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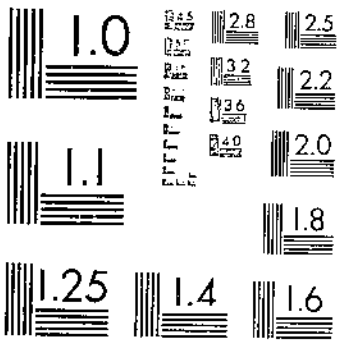

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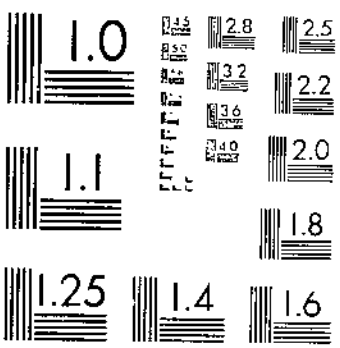

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WASHINGTON, D.C.

COMPARISON OF SCHEDULE AND ACCOUNT METHODS OF COLLECTING DATA ON FAMILY LIVING

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CONTENTS

INTRODUCTION

The rapid changes which have occurred in consumption habits in the United States since the World War accentuate the need for comprehensive and accurate statistics on family living. There is an increasing recognition of the uses of such statistics in a wide variety of current social and economic problems—in planning for commodity production and distribution, in education, in household purchasing and consumption, in adjusting basic wage rates, in arranging for unemployment insurance and old-age pensions, in caring for dependents, and in developing programs of taxation. The need for new information in solving these and other public problems will undoubtedly stimulate extensive investigation in this field in the near future. It is therefore important that information be made available on the reliability of different methods for obtaining data on consumption from families of different types.

[1] This investigation was begun by the senior author, and the data were collected and partly analyzed under her direction. The analysis was completed by the junior author. The authors are indebted to Edith Hawley, formerly senior food economist of the Bureau, for assistance in planning the investigation and in the field work. The authors are also indebted to Venia M. Kellar, State home demonstration agent at the University of Maryland; Elizabeth Thompson, then county home demonstration agent, Frederick County, Md.; Marianne Muse and Charlotte P. Brooks of the Vermont Agricultural Experiment Station; Geneva Bane and C. E. Lively, of Ohio State University; and M. Attie Souder, then of the University of Illinois, for assistance in obtaining the cooperation of the farm families in their respective States; and to Lois Meek, then educational secretary of the American Association of University Women, and Minna Denton, then of George Washington University, for assistance in interesting the cooperating professional families; and to Melissa F. Snyder of the Bureau of Home Economics for assistance in the field work, in editing the accounts and schedules, and in the statistical analysis. The accounts and schedules obtained from farm families in Vermont by Miss Muse and Mrs. Brooks have been summarized by them in a separate report published by the Vermont Agricultural Experiment Station.

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METHODS OF OBTAINING DATA ON FAMILY LIVING

Systematic studies of family living have been made in the United States ever since the close of the Civil War. Most of them have been concerned only with the goods and services consumed by the families investigated, but a few have included other aspects of family living. The methods of collecting data in these investigations have varied all the way from a brief questionnaire sent by mail asking for estimates of expenditures for food, clothing, shelter, and all other items purchased, to a detailed case record kept by an investigator living with the family studied. The majority of studies in this country, however, have used the schedule method, in which information is obtained from each family in one or two personal interviews, with the use of schedules providing for the entry of the data by a field agent. A considerable number of the studies in the United States have also been made by the account method, in which a day-by-day record of receipts and expenditures has been kept by the home maker or some other member of the family.

Each of these methods has its advantages and disadvantages. The questionnaire has been found the least satisfactory. It was used by some State departments of labor in early investigations of wage-earners' expenditures, but its use in recent years has been restricted to studies of professional groups.[2] It is natural that the questionnaire method should be more successful with the professionally trained than with others, but even with such groups it is open to serious question. The most carefully framed questions convey different meanings to different persons and with no interviewer to explain the terms used, to check hasty entries, or to point out questions left unanswered, the returns are too often incomplete, confused, or unreliable.

The record method of obtaining data on consumption would seem to be the logical one to use, as a record of events made day by day as they occur should be more accurate than a report of these same events made from memory several months later. In practice, however, the record method has distinct disadvantages. When the record is kept by an investigator rather than by a member of the family, the cost of securing the data from each family is very high, as the investigator must live with the family throughout the period of the study or make daily visits. This form of record has been extensively used abroad in studies of the LePlay type, (*11*)[3] in which information on family relationships and other qualitative aspects of family living is obtained in great detail from a small number of families. But it is not suited to studies covering a large sample of families in which the data are mainly restricted to the goods and services consumed.

When household accounts are kept by a member of the family, the cost of securing each record depends, of course, upon the amount of supervision given to each family. In some studies made by this method, the accounts have been kept without supervision for the entire period of the investigation; in others, they have been mailed at regular intervals to an investigator who has sought to remedy obvious omissions and inconsistencies by letter; and in still others, an investigator has visited each family at more or less frequent intervals.

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[2] WILLIAMS, F. M., and CONNOLLY, H. BIBLIOGRAPHY ON STUDIES OF COSTS AND STANDARDS OF LIVING IN THE UNITED STATES. U.S. Dept. Agr., Bur. Home Econ. 104 p. 1930. [Mimeographed.]

[3] Italic numbers in parentheses refer to Literature cited, p. 41.

Experience with this method in this country and abroad, however, indicates that the accounts must be supervised at frequent intervals if complete and accurate data are to be obtained. Moreover, the cost of editing and summarizing data obtained by the account method is much greater than that of editing and summarizing the data obtained by either the questionnaire or the schedule method. There are fewer entries to edit and tabulate in the average schedule or questionnaire covering consumption over a 12-month period than in the average record kept for even a few weeks.

Even when it is possible to meet the cost of obtaining and summarizing the data the account method has disadvantages. It is extremely difficult to find a large number of home makers who are willing to keep full and accurate records for even a few weeks, to say nothing of 12 months. There is grave question as to whether the families who are willing to cooperate with research workers in keeping household records are not exceptional. In any case much time and ingenuity are required to maintain the interest of the record keepers over the 12-month period.

Because of the difficulties involved in obtaining, editing, and summarizing large numbers of records of consumption from families representative of most important groups in the country, the schedule method has been used very extensively in the United States. The advantages of this method are many. It is comparatively easy to select a large number of home makers representative of a given group, each willing to devote from 1½ to 3 hours to giving the necessary information. If the visits are well planned, the field worker can obtain under ordinary circumstances from 2 to 4 schedules a day in an urban group, and 2 or 3 a day in a farming community. She is able to explain to each person interviewed the purpose for which the information is being gathered and thus interest many who would not trouble to answer a mailed questionnaire. Further, the field worker can explain to the home maker any terms used in the schedule which may not be entirely clear to her.

The schedule method has given best results when the interviewers obtaining the information have been trained in the technic of schedule taking and have used a very carefully prepared schedule. It requires considerable skill on the part of the interviewer, with patience and a good memory on the part of the home maker, to go back over the 12 months just past and estimate, without gross error, the quantities and money value of all items entering into the family living. Inaccuracies are bound to occur, even under the most favorable circumstances. The investigators who have used the schedule have assumed that the overestimates of some families would be compensated by the underestimates of others and that the averages would thus present a true picture.

Methods of obtaining data on family living have been discussed from time to time at the scientific meetings of investigators in this field. Several meetings of the International Institute of Statistics in the late nineteenth century were devoted to detailed discussions of the subject (*3*). The Third International Conference of Labour Statisticians (*8*), meeting at Geneva in 1926, adopted a resolution recommending the use of the account method and urging that wherever possible daily records of income and expenditure be kept by a member of the family for a period of 12 months under the supervision of com-

petent persons who could visit the cooperating families during the course of the inquiry and advise them regarding the keeping of the accounts. This conference recommended that where it would be impracticable to obtain annual accounts from a large number of families, records covering four periods of not less than a week, one in each quarter, or two periods of at least a fortnight in different seasons of the year, might be supplemented by annual records from a smaller number of families, or "by information on which annual estimates could be based" (*8, p. 26*).

The record method has been followed much more extensively in other countries than in the United States. In the British investigation of 1918 (*6*) records kept for 1 week were secured from 1,306 families with the assistance of volunteer field workers and in the Japanese investigation of 1926–27 (*1*) household accounts were kept by 5,455 families for the period of a year under the supervision of volunteer agents. A report of the International Labour Office (*7*) lists 27 official investigations of family living in foreign countries in the period from 1900 to 1926 which were based on household account books, kept for longer or shorter periods by 11,675 families.

American students of this subject who have employed the schedule method more than investigators in other countries are keenly aware of the dangers involved in its use. They recognize that it is especially doubtful when used with farm families, where much of each family's food supply comes from its own farm, without direct money outlay and without those measurements of quantity and quality which are a necessary part of purchase at retail. There is, however, very little information on the differences in the results obtained by the schedule method and by household accounts.

THE PURPOSE AND PLAN OF THE PRESENT STUDY

The present study was undertaken to compare the results obtained by the schedule and account methods. It considers the differences which appear in schedule and account figures from identical families for an identical year. It also considers the effect of the forms used and of supervision on the results obtained by both methods, and the possibilities of a combined method in which schedule data would be supplemented by accounts kept for short periods. Data from two types of families were secured for the purposes of the investigation—from farm families in contact with the extension service and from families of the professional group.

The information called for on schedules and in accounts used in this study included the quantity, kind, and cost of goods and services purchased, the quantity, kind, and value of goods furnished the family without direct money payment, and the savings accumulated during the period of a year. Because of the inclusion of the latter items the term "money value of family living" rather than "family expenditure" or "cost of living" is used throughout this report, except where reference is made to actual cash outlay for goods and services, in which case the term "family expenditures" is employed. The contribution of unpaid labor to the family living is not included in the investigation.

The data were obtained from 40 farm families and from 24 families of the professional group living in cities, and cover 12 consecutive

months in 1926–27. Day-by-day records were kept by each of these families, and at the end of the year schedule estimates were secured from them for the same period before they had received summaries of their accounts. The geographic distribution of these families was as follows:

Farm families	
Vermont: Addison, Chittenden, Lamoille, and Washington Counties	13
Ohio: Mahoning and Warren Counties	5
Illinois: Coles and Marshall Counties	3
Maryland: Frederick County	19
Total	40

Families of the professional group	
Elmira, N.Y.	4
Poughkeepsie, N.Y.	1
Cranford, N.J.	1
Chicago, Ill.	2
Washington, D.C.	12
Suburbs of Washington, D.C.	4
Total	24

In order to discover whether the keeping of accounts had improved the home maker's ability to give the schedule estimates, additional information was secured from the farm families living in Maryland. Before they began their daily record keeping, schedules were obtained covering their family living for the previous 12 months to use in comparison with the schedules taken after accounts had been kept for a year. As a check against these figures, schedule estimates were also secured for the same two years from other farm families in Maryland who did not keep household accounts. This second group was carefully selected as to size and composition of family, type of farm, and general level of living, so as to make it as similar as possible to the record-keeping group.

THE RECORDS

The records of the farm families in Illinois and Ohio were kept in the type of yearly many-columns-to-a-page bound account book usually provided by State extension workers (*18*). In the Maryland and Vermont farm families and in all the families of the professional group the records were kept on special weekly forms provided by the Bureau of Home Economics. They included a double sheet upon which to enter expenditures and a wall card for the use of the farm families in recording food, fuel, and ice furnished by the farm and food not used by the family. A wall card for listing the kind and amount of edible material wasted was also provided for the city families.

The weekly expenditures sheet provided 5 columns—1 for food, 1 for clothing, 1 for automobile, 1 for electric-light and power plants, and 1 for all other items purchased, with space in addition for recording number of persons present for meals. This latter information was needed for detailed analysis of the food-consumption figures. Items connected with automobiles, and with electric-light and power plants were treated in special columns because with farm families they are chargeable to both family and farm use. All such expenditures were entered on the day they were made, and at the end of the week allocated to family or to farm expenses according to the proportion used for each purpose. The automobile expenditures were assigned according to mileage used for family and for farm purposes, and light and power-plant costs according to the number and power of bulbs and to the hours of power used for each purpose.

The record form used was the outcome of an experiment carried on before this study was started with the home makers in 15 families

of the business and professional groups in Washington, D.C., and 11 farm families in Maryland. Each of these 26 home makers kept household records for 3 months—for 1 month in the double-page-of-many-columns type of form, the item purchased being written on the stub and the amount paid entered in the appropriate column under a heading giving the general class of item; for 1 month in the box type of form, a double page being divided into a number of boxes, 1 for food, 1 for clothing, 1 for operating items, and so on; and for 1 month on the form used in this study, with its 5 columns. The forms were distributed in such a way that each type was used for the first, second, and third month by approximately the same number of women. The majority of these home makers found the 5-column form the most acceptable. It took less time to keep than either of the others and there was no question of deciding where to classify debatable items.

THE SCHEDULES

The schedule forms used in this investigation were similar to those prepared by the Bureaus of Agricultural Economics and Home Economics for use in previous studies. For the families of the professional group a schedule changed in certain particulars was prepared to fit urban needs, but the difference between the schedules used with the two groups was slight.

Questions about goods and services consumed were provided for on the schedule in great detail to assist the home maker in estimating the amount and value of the items purchased or furnished by the farm. For example, if asked how much the family had spent for clothing, it would be extremely difficult for her to answer; but if asked how many pairs of shoes she bought for herself last year and the price of each, she can make a mental review and arrive at a more accurate figure.

In obtaining the estimates of food consumption, every effort was made to secure only the quantities actually consumed by the family, excluding the quantities spoiled in storage or fed to farm animals. When omissions or inconsistencies in any item were discovered in editing the schedules the family was revisited if possible. If the difficulty was not discovered until after the field worker had left the community, a letter was written to the home maker asking for assistance in completing or correcting the schedule. The intention of the investigators was, in so far as possible, to treat the data gathered by either the schedule or the account method as if that method were the only one being used for the investigation, and to use each method with equal care.

DATA FROM FARM FAMILIES

METHODS OF SECURING AND EDITING DATA

In all studies of family living where household accounts are used, the initial difficulty is to find families who are willing to begin the accounts. In Maryland contacts with farm women who were members of home economics clubs were secured through the cooperation of members of the home economics extension service in that State, and interest in the subject was stimulated by a series of talks on household accounts.

In July and August 1926 schedules were filled out with estimates of the family living for the previous 12 months for 30 Maryland farm

families who were willing to keep household records, and, as explained above, for a group of similar families which, for one reason or another, did not plan to keep such records. The 30 families that began keeping accounts were provided with forms from the Bureau of Home Economics and with hanging scales to use in weighing food purchased and furnished by the farm. Twenty-two of these families completed records for the 12-month period. Of the 8 who dropped out, 2 families were broken up by death, 1 moved into town, 2 home makers found they could not get the cooperation of the other members of the family and thus were unable to make complete reports, and the other 3 lost interest. Three of the 22 records received proved to be incomplete and were not used for this report.

The weekly records of the Maryland families were mailed to the Bureau on Thursday of each week and were promptly edited. Any discrepancy or any question was cleared up immediately either by correspondence or through the county home demonstration agent. At the end of the year the records were again checked for such items as taxes, interest on mortgage, and insurance premiums. When the record figures had been summarized, they were sent to the home maker with a letter asking her to review the summary, with her husband if possible, to see that it presented a full and accurate record of the family living for the year. Estimates of the value of the home and of the farm were secured from the family, and the valuations obtained were checked with the county clerk. Taxes, interest on mortgage, and fire insurance on buildings were prorated to house and farm in proportion to the relative value of the two.

Each of these families was visited at the end of the record year and schedule estimates of the family living were obtained for the 12 months of the record period. In order to avoid influencing these estimates, summaries of the year's records were not given the home makers until after the schedule figures had been secured. Schedules for this period were also obtained from 19 comparable families who had furnished schedule estimates for the preceding year and who had not kept household accounts in the interval.

The account and schedule data from 13 Vermont families were collected by the Vermont Agricultural Experiment Station in cooperation with the Bureau of Home Economics. Contacts with families interested in keeping accounts were made through the extension service. The same account forms were used as in Maryland and the cooperating families in Vermont were provided with platform scales on which to weigh food received. The accounts were started in the summer of 1926 and were sent to the experiment station each week, although they were not edited until the end of the year. The gaps then found seem to justify the expense of more frequent editing and of letters to the cooperating families asking about omissions or inconsistencies. In a report issued by the Vermont Experiment Station (*12*) the account and schedule figures are presented as they were first received.

In the present report certain items which the Vermont home makers failed to record in their accounts, but which they reported at the time the schedules were taken, have been added to the original entries on the account forms to make them as nearly comparable as possible to the records from the other States. Such additions were made only

when the fact that there was an omission in the record would have been obvious to an editor who did not have the schedule figures.

Further differences between the Vermont figures appearing in these two reports are due to differences in the classification of certain items and to a difference in the treatment of housing. The figures on the value of the house and the farm for the Vermont families here presented were secured by the methods used in Maryland. The interest on mortgages, taxes, and fire insurance on buildings also were prorated between house and farm in proportion to the value of the two.

Five household account books were secured through the Ohio Agricultural Experiment Station and three through the Illinois State Extension Service. The books were sent to the Bureau of Home Economics at intervals of 1 to 3 months, where they were promptly edited, and questioned points were sent to the State workers for explanation. These accounts were found more time-consuming to edit than those kept on the Bureau forms, but otherwise gave satisfactory results. At the end of the record year, in the summer of 1927, schedules were obtained from the Illinois and Ohio families by the State workers, and the completed records were reviewed as with the Maryland families. The State workers also checked value of house and taxes as in Maryland.

In editing all the accounts and schedules the items were classified under 19 headings, most of which are self-explanatory. Wherever family expenditures are discussed the housing item includes only money outlay attributable to the house for repairs, interest on mortgage, and taxes. Where family living is discussed the housing item includes, in addition, housing furnished by the farm. In the case of nonowners, this figure represents the estimated rental value of the house, computed by taking 10 percent of its estimated depreciated replacement value; in the case of owners, the annual value of the equity in the house, computed by taking 6 percent of the estimated value of the house and, wherever necessary, subtracting interest on the mortgage attributable to the house.

All expenditures for automobiles, including payments for new cars, made during the 12 months were recorded and allocated to farm or to family living expenditures according to the relative amount of use for each purpose. No attempt was made to allow for depreciation of automobiles.

The figures on expenditures for "formal education" include expenditures for school books and supplies, for school and college fees and tuition, for music and dancing and other special lessons, and for board and lodging at school and college; those on expenditures for "vocation" include expenses incurred in connection with business or profession paid for out of family income, such as attendance at business or professional conferences, dues to business, professional or home-making organizations, technical literature, and entertaining directly necessitated by business reasons.

Furnished food, fuel, and ice were valued at prices which the homemaker would have paid had she purchased these items locally. In Maryland a field worker from the Bureau of Home Economics collected prices of food every 3 months from 3 stores most frequently patronized by the families keeping accounts. In the other States prices were collected by the cooperating State workers.

CHARACTERISTICS OF THE 40 FARM FAMILIES

The accuracy of the results obtained by either the schedule or the account method varies with the type of families studied. Education, the size and composition of the families in the sample, the type and size of their farms, the money income of the group, and the total value of their family living, all affect the results of a comparative study of methods. An analysis of the characteristics of the 40 farm families cooperating in this investigation will define the type of farm family to which the results of this study apply.

The contact of these 40 farm women with the work of the Extension Service of the United States Department of Agriculture implies that they were somewhat better informed on the subject of budgets and of household accounts than most farm women who are not reached by the Extension Service.

The formal education of these home makers and of their husbands lasted longer than is usual in farm families in the United States. In three fourths of these families both the farm operator and the home maker had gone beyond the eighth grade, and in more than one fourth either the operator or the home maker had gone to college, normal school, or some technical school after leaving high school. In a survey of 2,886 white farm families in 11 States in 1922–24, Kirkpatrick and his associates (*10*) obtained figures on the education of the farm operator and the home maker in 2,316 families. In more than half of these families both operator and home maker had completed only the eighth or a lower grade and in only 10 percent had either continued education after high school.

The small number of women in this group who had young children illustrates the difficulty of procuring representative figures by the account method. In only one of the cooperating farm families was there a child under 1 year of age. In 3 families the youngest child was from 1 to 2 years old; in 3 families the youngest was from 3 to 5 years old; in 23 families the youngest child was 6 years old or older. There were 10 childless families, 8 were composed of husband and wife only, and 2 included husband and wife and other adults. Only 3 of the account-keeping farm home makers were under 30 years of age; over half were between 40 and 50 years of age; their average age was 42 years.

In regard to size of family, the cooperating group was not, however, unusual. When size of family is measured in terms of the number of persons in the home during the year who were dependent on the family income, the average size of these 40 families is 4.2 persons and the range is found to be from 2 to 8 persons. When hired help, visitors, and boarders are included in the household, the average size is 4.9 persons and the range from 2.4 to 10.2 persons.

Table 1 presents data on the farms operated by these 40 families. It is apparent that families owning their farms and engaged in general farming or in dairy farming predominate among the families cooperating in this study, and that in general their farms are larger than the average for their respective States.

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TABLE 1.—*Type and size of farms operated by 40 farm families*

Item	Data for farms in—			
	Maryland	Vermont	Ohio and Illinois	All localities
Farms, total ..... number	19	13	8	40
Farm operators, by tenure:				
Owners ..... do	13	11	6	30
Tenants ..... do	6		2	8
Managers ..... do		[1] 2		[1] 2
Type of farm:				
Dairy ..... do	2	9		11
Dairy and other ..... do	5	2		7
General ..... do	10	2	4	16
Poultry ..... do			1	1
Grain and stock ..... do	1		3	4
Grain ..... do	1			1
Size of farm: [2]				
Under 100 acres ..... do	3	1	2	6
100–149 acres ..... do	7	3	2	12
150–199 acres ..... do	5	5	1	11
200 acres and over ..... do	4	4	2	10
Average size of farms operated by families who kept accounts ..... acres	155.7	218.1	[3] 156.7	176.3
Average size of all farms in the 4 States concerned ..... do	[3] 90.5	[4] 141.3	[4] 112.6	112.1

[1] Hired on father's farm in both cases.
[2] Size of farm not available for 1 Illinois family.
[3] U.S. Department of Commerce, Bureau of the Census, Census of Agriculture for 1925, 2:92.
[4] Ibid, 1: 122; 331; 491.

The economic status of these farm families is presented in table 2 in terms of figures obtained from the accounts. The average value of the goods they purchased according to this source was $1,484, the average value of goods furnished by the farm $882, and the average amount of savings $198, making a total value of living of $2,564. In the studies of farm family living that have been made in different parts of the United States since 1922, the average value of family living ranges from $689 among the families studied in the mountains of Laurel County, Ky., by Oyler (*13*), to $2,937 for the Maryland families cooperating in the present study. King has estimated that average value of living of farm families in the United States in 1927 was $1,006 (*9*). In that year the Bureau of Agricultural Economics (*15*) received reports of farm returns from 13,859 owner-operators for their own farms; these reports showed average cash available from the farm for family living and farm improvements as amounting to $847. None of the families which kept accounts reported total value of family living or cash available for family living (including savings in the form of farm improvements) as low as these averages.

TABLE 2.—*Distribution of 40 farm families by money value of family living* [1]

Money value of family living	Data for families in—			
	Maryland	Vermont	Ohio and Illinois	All localities
Dollars	*Number*	*Number*	*Number*	*Number*
Under 1,499		1	1	2
1,500–2,099	5	5	4	14
2,100–2,699	3	4	2	9
2,700–3,299	4	3	1	8
3,300–3,899	4			4
3,900 and over	3			3
All families	19	13	8	40

[1] Based on figures from accounts.

It seems clear that the 40 farm home makers from whom accounts and schedules were obtained for this report represent well-to-do, well-educated farm groups. They were in the prime of life, with resources distinctly above the average for the farm population of the United States. Most of their families were without very young children, and 10 out of the 40 households had no children at all. Another investigation will be necessary to determine the conditions under which it is possible to secure annual household accounts from farm families with more limited education and economic resources and to measure the differences between account and schedule data on their family living.

COMPARISON OF ACCOUNT AND SCHEDULE DATA

In order to compare the account and schedule figures for these 40 families, the various items in the family living were classified under the 19 headings shown in table 3. In computing the relation of the average values obtained by the 2 different methods, the account averages were taken as 100, since it seemed likely that accounts kept from day to day and carefully edited would be more accurate than schedules taken with equal care.

TABLE 3.—*Money value of the various items included in family living for 1 year as shown by accounts and schedules from 40 farm families*

Item	Average value as shown by—		Schedule minus account average	Relation of schedule to account average (account average=100)	Standard deviation of the differences	t[1]
	Accounts	Schedules				
Money expenditures:	*Dollars*	*Dollars*	*Dollars*	*Percent*	*Dollars*	
Food	315	355	+40	113	102.24	2.47
Clothing	234	268	+34	115	55.22	3.89
Housing	142	81	−61	57	176.89	2.18
Household operation	216	223	+7	103	68.79	.64
Furnishings and equipment	84	84	(2)	100	42.73	.03
Automobile	192	160	−32	83	198.86	1.02
Personal items	44	40	−4	91	31.92	.79
Medical care	48	55	+7	115	33.19	1.33
Recreation	69	85	+16	123	55.22	1.83
Formal education	36	50	+14	139	47.84	1.85
Vocation	10	8	−2	80	7.35	1.72
Community welfare	44	49	+5	111	28.58	1.11
Gifts to persons outside the family	40	44	+4	110	50.12	.50
Miscellaneous items	10	5	−5	50	31.66	1.00
Total money expenditures	1,484	1,507	+23	102	444.14	.33
Goods furnished by the farm:						
Food	543	694	+151	128	216.83	4.40
Housing	284	284	(2)	100	1.26	1.00
Fuel, ice, and soap	55	67	+12	122	83.78	.91
Total value goods furnished	882	1,045	+163	118	236.67	4.35
Savings:						
Life insurance	123	126	+3	102	29.29	.65
Other savings	75	56	−19	75	60.38	1.09
Total savings	198	182	−16	92	67.46	1.50
Money value of family living	2,564	2,734	+170	107	545.00	1.97

[1] Computed according to the formula $t=\frac{\bar{x}\sqrt{n}}{s}$, in which $\bar{x}$ represents the average difference, n the number of differences, and s the standard deviation of the differences (*4, p. 105*). For a sample of this size a value of t of 2.00 or more indicates a significant difference between the account and schedule average.

[2] Less than 50 cents.

The difference between the schedule and account figures, it will be noted, is very slight for the total of items purchased by the 40 families, the schedule average being only 2 percent greater. For the total of goods furnished by the farm, however, the schedule figures average 18 percent higher, owing largely to the higher figures given on the schedules for food furnished by the farm. For savings the schedule estimates fall 8 percent lower than the account figures. Schedule figures on savings other than insurance are 25 percent less than the account figures for this item. When the money value of family living is considered, the schedules average 7 percent higher than the accounts.

Of the 19 groups under which the items included in family living have been classified, 11 show a higher average figure for the schedules than for the accounts, 2 almost identical figures (differing less than 50 cents), and only 6 a lower figure. Of the 11 groups for which the schedule averages are greater by far the greatest absolute difference appears in the value of food furnished by the farm, the schedule average exceeding that from the accounts by $151, or 28 percent of the account average. Money expenditures for food and clothing show the next largest excess, amounting to $40 and $34 respectively. Since the expenditures for these two items were relatively large, the percentage differences were only 13 and 15 percent. The highest percentage of excess in the schedule averages occurs in expenditures for formal education, the schedule figure averaging 39 percent more than that from the accounts, although the absolute difference was only $14. The schedule averages for expenditures for recreation and for the value of fuel, ice, and soap furnished by the farm are also more than 20 percent in excess of the account averages, the absolute differences being $16 and $12. For the other five items for which the schedule averages are higher than the account averages—expenditures for household operation, medical care, community welfare, gifts, and savings in the form of life insurance—the absolute differences are slight.

Three of the six items for which the schedule averages are less than the account averages also showed slight differences; the averages for vocational expenditures differed by only $2, those for personal items by $4, and those for miscellaneous expenditures by $5. There are, however, larger differences between the two sets of figures for housing expenditures, automobile expenditures, and savings other than insurance, the excess of the account over the schedule figures amounting to $61, $32, and $19, respectively. The difference between the figures for these three items are due at least in part to the form of the schedules used in the investigation. Although the instructions carried by the field workers when they secured the schedule data directed them to obtain figures on these items, there was no indication on the schedule itself that figures on housing expenditures, and expenditures for new automobiles, and savings other than insurance were to be obtained.

In the case of housing expenditures the greatest discrepancy occurred in the figures for repairs. Thirty-six household accounts included expenditures of varying amounts for repairs to the house, but only 10 schedules included any such figure. In consequence the average expenditure for this item amounted to $75 according to the accounts, $15 according to the schedules. The omissions from

the schedule data might have been avoided by a slight change in the schedule.

The difference between the two averages for expenditures for automobiles is in large part accounted for by the fact that 2 of the 3 families which purchased new automobiles during the year recorded the amount of the purchase in their accounts, but did not give this large item of expense to the field worker who obtained the schedule data. These omissions might also have been avoided if the section of the schedule dealing with automobile expenditures had included a question on expenditures for new cars.

Of the 13 farm families recording savings other than insurance in their household accounts, only 6 reported such savings when the schedule data were obtained. The items included in the accounts, but omitted on the schedules, covered deposits made in savings accounts, repayment of notes owed by the family, and reduction of outstanding mortgages. Changes in the value of farm inventories are not included in either the account or the schedule data.

The proportion of the taxes on the farm and of the interest on a mortgage, if any, chargeable to the farm house were necessarily computed figures, and the same method was used in computing the figures to be included with the account and schedule data for each family. Figures on total taxes paid were the same on both accounts and schedules, and the figures on the total amount of interest paid on mortgages were identical with one exception. In that case the difference was so small that its effect on the average for 40 families was negligible.

The method of computing value of housing furnished by the farm has already been discussed (p. 8). The same estimates of the depreciated replacement value of the houses occupied were used with both the accounts and schedules. This fact, together with the fact just mentioned, that the account and schedule figures on interest paid on mortgages were identical with only one exception, explains the identity of the averages on housing furnished by the farm.

The very small difference (less than 50 cents) between the account and schedule figures on expenditures for furnishings and equipment seems to indicate that the check list for items of this type provided on the schedule covered the purchases of the farm families cooperating in this investigation in a very thorough fashion. It also implies that purchases of furniture and equipment were important enough to most of these home makers for them to remember prices paid with considerable accuracy.

The extent of the agreement between the figures collected by the two methods used in this study may be judged from the fact that the coefficient of correlation between the account and schedule figures for total value of family living is $+0.79 \pm 0.06$; for total money expenditures $+0.68 \pm 0.08$; and for the money value of goods furnished by the farm $+0.79 \pm 0.06$.

The differences in the results obtained by the accounts and the schedules are due in some cases to chance variations. In other cases, they may indicate persistent tendencies to error, a bias inherent in one or the other of the methods used. The central problem of this investigation is to discover whether such persistent differences exist.

An approach to the problem may be made by examining in detail the relation of the schedule to the account figures from individual families. In table 4 is presented a distribution of the 40 farm fam-

ilies by the percentage relationship of schedule to account figures for the various items entering into the family living. A percentage above 100 indicates a schedule figure higher than the account figure; a percentage below 100 indicates that the schedule figure is lower. In the case of those items for which the families are more or less evenly distributed above and below 100, average differences due to the influence of a few large deviations may be attributed to chance. But where the families arranged in this way are grouped at one end of the distribution a persistent bias is indicated. For example, the 40 families are divided equally above and below 100 as regards the percentages for household operation expenditures; 3 appear with percentages of 50–74, 17 with percentages of 79–99, 11 with percentages of 100–124, 6 with percentages of 125–149, and only 3 over 150 percent. But in the case of food furnished by the farm, 2 families appear with percentages below 50, 3 with percentages from 75–99, 17 with percentages from 100–124, 10 with percentages from 125–149, and 8 over 150 percent.

TABLE 4.—*Distribution of 40 farm families by the relation of schedule to account figures for the various items included in family living*

[Account figure=100]

Item	Number of families having percentage of schedule to account figures of—						Total number reporting [1]
	Under 50 percent	50–74 percent	75–99 percent	100–124 percent	125–149 percent	150 percent and over	
Money expenditures:							
Food		3	9	16	9	3	40
Clothing		1	8	21	6	4	40
Housing	15	4	13	5		2	39
Household operation		3	17	11	6	3	40
Furnishings and equipment	5	8	11	4	2	10	40
Automobile	3	7	8	12	2	7	39
Personal items	8	6	6	7	4	9	40
Medical care	2	8	8	9	2	11	40
Recreation	2	2	8	16	3	9	40
Formal education	6	2	3	6	4	12	33
Vocation	4		3	19		5	31
Community welfare	2	6	8	7	3	14	40
Gifts to persons outside the family	5	6	8	4	4	13	40
Miscellaneous items	3			1			4
For all money expenditures	1	3	15	14	4	3	40
Goods furnished by the farm:							
Food	2		3	17	10	8	40
Fuel, ice, and soap	5	4	3	8		13	33
For value of all goods furnished	1		7	19	7	6	40
Savings:							
Life insurance		1	9	16	4	2	32
Other savings	8	1	1	4			14
For all savings	1	5	10	13	2	2	33
Money value of family living		3	10	20	6	1	40

[1] Includes families reporting item in account or schedule or both.

This procedure gives some insight into the behavior of the series under consideration, but does not supply any exact index of the significance of the differences. For this purpose one may use a method originated by Student and developed by R. A. Fisher, of the Rothamsted Experimental Station (*4*). According to this method, a value t is computed from the following equation:

$t=\frac{\bar{x}\sqrt{n}}{s}$, in which

$\bar{x}$ = the average difference,
n = the number of differences,
s = the standard deviation of the differences.

For the purpose of the present investigation

$\bar{x}$ = the average difference between the account and schedule figures for a given item,
n = the number of differences,
s = the standard deviation of the differences between the account and schedule figures from individual families.

Variations in the value of t are then used as an index of the significance of the differences to which they apply. The smaller the number of cases in the samples considered, the higher the value of t required to indicate any given degree of significance. Fisher has computed a table which shows for any value of t how frequently the average difference to which it applies would occur by chance, assuming there were no difference either in the universes from which the samples were drawn, or in the methods of securing the data in each sample. In statistical analyses, a difference which, it is estimated, would occur by chance in only 5 of 100 cases, is usually accepted as a significant difference. In comparing paired samples, like the ones in the present investigation, each with 40 cases, a difference is regarded as significant when the value of t is 2.00 or higher.

The values of t shown for the different items in table 3 indicate for the 40 families combined a significant difference between the account and schedule averages for expenditures for food, clothing, and housing, and for the money value of food and of the total of all goods furnished by the farm. The possibility of remedying the omissions in the schedule figures for expenditures for housing have been mentioned above. The difference in dollars between the account and schedule figures for food and clothing purchases are relatively not very large, but the values of t applying to these differences bring out the fact that the schedule figures are persistently larger than the account figures. The difference between the average account and schedule figures for the money value of food furnished by the farm is very striking, and the value of t for this item is so large that there can be no doubt that the difference in the method of collecting the figures had an important influence on the figures obtained for food furnished by the farm.

In considering the differences between the account and schedule figures, it is important to keep in mind the fact that the account figures from the three groups of families were obtained by different methods. The effect of these differences in method on the relationship between the schedule and account figures is reflected in table 5. It seems reasonable to attribute the persistence of percentages above 100 for the Vermont group to omissions in their accounts, due, at least in part, to the fact that the accounts from this group were not supervised throughout the record period. Arranged in this way, the Maryland, Ohio, and Illinois families, whose accounts were supervised by mail, are much more evenly distributed above and below 100 than are those from Vermont.

TABLE 5.—*Distribution according to States of 40 farm families by the relation of schedule to account figures for the various items included in family living*

[Account figure=100]

Item	19 Maryland families					13 Vermont families					8 Ohio and Illinois families				
	Number having percentage of schedule to account figures of—				Total number reporting [1]	Number having percentage of schedule to account figures of—				Total number reporting [1]	Number having percentage of schedule to account figures of—				Total number reporting [1]
	Under 50 per cent	50–99 per cent	100–149 per cent	150 per cent and over		Under 50 per cent	50–99 per cent	100–149 per cent	150 per cent and over		Under 50 per cent	50–99 per cent	100–149 per cent	150 per cent and over	
Money expenditures:															
Food		3	14	2	19		2	10	1	13		7	1		8
Clothing		4	15		19		1	8	4	13		4	4		8
Housing	5	8	4	2	19	4	8	1		13	6	1			7
Household operation		11	7	1	19		6	5	2	13		3	5		8
Furnishings and equipment	2	11	4	2	19	2	2	1	8	13	1	6	1		8
Automobile	2	8	7	2	19	1	5	2	4	12		2	5	1	8
Personal items	3	5	6	5	19	1	5	4	3	13	4	2	1	1	8
Medical care	2	11[2]	4	2	19		3	2	8	13		2	5	1	8
Recreation		5	11	3	19		2	6	5	13	2	3	2	1	8
Formal education	4	2	6	3	15	1	2	2	6	11	1	1	2	3	7
Vocation	1	2	10		13	2		5	5	12	1	1	4		6
Community welfare		8	6	5	19		2	3	8	13	2	4	1	1	8
Gifts to persons outside the family	5	5	3	6	19		5	1	7	13		4	4		8
Miscellaneous items	1				1			1		1	2				2
For all money expenditures	1	7	10	1	19		3	8	2	13		8			8
Goods furnished by the farm:															
Food		3	12	4	19	1		10	2	13	1		5	2	8
Fuel, ice, and soap	1	4	6	7	18	2	2	1	5	10	2	1	1	1	5
For value of all goods furnished		3	13	3	19		4	7	2	13	1		6	1	8
Savings:															
Life insurance		5	10		15		2	6	2	10		3	4		7
Other savings	6		1		7	1	1	3		5	1	1			2
For all savings	1	7	8		16		4	4	2	10		4	3		7
Money value of family living		6	13		19		3	9	1	13		4	4		8

[1] Includes families reporting item in account or schedule or both.

Table 6 continues the analysis of the figures from the three groups of families from whom accounts were received, by presenting averages from the accounts and schedules from each group, the absolute differences between the account and schedule averages, their percentage relationship, the standard deviations of the differences between the account and schedule figures for each item, and the t measure of the significance of the differences. Here again the persistent differences between the account and schedule figures from the Vermont families are very striking. For only 3 out of the 19 items for which averages are presented are the schedule figures smaller than the account figures from this group, although 10 schedule averages are smaller than the account averages in the figures from the Maryland group, and 11 in the figures from the Ohio and Illinois group.

The relatively larger difference between account and schedule figures for total value of family living for the Vermont group is also of interest. For the other two groups, differences in the various figures which are included in total value of family living combine in such a way that the average difference between the totals is very small indeed—only 4 percent of the account total for one group and 1 percent for the other. For the Vermont groups, however, the average value of family living is 16 percent higher as shown by schedules than as shown by the accounts.

Total money expenditures as shown by the schedules of both the Maryland and the Ohio and Illinois groups are smaller than expenditures as shown by the accounts, the difference amounting to 5 percent of the account average in one case, and 10 percent in the other. For the Vermont group, however, the schedule average for total money expenditures exceeds the account average by 20 percent.

The differences between the averages for goods furnished by the farm are similar for the three groups; for each group the schedule figures considerably exceed the account figures.

The Vermont group again differs from the other two in the figures on savings. The schedule average for payments on life insurance by the Vermont families is 19 percent larger than the account average. For all the other figures on savings, the account averages exceed the schedule averages.

The difference in the size of these three samples must be taken into account in interpreting the significance of the differences between their account and schedule averages. According to the table prepared by Fisher for the use of the t measure, a significant difference is indicated when the sample includes 19 cases, and the value of t amounts to or exceeds 2.10; when the sample includes 13 cases and the value of t amounts to or exceeds 2.18; when the sample includes 8 cases and the value of t amounts to or exceeds 2.37.

An analysis of the values of t applying to the differences between the accounts and schedules from the 19 Maryland farm families shows that in this group 5 out of the 22 differences for which values of t have been computed must be regarded as significant, those for value of food furnished by the farm and for all goods furnished by the farm, and for expenditures for food, clothing, and recreation. The distribution of the percentages shown in table 5 had already indicated the persistent differences between the schedule and account figures from the Maryland families for these items.

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TABLE 6.—*Money value of items included in family living for 1 year as shown by accounts and schedules from 3 groups of farm families*

Item	19 Maryland families						13 Vermont families						8 Ohio and Illinois families					
	Average value as shown by—		Schedule minus account average	Relation of schedule to account average (account average=100)	Standard deviation of the differences	t[1]	Average value as shown by—		Schedule minus account average	Relation of schedule to account average (account average=100)	Standard deviation of the differences	t[1]	Average value as shown by—		Schedule minus account average	Relation of schedule to account average (account average=100)	Standard deviation of the differences	t[1]
	Accounts	Schedules					Accounts	Schedules					Accounts	Schedules				
Money expenditures:	*Dollars*	*Dollars*	*Dollars*	*Percent*	*Dollars*		*Dollars*	*Dollars*	*Dollars*	*Percent*	*Dollars*		*Dollars*	*Dollars*	*Dollars*	*Percent*	*Dollars*	
Food	271	336	+65	124	89.36	3.17	388	446	+58	115	122.01	1.72	299	255	−44	85	54.88	2.27
Clothing	273	289	+16	106	26.26	2.66	199	281	+82	141	70.51	4.20	196	199	+3	102	32.68	.26
Housing	224	140	−84	63	217.89	1.68	94	37	−57	39	168.90	1.22	27	11	−16	41	21.26	2.13
Household operation	248	250	+2	101	41.60	.21	176	196	+20	111	101.30	.71	204	201	−3	99	62.46	.14
Furnishings and equipment	99	91	−8	92	28.92	1.21	46	73	+27	159	58.02	1.68	109	86	−23	79	19.80	3.29
Automobile	254	193	−61	76	248.41	1.07	140	128	−12	91	181.63	.24	130	132	+2	102	31.64	.18
Personal items	35	32	−3	91	29.11	.45	56	60	+4	107	39.97	.36	44	27	−17	61	21.54	2.23
Medical care	48	47	−1	98	16.90	.26	34	56	+22	165	49.31	1.61	70	73	+3	104	25.81	.33
Recreation	68	82	+14	121	21.84	2.79	63	106	+43	168	82.24	1.89	81	60	−21	74	39.92	1.49
Formal education	16	16	(2)	100	10.49	.08	85	124	+39	146	79.09	1.78	7	9	+2	129	3.74	1.51
Vocation	11	8	−3	73	6.55	2.00	8	10	+2	125	6.48	1.11	9	6	−3	67	9.80	.87
Community welfare	57	66	+9	116	20.61	1.33	21	30	+9	143	15.03	2.16	50	39	−11	78	30.47	.79
Gifts to persons outside the family	49	37	−12	76	55.48	.94	29	58	+29	200	49.95	2.10	36	36	(2)	100	8.31	.34
Miscellaneous items	11	------	−11	------	46.00	1.04	16	16	------	100	------	------	1	------	−1	------	1.30	2.18
Total money expenditures	1,664	1,587	−77	95	495.23	.68	1,355	1,621	+266	120	418.37	2.30	1,263	1,134	−129	90	136.56	2.67
Goods furnished by the farm:																		
Food	709	913	+204	129	221.10	4.02	381	452	+71	119	117.06	2.19	414	567	+153	137	316.42	1.37
Housing	272	272	------	100	------	------	246	247	+1	100	2.24	1.61	375	375	------	100	------	------
Fuel, ice, and soap	42	54	+12	129	32.08	1.63	100	118	+18	118	145.40	.45	13	13	(2)	100	6.11	.05
Total value goods furnished	1,023	1,239	+216	121	228.01	4.13	727	817	+90	112	200.44	1.62	802	955	+153	119	314.90	1.38
Savings:																		
Life insurance	167	163	−4	98	11.51	1.52	80	95	+15	119	48.27	1.12	90	87	−3	97	4.58	1.85
Other savings	83	53	−30	64	83.31	1.57	94	86	−8	91	28.07	1.03	23	15	−8	65	21.86	1.04
Total savings	250	216	−34	86	83.30	1.78	174	181	+7	104	55.30	.46	113	102	−11	90	21.38	1.46
Money value of family living	2,937	3,042	+105	104	596.63	.77	2,256	2,619	+363	116	543.35	2.41	2,178	2,191	+13	101	375.33	.10

[1] Computed according to the formula $t=\frac{\bar{x}\sqrt{n}}{s}$, in which $\bar{x}$ represents the average difference, n the number of differences, and s the standard deviation of the differences. For the Maryland group a value of t of 2.10 or more indicates a significant difference, for the Vermont group a value of t of 2.18 or more indicates a significant difference, and for the Ohio and Illinois group a value of t of 2.37 or more indicates a significant difference.

[2] Less than 50 cents.

The values of t applying to the differences between the account and schedule averages from the 13 Vermont families indicate significant differences for money value of family living, total money expenditures, expenditures for clothing, and value of food furnished by the farm.

Only two of the values of t applying to the differences between the account and schedule figures from the Ohio and Illinois families indicate significant variations. However, one of these values is extremely important for the interpretation of the data, as it shows the difference between the account and schedule figures on total money expenditures to be a significant one. The excess of the account average for expenditures for furnishings and equipment over the schedule average is the only other difference in the figures from this group for which the value of t exceeds 2.37, although in two other cases its value approaches this point. An inspection of the differences between the two sets of figures for the various money expenditures of this group shows that for the items where the schedule average exceeds the account average the differences are small, $3 or less, but that, where the account average exceeds the schedule average, most of the differences are considerably larger. The persistent differences between these two sets of figures for total expenditures are evidently caused by a cumulation of account figures somewhat larger, but not significantly larger, than the schedule figures for a great many items. Table 5 shows that the account figure on total money expenditures exceeded the schedule figure for all the families in the Ohio and Illinois group.

FOOD CONSUMPTION OF MARYLAND AND VERMONT FARM FAMILIES

The accuracy of figures on the amounts and kinds of food consumed by families of different types is of even greater importance than the accuracy of the other figures making up the total family living. A relatively large proportion of the total money value of the living of most families is represented by the value of their food, and the amount and character of that food is crucial for health. There is more general agreement among specialists in human nutrition as to the needs of the human body for food than among any other group of scientists whose work can be applied to evaluation of family living, and on this account also it is of especial importance to make data on food consumption as accurate as possible.

On the other hand, it is particularly difficult to procure accurate figures on food consumption. The fact that in most families new food supplies are brought into the house every day, and sometimes oftener, makes an accurate record over a long period of time very difficult to keep. Most students of food consumption, following Atwater's (*2*) example, have used records kept by trained investigators (for relatively short periods).

The data available for the present report on the amount and kinds of food consumed by farm families are based on accounts kept for 1 year and schedules for 1 year from 18 Maryland and 13 Vermont families.

Table 7 presents the figures for the accounts and schedules of these two groups of families on quantities of specified food materials purchased and furnished by the farm. For some foods there are very great differences between the account and schedule figures. The schedule figures on quantities of the following foods furnished by the

farm were more than twice as large as the account figures: Bacon and salt pork furnished the Maryland families; leafy vegetables and fresh fruits furnished the Vermont families. In the case of foods purchased the account averages for eggs purchased by both the Maryland and Vermont families, and for milk purchased by the Vermont families are relatively small, and the schedule averages are more than seven times the account averages.

TABLE 7.—*Quantities of specified food materials furnished by the farm and purchased during 1 year by 18 Maryland and 13 Vermont farm families as shown by accounts and schedules*

Food material	Average quantities for—				Relation of schedule to account average (account average=100)	
	18 Maryland families as shown by—		13 Vermont families as shown by—		18 Maryland families	13 Vermont families
	Accounts	Schedules	Accounts	Schedules		
	Pounds	*Pounds*	*Pounds*	*Pounds*	*Percent*	*Percent*
Furnished by the farm:						
Meat, fish, and poultry	941	999	218	360	106	165
Eggs	170	216	172	174	127	101
Cheese	8	5	(1)		63	
Milk	2,448	2,413	2,966	3,211	99	108
Cream	74	101	84	161	136	192
Butter and butter substitutes	32	47	1..	2	147	11
Bacon and salt pork	71	242	6	7	341	117
Lard and lard substitutes	94	142	5	4	151	80
Potatoes and sweetpotatoes	1,291	1,385	974	1,265	107	130
Other root vegetables	106	199	98	168	188	171
Tomatoes	258	393	53	105	152	198
Leafy vegetables	295	299	82	181	140	221
Other vegetables	649	928	363	463	143	153
Fruits, fresh [2]	754	1,117	285	643	148	226
Flour	152	260	15	13	137	87
Other cereals	20	38	3		190	
Purchased:						
Meat, fish, and poultry	259	294	258	326	114	126
Eggs	2	22	8	59	1,100	738
Cheese	10	12	18	23	120	156
Milk	22		1	94		9,400
Cream	(1)		11	2		18
Butter and butter substitutes	65	71	131	163	109	124
Bacon and salt pork	(1)	(1)	18	21		117
Lard and lard substitutes	10	18	72	67	180	93
Potatoes and sweetpotatoes	39	65	206	349	167	118
Other root vegetables	1	4	36	78	400	217
Tomatoes	19	13	29	34	68	117
Leafy vegetables	51	58	32	29	114	91
Other vegetables	85	102	60	72	120	120
Fruits, fresh	524	725	282	382	138	146
Fruits, dried and canned	36	50	30	38	139	97
Bread	236	232	125	114	98	91
Flour	361	532	409	540	147	115
Other cereals	165	271	143	185	164	129
Sweets	538	553	606	594	103	117

[1] Amount negligible.

[2] Including home-produced fruits canned.

The account averages on the consumption of milk furnished by the farm and of bread purchased are within 10 percent of the averages from the schedules for both the Maryland and Vermont families. The average for sweets as given in the Maryland accounts is within 3 percent of the average given in the Maryland schedules, but the discrepancy between the Vermont account and schedule average amounts to 17 percent of the account figure. Close agreement is shown in the averages from the Maryland accounts and schedules for meat, fish,

and poultry, and potatoes furnished, and butter and butter substitutes purchased, and in the averages from the Vermont accounts and schedules for eggs furnished by the farm, and for lard and lard substitutes, leafy vegetables, and dried and canned fruits purchased. In general, the schedule figures on quantities of foods purchased and furnished by the farm are much larger than the account figures.

It is impossible to conclude from these comparisons either that the schedule data overstate the quantities of food purchased or furnished by the farm, or that the accounts, being incomplete, understate these quantities. Differences between the account and schedule figures from individual families indicate that there were sometimes omissions in the schedule data and sometimes in the accounts. Food purchases are apt to occur very frequently in farm families of the type cooperating in this study, and food is brought into the kitchen and pantry from barn, chicken house, garden, and storeroom in most farm families more than once a day. The difficulties of keeping a complete record for a year, or of accurately estimating at the end of the year quantities consumed during that period, are enormous. Conspicuous errors in the accounts, such as omitting for a week milk, meat, potatoes or bread (in a bread purchasing family) were noticed in the weekly editing of the Maryland accounts, and a letter was written to the home maker to ask her to repair the omission if she could. It seems quite likely, however, that it is impossible to insure a high degree of accuracy in records of this sort without frequent visits from a field worker. As the figures stand, it is impossible to say which are the more accurate, the schedule or the account reports. This comment applies to all the account and the schedule figures being considered in this report, but the difficulties of procuring a complete record of food received during a year are so great that it is worth while to emphasize the imperfect nature of both the account and schedule figures at this point.

The field workers who obtained the schedule figures took especial care to ask the home makers to exclude from their estimates waste in storage, and food fed to farm animals. The instructions given the families who kept accounts in Maryland and Vermont for recording food purchased and furnished by the farm, directed them not to record in their accounts meats, fruits, and vegetables as they were stored in the cellar, but as they were brought into the kitchen for use, so that waste in storage is not included in the figures available for this report. No record of losses in food preparation was asked. The cooperating home makers recorded, however, the quantity of edible food materials not used for the family. Notes on the waste sheets make it obvious that most of the foods listed as "wasted" represent table waste, which was as a rule fed to pets or to farm animals. There were also small quantities of food recorded as having spoiled in refrigerator or pantry. The average quantities of such waste as reported are relatively small. The quantities varied considerably from family to family and from time to time in the same family.

The food reported as "wasted" in largest quantity is milk, the average quantity not used for the family being 119 pounds in the Maryland families and 94 pounds in the Vermont families, 5 and 3 percent respectively of the total amount of milk recorded as received. The Maryland families reported not using 16 pounds of the potatoes originally prepared for the table, and the Vermont families 42 pounds; the Maryland families reported 13 pounds of meat as not used for the table and the Vermont families 2 pounds. For the other groups of

foods listed in table 7 the quantities recorded as not used for the family averaged not more than 10 pounds during the entire year for either the Maryland or the Vermont families. The differences between the account and schedule figures on food purchased and furnished by the farm make it seem likely that these records of edible food not used for the family are incomplete. The irregularity of the quantities of waste recorded emphasizes the fact that studies of the nutritional adequacy of food consumption should include complete records of waste kept for short periods at different seasons of the year. It is difficult, if not impossible, for the home maker to remember the kinds and quantities of table waste and of spoilage in refrigerator and pantry, and to estimate the quantities for an entire year. The difficulties of keeping a complete record of waste during a long period are also very great.

CLOTHING EXPENDITURES

Figures on average clothing expenditures in the year 1926–27 for the 40 farm families who kept accounts have already been presented in the summary tables giving distribution of total family living. The differences between the account and schedule figures were relatively small in Ohio and Illinois, but four fifths of the schedules from the Maryland and Vermont families showed total clothing expenditures larger than those given in the accounts for the same families. Table 8 presents separate figures on the clothing expenditures for wives and husbands in the three State groups. It shows that the schedule estimates for the Maryland wives' clothing expenditures were very close to the account figures, but that for the clothing expenditures of the Maryland husbands there was a significant difference between the schedule estimates and the account records. In Vermont the average account figures for both wives and husbands were very much lower than the average schedule figures, the values for t showing the difference in the case of the figures for the wives in the Vermont families to be significant. In Ohio and Illinois, the differences between account and schedule figures were small. The schedule figures for the husbands' clothing in this last group were above the account figures in 4 cases and below in 4 cases.

TABLE 8.—*Clothing expenditures during 1 year for wives and husbands as shown by accounts and schedules from 40 farm families*

Group	Persons	Average expenditures as shown by—		Schedule minus account average	Relation of schedule to account average (account average =100)	Standard deviation of the differences	t [1]
		Accounts	Schedules				
Wives:	*Number*	*Dollars*	*Dollars*	*Dollars*	*Percent*	*Dollars*	
Maryland	19	105	108	+3	103	13.96	.94
Vermont	13	59	81	+22	137	18.21	4.36
Ohio and Illinois	8	43	48	+5	112	7.15	1.98
Husbands:							
Maryland	19	73	80	+7	110	13.27	2.30
Vermont	13	38	59	+21	155	34.87	2.17
Ohio and Illinois	8	54	58	+4	107	18.60	.61

[1] Computed according to the formula $t=\frac{\bar{x}\sqrt{n}}{s}$, in which $\bar{x}$ represents the average difference, n the number of differences, and s the standard deviation of the differences (*4, p. 105*).

HOUSEHOLD-OPERATION EXPENDITURES

Differences between the figures for household-operation expenditures as given in the accounts and schedules are relatively small. Table 9 presents in detail the most important of the items classified under this heading. The largest actual difference appears in the case of laundry and other service expenditures among the Vermont families, the greatest relative difference in the case of expenditures for ice by this same group. In the cases of the Maryland light and power expenditures and the Vermont stationery expenditures, the values for t indicate the difference between the account and schedule figures to be significant.

TABLE 9.—*Expenditures during 1 year for the most important items connected with household operation as shown by accounts and schedules from 40 farm families*

State group and item	Average expenditure as shown by—		Schedule minus account average	Relation of schedule to account average (account average =100)	Standard deviation of the differences	t[1]
	Accounts	Schedules				
19 Maryland families:	*Dollars*	*Dollars*	*Dollars*	*Percent*	*Dollars*	
Fuel	71	77	+6	108	23.47	1.11
Light and power	34	24	−10	71	12.65	3.45
Telephone	24	23	−1	96	3.01	1.21
Ice	8	9	+1	113	13.89	.31
Supplies	9	10	+1	111	4.53	.95
Laundry and other services	87	94	+7	108	26.23	1.16
Stationery	4	5	+1	125	3.32	1.31
13 Vermont families:						
Fuel	59	53	−6	90	62.96	.34
Light and power	33	35	−1	97	25.83	.14
Telephone	18	20	+2	111	7.75	.93
Ice	3	7	+4	233	14.59	.99
Supplies	14	15	+1	107	6.71	.54
Laundry and other services	27	39	+12	144	44.70	.97
Stationery	7	14	+7	200	10.82	2.34
8 Ohio and Illinois families:						
Fuel	86	83	−3	97	55.34	.15
Light and power	26	22	−4	85	16.00	.70
Telephone	18	17	−1	94	9.80	.29
Ice	9	6	−3	67	8.00	1.06
Supplies	11	8	−3	73	7.68	1.11
Laundry and other services	45	53	+8	118	29.36	.77
Stationery	5	4	−1	80	2.24	1.26

[1] Computed according to the formula $t=\frac{\bar{x}\sqrt{n}}{s}$, in which $\bar{x}$ represents the average difference, n the number of differences, and s the standard deviation of the differences (*4, p. 105*).

RECREATION EXPENDITURES

Expenditures for goods and services used in connection with recreation activities of the cooperating farm families were relatively small, but for certain of the items classified under this heading, differences between the account and schedule figures were comparatively large. The schedule estimates of the Maryland and Vermont families were in general larger than the figures given in the accounts, but figures from the Ohio and Illinois accounts were larger than the figures on the schedules from these same families. The account and schedule averages for dues and other expenditures connected with membership in recreational associations as reported by both the Maryland and Vermont families and expenditures for children's play equipment as reported by the Maryland families were in approximate agreement. Detailed figures on the recreation expenditures of the three groups of farm families are given in table 10.

TABLE 10.—*Expenditures during 1 year for the various items connected with recreation as shown by accounts and schedules from 40 farm families*

State group and item	Average expenditure as shown by—		Schedule minus account average	Relation of schedule to account average (account average=100)	Standard deviation of the differences	t [1]
	Account	Schedule				
19 Maryland families:	*Dollars*	*Dollars*	*Dollars*	*Percent*	*Dollars*	
Reading	16	17	+1	106	3.61	1.21
Associations	9	9	(2)	100	1.00	.44
Entertaining [3]	1		−1		2.24	1.25
Plays, concerts, and other amusements	15	22	+7	147	19.92	1.53
Children's play equipment	4	4	(2)	100	5.48	.08
Other recreational equipment	7	11	+4	157	6.00	2.91
Vacation trips	16	19	+3	119	10.49	1.25
13 Vermont families:						
Reading	4	14	+10	350	6.32	5.71
Associations	3	3	(2)	100	3.00	.00
Entertaining [3]	2		−2		4.24	1.70
Plays, concerts, and other amusements	18	33	+15	183	20.90	2.59
Children's play equipment	1	(2)	−1		1.41	2.56
Other recreational equipment	27	34	+7	126	13.00	1.94
Vacation trips	9	22	+13	244	56.14	.84
8 Ohio and Illinois families:						
Reading	11	10	−1	91	5.02	.48
Associations	9	5	−4	56	6.40	1.77
Entertaining [3]						
Plays, concerts, and other amusements	14	9	−5	64	8.83	1.60
Children's play equipment	2		−2		2.65	2.14
Other recreational equipment	35	27	−8	77	18.65	1.21
Vacation trips	10	9	−1	90	15.97	.18

[1] Computed according to the formula $t=\frac{\bar{x}\sqrt{n}}{s}$, in which $\bar{x}$ represents the average difference, n the number of differences, and s the standard deviation of the differences (*4, p. 105*).
[2] Food used for entertaining guests included with figures on food for family.
[3] Less than 50 cents.

The values of t given in the last column of table 10 indicate significant differences between account and schedule figures for expenditures for recreational equipment other than children's play equipment by the Maryland families, and for reading matter, plays, concerts, and other amusements, and children's play equipment by the Vermont families. In only 2 out of the 19 cases were the account figures on purchases of recreational equipment for adults in the Maryland families arger than the schedule figures. In none of the 13 cases were the account figures on purchases of reading matter by the Vermont families as large as the schedule figures; in only 2 cases did the account figures on expenditures for plays, concerts, and other amusements by this group exceed the schedule figures. The relatively large difference between account and schedule figures on expenditures for vacation trips by Vermont families is caused by the difference between the figures furnished by one family. The home maker in this family estimated that vacation trips had cost the family $200, but she recorded in her year's accounts only $4 as spent for this purpose. Differences between the account and schedule figures on cost of vacation trips for the other 12 families were small; in 5 cases account figures were larger than those from schedules, in 3 they were smaller, in 4 neither account nor schedule showed any entry under this heading.

THE EFFECT OF KEEPING ACCOUNTS UPON THE SCHEDULE ESTIMATES

It is evident that the home maker who has kept household accounts during the year will be able to recall the receipts and expenditures of her family for that period more accurately than one who has not kept systematic records in the immediate past. The very process of making the entries from day to day would presumably impress them on her memory even though she had not summarized them. The schedule estimates of the families in this study may therefore be more accurate than those generally obtained in studies using this method, since most families do not have complete records of receipts and expenditures.

An effort was accordingly made to determine what effect, if any, keeping accounts had upon the schedule estimates which are compared with figures from household accounts in this investigation.

As explained above, schedules for two consecutive years were secured from a second group of 19 farm families in Maryland that had not kept household accounts. They were selected so as to be as similar as possible to the 19 Maryland farm families that kept accounts. Schedules covering their family living in the year before they kept accounts were secured from the Maryland families whose accounts and schedules for an identical year have already been analyzed. A comparison of the figures of each group for the 2 years will show whether those of the group that kept accounts differ more than those of the other group. If such a difference appears, and if the 1925–26 schedule figures from the families having kept accounts exceed the 1926–27 schedule figures from these families for the same items for which the 1926–27 schedules exceed the account figures for that year, the differences may probably be attributed to the effect of having kept the accounts.

Of the 19 families in the control group, 10 were engaged in general farming, 3 in dairy farming, 4 in dairy farming combined with farming of other types, 1 in truck gardening, and 1 in raising grain. The average size of their farms was 111 acres. There were slightly more owners in the control group than among the Maryland families who kept accounts and the control group had slightly smaller farms.

Schedule figures on value of family living for the year 1925–26, when the two groups were, as far as could be ascertained, on an equal basis as regards estimating ability, show an average value of living of $3,303 for the families who kept accounts during the ensuing year, and of $2,720 for the families who did not do so.

Average size of family in the two groups was almost exactly the same, 3.9 persons in the group who kept accounts, and 3.8 persons in the control group. The number of young children in the two groups was very similar There were 5 children under 6 years old in the control group as compared with 7 in the group keeping accounts.

The formal education of the home makers and their husbands in the control group was slightly more extensive than that of the Maryland group who kept accounts. Contacts were first made with the families in the control group through the extension service.

Table 11 presents figures on the average value of the various items included in family living for the 2 years, 1925–26 and 1926–27, for the group that had not kept accounts. The differences between the average schedule figures for the 2 years were relatively small. Average money value of family living was estimated as 4 percent higher

in 1925–26 than in 1926–27, goods furnished by the farm as 6 percent higher, money expenditures as 3 percent higher, and life insurance 24 percent lower. The greatest percentage differences occurred in the average amounts estimated as spent for gifts and for medical care.

TABLE 11.—*Differences between the money value of the various items included in family living for the years 1925–26 and 1926–27 as shown by schedules from 19 Maryland farm families who did not keep accounts*

Item	Average value		1925–26 average minus 1926–27 average	Relation of 1925–26 to 1926–27 average (1926–27 average=100)	Standard deviation of the differences	t[1]
	1925–26	1926–27				
Money expenditures:	*Dollars*	*Dollars*	*Dollars*	*Percent*	*Dollars*	
Food	320	340	−20	94	69.80	1.25
Clothing	299	249	+50	120	108.33	2.01
Housing	50	54	−4	93	12.58	1.39
Household operation	106	108	−2	99	96.43	.09
Furnishings and equipment	49	55	−6	89	39.05	.67
Automobile	65	74	−9	88	70.45	.56
Personal items	37	46	−9	80	37.28	1.05
Medical care	118	54	+64	219	187.09	1.49
Recreation	54	70	−16	77	48.38	1.43
Formal education	22	38	−16	58	59.95	1.16
Vocation	4	5	−1	80	3.14	1.39
Community welfare	46	51	−5	90	26.52	.82
Gifts to persons outside the family	52	25	+27	208	46.24	2.55
Miscellaneous items	5	16	−11	31	73.79	.65
Total money expenditures	1,296	1,254	+42	103	336.39	.54
Goods furnished by the farm:						
Food	1,074	995	+79	108	307.94	1.12
Housing	222	222		100		
Fuel, ice, and soap	56	55	+1	102	60.77	.09
Total value goods furnished	1,352	1,272	+80	106	295.83	1.18
Savings:						
Life insurance	72	95	−23	76	95.22	1.05
Other savings						
Total savings	72	95	−23	76	95.22	1.05
Money value of family living	2,720	2,021	+99	104	529.13	.82

[1] Computed according to the formula $t=\frac{\bar{x}\sqrt{n}}{s}$, in which $\bar{x}$ represents the average difference, n the number of differences, and s the standard deviation of the differences. For a sample of this size, a value of t of 2.10 or more indicates a significant difference between the averages from the schedules for the 2 years (*4, p. 105*).

While figures for the two different years from the control group are very similar, those from the families who kept accounts are strikingly different for certain items. Table 12 summarizes the figures from these two sets of schedules. The value of living was estimated as 9 percent higher in 1925–26 than in 1926–27, money expenditures as 1 percent higher, goods furnished by the farm as 24 percent higher, and savings as 23 percent lower. An inspection of the column presenting values of t for each item shows that there were significant differences between the figures on the schedules for the 2 years for expenditures for clothing, household operation, personal items, and gifts, and for food furnished by the farm and the total of all goods furnished by the farm. The largest difference for any single item occurs in the case of food furnished by the farm where the average for 1926–27 is $250 lower than the average for the previous year. If the figures in table 12 are compared with those giving differences between the

accounts and schedules from these families for 1926–27, presented in table 6, it will be seen that for a number of important items the schedule estimates for the second year are very much closer to the account figures than are those for the first year. The difference between the average value of food furnished by the farm in 1925–26 and in 1926–27 in the figures from this group is particularly striking. It is possible, of course, that the difference might have been caused by crop conditions, but the fact that a similar difference does not appear in the figures from the control group makes that possibility seem unlikely.

TABLE 12.—*Differences between the money value of the various items included in family living for the years 1925–26 and 1926–27, as shown by schedules from 19 Maryland farm families who kept household accounts*

Item	Average value		1925–26 average minus 1926–27 average	Relation of 1925–26 to 1926–27 average (1926–27 average=100)	Standard deviation of the differences	t [1]
	1925–26	1926–27				
Money expenditures:	*Dollars*	*Dollars*	*Dollars*	*Percent*	*Dollars*	
Food	383	336	+47	114	126.85	1.62
Clothing	344	289	+55	119	86.54	2.77
Housing	81	140	−59	58	125.51	2.05
Household operation	219	250	−31	88	60.05	2.25
Furnishings and equipment	81	91	−10	89	167.76	.26
Automobile	109	193	−84	56	201.19	1.83
Personal items	23	32	−9	72	18.41	2.13
Medical care	54	47	+7	115	61.30	.50
Recreation	128	82	+46	156	225.83	.89
Formal education	24	16	+8	150	47.54	.73
Vocation	32	8	+24	400	59.48	1.76
Community welfare	59	66	−7	89	29.48	1.04
Gifts to persons outside the family	66	37	+29	178	52.74	2.40
Miscellaneous items						
Total money expenditures	1,603	1,587	+16	101	421.55	.17
Goods furnished by the farm:						
Food	1,163	913	+250	127	322.44	3.38
Housing	296	272	+24	109	83.21	1.26
Fuel, ice, and soap	75	54	+21	139	50.91	1.80
Total value goods furnished	1,534	1,239	+295	124	348.50	3.69
Savings:						
Life insurance	105	163	+3	102	15.65	.84
Other savings		53	−53		229.66	1.01
Total savings	166	216	−50	77	231.13	.94
Money value of family living	3,303	3,042	+261	109	638.51	1.78

[1] Computed according to the formula $t=\frac{\bar{x}\sqrt{n}}{s}$, in which $\bar{x}$ represents the average difference, n the number of differences, and s the standard deviation of the differences. For a sample of this size, a value of t of 2.10 or higher indicates a significant difference between the averages from the schedules for the 2 years (*4, p. 105*).

The fact that the values of t applying to expenditures for gifts show a significant difference between the schedule figures for the years 1925–26 and 1926–27, for both the account-keeping and the control groups, and not between the account and schedule figures for 1926–27 probably indicates an actual difference between the 2 years in the expenditures for this item by both groups.

The evidence presented in tables 6, 11, and 12 seems to warrant the conclusion that the effect of keeping the accounts was to increase the accuracy with which the home maker was able to give schedule

estimates of food furnished by the farm, and of expenditures for clothing and household operation.

DATA FROM FAMILIES OF THE PROFESSIONAL GROUP

METHODS OF SECURING AND EDITING DATA

Contacts with home makers of the professional group interested in keeping records of family expenditures and savings were established through the American Association of University Women and through graduate students at George Washington University and at Teachers College, Columbia University. The 24 families included in this study were part of a large group of city families widely scattered throughout the country from whom yearly accounts were obtained. These 24 families lived either in communities relatively near Washington or in other communities visited by workers from the bureau in connection with other professional business so that schedule estimates were obtained from them at the end of their year of record keeping.

The record form used with these families was the same as that used for money expenditures and savings with the Maryland and Vermont farm families. At the beginning of the year each cooperating home maker supplied information on insurance policies carried, the kinds of electrical equipment owned, the value of the house occupied if it was owned by the family, the amount of principal and interest on the mortgage (if the house was mortgaged), and the make, type, model, and year of purchase of the automobile (if the family owned a car). This information proved valuable in editing the accounts, which were mailed to the Bureau of Home Economics weekly. As in the case of the records kept by the Maryland families, these reports were edited promptly and obvious omissions and inconsistencies were questioned by mail. At the end of the record period before they had received any summary of their weekly records, schedule data covering expenditures and savings were secured from each of these families.

The classification used in summarizing the data from this group is the same as that used with the data from the farm families. The term "money value of family living" as applied to these urban families is used to include money expenditures for goods and services, the annual value of the equity in owned homes, savings, and investments. None of these 24 families recorded contributions to their food supply from their own gardens nor gifts to which it was possible to assign a money value. The annual value of the equity in owned homes was computed by taking 6 percent of the estimated value of the house and subtracting interest paid on the mortgage if the house were mortgaged.

CHARACTERISTICS OF THE 24 FAMILIES

The chief source of income in this group of families was the salary earned by the father of the family. In two families wives supplemented their husbands' incomes, one by teaching and the other by writing; in one family the chief source of income was the salary of a woman, a widow; in 12 families, supplementary income was received from investments.

The occupations of the chief earners in these 24 families were: Business executives, 4; college teachers, 4; engineer (not in Government service), 1; Federal employees, 11, including 6 chemists, 2 economists, and 3 engineers; State livestock commissioner, 1; lawyers, 2; welfare worker, 1.

The occupational status of the men in these families presupposes formal education considerably above the average for the entire community. Three had finished their schooling with work at technical schools, 9 with college graduation and bachelor's degrees, 5 with master's degrees, and 6 with doctor's degrees. The method of making contacts with this group of home makers resulted in securing the cooperation of women with formal education above the average, even for the wives of professional men. Twenty-one of the cooperating home makers were college graduates and two of them had received master's degrees. Of the other three, one had attended college and one a technical school, while the other was a high-school graduate.

The proportion of families with young children in this group is larger and the proportion of families consisting of husband and wife only is smaller than in the farm group. There were only 3 childless families—2 families of husband and wife only and 1 of a widow and her mother; 2 families where the youngest child was under 1 year; 4 families where the youngest was 1 to 2 years old; 5 families where the youngest was 3 to 5 years old; 10 families where the youngest child was over 6 years old. The average size of family was 4 persons; average size of household 4.4 persons. In 8 of these households the home maker had full-time household help; in 8 of them she was assisted by part-time help.

The home makers in the professional group were, on the average, younger than the home makers in the farm group. Women under 40 years old predominated in the professional group; the average age of the women in the group was 36 years.

There was wide variation in the economic status of the cooperating professional families; total value of living for 1926–27 varied from $2,215 to $17,717. There were 16 families with value of living of less than $5,000; and 7 families with value of living of from $5,000 to $9,999. Only one of the cooperating families was found to have a value of family living over $10,000. The average for the group of 24 families was $5,327.

The information available on the economic status of professional families in the United States is so meager that it is impossible to say how large a group is represented by the 24 families cooperating in the present investigation. According to the report of the Wage and Personnel Survey of the Personnel Classification Board (*17, p. 226*) made in the summer of 1929, 87 percent of the professional employees in the departmental service of the Federal Government were receiving salaries less than $5,000, as of October 1, 1928; and 76 percent of the professional employees of 302 colleges and universities surveyed earned less than $5,000 in the academic year 1926–27. (In compiling the figures on earnings of the college and university teachers, earnings other than regular salaries were taken into consideration.) The family expenditures plus the savings of the University of California faculty families studied by Peixotto in 1922 (*14, p. 122*) averaged $5,512; those of 27 "prosperous" families in Lynchburg, Va., described by Gee and Stauffer as belonging to the business and professional group, averaged $6,771 in 1927–28 (*6, p. 11*). There is considerable similarity between average distribution of family living by the group cooperating in the present investigation and that of the groups studied in California and Virginia. All three groups are, however, so small that it is impos-

sible to infer that their distribution of family living is representative of that of any very large group in the United States.

COMPARISON OF ACCOUNT AND SCHEDULE DATA

The data on money value of family living from the accounts and the schedules of these 24 families are summarized in table 13. An inspection of this table will immediately bring out the fact that the figures given in the schedules from this group are much more nearly in agreement with figures from the accounts than were those from the farm groups. For only one item, gifts to persons outside the family, is the difference between the account and schedule average more than 20 percent of the account figure, and for the total value of family living the schedule average is within 4 percent of the account average. Moreover, the tendency for the schedule averages to be higher than the account averages, which was so striking in the tables presenting the data from farm families, is not so conspicuous in the figures from this group. There are more items for which the account averages are above the schedule averages than items for which they are below.

TABLE 13.—*Money value of the various items included in family living for 1 year as shown by accounts and schedules from 24 families of the professional group*

Item	Average value as shown by—		Schedule minus account average	Relation of schedule to account average (account average =100)	Standard deviation of the differences	t [1]
	Accounts	Schedules				
Money expenditures:	*Dollars*	*Dollars*	*Dollars*	*Percent*	*Dollars*	
Food	664	675	+11	102	123.25	0.44
Clothing	461	465	+4	101	62.74	.31
Housing	669	662	−7	99	86.11	.40
Household operation	486	500	+14	103	52.52	1.31
Furnishings and equipment	171	144	−27	84	35.01	3.78
Automobile	147	148	+1	101	40.72	.12
Personal items	98	91	−7	93	46.69	.73
Medical care	184	168	−16	91	83.06	.94
Recreation	239	195	−44	82	98.61	2.19
Formal education	136	140	+4	103	24.79	.79
Vocation	48	40	−8	83	26.51	1.48
Community welfare	117	103	−14	88	42.60	1.61
Gifts to persons outside the family	82	57	−25	70	44.81	2.73
Miscellaneous items	4		−4			
Total money expenditures	3,506	3,388	−118	97	299.13	1.93
Interest on equity in owned homes	276	278	+2	101	33.47	.29
Savings:						
Life insurance	267	253	−14	95	51.33	1.34
Payments on principal of mortgage	131	230	+39	120	205.99	.93
Other savings	1,087	981	−106	90	476.12	1.09
Total savings	1,545	1,464	−81	95	537.59	.74
Money value of family living	5,327	5,130	−197	96	628.28	1.54

[1] Computed according to the formula $t=\frac{\bar{x}\sqrt{n}}{s}$, in which $\bar{x}$ represents the average difference, n the number of differences, and s the standard deviation of the differences. For a sample of this size, a value of t of 2.07 or more indicates a significant difference between the account and the schedule average (*4, p. 139*).

Differences between the account and schedule figures from the individual families in this group have been measured by the methods used in interpreting the data from the farm group. In table 14 is

presented a distribution of the families of the professional group according to the percentage relationship between account and schedule figures for the various items included in family living. In computing these percentages the account figures have again been taken as 100.

It will be observed that percentages below 100 predominate in table 14. Although the range is wide for certain items, in general the professional families are more evenly distributed than was the case in the similar table for farm families. The five items for which the distribution is most strikingly skewed are expenditures for furnishings and equipment, medical care, gifts, recreation, and community welfare. A comparison of account and schedule averages for these items as given in table 13 shows that the schedule average for expenses for medical care was only 9 percent below the account average, and the schedule average for expenses for community welfare only 12 percent below the account average, but that the schedule averages for expenditures for furnishings and equipment, recreation, and gifts were 16, 18, and 30 percent below the account averages.

Figures on the standard deviation of the differences between the account and schedule figures for individual families for given items and the values of t applying to these differences are given in the last two columns of table 13. According to the tables prepared by Fisher (*4, p. 139*), for the interpretation of values of t, if 24 cases are involved, a significant difference is indicated when the value of t is as high as or higher than 2.07. An inspection of the values of t given in table 13 indicates a significant difference between the account and schedule figures on expenditures for furnishings and equipment, gifts, and recreation.

TABLE 14. *Distribution of 24 families of the professional group by the relation of schedule to account figures for the various items included in family living*

[Account figure=100]

Item	Number of families having percentage of schedule to account figures of—						Total number reporting [1]
	Under 50 per-cent	50–74 per-cent	75–99 per-cent	100–124 per-cent	125–149 per-cent	150 per-cent and over	
Money expenditures:							
Food			9	12	3		24
Clothing			10	14			24
Housing		1	12	9	2		24
Household operation			10	13	1		24
Furnishings and equipment	2	6	11	5			24
Automobile	1	2	4	9	1	2	19
Personal items	3	2	9	3	2	5	24
Medical care	2	6	10	5	1	1	24
Recreation	3	7	5	4	2	3	24
Formal education	1	1	4	5	1	1	13
Vocation	4	2	5	6	1	1	19
Community welfare	2	6	9	3	1	3	24
Gifts to persons outside the family	7	7	5	1	2	2	24
Miscellaneous items	2		1				3
For all money expenditures		1	12	11			24
Savings:							
Life insurance	1	2	8	12	1		24
Payments on principal of mortgage				9	1	2	12
Other savings	3	3	4	7	2	2	21
For all savings	1	5	6	10	2		24
Money value of family living		1	12	11			24

[1] Includes families reporting item in account or schedule or both.

An analysis of the schedule form suggests that there may have been omissions in the schedule figures for furnishings and equipment and for recreation and that such omissions might have been avoided, at least in part, if a more detailed list of possible expenditures had been provided to use in interviewing a group whose purchases for their homes and whose recreations express a great variety of interests. A comparison of schedule with account figures on gifts to persons outside the family led the investigators to believe that at least three families had made gifts involving relatively large sums of money from previously accumulated savings rather than from current income and that these gifts had been entered in the account but omitted from the schedules. These omissions might have been avoided if the schedule had included a specific question about gifts made from savings.

TABLE 15.—*Values of t applying to the differences between the account and the schedule figures for the various items included in the family living of four different groups of families* [1]

Item	Values of t applying to differences between account and schedule figures from—			
	19 Maryland farm families	13 Vermont farm families	8 Ohio and Illinois farm families	24 families of the professional group
Money expenditures:				
Food	3.17	1.72	2.27	0.44
Clothing	2.66	4.20	.26	.31
Housing	1.68	1.22	2.13	.40
Household operation	.21	.71	.14	1.31
Furnishings and equipment	1.21	1.68	3.29	3.78
Automobile	1.07	.24	.18	.12
Personal items	.45	.36	2.23	.73
Medical care	.26	1.61	.33	.94
Recreation	2.79	1.89	1.49	2.19
Formal education	.08	1.78	1.51	.79
Vocation	2.00	1.11	.87	1.48
Community welfare	1.33	2.16	.79	1.61
Gifts to persons outside the family	.94	2.10	.34	2.73
Miscellaneous items	1.04		2.18	
Total	.68	2.39	2.67	1.93
Goods furnished by the farm:				
Food	4.02	2.19	1.37	
Housing		1.61		
Fuel, ice, and soap	1.63	.45	.05	
Total	4.13	1.62	1.38	
Interest on equity in owned homes	(2)	(2)	(2)	.29
Savings:				
Life insurance	1.52	1.12	1.85	1.34
Payments on principal of mortgage	(3)	(3)	(3)	.93
Other savings	1.57	1.03	1.04	1.09
Total	1.78	.46	1.46	.74
Money value of family living	.77	2.41	.10	1.54

[1] Computed according to the formula $t = \frac{\bar{x}\sqrt{n}}{s}$, in which $\bar{x}$ represents the average difference, n the number of differences, and s the standard deviation of the differences. For the Maryland group a value of t of 2.10 or more indicates a significant difference, for the Vermont group a value of t of 2.18 or more indicates a significant difference, and for the Ohio and Illinois group a value of t of 2.37 or more indicates a significant difference; and for the professional group a value of t of 2.07 or more indicates a significant difference.

[2] Included with housing furnished by the farm.

[3] Included with other savings.

Table 15 makes possible a comparison of the values of t applying to the differences between the account and schedule data for the

various items included in the family living of the four groups of families cooperating in this investigation. It will be observed that the values of t for the professional group are very low for such major items in the family living as food, clothing, and housing expenditures, while for the three farm groups these values are considerably higher, except in the case of the clothing expenditures of the Ohio and Illinois families. The value of t applying to automobile expenditures is also lower for the professional group than for any of the farm groups, and that applying to formal education is lower than for two of the farm groups.

If the items for which values of t are significantly high are considered, the same contrast between the professional and farm groups appears. For the professional group the three items for which the values of t are high enough to indicate a significant difference between the account and schedule data (furnishings and equipment, recreation, and gifts to persons outside the family) represent only 9 percent of the money value of family living as shown by the accounts. For the Maryland farm group the items for which significant differences are indicated represent 45 percent of the total value of living; for the Vermont and the Ohio and Illinois farm groups, the values of t indicate significant differences between the account and schedule figures on total money expenditures, as well as between less important figures.

FOOD CONSUMPTION

Although all the 24 families in the professional group kept records of the amounts of money spent for food during the year, only 14 recorded in detail the quantities of food purchased. The period of these food-consumption records varied from 13 to 52 weeks; 8 of the 14 records covered a period of 40 weeks or more. Inventories of food on hand were secured at the beginning and the end of the record period. Inventory differences were applied to the figures on food purchased and the adjusted amounts were used to prepare an annual estimate from the accounts to compare with the annual estimate given in the schedules.

Table 16 presents the account and schedule figures on the most important foods purchased by this group. A comparison of these figures with those from the accounts and schedules of the farm group at once brings out the fact that here again averages computed from the account and schedule figures of the families of the professional group are much more nearly in agreement than those from the rural families that kept food consumption records. The greatest difference between the account and schedule averages for any food group occurs in the case of flour, where the schedule average is 32 percent higher than the account average.

In only four of the food groups were the schedule averages lower than the account averages. Differences between the averages secured from the two sets of figures vary from 1 to 32 percent. For 6 out of the 19 groups the averages agree within 10 percent.

All the families in this group keeping records of food purchased were asked to weigh and record quantities of edible material not used for the family during a typical week. Seven of the 14 families reported no edible food went unused by the family in their homes. The weekly figures of table waste and spoilage in refrigerator or pantry for the other seven have been summarized, multiplied by 52

and compared with the average quantities of foods purchased in the record year by these families. The percentages of waste to food purchased are all distinctly below 10, the figure used as a rule in estimating food waste in dietary studies where there has been no actual record of waste. Seven percent of the cereals other than flour purchased were reported as not used, and 4 percent of the meat, fish, and poultry. For the other groups of foods listed in table 16, the average quantities reported as wasted were not more than 3 percent of the average quantity purchased.

TABLE 16.—*Quantities of specified food materials purchased during 1 year by 14 families of the professional group as shown by accounts and schedules*

Food material	Quantities as shown by—		Relation of schedule to account average (account average=100)
	Accounts	Schedules	
	Pounds	*Pounds*	*Percent*
Meat, fish, and poultry	312	353	113
Eggs	153	163	107
Cheese	15	19	127
Milk	1,490	1,664	112
Cream	26	25	96
Butter and butter substitutes	83	90	108
Bacon and salt pork	32	29	91
Lard and lard substitutes	18	22	122
Potatoes and sweetpotatoes	437	409	94
Other root vegetables	95	116	122
Tomatoes	88	107	122
Leafy vegetables	214	266	124
Other vegetables	202	235	116
Fruits, fresh	655	801	122
Fruits, dried and canned	91	90	99
Bread	211	247	117
Flour	135	180	132
Other cereals	74	91	123
Sweets	231	265	115

As in the case of the figures on food consumption from the farm families, it is difficult to interpret the differences between the account and schedule figures on the food consumption of this group. Accounts supervised by mail and kept for so many weeks may easily have had many omissions, and may be less reliable than the schedule estimates. The schedule estimates on the other hand, may have overstated actual purchases. The figures given in table 16 show that the percentage differences between the account and schedule figures on purchases of foods so important to good nutrition as tomatoes, leafy vegetables, and fresh fruits are large enough to make interpretation of data secured by either the schedule or the account method, when accounts are supervised by mail, a very difficult problem.

CLOTHING EXPENDITURES

Account and schedule averages for the total clothing expenditures of the 24 families of the professional group are shown in table 13. The difference between them is so small as to be negligible. Table 17 shows there is closer agreement between the account and schedule averages on the clothing costs of wives and children than between the two sets of figures for the clothing expenditures of husbands. Either the home makers from whom the schedule estimates were secured had a tendency to overestimate their husbands' clothing expenditures,

or the husbands sometimes forgot to record clothing expenditures in the accounts—expenditures noted none the less by their wives, and remembered when the schedule figures were given the field worker. The average differences between the account and schedule figures on clothing expenditures for the individuals in the cooperating families is not large, but the values of t for the figures on the expenditures for husbands and for daughters less than 15 years old are large enough to indicate that the schedule figures from the individual families were higher than the account figures in the majority of cases.

TABLE 17.—*Clothing expenditures during 1 year for persons of different sex and age, as shown by accounts and schedules from 24 families of the professional group*

Sex and age group	Persons	Average expenditures as shown by—		Schedule minus account average	Relation of schedule to account average (account average=100)	Standard deviation of the differences	t [1]
		Accounts	Schedules				
	Number	*Dollars*	*Dollars*	*Dollars*	*Percent*	*Dollars*	
Wives	24	175	169	−6	97	38.13	0.77
Husbands	23	141	156	+15	111	34.59	2.08
Daughters 15 years of age and over	4	220	216	−4	98	6.56	1.22
Daughters under 15 years of age	12	74	65	−9	88	14.87	2.09
Sons 15 years of age and over	3	130	138	+8	106	12.33	1.12
Sons under 15 years of age	26	51	52	+1	102	13.71	0.37

[1] Computed according to the formula $t=\frac{\bar{x}\sqrt{n}}{s}$, in which $\bar{x}$ represents the average difference, n the number of differences, and s the standard deviation of the differences (*4, p. 105*).

HOUSEHOLD-OPERATION EXPENDITURES

The small average difference between the figures for total operating expenditures calculated from the account and the schedule data is shown in table 18. It amounts to but 3 percent of the account average and the value of t does not indicate that it is a significant difference. Values of t for the items making up this group indicate a significant difference in expenditures for light and power and water, but the absolute differences in each case are very small. The detailed figures on the operating expenditures of these families show how small differences in opposite directions tend to cancel one another when the difference between the account and the schedule averages is computed for a group of items.

HOUSING EXPENDITURES

Table 13 indicates that the average difference between the total housing expenditures of this group as shown in the accounts and the schedules is very small, indeed. In contrast to the schedule used with the farm groups, the schedule used with the professional group definitely provided space for entering data on housing expenditures. Total housing expenditures for the seven families in this group that rented their homes were, according to the accounts, $768–$760 for rent and $8 for repairs and improvements; according to the schedules the average was $760–$756 for rent and $4 for repairs and improvements. Total housing expenditures for the home-owning families averaged $628 according to the accounts, $622 according to schedules. Figures on fire insurance on the house averaged $7 in both accounts and schedules; interest on mortgages $287 in the accounts, $283 in the

schedules; tax payments on the house $147 in the accounts and $135 in the schedules; expenses for repairs and improvements $187 in the accounts, $197 in the schedules.

TABLE 18.—*Expenditures during 1 year for the various items connected with household operation as shown by accounts and schedules from 24 families of the professional group*

Item	Average expenditures as shown by—		Schedule minus account average	Relation of schedule to account average (account average=100)	Standard deviation of the differences	t [1]
	Accounts	Schedules				
	Dollars	*Dollars*	*Dollars*	*Percent*	*Dollars*	
Fuel	134	147	+13	110	30.92	2.06
Light and power	30	35	+5	117	11.26	2.18
Water	9	7	−2	78	3.70	2.65
Telephone	40	41	+1	103	6.20	.79
Ice	17	18	+1	106	11.74	.42
Cleaning supplies, etc	17	19	+2	112	11.26	.87
Laundry	24	25	+1	104	16.46	.30
Child care	8	10	+2	125	16.78	.58
Other service	154	149	−5	97	41.54	.59
Stationery	17	14	−3	82	9.06	1.62
Car fare	24	27	+3	113	15.67	.94
Insurance on furniture	3	2	−1	67	7.21	.68
Interest on loans	7	5	−2	71	25.09	.39
Safety-deposit box	2	1	−1	50	2.78	1.76
Total	488	500	+14	103	2.52	1.31

[1] Computed according to the formula $t=\frac{\bar{x}\sqrt{n}}{s}$, in which $\bar{x}$ represents the average difference, n the number of differences, and s the standard deviation of the differences (*4, p. 105*).

RECREATION EXPENDITURES

The predominance of schedule figures lower than account figures in the data on total expenditures for goods and services connected with recreational activities has been commented upon in discussion of table 14. Figures on expenditures for the various items which go to make up these totals are given in table 19. It is interesting to observe the relatively close agreement between figures from the accounts and the schedules on expenditures for reading matter. Figures on expenses for children's equipment were higher in the schedules than in the accounts, but the account figures were higher for all other items in this group.

TABLE 19.—*Expenditures during 1 year for the various items connected with recreation as shown by accounts and schedules from 24 families of the professional group*

Item	Average expenditures as shown by—		Schedule minus account average	Relation of schedule to account average (account average=100)	Standard deviation of the differences	t [1]
	Accounts	Schedules				
	Dollars	*Dollars*	*Dollars*	*Percent*	*Dollars*	
Reading	33	30	−3	91	19.40	0.76
Associations	23	18	−5	78	11.15	2.20
Entertaining [2]	7	3	−4	43	8.07	2.43
Plays, concerts, and other amusements	37	27	−10	73	25.81	1.90
Children's play equipment	11	18	+7	164	34.35	1.00
Other recreational equipment	21	16	−5	76	17.01	1.37
Vacation trips	107	83	−24	78	68.14	1.73
Total	239	195	−44	82	98.61	2.19

[1] Computed according to the formula $t=\frac{\bar{x}\sqrt{n}}{s}$, in which $\bar{x}$ represents the average difference, n the number of differences, and s the standard deviation of the differences (*4, p. 105*).

[2] Food used for entertaining guests included with figures on food for family.

A COMBINATION OF THE ACCOUNT AND SCHEDULE METHODS

Complete household accounts for a 12-month period are difficult to obtain and much time is required for editing and summarizing account data. On the other hand, schedule data have not proved an entirely satisfactory source of information on family living. Therefore it is of interest to analyze the possibilities of accounts kept for short periods, at different seasons, and supplemented by estimates of the family living for the year.

Such a procedure has several advantages: Supervised accounts for short periods at different seasons supply more accurate data on food consumption and on expenditures for food and for other recurrent items than can be obtained either by the schedule method or by unsupervised accounts for the entire year. Keeping records of family living even for brief periods probably aids the home maker in making schedule estimates. The record keeping is likely to make her more observant of the way in which the family money was spent. If she is a farm home maker, it helps her to keep track of quantities of goods furnished by the farm. The periodic checking of summaries of the account and schedule data with the home maker furnishes the investigator with opportunities for discovering omissions and inaccuracies in both sets of figures.

The frequency and the duration of the record periods required would vary with different climates and with families of different types. For some families, accounts for 1 month in every 3 or 4 would be necessary for satisfactory results; with others, accounts for 1 month in 6 might be sufficient. If it were desired, in certain studies, to have the food-consumption data recorded by a trained investigator rather than by a member of the family, records kept for shorter periods than a month at different seasons would perhaps be sufficient to give representative food-consumption data for most groups in the population.

Excerpts from the accounts used in the present study throw some light on the results which might be obtained with accounts kept for short periods at different seasons. For the Maryland farm families and for the professional group, annual estimates have been computed from the accounts for 2 months selected at 6-month intervals and for 4 months at 3-month intervals. The months were chosen so that all the months of the year have approximately equal representation in the average for each group of families. Allowances were made for differences in the lengths of the months used.

Estimates have been made for annual food expenditures and total money expenditures for both groups, and also for the money value of food furnished by the farm for the Maryland group. In making the estimates for food, it has been assumed that the average differences in the money value of food on hand at the beginning and end of a month were negligible in comparison with the average value of food furnished by the farm and purchased during the month. Since inventories of food on hand were obtained only at the beginning and end of the year covered by the study, such an assumption is necessary in using the accounts for selected months. For periods shorter than a month, inventory differences would be of greater importance, and no estimates have been computed on the basis of accounts for shorter periods.

The annual estimates of the money value of food furnished by the farm for the 19 Maryland families give excellent results. The averages for the annual estimates based on accounts for 2 and 4 months coincide

much more closely with the average from accounts kept for 12 months than does the schedule average. The annual account estimates are $711 and $729, respectively, the average from the 12-month accounts $709, and the average from the schedules $913. Estimates of the annual food expenditures of this same group of families yield similar results. Average annual food expenditures estimated on the basis of 2-month accounts are $267, on the basis of 4-month accounts $266; the average from the 12-month accounts was $271, and from the schedules, $336.

The estimated average annual food expenditures of the 24 families of the professional group based on accounts for 2 and for 4 months are not so closely in agreement with the average from the accounts for 12 months as the schedule average. The average account estimates differ from the 12-month account average by 9 and 8 percent, whereas the schedule average for the food purchases of these families differs from the 12-month account average by only 2 percent. The average of the estimates based on accounts for 2 months is $723, and of those based on accounts for 4 months $716, as compared with an average of $664 from the accounts for 12 months and $675 from the schedules. Evidently the food expenditures of the professional group varied somewhat more from month to month than those of the Maryland farm group.

Obviously annual estimates based on accounts kept for short periods would furnish unsatisfactory annual figures for items which are relatively expensive and which are paid for at irregular intervals—such items as fuel, furniture, medical care, or college tuition, unless accounts were obtained from a very large number of families. In low-income families the number of irregular expenditures is not very large, but in families with incomes as large as those represented in this investigation, there are many irregular expenditures, and total expenditures vary considerably from month to month. Estimates of the total annual expenditures of the 19 Maryland farm families based on accounts for 2 months and for 4 months selected at half-yearly and quarterly intervals average $1,165 and $1,892, respectively, as compared with $1,664, the average from the annual accounts, and $1,587, the average from the schedules. Average expenditures from the accounts for 12 months differ from the average based on accounts for 2 months by 30 percent, from the average based on accounts for 4 months by 14 percent, and from the schedule average by 5 percent.

Similar computations based on the accounts of the families of the professional group also show the schedule average for total annual expenditures nearer the average for the 12-month accounts than the averages of the account estimates. Estimates of the total annual expenditures of these families based on accounts for 2 months average $3,908, on accounts for 4 months $4,054, as compared with $3,506, the average from the annual accounts and $3,388, the average from the schedules. Average annual expenditures from the accounts of this group differ, therefore, from the average based on accounts for 2 months by 11 percent, from the average based on accounts for 4 months by 16 percent, and from the schedule average by only 3 percent.

If accounts for short periods were obtained from a very large number of similar families in such a way that the months of the year were equally represented in the sample, irregularities in the expenditures of individual families from month to month would disappear in

the averages. But the difficulties involved in editing and summarizing large quantities of account data would not be avoided. For samples of the size of those analyzed in this report, annual estimates based on accounts for 2 months and for 4 months are evidently not so satisfactory as schedule estimates, but a combination of annual schedules and of accounts for short periods would probably give excellent results.

The schedule method used in combination with accounts kept for short periods would have a further advantage in that visits in connection with the accounts would make it possible to procure 2, 3, or 4 schedules for periods of 6, 4, or 3 months each, rather than 1 schedule for 12 months. When the family was visited at the beginning of each new account period, schedule estimates could be obtained for the preceding half, third, or quarter year, starting with the month of the last account period. This procedure would check omissions in the accounts and aid in locating overestimates in the schedule data.

CONCLUSIONS

The agreement between the figures from the schedules and the household accounts of the families of the professional group cooperating in this investigation is so close that the use of the schedule method seems justified in future studies of the family living of this group. This conclusion may probably be extended to include studies of the family living of low-salaried groups since their purchasing habits are very similar to those of the professional group. Both types of family have, as a rule, certain household records. Even if they do not keep household accounts, they are likely to have files of receipted bills and canceled checks at hand for reference. The education and the purchasing habits of families of the wage-earning group are, however, distinctly different from those of almost all the families from whom accounts and schedules were obtained for this report, and it is impossible to draw conclusions as to methods of obtaining family-living data for the wage-earning group from the material here presented.

It is true, of course, that the families cooperating in this investigation had had, through account keeping, unusual preparation for estimating their family living for the year just past. The effect of account keeping on the farm families of the Maryland group has been shown above. There is no reason to suppose that the effect upon the home makers of the professional group was different. The fact that they made day-by-day records of their expenditures undoubtedly aided them in remembering what items were purchased during the account period.

It is also true, however, that the method of obtaining schedule estimates used in this investigation could be improved upon. Certain minor improvements in the schedule form which would increase the accuracy of the data collected are suggested in the course of the discussion. The accuracy of family-living data collected from the professional group also could be increased by including on the schedule questions on family income and other receipts of money in such a way that money receipts could be checked against money expenditures and savings. If this check had been made in the field, it would have been relatively easy to revisit families whose schedules showed important discrepancies between total receipts and total expenditures and savings, and to have corrected major errors. Such a check would

undoubtedly have resulted in changing the figures for some of the items for which there now appear significant differences between the account and schedule figures.

The schedule does not, however, appear to be a satisfactory means of collecting detailed figures on food consumption, either for the professional or the farm groups. Neither does the annual account supervised by mail. The value of securing accurate data to use as the basis for nutritional analysis makes it important to guard against the omissions which are likely to occur in unsupervised accounts and the overestimates characteristic of schedule data. Since there are important seasonal variations in food consumption, supervised records kept for a week or at different seasons of the year probably provide the best means of obtaining data on food consumption from either urban or rural families.

The comparisons of account and schedule data from farm families do not show the schedule to be as satisfactory with this group as with the professional group. Differences between the two sets of figures on money expenditures for goods of different types, as well as on the value of goods furnished by the farm, are great enough to leave the usefulness of the schedule method still open to question. Some of these differences, however, are undoubtedly due to omissions in the account data. It is clear, after the analysis of the account and schedule data from the Vermont families, that accounts must be supervised regularly throughout the account period. In studies of families less well educated than those of the present study, it would not be possible to rely so extensively on supervision by mail. More frequent home visits during the record period would be necessary.

That the figures obtained from the farm families by the schedule method would be better if the schedule forms were improved has already been suggested. The schedule results with this group would also be improved by obtaining data on the money received by each family during the year to check against total expenditures and savings. This involves so much specialized knowledge and so many computations that it is usually regarded as an additional piece of research, but the advantages of securing this information in connection with information on farm family living are obvious. It seems likely that many of the figures on the family expenditures which seem to have been overestimated by the farm group would have been scaled down, if the investigators had cooperated with a farm-management organization, and a schedule for the farm business had been secured for the year. As part of editing in the field, receipts could have been checked against expenditures and savings. Field workers could then have revisited the families whose total estimated expenditures and savings exceeded or fell below estimated receipts by an appreciable margin, and both sets of figures could have been reviewed with the family to discover the source of the discrepancy.

These improvements would not, however, take care of the discrepancies in the figures on food furnished by the farm. For the purpose of obtaining reliable data on this important aspect of farm family living, supervised records for at least part of the year, at different seasons, seem to be necessary.

In conclusion, the results from the small samples of families included in this study indicate that with families similar in education and in purchasing procedures to the professional group cooperating in the

present study, the schedule apparently can be made a satisfactory method of securing data on family expenditures and savings. If an analysis of the nutritional content of the diet of such a group is to be made a part of the project, the results of this investigation indicate that the schedules should be supplemented by records of food consumption. With farm families similar to those cooperating in this study, the schedule could perhaps be made a satisfactory method of securing data on family expenditures and savings. However, for the purpose of obtaining satisfactory data on the value of family living furnished by the farm, and on the quantities of foods consumed by farm families, it is apparent that accounts kept for short periods at different seasons in the year should be used to check the accuracy of the schedule data.

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