

Some Comments on the American Diet and Household Consumption Data

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THE PUBLICATION in 1957 by the U. S. Department of Agriculture of a report¹ based on a nationwide survey of household food consumption made from April through June 1955 has resulted in considerable publicity by governmental and cooperating private agencies designed to reassure the public of the adequacy of the American diet and, incidentally, increase the consumption of food. The implication contained in many newspaper articles was that it is practically impossible for Americans to consume inadequate diets if they make full use of available foods. The purpose of this brief communication is to point out that many Americans do in fact exist on inadequate diets, and that an overabundance of foodstuffs and food consumption cannot be relied upon to correct the situation.

The criterion for an assuredly adequate diet used here is the Recommended Dietary Allowances (revised, 1953) of the National Research Council.² We use the Allowances in this way because they are so used by the Department of Agriculture in the study referred to, in the dietary surveys to be referred to in this paper, in pertinent governmental releases and by the Council on Foods and Nutrition of the American Medical Association in its discussion of vitamins as supplemental and therapeutic agents.³ The last named agency uses the Allowances as revised in 1958.⁴ (Using the 1958 revision of the Allowances would strengthen, not weaken, our position, since this revision reduces the allowance of calories per pound of body weight for adults.)

The Department of Agriculture report¹

shows the amounts of nutrients in the food that came into household kitchens for consumption, corrected for cooking losses but not for kitchen and plate waste. By dividing household consumption by the number of persons in the household, nutrients available per capita (Table I) were obtained. Nutrients available per "nutrition unit" also were calculated (Table I).

The procedure used for computing nutrition units (or adult-male equivalents) was to express as relatives the National Research Council Allowances for a particular nutrient for persons in each sex and age group, using the allowance for the young adult male as 1.0. For each household these relatives were then multiplied by the number of persons (twenty-one-meal-at-home equivalents) in the appropriate sex-age group; the sum of these products giving the number of nutrition units per household. Obviously, the determination of nutrients available per nutrition unit provides much more meaningful data than do per capita figures which do not allow for the composition of the population.

REPORTED FINDINGS

From Table I it can be seen that, on the average, there is a gross excess in the household consumption per nutrition unit of all nutrients studied, except calcium, as compared to the 1953 National Research Council Allowances as adjusted for average twenty-one to thirty-four year old males in the United States.⁵ In spite of this fact, from 7 to 29 per cent of the households had diets not meeting the Allowances for at least one nutrient. This means, of course, that many households were consuming nutrients greatly in excess of the averages.

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TABLE I
Nutrients Available per Capita and per Nutrition Unit Compared to Adjusted 1953 National Research Council (NRC) Allowances

	Calories	Protein (gm.)	Calcium (gm.)	Iron (mg.)	Vitamin A Value (I.U.)	Thiamine	Riboflavin (mg.)	Niacin (mg.)	Ascorbic Acid (mg.)
Nutrients available per capita	3,120	103	1.13	17.3	8,680	1.53	2.23	18.6	108
Nutrients available per nutrition unit	4,390	121	1.00	19.3	9,960	2.15	2.65	25.8	117
1953 NRC allowances*	3,000	75	0.8	12	5,000	1.5	1.9	15	75
Per cent of households under 1953 NRC allowances*	12	8	29	10	16	17	19	7	24
Per cent excess of consumption per nutrition unit over 1953 NRC allowances*	146.33	161.33	125	160.83	199.2	143.33	139.47	172	156

* Adjusted for average twenty-one to thirty-four year old males in the United States.⁵

If the percentage of households not consuming (that is, taking into the kitchen) quantities of nutrients meeting the National Research Council Allowances represented the total of inadequate diets in the United States, the problem would be a relatively minor one, the proper approach to which is suggested by the data in Table II compiled from the 1957 Department of Agriculture report.¹

Although households "consuming" diets inadequate in at least one nutrient occur in all economic brackets, the prevalence of inadequacies varies directly with urbanization and inversely with income and presumably with education (Table II). It is interesting to note

that in the annual income range of \$2,000 to \$10,000 (for information on households with annual incomes lower than \$2,000 refer to the original report¹) nutrients consumed by farm households are little affected by income, except for vitamin A and ascorbic acid, in which respects the farmer does not do as well as the urban dweller. It may be that this is more a matter of education than income.

CALORIES

It would appear, at first glance, that the problem is entirely one of economics and consumer education; this, however, is not the whole story. The situation is complicated by

TABLE II
Distribution of Inadequate Household Consumption by Urbanization and Income

Annual Income	Protein Under 75 gm. (%)		Calcium Under 0.8 gm. (%)		Iron Under 12 mg. (%)		Vitamin A value Under 5,000 I.U. (%)		Thiamine* Under 1.5 mg. (%)		Riboflavin* Under 1.9 mg. (%)		Niacin* Under 15 mg. (%)		Ascorbic Acid* Under 75 mg. (%)	
	U†	F‡	U	F	U	F	U	F	U	F	U	F	U	F	U	F
\$2,000 to 2,999	13	7	42	25	14	4	18	23	22	9	30	17	11	7	30	29
3,000 to 3,999	6	6	31	22	10	4	15	17	19	9	18	14	5	6	24	28
4,000 to 4,999	4	3	27	24	9	2	11	13	15	5	16	11	5	0	19	20
5,000 to 5,999	2	8	24	16	7	4	9	17	18	10	12	12	4	4	19	23
6,000 to 7,999	4	5	22	33	9	0	11	15	19	6	14	15	5	2	16	19
8,000 to 9,999	5	3	28	21	9	3	9	10	21	5	17	15	4	3	11	10
10,000 and over	1	0	17	9	6	0	3	13	15	9	12	0	2	0	7	17

* Cooking losses deducted.

† U = Urban.

‡ F = Farm.

the fact that the apparent abundance of other essential nutrients is associated with a gross overabundance of calories. The reported average household consumption of calories per nutrition unit¹ is 4,390, or 146.33 per cent of the adjusted 1953 National Research Council Allowances (3,000 calories). This is a great deal more than the average person eats or can eat. Friedemann et al.,⁶ in four experiments, found the caloric requirement for weight equilibrium of soldiers engaged in moderate activities to range from 2,812 to 3,304 calories, with an average of 3,175 calories. The requirements of troops in basic training ranged from 3,698 to 4,227 calories, with an average of 4,066 calories. "This perhaps represents the upper limit of caloric requirements for sustained activities at a high level over a period of time."⁶ Young et al.⁷ found the caloric intake of sixty-two Cooper Union male students, aged twenty-one years or more, to average 2,604, while that of fourteen Cornell University male students in the same age group averaged 2,529 calories. If the household food consumption data of the U. S. Department of Agriculture¹ are correct, it is apparent not only that a great deal of the food, at least one-third of the calories consumed by the average household, is wasted, but also that this waste is obligatory, if all of us are not to become obese.

Some will react to this statement with: "Oh well, these excess calories just represent drippings, fats cut off meat, cooking fats and oils that are discarded. They carry insignificant amounts of other nutrients with them." A little arithmetic, however, shows that this is not so. In the average American diet, fat provides 40 per cent or more of the calories^{7,8} or at least 1,200 fat calories in a 3,000 calorie diet. The U. S. Department of Agriculture household consumption level per nutrition unit of 4,390 calories includes 1,931.6 fat calories. This means that in reducing our caloric consumption from 4,390 to 3,000 calories we are discarding not more than 731.6 fat calories and not less than 658.4 calories from other foods. Also, one-half of the fat available in the American diet is "hidden fat," much of which is not readily excluded from the diet

without excluding other nutrients. Thus, 32.3 per cent of the fat consumed by American households is contained in meat (excluding bacon and salt pork), poultry, fish, eggs, dry beans and nuts; 18.1 per cent is found in milk, cream, ice cream and cheese, and 13.5 per cent in butter and margarine. All other foods, including other fats and oils, provide the remaining 36.1 per cent. According to the U. S. Department of Agriculture household consumption data, bacon, salt pork, cooking fats and salad dressings account for 26.4 per cent of the calories available from fat, or a total of 510 of the 4,390 calories available per nutrition unit. If these four items were entirely omitted from the 3,000 calorie diet, an extremely unlikely situation, they could account for no more than 36.7 per cent of the discarded calories. It is apparent that a one-third reduction of the calories consumed in the average American household will of necessity bring about a variable reduction in the consumption of other essential nutrients.

RECENT STUDIES

Leverton and associates⁸ have reported on the diets of 353 women in Illinois and Nebraska who were subsisting on diets containing on the average 1,936 calories. This is 39.5 per cent less than the per capita calorie consumption figure (3,200 calories) reported in the U. S. Department of Agriculture household consumption study.¹ It is pertinent that calories from table and cooking fats in the diets of the Illinois and Nebraska women were less than in the U. S. Department of Agriculture per capita diet by 41.7 per cent, about the same as the per cent decrease in total calories, while those from meat, poultry, fish, eggs, cheese, beans and nuts were 55.72 per cent, those from milk 51.7 per cent and those from bread and cereals 59.2 per cent less. There was a proportionate increase in calories from vegetables and fruits, with a slight absolute decrease, 280.72 calories compared to 320. There was both a proportionate and absolute increase in calories from sweets and desserts, 453.02 calories as compared to 396.8 in the U. S. Department of Agriculture per capita data. The diets of these women supplied, on the



TABLE III
Per Cent of Adults and Adolescents (Ages Thirteen to Twenty Years) Eating Diets Containing Less than Recommended Dietary Allowances (Revised 1953)*

Age Group and Sex	Number of Individuals	Calories	Protein	Calcium	Iron	Vitamin A	Ascorbic Acid	Thiamine	Riboflavin	Niacin
<i>Less than 90 or 100 Per cent of the Allowances</i>										
Adolescent females ⁹⁻¹²	345	65.5	56.8	77.6	85.0	40.9	53.5	70.8	59.9	43.5
Adolescent males ⁹⁻¹²	249	70.7	31.9	50.9	49.6	22.4	61.4	64.2	35.5	47.5
Adult females ⁹	46	38.9	21.7	77.4	39.5	34.7	51.0	52.1	41.3	58.4
Adult males ⁹	46	6.2	0.0	21.5	0.0	8.6	30.3	28.4	2.2	21.4
<i>Less than 66 or 69 Per cent of the Allowances*</i>										
Adolescent females ⁹⁻¹²	345	15.5	12.9	44.8	42.8	15.4	28.7	22.2	18.2	6.9
Adolescent males ⁹⁻¹²	249	12.9	3.6	21.7	5.6	6.4	34.6	12.0	9.6	3.7
Adult females ⁹	46	8.3	4.2	44.9	11.2	26.2	28.0	25.2	21.7	6.3
Adult males ⁹	46	2.2	0.0	6.2	0.0	2.2	19.9	7.0	0.0	4.0

* Some workers reported percentages of subjects under 100 per cent, others under 90 per cent of NRC Allowances; similarly some used 66 per cent as the breaking point and others used 69 per cent. So that the total under 100 per cent and 69 per cent, respectively, is greater by an unknown factor than here reported.

average, 113 per cent of the protein, 90 per cent of the calcium, 147 per cent of the vitamin A, 91 per cent of the thiamine, 107 per cent of the riboflavin, and 133 per cent of the ascorbic acid recommended by the National Research Council in the 1953 revision of the dietary allowances. The margin of safety in the average diet of these women is, in every instance, considerably less than that indicated in the household consumption data (Table I), due in part to unwise food selection, but due primarily to the low caloric requirements of the women involved.

Leverton et al.⁸ found that only seventy-eight (22 per cent) of the women had diets that provided 90 per cent or more of the National Research Council allowances for all six of the nutrients studied. These women had an average intake of 2,164 calories as compared to 1,936 calories for the entire group of 353 women. Their average diet was improved over that of the group as a whole by the consumption of more milk, meat and vegetables, but there was no concomitant decrease in the consumption of table and cooking fats and sweets and desserts. The calories from table and cooking fats were 276.86 for the seventy-eight women with the most adequate

diets, as compared to 253.62 for the 353 women. The respective calorie levels for sweets and desserts were 465.05 and 453.02. It would appear that a substantial number of these seventy-eight may have been protected more by their good appetites than they were by any conscious efforts to select good diets.

DIETARY SURVEYS

Table I shows that the margin of safety (that is, the excess over National Research Council Allowances) is not large and may be non-existent for calcium, thiamine and riboflavin, and that there is considerable maldistribution of foods rich in ascorbic acid. We might, then, expect dietary inadequacies of these nutrients to be fairly common. Table III, which is a composite of a number of recent dietary surveys⁹⁻¹² bears this out. It also indicates a respectable incidence of dietary inadequacies of iron and vitamin A among females. Admittedly, Table III encompasses only a small fraction of the dietary studies which have been made, and includes a relatively small group of people, but we have reason to believe that it does reflect a fairly accurate picture.

Aside from the alarmingly high incidence of



inadequate diets among both adolescent and adult females, the most striking figures in Table III are those relating to the diet of the adult American male. He appears to be doing quite well indeed. Why, then, is his life expectancy so short? Why do so many American males die in their forties and fifties of degenerative vascular diseases? Could it be that he is being overfed by over-solicitous females to the detriment of his health? And, if this be so, what nutrients is he taking in excess to his own disadvantage? The only probabilities that need to be considered here are calories, fats and sodium chloride.

The high incidence of inadequate diets among adolescent girls and young women is of immediate concern. As pointed out by Stearns,¹³ "The importance of good nutrition in this group is so great that no steps toward its improvement should be neglected. It appears certain that pregnancy wastage and neonatal mortality are greater when the nutrition of the mother is habitually poor."

SUMMARY

The U. S. Department of Agriculture report on household food consumption in 1955¹ indicates that the average American household is consuming more than a sufficient amount of all nutrients studied to assure its members an adequate diet. However, since the supply of other essential nutrients is associated with a gross excess of calories, at least one-third more than actually is eaten per "nutrition unit," and since, in fact, calorie discard is not accomplished in the home without an appreciable discard of other nutrients, it cannot be concluded from the U. S. Department of Agriculture report that household food consumption in the United States is such as to preclude the possibility of a high incidence of dietary inadequacies. Nor can it be argued that educational programs designed to increase the consumption of particular foodstuffs are the answer to whatever dietary problems may exist. The calorie requirements of the average American adult probably are at an all-time low, and are not likely to increase in normal times. As the U. S. Department of Agriculture report amply demonstrates, it is not at all difficult to

persuade the consumer to purchase more food than he needs; however, this is quite a different matter from getting him to eat more calories than he requires or is accustomed to eating. Any nutritionist attempting to design a successful public health nutrition program must take cognizance of the fact that the addition of certain foods to the diet must be accompanied by the subtraction of an equivalent number of calories in the form of other foods. As pointed out by Leverton et al.,⁸ "Actually the need is often for *decreasing* the energy value [of the diet] and *increasing* nutritive values."

Consumer purchasing power and educational level remain, as they always have been, important determinants of the incidence and distribution of dietary inadequacies in the United States.

Dietary inadequacies do exist and are common in the United States where there is a plethora of food and where obesity is considered to be a public health problem of the first order. They are particularly prevalent and serious among adolescent girls and young women. This problem cannot be solved simply by encouraging an increased consumption of food.

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