

# Dietotherapy

## THE LOW CHOLESTEROL, LOW FAT DIET

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PERHAPS no diet is receiving more careful scrutiny by the medical profession than the low cholesterol, low fat diet. There is by no means agreement as to the value of the diet or its quantitative definition. Even if this type of diet is assumed to be effective, knowledge is lacking about all the modifying conditions which might increase or nullify its efficacy. Nevertheless, increasing numbers of physicians are prescribing the diet, the essential features of which are reviewed here. The intelligent use of the diet demands that its characteristics be understood, and that each patient's response to the diet be evaluated frequently.

### TERMINOLOGY

A low cholesterol diet is not synonymous with a low fat diet. Vegetable fats, for example, do not contain cholesterol, although they may serve as precursors for the synthesis of cholesterol in the body. On the other hand, organ meats are significant sources of exogenous cholesterol, but, since they are low in fat, they would be permissible in a low fat diet. The diet discussed here is low in both cholesterol and fat. It will be noted in the list of foods to avoid that separate categories have been set up for foods high in cholesterol and high in fat. Some foods obviously fall into both groupings. It is thus possible so to modify the diet described here that it is low in exogenous cholesterol but contains more liberal allowances of fat.

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### CHARACTERISTICS OF THE DIET

#### *Cholesterol Content*

The cholesterol values reported for foods by Okey<sup>1</sup> have been used widely. A recent compilation of values has also been made by Lange.<sup>2</sup> Cholesterol is present to some extent in all animal tissues but occurs in greater concentrations in active tissues and in body fats. Thus, liver, brains, heart, kidney, and sweetbreads contain especially large amounts of cholesterol. Likewise, egg yolk, fish roe, and caviar are abundant sources. Whole milk, butter, cream, cheese, and ice cream contain appreciable amounts, as do all meats, the concentration in fatty meats being somewhat higher than in lean.

The sterols in plant foods are not absorbed from the gastrointestinal tract, and therefore it is possible to use most plant foods without restriction.

The normal diet varies in its cholesterol content, depending upon the choice of foods. It may contain as little as 200 mg. daily for the person who does not eat eggs, organ meats, and excessive amounts of butter; or it may be as high as 1600-1800 mg. if one eats several eggs, liver, fatty meats, and butter. If one assumes the use of the basic diet described in an earlier paper of this series,<sup>3</sup> the cholesterol content would be approximately as follows:

	<i>Amount</i>	<i>Cholesterol</i>
		<i>mg.</i>
Whole milk	3 cups	100
Egg	1 whole	300
Meat (excluding organ meats), lean	3 ounces	50
Cheese, whole-milk	1 ounce	50
Butter	2 tablespoons	85
	<b>TOTAL</b>	<b>585</b>

### Fat

It has been estimated that the endogenous production of cholesterol is ten to twenty times as great as the dietary cholesterol. Since cholesterol can be easily synthesized from fat, it is usually considered advisable to restrict both animal and vegetable fats. Fat levels as low as 15 to 25 Gm. daily have been employed by some.

### Dietary Adequacy

Normal levels of protein are permitted, that is, 1 Gm. per Kg. of body weight. Since the fat is greatly reduced, it becomes necessary to increase sharply the carbohydrate intake to maintain caloric balance unless, as often happens, weight reduction is also indicated. A satisfactory intake of essential minerals and vitamins can be achieved with proper planning. It should be recognized that, with the omission of all animal fats and all organ meats, the vitamin A is derived from carotene. Whenever inability to convert carotene to vitamin A is suspected, a supplement of vitamin A should be prescribed.

### Acceptability

One of the chief obstacles to the use of the diet is its reduced palatability. The patient is not only denied the delicate flavors added with butter or margarine as a spread for bread or a seasoning for vegetables, but is considerably limited in his choice of foods. For example, the omission of egg yolk, whole milk, and butter or other fats means that a goodly number of prepared foods are also contraindicated—many puddings, ice cream, pastries, cakes, cookies, and quick breads, to mention but a few.

Skim milk is not liked by many, but usually the individual becomes accustomed to it and in time may even prefer it to whole milk. Such a simple expedient as serving the milk ice cold deserves emphasis because so often this precaution is not taken. Skim milk may be used successfully in the preparation of cornstarch puddings (without egg), in cream soups thickened with a little flour-water paste (no

fat), in cocoa-flavored beverages, and in the preparation of fruit ices.

Cooked vegetables may be seasoned with salt, pepper, or a variety of herbs and spices. A dash of nutmeg on green beans, peas cooked with mint, corn with tomatoes, just a speck of mace with potatoes mashed with double-strength skim milk (made from nonfat milk solids) suggest a few possibilities for adding flavor appeal when fats are missing. Occasionally, vegetables may be cooked in a small amount of fat-free broth for taste variety.

### LOW CHOLESTEROL, LOW FAT DIET

*Include these foods each day:*

- 3 cups skim milk
- 5 ounces lean beef, veal, or lamb; poultry; or fish
- 1 serving whole-grain or enriched cereal
- 6 slices whole-grain or enriched bread
- 1 medium potato
- 1-2 servings leafy green or yellow vegetable
- 1 serving other vegetable
- 1 serving citrus fruit or other source of ascorbic acid
- 2 other fruits

For additional calories use: sugar, jelly, jam, or greater amounts of vegetables, fruits, cereals, or breads.

*Nutritive value of listed foods:* Cholesterol, 75 mg.; protein, 75 Gm.; fat, 25 Gm.; carbohydrate, 220 Gm.; calories, 1400; calcium, 1150 mg.; iron, 12 mg.; vitamin A, 6200 I.U.; thiamine, 1.5 mg.; riboflavin, 2.3 mg.; niacin, 16 mg.; ascorbic acid, 145 mg.

### AVOID THESE FOODS:

#### *High in Cholesterol*

Brains	puddings, custard, egg
Butter	noodles, griddle cakes,
Caviar	waffles, etc.
Cheese—all except skim-	Heart
milk cottage	Kidney
Cream	Liver
Egg yolk	Mayonnaise
Fish roe	Milk, whole
Foods containing egg	Shellfish: oysters, clams,
yolk, butter, whole	crabs, lobster, shrimp
milk, or cream: cake,	Sweetbreads
cookies, eggnog, pas-	Tripe
tries, pie, milk and egg	

#### *High in Fat*

Butter	Fats and oils, both ani-
Cheese, whole-milk	mal and vegetable:
Chocolate	lard, margarine, hydro-
Cream	genated fats, salad oils

Cream sauces  
 Fatty meat: bacon, ham, pork, sausage, salt pork; mackerel, herring, fish canned in oil; duck, goose

Fried foods: doughnuts, fritters, griddle cakes, etc.  
 Nuts; peanut butter  
 Pastries, pies  
 Salad dressings

*Dinner*

Lean meat, poultry or fish  
 Potato or substitute  
 Green or yellow vegetable  
 Bread—2 slices  
 Jelly or jam  
 Fruit or dessert  
 Skim milk—1 cup

Baked flounder with Creole sauce  
 Steamed rice  
 Zucchini squash  
 Bread—2 slices  
 Grape jelly  
 Angel cake with fresh strawberries  
 Skim milk

The following menu pattern is one way in which the foods in the above list might be arranged:

PATTERN MENU	SAMPLE MENU
<i>Breakfast</i>	
Fruit, preferably citrus	Half grapefruit
Cereal	Oatmeal with sugar
Skim milk—1 cup	Skim milk
Bread—2 slices	Whole-wheat toast—2 slices
Jelly, jam, or marmalade	Orange marmalade
Hot beverage	Coffee, with sugar, if desired
<i>Luncheon or Supper</i>	
Clear soup, if desired	Consommé
Lean meat or cottage cheese	Sandwich: 2 ounces lean roast beef
Bread—2 slices	2 slices rye bread Lettuce Prepared mustard Celery and carrot sticks
Green or yellow vegetable	
Skim milk	Skim milk—1 cup
Fruit	Fresh fruit cup

## SUMMARY

A low cholesterol, low fat diet which provides the recommended dietary allowances for the man or woman has been described. Since the value of this diet in vascular disease has not been established, and since it must be used indefinitely by those patients whom it may benefit, it is essential that the diet not be used indiscriminately. The patients for whom the diet is prescribed should be evaluated at frequent intervals to determine any possible benefits accruing from this regimen.

## REFERENCES

1. OKEY, R.: Cholesterol content of foods. *J. Am. Dietet. A.* 21: 341, 1945.
2. LANGE, W.: Cholesterol, phytosterol, and tocopherol content of food products and animal tissues. *J. Am. Oil Chem. Soc.* 27: 414, 1950.
3. ROBINSON, C.: Food therapy begins with the normal diet. *J. CLIN. NUTRITION* 1: 150, 1953.

