

# Dietotherapy

## DIETS RESTRICTED IN FAT

By CORINNE ROBINSON\*

THE FAT content of the normal diet may be modified both qualitatively and quantitatively. One or both of these changes may be desirable in order that the caloric intake may be increased or decreased, and that the kind and amount of fat ingested may be compatible with the efficiency of fat digestion. This article will be concerned with qualitative and quantitative fat restriction as it is usually applied in the dietary treatment of diseases of the gallbladder.

### NORMAL DIETARY ALLOWANCES FOR FAT

The modification of the fat content of the diet will be more intelligently planned when one is aware of the many important functions of fat in normal nutrition. Voluntarily, people in the United States select diets in which 20 to 40 per cent of the calories come from fat. The fat available for consumption per capita per day in this country is approximately 140 Gm.

Fats, being the most concentrated source of calories in the diet, supply  $2\frac{1}{4}$  times as many calories as do equivalent weights of protein and carbohydrate. Thus, a reduction of the fat content of the diet by 100 Gm. would necessitate the addition of 225 Gm. of carbohydrate and protein if the caloric level were to be kept constant. The bulk of the diet is thereby considerably increased and people who are ill may find it impossible to eat the additional amounts of food required to maintain caloric balance. One possibility often suggested to surmount the bulky diet is to include sugars such as glucose or lactose in fruit juices and prepared foods. This is an acceptable procedure for some patients, but not satisfactory for others.

Fats contribute importantly to the satiety value of the diet. The sense of well-being experienced from this class of foodstuffs is no doubt the result of the longer time which fats remain in the stomach. This factor is at least one reason why calorically restricted diets which are moderate in fat content give promise of greater success for the correction of obesity than do isocaloric diets severely restricted in fat but providing greater amounts of bulk in the form of fruits and vegetables.

The flavors and odors of fat impart palatability to the diet not replaceable by other dietary constituents. The mouth-watering qualities of a steak well marbled with fat, the fine flavor of buttered vegetables, the piquancy of flavors blended in a salad dressing, the satisfying quality of butter with bread—all call forth feelings of pleasure. In times of scarcity when food must be rationed, people are willing to stand in long lines in order to get their “share” of fats.

Fats are sources of the essential fatty acids, but these substances can be obtained even in diets severely restricted in fat. Under experimental conditions healthy persons have been maintained without untoward symptoms on diets providing only 1 per cent of the calories from fat. However, it would be practically impossible to achieve acceptance of such extreme diets by ill people.

Fats are carriers of the fat-soluble vitamins. Diets in which whole milk, egg yolk, and cheese are omitted are correspondingly reduced in vitamin A content. This reduction is not corrected by the inclusion of yellow and green leafy vegetables in those situations where the ability of the body to convert carotene to vitamin A is diminished. Thus, severe restriction of dietary fat will necessitate the addition to the diet of supplementary vitamin A.

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There is good reason to believe that some restriction of fat may be beneficial to many persons in that it may help to curtail the incidence of obesity. Nevertheless, in view of the important considerations noted above, it becomes essential in planning the fat-restricted diet to consider not only the qualitative and quantitative changes required, but also to consider the diet in all its aspects and the patient as an individual.

#### DIETARY SOURCES OF FAT

Approximately half of the fat in the average American diet is provided by the so-called "visible" fats. These include lard, butter, and plant oils from the cottonseed, soybean, corn, coconut, and peanut. The oils are used not only as such, but in the manufacture of hydrogenated fats and margarine under many brand names. Of these fats, butter and fortified margarine are the only ones which contain vitamin A—approximately 15,000 I.U. per pound.

Sources of the "invisible" fats include whole milk, whole milk cheeses, and cream; meat, poultry, and fish; egg yolk; nuts and cacao products; and there are small amounts of fat in grains and legumes.

Milk, cream, and cheese account for about one-fifth of the average daily fat intake. Whole milk is of relatively constant fat composition, varying from 3 to 4 per cent depending upon local regulations. Coffee cream contains about 18 per cent fat, and ice cream an average of 12 per cent fat. Hard cheese made from whole milk contains in excess of 30 per cent fat, but cottage cheese made from skim milk contains as little as 1 per cent fat.

Meat, poultry, and fish contribute approximately one-fifth of the daily fat in the diet. The average fat content of meat is about 15 to 20 per cent, but the range is wide. Very lean meats such as veal, liver, and turkey may contain as little as 6 per cent fat, while many pork products exceed 30 per cent fat.

All of the fat in the egg is concentrated in the yolk, each egg supplying about 6 Gm. The fat in the egg yolk is of special interest because it is associated with the most concentrated dietary source of cholesterol.

(Of plant foods, nuts and chocolate are ex-

ceptionally high in fat, containing in excess of 50 per cent fat. Olives and avocados are likewise high in fat. On the other hand, cereal grains, fruits, and vegetables contain less than 2 per cent fat.

Normally, fats are almost completely digested and absorbed, the coefficient of digestibility being about 95 per cent. The rate of digestion is dependent upon the kind and amount of fat in the diet. Highly emulsified fats such as those in butter, cream, whole milk, and egg yolk are easily utilized, and moderate amounts are well tolerated even by most individuals in whom there is some interference with the flow of bile. On the other hand, the fats in fatty meats and fish and in fried foods retard the rate of digestion, and may be poorly tolerated by those with a faulty bile production or flow.

#### RESTRICTED FAT DIET

The restricted fat diet used in diseases of the gallbladder should have the following characteristics: (1) nutrients provided at levels essential to maintain or restore normal nutrition; (2) fat restricted to a level compatible with adequate nutrition; (3) fats restricted to those which are highly emulsified and readily digested; and (4) foods bland in flavor and nondistending.

A fat restriction to approximately 60 Gm. daily can be achieved without compromising good nutrition. Some patients who require diets restricted in fat have a poor tolerance for strongly flavored vegetables, melons, legumes, and spicy foods. Others do not experience discomfort after eating such foods so that their inclusion or exclusion is a highly individual matter. One plan suitable for a fat-restricted diet is presented here:

RESTRICTED FAT DIET

Suggested basic foods	Household measure	Approximate weight, Gm.	Average fat content, Gm.
Milk	2 cups	480	18
Egg, whole	1	50	6
Lean meat, poultry, fish, or cottage cheese	5 ounces (raw wt.)	120 (cooked wt.)	17



Whole grain or enriched cereal	1/2 cup cooked or 3/4 cup dry	30 (dry)	1
Whole grain or enriched bread	3 slices	90	3
Potato, white or sweet	1-2 servings	150	Tr.
Green or yellow vegetable	1-2 servings	150	Tr.
Other vegetable	1 serving	100	Tr.
Fruit, including 1 citrus	3 servings	300	Tr.
Butter or margarine	3 teaspoons	15	12
<b>TOTAL FAT</b>			<b>57</b>

Nutritive value of basic list of foods: calories, 1475; protein, 75 Gm.; fat, 55 Gm.; carbohydrate, 170 Gm.; calcium, 0.9 Gm.; iron, 14 mg.; vitamin A, 12,500 I.U.; thiamine, 1.3 mg.; riboflavin, 2.0 mg.; niacin, 12.8 mg.; ascorbic acid, 140 mg.

The calorie level is increased or decreased by adjusting the amounts of bread and cereals, potato, sugars, and sweets. Desserts may be planned on the basis of the milk and egg allowance of the diet, and may include, in addition to fruit ices, gelatin desserts, milk puddings, and fruit whips made with egg white.

If severe fat restriction is necessary, the diet may be modified by substituting skim milk for whole milk, and omitting whole egg and butter or margarine. Such a diet requires supplementation with vitamin A whenever there may be a question of the conversion of carotene to vitamin A.

Additional protein may be provided by using nonfat milk solids, egg white, cottage cheese.

These foods are generally *contraindicated*:

#### High Fat Foods

Chocolate  
Cheese except cottage cheese  
Cream  
Fatty meats or fish; bacon, pork, goose, duck, mackerel, sardines  
Fried or greasy foods; griddle cakes, doughnuts, potato chips  
Gravies and sauces  
Nuts; peanut butter  
Oils, cooking fats  
Rich desserts: pie, ice cream, cookies, cake except Angel Food, pastries  
Salad dressings, including mineral oil dressings.

*Also omitted if not well tolerated:*

Strongly flavored vegetables: broccoli, Brussels sprouts, cabbage, cauliflower, cucumber, onions, peppers, radishes, turnips

Legumes

Melons

Berries

Spices

Meal plans should always be adapted to individual requirements. The following plan illustrates the use of the basic foods, but should not be construed as a fixed guide for the use of all persons.

#### SUGGESTED MEAL PATTERN

#### SAMPLE MENU

##### Breakfast

Citrus fruit	Half grapefruit
Cereal	Wheat flakes with milk and sugar
Egg—1 only, not fried	Soft cooked egg, 1
Toast	Toast
Butter—1 teaspoon only	Butter, 1 teaspoon
Hot beverage with milk, sugar. <i>No cream</i>	Coffee, black or with milk, sugar

##### Lunch or Supper\*

Clear soup, fat free, if desired	Boullion
Sandwich	Sandwich
Bread—2 slices	Wholewheat bread—2 slices
Butter—2 level tea spoons	Butter—2 teaspoons
Lean meat—2 ounces	Chicken—2 ounces (medium slice)
Raw vegetable	Lettuce
Fruit	Whole tomato
Milk—1 cup	Banana
Hot beverage, if desired	Milk

##### Dinner

Meat, poultry, or fish, lean—3 oz.	Roast beef, lean
Potato or substitute	Steamed rice (no fat)
Vegetable, green or yellow	Green beans (no fat)
Salad, if none served at noon. (No oil dressing!)	Carrot, celery strips
Fruit or low fat dessert	Raspberry ice
Milk—1 cup, as beverage or in dessert	Milk
Hot beverage, if desired	Tea with lemon, sugar

\* Planned as a lunch which might be carried to work, purchased at a lunch counter, or easily prepared in the home.