utilize the equipment in these two departments. The prepared salads and desserts would be placed on portable carts prior to the serving period and wheeled into the refrigerator until needed on the counter.

Vegetable Preparation Area

The vegetable preparation unit was located near the receiving area and in close proximity to the refrigerators, salad unit, and cook's unit. Two single sinks were planned, one sink for soaking vegetables and one for scrubbing with a drainboard on the

left. Other equipment in this area consisted of a vegetable peeler, work table, and garbage disposal. The disposal was placed here because the bulk of the garbage would be in this unit. Diabetics have been taught the necessity of eating all the food served to them. As a result, plate garbage would be kept to a minimum. Arrangement of equipment as shown in the plan would permit convenient routing of vegetables from storage, through preparation and to the units where the vegetable would be needed.

Cleaning and Disposal Area

Dishwashing Unit. The dishwashing unit was separated from the dining room by lift-up panels. The unit was equipped with a soiled dish counter for receiving and scraping of dishes, a pre-rinse sink, a dish washer, a clean dish counter with sufficient space for the dishes to drain dry, and a portable dish truck on which dishes could be transported for storage under the cafeteria counter. Garbage collected in garbage cans under the scraping hole in the scraping counter would be carried to the disposal in the vegetable preparation unit.

Pot and Pan Unit. The L-shaped pot and pan unit was equipped with a three-compartment sink with drainboards at each end and a garbage strainer, and a portable pot and pan rack for storage of clean, dry utensils. Sufficient aisle space was planned between this area and other units to allow easy movement of the workers.

Storage Area

Dry Storage Unit. The dry storage unit was placed adjacent to the kitchen. In the proposed plan portable shelves were planned that would be open from both sides and adjustable for storage of canned foods. A portable rack of three sections was provided for storage of sugar, flour, and potatoes.

Refrigeration Unit. The refrigerator was planned so that it was in direct line with the receiving area. This was equipped with portable shelves with openings on both sides. Space was allowed for storage of carts from the kitchen containing salads and desserts.

Receiving Area

A receiving platform at the rear of the building was provided for deliveries of food. Supplies would be taken through the back door of the kitchen to the storeroom, refrigerator, or directly to the food preparation units with a minimum of cross traffic.

Cafeteria Counter

The cafeteria counter consisted of a table for silverware and trays, a hot food counter, cold food counter, and a water dispenser. Enclosed shelves under all of this equipment except the water dispenser were planned for storage of dishes.

Other Areas

The screened porch adjoining the kitchen had one section enclosed for storage of trash and a small, cleaning closet for storage of daily cleaning supplies such as mops, mop buckets, and brooms.

The screened porch at the entrance of the building was planned to provide protection from weather for the children coming to meals. Direct entrance was provided from the porch to the doctor's office and to the dining room.

Restrooms for both boys and girls were located near the doctor's office and the front of the building which makes them easily accessible to campers as well as kitchen personnel.

The doctor's office provided space for interviews with parents when the children were brought to camp and space for emergency care of children.

FIXED EQUIPMENT LIST

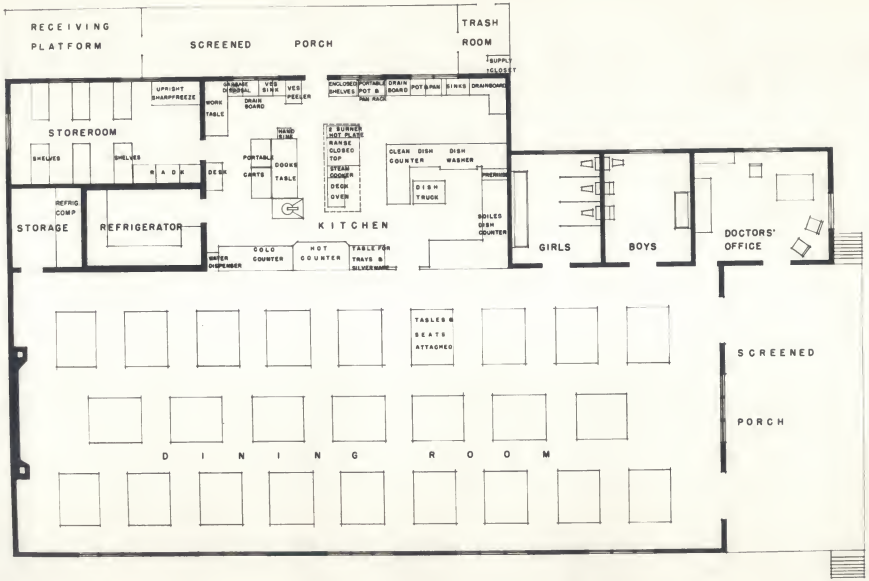
Cook's Unit	Approximate space requirements
Hand Sink	15" x 18"
Table	2½'x 6'
Mixer, 60-30 quart	2¼'x 3½'
Range, closed top	3' x 3½'
Open Burner Unit, 2 burners	1½'x 3½'
Steam Cooker	18" x 25"
Deck Ovens	22⅔"x 36"

Salad and Dessert Unit	Approximate space requirements
Carts, portable, 2	2½' x 3½'
Vegetable Preparation Unit	
Sink, 2-compartment, 2 drainboards	2' x 45"
Peeler, potato, 15# capacity	21" x 33"
Garbage disposal	19" x 24"
Table	2½' x 6'
Pot and Pan Unit	
Rack, portable	2' x 3'
Sink, 3-compartment, 2 drainboards with garbage strainer	24" x 78"
Dishwashing Unit	
Dishwashing Unit	30" x 4'
Truck, clean dish	2½' x 3'7"
Sink, pre-rinse	18" x 30"
Soiled Dish Counter	
Scraping counter	4½' x 8¼'
Racking area	30" x 4½'
Pre-rinse	18" x 30"
Pre-rinse area	30" x 3'
Clean dish area	30" x 6½'
Cafeteria Counter	
Table	30" x 48"
Hot food counter	2'9" x 6'
Cold food counter	2'6" x 7'6"
Water dispenser	20" x 24"

EXPLANATION OF PLATE I

Proposed physical layout for the food service of a diabetic camp planned to accommodate 150 children.

PLATE I


RECEIVING PLATFORM
SCREENED PORCH
TRASH ROOM
SUPPLY CLOSET
UPRIGHT SHARPFREEZE
GARBAGE DISPOSAL
VEG SINK
VEG FREEZER
WORK TABLE
DRAIN BOARD
ENCLOSED SHELVES
PORTABLE POT & PAN RACK
DRAIN BOARD
POT SINK
SINKS
DRAINBOARD
STOREROOM
SHELVES
SHELVES
R A D
DESK
HAND SINK
PORTABLE CARTS
COOKS TABLE
2 BURNER HOT PLATE
RANGE CLOSED TOP
STEAM COOKER
DEEP OVEN
CLEAN DISH COUNTER
DISH WASHER
PREWASH
DISH TRUCK
BOILER OVER COUNTER
REFRIG COMP
STORAGE
REFRIGERATOR
KITCHEN
WATER DISPENSER
COLD COUNTER
HOT COUNTER
TABLE FOR TRAYS & SILVER WARE
GIRLS
BOYS
DOCTORS' OFFICE
TABLES & SEATS ATTACHED
SCREENED PORCH
D I N I N G R O O M

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APPENDIX

Table 1. Food value charts used in calculation of diet outline.

	Percentage composition		
	Protein	Fat	Carbo-hydrate
Milk	3	4	5
Egg	12	10	-
Meat (average)	17	13	-
Cereal	8	-	86
Bread	10	-	50
Butter	-	85	-
Bacon	14	27	-
Fruit (may vary between)	-	-	3 and 18
Vegetable (may vary between)	-	-	3 and 21
Cream	2	19	4
Graham Cracker	1	-	70

Table 2. Meats allowed on diabetic diet.

Meats allowed		
Beef	Fresh Fish	Kidney
Lamb	Tuna	Cooked Sausage
Pork	Salmon	Sweetbreads
Veal	Sardines	Braunsweiger
Bologna	Smoked Herring	Liver
Cheese	Egg (1 egg equal to 1 oz. or 30 gms meat)	Tongue
Chicken	Frankfurter	Rabbit
Duck	Ham	Peanut butter (2 Tbsp. in place of 30 gms meat and 9 gms CHO from fruits & veg.)
Turkey	Heart	

Table 3. Fruits and vegetable classification.

Fresh fruits allowed			
3%	6%	9%	9% (cont.)
Rhubarb	Cantaloupe	Gooseberries	Lemon Juice
Tomatoes	Watermelon	Grapefruit	Limes
		Grapefruit Juice	Lime Juice
		Honey Dew Melon	Oranges
		Lemons	Strawberries
12%	15%	18%	21%
Apple Juice	Apples	Figs	Banana
Apricots	Blueberries	Grape Juice (unsweetened)	
Blackberries	Cherries, Bing		
Cranberries	Cherries, red sour pitted		
Loganberries	Grapes, Concord		
Orange Juice	Grapes, Seedless		
Peaches	Mulberries		
Pineapple Juice	Nectarines		
Plums	Pears		
Tangerines	Pineapple		
	Raspberries, red or black		

Water packed fruits allowed		
6%	9%	12%
Apricots	Applesauce	Figs
Blackberries	Blueberries	Pineapple
Fruit Cocktail	Cherries, red sour pitted	
Peaches	Cherries, Royal Anne	
Pears	Raspberries, red or black	

Vegetables allowed			
3%	6%	9%	15%
Asparagus	Beans, string	Beets	Parsnips
Cabbage	Beet Greens	Brussel Sprouts	Peas
Cauliflower	Broccoli	Carrots	Sweet Corn
Chard	Collards	Greens, Dandelion	
Chinese Cabbage	Eggplant	Onions	
Mustard Greens	Green Peppers	Pumpkin	
Sauerkraut	Kale	Rutabagas	
Tomatoes	Kohlrabi	Winter Squash	
Tomato Juice	Turnips		
Spinach	Okra		

Table 3. (concl.)

Vegetables allowed		
21%	30%	75%
White Potatoes	Sweet Potato	Popped Corn
Limabeans		
Navy Beans, cooked		
Kidney Beans, "		
Blackeyed peas"		
Lentils, "		
Yams		

FOOD SERVICE IN A DIABETIC CAMP

by

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OF AGRICULTURE AND APPLIED SCIENCE

1954

INTRODUCTION

Camps for normal children have been well established in all parts of the United States for many years. Although physicians long have recognized the need for camps for diabetic children, the first such camping facilities were provided in 1925. Interest and enthusiasm for diabetic camps have increased since that time to such an extent that in 1953 there were 16 camps in operation in the United States and one in Canada which provided facilities for approximately 2000 children. It has been estimated that in 1947 there were 40,800 diabetic children in this country. If all diabetic children are to be given the advantages of camp life, there will be need to establish many more similar camps throughout the United States.

The present study was based on the investigator's experience as a dietitian in planning and operating the food service for the diabetic children in a camp in the St. Louis area.

PART I

The objectives of this study were to aid in the adequate control of the children's diabetes at camp by providing food according to the doctor's prescription; to plan and supervise the preparation and service of the food for the diabetic children and the staff; and to provide nutrition education that would assist the diabetic child in analyzing and solving some of his nutritional problems.

The camp medical director decided that four diets consisting of 2000, 2400, 2800, and 3200 calories fulfilled the caloric requirements of the children at camp. The Wetzel Grid was used in determining the caloric needs of each child, and additional calories were added to cover their increased activity. Fifteen percent of the total calories came from Protein, 50 percent from Fat, and 30 percent from Carbohydrate. Fifty-eight percent of the Protein in grams, 10 percent of the Fat, and 100 percent of the Carbohydrate were added to obtain the Total Available Glucose. Thirty percent of the Total Available Glucose was received at breakfast, 30 percent at lunch, 30 percent at dinner, and 10 percent at bedtime. The diet outline was so constructed that all children received the same sized portion of meat, fruits, and vegetables. The difference in calories was made in the size of portions of bread, butter, and milk served.

The nutrition education material was incorporated during the service of the meal at which time the child faced his problems. This method enabled the child to apply the knowledge gained and have a broader understanding of his problems. In order for the nutrition education to be effective, variations in age, intelligence, education, and family backgrounds were recognized. Problems were handled when they arose and instruction was adjusted to the individual as well as to the situation.

PART II

The 17 diabetic children were housed in a camp with 250 day

campers and a few children who lived in the camp for the entire summer. The family-sized kitchen was used for the preparation of the food for the entire camp, but many of the foods served the regular campers could not be given to children with diabetes and food for this group had to be prepared separately.

The need for more information concerning the physical layout of a camp for diabetic children was recognized by the investigator as a result of experience gained in managing this one food service for diabetic children. The objective of Part II was to propose a physical plan for a food service that could be used for establishing other new camps. A short check list was sent to the 16 known organized diabetic camps. All camp representatives acknowledged the letter and 15 of the forms were filled out. Based on the summary of the check list and the investigator's observations, a plan was drawn for a proposed physical layout for a diabetic camp planned to accommodate 150 children.

SUMMARY

In a diabetic camp situation such as described in this study it was possible to achieve adequate diabetic control by the use of standardized diets on four caloric levels. In this regimen it was necessary to adjust the insulin to balance the dietary intake against the activity.

Effective nutrition education can be integrated into the meal service by means of informal group discussion.

A proposed layout for the food service of a camp accommodating 150 children was planned.