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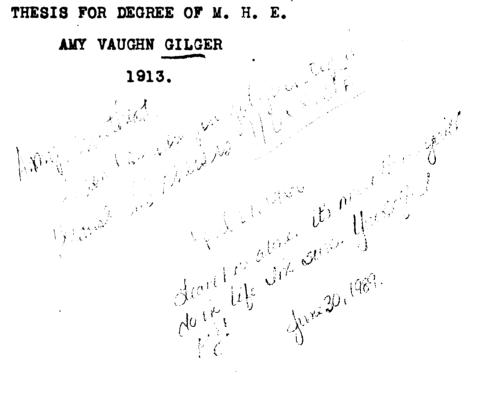
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## FEEDING OF CHILDREN

# THESIS FOR DEGREE OF M. H. E.



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THESIS

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#### THE FEEDING OF CHILDREN.

One of the important questions which confronts the mother and one to which she must give time and consideration is the proper nourishing of her children. Men and women reaching the age of forty or fifty years find that the foundations of disease have already been laid in their youth as a result of ignorance, neglect or violation of nature's inexorable laws. Every child born of ordinarily healthy parents given proper nourishment, plenty of outdoor exercise and sufficient sleep ought to have a strong healthy body. All the organs and tissues of the body, - the blood and muscles, bone and tendon brain and nerve are built from the nutritive ingredients of food. Every motion of the body, every exercise of feeling and thought consumes material of the body and it must be replaced by food. Proper nourishment means food which when taken into the body builds tissue or yields energy. The value of food for nutriment depends mainly upon its composition and digestibility.

Experiments in the analysis of food and their value to the body are carried on in Washington, D.C. under the auspices of the Department of Agriculture. Anyone can obtain the results of these experiments by asking for them through their State Representative. Many valuable suggestions can be obtained by mothers which will help

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them in the proper choice of foods for their table. It has been found by analysis that the chemical substances of the body are similar to the chemical substances found in food.

The most important kinds of compounds in the body and in foods are protein, fats, carbohydrates, mineral matter and water. The functions of these compounds in the body are to build and repair the various tissues of the body and to supply it with heat and energy. Protein includes the principal nitrogenous compounds. It is found in the lean and gristle of meat, the whites of eggs, the gluten of wheat, the casein of milk, etc. In the body it is used to make muscle and tendon cartilage, bone, skin and corpuscles of the blood. Fats occur chiefly in animal foods as meat, fish, butter, etc. They are also abundant in some vegetable products as in the cereals and nuts. Carbohydrates include such compounds as starch, different kinds of sugar and the fiber of plants which is called cellulose. Meats contains almost no carbohydrates and eggs none whatever. The fats and the carbohydrates are the chief fuel ingredients of the body. Sugar and starch are burned in the body to yield heat and energy. The mineral substances are chiefly compounds of lime, which are found in the bones, teeth and tissues and in solution in the various liquids. Mineral matter is especially

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necessary to the young to help build the bones. If compounds of lime are not in sufficient quantities they are withdrawn from some of the tissues, particularly the bones and muscles, to supply the more active parts. It is therefore of greatest importance during such a period as rapid growing childhood to have foods which will give the bones proper nourishment. If this is not furnished the bones are frequently so poorly built that they bend under the weight of the child and he becomes bow-legged and may even have a crooked back. Many mothers do not realize that a child may be fat and yet be weak because he is being deprived of necessary food constitu-The excess of fat is really a great disadvantage ents. because it over burdens weak bones. If the vitality of the bones is weakened they seem predisposed to disease. Water is one of the most abundant of the compounds. It forms over sixty percent of the weight of the body. It is a component part of all of the tissues. Since it cannot be burned it yields no energy to the body.

The amount of food sufficient for the body's need varies with age and activity. The aged person whose activity is slight and whose tissues are changing but slowly needs comparatively little food. The active growing child not only requires food to produce energy but to build tissue. He requires more food in proportion to his weight than an adult. It is hard to prescribe rules for the

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amount of food to be eaten at once. Hunger and taste are usually reliable guides when plain food is eaten slowly.

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The idea exists that to eat a good deal of food one is certain to be rewarded with good health and vigor. But it should be remembered that any food taken in excess of the actual requirements of the body is a source of weakness and not strength. No food should be allowed between meals. It interferes with the rest which the stomach needs. The child's request for it is usually a matter of habit. In such cases give a glass of water off fruit juice. It is a mistake to allow children to be constantly nibbling at crackers. This prevents the proper recurrence of appetite.

Food must go through a series of changes mechanical and chemical, before it can build tissue or yield heat and energy to the body. This process is called digestion. It is necessary to know something about where and how different foods are digested in order to appreciate the importance in the selection of foods.

The first step in digestion takes place in the mouth. Food in the mouth causes the salivary glands to give out a large amount of saliva. The saliva contains a ferment which acts on the starch in foods changing it into sugar. The chewing of food or mastication is a very impor-

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tant step in digestion. Many of the ills of childhood would be avoided if mothers would insist on the children thoroughly chewing the food. Mastication is important not only because it mixes the food with saliva thus giving the ptyalin, or the ferment, a chance to act on the starch but also because imperfectly chewed food acts as an irritant to the stomach. The food passes from the mouth through the gullet into the stomach. The digestive liquid here is called gastric juice. A sort of churning process takes place in the stomach mixing the food with the gastric juice. There are two ferments in the gastric juice, pepsin and rennet. Pepsin acts upon the proteid matter converting it finally into peptone which passes easily into the blood vessels of the stomach. Rennet acts upon milk separating it into curds and whey. Gastric juice has no action at all upon starches or fats, except that it dissolves the cell walls and thus liberates the fat to be acted on in the intestines. Cane sugar is slowly altered in the stomach into dextrose and milk sugar partly changed into lactic acid. During gastric digestion all soluable matters, water, soluable salts and peptones are being absorbed by the stomach walls and the remaining proteids with all the fats and starches and the great bulk of the sugars pass through the pyloric valve into the bowel.

Many people think that the stomach is the chief

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seat of digestion but this is not true, the stomach is merely a preparatory organ, adapting food for treatment in the real digestive organ, the small intestine. Two important digestive juices flow into the upper part of the intestine, the bile from the liver and the pancreatic juice from the pancreas. The intestine has a slow wave like motion by which it contents is slowly forced down at the rate of about one half inch per minute, so that it takes three hours for the food to traverse the small intestine. Digestion in the small intestine is accomplished by the bile, the pancreatic juice and the intestinal juice. The digestion of starch which had been begun by the saliva is now continued by the action of the ferment in the pancreatic juice. All of the starchy material of food is now changed into maltose. This maltose is then converted by the intestinal juice into dextrose in which condition it finds its way into the blood. The proteids which have not been digested in the stomach are now converted by a ferment in the pancreatic juice to peptone. By the action of the bile fat is now changed so that it can be readily absorbed through the walls of the intestine.

After the food has been digested in the small intestine there still remains a certain amount of undigested material. This consists of the cellulose from vegetables and grains, connective tissue from meats and any matter which has escaped the action of the various digestive

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fluids. This passes from the small into the large intestine. Here a certain amount of digestion and absorption, especially of water still goes on. As a result this mass of undigested material becomes firmer and dryer and finally ejected from the body.

In babies the ferments in the digestive juices are not present so that he cannot digest solid foods. When the baby begins to be active and to require other food than milk his teeth push their way through the soft gums. At the age of two years he should have his first set of teeth. The digestive juices are now present to a certain extent and he is now prepared to take some solid food.

When the mucous surface of the bowel is irritated by unsuitable food the intestinal glands are over stimulated and the result is laxity of the bowels which may pass into diarrhea and if the irritation be continued the glands may become exhausted and then constipation is the result. Under ordinary circumstances food contains enough indigestible matter to induce a moderate flow of intestinal juices and in this way the bowels are naturally kept open. Diarrhea is this due to an excess of fluid in the bowels and constipation is due to an insufficient amount of fluid.

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This fact gives a clue to the dietic treatment of this disorder. It is usual in such cases to begin giving a dose of castor oil. The oil sweeps out of the bowel any irritating matter which has been exciting the glands. When this has been accomplished the treatment is continued by giving the patient food as bland as possible. Castor oil is the only medicine I ever give to my children without the advice of a physician. I find that what we call colds are nearly always gotten rid of by a good cathartic. I have very little sickness with my children but I am very careful to know that they have a regular movement of the bowels each day.

Wilk is essentially the diet of the first year of an infant and through childhood is a valuable source of all the food principles. Wilk is the only single article of food that contains all the elements necessary to build up the body. For that reason it is often called a perfect food. This is true however only for the very young as the substances required for nourishing the adult are not present in the right proportion. Wilk surpasses many other foods in real nourishing value not only because it contains more nutrition but because it is almost completely digested and absorbed whereas from one tenth to one fourth of some vegetables consumed remain un-

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digested. Skimmed milk contains most of the casein, albumen and milk sugar and is very nutritious. While milk is deficient in the proper amount of carbohydrates this can be supplied by bread. Bread and milk makes a very excellent meal for children.

Fresh butter is the most digestible form of fat and children who cannot eat fat may obtain their necessary amount of this principle more easily and agreeably in this form.

Eggs are another important food. They consist of the white which is mostly albumen and the yolk which contains a relatively large amount of fat together with proteid and other substances. As a complete food for an adult eggs lack carbohydrate material. Eggs are valuable as food whether eaten raw, slightly cooked or thoroughly boiled. When boiled for a minute or two the albumen of eggs is partly coagulated to a soft jelly-like substance. Boiling for a few minutes coagulates all the albumen to an elastic mass which is not easily mixed with the digestive juices. If the egg is boiled for ten minutes it is easily chewed fine and consequently not hard to digest. When a raw egg is switched with milk it may be digested more easily than a cooked one. Fried eggs are made tough by the hot grease and should not be given to children.

Meat is a food which is very rich in proteid

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material and contains valuable mineral matter. As a food good beef ranks next to milk and eggs. Veal is much less nutritious than beef although the fibers of the veal are softer thus rendering it easier of digestion. Pork more than any other animal food is responsible for the introduction of parasites into the human body. Of all meats pork is the most difficult to digest. For these two reasons it should not be given to children. The white meat of a well fed young chicken is the most digestible of all meats.

Vegetable food as well as animal food contains approximately all the principles but in very different proportions. They are as a rule poor in fat but rich in carbohydrates. Vegetable proteid matter is less digestible and less easy to assimilate than animal proteid. The great bulk of carbohydrates is found in vegetable food and is represented by starch, sugar and cellulose. All vegetables contain organic salts which are essential to health. Although the cellulose of vegetables cannot be digested it is valuable in that it furnishes considerable residue in the intestines thus causing a regular onward movement of the contents of the bowel.

The leading vegetables used as food are the cereals and legumes. Bread is the most common food made from grain. Oats have more nitrogenous matter and fat than any of the other cereals. Rice is much less nutri-

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tions being deficient in everything but starch but it contains this in a very digestible form almost without any cellulose. Certain vegetables as white potates and tapioca are like the cereals in that they are rich in starch. Peas and beans are rich in proteid material.

We have the various preparations of cereals on the market, known as breakfast foods. They are as a class nutritious foods. Unless something is added in the manufacture, all brands however scientifically named have the same composition as the cereals from which they are made. It is a question whether any of the "predigested" ones have any more starch than any thoroughly cooked cereal.

Ripe and wholesome fruit forms a valuable addition to the diet of children. The ripe fruits are rich in the choicest of all sugar, levulose or fruit sugar. Levulose represents starch in a state of almost complete digestion ready for rapid absorption by the body. Fruits are invaluable for the fruit sugar, the acid and the water which they contain. The apple is one of the most valuable of fruits. Children who eat freely of good ripe apples, either raw or baked, with the skins removed, are usually free from constipation. Scraped apples are better for young children especially if mastication is imperfect.

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Candy must have some consideration in the diet of children. No doubt their relish for sweets has a physiological basis. If the candy is of good grade children should be allowed to have some of it. Most candies are made from glucose and this undergoes fermentation more readily in the stomach than cane sugar. Often children who eat much candy especially between meals lose their appetite for the plain wholesome food.

Tea and coffee are not foods but stimulants. They are said to effect the nervous system. Do not let children form the habit of drinking them.

Scrupulous cleanliness should always be observed in keeping, handling and serving food. It behooves mothers to know something about the condition of stores from which they obtain their food. Too often we see in stores crackers and cookies exposed to air and flies and yet mothers often order and get these same cookies. Flies are carriers of deadly bacteria and should not be tolerated near food.

My children are aged two and half years, four and a half, and nine. They have plain but wholesome food. Often my entire time at the table is taken up with them. I am constantly trying to have them form the habits of eating slowly and thoroughly chewing their food. They have now reached the age where they can eat

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most any plain foods eaten by adults, providing that they do not eat too much and that they thoroughly chew the food. I have already begun to try to impress on them the value of a strong healthy body.

Their three meals are served regularly. Their breakfast nearly always consists of fruit, breakfast food and toast. Breakfast foods which need cooking are always thoroughly cooked. By having different kinds on hand to serve they have never seemed to tire of them. The nutty flavor of grains should not be concealed by the addition of too much sugar. Toast is suitable for children for nearly all the starch in the bread has been altered to dextrin. Their dinner comes at noon. This consists of a clear soup, one or two vegetables, meal, fish or eggs, bread and butter and a light dessert. For their supper they have sometimes a cream soup, sandwiches, milk and sauce. I find that children sleep better at night after a light meal.

From Dr. G. W. Fitz's late book on Physiology and Hygiene I obtained this table showing the amount of food principles needed in the diet for a day.

Children $1\frac{1}{2}$ to 6 years. 6 15 *	Proteids, Gms. 55 75	Fats, Gms. 40 43	Carbohydrates Gms. 200 325	,Fuel Value Calories. 1423 2048
The unit is the calori	, the amount	of heat	t which would	
raise the temperature (	of 1 kilogram	of wate	er 1 <sup>0</sup> C.	

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In conclusion I will add the following menus which I have used for my children during the month of April. In the choice of foods I have kept in mind the food principles needed in the daily diet of children.

## TUESDAY

## BREAKFAST

#### DINNER

#### SUPPER

Oatmeal with chopped nuts,	Clear Soup-Wafers, Broiled Lamp Chops,	Corn Cake, Strawberry jam,
Sugar, Milk,	Creamed Potatoes,	Milk.
Toast.	Whole Wheat Bread,	
	Jelly.	

#### WEDNESDAY

## BREAKFAST

#### DINNER

## SUPPER

Oranges,	Steamed Eggs,	Cream of Celery
Wheatlet,	Mashed Potatoes,	Soup,
Milk, Sugar,	Stewed Onions,	Peanut Butter
Toast.	Bread Butter,	Sandwiches,
	Cream of Tapioca.	Stewed Figs.

## THURSDAY

## BREAKFAST

## DINNER

## SUPPER

Grape Fruit, Shredded Wheat Biscuit, Sugar, Milk, Toast.	Irish Stew, Brown Bread-Butter, Cup Custard.	Poached Egg, Toast, Nilk, Canned Pine- apple, Cookies.
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## FRIDAY

## BREAKFAST

Oatmeal-Bananas, Toast. DINNER

#### SUPPER

Clear Soup, Baked Fish-Boiled Potatoes, Graham Bread-Butter, Rice Pudding. Milk Toast, Stewed Prunes, Graham Wafers.

## SATURDAY

## BREAKFAST

## DINNER

## SUPPER

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Oranges,	Flank Steak,	Cream of Pota-
Cream of Wheat,	Macaroni,-Celery,	to Soup,
Sugar, Milk,	Butter, Whole wheat	Croutons,
Toast.	Bread,	Nut Sandwiches.
	Prune Whip.	

#### SUNDAY

#### BREAKFAST

## DINNER

## SUPPER

Bread and Milk.

Stewed Figs, Grape nuts, Sugar - Cream, Toast. Clear Soup, Roast Chicken, Mashed Potatoes, Stewed Corn, Gravy - Celery.

## MONDAY

## BREAKFAST

#### DI NNER

## SUPPER

Oranges, Cornmeal Mush, Sugar, Milk, Toast.	Baked Potatoes, Butter, Bread Jelly, Apple Tapioca.	Cream of Corn Soup, Wafers, Baking Powder
		Biscuits, Jelly.

## TUESDAY

## BREAKFAST

## DINNER

## **SUPPER**

Shredded Wheat Biscuit, Milk, Sugar, Toast.

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Clear Soup, Escalloped Potatoes, Bacon -Brown Bread, Carmel Custard.

## Wilk Toast, Steamed Rice, Cream, Sugar,

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## WEDNESDAY

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## BREAKFAST

## DINNER

## SUPPER

Oranges,	Pot Roast,	Corn Meal Mush,
Quaker Oats,	Boiled Potatoes,	Peanut Butter
Milk, Sugar,	Bread, Butter,	Sandwiches,
Toast.	Rice Pudding.	Milk.

## THURSDAY

#### BREAKFAST

## DINNER

## SUPPER

Oranges,	Clear Soup,	Cream Tomato
Cream of Wheat,	Hash,	Soup,
Milk, Sugar,	Whole Wheat bread,	Croutons,
Toast.	Cream of Sago	Corn Meal Bread,
	Pudding.	Milk.

#### FRIDAY.

#### BREAKFAST

## DINNER

## SUPPER

Baked Apples, Wheatlet - Toast, Wilk, Sugar.	Broiled White Fish, Riced Potatoes-Peas, Graham Bread, Bread Pudding, Hard Sauce.	Eggs on Toast, Canned Peaches, Cookies, Milk.
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## SATURDAY

## BREAKFAST

Oranges, Shredded Wheat Biscuit, Nilk, Sugar,

Toast.

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DINNER

## SUPPER

Boiled Ham, Mashed Potatoes, Asparagus, Brown Bread-Butter, Cream of Tapioca. Corn Meal Mush, Milk, Sugar, Egg Sandwiches.

## SUNDAY

#### BREAKFAST

## DINNER

## SUPPER

Grape Fruit, Roast Beef, Bread and Milk. Cream of Wheat, Sweet Potatoes, Sugar, Milk, Jelly, Toast. Bread, Butter, Ice Cream.

#### MONDAY

#### BREAKFAST

## DINNER

## SUPPER

Stewed Figs,	Creamed Beef on	Cream of Celery
Oatmeal,	Toast,	Soup,
Cream, Sugar,	Baked Potatoes,	Crontons,
Toast.	Whole Wheat Bread,	Corn Cake,
	Jello.	Milk.

## TUESDAY

## BREAKFAST

#### DINNER

## SUPPER

Oranges,	Broiled Steak,	Soft Boiled Eggs,
Cracked Wheat,	Creamed Potatoes,	Bread and Butter
Milk, Sugar,	Graham Bread, Jelly,	Sandwiches,
Toast.	Cup Custard.	Nilk.

## WEDNESDAY

## BREAKFAST

Oranges, Oatmeal,Toast, Sugar, Wilk. Clear Soup, Hash, Macaroni,Brown Bread, Prune Whip.

DINNER

## SUPPER

Baking Powder Biscuits, Maple Syrup, Milk.

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## THURSDAY

## BREAKFAST

# DINNER

## SUPPER

Baked Apple,	Mutton Broth,	Steamed Eggs,
Cream of Wheat,	Wafers,	Bread, Butter,
Milk, Sugar, Toast.	Scalloped Potatoes,	Canned Pine-
Toast.	Bacon, Bread,	apple ,
	Rhubarb Sauce.	Cookies.

# FRIDAY

## BREAKFAST

#### DINNER

## SUPPER

Oranges,	Baked Fish,	Cream of Corn
Oatmeal-Sugar,	Riced Potatoes,	Soup,
Milk, Toast.	String Beans, Caramel Custard.	Wafers, Sand- wiches, Prunes without
		skins.

## SATURDAY

#### BREAKFAST

## DINNER

#### SUPPER

Shredded Wheat Biscuit,	Broiled Lamp Chops,	Corn Cake,
Sliced Bananas,	Baked Potatoes,	Canned Peaches,
Wilk, Šugar, Toast.	Brown Bread, Rhubarb Sauce.	Milk.

# SUNDAY

## BREAKFAST

## DINNER

#### SUPPER

Oatmeal with dates, Sugar, Milk, Roast Chicken, Mashed Potatoes, Asparagus on Toast, Strawberry Short Bread and Milk. Sugar, Toast. Cake.

## MONDAY

## BREAKFAST

## DINNER

#### SUPPER

Oranges,	Cream Chicken,	Soft Boil	ed Eggs,
Oatmeal,	Baked Potatoes,	Toast,	Milk,
Milk, Sugar,	Rhubarb Sauce,	Canned Pi	neapple.
Toast.	Brown Bread-Butter.		

#### TUESDAY

#### BREAKFAST

## · DINNER

## SUPPER

Stewed Figs,	Irish Stew,	Nut Sandwiches,
Wheatlet, Milk,	Bread, Butter,	Nilk,
Sugar, Toast.	Canned Plums.	Rice with Cream.

## WEDNESDAY

## BREAKFAST

Cream - Sugar,

Toast.

Grape Fruit, Puffed Wheat,

## DINNER

Bread,

Broiled Steak,

Rhubarb Sauce,

Bread Pudding.

Mashed Potatoes,

## SUPPER

Cream of Potato Soup, Crostons, Peanut Butter Sandwiches, Canned Cherries.

## THURSDAY

## BREAKFAST

## DINNER

#### SUPPER

Oranges, Oatmeal, Milk, Toast.

Clear Soup, Hash, Brown Bread, Butter, Strawberry Short Cake, Corn Meal Mush, Milk, Prunes.

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## FRIDAY

#### BREAKFAST

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# DINNER

#### SUPPER

Shredded Wheat Biscuit, with sliced bananas,	Boiled Fish, Baked Potato,	Egg on Toast, Nilk,
Milk, Sugar,	Canned Peas,	Bread - Jelly.
Toast.	Rhubarb Sauce,	
	Brown Bread-Butter.	

#### SATURDAY

#### BREAKFAST

## DINNER

## SUPPER

Oranges,	Clear Soup,	Corn Bread,
Cream of Wheat,	Flank Steak,	Strawberry jam.
Sugar, Milk,	Creamed Potatoes,	Milk.
Toast.	Asparagus,	
	Prune Whip.	

## SUNDAY

#### BREAKFAST

## DINNER

## SUPPER

Bread and Milk.

Strawberries, Oatmeal, Milk, Toast.	Leg of Lamb, Mashed Potatoes, String Beans, Bread Butter	Bre
	Bread, Butter, Ice Cream.	

## MONDAY

## BREAKFAST

## DINNER

Cracked Wheat, Milk, Toast. Clear Soup, Cold Sliced Lamb, Baked Potatoes, Jelly, Rhubarb Sauce.

## SUPPER

Soft Boiled Eggs, Graham Bread, Milk, Prune Whip.

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## TUESDAY

## BREAKFAST

# DINNER

## **SUPPER**

Quaker Oats with dates,	Clear Soup, Hamburg Steak,	<b>As</b> paragus on Toast,
Milk, Sugar,	Creamed Potatoes,	Corn Čake,
Toast.	Bread,	Milk.
	Corn Starch Pudding.	

## WEDNESDAY

## BREAKFAST

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## DINNER

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# SUPPER

Oranges, Cream of Wheat,	Broiled Lamp Chops, Scalloped Potatoes,	Cream of Corn Soup.
Sugar and Wilk,	Rhubarb Sauce,	Croutons,
Toast.	Cup Custard.	Nut Sandwiches, Milk.

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