Principles of a Low Fat Diet

By E. A. Hildreth, M.D., D. M. Hildreth, B.S., and S. M. Mellinkoff, M.D.

From personal experience on low fat diets and through experience gained treating patients with low fat diets, the authors suggest that when such a diet is prescribed carefully it may be quite palatable and also reduce serum cholesterol concentration. The principles of a low fat diet and methods for making the diet appetizing are presented. Sample diet instruction sheets which can be individualized for different patients are also illustrated.

A GROWING body of evidence has suggested that a reduction or modification in the form of the serum cholesterol concentration is one practical method of preventing or possibly even treating atherosclerosis. Since it has been demonstrated that decreasing the amount of fat in the diet is an effective means of lowering the serum cholesterol concentration and certain other lipid components of the blood, clinicians and investigators have prescribed a variety of low fat diets. It is not the purpose of this paper to discuss the theoretic or experimental ramifications of this subject, but rather to present certain principles in the formulation of a low fat diet found to be helpful in enlisting the cooperation of patients.

Components of the Diet to Restrict

Conflicting reports in the literature recommend restriction of animal fat or cholesterol in order to reduce serum cholesterol concentration, but little attention has been paid to vegetable fat. Animal fats, found largely in meats and dairy products, contain cholesterol as well as fat. On the other hand, vegetable fats, such as margarines, vegetable cooking oils, and peanut butter, are high in fat content but contain no cholesterol.

There is good evidence that, when attempting to lower serum cholesterol concentration in patients by dietary means, the animal fat content of the diet must be restricted. Also, in human subjects, the addition to the diet of vegetable fat, containing no cholesterol, will raise the serum cholesterol concentration. This and other evidence indicates that the total fat content of the diet is a more important factor in determining serum cholesterol concentration than is the amount of cholesterol ingested.

For these reasons and from experience gained in treating patients, we believe that a diet restricting total fat is a practical and effective dietary means of reducing serum cholesterol concentration. A low fat diet in most cases automatically restricts cholesterol ingestion, but the latter seems to require no special attention if the objective is to reduce serum cholesterol concentration.
**General Principles**

It is not satisfactory to apply a standard regimen to every patient. Individual tastes are so variable that it is far more effective to give the patient a knowledge of his dietary restrictions and let him adapt the prescribed program to his own needs. This policy is particularly necessary if the patient eats at places where food cannot be specially prepared for him.

In order to prevent confusion in the practical application of the diet at home, it is important to have the person responsible for the preparation of the patient’s meals present when diet instruction is given.

The amount of fat restriction needed to reduce the serum cholesterol concentration varies in different people. One subject's serum cholesterol may fall appreciably on a 60 Gm. fat diet. In the next case, there may be no change in the serum cholesterol until the dietary fat is less than 20 Gm. daily.

Serial determinations of the serum cholesterol concentration will measure the effectiveness of the prescribed diet. It is our usual practice to start normocholesteremic patients on 25 to 30 Gm. fat diets. In one month or more, if the serum cholesterol concentration has not responded in the manner desired, the diet is further restricted until the serum cholesterol concentration is significantly reduced. In some cases, usually in hypercholesterolemic patients, we have found it necessary to restrict dietary fat to as little as 10 Gm. per day to obtain this effect. In some of these last-mentioned cases it has been noted that although one could reduce the serum cholesterol concentration by 100 to 500 mg. per 100 ml. by such diets, normal values could not be reached. Generally speaking, the more severely one limits dietary fat, the more rapid and the greater is the reduction in serum cholesterol concentration.

In calculating diets, it is usually necessary to have access to detailed tables in which one can look up the fat content of foods. Many texts, even some recent ones, contain tables that are now out of date. Although there are other good references, we have found reliable data in the tables in the most recent edition (1951) of “Food Values of Portions Commonly Used” by Bowes and Church.

**Diet Instructions**

Tables 1 and 2 contain diet sheets which we have found useful in instructing patients. One notes in table 1 that blank spaces have been left in most paragraphs concerned with the various groups of foods that are particularly high in fat content. (For quantitative data see table 3). Filling these in while discussing the diet with the patient makes it possible to individualize the diet and at the same time give the patient something in writing to which he can refer.

The first step in formulating the diet is for the physician to ask the patient to submit an outline menu of what he eats during an average day. Many patients will list only their three main meals and forget to mention snacks. Usually, this information must be obtained through direct questioning by the physician. From these sample menus one can readily determine the food habits of the patient and those foods which must be limited in amount in order to restrict the diet to the desired number of grams of fat.

For a diet containing 25 to 30 Gm. of fat daily the instructions from the physician to the patient could be as shown in the next two examples:

**Example A:** A few patients will have no desire for butter or eggs. Therefore the diet sheet in table 1 would be filled in as below:

- Meat, Fish and Poultry: 3 servings (18 Gm. of fat).
- Bread and Cereal: 4 slices of bread (4 Gm.).
- Eggs: None
- Beverages: 1 qt. of a powdered milk preparation (1 Gm.)
- Butter: None
- Salads: one tbsp. of salad dressing (6 Gm.)

**Example B:** Most patients would like to have their fat allotment permit the use of all the fat containing substances in table 1. This can be modified as follows:

- Meat: 2 servings (12 Gm. of fat)
- Eggs: substitute (for meat, when desired)
- Bread and cereal: 3 slices (3 Gm.)
- Beverages: 1 to 2 qts. of a powdered milk preparation, or skim milk (1 Gm.)
- Butter: 2 pats
- Salad dressing: only when substituted for the daily butter allowance.
Besides marking the diet sheet, the patients need further instructions on several very important points.

**Gravy.** No natural gravy is permitted; however certain relatively fat-free gravies can be added or roasted or cooking.

**Beverages**

Consomme

You are allowed one serving of lean meat. See attached list. No natural gravy allowed.

**Eggs or Cheese**

You are allowed one medium egg per day. One egg may be substituted for one serving of meat. Cheese may also take the place of one serving of meat. See attached list for amount. Cottage cheese may be used freely up to one-half cup.

**Vegetables, Potatoes and Potato Substitutes**

With the exception of soybeans, all vegetables and potatoes may be used as desired. When one cup of noodles, macaroni and spaghetti are used they must be used in place of one piece of bread.

**Fruits**

As desired.

**Desserts**

No pastries of any kind, also no ice cream. Fruit, fruit ices, gelatin, Jello, and angel food cake are the only desserts permitted.

**Bread and Cereal**

You are allowed one slice(s) of bread per day. The type of bread does not matter. Rolls and crackers are not permitted. Any cereal is all right except cooked oatmeal which is forbidden. Pancakes made with Aunt Jemima mixes, and skim milk only can be used in place of 1 slice of bread. Size of pancake is 4 inches in diameter.

**Beverages**

Coffee without cream, tea and liquor may be used if permitted by the doctor. Milk allowance for the day is

**Beverages**

Your butter allowance per day is standard pat(s). This may be used as you desire, on bread, vegetables, in cooking, etc. Jellies may be used in place of butter on your bread.

**Salads**

As you wish except for avocados, ripe and green olives. Salad dressing may be used as a substitute for butter. One tablespoon for one pat of butter. Mineral oil dressing and mayonnaise may be used freely. Sweetened vinegar is a good dressing for vegetable salads.

**Candies and Nuts**

Only the following candies are permitted: fondant, gum drops, hard candy, jelly beans, marshmallows, and cream mints. No chocolates or nuts.

**Condiments**

As desired.

**Soups**

Consomme and bouillon may be used freely. Other soups with the fat drained off may be used occasionally.

No cream soups permitted.

**Sandwiches**

May be eaten, using some of the meat allowance for that day. Mustard may be used up to 2 teaspoons per day. Mayonnaise may be used if substituted for butter. Pickle relish and ketchup are helpful in making a sandwich tasty and are allowed. No peanut butter sandwiches.

made. For example, after meat has been broiled, roasted or pan broiled the fat can be drained off, and bouillon, consomme or tomato soup added to the meat in the last few minutes of cooking. The addition of flour for thickening the juice then makes a substitute gravy containing very little fat.

"Regular gravy" very low in fat content can be made in the following manner: When cooking a roast, cook it for two-thirds of the necessary time the day before serving. Collect the meat drippings and put them in the icebox.

**Table 1.**—Diet Instruction Sheet "A"

**Meat, Fish and Poultry**

Your meat allowance for the day is servings of lean meat. See attached list. No natural gravy allowed.

**Egg or Cheese**

You are allowed medium eggs per day. One egg may be substituted for one serving of meat. Cheese may also take the place of one serving of meat. See attached list for amount. Cottage cheese may be used freely up to one-half cup.

**Vegetables, Potatoes and Potato Substitutes**

With the exception of soybeans, all vegetables and potatoes may be used as desired. When one cup of noodles, macaroni and spaghetti are used they must be used in place of one piece of bread.

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**Table 2.—Diet Instruction Sheet “B”**

*One Serving of Meat and Poultry (fat trimmed off, lean as possible)*

(Measurements in Inches)

<table>
<thead>
<tr>
<th><strong>Beef</strong></th>
<th><strong>Fish</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Chuck, pot roasted—1 slice—2 x 1 1/2 x 1</td>
<td>Cod Fish Cakes—1 large</td>
</tr>
<tr>
<td>Corned, canned—1 slice—3 x 2 1/2 x 1</td>
<td>Halibut—1 piece—3 x 2 x 1</td>
</tr>
<tr>
<td>Corned, canned hash—1 cup</td>
<td>Herring, lake—1 fish</td>
</tr>
<tr>
<td>Dried, or chopped—5 to 6 slices</td>
<td>Salmon, chum—1 1/2 cup</td>
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<tr>
<td>Hamburger—one small</td>
<td>Salmon, pink or hump back—3/4 cup</td>
</tr>
<tr>
<td>Rib, roasted—1 slice—3 x 2 1/2 x 1</td>
<td><strong>Fish Servings Equivalent to 1/4 Serving of Meat</strong></td>
</tr>
<tr>
<td>Roast, canned—1 slice—3 x 2 1/2 x 1</td>
<td>Clams, long round—5-10</td>
</tr>
<tr>
<td>Round, 3 1/2 ounces</td>
<td>Fresh Cod—1 piece—3 x 3 x 1/2</td>
</tr>
<tr>
<td>Steak, club (sirloin)—4 x 1 x 1</td>
<td>Crab, canned or cooked—3/4 cup of flakes</td>
</tr>
<tr>
<td>Tongue, potted and deviled—1 rnd. tbsp.</td>
<td>Flounder—2 pieces—3 x 3 x 1/2</td>
</tr>
<tr>
<td>Liver,—2 slices, 3 x 2 1/2 x 1</td>
<td>Frog Legs—2-3 large legs</td>
</tr>
<tr>
<td>Liver, calves—2 slices, 3 x 2 1/2 x 1</td>
<td>Haddock—3 pieces—3 x 3 x 1/4</td>
</tr>
<tr>
<td>Liver spread—1 rnd. tbsp.</td>
<td>Herring, Pacific—1 small fish</td>
</tr>
<tr>
<td><strong>Pork</strong></td>
<td><strong>Lobster, canned—3/4 cup</strong></td>
</tr>
<tr>
<td>Bacon—broiled—1 strip—6 in. in length</td>
<td><strong>Oysters—5-8 medium</strong></td>
</tr>
<tr>
<td>Bacon—Canadian—1 slice</td>
<td>Perch, yellow—1 medium fish</td>
</tr>
<tr>
<td>Frankfurter—one, average size</td>
<td>Scallops—4-6</td>
</tr>
<tr>
<td>Ham, fresh cooked—1 slice—4 x 2 1/2 x 1</td>
<td>Shrimp, canned, drained—8-12</td>
</tr>
<tr>
<td>Ham, deviled—1 rnd. tbsp.</td>
<td>Smelts, raw—4-5 medium</td>
</tr>
<tr>
<td>Ham, spiced and canned—1 slice—3 1/2 x 2 1/2 x 1</td>
<td>Swordfish, raw—1 piece—3 x 3 x 1/4</td>
</tr>
<tr>
<td>Loin, roasted—1 slice—3 x 2 1/2 x 1</td>
<td>White Fish, raw—1 small serving</td>
</tr>
<tr>
<td>Bologna—1 slice, 4” diam. x 1/8 thick</td>
<td><strong>Miscellaneous</strong></td>
</tr>
<tr>
<td>Liverwurst—1 slice, 3” diam. x 1/4 thick</td>
<td>Luncheon meat—1 slice</td>
</tr>
<tr>
<td><strong>Veal</strong></td>
<td>Deviled meat—1 rnd. tbsp.</td>
</tr>
<tr>
<td>Breast, stewed—4 pieces, small</td>
<td><strong>Cheese (1 oz. equiv. to one serving of meat)</strong></td>
</tr>
<tr>
<td>Chop, loin, 1 chop 3/4” thick</td>
<td>Camembert</td>
</tr>
<tr>
<td>Cutlet—1 piece—4 x 2 1/2 x 1</td>
<td>American Cheddar</td>
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<tr>
<td>Leg, roasted—1 slice, 3 x 2 x 1/4</td>
<td>Edam</td>
</tr>
<tr>
<td>Shoulder, roasted—2 slices, 3 1/2 x 2 x 1/4</td>
<td>Gruyere</td>
</tr>
<tr>
<td><strong>Poultry and Game</strong></td>
<td>Liederkranz</td>
</tr>
<tr>
<td>Chicken, broiler—3 1/2 ozs. (no bone)</td>
<td>Limburger</td>
</tr>
<tr>
<td>“ canned—1 1/4 cup boned meat</td>
<td>Mysost</td>
</tr>
<tr>
<td>“ frier, leg—3 1/2 ozs. (no bone)</td>
<td>Pabst-ett</td>
</tr>
<tr>
<td>“ frier, breast—7 ozs. (no bone)</td>
<td>Swiss</td>
</tr>
<tr>
<td>“ hen, stewed—1 slice, 3 1/2 x 2 1/2 x 1/4</td>
<td>Velveeta</td>
</tr>
<tr>
<td>“ roast—2 slices, 3 1/2 x 2 1/2 x 1/4</td>
<td>Cheese Spreads</td>
</tr>
<tr>
<td>“ livers—2 large</td>
<td>Olive pimento</td>
</tr>
<tr>
<td>Turkeys—roasted—3 slices,—3 1/2 x 2 1/2 x 1/4</td>
<td>Pineapple</td>
</tr>
<tr>
<td>Duck—1 slice, 3 1/2 x 3 x 1/2</td>
<td>Relish</td>
</tr>
<tr>
<td>Quail—3 1/2 ozs.</td>
<td>Roka</td>
</tr>
<tr>
<td>Venison—3 slices—3 1/2 x 2 1/2 x 1/4</td>
<td></td>
</tr>
</tbody>
</table>
Table 3.—Fat Content of the Foods Mentioned in Tables 1, 2

<table>
<thead>
<tr>
<th>Food Description</th>
<th>Fat Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meat, Fish, Poultry, one serving</td>
<td>6.0 Gm.*</td>
</tr>
<tr>
<td>Egg, one medium</td>
<td>6.0 Gm.</td>
</tr>
<tr>
<td>Cheese, one serving</td>
<td>6.0 Gm.</td>
</tr>
<tr>
<td>Butter, and Margarine, one standard pat.</td>
<td>6.0 Gm.</td>
</tr>
<tr>
<td>Mayonnaise or Salad Dressing, 1 tbsp.</td>
<td>6.0 Gm.</td>
</tr>
<tr>
<td>Noodles, macaroni or spaghetti, 1 cup.</td>
<td>1.0 Gm.</td>
</tr>
<tr>
<td>Bread, 1 slice</td>
<td></td>
</tr>
<tr>
<td>Pancake, one Aunt Jemima (4 in. diameter)</td>
<td>1.0 Gm.</td>
</tr>
<tr>
<td>Skim milk (dairy), one pint.</td>
<td>0.5 Gm.</td>
</tr>
<tr>
<td>Skim milk (powdered), 1 to 2 pints.</td>
<td>0.5 Gm.</td>
</tr>
</tbody>
</table>

* The figure of 6 Gm. of fat per serving is an average value based upon all meats and cheeses appearing on the list, (table 2).

must be given methods by which he can make changes in the menu, within the limits of the fat restriction. These are discussed in table 1, under the foods involved. It should be remembered that although one pat of butter contains the same amount of fat as one serving of meat (table 3), it contains no protein and therefore should not be substituted for a serving of meat.

Foods that May Be Used Freely. Since fresh and canned vegetables and fruits (other than avocados), plain sugar candies, and fat free desserts can be used without restriction, there is no reason for the patients to be hungry or to lose weight, unless this is desired for other reasons.

Foods to Avoid. In general these fall into the following groups: (a) fried foods, (b) fatty cuts of meat, (c) cream, whole milk and their products, (d) concentrated vegetable oils such as peanut butter, shortening, mayonnaise, and similar substances, (e) avocados, nuts, olives, and soy beans.

Precautionary Measures. Instruct the patient that the family shopper should study food labels. If any product contains margarine, butter, shortening, oils, or eggs, or if there is any doubt as to the fat content, it should not be used.

On extremely low fat diets, the protein and vitamin requirements may become a problem. Protein requirements may be increased by the use of skim milk, powdered milk preparations, plain cottage cheese, bouillon and consomme. Proteinum is a good source of protein and contains only 2 Gm. of fat for every 42 Gm. of protein. If used, it should be dissolved in skim milk, water or some other relatively fat free substance.

The level of dietary fat below which a patient would be subject to vitamin deficiency is not clearly known. It would appear safest to add the fat soluble vitamins (water miscible preparations) to the diet when dietary fat is below 20 Gm. daily.

Summary

The principles of a low fat diet and methods of making the diet appetizing are presented.

Acknowledgment

The authors wish to express their appreciation to Dr. Isaac Starr and Dr. F. C. Wood for their help in the preparation of this paper.

REFERENCES

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