

Nationwide Food Consumption Survey 1977-78  
Preliminary Report No. 3

NUTRIENT LEVELS IN FOOD  
USED BY HOUSEHOLDS  
IN THE UNITED STATES, SPRING 1977

U.S. Department of Agriculture  
Science and Education Administration      January 1981

## ABSTRACT

This report presents findings on the levels of nutrients in food used by about 3,500 housekeeping households surveyed in the 48 conterminous States in the spring of 1977 (April-June). The nutrient content of food used at home was estimated using information collected on the kinds and quantities of food used by the households during 7 days and U.S. Department of Agriculture food composition tables. The nutrient levels of food used by each household are expressed as percentages of the 1974 Recommended Dietary Allowances set by the Food and Nutrition Board of the National Research Council, National Academy of Sciences. Findings are given for households classified by region, urbanization, and income.

**KEYWORDS:** Food consumption survey, household food, nutrient levels, nutrient levels by income, nutrient levels by region, nutrient levels by urbanization, Recommended Dietary Allowances.

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SUMMARY

The survey of food consumption from about 3,500 housekeeping households in the 48 conterminous States in the spring of 1977 indicates that--

- o Amounts of food used in a week by U.S. housekeeping households were sufficient on the average to provide the 1974 Recommended Dietary Allowances (RDA) for food energy and 11 nutrients appropriate for persons in the households. Nutrients studied were protein, calcium, iron, magnesium, phosphorus, vitamin A, thiamin, riboflavin, vitamin B<sub>6</sub>, vitamin B<sub>12</sub>, and ascorbic acid.
- o Averages conceal the variation in nutrient levels among households. Although some households used food that failed to meet the RDA for each of the 11 nutrients, most used food that provided amounts well above the RDA. The conclusion cannot be made from the data, however, that each person in most households actually ate food that exceeded his or her RDA. There are two major reasons for this. First, household food may include, in addition to food eaten, some edible food that was discarded in the kitchen or at the table, or leftovers fed to pets. Second, household food that provides the RDA for a nutrient may not be divided among household members according to nutritional need; therefore, some members of the household may get more and others less than the RDA for the nutrients studied.
- o Only 3 percent of the households used food that failed to provide the RDA for protein. Fewer than 10 percent used food that failed to provide the RDA for phosphorus, riboflavin, and ascorbic acid.
- o Calcium and vitamin B<sub>6</sub> were the nutrients most often found to be below allowances in household food supplies. About one-third of the households used food that provided less than the RDA for these two nutrients.
- o Differences among the 4 regions in the percentage of households meeting the allowances for food energy and 11 nutrients were small. Households in the South were somewhat less likely to meet or exceed the RDA for 8 of the 11 nutrients studied than were households in the other regions.

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<sup>1</sup>Prepared by the Consumer Nutrition Center, Human Nutrition, Science and Education Administration, U.S. Department of Agriculture, Hyattsville, Md. 20782.

- o Small differences were noted among household food energy and nutrient levels in the central city, suburban, and nonmetropolitan areas. Proportions of suburban households with food that met the RDA for the 11 nutrients studied were the same or a few percentage points higher than those of households in the central city and nonmetropolitan areas.
- o Generally at each successively higher level of income, a slightly greater percentage of households used food that met allowances. High income itself, however, did not assure that household food met the RDA for all nutrients. Over one-fourth of the households with incomes of \$20,000 or more failed to meet the RDA for calcium and vitamin B<sub>6</sub>.
- o Published information on the proportion of households meeting the RDA from the 1965-66 Household Food Consumption Survey cannot be compared with information in this report, because the RDA for several nutrients have been changed substantially since the earlier data were analyzed.

### SCOPE OF 1977-78 SURVEY

The Nationwide Food Consumption Survey (NFCS) 1977-78 is the sixth nationwide survey conducted by the Department of Agriculture since 1936. It is the second to include households in all four seasons of the year and to obtain nationwide information on diets of selected individual household members as well as food consumption for the total household. The most recent survey was conducted in 1965-66 (5).<sup>2</sup>

The survey provides detailed information on the food consumption of households (at home) and food intake of individuals (at home and away from home), from which the nutritional quality of household food supplies and individual intakes can be appraised. It includes data on the money value of food used by the household (4), expense for food away from home, home production and preservation of food, and selected practices of households in the purchase and use of specific foods. In addition, detailed information is given on the dietary behavior of individuals (6), as well as income, participation in food programs, education and employment of household heads, and other factors that might affect food consumption.

From April 1977 to March 1978, a stratified probability sample of households was surveyed. Information was obtained from approximately 15,000 households in the 48 conterminous States and about 34,000 individuals from these households. In addition, 5 supplemental surveys were conducted yielding information for about 5,000 households in which at least 1 member was over 64 years of age, about 4,700 households with members participating or eligible to participate in the Food Stamp Program, 3,100 households in Puerto Rico; 1,100 urban households in Alaska, and 1,250 households in Hawaii. All these supplemental surveys provide data on household food consumption and individual food intake.

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<sup>2</sup> Underlined numbers in parentheses refer to Literature Cited at the end of this report.

## DATA COLLECTION

Information on food used in a surveyed household was obtained through an interview with the person identified as most responsible for food planning and preparation. Trained interviewers used an aided recall schedule to obtain the kind (such as ground beef and skim milk), the form (as canned and frozen), the quantity, and the cost, if purchased, of each food or beverage used in the household during 7 days prior to the interview. Households were contacted at least 7 days prior to the interview and asked to keep informal notes, such as shopping lists, menus, and prices of foods used, to assist them in recalling the food used during the 7-day period.

In addition to information on food used, respondents reported the number of meals eaten from home food supplies during the week by household members and others. They also provided information needed to classify households by income, size, and other family characteristics.

The methodology used to obtain household food consumption data in the 1977-78 NFCS was the same as that used in the 1965-66 survey with a few exceptions. The households were interviewed at the initial contact in 1965-66, whereas households were contacted and informed about the survey at least 7 days prior to the interview in 1977-78. For a measurement of the impact of this change in procedure, about 1,300 households from a special "bridging" sample were interviewed without prior contact during the spring quarter. Preliminary analysis of data from the bridging sample and data obtained during the spring quarter by the new procedure indicate that the latter procedure did not affect the findings as to the nutrient levels of food used by households.

## ESTIMATION OF NUTRITIVE VALUE OF FOODS USED

Nutrient levels given in this report were calculated from information collected on the kinds and quantities of food used by the households during 7 days in the spring of 1977 and from tables of the nutritive value of foods. The nutritive values are for the edible portion of food as brought into the household except that vitamin values were adjusted for losses during cooking. Edible portion in this report includes all food as brought into the household except those parts that are clearly inedible, such as bones in meat. All fat on meat cuts is considered to be edible, and its energy and nutrient content is a part of the nutritive value of food used by the households, as reported here.

The basis for nutritive values is "Composition of Foods...Raw, Processed, Prepared," U.S. Department of Agriculture Handbook No. 8 (10), its revised supplements (1, 2, and 3), and "Pantothenic Acid, Vitamin B<sub>6</sub>, and Vitamin B<sub>12</sub> in Foods" (9). Some values from these sources were updated to reflect nutritive values of foods available to households at the time of the survey. The updating was done by the Nutrient Data Research Group, Consumer Nutrition Center (CNC), of the Department's Science and Education Administration. Updating was based on results from new food composition research, on information from industry about new food products, on enrichment of foods in accordance with new regulations,

and on other known changes in the food supply. When a nutritive value for a food reported was not available, a value was imputed from similar foods by the CNC staff members. Although nutrient data are limited for some foods and for certain nutrients, particularly magnesium, vitamin B<sub>6</sub>, and vitamin B<sub>12</sub>, data used were believed to be the best available at the time the survey was conducted.

The nutritive value of household food includes not only values of food eaten by people in the household but also some food that is not eaten, such as food discarded in the kitchen and at the table and leftovers fed to animals. Some households customarily do not eat all edible parts of certain foods, such as fat that can be trimmed from meat. Therefore, although this report reflects the nutrient levels available to households from food they reported having used, the amount is overestimated somewhat of the food energy and nutrient levels of foods actually eaten in many households.

### USE OF RECOMMENDED DIETARY ALLOWANCES

The nutritive value of household diets is compared with recommended amounts of nutrients for persons eating in each household. The Recommended Dietary Allowances (RDA) published in 1974<sup>3</sup> by the Food and Nutrition Board, National Research Council - National Academy of Sciences (8) are used as the standard.

When using the RDA to assess the nutritional quality of diets, one should keep in mind that the RDA are intakes of nutrients judged to be adequate for maintaining good nutrition in essentially all healthy persons in the United States. The Food and Nutrition Board (8, p. 3) stated:

"RDA should not be confused with requirements. Differences in the nutrient requirements of individuals that derive from differences in their genetic makeup are ordinarily unknown. Therefore, as there is no way of predicting whose needs are high and whose are low, RDA (except for energy) are estimated to exceed the requirements of most individuals, and thereby insure that the needs of nearly all are met."

The data from the 1965-66 Household Food Consumption Survey were compared with the 1963 RDA in published reports. Some of the 1963 RDA were substantially different from the 1974 RDA used in this report. For example, the allowance for ascorbic acid for adults was reduced from 70 mg in 1963 to 45 mg in 1974 and for teenagers from 80 to 45 mg. The allowance for iron was 10 mg for adult males in both 1963 and 1974 but increased from 15 mg in 1963 to 18 mg in 1974 for all teenagers and adult females under 51 years of age. Because of such changes, published information on nutrient levels from the 1965-66 Household Food Consumption Survey cannot be compared directly with those in this report. However, comparisons of average nutritive values of food used per person in households for spring 1977 and spring 1965 indicate that food energy and fat levels were lower and levels of vitamins and minerals, except calcium, were as high or higher in 1977 than they were in 1965 (7).

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<sup>3</sup>The revision of the Recommended Dietary Allowances in 1980 is not believed to change substantially the results reported here.

A special procedure was used to compare nutrient levels of households and groups of households with different household composition and varying numbers of meals from household food supplies. Nutrient levels for a household were expressed as the amount of each nutrient in the household food per nutrition unit. A nutrition unit is equal to the RDA for a nutrient for males from 23 to 50 years of age. The number of nutrition units for a given nutrient in a household is the sum of the RDA for that nutrient for persons eating in the household (adjusted for meals eaten away from home) divided by the RDA for the adult male. The percentage of the RDA provided by food used in a household or by a group of households is calculated by dividing the nutritive value per nutrition unit for the household or group of households by the RDA for the adult male.

Diets of some individual household members may not meet their RDA even though the household diet as calculated meets the RDA.<sup>4</sup> Unless the household food is divided according to nutritional need, some members may not have diets with levels as high as household food use indicates. On the other hand, if the household food does not meet the RDA, some of the household members, if not all of them, have diets that do not meet the RDA.

## RESULTS

The food used in most U.S. housekeeping households<sup>5</sup> in the spring of 1977 was sufficient to meet the RDA for food energy and the nutrients studied for people eating in the household (table 1 and figs. 1-12). Food energy levels for most households exceeded the RDA (fig. 1); however, levels for some households were less than the RDA. This does not necessarily mean that household members received less food energy than needed. Energy needs may be less than the RDA because of a small body, light activity, and other factors.

Over 85 percent of the households used food that met or exceeded the RDA for protein (fig. 2), phosphorus (fig. 6), thiamin (fig. 8), riboflavin (fig. 9), vitamin B<sub>12</sub> (fig. 11), and ascorbic acid (fig. 12). These nutrients were available in diets of most households in amounts well above the RDA. For calcium (fig. 3), iron (fig. 4), magnesium (fig. 5), vitamin A (fig. 7), and vitamin B<sub>6</sub> (fig. 10), the Recommended Dietary Allowances were met by most households but by fewer than for the previous nutrients.

Although differences in the RDA used with the spring 1965 and 1977 data for several nutrients do not permit direct comparisons of nutrient levels, certain general trends may be noted. Levels below the RDA of two nutrients--

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<sup>4</sup>After household food consumption information was obtained, individual food intakes for 3 days were obtained from household members. Food intakes both at home and away from home were reported and published in Preliminary Report No. 2 (6).

<sup>5</sup>Housekeeping households are those with at least 1 person having 10 or more meals from the household food supply during 7 days preceding the interview. Ninety-three percent of all reporting households met this criterion.

TABLE 1.--U.S. households using food that provided RDA by region, urbanization, and income, spring 1977

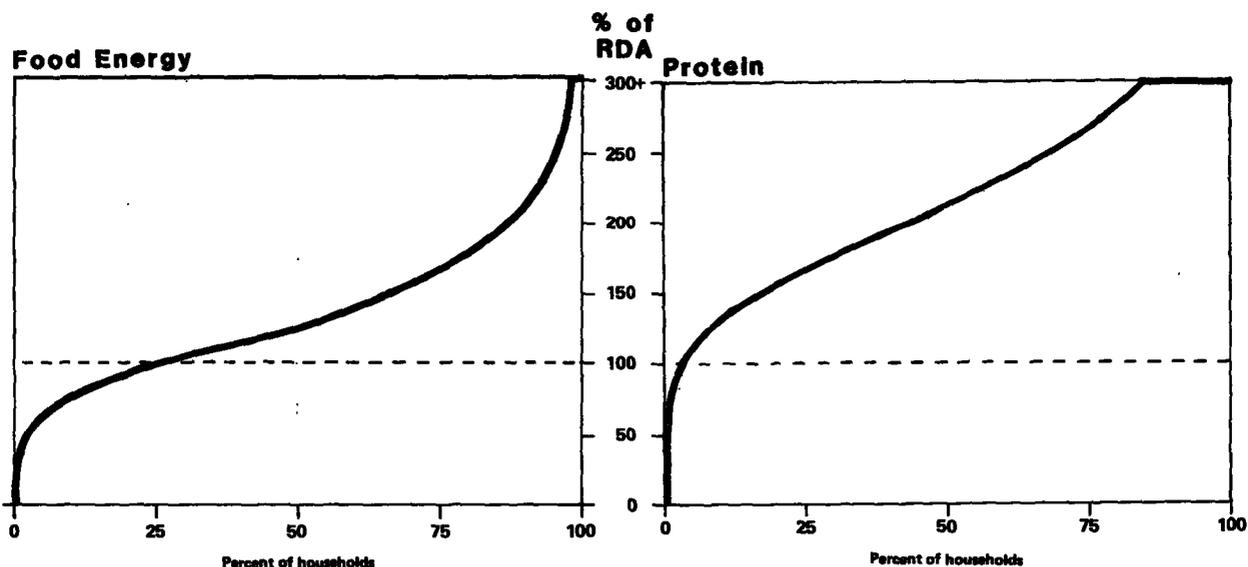
Item	Percent of households											
	Food energy	Pro-tein	Cal-cium	Iron	Magne-sium	Phos-phorus	Vitamin A	Thia-min	Ribo-flavin	Vitamin B <sub>6</sub>	Vitamin B <sub>12</sub>	Ascor-bic acid
All households <sup>1</sup> .....	76	97	67	84	74	95	80	87	94	65	87	93
Region:												
Northeast.....	76	97	67	84	75	95	84	87	95	66	89	95
North Central.....	78	97	69	85	76	97	79	88	95	65	90	92
South.....	75	96	62	84	71	94	75	87	92	65	82	91
West.....	76	97	72	81	78	96	83	85	94	64	90	94
Urbanization:												
Central city.....	73	95	64	83	73	93	82	84	92	66	85	92
Suburban.....	78	99	70	84	78	97	82	89	96	68	91	95
Nonmetropolitan.....	77	97	66	84	73	96	76	88	94	63	85	91
1976 income, before tax: <sup>2</sup>												
Under \$5,000.....	74	93	62	84	69	91	78	89	91	59	79	90
\$5,000-\$9,999.....	74	96	62	81	72	94	78	87	93	63	83	91
\$10,000-\$14,999.....	76	98	67	83	75	97	78	86	95	67	89	92
\$15,000-\$19,999.....	76	98	67	83	76	96	78	85	94	67	91	94
\$20,000 or more.....	81	99	73	87	81	98	86	90	96	73	94	96

<sup>1</sup>Total 3,474.

<sup>2</sup>Includes only households (2,776) providing income information.

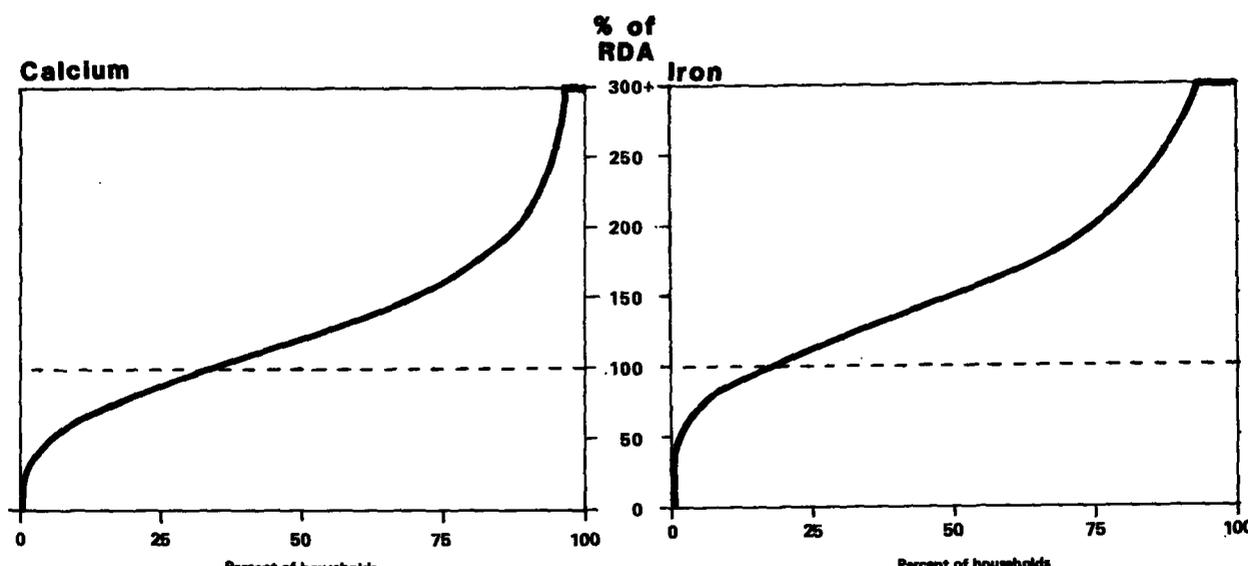
Source: USDA Nationwide Food Consumption Survey 1977-78, 48 conterminous States, spring 1977 (preliminary).

# Nutrient Levels in Food Used by Households, Spring 1977



**Figure 1**

**Figure 2**

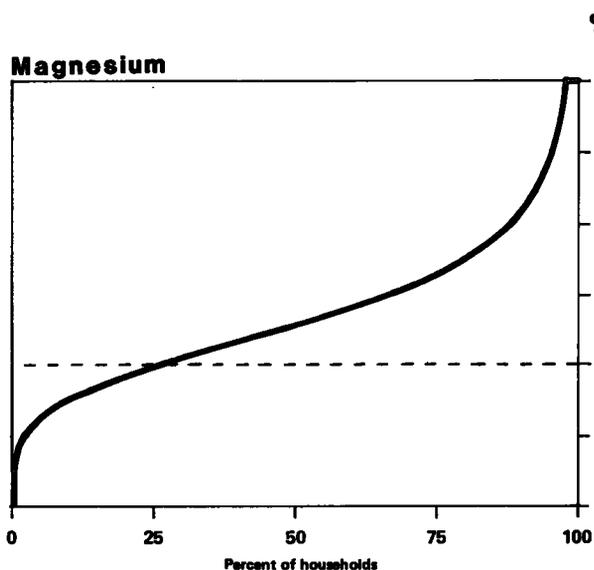


**Figure 3**

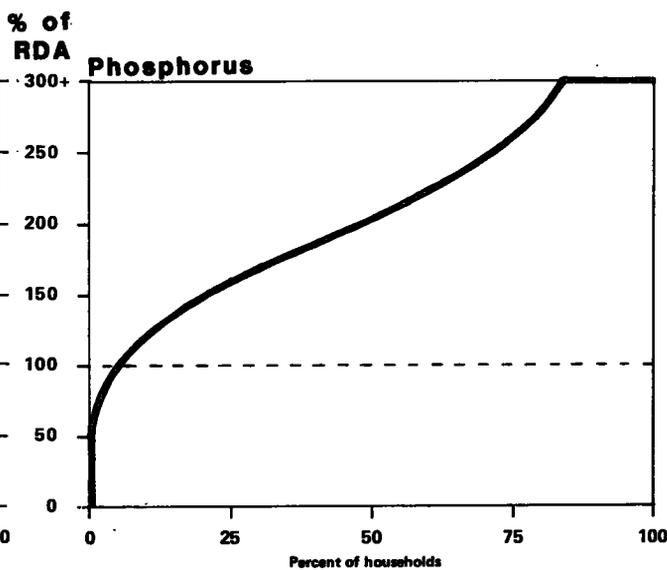
**Figure 4**

Source: Recommended Dietary Allowances, 1974.  
 USDA Nationwide Food Consumption Survey 1977-78,  
 48 conterminous States, spring 1977 (preliminary).

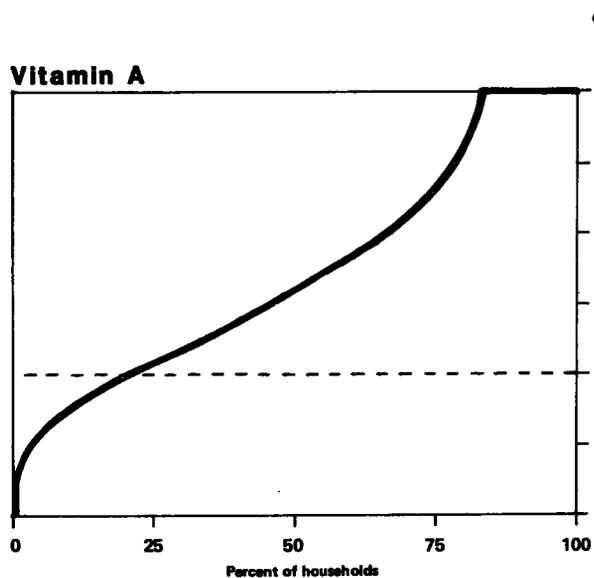
# Nutrient Levels in Food Used by Households, Spring 1977



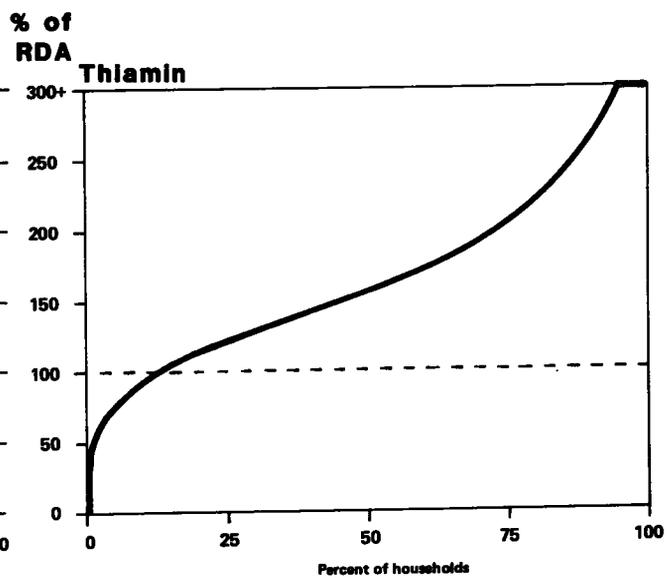
**Figure 5**



**Figure 6**



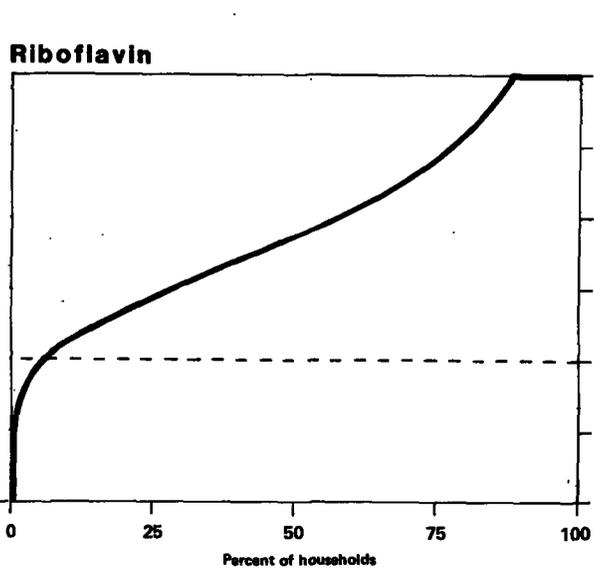
**Figure 7**



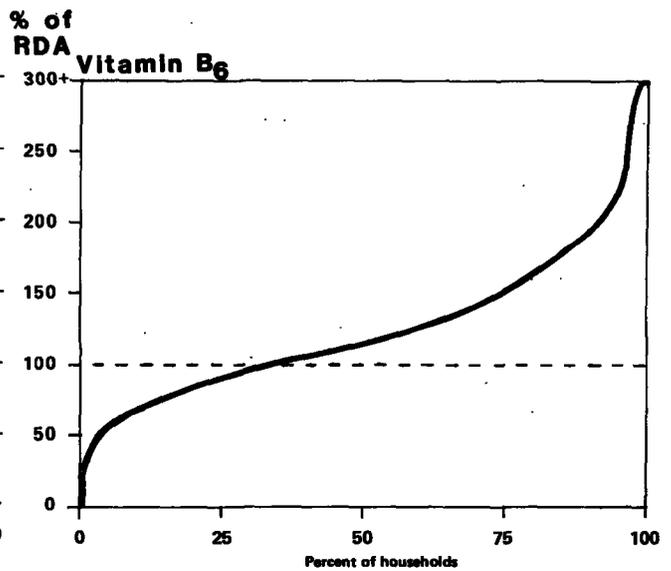
**Figure 8**

Source: Recommended Dietary Allowances, 1974.  
 USDA Nationwide Food Consumption Survey 1977-78,  
 48 conterminous States, spring 1977 (preliminary).

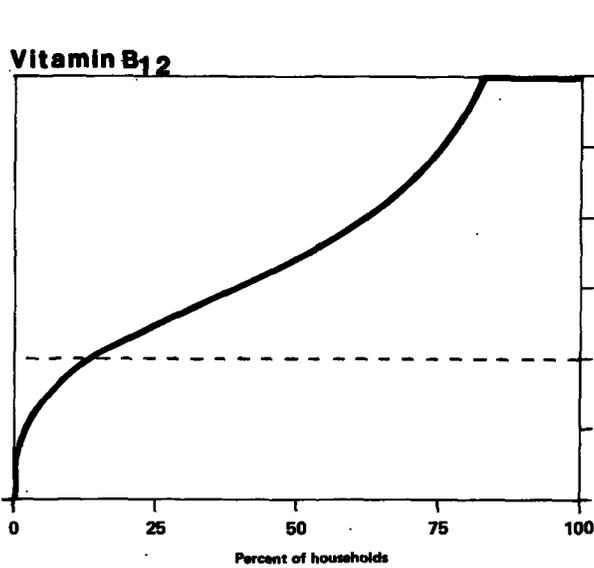
# Nutrient Levels in Food Used by Households, Spring 1977



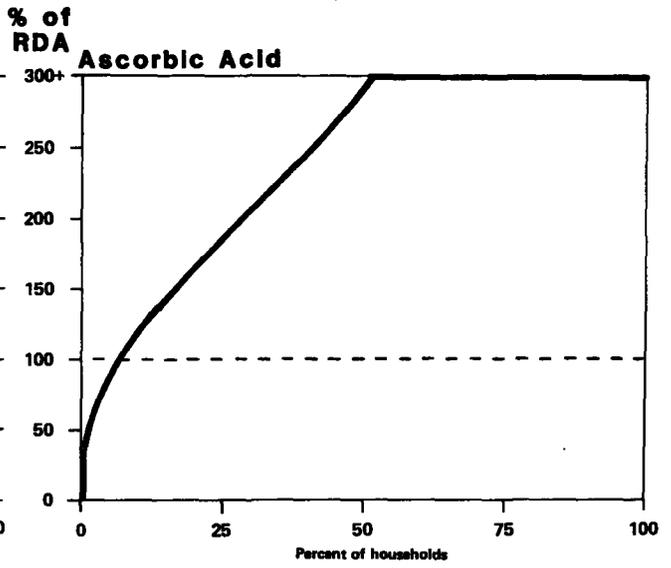
**Figure 9**



**Figure 10**



**Figure 11**



**Figure 12**

Source: Recommended Dietary Allowances, 1974.  
 USDA Nationwide Food Consumption Survey 1977-78,  
 48 conterminous States, spring 1977 (preliminary).

calcium and vitamin A--were observed in both 1965 and 1977 for one-fifth or more of the households studied. Substantial numbers of households reported ascorbic acid levels below the RDA in the earlier survey; however, the levels of ascorbic acid for most households in the spring of 1977 were well above the RDA (fig. 12). Although some of this change can be attributed to the reduction in the RDA for ascorbic acid, other factors such as the fortification of more foods and beverages with ascorbic acid and increased use of ascorbic acid-rich fruit and vegetables are also important. The impact of changes in household food selection on the nutrient levels of diets will be explored in other reports of the survey.

### Differences by Region

The average<sup>6</sup> nutritive value of food used by households grouped by four census regions<sup>7</sup> was compared to the RDA (table 2). Little difference by region was noted. In each region, the average values for all nutrients exceeded the RDA, with values well above the RDA--about twice as high or more for protein, phosphorus, riboflavin, vitamin B<sub>12</sub>, and ascorbic acid. Slightly smaller proportions of households in the South than in the other regions used food that provided the RDA for 8 of the 11 nutrients (table 1 and fig. 13).

### Differences by Urbanization

Average nutritive values as a percentage of the RDA for households grouped by urbanization are presented in table 2. The categories--central city, suburban, and nonmetropolitan--are those used by the 1970 Decennial Census.<sup>8</sup>

Average nutritive values of food used were above the RDA for households in the three categories (table 2). Protein, phosphorus, riboflavin, vitamin B<sub>12</sub>, and ascorbic acid were substantially in excess of the RDA. Differences among the three urbanization categories were small. For most nutrients, slightly fewer households in the central city and nonmetropolitan areas than in suburban areas used foods that provided more than the RDA for the nutrients studied (table 1 and fig. 14).

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<sup>6</sup>The statistic referred to as an average in this report was calculated utilizing a population ratio procedure.

<sup>7</sup>Northeast--Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont; North Central--Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin; South--Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, West Virginia; and West--Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming. (Alaska and Hawaii were surveyed separately.)

<sup>8</sup>Central city--has a population of 50,000 or more and is the main or core city within a Standard Metropolitan Statistical Area (SMSA); suburban--generally those areas within boundaries of SMSA but not within legal limits of central city of SMSA; and nonmetropolitan--all U.S. areas not within SMSA.

TABLE 2.--Nutritive value of household food as percentage of RDA by region, urbanization, and income, spring 1977

Item	Average value per nutrition unit <sup>1</sup> per day as percentage of RDA											
	Food energy	Protein	Calcium	Iron	Magnesium	Phosphorus	Vitamin A	Thiamin	Riboflavin	Vitamin B <sub>6</sub>	Vitamin B <sub>12</sub>	Ascorbic acid
All households <sup>2</sup> .....	130	220	124	149	130	203	182	164	193	122	222	311
Region:												
Northeast.....	128	222	122	145	130	199	185	160	192	122	236	346
North Central.....	130	221	126	150	130	203	180	164	197	123	231	304
South.....	135	217	120	154	129	205	176	171	192	121	201	290
West.....	126	218	130	145	133	203	189	159	190	119	222	307
Urbanization:												
Central city.....	130	222	120	150	130	201	204	166	191	125	236	337
Suburban.....	131	225	128	148	133	205	181	163	198	124	230	322
Nonmetropolitan.....	130	212	122	149	128	201	164	164	189	117	201	277
1976 income, before tax: <sup>3</sup>												
Under \$5,000.....	134	217	122	156	128	204	202	181	201	119	239	302
\$5,000-\$9,999.....	130	212	116	151	129	196	191	166	189	119	219	305
\$10,000-\$14,999.....	129	217	123	150	130	200	172	166	191	122	220	295
\$15,000-\$19,999.....	125	213	119	137	125	194	161	151	183	117	214	290
\$20,000 or more.....	132	232	133	147	137	211	185	164	201	128	228	333

<sup>1</sup> Nutrition unit is adult male equivalent of persons eating in household in terms of RDA for a nutrient. This allows comparison to be made among households and groups of households of different sex-age compositions that eat different numbers of meals at home.

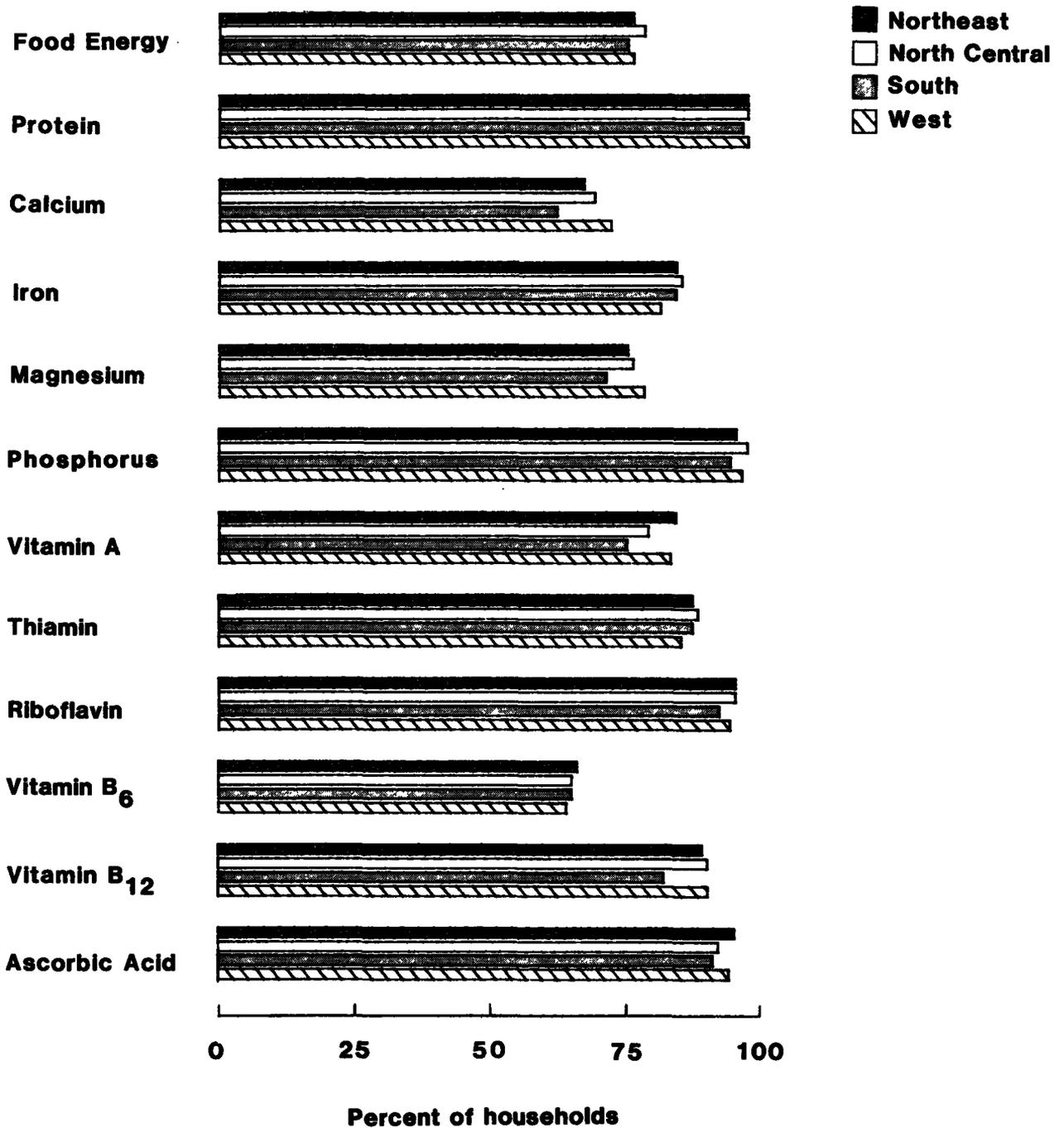
<sup>2</sup> Total 3,474.

<sup>3</sup> Includes only households (2,776) providing income information.

Source: USDA Nationwide Food Consumption Survey 1977-78, 48 conterminous States, spring 1977 (preliminary).

# HOUSEHOLDS BY REGION

## With Food Providing RDA, Spring 1977



**Figure 13**

Source: USDA Nationwide Food Consumption Survey 1977-78, 48 conterminous States, spring 1977 (preliminary).

# HOUSEHOLDS BY URBANIZATION

With Food Providing RDA, Spring 1977

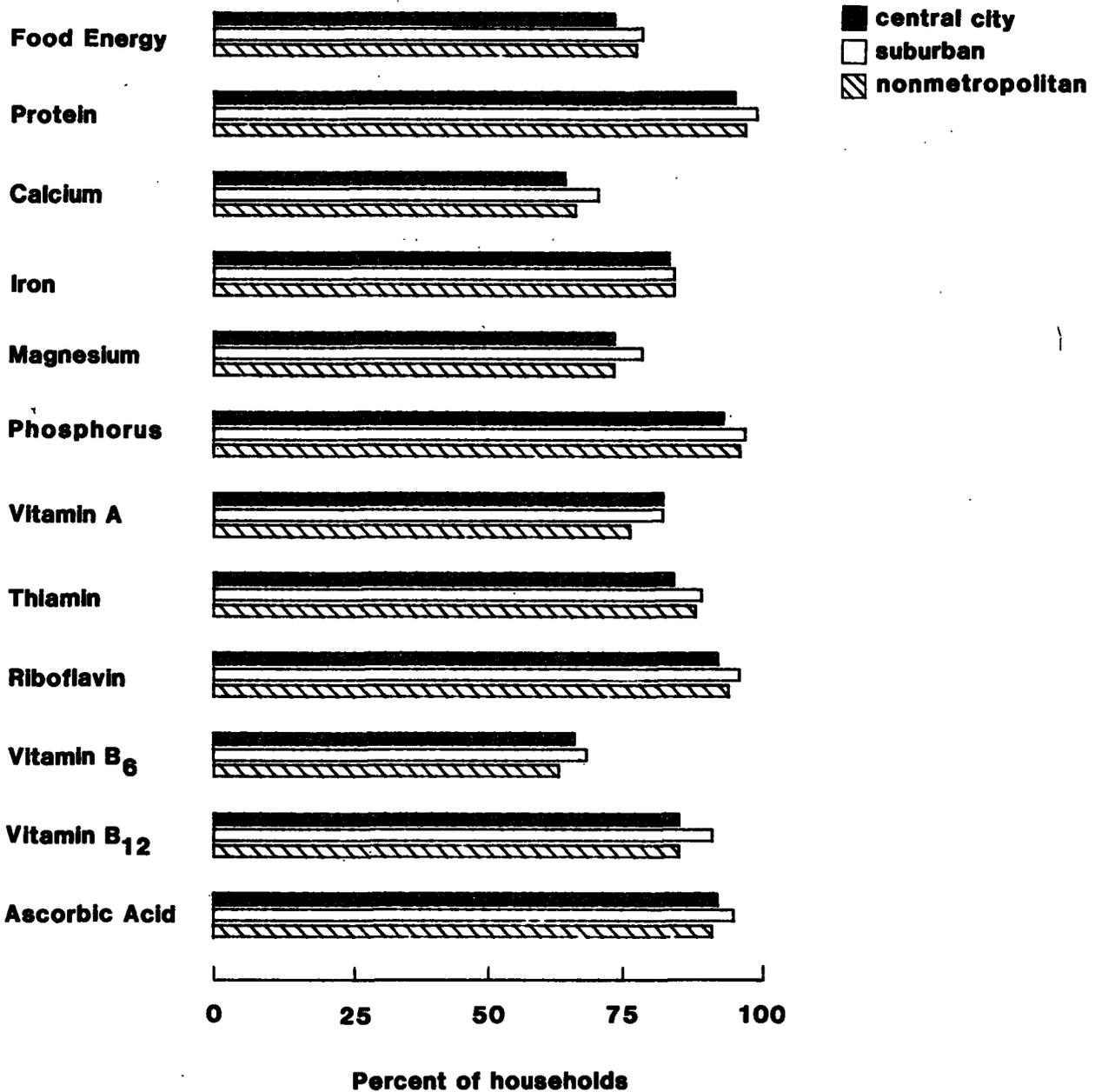


Figure 14

Source: USDA Nationwide Food Consumption Survey 1977-78, 48 conterminous States, spring 1977 (preliminary).

## Differences by Income

The average nutritive value of food used by households at different levels of income was compared to the RDA for food energy and 11 nutrients (table 2). Income is based on cash income of all household members before taxes in 1976, the year prior to the survey.

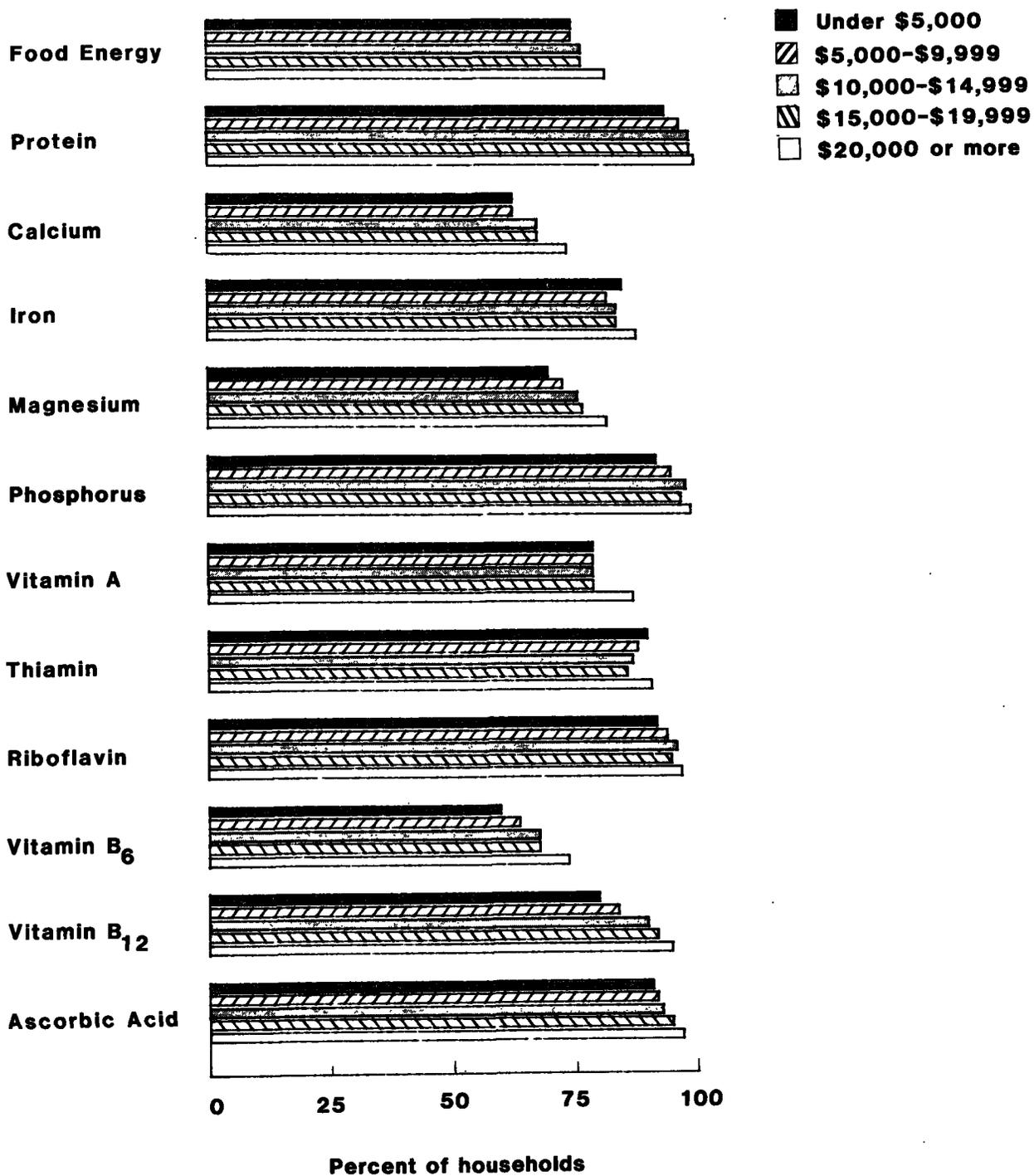
At each income category the average value for all nutrients exceeded the RDA. Values were well above the RDA for protein, phosphorus, riboflavin, vitamin B<sub>12</sub>, and ascorbic acid. Households with the lowest incomes used food, on the average, that was as high for most nutrients relative to the RDA as households with higher incomes. The \$15,000-\$19,999 income level had the lowest average values for food energy and nine nutrients (table 2). However, most households in this category, as in others, used food that exceeded the RDA for most nutrients (table 1 and fig. 15).

About 60 percent or more of households at each income level used food that met or exceeded the RDA for the nutrients studied. At all income levels, smaller percentages of households met or exceeded the RDA for calcium, magnesium, vitamin A, and vitamin B<sub>6</sub> than for other nutrients.

For all nutrients except iron and thiamin, the percentage of households that met or exceeded the RDA increased as income increased. For example, from the lowest to the highest income category the percentage of households meeting the RDA for protein increased from 93 to 99 percent and for calcium from 62 to 73 percent. These lower levels for low-income households conflict with the results reported above based on averages--that low-income households fared as well as those with higher income. Apparently averages for low-income households are inflated by extremely high values for some households.

# HOUSEHOLDS BY INCOME

With Food Providing RDA, Spring 1977



**Figure 15**

Source: USDA Nationwide Food Consumption Survey 1977-78, 48 conterminous States, spring 1977 (preliminary).

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