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The Health-Promoting Diet throughout Life: Adults

Marsha Read

Introduction

The normal diet for adults is based on the need to provide sufficient nutrients to sustain life and an appropriate balance of nutrient intake to support optimal health. The first *Surgeon General's Report on Nutrition and Health* in 1988¹ brought together a substantial body of research that documented that diet, aside from providing the essential nutrients for daily functioning, was a key factor with respect to chronic diseases such as coronary heart disease, cancer, diabetes, and obesity. The underlying premise of the various dietary guidelines/recommendations that have been developed has been to provide adequate nutrient intake while avoiding dietary patterns that might place an individual at greater risk for chronic disease. The following subsections describe the most commonly used dietary guidelines/recommendations, guidelines for counseling healthy adults, information on current food and nutrient consumption patterns of adults, and current research with respect to health implications of inappropriate macronutrient intake.

Dietary Recommendations and Guidelines

Dietary Guidelines

Dietary guidelines have undergone several revisions from the late 1970s to the recently released *Dietary Guidelines for Americans 2000*.² The 1970s Dietary Goals provided recommendations with respect to energy intake, carbohydrate, fat, and sodium intakes. Specific percent of calories from carbohydrate and fat were put forth, 48 and 30% respectively. Cholesterol intake was recommended at 300 mg/day and sodium intake was recommended not to exceed 5 g/day.³ The first set of the U.S. Dietary Guidelines was published in 1980⁴ ([Table 9.1](#)).

The first guidelines were followed by several revisions. The most recent iteration of dietary guidelines for Americans adopts a basic "ABC" concept — **Aim for Fitness, Build**

TABLE 9.11980 U.S. Dietary Guidelines

Eat a wide variety of foods
Maintain ideal weight
Avoid too much fat, saturated fat, and cholesterol
Eat foods with adequate starch and fiber
Avoid too much sugar
Avoid too much sodium
If you drink alcohol, do so in moderation

TABLE 9.22000 U.S. Dietary Guidelines^a

Aim for Fitness
 Aim for a healthy weight
 Be physically active each day
Build a Healthy Base
 Let the Pyramid guide your food choices
 Eat a variety of grains daily, especially whole grains
 Eat a variety of fruits and vegetables daily
 Keep food safe to eat
Choose Sensibly
 Choose a diet low in saturated fat and cholesterol, and moderate in total fat
 Choose beverages and foods that limit your intake of sugars
 Choose and prepare foods with less salt
 If you drink alcoholic beverages, do so in moderation

^a www.ars.usda.gov/dgac/dgacguideexp.pdf

a Healthy Base, and Choose Sensibly as the key constructs² (Table 9.2). These current dietary guidelines continue to emphasize sensible dietary choices, variety, and moderation.

From the first edition of the guidelines to the current, the focus has been on a variety of foods to supply adequate nutrient intake, increased complex carbohydrate consumption, moderate fat intake, and moderate alcohol consumption if you drink. A new concept added to the 2000 guidelines deals with the issue of food safety. This introduces a new concept on diet and health and reflects the current issues with respect to maintaining a safe food supply from production to consumption. The concept “Keep Food Safe” adds discussion on prevention of foodborne illness consistent with the concerns arising from several recent food poisoning outbreaks in the United States.

The Food Guide Pyramid

The Food Guide Pyramid sets forth recommendations for a pattern of daily food choices based on servings from five major food groups — bread, cereal, rice and pasta; fruit; vegetable; milk, yogurt and cheese; and meat, poultry, fish, dry beans, eggs and nuts⁵ (Figure 9.1). The visual presentation as a pyramid was meant to convey that from the five food groups emphasis should be placed on those shown in the lower three levels/sections of the pyramid. The Food Guide Pyramid was also meant to be used in concert with the dietary guidelines, i.e., to eat a variety of foods and balance the foods eaten with physical activity, and either maintain or improve weight. Each food group suggests a range of servings. Selecting the lower number of recommended servings is estimated to provide approximately 1600 kcals, with the mid-range providing approximately 2200 kcals, and 2800 kcals at the upper range. Refer to Table 9.3 for examples of menu plans at the lower and upper caloric range based on the Food Guide Pyramid. These estimates are intended

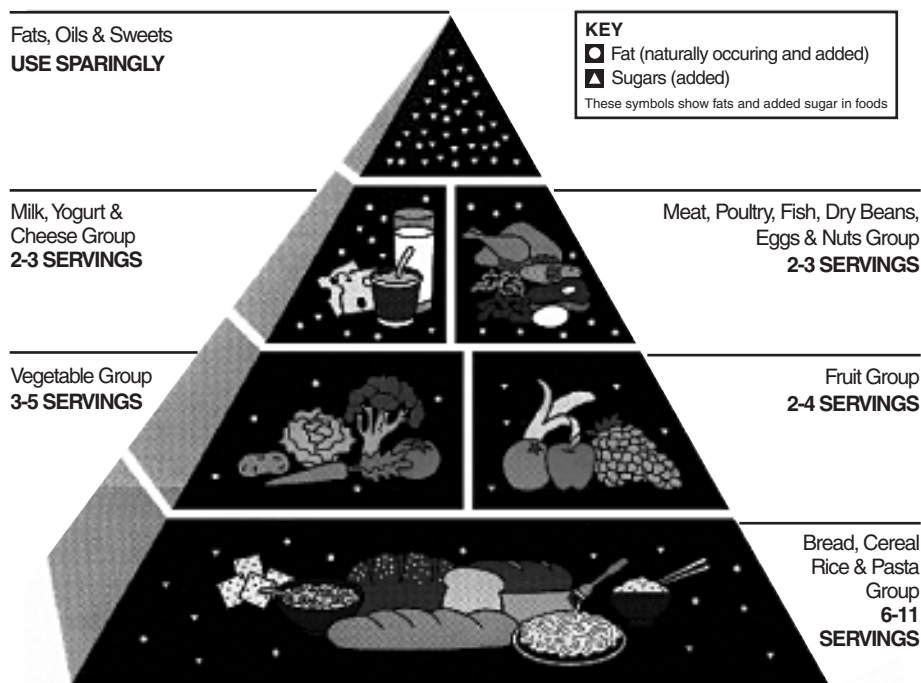


FIGURE 9.1
USDA Food Guide Pyramid.

to help consumers choose an appropriate level of caloric intake while maintaining an appropriate variety of foods to support health. In addition, the visual representation of the food guide as a pyramid was meant to imply that appropriate nutritional choices build upon a *base* of nutrient dense food choices before consuming foods from the less nutrient dense foods of fats, oils, and sweets at the top of the pyramid. Cited advantages and disadvantages of the Food Guide Pyramid according to Kant, Block, Schatzkin, et al.⁶ include:

Advantages:

- The pyramid depicts foods, which makes it easier for consumers to relate to rather than nutrients and numbers such as recommended dietary allowances (RDAs).
- The pyramid is relatively simple and easy to read and to remember.
- The pyramid food groups and recommended servings from each food group are likely to represent a variety of foods that can subsequently provide adequate nutrient intake.
- The pyramid food groups allow for personal choice within a food group and thereby supports individual food choices.

Disadvantages:

- Applicability of the food groups within the pyramid to alternate dietary patterns such as vegetarianism and ethnic food patterns may be unclear.
- The Food Guide Pyramid does not address the dietary guideline regarding alcohol intake.

TABLE 9.3

Meal Plans Based on the Food Guide Pyramid

1600 kcalorie Menu (Minimum Servings from Each Food Group)

Breakfast

- 1 cup Raisin Bran cereal
- 4 oz skim milk
- 1/2 grapefruit

Lunch

- Turkey sandwich with mustard
 - 2 pieces of whole wheat bread
 - 3 ounces lean turkey
 - 1 tablespoon mustard
- Carrot sticks (1 medium)
- Apple (1 medium)

Snack

- 1 cup low fat yogurt
- 1/2 sesame bagel

Dinner

- 3 ounces grilled salmon
- Green salad (romaine, iceberg lettuce, tomato, cucumber)
- 1 tablespoon low-fat dressing
- 1/2 cup green beans
- 1 cup wild rice

2800 kcalorie Menu (Upper Serving Recommendations from Each Food Group)

Breakfast

- 1 bowl oatmeal cereal with 1/4 cup raisins
- 4 ounces skim milk
- 2 pieces whole wheat toast
- 2 teaspoons margarine
- 1 tablespoon jam
- 4 ounces orange juice

Lunch

- 1 peanut butter and jelly sandwich
 - 2 pieces whole wheat bread
 - 1 tablespoon jelly
 - 2 tablespoons peanut butter
- Apple (1 medium)

Celery sticks (1 stalk)

Snacks (a.m. and p.m.)

- 1 ounce low fat cheese
- 4 crackers
- banana
- plain bagel

Dinner

- 3 ounces grilled chicken breast
 - 1/2 cup peas
 - 1 cup herb rice
 - Green salad (romaine, iceberg lettuce, sliced tomatoes, cucumber)
 - 1 tablespoon of low-fat dressing
 - Melon slices
 - Dinner roll
-

- Interpretation of combination foods as pizza, stews, etc., is not clear within the framework of the pyramid food groups.
- Dietary adequacy may not be obtained if individuals make poor choices within the pyramid food groups.

While there is only one Food Guide Pyramid published by the U.S. Department of Agriculture, variations of the pyramid have arisen. These variations have been constructed to help Americans with alternative dietary preferences build a healthy dietary pattern. These are described in other sections of this handbook (see Section 11 on Guidelines).

Recommended Dietary Allowances (RDA), Estimated Safe and Adequate Daily Dietary Intakes (ESADDIs), Daily Reference Intake (DRI), and Daily Values (DV)

The most common reference standard for nutrient intake has been the recommended dietary allowance (RDA). This standard was first established by the Food and Nutrition Board in 1941, with the most recent edition in 1989.⁷ The original intent was to review and revise the RDAs every four to five years, taking into account current research. The constructs used in formulating a specific RDA were: (a) an estimation of how much of each essential nutrient the average healthy person requires to maintain health and how those requirements vary among people; (b) an increase in the average requirement to cover the needs of almost all members of the population, based on a bell curve distribution; (c) an increase in the RDA again to cover cooking losses and inefficient body utilization, as well as provide for cases of greater nutrient need such as in pregnancy and infancy; and (d) use of scientific judgment in establishing the RDA. Three central premises underlie the RDAs:

1. The RDA is an amount intended to be consumed as part of a normal diet
2. The RDA is neither a minimal requirement nor an optimal level of intake, but instead represents a safe and adequate level of intake based on current scientific knowledge
3. The RDA is most appropriately used as a nutrient intake guide applied to subgroups of the population, but can be used to estimate the probable risk of nutrient deficiency for an individual.

For nutrients in which scientific evidence provides support for their essentiality but are insufficient to establish an RDA, there are estimated safe and adequate daily dietary intakes (ESADDIs). Most ESADDIs are shown as a range of intake values that represent the upper and lower limits of safe intake. ESADDIs are established for biotin, copper, manganese, and molybdenum.⁷

The current iteration of recommended intakes includes the dietary reference intake (DRI). DRI encompasses four types of nutrient recommendations for healthy individuals: adequate intake (AI); estimated average intake (EAR); recommended dietary allowance (RDA); and tolerable upper intake levels (UL).^{8,9} AI is a nutrient recommendation based on observed or experimentally determined approximation of nutrient intake by a group (or groups) of healthy people when sufficient scientific evidence is not available to calculate an RDA or an EAR. The EAR is the average requirement of a nutrient for healthy individuals in which a functional or clinical assessment has been conducted and measures of adequacy have been made at a specified level of dietary intake. The EAR is an amount of intake of a nutrient at which approximately 50% of subjects would have their needs met and 50% would not. The EAR is intended to be used for assessing nutrient adequacy of populations and not individuals. The new RDA is the amount of a nutrient needed to meet the requirements of nearly all (97 to 98%) of the healthy population of individuals

TABLE 9.4**WHO Dietary Recommendations**

Total Energy: sufficient to support normal growth, physical activity, and body weight (body mass index = 20-22)
Total Fat: 15-30% of total energy
Saturated fatty acids: 0-10% total energy
Polyunsaturated fatty acids: 3-7% total energy
Dietary cholesterol: 0-300 milligrams per day
Total Carbohydrate: 55-75% total energy
Complex carbohydrates: 50-75% total energy
Dietary fiber: 27-40 grams/day
Refined sugars: 0-10% total energy
Protein: 10-15% total energy
Salt: upper limit of 6 grams/day (no lower limit set)

for whom it was developed. An RDA for a nutrient should serve as an intake goal for individuals and not as a standard of adequacy for diets of populations. This is different than the previous or old RDA. UL values are established in cases where there is adequate scientific evidence to suggest an upper level of intake that is consistent with adverse or toxic reactions. The UL represents the maximum level of intake for a nutrient that will not cause adverse effects in almost all of the population ingesting that amount.

The daily values (DV) are used as standards in food labeling. DVs provide reference intake standards for nutrients that have an RDA, in which case they are referred to as reference daily intakes (RDIs), and for nutrients for which no RDA exists, in this case referred to as daily reference values (DRVs). DRVs are established for fat, saturated fat, cholesterol, carbohydrate, dietary fiber, sodium, and potassium. As a rule the RDIs are greater than the RDA for specific nutrients and provide a large margin of safety. The term RDI replaces the term U.S. Recommended Daily Allowances (USRDA) used on earlier food labels.¹⁰

World Health Organization (WHO) Recommendations

The World Health Organization (WHO) has also published diet recommendations with the goal of reducing risk for chronic disease.¹¹ WHO recommendations are expressed as a range of average daily intakes from lower to upper limits (Table 9.4).

Food Labels

Food labeling became mandatory in 1993 with the enactment of the Nutrition Labeling and Education Act (NLEA).¹⁰ The legislation required food labeling on most foods with the exceptions of low nutrient-dense foods such as coffee, spices, and ready-to-eat foods prepared on site. Nutrition information remains voluntary on many raw foods. The nutrition facts panel on food labels provides information to help the consumer make more informed choices, including information on calories per serving, calories from fat, saturated fat and cholesterol, and protein among other nutrients (Table 9.5).

American Cancer Society and National Cancer Institute Guidelines

In the 1980s the American Cancer Society issued the following dietary guidelines aimed at reducing cancer risk within the populace:¹²

1. Choose most of the foods you eat from plant sources.
 - Eat five or more servings of fruits and vegetables every day.

TABLE 9.5

Nutrition Facts Panel Information^a

Serving size (based on amounts commonly used)
Number of servings per container
Kcalories per serving
Kcalories from fat
% Daily value of total fat, saturated fat, cholesterol, sodium, total carbohydrate, dietary fiber, sugars, protein, vitamin A, vitamin C, calcium and iron
Reference values for total fat, saturated fat, cholesterol, sodium, total carbohydrate, and fiber
Kcaloric conversion guide for protein, fat, and carbohydrates

^a www.healthfinder.gov/searchoptions/topicsaz.htm — search for food labels.

- Eat foods from plant sources, such as breads, cereals, grain products, rice, pasta, or beans several times each day.
2. Limit your intake of high-fat foods, particularly from animal sources.
 - Choose foods low in fat.
 - Limit consumption of meats, especially high-fat meats.
3. Be physically active: achieve and maintain a healthy weight.
 - Be at least moderately active for 30 minutes or more on most days of the week.
 - Stay within your healthy weight range.
4. Limit consumption of alcoholic beverages, if you drink at all.

The National Cancer Institute endorses the following guidelines, which reflect in large part the recommendations of the American Cancer Society:¹³

1. Avoid obesity.
2. Reduce fat intake to 30% of total energy intake as a start. Then consider a reduction closer to 20% of total energy intake if at high risk, such as a family history of cancer.
3. Eat more higher-fiber foods, such as fruits, vegetables, and whole-grain cereals.
4. Include foods rich in vitamins A, E, and C, as well as carotenoids, in the daily diet.
5. If alcohol is consumed, do not drink excessively.
6. Use moderation when consuming salt-cured, smoked, and nitrite-cured foods.

There are also guidelines set forth by the National Cholesterol Education Program and the American Heart Association (refer to the section on cardiovascular disease).

Nutrition Counseling for Adults

Determining Energy Requirements

To plan a diet consistent with dietary guidelines, the nutrition professional should first determine the caloric requirements of a client. The total energy requirements will be the sum of the resting energy requirement, energy needs for physical activity and the energy needed for the thermic effect of foods. To determine the total energy requirement:

Step 1: Estimating Appropriate Body Weight

The Hamwi method is a common tool to estimate appropriate body weight. For females, the estimation is 100 lb for the first 5 feet of height and 5 lb per inch over 5 feet; e.g., a 5'6" woman would be calculated as: (100 lbs for first five feet) + (5 lbs/inch over 5 ft = 5 × 6 = 30) = 130 lbs. For men the estimation is 106 lbs for the first 5 feet of height and 6 lbs per inch over 5 feet; e.g., a 6'0" man's desirable weight would be calculated as: (106 lbs for first five feet) + (6 lbs/ inch over 5 feet = 6 × 12 = 72) = 178 lbs. Adjustments are made for a large frame (+10%) or a small frame (-10%).

Step 2: Estimating Energy Needs Based on Body Weight

To estimate energy needs, the first step is to determine resting energy requirements (REE). While several methods exist to calculate energy requirements based on weight, the abbreviated or quick method is probably useful for normal adults. The abbreviated method is as follows:

For adults:

Women wt in kg × 23

Men wt in kg × 24

Step 3: Estimating Energy Required for Physical Activity

Once the REE requirements are determined, an estimate of the energy needs for physical activity must be made. Again there are several alternatives to use to estimate caloric needs for physical activity. The Physical Activity Levels (PALs)¹⁴ method is shown below:

- Seated work with no option of moving around and little or no strenuous leisure activity (PAL factor = 1.4 to 1.5 × REE)
- Seated work with ability or requirement to move around but little or no strenuous leisure activity (PAL factor = 1.6 to 1.7 × REE)
- Standing work (housework, shop clerks) (PAL factor 1.8 to 1.9 × REE)
- Significant amounts of sport or strenuous leisure activity (30 to 60 minutes four to five/week) (PAL factor + 0.3 increment over 1.8 to 1.9 × REE)
- Strenuous work or highly active leisure (PAL factor 2.0 to 2.4)

Step 4: Add REE (Step 2) and Physical Activity (Step 3)

Step 5: Calculate Thermic Effect of Food

To estimate the thermic effect of food multiply the sum of the REE and physical activity by 10% and add that amount to the total.

Determining Protein, Fat, and Carbohydrate Requirements

After the total energy requirements are determined, the contributions from protein, fat, and carbohydrate need to be determined.

1. **Protein:** by converting grams of protein into its caloric equivalent, the percent of protein from total calories can be derived.

2. **Fat:** the recommendation for fat is 30% or less of total energy requirements.
3. **Carbohydrate:** the percent of calories that will come from carbohydrate will be the difference between total energy requirements minus the percent of calories from protein and fat.

Estimates of Actual Intakes of Adults for Macronutrients

Nutrition monitoring has been going on since the early 1900s in the United States, when the USDA's Food Supply Series was initiated.¹⁵ Currently the National Nutrition Monitoring and Related Research Program (NNMRRP) is the umbrella for activities that provide regular information about the contribution that diet and nutritional status make to health.¹⁶

Energy Intake

With respect to total energy intake, for adult men, caloric consumption consistently exceeds that of adult women by approximately 400 kcalories. With one age group exception (ages >70 years), men consumed in excess of 2000 kcalories on average, while women consistently averaged less than 2000 kcalories per day. Fat was contributing slightly above the recommended 30% of kcalories for both men and women. Adult men derive somewhat more kcalories from alcohol compared to women, but women are considerably higher in their carbohydrate intake than men. Men consumed not quite a third of their total energy intake from foods consumed away from home. For women, the contribution of energy from foods eaten away from home is one fourth of their total energy intake. Men were more likely than women to consume a diet that met 100% of the RDA. [Table 9.6](#) provides energy intake data on age cohorts for adult men and women based on the 1994-96 Continuing Survey of Food Intake for Individuals (CSFII). Foods eaten away from home are contributing approximately 30 to 40% of total kcalories consumed by young adults. The percent of kcalories derived from foods eaten away from home decreases with age ([Table 9.7](#)).

Total Protein, Carbohydrate, and Fat Intakes

Protein intake is higher for adult men compared to adult women, yet the mean protein intake for both men and women exceeds the 1989 RDA ([Table 9.8](#)). With their higher mean protein intake, more men (80.2%) than women (69.2%) met 100% of the 1989 RDA for protein. As with total energy intake, foods consumed away from home contribute at least 25% of the overall protein intake. For men, 29% of the total protein intake was derived from foods eaten away from home. For women, this was 24.6%.

Total carbohydrate intake is higher for men than women, consistent with their higher total energy intake. The mean intake of carbohydrate for adult men was roughly 50 grams/day higher than the adult female intake ([Table 9.8](#)). The mean fiber intake per day for both men and women is below even the lower level of the recommended 24 to 70 grams per day ([Table 9.9](#)).

Fat intake for adult men and women, as with protein and carbohydrate intakes, reflects the gender differences in total energy intake pattern, i.e., men consume more than women. The majority of adult men and women exceed the 30% of energy from fat recommendation. Only 29.4% of adult men and 36.8% of adult women maintained a diet within the 30%

TABLE 9.6Total Energy Intake and Sources of Energy for Adult Men and Women^a

Age	Males	Females
20–29 yrs	2821	1841
30–39 yrs	2665	1710
40–49 yrs	2435	1682
50–59 yrs	2270	1600
60–69 yrs	2072	1489
70 > yrs	1834	1384
20 < yrs	2455	1646

Sources of Energy Intake (% of Total kcalories)

Age	Protein		Total Fat		Carbohydrate		Alcohol	
	M	F	M	F	M	F	M	F
20–29 yrs	15.2	14.7	32.4	31.8	49.8	63.0	3.4	1.9
30–39 yrs	15.9	15.7	34.0	32.4	48.8	61.8	2.4	1.5
40–49 yrs	16.0	15.6	33.1	33.4	49.2	51.1	2.8	1.4
50–59 yrs	16.3	16.5	33.8	32.4	48.7	51.2	2.5	1.6
60–69 yrs	16.6	16.7	33.5	32.6	49.3	61.2	2.1	1.3
70 > yrs	16.3	16.7	33.0	31.4	50.9	63.3	1.6	1.5
20 < yrs	16.0	15.9	33.3	32.4	49.3	51.9	2.6	1.4

Percent of Individuals Meeting 100% of the 1989 RDA for Energy (2-Day Average)

Age	Males	Females
20–29 yrs	35.4	20.5
30–39 yrs	32.5	17.4
40–49 yrs	26.4	14.0
50–59 yrs	39.0	21.4
60–69 yrs	32.5	15.2
70 > yrs	19.5	12.4
20 > yrs	31.5	17.0

M = males, F = females

^a <http://www.barc.usda.gov/bhnrc/foodsurvey/home.htm>**TABLE 9.7**Contribution (% kcal) of Breakfast, Snacks, and Foods Consumed Away from Home to Total Energy Intake (1 day) 1994–1996; M = males; F = females^a

Age	Breakfast		Snacks		Foods Away From Home	
	M	F	M	F	M	F
20–29 yrs	14.2	16.0	18.2	17.0	40.0	34.3
30–39 yrs	15.5	16.9	15.5	16.9	31.4	26.6
40–49 yrs	16.3	16.9	15.5	17.1	29.4	25.4
50–59 yrs	18.2	19.1	15.4	15.2	26.7	23.0
60–69 yrs	20.9	19.9	15.0	15.1	20.0	17.6
70 > yrs	23.8	23.0	12.2	12.3	14.2	12.5
20 < yrs	17.1	18.2	15.7	15.9	29.4	24.5

^a <http://www.barc.usda.gov/bhnrc/foodsurvey/home.htm>

recommendation. Foods eaten away from home contributed 30.9% of the total fat intake for men and 26.2% for women (Table 9.8). Cholesterol intake is considerably less for women than men. Women of all age groups consumed under 300 mg/day, whereas, adult men generally consumed slightly more than 300 mg/day on average (Table 9.10). More

TABLE 9.8Total Protein, Carbohydrate, and Fat Intakes (gm)^a

Age	Protein Intake (gm)		Carbohydrate (gm)		Fat (gm)	
	M	F	M	F	M	F
20–29 yrs	104.1	65.9	344.9	241.6	103.3	65.9
30–39 yrs	102.7	65.3	322.3	218.8	102.7	63.2
40–49 yrs	95.3	63.5	294.7	213.8	95.3	63.5
50–59 yrs	90.3	64.1	273.1	201.5	90.3	59.4
60–69 yrs	83.5	60.4	252.5	188.7	83.5	56.2
70 > yrs	72.9	56.6	239.2	183.5	72.9	49.2
20 < yrs	94.9	63.8	298.8	211.7	94.9	50.5

M = males, F = females

^a <http://www.barc.usda.gov/bhnrc/foodsurvey/home.htm>**TABLE 9.9**Fiber Intake (gm)^a

Age	M	F
20–29 yrs	18.3	13.2
30–39 yrs	19.4	13.6
40–49 yrs	18.3	14.0
50–59 yrs	18.5	14.5
60–69 yrs	18.5	14.2
70 > yrs	17.7	14.2
20 < yrs	18.6	13.9

M = males, F = females

^a <http://www.barc.usda.gov/bhnrc/foodsurvey/home.htm>

adults consumed a diet consistent with the recommended cholesterol intake (55.1% of men; 79.4% of women) than for total fat, where only 29.4% of adult men and 36.8% of adult women maintained a diet within 30% of the total energy intake. The intake of the types of fat — saturated, polyunsaturated, monounsaturated, and cholesterol is presented in [Table 9.10](#).

Health Implications of Current Macronutrient Intakes

Energy and Obesity Issues

Overweight is associated with several chronic diseases — coronary heart disease, hypertension, noninsulin-dependent diabetes mellitus, and some forms of cancer.^{17,18} An estimated 300,000 Americans per year die from obesity-related conditions.¹⁸ Obesity is also an associated risk factor for joint disease, gallstones, and obstructive sleep apnea.¹⁹ In 1995, the economic cost associated with obesity was estimated at \$62.3 billion.²⁰

From 1976–1980 and 1988–1994, the Centers for Disease Control and Prevention (CDC) reported an increase of 10% in the incidence of overweight in the American population.²¹ Data from the CSFII, 1994 (<http://www.barc.usda.gov/bhnrc/foodsurvey/home.htm>) indicate among adults, both men and women, the incidence of overweight is approximately 30% ([Table 9.11](#)). If the incidence of obesity continues to rise at current rates, it is predicted that by 2230, every adult in the U.S. will be overweight.²²

TABLE 9.10

Intake of Saturated Fatty Acids, Monounsaturated Fatty Acids, Polyunsaturated Fatty Acids, and Cholesterol^{a,b}

Age	Saturated Fatty Acids		Monounsaturated Fatty Acids		Polyunsaturated Fatty Acids		Cholesterol	
	M	F	M	F	M	F	M	F
20–29 yrs	35.4	22.3	40.1	25.2	19.6	13.5	348	219
30–39 yrs	35.3	21.3	39.4	24.1	20.1	12.8	362	217
40–49 yrs	30.6	21.0	35.6	24.0	18.3	13.6	331	222
50–59 yrs	28.6	19.1	33.9	22.6	18.1	13.1	332	200
60–69 yrs	25.9	17.9	30.1	20.8	16.5	12.1	307	218
70 > yrs	22.8	15.9	26.4	18.7	13.9	10.6	270	188
20 < yrs	31.3	20.0	36.8	23.0	18.4	12.8	331	213

Percent of Individuals Meeting the Recommendations for Total Fat, Saturated Fat, and Cholesterol

Age	Total Fat		Saturated Fatty Acids		Cholesterol	
	M	F	M	F	M	F
20–29 yrs	29.3	40.1	34.1	42.3	63.1	77.0
30–39 yrs	28.1	35.9	30.7	39.7	62.6	80.9
40–49 yrs	27.4	30.5	31.7	38.5	53.5	76.0
50–59 yrs	28.0	36.5	36.2	46.0	54.2	80.7
60–69 yrs	33.9	38.0	42.1	46.1	58.1	78.7
70 > yrs	34.4	42.2	41.6	47.9	67.1	84.5
20 > yrs	29.4	36.8	34.5	42.7	55.1	79.4

M = males, F = females

^a Saturated fatty acids, monounsaturated fatty acids, polyunsaturated fatty acids in grams; cholesterol in milligrams.

^b <http://www.barc.usda.gov/bhnrc/foodsurvey/home.htm>

TABLE 9.11

Incidence of Overweight (%)^a

Age	Men	Women
20–29 yrs	21.5	22.1
30–39 yrs	32.3	27.4
40–49 yrs	37.0	36.1
50–59 yrs	39.9	37.8
> 60 yrs	40.7	33.4
< 20 yrs	31.8	31.7

^a <http://www.barc.usda.gov/bhnrc/foodsurvey/home.htm>

The prevalence of overweight/obesity among Americans is at odds with the perceptions of the importance of maintaining an appropriate body weight. When Americans were surveyed as part of the 1994–96 USDA Diet and Health Knowledge survey, 68.1% of adult males over 20 years of age reported that “maintaining a healthy weight” was very important. For that same survey, 77% of the adult women over 20 years of age reported maintenance of a healthy body weight as very important. Given the importance Americans place on maintaining healthy body weight and given the high incidence of overweight/obesity, it is little wonder that Americans spend in excess of \$33 billion a year on weight loss schemes.²³ Among these are the myriad of weight loss diets that appear on the market every year. In 1992, 33–40% of American women and 20–24% of American men reported being on a diet.²⁴

Fad Diets Used for Weight Loss Promotion

While numerous fad diets come and go, several categories tend to remain fairly common. These include high protein/low carbohydrate diet regimens, low fat diets, and very low calorie diets.

High Protein/ Low Carbohydrate

These diets generally restrict the carbohydrate intake to 100 grams or less per day. Restriction of carbohydrate leads to an initial mobilization of glycogen and then to gluconeogenesis and ketosis, all of which promote water loss and some lean tissue loss, which constitute a significant portion of the weight loss. Some of the low carbohydrate diets promote high protein and consequently a higher animal fat intake which is inconsistent with the dietary guidelines for fat intake.²⁵ Examples of high protein/low carbohydrate diets are Atkins' Diet Revolution, Calories Don't Count, and The Doctor's Quick Weight Loss Diet (Stillman's).

Low Fat Diets

Generally these diets restrict fat intake to 20% or less of total energy intake. Examples of these types of diets include the T-factor Diet, the Pasta Diet, the Pritikin Diet, and Fit or Fat. The average weight loss on these types of diets is 0.1 to 0.2 kg per week. With the limited fat intake, one drawback is the low satiety factor which may prompt noncompliant diet behavior.²⁶

Very Low Calorie Diets

These diets arose during the 1970s and were known as protein-sparing-modified fasts or liquid protein diets. These diet plans generally rely on liquid supplements to substitute for food intake and restrict the overall caloric level to less than 800 kcalories per day. These diets may be indicated for moderately to several obese patients (BMI >30). The severe caloric restriction does lead to weight loss, but generally this level of caloric intake cannot be sustained, and weight regain is a potential problem. These diets may also lead to weight loss from lean tissue mass.^{23, 27}

The Zone Diet

The Zone Diet is a modified approach to the low carbohydrate-high protein type of diet. The diet promotes a macronutrient intake of 30% protein, 30% fat, and 40% carbohydrate. At this ratio of protein: fat: carbohydrate, the author contends that insulin levels will remain stable, and this, in turn, dampens insulin's potential to promote the conversion of carbohydrates into fat and thereby promote weight gain. The Zone Diet claims go beyond the promise of weight loss via insulin regulation into the realms of disease prevention. The Zone Diet author argues that a high carbohydrate, low fat diet promotes an imbalance in "bad" eicosanoid production that can lead to the development of such diseases as arthritis and coronary heart disease. However, there is no significant body of evidence to support the author's claims.^{28, 29}

Putting fad diets aside, an approach to weight management that recognizes overweight obesity as a chronic condition and incorporates the elements of a healthy diet, exercise, and behavior modification, is more likely to be successful over time, and particularly in the maintenance of weight loss.³⁰

Protein Intake — Health Issues

The average American diet is very liberal with respect to protein intake. The RDA for protein for women aged 19 to 24 is 46 grams, and for men of the same age the RDA is 58 grams.⁷ In contrast, the average protein intake in grams for adults over 20 in the U.S. is 63.8 grams for women and 94.9 grams for men. Some concern has been expressed over the long term health consequences of excessive protein intake. There is some evidence in humans that a lifetime on a high animal protein diet (typical American diet pattern) can aggravate existing renal problems,³¹ may increase the risk for cancer of the kidney,³² and can accelerate adult bone loss.^{33,34} Lastly, higher animal protein intake is associated with higher than desirable levels of total fat and saturated fat intake.

A primary, albeit not exclusive source of protein in the American diet is meat. The U.S. Food Guide Pyramid recommends between 5 and 7 ounces of cooked lean meat or equivalent in meat alternatives per day. To be consistent with the Dietary Guidelines to reduce total fat and saturated fat in the diet, it would be helpful to consume lower-fat types of meat and perhaps a greater amount of some forms of meat alternatives such as soybean products. However, Americans derive the majority of their protein from meat. The 1994-96 CSFII indicated that for adult males over 20 years of age, the average daily intake of meat and meat alternatives was 6.4 ounces, and for women the total was 3.9. With respect to total intake, men were consuming sufficient amounts of meat and meat alternatives when compared to the recommended 5 to 7 ounces. Women, on the other hand, fell below the minimum 5 ounces recommended in the U.S. Food Guide Pyramid. With that in mind, data from the CSFII indicate that regardless of meat servings, protein intake is meeting RDA requirements. Consequently, the source of protein may be an important consideration. The ratio of meat to meat alternatives is skewed heavily in favor of meat (beef, pork, lamb, and veal). For men, of the average 6.4 ounces of lean meat and meat alternatives consumed daily, 2.7 ounces are derived from lean meat and another 1.0 ounce from the higher fat sources of frankfurter and lunch meat. Consequently, 3.7 of the 6.4 ounces, or 58%, was from meat. Only 1.5 ounces and 0.5 ounce, respectively, were contributed by poultry and fish. For women, 1.4 ounces of meat and 0.5 ounces of frankfurter and lunch meat were consumed on a daily average. This accounts for 49% of the total meat or meat alternative consumption. For women, poultry contributed 1.1 ounce and fish 0.4 ounce towards the total meat and meat alternative intake. Some data suggest that an increase in fish and consequently in omega-3-fatty acid intake may be warranted.

Protein Supplements

Protein supplements are quite common among athletes and physically active adults as part of their strength training regimens.³⁵ Bucci argues that while there is very little research that documents the benefits of protein supplementation, high protein diets are safe.³⁵ However, the amount recommended for endurance athletes is 70 gm/day, and for strength athletes 112 to 178 gm. The lower range of these recommendations is clearly within the normal intake of American men. This argues against the need for further protein supplementation.

Amino Acid Supplements

Individual amino acid supplements have been promoted on the market periodically. Again, a target audience has often been the athlete or physically active adult, with promises of enhanced performance. There is a dearth of research that can support such claims.³⁵ In addition, in 1992 a scientific panel convened to address the safety of amino acid supple-

ments concluded that there is little research on which to support making amino acid supplement recommendations, and some amino acid supplementation (serine and proline) can have adverse health effects. Consequently, the panel concluded that no level of amino acid supplementation may be considered safe at this time.³⁶

Fat Intake Issues — Amount and Type of Fat

The adult American diet is slightly over the 30% of total energy that is recommended. Data from the 1994-96 CSFII reveals that approximately 25% of the total energy intake is contributed by discretionary fats as cream, butter, margarine, cream cheese, oil, lard, meat drippings, cocoa, and chocolate. Based on the average energy intake of adult males, discretionary fat contributes 614 kcals per day, and for females 412 kcals per day. By cutting back on discretionary fat intake, American adults could conceivably lose 0.8 to 1.0 lb per week. This would be helpful in dealing with the adult obesity rates in the U.S. Simple changes in discretionary fat intake could be helpful. For example:

- Substituting mustard for mayonnaise on sandwiches = 5 gm (45 kcals) fat savings
- Ordering hamburger rather than a cheeseburger = 9 gm fat savings (81 kcals)
- Using salt and pepper instead of sour cream on a baked potato = 3 gm fat savings (27 kcals)

Americans consume more saturated fat than is desirable. In addition, approximately 5% of the total fat intake in the American diet is contributed from trans-fatty acids.³⁷ Biochemically, trans-fatty acids act similarly to saturated fatty acids, raising LDL levels and decreasing HDL levels.³⁸ While their effect is not as great as saturated fat, they may contribute to a lipid intake pattern that raises the risk for coronary heart disease.³⁹ Trans-fatty acids are formed as a result of the hydrogenation process and are found in such food items as margarine, shortening, commercial frying fats, and many high-fat baked and snack foods. Trans-fatty acids also occur naturally in milk and butter as a result of the fatty acids synthesized by rumen flora in the rumen. Concern over trans-fatty acid intake has led some consumers to question whether they should forgo margarine and return to butter. Research suggests that saturated fat, as in butter, still exerts a greater negative effect on a person's lipid profile than do trans-fatty acids. However, use of less hydrogenated forms such as tub rather than stick margarine may be beneficial.

Carbohydrate Intake Issues

Two issues arise with respect to the carbohydrate intake of American adults — low fiber intake and high sugar intake. Low fiber intake is associated with a higher incidence of such chronic diseases as heart disease,⁴⁰ cancer,⁴¹ and diabetes.⁴² At least partial explanation for the low fiber intake is related to the low fruit and vegetable intake associated with the typical American diet. Data from the 1994-96 CSFII indicated that for adult males the average total servings (based on the Food Guide Pyramid serving recommendations) of vegetables per day was four. For females the average was three servings. For both men and women, one-third of the vegetable servings were accounted for by white potatoes. Average servings of fruit per day for both men and women was 1.5. This is just under the minimum Food Guide Pyramid recommendation for two servings per day. Another contributing factor to the low fiber intake is the lack of whole grain foods in the diet. Adult

men consumed on average 8 servings of grain products per day, which is approximately mid-range of the 6 to 11 servings of grain products recommended by the Food Guide Pyramid. Women averaged six servings from grain products. However, for both men and women, only one of these servings was from whole grain products. The health benefits of a higher fiber diet are addressed in other relevant sections of this handbook.

The other carbohydrate intake issue is the consumption of refined sugar, which contributes calories but little other nutritive value to the diet. The 1994-96 CSFII data revealed that approximately 14% of the average energy intake for adult males was from added sugars. For women, the caloric contribution from added sugars was slightly higher at approximately 15%. Foods such as breads, cakes, soft drinks, jam, and ice cream were contributing to the discretionary sugar intake. In 1994 to 1996, soft drink consumption out-paced milk and coffee, and approximately 75% of the soft drink consumption is of the sugar-sweetened variety.⁴³ During the last decade, consumption of snack foods such as cakes, cookies, pastries, and pies has increased 15%, likely contributing to the high intake of discretionary sugar.⁴³ These data are in contrast to the importance consumers report they place on a diet moderate in sugar intake. A majority (slightly over 50%) of adults surveyed in the 1994-96 CSFII indicated it was very important to consume a diet moderate in sugar.

Summary

Counseling the normal healthy American adult should focus on dietary intake patterns that promote health and reduce risk for chronic disease, i.e., diet recommendations should follow the U.S. Dietary Guidelines. Therefore, consistent with the 2000 edition of the U.S. Dietary Guidelines, the focus on nutrition counseling should be:

Aim for fitness.

- Aim for a healthy weight:
 1. Calculate the appropriate weight for the individual.
 2. Consider the fat distribution pattern and take a more aggressive posture with individuals whose body fat distribution is more “apple” than “pear” shaped and hence places them at higher health risk.
 3. For individuals whose body weight is inappropriate, initiate counseling to assist in weight reduction. This may include calculation of appropriate caloric intake, recommendations of sources of caloric intake from the macro-nutrients of protein, fat, and carbohydrate, appropriate portion sizes to control caloric intake, and increases in physical activity (second dietary guideline, see below).
- Be physically active each day.

Build a healthy base.

- Let the pyramid guide your food choices. Based on current consumption patterns, the average adult can likely benefit from nutrition counseling that:
 1. Recommends greater restraint with respect to servings of discretionary fats, sweets, and alcohol from the top portion of the pyramid.

2. Recommends somewhat higher intake of fish and meat alternatives such as soy products and a continued reduction of ounces of high fat meats like frankfurters and luncheon meats.
- Eat a variety of grains daily, especially whole grains. Current carbohydrate consumption patterns indicate that the average adult American should be counseled to:
 1. Increase his/her consumption of whole grain products.
 2. Use greater restraint with respect to his/her consumption of less nutrient dense refined sugar.
 - Eat a variety of fruits and vegetables daily. Variety as well as an increase in quantity is appropriate when counseling adults. Data indicate that the most common vegetable is the potato. Greater variety of both fruits and vegetables will help contribute a wider range of nutrients and other phytochemicals that might be more appropriate for health promotion.
 - Keep food safe to eat. Food safety is as important as nutrient intake with respect to health maintenance. Attention in counseling should be given to insuring the individual's understanding of safe food handling and food preparation techniques.

Choose sensibly.

- Choose a diet low in saturated fat and cholesterol and moderate in total fat. Over-consumption of discretionary fat is common with adult Americans. Counseling that helps identify small dietary changes that can be made to reduce total fat, saturated fat and cholesterol intake is appropriate.
- Choose beverages and foods that limit your intake of sugars. Nutrition counseling for adults should help clients identify sources of sugars in their diet, particularly the sugar contribution that might be coming from soft drinks. Not only are soft drinks widely promoted in the American culture, but popular serving sizes range from 8 to 16 to as high as 32 ounces.
- Choose and prepare foods with less salt. The concerns of a high salt intake are dealt with in other sections of this handbook, which also indicate the need to help adults recognize foods that are contributing to an excessive salt intake.
- If you drink alcoholic beverages, do so in moderation. The average American adult needs to be cognizant of his/her caloric intake. Low nutrient dense alcohol calories may be inconsistent with the caloric intake needed to achieve/maintain a healthy weight. This fact needs to be discussed in a nutrition counseling session.

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