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# A Primer for Diabetic Patients

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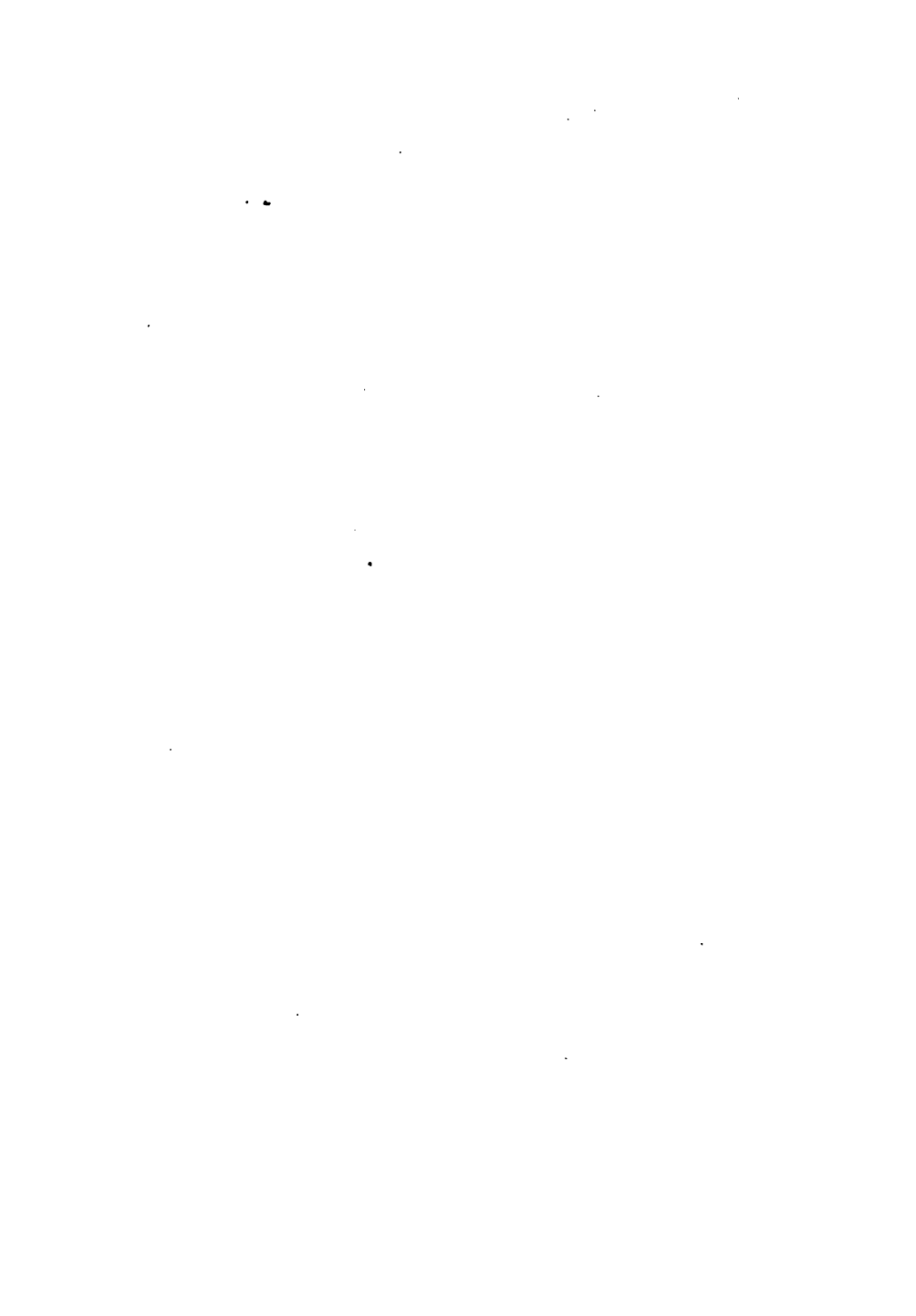
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PLATE I



Urine  
without  
sugar

Urine with trace of sugar

Urine with  
2 per cent.  
sugar

THE BENEDICT TEST FOR SUGAR IN THE URINE.

*Each tube contains 5 c.c. of Benedict's reagent and 8 drops of urine. The tubes have been heated for five minutes in a boiling water-bath and allowed to cool (see page 18).*

**A Primer**  
*for*  
**Diabetic Patients**

A Brief Outline of the Principles of  
Diabetic Treatment, Sample Menus  
Recipes and Food Tables

By

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The Mayo Clinic

Philadelphia and London

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## PREFACE

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THE need for a brief outline of the principles underlying the dietary treatment of diabetes was felt by us in the daily instruction of patients in the matter of their diets and hygiene. Dr. Elliott P. Joslin's "Diabetic Manual" has been a great help, but we desired something more like a primer to place in the hands of the patients. For this reason an outline was prepared and mimeographed; copies of this were used for several months, when the demand for them made it necessary to publish the outline in the present form.

We entirely agree with Dr. Joslin that the education of the patient is essential to successful treatment. It may be true that an occasional nervous person is hurt by such procedure, but those who are benefited vastly outnumber those who have been harmed. We can name only 2 of more than 100 patients treated on the diabetic service of the Mayo Clinic during the past year who might have benefited more had they been left in ignorance of the nature of their condition.

MAYO CLINIC,  
ROCHESTER, MINN.



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# A Primer for Diabetic Patients

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## SECTION I

### THE PURPOSE OF THE DIET

DIABETES is a disease which is manifested by the excretion of sugar in the urine. This sugar comes from foods which the patient eats, but which his body, owing to the disease, is unable to utilize. It is normal for the body to manufacture sugar from many foods. This sugar is the chief source of energy in the healthy man, providing the muscles with the fuel they must have in order to work. The diabetic patient who is unable to make use of this fuel after he has manufactured it loses much of the food value of his meals.

In few if in any diabetics is the sugar-using function completely incapacitated. Most patients, therefore, are only partially diabetic. The aim of the dietary management of diabetes is to make the load on the weakened sugar-using function as light as possible in order to rest it and thus favor its restoration. This can be done by suiting the diet to the condition of the patient and feed-

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ing no more sugar-forming foods than the patient's body is able to use. The appearance of sugar in the urine is an indication that the diet is too rich in sugar formers. The immediate object, therefore, is to keep the urine sugar free. When we speak of a patient's tolerance we mean the amount of sugar-forming foods which he can eat in twenty-four hours without causing sugar in the urine. A healthy man has a very high tolerance. A diabetic patient, even mildly diabetic, has a much lower tolerance.

The tolerance of a given patient is ascertained by feeding foods of known composition in weighed and gradually increasing amounts. When this tolerance is known a diet can be prescribed which will fit, a diet made to order, so to speak, on which the patient should be able to maintain his strength and remain persistently sugar free. Such a diet, if faithfully adhered to, does much to make the life of the diabetic patient more comfortable and more nearly normal; life is prolonged, and many of the dangerous complications of the disease are prevented. The success of the treatment depends very largely on the patient himself. He must learn as much as he can about his disease in order to care for himself properly. He must learn the composition of the various foods in order to make the fullest use of the limited number of food materials at his disposal, and he must continually exercise his intelligence, his resourcefulness, and his self-control.

## SECTION II

### MEASURES AND WEIGHTS AND THEIR IMPORTANCE TO THE DIABETIC PATIENT: THE METRIC SYSTEM

THE diabetic patient must select with care not only the variety of his food, but the exact quantity. This means acquiring a working familiarity with weights and measures and the constant use of a good balance for weighing food. Every patient is strongly urged to procure a counterweighted balance similar to those in use in the hospital (Fig. 1). The dial is movable so that the 0 point on the balance may be adjusted. Thus scale pans of different weights may be employed, such as plates, glasses, or cups. The face of the scale reads in grams and kilograms, that is, in the metric system. A suitable balance is manufactured by John Chatillon Sons, New York City.

*The Metric System.*—The metric system is in general use in the European countries and in the scientific English-speaking world. Its simplicity gives it advantages over the cumbersome English weights and measures.

The unit of weight in the metric system is the gram. A gram is  $\frac{1}{70}$  of an ounce. The kilogram is 1000 grams. Kilogram is abbreviated to kg.; 1 kg. = 2.2 pounds. The unit measure of fluid volume is the cubic centi-



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meter (c.c.). A cubic centimeter of water weighs 1 gram (1 gm.). A liter is 1000 c.c. This is a great help, as it makes it possible either to weigh fluids on a balance or measure them in a graduate.

For the convenience of the reader a table of weights and measures is given to show the relations of the metric system to the weights and measures in common use in the United States. The patient is advised, however, to disregard the Troy or the English system and learn to think in grams and kilograms as early as possible. This will greatly facilitate his early mastery of his diet.

### WEIGHTS AND MEASURES

#### *Approximate Equivalents*

1 ounce	=	30 gm.	
2.2 pounds	=	1000 gm. or 1 kg.	
1 fluidounce	=	30 c.c. and weighs about 30 gm.	
1 quart	=	1000 c.c. or 1 liter and weighs about	
1 teaspoon, fluid	=	5 c.c.	[1000 gm.]
1 dessertspoon, fluid	=	10 c.c.	
1 tablespoon, fluid	=	15 c.c.	
1 large cup or tumbler	=	240 c.c.	

To convert ounces to grams, multiply the ounces by 30.

To convert pounds to kilograms, divide the pounds by 2.2.

To convert kilograms to pounds, multiply the kilograms by 2.2.

To convert cubic centimeters to ounces, divide the number of cubic centimeters by 30.



Fig. 1.—Chatillon gram scales with movable disk. A counter-weighted balance convenient for weighing food. An empty glass was placed on the scale pan. The dial was turned by means of the knob, so that its 0 point coincided with the pointer. Milk was then poured into the glass until the pointer stood at 105, the amount of milk desired for a certain diet.



## SECTION III

### FOOD AS ENERGY

THE body of a man functions much as does an engine. To make it run fuel must be supplied to be burned and converted into heat and energy. Experiments have shown that weighed quantities of food develop exactly the same number of units of heat when burned by a man as they would if burned outside of the body, allowance being made for the excretion of unused fractions.

The measure or unit of heat made use of in these determinations is the calory; a calory is the quantity of heat consumed in raising the temperature of 1 liter of distilled water 1 degree Centigrade (see Section II). A lump of sugar, if burned, would generate about 20 calories.

Our bodies give out from 2000 to 3000 calories of heat each day. The exact amount depends on the amount of physical work performed during the day and on the size of the body. A man at hard labor may require as many as 6000 calories daily; for a person confined to bed 1000 calories or less suffice. A large man requires more food than a small man. The average in-take varies between 20 and 40 calories for each 2.2 pounds (1 kg.) of the weight.

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The normal person depends very largely on the carbohydrate and protein foods to supply energy requirements. The diabetic person is forced to restrict his use of such foods and therefore depends, to a greater extent, on fat.

The fuel values of 1 gram each of carbohydrate, protein, and fat are approximately as follows:

1 gram carbohydrate	= 4 calories
1 gram protein	= 4 calories
1 gram fat	= 9 calories

## SECTION IV

### THE URINE

THE patient must learn how to test his own urine for sugar and for diacetic acid. Fortunately, both of these tests are very simple and can be mastered easily.

Reference was made in Section I to the excretion of sugar by the diabetic patient. The appearance of sugar in the urine signifies that the diet is too rich in sugar formers and that the body is not utilizing all the sugar it is making from its food. Sugar in the urine indicates that sugar is accumulating in the tissues and that the disease is improperly controlled. The test for sugar in the urine is, therefore, of the utmost importance and must be made daily.

Diacetic (or aceto-acetic) acid is a substance formed when fat is incompletely consumed by the tissues. It may be excreted in the urine of healthy persons if they are put on a diet of fat. The same is true of diabetic persons. The presence of diacetic acid in the urine is a danger signal. The test for diacetic acid is, therefore, of great importance.

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### THE BENEDICT TEST FOR SUGAR IN THE URINE

The Benedict solution used for this test must be prepared with care and should be secured from a reliable druggist. The solution is made as follows:

	Gm. or c. c.
Copper sulfate (pure crystallized).....	17.3
Sodium or potassium citrate.....	173.0
Sodium carbonate, crystallized. (If the anhydrous sodium carbonate is used, only one-half this amount should be taken.).....	200.0
Distilled water, to make.....	1000.0

The citrate and carbonate are dissolved together with the aid of heat in about 700 c.c. of water. The mixture is poured (through a filter if necessary) into a large beaker. The copper sulfate is dissolved separately in about 100 c.c. of water and is poured slowly into the first solution, with constant stirring. The mixture is cooled and diluted to 1 liter. This solution will keep indefinitely.

*The Directions for the Test.*—Place 5 c.c. of the solution, or a trifle over 1 teaspoonful, in a test-tube and add to it from 8 to 10 drops (not more) of the urine to be tested. Heat this over a free flame (alcohol lamp), boil vigorously for three minutes, and allow to cool spontaneously. If sugar is present a large amount of precipitate will form, filling the solution from top to bottom. The precipitate will be greenish, yellow, or red, depending on the amount of sugar present (Plate 1).

A very convenient way to heat the test-tube is to

place it in a tea-kettle or pan which contains a small amount of boiling water. In this case the heating must be continued for five minutes, during which time the water must boil vigorously. The advantages of this method are that there is less danger of the alkaline solution boiling over and burning the fingers, and less danger of breaking the test-tube.

It is important to clean the test-tube thoroughly after each test. This can be done with a cotton swab or with a test-tube brush. The precipitate clings to the glass and will not rinse away.

#### THE GERHARDT OR FERRIC CHLORID TEST FOR DIACETIC ACID

To 5 c.c. of freshly voided urine in a test-tube add a 10 per cent. solution of ferric chlorid, 1 drop at a time. If diacetic acid is present a Burgundy-red color will form. Continue adding ferric chlorid until no further deepening of the color occurs, then heat. If the color is due to diacetic acid, it will fade. Salicylates, anti-pyrin, and certain other drugs, if taken by the patient, will cause the urine to turn a bluish red on the addition of ferric chlorid. If the red color is due to any of these, however, it will not fade on heating. If filter-paper and a glass funnel are available, it is desirable to filter after adding the ferric chlorid and before heating. Divide the filtrate between two test-tubes and heat one portion, comparing its color after heating with that of the unheated portion.



## SECTION V

### FOODS AND THEIR COMPOSITION

THERE are three fundamental constituents in foods. Some foods contain all three, others only two, and still others but one. These constituents are the carbohydrates, the proteins, and the fats. Both carbohydrates and proteins are sugar formers.

*Carbohydrates.*—Examples of pure carbohydrate are cane-sugar and cornstarch. These substances may be said to contain 100 per cent. carbohydrate. In the vegetables, such as spinach, carrots, and potatoes, there are small fractions only of carbohydrate, approximately 3 per cent. in spinach, 6 per cent. in carrots, and 20 per cent. in potatoes. The balance of such vegetables consists of very small amounts of protein and fat, as well as certain non-digestible materials and water. It is essential that the patient receive some carbohydrate in his diet because otherwise he fails to use the fat in his food properly and runs the danger of acid poisoning. But the carbohydrate eaten by the patient is less well tolerated if taken in a concentrated form. Hence the concentrated carbohydrates, such as raw sugars, the starches and cereals, must be avoided, and the dilute carbohydrates of vegetables, fruits, milk, and cream, be depended on. Table I shows the carbohydrate content of these and other foods.

*Protein.*—An example of pure protein is the white of an egg. Meat, fish, milk, and the cheeses contain large

proportions of protein combined with more or less fat and a small amount of carbohydrate. So also some vegetables, for example, lentils, peas, and beans, are rich in protein. We must supply our bodies with a certain minimum amount of protein in order to maintain our health. The daily requirement of protein is usually estimated as from 1 to 1.5 gm. for each kilogram of the body weight, or 100 gm. each day for a man of average weight. Larger amounts of protein should be taken with caution by the patient, since the body manufactures sugar from protein as well as from carbohydrate, and an excess of protein is as harmful as is the ingestion of large amounts of carbohydrate.

*Fat.*—Examples of pure fat foods are butter and olive oil. All meats contain varying proportions of fat, and many vegetables, fruits, and nuts are rich in fat. Fat is a valuable food because it supplies an abundance of energy in proportion to its weight, and it is especially valuable for the patient since he must restrict his intake of both carbohydrate and protein and must, therefore, depend on the fats to meet his energy requirements (Section III).

The foregoing is an explanation of the use and value of food tables such as those which are appended (see Section VIII). A knowledge of the relative proportion of carbohydrate, fat, and protein in a food is essential for the wise selection of a diabetic diet and menu. These food tables must be studied diligently and memorized as early as possible.

## SECTION VI

### THE DIETARY MANAGEMENT OF DIABETES

VERY considerable progress has been made in recent years in the treatment of diabetes. Further progress may be anticipated in the near future, so that while our knowledge of the prevention and treatment of the disease is still very incomplete, we may look forward hopefully for more light and more help, and none of us should ever become discouraged.

The generally accepted treatment today which has proved of immense value is based largely on the painstaking research of Dr. Frederick M. Allen, formerly of the Rockefeller Institute in New York. The first thing to be done is to put a stop to the excretion of sugar. This is accomplished most rapidly and with least danger by a period of starvation which may be continued for several days if properly controlled. During this starvation period, however, the patient must be watched carefully. Frequently he must be confined to bed. Repeated analyses must be made of his blood and urine in order to guard against complications. It should be understood clearly that this starvation treatment is in the nature of an operation and, like any operation, is attended by very definite risks. It is

essential that the patient shall be in a hospital under constant and trained observation.

During the fasting period the patient is supplied with an abundance of fluids to drink. These are given as water, as clear coffee or tea, and in part as beef bouillon. The fluid intake should not fall below 3000 c.c. daily. The patient is often disinclined to drink this much fluid. His thirst, which has been excessive before, rapidly disappears with the beginning of treatment. It is therefore necessary to impress him with the necessity of drinking freely.

The next step is the determination of the patient's tolerance. The actual procedure will vary with different patients, but, in general, foods of known composition in weighed amounts are fed, the total intake of carbohydrate, protein, and fat being increased very gradually as high as is possible without the return of sugar in the urine.

During this entire period it is absolutely essential that every drop of urine passed be saved for analysis. Fresh bottles are provided each morning and continuous twenty-four-hour collections are made.

It is equally essential that nothing whatever in the form of food be eaten that is not supplied from the diet kitchen. This means not only the ordinary foods, but also alcohol in any form, chewing gum and chewing tobacco; the latter usually contains a certain amount of molasses.

Some patients will be found to have a low tolerance,

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others may stand 100 gm. of carbohydrate. Every patient should be treated as an individual case, but for convenience in prescribing diets the following arbitrary grouping is made:

*Group A.*—Tolerance below 40 gm. carbohydrate.

*Group B.*—Tolerance between 40 and 60 gm. carbohydrate.

*Group C.*—Tolerance between 60 and 100 gm. carbohydrate.

*Group D.*—Tolerance above 100 gm. carbohydrate.

When patients of Group A leave the hospital they are advised to interrupt their diet by a "fast day" once each week. They are instructed to remain indoors this day, and quiet, and to take liberally of liquids, including beef broth and coffee or tea.

Patients of Group B are advised to institute weekly days of half-fast, on which days they restrict their diet to 20 gm. of carbohydrate in the form of 5 per cent. vegetables and two "hepc" cakes, or their equivalent, 12 gm. of protein and 12 gm. of fat.

On the appearance of sugar in the urine at any time the patient, irrespective of his group, must institute a fast day. If sugar persists, a second fast day should follow the first. If sugar still persists, the patient should return to one-half of his diet, continue on this for a week, and then again try the effect of a fast day. After the urine is again sugar free he can return gradually to his previous diet. Longer fasts should never be attempted outside of an institution.



**DIABETIC DIET ORDER—MAYO CLINIC**

No. X Name John Smith Date 11/1/30  
 Bed No. 116 Table No. 13  
 Diet Rx COH 60 Prot. 70 Fat 100

FOOD	Breakfast	Dinner	Supper	Total Grams	GRAMS		
					COH	Prot.	Fat
5% Vegetables		200		200	6	1	0
10% Vegetables		100		100	6	1	0
10% Fruit	200			200	20	1	0
15% Veg. and Fruit							
20% Veg. and Fruit			50	50	10	1	0
Hepco Cakes	1	1	1	3	0	18	18
Eggs	1		1	2	0	12	12
Cream, 16%	200		100	300	15	9	48
Milk, Skimmed		100		100	5	3	0
Butter or Oil							
Bacon							
Meat		100		100	0	25	15
Fish							

Total Grams 62 71 93

**FOOD VALUE OF THE DIET CALORIES**  
62 Grams COH at 4 Equals 248  
71 Grams Prot. at 4 Equals 284  
93 Grams Fat at 9 Equals 837  
 Total 1369

W.H.P.  
 Physician

4-025-W

Fig. 2.—The diet order slip. One of these is furnished to each patient daily. It shows the dietary prescription for the day, the type of food and the actual amounts of each food used to fill the prescription, the composition of each of the three meals and the food value of the diet.

On the occurrence of more than a trace of diacetic acid in the urine the patient should omit all fat from his diet. Usually a few days of fat restriction will bring about the disappearance of the offending acid.

*The Note-book.*—The patient is provided with a note-book in the hospital and should keep a daily journal. He should record his food in-take from the diet order slips (Fig. 2) which are furnished daily and compute and record the total number of grams of carbohydrate, protein, and fat in each day's menu. If he finds any discrepancies between his calculations and his dietary prescription for the day he should report it without delay to the dietitian. In this way a double check on the diet is secured. In the book also he should record all symptoms which develop and should write all questions which he cares to ask the doctor. The doctor will answer these in writing so that a permanent record of the doctor's answers may be preserved and mistakes avoided. After he leaves the hospital he should continue to keep up this daily record.

*Reporting by Correspondence.*—Patients are urged to write after they leave the hospital whenever any complications develop or any difficulties arise. They are also urged to reply promptly to the questionnaires which will be sent to them at intervals. Such correspondence should be addressed to the Diabetic Service, Mayo Clinic, Rochester, Minn.



## SECTION VII

### SPECIAL NOTES OF IMPORTANCE TO THE DIABETIC PATIENT

*The Teeth.*—Diabetics are prone to develop bad teeth. It therefore behooves them to take special care of their teeth. Once a year they should present themselves to a good dentist for examination, the examination to include a set of *x-ray* films of the teeth.

Abscesses around the roots of the teeth may affect the course of the disease; therefore the mouth must be kept as free as possible from infection. Definitely abscessed teeth should be removed, caries should be promptly attended to, and the teeth should be kept scrupulously clean by methodic brushing, mouth-washes, and the use of dental floss. If abscessed teeth requiring extraction occur the patient is urged to return to the clinic in order that the operation may be performed while he is under strict dietetic control. Very considerable danger attends all operations on diabetic patients.

*The Skin.*—Infections of the skin, boils, carbuncles, acne, and eczema are usually common in untreated diabetes. The body should be kept clean, therefore, by frequent bathing. Cuts and abrasions should be

avoided and the development of all skin infections should be promptly reported to a physician.

*Acidosis and Coma.*—These conditions are of grave significance in diabetes. To avoid them is the secret of their treatment. It would lead us too deeply into the subject to attempt to explain them. Suffice it, therefore, to repeat the statement made above as to the danger inherent in a diet which contains a disproportionate amount of fat. Every diabetic must have some carbohydrate, and it is extremely unwise to omit carbohydrates unless at the same time the fats are removed from the diet.

The presence of a *strong* ferric chlorid reaction in the urine should put patient and physician on guard against coma. The symptoms heralding coma are drowsiness, nausea, vomiting, roaring of the ears, and painful deep breathing. The appearance of any of these symptoms should be met by the prompt institution of measures as follows:

#### TREATMENT OF IMPENDING COMA

1. Put the patient to bed and keep him warm with blankets and hot water bottles. A special nurse should be procured if possible. The patient must be watched constantly.
2. Administer a cleansing enema of 1 quart of soap-suds.
3. Give liquids in abundance, including water, bouillon, and, especially, hot, clear coffee. The amount of

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liquid given should equal, in the case of an adult, 1 quart every six hours. If the patient is vomiting, an amount of liquid equal to this should be administered by retention enemas. For these, warm salt solution is used, 1 teaspoonful of salt to 1 quart of water.

4. Give the juice of one small orange (strained) every three hours. Allow no other food. If orange juice is not tolerated by the patient, try thin strained oatmeal gruel,  $\frac{1}{2}$  cupful every three hours.

## SECTION VIII

### DIET MENUS AND RECIPES

It is desirable for all patients to learn the use of food tables so that they can select their diets to suit their individual tastes, conforming only to the number of grams each of carbohydrate, protein, and fat determined as their safety limits by the test of their tolerance. If patients can do this, their diets will be more diversified and less likely to become monotonous. Some patients, however, find it impossible to master the rudiments of arithmetic necessary for this diet planning. In such cases we prescribe definite menus, mentioning each food by name and writing out in detail breakfasts, dinners, and suppers. For this reason we have planned a series of meals for each of the four different groups of patients referred to in Section VI. For patients in Group A, with tolerance below 40 gm. of carbohydrate, there is a choice of four different breakfasts, four dinners, and four suppers. For patients in Group B there are four breakfasts, four dinners, and four suppers. For patients in Groups C and D respectively a choice of six breakfasts, six dinners, and six suppers is provided.

It should be emphasized that these menus are intended for the use of patients who have been in the hospital and whose carbohydrate tolerance is known.

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They are not harmless and may not be followed indiscriminately by untrained patients.

The recipes which follow the menus are designed to add variety to the patients' diabetic diet. The meals served in the hospital are intentionally simple, first, in order to avoid mistakes, and second, because the patients learn food values more easily from observing the simple foods than from more elaborate preparations. After they are trained, however, they are encouraged to diversify their diets as much as possible.

*Caution.*—A warning is inserted here to guard against mistakes:

1. Remember that it is not so much the kind of food as the amount that matters, that sugar and starches are dangerous chiefly because the carbohydrate they contain is very concentrated, and hence a very little of these may overload tolerance, but that no food can be considered entirely harmless.

2. Remember, therefore, that all foods must be weighed and no more than the estimated allowance eaten. The penalty for carelessness may be a gradually diminishing tolerance.

### DIETS FOR PATIENTS IN GROUP A, WITH TOLERANCE BELOW 40 GM. CARBOHYDRATE

Choice of one breakfast, one dinner, and one supper. The food value of any three such meals is 20 gm. of carbohydrate, 70 gm. of protein, 100 gm. fat; 1260 calories.

1. *Breakfast:*

Orange.....	50 gm.	..
Eggs.....	2	
Hepco cake (Recipe 5).....	1	
Butter.....	10	"
Cream.....	20	"

2. *Breakfast:*

Grapefruit.....	50 gm.	
Egg.....	1	
Hepco cake.....	2	
Butter.....	10	"
Cream.....	20	"

3. *Breakfast:*

Peach, fresh.....	50 gm.	
Cellu-flour griddle cakes (Recipe 4).....		
Egg.....	1	
Hepco cake.....	1	
Butter.....	10	"
Cream.....	20	"

4. *Breakfast:*

Strawberries.....	50 gm.	
Eggs.....	2	
Hepco cake.....	1	
Butter.....	10	"
Cream.....	20	"

1. *Dinner:*

Beef stew (Recipe 10).....		
Hepco cake.....	1	
Butter.....	15 gm.	
Cream.....	15	"

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### 2. *Dinner:*

Meat, weighed cooked . . . . .	100 gm.
Onions, weighed cooked . . . . .	50 "
Tomatoes, weighed uncooked . . . . .	100 "
Hepco cake . . . . .	1
Butter . . . . .	15 "
Cream . . . . .	15 "
Coffee jelly (Recipe 37).	

### 3. *Dinner:*

Meat, weighed cooked . . . . .	100 gm.
Spinach, weighed cooked . . . . .	100 "
Squash, weighed cooked . . . . .	50 "
Hepco cake . . . . .	1
Butter . . . . .	15 "
Cream . . . . .	15 "

### 4. *Dinner:*

Fish, weighed cooked . . . . .	100 gm.
Asparagus, weighed cooked . . . . .	100 "
Carrots, weighed cooked . . . . .	50 "
Hepco cake . . . . .	1
Butter . . . . .	20 "
Cream . . . . .	15 "

### 1. *Supper:*

Eggs . . . . .	2
Stringbeans, weighed cooked . . . . .	100 gm.
Beets, weighed cooked . . . . .	50 "
Butter . . . . .	15 "
Hepco cake . . . . .	1
Cream . . . . .	15 "

2. *Supper:*

Baked egg with cheese (Recipe 25).	
Egg plant, weighed cooked . . . . .	100 gm.
Asparagus, weighed cooked . . . . .	100 "
Hepco cake . . . . .	1
Butter . . . . .	10 "

3. *Supper:*

Eggs . . . . .	2
Squash, weighed cooked . . . . .	50 gm.
Spinach, weighed cooked . . . . .	50 "
Lettuce, celery, raw tomato, with vinegar . . . . .	50 "
Hepco cake . . . . .	1
Butter . . . . .	15 "
Cream . . . . .	15 "

4. *Supper:*

Egg . . . . .	1
Pale American cheese . . . . .	25 gm.
Celery, weighed cooked . . . . .	100 "
Tomato, weighed uncooked . . . . .	100 "
Hepco cake . . . . .	1
Butter . . . . .	10 "
Cream . . . . .	15 "

DIETS FOR PATIENTS IN GROUP B, WITH TOLERANCE  
BETWEEN 40 AND 60 GM. CARBOHYDRATE

Choice of one breakfast, one dinner, and one supper. The food value of any three such meals is 40 gm. carbohydrate, 70 gm. protein, 100 gm. fat; 1340 calories.



## 34 A PRIMER FOR DIABETIC PATIENTS

### 1. *Breakfast:*

Orange.....	100 gm.
Egg.....	1
*Bacon.....	30 "
Hepco cake (Recipe 5).....	1
Butter.....	5 "
Milk.....	80 "
Cream.....	20 "

### 2. *Breakfast:*

Blueberries.....	65 gm.
Egg.....	1
Bacon.....	30 "
Hepco cake.....	1
Butter.....	5 "
Milk.....	80 "
Cream.....	20 "

### 3. *Breakfast:*

Strawberries.....	100 gm.
Egg.....	1
Bacon.....	30 "
Hepco cake.....	1
Butter.....	5 "
Milk.....	80 "
Cream.....	20 "

### 4. *Breakfast:*

Grapefruit 100 gm., or apple.....	65 gm.
Egg.....	1
Bacon.....	30 "
Hepco cake.....	1
Butter.....	5 "
Milk.....	80 "
Cream.....	20 "

\* All bacon is weighed and then cooked.

1. *Dinner:*

Meat, weighed cooked . . . . .	75 gm.
Squash, weighed cooked . . . . .	100 "
Tomatoes, weighed cooked . . . . .	50 "
Cabbage, weighed cooked . . . . .	100 "
Hepco cake . . . . .	1
Butter . . . . .	10 "
Milk . . . . .	80 "
Cream . . . . .	20 "

2. *Dinner:*

Beef stew (Recipe 12).	
Hepco cake . . . . .	1
Butter . . . . .	10 gm.
Milk . . . . .	80 "
Cream . . . . .	20 "

3. *Dinner:*

Creamed chicken with asparagus (Recipe 17).	
Turnips, weighed cooked . . . . .	100 gm.
Fresh tomatoes or cucumbers . . . . .	50 "
Hepco cake . . . . .	1
Butter . . . . .	5 "

4. *Dinner:*

Fish baked with bacon (Recipe 20).	
Beets . . . . .	100 gm.
Celery, weighed cooked . . . . .	150 "
Hepco cake . . . . .	1
Butter . . . . .	10 "
Milk . . . . .	80 "
Cream . . . . .	20 "

## 36 A PRIMER FOR DIABETIC PATIENTS

### 1. *Supper:*

Egg .....	1	} scrambled
Egg white .....	1	
Butter .....	5 gm.	
Spinach, weighed cooked .....	100 gm.	
Squash, weighed cooked .....	75 "	
Hepco cake .....	1	
Butter .....	10 "	
Milk .....	100 "	

### 2. *Supper:*

Egg .....	1	} scrambled
Egg white .....	1	
Butter .....	5 gm.	
Onions, weighed cooked .....	75 gm.	
Stringbeans, weighed cooked .....	100 "	
Hepco cake .....	1	
Butter .....	10 "	
Milk .....	100 "	

### 3. *Supper:*

Egg .....	1
Celery, weighed cooked .....	100 gm.
Carrots, weighed cooked .....	75 "
Hepco cake .....	1
Butter .....	15 "
Purity custard (Recipe 31).	

### 4. *Supper:*

Baked cauliflower with cheese (Recipe 26).	
Hepco cake .....	1
Butter .....	10 gm.
Milk .....	100 "

DIETS FOR PATIENTS OF GROUP C, WITH TOLERANCE  
BETWEEN 60 AND 100 GM. CARBOHYDRATE

Choice of one breakfast, one dinner, and one supper.  
The food value of any three such meals is 60 gm.  
carbohydrate, 70 gm. protein, 100 gm. fat; 1420  
calories.

1. *Breakfast:*

Orange.....	100 gm.
Cellu-flour griddle cakes (Recipe 4).	
Butter.....	10 "
Egg.....	1 "
Bacon.....	30 "
Milk.....	100 "
Cream.....	35 "

2. *Breakfast:*

Apple.....	65 gm.
Egg.....	1 "
Bacon.....	15 "
Hepco cake (Recipe 5).....	1 "
Butter.....	10 "
Milk.....	100 "
Cream.....	35 "

3. *Breakfast:*

Grapefruit.....	100 gm.
Cellu-flour griddle cakes (Recipe 4).	
Bacon.....	15 "
Hepco cake.....	1 "
Butter.....	10 "
Milk.....	100 "
Cream.....	35 "

## 38 A PRIMER FOR DIABETIC PATIENTS

### 4. *Breakfast:*

Peaches, fresh.....	100 gm.
Egg.....	1
Bacon.....	15 "
Hepco cake.....	1
Butter.....	10 "
Milk.....	100 "
Cream.....	35 "

### 5. *Breakfast:*

Pears, fresh.....	65 gm.
Egg.....	1
Bacon.....	15 "
Hepco cake.....	1
Butter.....	10 "
Milk.....	100 "
Cream.....	35 "

### 6. *Breakfast:*

Fresh pineapple.....	100 gm.
Egg.....	1
Bacon.....	15 "
Hepco cake.....	1
Butter.....	10 "
Milk.....	100 "
Cream.....	35 "

### 1. *Dinner:*

Meat, weighed cooked.....	50 gm.
Sauerkraut.....	100 "
Asparagus, weighed cooked.....	100 "
Squash, weighed cooked.....	100 "
Hepco cake.....	1
Butter.....	15 "
Milk.....	100 "
Cream.....	35 "

2. *Dinner:*

Meat, weighed cooked.....	50 gm.
Beet greens, weighed cooked.....	100 "
Turnips, weighed cooked.....	100 "
Hepco cake.....	1
Butter.....	15 "
Rhubarb, weighed cooked.....	100 "
Junket (Recipe 34).	

3. *Dinner:*

Beef stew (Recipe 11).	
Hepco cake.....	1
Butter.....	15 gm.
Milk.....	100 "
Cream.....	35 "

4. *Dinner:*

Creamed chicken with asparagus and mushrooms (Recipe 18).	
Onions, weighed cooked.....	100 gm.
Lettuce, cucumbers, and tomatoes.....	100 "
Hepco cake.....	1
Butter.....	10 "

5. *Dinner:*

Steak, weighed cooked.....	50 gm.
Fried onions, weighed cooked.....	100 "
Stringbeans, weighed cooked.....	100 "
Lettuce, celery, and cabbage.....	100 "
Hepco cake.....	1
Butter.....	15 "
Milk.....	100 "
Cream.....	35 "

## 40 A PRIMER FOR DIABETIC PATIENTS

### 6. *Dinner:* New England boiled dinner (Recipe 14).

Hepco cake.....	1
Butter.....	15 gm.
Milk.....	100 "
Cream.....	35 "

1. <i>Supper:</i> Egg.....	1	} scrambled
Egg white.....	1	
Butter.....	6 gm.	
Spinach, weighed cooked.....	100 gm.	
Celery, weighed cooked.....	100 "	
Beets, weighed cooked.....	100 "	
Hepco cake.....	1	
Butter.....	10 "	
Milk.....	100 "	
Cream.....	30 "	
Peach, fresh.....	60 "	

2. <i>Supper:</i> Egg.....	1	} scrambled
Egg white.....	1	
Butter.....	6 gm.	
Cream.....	30 gm.	} creamed
Peas, weighed cooked.....	75 "	
Hepco cake.....	1	
Butter.....	10 gm.	
Milk.....	100 "	
Blackberries.....	60 "	

3. <i>Supper:</i> Squash, weighed cooked.....	100 gm.
Cauliflower, weighed cooked.....	100 "
Tomatoes, weighed uncooked.....	100 "
Hepco cake.....	1
Butter.....	16 "
Orange.....	60 "
Custard (Recipe 32).	

4. *Supper:*

Cheese.....	25 gm.
Peas, weighed cooked.....	75 "
Hepco cake.....	1
Butter.....	16 "
Milk.....	100 "
Cream.....	30 "
Grapefruit.....	60 "

5. *Supper:*

Fish.....	60 gm.
Tomatoes, weighed cooked.....	100 "
Beets, weighed cooked.....	150 "
Hepco cake.....	1
Butter.....	16 "
Milk.....	100 "
Cream.....	30 "
Pineapple, fresh.....	60 "

6. *Supper:*

Creamed eggs (Recipe 22).	
Stringbeans, weighed cooked.....	150 gm.
Turnips, weighed cooked.....	125 "
Hepco cake.....	1
Butter.....	10 "
Fresh gooseberries.....	60 "

DIETS FOR PATIENTS IN GROUP D, WITH TOLERANCE  
ABOVE 100 GM. CARBOHYDRATE

Choice of one breakfast, one dinner, and one supper.  
The food value of three such meals is 100 gm. carbo-  
hydrate, 70 gm. protein, 140 gm. fat; 1940 calories.



## 42 A PRIMER FOR DIABETIC PATIENTS

### 1. *Breakfast:*

Orange.....	100 gm.
Oatmeal, weighed uncooked.....	10 "
Milk.....	80 "
Egg.....	1
Bacon.....	30 "
Hepco cake (Recipe 5).....	1
Butter.....	10 "
Cream.....	80 "

### 2. *Breakfast:*

Peach, fresh.....	90 gm.
Farina, weighed uncooked.....	10 "
Milk.....	80 "
Bacon.....	30 "
Hepco cakes.....	2
Butter.....	10 "
Cream.....	80 "

### 3. *Breakfast:*

Grapefruit.....	50 gm.
Cornmeal, weighed uncooked.....	10 "
Milk.....	80 "
Cellu-flour griddle cakes (Recipe 4).	
Bacon.....	30 "
Hepco cake.....	1
Butter.....	10 "
Cream.....	80 "

### 4. *Breakfast:*

Orange.....	50 gm.
One-half shredded wheat biscuit.....	15 "
Milk.....	80 "
Egg.....	1
Bacon.....	30 "
Hepco cake.....	1
Butter.....	10 "
Cream.....	80 "

5. *Breakfast:*

Strawberries.....	150 gm.
Milk.....	80 "
Cellu-flour griddle cakes (Recipe 4).	
Egg, fried.....	1
Bacon.....	30 "
Butter.....	10 "
Cream.....	80 "

6. *Breakfast:*

Baked apple.....	100 gm.
Milk.....	80 "
Egg, poached.....	1
Bacon.....	30 "
Hepco cake.....	1
Butter.....	10 "
Cream.....	80 "

1. *Dinner:*

Meat, weighed cooked.....	50 gm.
Baked potato, weighed cooked.....	100 "
Swiss chard or dandelion greens, weighed cooked	100 "
Turnips, weighed cooked.....	100 "
Hepco cake.....	1
Butter.....	20 "
Milk.....	80 "
Cream.....	60 "

2. *Dinner:*

Roast pork and fried apples (Recipe 16).	
Potato.....	100 gm.
Butter.....	5 "
Cream.....	30 "
Onions, weighed cooked.....	150 gm.
Hepco cake.....	1
Butter.....	5 "
Milk.....	80 "
Cream.....	30 "

} Mashed potato

## 44 A PRIMER FOR DIABETIC PATIENTS

### 3. *Dinner:*

Roast lamb, weighed cooked.....	50 gm.
Potato.....	100 "
Peas, weighed cooked.....	90 "
Hepco cake.....	1
Butter.....	20 "
Milk.....	80 "
Cream.....	60 "
Grapefruit.....	50 "

### 4. *Dinner:*

Beef stew (Recipe 13).	
Potato, weighed cooked.....	100 gm.
Hepco cake.....	1
Butter.....	20 "
Milk.....	80 "
Cream.....	60 "
Orange.....	80 "

### 5. *Dinner:*

New England boiled dinner (Recipe 15).	
Hepco cake.....	1
Butter.....	20 "
Strawberries.....	75 "
Cream.....	40 "
Junket (Recipe 35).	

### 6. *Dinner:*

Fish, weighed cooked.....	50 gm.
Bacon.....	15 "
Creamed potatoes (Recipe 27)	
Cabbage, weighed cooked.....	100 "
Squash, weighed cooked.....	100 "
Hepco cake.....	1
Butter.....	15 "
Orange.....	100 "

7. *Dinner:*

Chicken stew (Recipe 19).

Hepco cake.....	1
Butter.....	10 gm.
Grapefruit.....	50 "

1. *Supper:*

Egg.....	1
Celery, weighed cooked.....	150 gm.
Baked squash, weighed cooked.....	100 "
Hepco cake.....	1
Butter.....	20 "
Milk.....	100 "
Cream.....	60 "
Pineapple, fresh.....	100 "

2. *Supper:*

Beets, weighed cooked.....	120 gm.
Tomatoes, weighed cooked.....	150 "
Hepco cake.....	1
Butter.....	20 "
Rhubarb, weighed cooked.....	100 "
Custard (Recipe 33).	

3. *Supper:*

Cheese (pale American).....	25 gm.
Pumpkin, weighed cooked.....	150 "
Lettuce, cucumbers, cabbage, and celery salad, uncooked.....	100 "
Hepco cake.....	1
Butter.....	20 "
Peach, fresh.....	100 "
Milk.....	100 "
Cream.....	60 "

## 46 A PRIMER FOR DIABETIC PATIENTS

### 4. *Supper:*

Cheese (pale American).....	25 gm.
Carrots, weighed cooked.....	100 "
Asparagus, weighed cooked.....	150 "
Hepco cake.....	1
Butter.....	20 "
Milk.....	100 "
Cream.....	60 "
Grapefruit.....	100 "

### 5. *Supper:*

Egg.....	1	} scrambled
Butter.....	5 gm.	
Milk.....	50 "	
Spinach, weighed cooked.....	100 gm.	
Hepco cake.....	1	
Butter.....	15 "	
Milk.....	50 "	
Cream.....	60 "	
Baked apple, weighed cooked.....	100 "	

### 6. *Supper:*

Fish, weighed cooked.....	50 gm.
Bacon.....	15 "
Tomatoes, weighed cooked.....	150 "
Celery, weighed cooked.....	100 "
Hepco cake.....	1
Butter.....	20 "
Milk.....	100 "
Cream.....	60 "
Apple, weighed uncooked.....	70 "

## RECIPES

The following preparations are used at the present time in prescription diets for diabetic patients in the Mayo Clinic:

Hepco flour, prepared by Waukesha Health Products Company, Waukesha, Wisconsin.

Cellu-flour, prepared by Dietetic Cellulose Company, 2557 West Chicago Avenue, Chicago, Illinois.

Sugar-free raspberry, lemon, orange, and maple flavorings may be secured from Emma Hall, 17 Oak Square Avenue, Brighton, Massachusetts.

India gum, sometimes called Karaya gum, is a commercial form of gum Arabic and may be secured at drug stores or from the Dietetic Cellulose Company.

The bran used in the recipes is ordinary milled bran and may be secured at feed-stores or mills. Prepared brans are expensive and are not recommended. All bran before it is used should be washed in cheese-cloth under the tap until the water runs clear.

Preparation of thrice cooked vegetables: Cook vegetables until tender, drain off water, add boiling water, and boil for fifteen minutes. Then drain off water, add boiling water, and boil for fifteen minutes. Drain and serve. Five per cent. vegetables prepared in this way are reckoned as 1 per cent. vegetables.

Some of the following recipes are modifications of recipes which will be found in Dr. Joslin's "Manual of Diabetes." Some were suggested to us by Dr. Frederick M. Allen, of New York. Others we have devised.

## 48 A PRIMER FOR DIABETIC PATIENTS

### CELLU-BRAN BREAD—RECIPE 1

Cellu-flour.....	80 gm.
Dry, washed bran.....	50 "
Baking powder.....	10 "
India gum.....	10 "
Mineral oil.....	4 tablespoonfuls
Hot water	
Salt	

Mix dry ingredients thoroughly. Add the oil and just enough hot water to enable the mixture to be molded into a loaf about 2 inches in thickness. Bake in a greased pan in a very slow oven. Time required for baking one to one and a half hours. Wet, washed bran may be used if the quantity of water is diminished accordingly. No food value.

### CELLU-BRAN MUFFINS—RECIPE 2

Cellu-flour.....	80 gm.
Dry, washed bran.....	50 "
Baking powder.....	10 "
India gum.....	10 "
Mineral oil.....	4 tablespoonfuls
Saccharin.....	$\frac{1}{2}$ gr.
Hot water	
Salt	

Mix dry ingredients thoroughly. Add oil and saccharin dissolved in a small amount of water. Add hot water sufficient to make a mixture which can be easily molded. Place in muffin tins, greased with mineral oil. Bake in a very slow oven, increasing heat to brown. No food value.

## CELLU-BRAN COOKIES—RECIPE 3

Cellu-flour.....	25 gm.
Dry, washed bran.....	60 "
Cinnamon.....	1 teaspoonful
India gum.....	10 gm.
Mineral oil.....	6 tablespoonfuls
Hot water.....	100 gm.
Saccharin.....	1 gr.
Vanilla	
Salt	

Mix dry ingredients thoroughly. Add oil, vanilla, and hot water, in which the saccharin has been dissolved. Shape into very thin cookies and bake in a hot oven until crisp and brown. No food value.

## CELLU-FLOUR GRIDDLE CAKES—RECIPE 4

Egg.....	1
Salt	
Hot water.....	2 tablespoonfuls
Cellu-flour	

Beat egg until light and creamy. Add salt, water, and sufficient cellu-flour to make a thick batter. Fry on hot griddle greased with mineral oil. This recipe contains 6 gm. protein and 6 gm. fat.

## HEPCO CAKES—RECIPE 5

Eggs.....	2
Cream (20 per cent.).....	60 gm.
Hepco flour.....	140 "
Butter.....	20 "
Water.....	100 "



## 50 A PRIMER FOR DIABETIC PATIENTS

Beat eggs, add cream, and then flour, beating all the time. Add water and melted butter. Mold into 12 cakes and bake. Each cake contains 6 gm. protein, 6 gm. fat: approximately 75 calories.

### BRAN CAKES—RECIPE 6

Bran.....	70 gm.
Butter.....	30 "
Eggs.....	2
Egg white.....	1
Salt.....	1 level teaspoonful
Water	

Tie the bran in cheese-cloth and wash thoroughly by fastening on to the water-tap until the water comes away clear. The bran should be frequently kneaded so that all parts of it come in contact with the water. Wring dry. Mix bran, well beaten whole eggs, melted butter, and salt. Beat the egg white very stiff and fold in at the last. Shape with a knife and tablespoon into 36 small cakes. If desired 0.5 gm. cinnamon may be added. Each cake contains 0.5 gm. protein, 1 gm. fat: 11 calories.

### BRAN CAKES FOR CONSTIPATION—RECIPE 7

Bran.....	420 gm.
India gum.....	30 "
Water.....	2½ tablespoonfuls
Salt.....	1 teaspoonful

Put the bran in a double cheese-cloth bag. Wash under the cold water-tap until the water runs clear,

usually about three-quarters of an hour. Mix India gum and water to thick paste. Mix with washed bran, kneading the bran and gum together. Caraway seeds may be added. Spread in a thin layer on a baking sheet or on the bottom of baking pans and press smooth and flat and firm. Cut into cakes of desired size and bake in a moderate oven until biscuits are dry and crisp. No food value.

## TOMATO SOUP—RECIPE 8

Clear broth.....	1 cupful
Tomatoes, cooked.....	80 gm.
Onions, uncooked.....	10 "

To 1 cup of clear broth add 80 gm. of tomatoes and 10 gm. of onions cut fine. Cook for fifteen minutes. Season with salt and pepper and serve. Food value: 3 gm. carbohydrate; 1 gm. protein.

## VEGETABLE SOUP—RECIPE 9

Clear broth.....	2 cupfuls
*5 per cent. vegetables, uncooked.....	50 gm.
*10 per cent. vegetables, uncooked.....	25 "

To 2 cupfuls of clear broth add 30 gm. of tomato, 10 gm. of celery, 10 gm. of cabbage, 15 gm. of onions, and 10 gm. of carrots. Cook until vegetables are tender. Season with salt and pepper. Food value: 3 gm. carbohydrate; 1 gm. protein.

\* The 5 and 10 per cent. vegetables will be found listed on page 65.

## 52 A PRIMER FOR DIABETIC PATIENTS

### BEEF STEW—RECIPE 10

Meat, uncooked.....	125 gm.
5 per cent. vegetables, uncooked.....	50 "
10 per cent. vegetables, uncooked.....	50 "

To 125 gm. of meat add 3 cupfuls of boiling water and  $\frac{1}{2}$  teaspoonful salt, and let simmer until tender. Remove meat from water and add 50 gm. of cabbage, 25 gm. of carrots, and 25 gm. of onions. Boil until vegetables are tender. Add meat and serve. Food value: 5 gm. carbohydrate; 26 gm. protein; 15 gm. fat.

### BEEF STEW—RECIPE 11

Meat, uncooked.....	60 gm.
5 per cent. vegetables, uncooked.....	200 "
10 per cent. vegetables, uncooked.....	100 "

To 60 gm. of meat add 3 cupfuls of boiling water and  $\frac{1}{2}$  teaspoonful of salt, and let simmer until the meat is tender. Remove meat from water and add 100 gm. of tomato, 100 gm. of cabbage, 50 gm. of carrots, and 50 gm. onions. Boil until vegetables are tender. Add meat and serve. Food value: 12 gm. carbohydrate; 16 gm. protein; 8 gm. fat.

### BEEF STEW—RECIPE 12

Meat, uncooked.....	100 gm.
5 per cent. vegetables, uncooked.....	150 "
10 per cent. vegetables, uncooked.....	100 "

To 100 gm. of meat add 3 cupfuls of boiling water and  $\frac{1}{2}$  teaspoonful of salt, and let simmer until tender.

Remove meat from water and add 50 gm. of cabbage, 50 gm. of tomato, 50 gm. of celery, 50 gm. of carrots, and 50 gm. of onions. Boil until vegetables are tender. Add meat and serve. Food value: 11 gm. carbohydrate; 23 gm. protein; 11 gm. fat.

## BEEF STEW—RECIPE 13

Use Recipe 12, substituting 60 gm. of meat for the 100 gm. Food value: 11 gm. carbohydrate; 16 gm. protein; 8 gm. fat.

## NEW ENGLAND BOILED DINNER—RECIPE 14

Meat, uncooked.....	50 gm.
5 per cent. vegetables, uncooked.....	100 "
10 per cent. vegetables, uncooked.....	100 "
15 per cent. vegetables, uncooked.....	25 "

To 50 gm. of corned beef add 3 cupfuls of boiling water; simmer until the meat is tender. Remove meat, add 100 gm. of cabbage, 50 gm. of beets, 50 gm. of carrots, and 25 gm. of parsnips. Boil until tender. Add meat and serve. Season with salt and pepper. Food value: 13 gm. carbohydrate; 13 gm. protein; 5 gm. fat.

## NEW ENGLAND BOILED DINNER—RECIPE 15

Meat, uncooked.....	60 gm.
5 per cent. vegetables, uncooked.....	100 "
10 per cent. vegetables, uncooked.....	100 "
15 per cent. vegetables, uncooked.....	25 "
Potato, uncooked.....	100 "

## 54 A PRIMER FOR DIABETIC PATIENTS

To 60 gm. of corned beef add 3 cupfuls of boiling water; simmer until meat is tender. Remove meat; add 100 gm. of cabbage, 50 gm. of turnips, 50 gm. of carrots, 25 gm. of parsnips, and 100 gm. of potato. Boil until tender. Add meat and serve. Season with salt and pepper. Food value: 33 gm. carbohydrate; 19 gm. protein; 8 gm. fat.

### ROAST PORK AND FRIED APPLES—RECIPE 16

Roast pork, cooked.....	50 gm.
Apple.....	75 "
Butter.....	10 "

Put 50 gm. of roast pork (cooked) into small dish. Cover with 75 gm. of apples sliced and 10 gm. of butter. Add a small amount of water; cover and bake in a moderate oven about twenty minutes. Food value: 12 gm. carbohydrate; 14 gm. protein; 16 gm. fat.

### CREAMED CHICKEN WITH ASPARAGUS—RECIPE 17

Chicken, cooked.....	75 gm.
Asparagus, cooked.....	100 "
Milk.....	80 "
Cream.....	20 "
Butter.....	5 "

Cut 75 gm. of cooked chicken into small pieces. Add 100 gm. of asparagus. Heat 80 gm. of milk, 20 gm. of cream, and 5 gm. of butter. Pour over chicken and asparagus and reheat. Season with salt and pepper. Food value: 8 gm. carbohydrate; 22 gm. protein; 21 gm. fat.

## CREAMED CHICKEN WITH ASPARAGUS AND MUSHROOMS—RECIPE 18

Chicken or veal, cooked.....	50 gm.
Asparagus, cooked.....	50 "
Mushrooms, cooked.....	50 "
Milk.....	100 "
Cream.....	35 "
Butter.....	5 "

Mix 50 gm. of cooked chicken, 50 gm. of asparagus, and 50 gm. of mushrooms together. Heat 100 gm. of milk, 35 gm. of cream, and 5 gm. of butter. Pour over chicken, asparagus, and mushrooms; reheat and serve. Season with salt and pepper. Food value: 9 gm. carbohydrate; 18 gm. protein; 22 gm. fat.

## CHICKEN STEW—RECIPE 19

Chicken broth.....	1½ cupfuls
Chicken, cooked.....	50 gm.
Potato, uncooked.....	100 "
Cream.....	60 "
Milk.....	80 "
Butter.....	10 "
Peas.....	65 "

Cook 100 gm. of potato in 1½ cupfuls of clear chicken broth; save ½ cupful of the broth and add to it 60 gm. of cream, 80 gm. of milk, and 10 gm. of butter. Heat and add the cooked potato, 50 gm. of cooked chicken, and 65 gm. of cooked peas. Season with salt and pepper. Food value: 37 gm. carbohydrate; 25 gm. protein; 29 gm. fat.

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### BAKED FISH WITH BACON—RECIPE 20

Put 75 gm. of uncooked fish in a small baking pan. Cover with 15 gm. of bacon. Bake in a moderate oven about twenty minutes. Food value: 16 gm. protein; 14 gm. fat.

### BAKED FISH, SPANISH—RECIPE 21

Fish, uncooked.....	100 gm.
Water.....	$\frac{1}{2}$ cupful
Tomatoes, cooked.....	80 gm.
Onions, uncooked.....	10 "
Bacon.....	15 "

Put 100 gm. of fish in small baking dish, add  $\frac{1}{2}$  cupful of water, 80 gm. of cooked tomato, and 10 gm. of uncooked onions sliced fine. Cut 15 gm. of uncooked bacon into small pieces and add. Cover and bake in a moderate oven twenty minutes. Season with salt and pepper. Food value: 3 gm. carbohydrate; 21 gm. protein; 15 gm. fat.

### CREAMED EGGS—RECIPE 22

Egg.....	1
Egg white.....	1
Milk.....	100 gm.
Cream.....	30 "
Butter.....	6 "

Cut one hard-boiled egg and the white of another hard-boiled egg into pieces and add them to 100 gm. of milk, 30 gm. of cream, and 6 gm. of butter which have been mixed together and heated. Season with

salt and pepper. Food value: 6 gm. carbohydrate; 15 gm. protein; 19 gm. fat.

#### BAKED EGG AND TOMATO—RECIPE 23

Tomato, uncooked.....	100 gm.
Egg.....	1
Butter.....	5 "

Scoop out the center of a raw tomato that weighs 100 gm.; drop the egg into the tomato; cover with the scooped-out tomato pulp. Add 5 gm. of butter. Season with salt and pepper and bake about fifteen minutes in a moderate oven. Food value: 3 gm. carbohydrate; 7 gm. protein; 10 gm. fat.

#### POACHED EGG AND TOMATO—RECIPE 24

Tomato, cooked.....	100 gm.
Egg.....	1

Put 100 gm. of cooked tomato in a small pan; when the tomato is boiling drop the egg into the center. Remove the pan to a cooler part of the stove and let stand until the egg white is firm and a film forms over the yolk. Season with salt and pepper and serve. Food value: 3 gm. carbohydrate; 7 gm. protein; 6 gm. fat.

#### BAKED EGG WITH CHEESE—RECIPE 25

Egg.....	1
16 per cent. cream.....	15 gm.
Pale American cheese.....	25 "
Butter.....	5 "



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Butter a small dish with 5 gm. of butter. Add the egg, 15 gm. of cream, and 25 gm. of cheese grated fine. Bake in moderate oven until cheese is melted. Food value: 1 gm. carbohydrate; 13 gm. protein; 22 gm. fat.

### BAKED CAULIFLOWER WITH CHEESE—RECIPE 26

Cauliflower, cooked.....	150 gm.
Tomato, cooked.....	100 "
Cheese.....	25 "
Butter.....	5 "

Butter a small dish with 5 gm. of butter. Add 150 gm. of cauliflower cooked, 100 gm. of tomato, and 25 gm. of pale American cheese grated. Bake in moderate oven twenty minutes; 150 gm. of cabbage may be substituted for 150 gm. of cauliflower. Food value: 7 gm. carbohydrate; 10 gm. protein; 13 gm. fat.

### CREAMED POTATO—RECIPE 27

Potato, cooked.....	100 gm.
Cream.....	30 "
Milk.....	30 "
Butter.....	5 "

Mix 30 gm. of cream, 30 gm. of milk, and 5 gm. of butter, and heat. Add 100 gm. of cooked potato, diced. Season with salt and pepper and serve. Food value: 24 gm. carbohydrate; 4 gm. protein; 12 gm. fat.

## TOMATO JELLY SALAD—RECIPE 28

Tomato, cooked . . . . .	100 gm.
Onions, uncooked . . . . .	10 "
Allspice . . . . .	$\frac{1}{8}$ teaspoonful
Cloves . . . . .	$\frac{1}{8}$ "
Gelatin . . . . .	$\frac{1}{2}$ tablespoonful
Salt and pepper	

Cook 100 gm. of tomato, 10 gm. of onions, and  $\frac{1}{8}$  teaspoonful of allspice and  $\frac{1}{8}$  teaspoonful of cloves for five minutes. Strain through cheese-cloth and add enough water to make  $\frac{3}{4}$  cupful. Soak  $\frac{1}{2}$  tablespoonful of gelatin in  $\frac{1}{4}$  cupful of cold water and then add hot tomato juice. Chill and serve. Food value: 4 gm. carbohydrate; 1 gm. protein.

## VARIETY SALAD—RECIPE 29

Gelatin . . . . .	1 $\frac{1}{2}$ tablespoonfuls
Cold water . . . . .	$\frac{1}{2}$ cupful
Vinegar, hot . . . . .	$\frac{3}{4}$ "
Boiling water . . . . .	$\frac{3}{4}$ "
Salt . . . . .	$\frac{1}{2}$ teaspoonful
Celery, uncooked, cut fine . . . . .	50 gm.
Cabbage, uncooked, cut fine . . . . .	50 "
Green peppers, cut fine . . . . .	20 "
Lettuce, cut fine . . . . .	10 "

Soak gelatin in cold water, add vinegar, boiling water, and salt. When liquid has cooled add other ingredients. Mold and chill. Food value: 5 gm. carbohydrate; 2 gm. protein.

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### MAYONNAISE DRESSING—RECIPE 30

Egg yolk.....	1
Russian oil.....	2 cupfuls
Vinegar.....	2 tablespoonfuls
Salt.....	1 teaspoonful
Pepper	

Beat the egg yolk until thick. Add oil drop by drop, beating all the time. Then add little vinegar, then oil slowly, then vinegar as necessary. Add salt and pepper. Have all ingredients cold. This will make about twelve servings. Food value: 2 gm. protein; 6 gm. fat.

### PURITY CUSTARD—RECIPE 31

Egg white.....	1
Salt.....	$\frac{1}{8}$ teaspoonful
Vanilla	
Milk.....	100 gm.

Beat the egg white with a fork. Add the salt, a few drops of vanilla, and the milk. Mix well. Pour into a custard cup placed in a dish of water, and bake in a moderate oven. Food value: 5 gm. carbohydrate; 7 gm. protein; 4 gm. fat.

### CUSTARD—RECIPE 32

Egg.....	1
Egg white.....	1
Salt.....	$\frac{1}{8}$ teaspoonful
Vanilla	
Milk.....	100 gm.
Cream.....	30 "

Beat the egg and egg white with a fork. Add the salt, a few drops of vanilla, milk, and cream. Mix well. Pour into a custard cup placed in a dish of water, and bake in a moderate oven. If desired, saccharin may be added. Food value: 7 gm. carbohydrate; 14 gm. protein; 15 gm. fat.

## CUSTARD—RECIPE 33

Egg.....	1
Salt	
Vanilla	
Milk.....	100 gm.
Cream.....	40 "

Beat the egg. Add salt, a few drops of vanilla, saccharin if desired, milk, and cream. Mix well. Pour into a custard cup placed in a dish of water, and bake in a moderate oven. Food value: 7 gm. carbohydrate; 10 gm. protein; 18 gm. fat.

## JUNKET—RECIPE 34

Milk.....	100 gm.
Cream.....	35 "
Junket.....	$\frac{1}{4}$ tablet
Cold water.....	1 tablespoonful
Vanilla	

Heat milk and cream until lukewarm, or 100° F. Dissolve the junket tablet in the cold water. Add the dissolved junket tablet and a few drops of vanilla to the lukewarm milk. Stir quickly several times; pour into

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custard cups and let stand in a warm place until set; then place in refrigerator. Food value: 7 gm. carbohydrate; 4 gm. protein; 10 gm. fat.

### JUNKET—RECIPE 35

Milk.....	80 gm.
Cream.....	20 "
Junket.....	¼ tablet
Cold water.....	1 tablespoonful
Vanilla	

Prepare as Recipe 34. Food value: 5 gm. carbohydrate; 2 gm. protein; 7 gm. fat.

### RASPBERRY JELLY—RECIPE 36

Gelatin.....	2 tablespoonfuls
Cold water.....	1 cupful
Boiling water.....	3 cupfuls
Raspberry flavoring.....	2 tablespoonfuls
Saccharin.....	1 gr.

Soak the gelatin in cold water for five minutes. Then add boiling water, raspberry flavoring, and saccharin. Put in a cold place to jell. This jelly need not be reckoned as food.

### COFFEE JELLY—RECIPE 37

Gelatin.....	2 tablespoonfuls
Cold water.....	1 cupful
Boiling coffee.....	3 cupfuls
Saccharin.....	1 gr.

Soak the gelatin in cold water. Add the boiling coffee and saccharin. Stir the gelatin until it is dissolved. When cool, chill. This will make about six servings and need not be reckoned as food.

## COFFEE BAVARIAN—RECIPE 38

Gelatin.....	7 gm.
Cold water.....	40 "
Clear coffee, boiling.....	100 "
Saccharin.....	1 gr.
Egg white.....	1

Soak the gelatin in cold water. Add the boiling coffee and saccharin. When jelly begins to thicken, fold in egg white beaten stiff. Chill. This recipe makes one serving. Food value: 4 gm. protein.

## MAPLE SYRUP—RECIPE 39

Agar-agar.....	4 gm.
Hot water.....	1 cupful
Mapleine extract.....	$\frac{1}{4}$ teaspoonful
Saccharin.....	$\frac{1}{4}$ gr.

Dissolve the agar-agar in hot water. Cook until the mixture is clear, add mapleine, remove from fire, and add saccharin. Serve hot. No food value. This recipe is suggested by the Dietetic Cellulose Company, as are Recipes 1, 2, 3, and 4.

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### COCOA SHELLS—RECIPE 40

Cocoa shells.....	30 gm.
Milk.....	150 "

Soak the cocoa shells over night in one cupful of water. Bring slowly to the boiling-point. Add the milk, heat, strain, and serve. Saccharin may be added if desired. Food value: 7 gm. carbohydrate; 5 gm. protein; 7 gm. fat.

## SECTION IX

### TABLES OF FOOD VALUES

The following vegetables, fruits, and nuts have been classified according to their carbohydrate content by Dr. Elliott P. Joslin. This classification is of great convenience.

TABLE I

5 per cent.	10 per cent.	15 per cent.	20 per cent.
Cucumbers	Pumpkin	Green peas	Potato
Lettuce	Turnip	Artichokes	Shell beans
Spinach	Kohl-rabi	Parsnips	Canned lima beans
Asparagus	Squash		Baked beans
Rhubarb	Beets	Apples	
Endive	Carrots	Pears	
Marrow	Onions	Apricots	Boiled rice
Sorrel	Leeks	Blueberries	Macaroni
Sauerkraut		Cherries	
Beet greens	Grapefruit	Currents	Plums
Dandelion greens	Lemons	Raspberries	Banana
Swiss chard	Oranges	Huckleberries	Prunes
Celery	Cranberries		
Tomato	Strawberries	Hickory nuts	English walnuts
Brussels sprouts	Blackberries	Black walnuts	
Water-cress	Gooseberries	Pecans	Almonds
Sea kale	Peaches	Filberts	25 per cent.
Cauliflower	Pineapple	Beechnuts	Peanuts
Egg plant	Watermelon		
Cabbage			
Radishes	Brazil nuts		
String beans			
Brocoli			
Mushrooms			
Butternuts			



Reckon the available carbohydrate in the vegetables of the 5 per cent. group as 3 per cent.; of the 10 per cent. group as 6 per cent. All of the vegetables in these two groups contain less than 5 to 10 per cent. carbohydrate respectively. The carbohydrates in the other vegetables together with that of the fruits and nuts should be reckoned as listed above.

In the process of cooking, foods lose both in weight and in carbohydrate content due to the loss of water and carbohydrate which is dissolved out. These losses approximately balance each other so that the foods may be weighed either fresh or after cooking provided the water in which they are cooked is discarded. When they are served in the water in which they are cooked, as in the case with stewed rhubarb, vegetable soups, and stewed fruits, they should be weighed fresh.

The following table contains most of the common foods entering into the composition of diabetic diets. For more complete tables consult Locke, E. A., "Food Values," D. Appleton & Co., New York, or Atwater, W. A., and Bryant, A. P., "The Chemical Composition of American Food Materials," Bulletin No. 28, U. S. Dept. of Agriculture. The latter publication may be obtained by sending 10 cents in coin to the Superintendent of Documents, Government Printing Office, Washington, D. C.

TABLE II

<i>Vegetables and Fruits:</i>	Composition of 100 gm.		
	Carbohydrate, per cent.	Protein, per cent.	Fat per cent.
5 per cent. vegetables.....	3	1	0
Thrice-cooked 5 per cent. vegetables.....	1	0	0
10 per cent. vegetables.....	6	1	0
Thrice-cooked 10 per cent. vegetables.....	3	0	0
15 per cent. vegetables.....	15	2	0
Shelled green peas.....	15	7	0
20 per cent. vegetables:			
Potato.....	20	2	0
Beans (shelled).....	20	7	0
Green corn.....	20	3	1
10 per cent. fruits.....	10	1	0
15 per cent. fruits.....	15	1	0
20 per cent. fruits.....	20	1	0
Green olives.....	2	1	10
Ripe olives.....	4	2	20
<i>Nuts:</i>			
Butternuts.....	3	28	61
Brazil nuts.....	7	17	67
Hickory nuts.....	11	15	67
Black walnuts.....	12	28	56
Pecans.....	13	11	71
Filberts.....	13	15	66
Beechnuts.....	13	22	57
English walnuts.....	16	17	63
Almonds.....	17	21	55
Peanuts.....	24	26	39
Chestnuts.....	42	6	5

TABLE II (Continued)

	Composition of 100 gm.		
	Carbohydrate, per cent.	Protein, per cent.	Fat, per cent.
<i>Cereals and Bread-stuffs:</i>			
Oatmeal (weighed dry).....	67	16	7
White bread.....	53	9	2
Whole wheat bread.....	49	10	1
Corn bread.....	46	8	5
Rye bread.....	53	9	1
Bran cakes (Recipe 6).....	0	0.5	1
Hepco cakes (Recipe 5).....	0	6	6
Wheat flour.....	76	8	1
Cellu flour (Dietetic Cellulose Co.).....	0	0	0
Hepco flour (Waukesha Health Products Co.).....	22*	43	21
<i>Dairy Products:</i>			
Whole milk.....	5	3	4
Skimmed milk.....	5	3	0
Cream, 16 per cent. fat.....	5	3	16
Cream, 20 per cent. fat.....	5	3	20
Cream, 40 per cent. fat.....	3	2	40
Buttermilk.....	5	3	1
Koumiss.....	5	3	2
Butter.....	0	1	85
Cheese, American (pale).....	0	29	36
Cheese, American (red).....	0	30	38
Cheese, cottage.....	4	21	1
Cheese, Swiss.....	1	28	35
Eggs, each.....	0	6	6
Egg white (one).....	0	4	0
Egg yolk (one).....	0	2	6

\* Largely non-assimilated.

TABLE II (Continued)

	Composition of 100 gm.		
	Carbohydrate, per cent.	Protein, per cent.	Fat, per cent.
<i>Meats and Fish:</i>			
Meat, lean, fresh.....	0	20	10
Meat, lean, cooked.....	0	25	15
Beef, roast fat, cooked.....	0	22	29
Bacon, lean .....	0	16	43
Bacon, fat. ....	0	10	67
Fish, halibut, lake trout, perch, whitefish.....	0	18	5
Fish, salmon, fresh, or canned..	0	22	13
Oysters.....	4	6	1
Lard, tallow, oleomargarine, cod-liver oil, olive oil, Crisco, and other oils except mineral oil.....	0	0	85 to 100
Mineral oil.....	0	0	0

In Table II fractions of grams have been omitted in order to facilitate the patient's work in estimating his diet.



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