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To the Graduate Council:

I am submitting herewith a thesis written by Robert Wilson Johnson entitled "Effects of School Milk Program on Total Consumption of Milk by Families with Children in Jennie Bell School, Dyersburg, Tennessee, 1956." I recommend that it be accepted for nine quarter hours of credit in partial fulfillment of the requirements for the degree of Master of Science, with a major in Agricultural Economics.

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EFFECTS OF SCHOOL MILK PROGRAM ON TOTAL CONSUMPTION OF MILK BY FAMILIES WITH CHILDREN IN JENNIE BELL SCHOOL, DYERSBURG, TENNESSEE, 1956

A THESIS

Submitted to
The Graduate Council
of
The University of Tennessee
in
Partial Fulfillment of the Requirements
for the degree of
Master of Science

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by

Robert Wilson Johnson

June 1957

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CHAPTER I

INTRODUCTION

Purpose of Study

The purpose of this study was to determine if the Special Milk Program and the National School Lunch Program were effective in increasing milk consumption by the families with children in Jennie Bell School, Dyersburg, Tennessee, 1956.

History of Federal Aid to School Lunch Programs

Legislation in 1933

The first federal assistance to the school lunch programs was begun in 1933. This was made possible by the passage of the Federal Emergency Relief Act of 1933 on May 12, 1933. The Act provided $250 million to be granted to the states

> . . . to aid in meeting the cost of furnishing relief and work relief and in relieving the hardship and suffering caused by unemployment in the form of money, service, materials, and/or commodities to provide the necessities of life to persons in need as a result of the present emergency, and/or to their dependents, whether resident, transient, or homeless.

The Act created the Federal Emergency Relief Administration for the purpose of administering the federal aid provided.[1]

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[1]Seventy-third Congress of the United States, United States Statutes at Large, Vol. 48, Part 1, Public Acts and Resolutions (Washington: Government Printing Office, 1934), Public Law No. 15, pp. 55-58.

On October 4, 1933 the Federal Surplus Relief Corporation, a non-stock, non-profit organization, was chartered under the laws of the State of Delaware.[2] At the first meeting of the Board of Directors, the administrator of the Federal Emergency Relief Administration was elected President of the Corporation.[3] The Corporation received funds from the States, Territories, and the District of Columbia. These funds were used for the purchase, processing, and distribution of commodities which, along with commodities donated by the Agricultural Adjustment Administration, were distributed to the needy and destitute.[4] Institutions could receive commodities provided sworn affidavits declaring such supplies were used in addition to, and not as substitution for, normal purchases were filed.[5]

Legislation in 1935

In section thirty-two of the Agricultural Adjustment Act of 1935 there was appropriated for each fiscal year beginning with July 1, 1935 through June 30, 1936 an amount equivalent to thirty per cent of the gross receipts from duties collected under the customs laws during the preceding calendar year. This money was to be kept in a separate fund and was to be used by the Secretary of Agriculture, among other things,

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[2]Federal Surplus Relief Corporation, "Report of Federal Surplus Relief Corporation for the Period October 4, 1933 to December 31, 1934" (Washington: Government Printing Office, 1935), p. 1.

[3]Federal Surplus Commodities Corporation, "Report of Federal Surplus Commodities Corporation for the Calendar Year 1935" (Washington: Government Printing Office, 1936), p. 1.

[4]Federal Surplus Relief Corporation, op. cit., p. 1.

[5]Ibid., p. 5.

to ". . . (2) encourage the domestic consumption of such commodities or products by diverting them, by the payment of benefits or indemnities or by other means from the normal channels of trade and commerce."[6]

On November 18, 1935 the charter of the Federal Surplus Relief Corporation was amended so as to shift its control from the Federal Emergency Relief Administration to the Department of Agriculture. The Corporation then became the principal agency of the Agricultural Adjustment Administration and the primary emphasis in its activities was shifted from procurement for supplying direct relief to the needy and unemployed to the encouragement of domestic consumption by diversion of surplus farm products from normal channels of trade and commerce.[7] Large amounts of the commodities thus "diverted from the normal channels" were used in school lunch programs in the various states.

On June 28, 1937 an act was passed making it possible for the Secretary of Agriculture to transfer to the Federal Surplus Commodities Corporation such funds appropriated under section thirty-two of the Agricultural Adjustment Act of 1935 as were necessary to carry out clause (2) of section thirty-two.[8]

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[6]Seventy-third Congress of the United States, op. cit., Public Law No. 320, p. 774.

[7]Federal Surplus Commodities Corporation, op. cit., pp. 1-2. Federal Surplus Commodities Corporation, "Report of Federal Surplus Commodities Corporation for the Calendar Year 1936" (Washington: Government Printing Office, 1937), pp. 1-2.

[8]Seventy-fifth Congress of the United States, United States Statutes at Large, Vol. 50, Part 1, Public Acts and Resolutions (Washington: Government Printing Office, 1938), Public Law No. 396, p. 230.

National School Lunch Act of 1946

On June 4, 1946 the National School Lunch Act was passed. Section two of the Act was a "Declaration of Policy."

> Sec. 2. It is hereby declared to be the policy of Congress, as a measure of national security, to safeguard the health and well-being of the Nation's children and to encourage the domestic consumption of nutritious agricultural commodities and other food, by assisting the States through grants-in-aid and other facilities for the establishment, maintenance, operation, and expansion of nonprofit school-lunch programs.[9]

Beginning with the fiscal year ending June 30, 1947, there was authorized to be appropriated, out of money in the Treasury, such sums as were necessary to enable the Secretary of Agriculture to carry out the provisions of the Act.[10] Funds authorized, by the Act of June 28, 1937, to be spent by the Federal Surplus Commodities Corporation for the purchase and disposition of surplus agricultural commodities under section thirty-two of the Agricultural Adjustment Act of 1935 were also applicable to expenditures of funds by the Secretary under the National School Lunch Act.[11]

Money was apportioned among the states on the basis of "(1) The number of school children in the State and (2) the need for assistance in the State as indicated by the relation of the per capita income in

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[9]Seventy-ninth Congress of the United States, United States Statutes at Large, Vol. 60, Part 1, Public Laws and Reorganization Plans (Washington: Government Printing Office, 1947), Public Law No. 396, p. 230.

[10]Loc. cit.

[11]Ibid., p. 231.

the United States to the per capita income in the State."[12]

Section seven of the Act made it necessary that each dollar of Federal assistance be matched by the State to which the assistance went on the following basis. For the fiscal year 1947 through 1950 each dollar of Federal aid was matched by one dollar from State funds. For the fiscal years 1951 through 1955 each dollar of Federal aid was matched by one and one-half dollars and for any fiscal year thereafter it was made necessary for the State to match each dollar of Federal aid with three dollars.[13]

The State educational agencies disburse funds to the schools on the basis of need and attendance.[14] Any public or non-profit private school of high-school grade or under may participate in the program.[15]

Section nine of the Act prescribed that the lunch programs in the schools must meet the following requirements:

> Lunches served by schools participating in the school-lunch program under this Act shall meet minimum nutritional requirements prescribed by the Secretary on the basis of tested nutritional research. Such meals shall be served without cost or at a reduced cost to children who are determined by local school authorities to be unable to pay the full cost of the lunch. No physical segregation of or other discrimination against any child shall be made by the school because of his inability to pay. School-lunch programs under this Act shall be operated on a nonprofit basis. Each school shall, insofar as practicable utilize in its lunch program commodities designated from time to time by the Secretary as being in abundance, either nationally or in the school area, or commodities donated by the Secretary.[16]

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[12] Loc. cit.

[13] Ibid., p. 232.

[14] Loc. cit.

[15] Ibid., p. 231.

[16] Ibid., p. 233.

Although foods are distributed to the schools by the U. S. Department of Agriculture, "most of the food used in the School Lunch Program is purchased locally by the participating schools."[17]

There are three types of lunches which may be served under the National School Lunch Program. Type A consists of the following:

1. One-half pint of whole milk as a beverage.
2. Two ounces of lean meat, poultry, fish, or cheese, or one egg, or one-half cup of cooked dry beans or peas, or four tablespoons of peanut butter.
3. Three-fourths cup of vegetables or fruit or both.
4. One or more proteins of bread or muffins or other bread made of whole-grain cereal or enriched flour.
5. Two teaspoons of butter or fortified margarine.

The protein requirement of item 2 may be met by serving one-half the quantities of each of two of the protein rich foods.

If a school has limited lunchroom facilities it may serve the Type B lunch. The Type B lunch provides two-thirds as much food as the Type A lunch and where it is served the children are urged to bring additional food from home.

The Type C lunch consists of one-half pint of whole milk and may be used in schools with limited lunchroom facilities.[18]

The expenditures, number of schools participating and number of meals served for the school years 1953-54, 1954-55, and 1955-56 are given in Table I.

The appropriation for the 1956-57 school year is $100 million.[19]

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[17]Production and Marketing Administration, "National School Lunch Program," U. S. Department of Agriculture (Washington: Government Printing Office, 1949), p. 3.

[18]Ibid., p. 4.

[19]Agricultural Marketing Service, "Selected Statistics on Operation of Food Distribution Programs During Fiscal Years 1954, 1955, and 1956" (Washington: U. S. Department of Agriculture, October 2, 1956).

TABLE I

EXPENDITURES, NUMBER OF SCHOOLS PARTICIPATING, AND NUMBER OF MEALS SERVED FOR THE NATIONAL SCHOOL LUNCH PROGRAM IN THE UNITED STATES DURING SCHOOL YEARS 1953-1954, 1954-1955, AND 1955-1956[a]

School Year	Expenditures	Number of Schools Participating	Number of Meals Served
1953-54	$82,092,000	56,337	1,268,000,000
1954-55	81,972,000	58,465	1,439,000,000
1955-56	81,948,000	56,141	1,575,000,000

[a]Agricultural Marketing Service, "Selected Statistics on Operation of Food Distribution Programs During Fiscal Years 1954, 1955, and 1956" (Washington: U. S. Department of Agriculture, October 2, 1956).

Legislation in 1954

No matter what type of lunch is served under the National School Lunch Program, reimbursement may not be paid for more than one half-pint of milk daily per child.[20] So that milk consumption in the schools might be increased even more, Congress, on August 28, 1954, included in the Agricultural Act of 1954 the following amendment to Section 201 (c) of the Agricultural Act of 1949: ". . . Beginning September 1, 1954, and ending June 30, 1956, not to exceed $50,000,000 annually of funds of the Commodity Credit Corporation shall be used to increase the consumption of fluid milk by children in non-profit schools of high school grade and under."[21] On April 2, 1956 this was amended to include children in ". . . (2) such nonprofit nursery schools, child-care centers, settlement houses, summer camps, and similar nonprofit institutions as are devoted to the care and training of underprivileged children on a public welfare or charitable basis."[22] On July 20, 1956 the specification that institutions, in order to be eligible, must be devoted to the care and training of underprivileged children was dropped and Section 201 (c) of

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[20]S. W. Williams, et. al., "Increasing Milk Consumption in Schools" (East Lansing: Michigan State University, Agricultural Experiment Station, Special Bulletin 403, August 1955), p. 16.

[21]Eighty-third Congress of the United States, United States Statutes at Large, Vol. 68, Part 1, Public Laws and Reorganization Plans (Washington: Government Printing Office, 1955), Public Law No. 465, p. 86.

[22]Eighty-fourth Congress of the United States, United States Statutes at Large, Vol. 70, Part 1, Public Laws and Reorganization Plans (Washington: Government Printing Office, 1957), Public Law No. 465, p. 86.

the Act of 1949 then read ". . . children in (1) nonprofit schools of high-school grade and under; and in (2) nonprofit nursery schools, child care centers, settlement houses, summer camps, and similar nonprofit institutions devoted to the care and training of children."[23]

The Special Milk Program provides reimbursement for milk consumed (1) in addition to milk consumed on the National School Lunch Program, (2) in schools not on the National School Lunch Program, and (3) by children bringing their own lunch. During the 1956-1957 school year the states were responsible for establishing rates of reimbursement for individual schools. A maximum rate was established by the Department of Agriculture. This rate was four cents per half-pint for schools serving type A and B lunches under the National School Lunch Program and three cents per half-pint for all other schools.[24]

During the 1955-1956 school year the maximum rate to Tennessee

> schools on the National School Lunch Program was four cents per half-pint over and above the first half-pint served with the lunch and the amount served to adults. Those schools charging a child a price which exceeded one cent profit were reduced in rates.
>
> Schools not on the National School Lunch Program were given a rate of three cents for all milk served to children. If the profit was more than one cent, the rate was reduced accordingly.[25]

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[23] Ibid., Public Law No. 753, p. 596.

[24] National Milk Producers Federation, "New Opportunities in the Special School Milk Program" (Washington: National Milk Producers' Federation), p. 2.

[25] Letter from Frances M. Nave, State Supervisor, School Lunch Program, State of Tennessee, Department of Education, to Robert W. Johnson, dated May 8, 1957.

The amounts of money which have been appropriated and spent for the Special Milk Program and the number of schools participating in the United States thus far are shown in Table II.

TABLE II

APPROPRIATIONS FOR SCHOOL YEARS 1954-1958 AND EXPENDITURES AND NUMBER OF SCHOOLS PARTICIPATING IN THE SPECIAL MILK PROGRAM FOR SCHOOL YEARS 1954-1955 AND 1955-1956

For School Year	Appropriations[a]	Expenditures[b]	Number of Schools Participating[c]
1954-55	$50,000,000	$17,150,000	41,094
1955-56	60,000,000	45,992,000	62,322
1956-57	75,000,000	NA	NA
1957-58	75,000,000	NA	NA

[a]Eighty-fourth Congress of the United States, United States Statutes at Large, Vol. 70, Part 1, Public Laws and Reorganization Plans (Washington: Government Printing Office, 1957), Public Law No. 753, p. 596.

[b]Agricultural Marketing Service, "Selected Statistics on Operation of Food Distribution Programs During Fiscal Years 1954, 1955, and 1956" (Washington: U. S. Department of Agriculture, October 2, 1956).

[c]Loc. cit.

CHAPTER II

BACKGROUND TO THE STUDY

> Perhaps the basic reason for the phenomenal success of Western democracies in raising living standards has been the conservation and reclamation of human resources throughout the whole population. Public policies aimed at equalizing opportunities, at strengthening the bargaining power of vulnerable individuals and groups, and restraining the powerful from exploiting the weak have played an important role in the past and are destined to gain in importance in the future.
>
> These policies can be grouped into two categories according to their economic nature: (1) distributive and (2) regulatory.
>
> Distributive policies are designed to improve the distribution of income among families, of bargaining power among groups, of opportunities among individuals. They reduce the impact of poverty upon the individual's education, health, and economic security. Old-age pensions, industrial accident insurance (workmen's compensation), unemployment insurance, school-lunch programs, relief grants, certain farm tenure and settlement programs are examples of such policies.[1]

The school milk programs are distributive policies designed to improve the diets of children by increasing milk consumption by children in schools and nonprofit institutions devoted to the care and training of children.

Nutritional Recommendations

The Bureau of Human Nutrition and Home Economics of the United States Department of Agriculture recommends that boys and girls four through twenty years of age consume approximately six quarts, or twenty-four half-pints, of milk or its equivalent in cheese, evaporated milk,

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[1]Ranier Schickele, Agricultural Policy (New York: McGraw-Hill, 1954), pp. 26-27.

or dry milk each week. (The exact amount recommended varies from five and one-half to six and one-half quarts depending on age and sex.)[2]

Work Which Has Been Done on Milk Consumption in Tennessee Schools

For the month of March of 1954, 1955, and 1956 the Department of Agricultural Economics and Rural Sociology of the University of Tennessee obtained and analyzed data on milk consumption in all Tennessee schools. Data for schools on the National School Lunch Program or the Special Milk Program or both were obtained from the State Office of the School Lunch Program and data for schools on neither program were obtained by survey personnel from the County Superintendents of Schools or from the school principals. Some of the results of these studies are given in Table III.

Extent to Which Nutritional Recommendations Have Been Met in Tennessee Schools

During March of 1956 the average milk consumption per student per day at school was 0.92 half-pint for Tennessee schools on both the National School Lunch Program and the Special Milk Program.[3] Thus the average student who attended an average school on both programs five days during the week consumed, at school, almost twenty percent of the amount of milk recommended for him to consume in a week. The average student

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[2]U. S. Bureau of Human Nutrition and Home Economics, Agricultural Research Administration, "Helping Family Plan Food Budgets" (Washington: U. S. Department of Agriculture, Miscellaneous Publication 662, 1952), p. 12.

[3]M. L. Downen, Consumption of Milk in Tennessee Schools, March, 1956 (Knoxville: University of Tennessee, Agricultural Experiment Station, Department of Agricultural Economics and Rural Sociology, Rural Research Series Monograph 275, February, 1957), p. 4.

TABLE III

SOME RESULTS OF STUDIES ON MILK CONSUMPTION IN TENNESSEE SCHOOLS DURING MARCH, 1954, 1955, AND 1956

Year	Number of Schools					Average Milk Consumption per Student per Day in Schools, One-half Pint				
	Included in the Study	On NSLP Only	On SMP Only	On NSLP and SMP	Not on NSLP or SMP	All Schools in the Study	On NSLP Only	On SMP Only	On NSLP and SMP	Not on NSLP or SMP
1954*[a]	1,942	1,756	NA	NA	186	0.67	0.72	NA	NA	0.51
1955[b]	2,280	377	293	1,502	108	0.79	0.70	0.54	0.90	0.60
1956[c]	2.417	223	479	1,672	43	0.83	0.74	0.61	0.92	0.58

NSLP - National School Lunch Program

SMP - Special Milk Program

*The Special Milk Program was not in effect in March, 1954.

[a]M. L. Downen, Milk Consumption in Tennessee Schools, March, 1954 (Knoxville: University of Tennessee, Agricultural Experiment Station, Department of Agricultural Economics and Rural Sociology, Rural Research Series Monograph 271, August, 1955), p. 4.

[b]M. L. Downen, Consumption of Milk in Tennessee Schools, March, 1955 (Knoxville: University of Tennessee, Agricultural Experiment Station, Department of Agricultural Economics and Rural Sociology, Rural Research Series Monograph 274, March, 1956), p. 4.

[c]M. L. Downen, Consumption of Milk in Tennessee Schools, March, 1956 (Knoxville: University of Tennessee, Agricultural Experiment Station, Department of Agricultural Economics and Rural Sociology, Rural Research Series Monograph 275, February, 1957), p. 4.

in Jennie Bell School, which was on both programs,[4] consumed slightly more than this.

For Tennessee schools on neither program average milk consumption per student per day was 0.58 half-pint.[5] Thus the average student who attended school five days in these schools consumed, at school, approximately twelve percent of the amount of milk recommended for him to consume in a week.

Expanding the Market for Fluid Milk Sales

If the National School Lunch Program and the Special Milk Program increase milk consumption by children in schools and nonprofit institutions devoted to the care and training of children, then they will expand the market for fluid milk sales.

In the United States

During 1953, the last year before the Special Milk Program went into effect, approximately one percent of the nation's milk supply was utilized in the National School Lunch Program.[6] During the 1955-1956 school year, the second school year during which the Special Milk Program

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[4] Ibid., p. 49.

[5] Ibid., p. 4.

[6] G. G. Quakenbush, "Student Participation and Use of Milk in School Lunches" (East Lansing: Michigan State University, Agricultural Experiment Station, Technical Bulletin 252, September, 1955), p. 3.

was in operation, three billion half-pints of milk were utilized in the National School Lunch and Special Milk Programs.[7] This was approximately 1.6 percent of the whole milk marketed by producers during 1955.[8]

In the Southeast

During the 1955-1956 school year almost 650 million half-pints of milk were utilized in the National School Lunch Program and the Special Milk Program in the Southeast. This was approximately four percent of the whole milk marketed by producers in this area.[9]

In Tennessee

During the 1955-1956 school year approximately nine million half-pints of milk were utilized in the school milk programs in Tennessee. This was approximately three percent of the whole milk marketed by Tennessee milk producers.[10]

Making Milk More Readily Available, at a Lower Price, to Children in Schools and Nonprofit Institutions

In order to increase milk consumption, the National School Lunch

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[7]Martin D. Garber, "The Special Milk Program," talk made at panel discussion, Southeastern Cooperative Dairy Marketing Clinic, Nashville, Tennessee, April 17-18, 1957, p. 2.

[8]U. S. Bureau of the Census, Statistical Abstract of the United States, 1956 (Washington: Government Printing Office, 1956), p. 690.

[9]Martin D. Garber, op. cit., pp. 3-4.

[10]Ibid., p. 5.

Program and the Special Milk Program make milk more readily available, at a lower price, to children in schools and nonprofit institutions devoted to the care and training of children.

In the United States

During the 1955-1956 school year seventeen million children or forty-eight percent of all the children enrolled in elementary and secondary schools in the United States were drinking milk in schools on one or both of the school milk programs.[11]

In the Southeast

During the 1955-1956 school year about three and one-half million or fifty-three percent of the children enrolled in schools in the Southeast were drinking milk on one or both of the programs.[12]

In Tennessee

During March, 1956 ninety-six percent of the total average daily attendance in all Tennessee schools was in schools on the National School Lunch Program or the Special Milk Program or both.[13]

Need for the Study

Since a large amount of money and time is spent on the school milk

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[11] Martin D. Garber, op. cit., pp. 2-3.

[12] Ibid., p. 4.

[13] M. L. Downen, Consumption of Milk in Tennessee Schools, March, 1956, op. cit., p. 4.

programs in an effort to increase milk consumption by school age children, it seemed that some attempt should be made to evaluate the effectiveness of these programs.

Selecting the School

In April, 1956 the I. B. M. cards for all schools in Tennessee with milk service were run through the sorter to select a school that

1. participated in the National School Lunch Program and the Special Milk Program in March, 1955,
2. had an average daily attendance within ten of the average of all schools participating in both programs listed above,
3. consumption of milk per student per day was within .05 half-pint of the average for schools participating in both programs,
4. had no unusual changes as indicated by the data for 1956.

Jennie Bell School in Dyersburg, Tennessee was the nearest to this "average." Jennie Bell was therefore selected for a pilot study to be made during 1956.

CHAPTER III

CHARACTERISTICS OF THE SCHOOL AND THE SURROUNDING AREA

Dyer County and Dyersburg

Dyer County is located in the northwestern part of Tennessee adjoining the Mississippi River. The population of Dyer County in 1950 was 33,473. This was a 4.1 percent decrease from 1940.[1] The estimated population for 1956 was 31,700.[2]

In 1950 Dyer County's average agricultural income per farm worker was $2,232. This was the highest in the State. During the same year cotton accounted for 70.8 percent of the county's total inventory value and 81.9 percent of its sales of agricultural products. Dairy products accounted for 1.3 percent of farm income.[3]

Dyersburg is located seventy-five miles north of Memphis and seventeen miles east of the Mississippi River. The population of Dyersburg in 1950 was 10,885. This was a 12.9 percent increase from 1950.[4] The estimated population for 1956 was 11,300.[5]

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[1] U. S. Bureau of the Census, 1950 Census of Population, Tennessee, General Characteristics (Washington: Government Printing Office, 1952), p. 31.

[2] Sales Management, May 10, 1956, p. 721.

[3] B. H. Luebke, "Selected Agricultural Data for Dyer County, Tennessee" (Knoxville: University of Tennessee, Agricultural Experiment Station, Department of Agricultural Economics and Rural Sociology), pp. 2-3.

[4] 1950 Census of Population, op. cit., p. 33.

[5] Sales Management, op. cit., p. 721.

Estimates of effective buying income per family and per capita for Tennessee, Dyer County, and Dyersburg for 1955 are given in Table IV.

During the 1930's a textile mill was built in Dyersburg. The company which built the mill bought a large tract of land on the edge of the city, built the mill on a part of it, and divided the remainder into small lots which were sold to mill employees. Jennie Bell School is on a tract of land adjacent to the textile mill and is approximately in the center of what is known as the Milltown section of Dyersburg.

Jennie Bell School

There were 190 families which had children in Jennie Bell School in May, 1956. The monthly incomes of 129 of these families were obtained for the study. The median monthly income per family was from $200 to $250. Figure 1 is a frequency distribution of the monthly incomes of these 129 families.

As previously stated one of the requirements of the school selected for the study was that milk consumption per student per day be within 0.05 half-pint of the average for all Tennessee schools participating in both the National School Lunch Program and the Special Milk Program. Average milk consumption per student per day and changes in average milk consumption per student per day for March, 1954, 1955, and 1956 for Jennie Bell School are compared in Table V with the average milk consumption per student per day and changes in average milk consumption per student per day for March, 1954, 1955, and 1956 for all schools in Dyer County serving milk and for all schools in Tennessee serving milk.

TABLE IV

ESTIMATED EFFECTIVE BUYING INCOME PER FAMILY AND PER CAPITA FOR TENNESSEE, DYER COUNTY, AND DYERSBURG, 1955[a]

	Effective Buying Income per Family	Effective Buying Income per Capita
Tennessee	$4,284	$1,153
Dyer County	3,467	984
Dyersburg	4,442	1,376

[a]Sales Management, May 10, 1956, pp. 721-724.

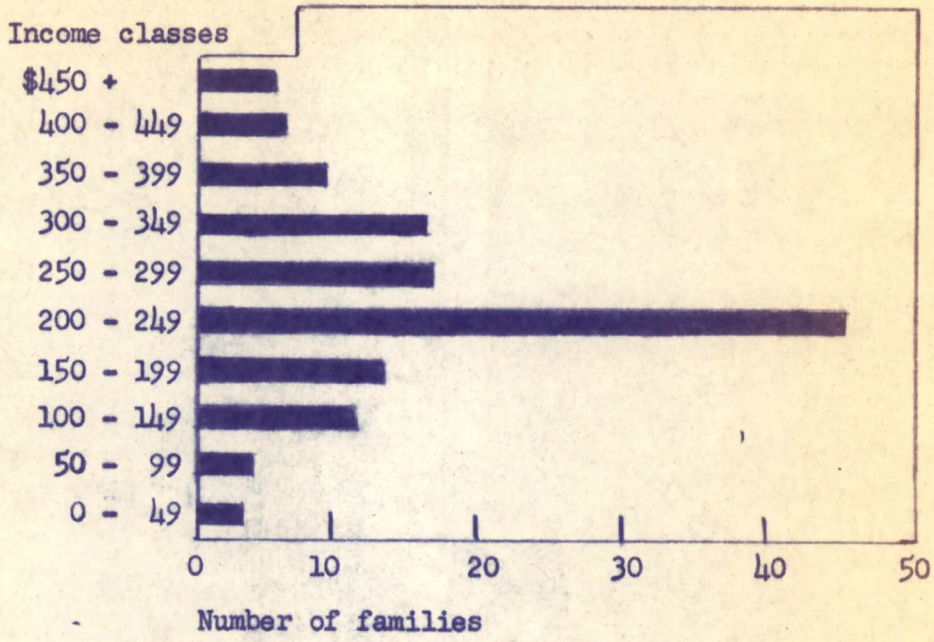


Figure 1. Frequency distribution of the monthly incomes of 129 of the 190 families which had children in Jennie Bell School, Dyersburg, Tennessee., May, 1956.

TABLE V

SOME DATA ON AVERAGE MILK CONSUMPTION PER STUDENT PER DAY AND CHANGES IN AVERAGE MILK CONSUMPTION PER STUDENT PER DAY FOR JENNIE BELL SCHOOL, DYER COUNTY SCHOOLS, AND TENNESSEE SCHOOLS FOR THE MONTH OF MARCH, 1954, 1955, AND 1956

	Average Milk Consumed per Student per Day, One-half Pint			Change in Average Milk Consumed per Student per Day, One-half Pint	
	March, 1954[a]	March, 1955[b]	March, 1956[c]	March, 1954 to March, 1955[b]	March, 1955 to March, 1956[c]
Jennie Bell[d]	0.69	0.90	0.96	+0.21	+0.06
Dyer serving milk[e]	0.74	0.76	0.83	+0.02	+0.07
Dyer on NSLP and SMP*[f]	NA	0.86	0.91	NA	+0.05
Tennessee serving milk[g]	0.67	0.79	0.83	+0.12	+0.04
Tennessee on NSLP and SMP*[h]	NA	0.90	0.92	NA	+0.02

*The Special Milk Program was not in effect in March, 1954.

[a]M. L. Downen, Milk Consumption in Tennessee Schools, March, 1954 (Knoxville: University of Tennessee, Agricultural Experiment Station, Department of Agricultural Economics and Rural Sociology, Rural Research Series Monograph 271, August, 1955), p. 36.

[b]M. L. Downen, Consumption of Milk in Tennessee Schools, March, 1955 (Knoxville: University of Tennessee, Agricultural Experiment Station, Department of Agricultural Economics and Rural Sociology, Rural Research Series Monograph 274, March, 1956), pp. 50-51.

[c]M. L. Downen, Consumption of Milk in Tennessee Schools, March, 1956 (Knoxville: University of Tennessee, Agricultural Experiment Station, Department of Agricultural Economics and Rural Sociology, Rural Research Series Monograph 275, February, 1957), pp. 49-50.

[d]Jennie Bell School

[e]Average for all schools in Dyer County serving milk.

[f]Average for all schools in Dyer County on the National School Lunch Program and Special Milk Program.

[g]Average for all schools in Tennessee serving milk.

[h]Average for all schools in Tennessee on the National School Lunch Program and Special Milk Program.

CHAPTER IV

THE STUDY AND ITS RESULTS

Object of the Study

The object of the study was to answer the question: Is average milk consumption per person per day for the families which have children in Jennie Bell School higher when school is in session than when it is not in session? If it were higher while school was in session, then the National School Lunch Program and the Special Milk Program increased milk consumption by the children from the families surveyed in Dyersburg, Tennessee during May, June, August, and September, 1956.

The months of May, June, August, and September were selected for the study because these included two school months, May and September, and two non-school months, June and August. The school month of May was just before, and the school month of September was just after the summer vacation so that the change in milk consumption from school to non-school months could be observed.

Data on milk consumption at home were obtained for the school and the non-school months and data on milk consumption at school by the children from these families were obtained from the school for the school months of May and September. Average milk consumption per person per day during each of the four months was then computed. Average milk consumption per person per day included milk consumed at home and at school during the school months and milk consumed at home only during the non-school months.

Results of the Study

The data on average milk consumption per person per day for each month studied are shown in Table VI.

Average milk consumption per person per day for both of the school months of May and September (See Table VI) cannot be compared with both of the non-school months of June and August because the same families were not surveyed for all four months. Completed schedules were obtained for 158 families for May and June and for 120 of these same families for August and September. The reason for the difference in the number of families is explained in this chapter under the sub-heading "Milk Consumption at Home." Since the same families were surveyed for May and June and only a part of these were surveyed for August and September, average milk consumption per person per day for the school month of May must be compared with the non-school month of June and average milk consumption per person per day for the school month of September must be compared with the non-school month of August.

These four months have been divided into two periods in Table VI. Period I consists of May and June and period II consists of August and September.

Average milk consumption per person per day for 158 families was 0.17 pint less during the non-school month of June than during the school month of May. (See Table VI.) This was a 20.7 percent decrease. Average milk consumption per person per day for 120 families was 0.10 pint more during the school month of September than during the non-school month of August. This was a 15.1 percent increase.

TABLE VI

TOTAL MILK CONSUMPTION AT HOME AND AT SCHOOL AND AVERAGE MILK CONSUMPTION PER PERSON PER DAY FOR THE FAMILIES WHICH WERE SURVEYED DURING MAY, JUNE, AUGUST AND SEPTEMBER, 1956, DYERSBURG, TENNESSEE

	Period I				Period II			
	May	June	Change Pints[a]	Change Percent[a]	August	Sept.	Change Pints[b]	Change Percent[b]
Milk consumption at home, total by the 158 families which were surveyed in May and June and 120 of these 158 which were surveyed in August and September, pints	18,059	15,245	NA	NA	12,259	12,203	NA	NA
Milk consumption at school by the children from these families, pints	1,982	NA	NA	NA	NA	1,459	NA	NA
Total milk consumption including consumption at home and at school, pints	20,041	15,245	NA	NA	12,259	13,662	NA	NA
Person days for 158 families in May and June and 120 families in August and September	24,579	23,371	NA	NA	18,646	17,865	NA	NA
Average milk consumption per person per day (including consumption at school and at home) for 158 families during May and June and 120 families during August and September, pints	0.82	0.65	-0.17	-20.7	0.66	0.76	+0.10	+15.1

[a]Change from May to June.

[b]Change from August to September.

Another way to show the difference in average milk consumption per person per day between the school and the non-school months for each period is to state that average milk consumption per person per day was twenty-six percent higher during the school month of May than during the non-school month of June and fifteen percent higher during the school month of September than during the non-school month of August.

Method Used for Analyzing the Data

The method which was used to analyze the data and compute milk consumption at home, milk consumption at school, and average milk consumption per person per day for each month studied is explained in this section.

Milk Consumption at Home

There were 190 families which had children in Jennie Bell during May. Twenty-five of these moved away before the survey or could not be found. Two refused to answer questions. Two were gone during the entire month of June; and three could not remember their purchases. Completed schedules on the milk purchases of 158 of the 190 families were obtained for the months of May and June. Thirty-eight of this 158 moved away or did not have children in Jennie Bell during September leaving 120 of the original 158. Completed schedules for this 120 families were obtained for the months of August and September.

A field representative went to each of the families which were surveyed during each month included in the study and obtained data on the family's monthly purchases of sweet milk, buttermilk, chocolate milk,

nonfat dry milk solids, and evaporated milk. An estimate of the percentage of the nonfat dry milk solids and evaporated milk which was consumed as fluid milk was also obtained. The total amounts of sweet milk, buttermilk, chocolate milk, nonfat dry milk solids consumed as fluid milk and evaporated milk consumed as fluid milk which was consumed by all of the families included in the study were then added together for each month included in the study. These figures are shown in Table VII. Table VIII gives each type of dairy product as a percentage of the total consumption at home for each month studied.

The number of "person days during the month" was found for each family by multiplying the number of days in the month by the number of persons in the family, adding to this product the number of "person days visited" and subtracting the number of "person days absent." The number of "person days visited" was found by multiplying the number of visitors who visited during the month by the number of days they stayed. The number of "person days absent" was found by multiplying the number of people who were gone during the month by the number of days they were away.

The total amount of milk consumed at home was then divided by the number of person days during the month. The quotient obtained by this operation was average milk consumption per person per day at home. This was found for May and June for the 158 families which were surveyed during May and June and for all four of the months studied for the 120 of these 158 families which were surveyed for all four months. These figures are shown in Table IX. Average milk consumption per person per day during

TABLE VII

MILK CONSUMPTION AT HOME BY TYPE OF DAIRY PRODUCT FOR THE FAMILIES WHICH WERE SURVEYED DURING MAY, JUNE, AUGUST, AND SEPTEMBER, 1956, DYERSBURG, TENNESSEE

	Pints			
	Period I 158 Families		Period II 120 Families	
	May	June	August	September
Sweet milk	12,330	10,666	8,654	8,386
Buttermilk	2,632	1,844	1,266	1,372
Chocolate milk	488	264	356	320
Nonfat dry milk solids (consumed as fluid milk)	1,247	1,207	842	1,058
Evaporated milk (consumed as fluid milk)	1,362	1,264	1,141	1,069
Total	18,059	15,245	12,259	12,205

TABLE VIII

EACH TYPE OF DAIRY PRODUCT AS A PERCENTAGE OF THE TOTAL MILK CONSUMPTION AT HOME BY THE FAMILIES WHICH WERE SURVEYED DURING MAY, JUNE, AUGUST, AND SEPTEMBER, 1956, DYERSBURG, TENNESSEE

	Pints			
	Period I 158 Families		Period II 120 Families	
	May	June	August	September
Sweet milk	68.28	69.96	70.59	68.72
Buttermilk	14.57	12.10	10.33	11.24
Chocolate milk	2.70	1.73	2.90	2.62
Nonfat dry milk solids (consumed as fluid milk)	6.91	7.92	6.87	8.66
Evaporated milk (consumed as fluid milk)	7.54	8.29	9.31	8.76
Total	100.00	100.00	100.00	100.00

TABLE IX

SUMMARY OF DATA ON MILK CONSUMPTION AT HOME BY THE FAMILIES WHICH WERE SURVEYED DURING MAY, JUNE, AUGUST, AND SEPTEMBER, 1956, DYERSBURG, TENNESSEE

	Period I				Period II			
	May	June	Change Pints[a]	Change Percent[a]	August	Sept.	Change Pints[b]	Change Percent[b]
158 Families Surveyed During May and June								
Total milk consumption at home, pints	18,059	15,245	NA	NA	NA	NA	NA	NA
Person days during the month	24,579	23,371	NA	NA	NA	NA	NA	NA
Average milk consumption per person per day at home, pints	0.73	0.65	-0.08	-11	NA	NA	NA	NA
120 of These Same Families Surveyed During all Four Months								
Total milk consumption at home, pints	13,691	11,489	NA	NA	12,259	12,203	NA	NA
Person days during the month	18,598	17,548	NA	NA	18,646	17,865	NA	NA
Average milk consumption per person per day at home, pints	0.74	0.65	-0.09	-12	0.66	0.68	+0.02	+3

[a]Change from May to June.

[b]Change from August to September.

May and June for the 120 families which were surveyed for all four months is little different from average milk consumption per person per day for the 158 families which were surveyed for May and June only.

Figures 2 through 5 are frequency distributions of all the families included in the study according to their average milk consumption per person per day at home for each month studied.

In finding average milk consumption per person per day at home no adjustment was made for women who worked away from home or for children who ate lunch away from home while their mothers worked. The number of women who worked was found in the survey but these women were not asked if they took their lunches or if they came home for lunch. In either case they might have consumed milk which was purchased for home consumption. In order to find the significance of mothers and children eating lunch away from home, the total number of lunches which it would have been possible for mothers and children to have eaten away from home while the mothers worked was taken as a percentage of the total number of lunches which could have been consumed by all the people in these families had everyone eaten lunch. These figures were 3.4 percent for May, 4.2 percent for June, 4.8 percent for August, and 3.9 percent for September. As these figures are small and as they vary little from month to month, no adjustment for women who worked away from home was made. The variation from month to month is important because the change in average milk consumption per person per day from month to month is the important thing which must be determined.

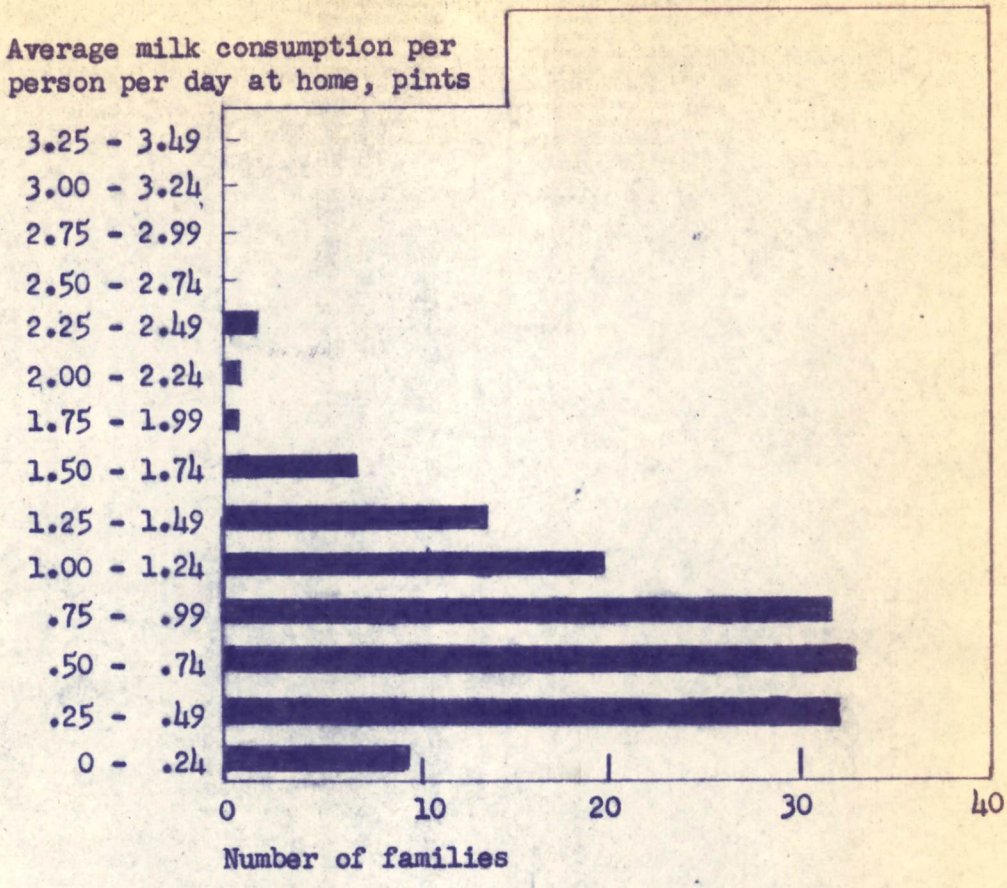


Figure 2. Frequency distribution of 158 families according to their average milk consumption per person per day at home during May, 1956, Dyersburg, Tennessee.

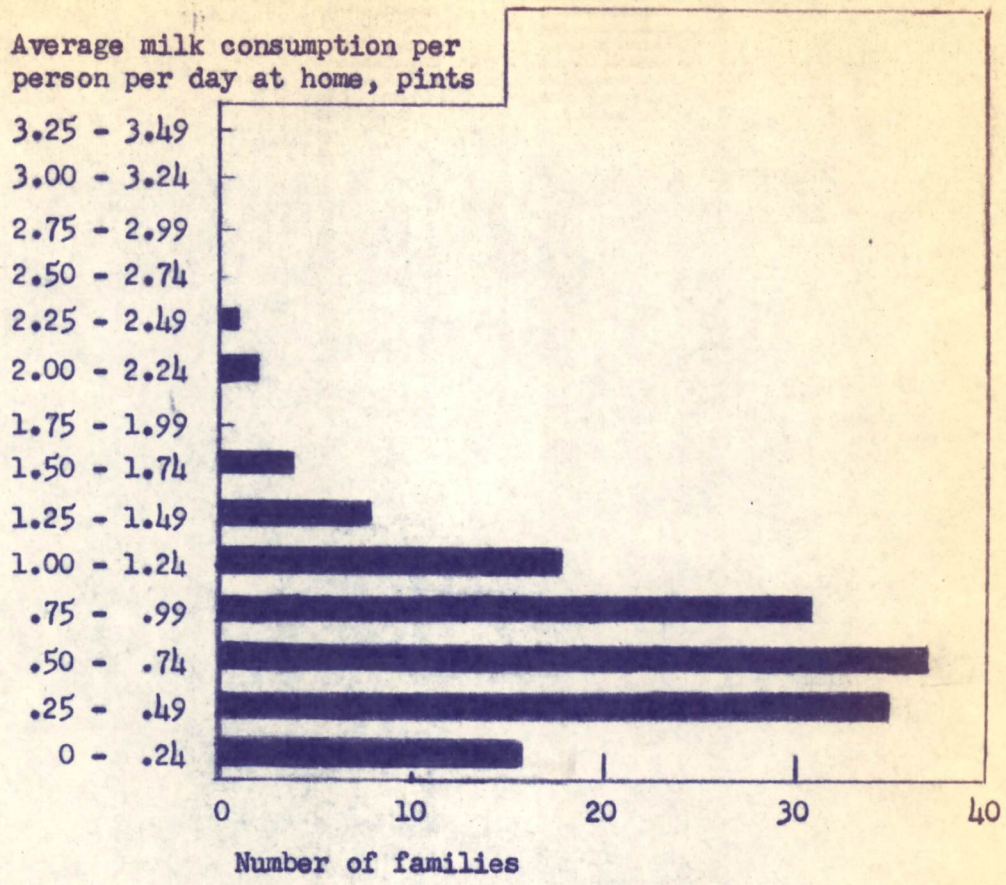


Figure 3. Frequency distribution of 158 families according to their average milk consumption per person per day at home during June, 1956, Dyersburg, Tennessee.

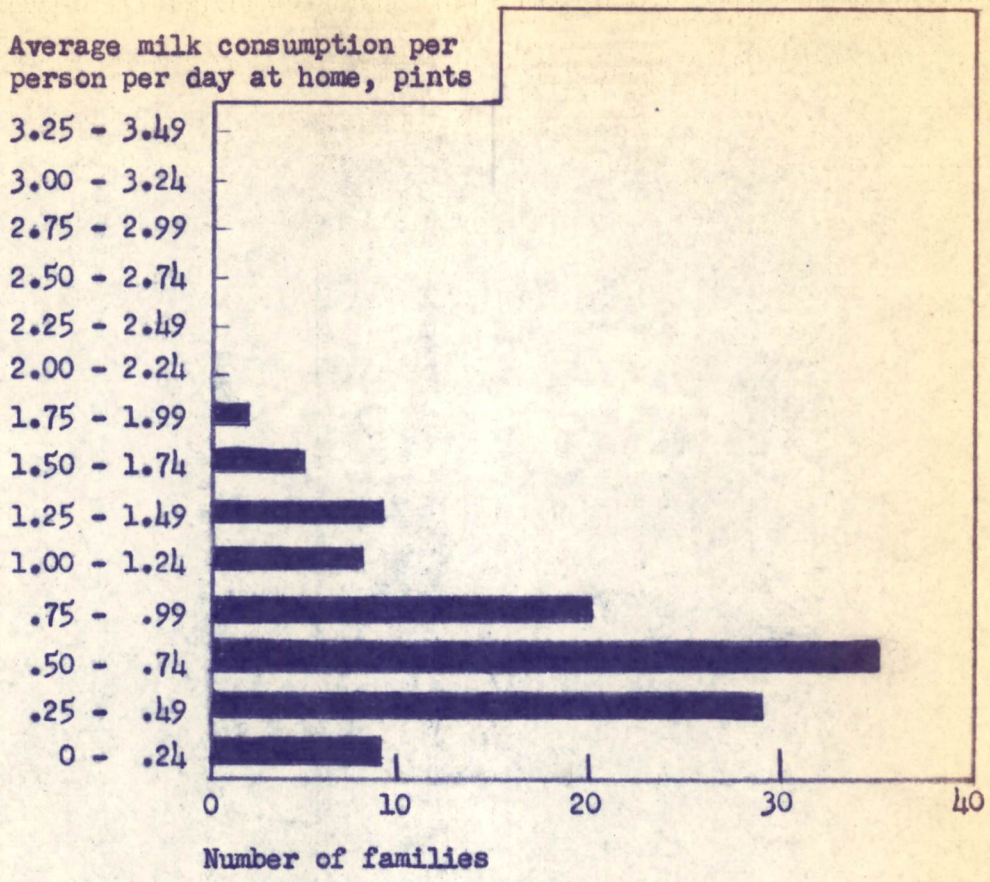


Figure 4. Frequency distribution of 120 families according to their milk consumption per person per day at home during August, 1956, Dyersburg, Tennessee.

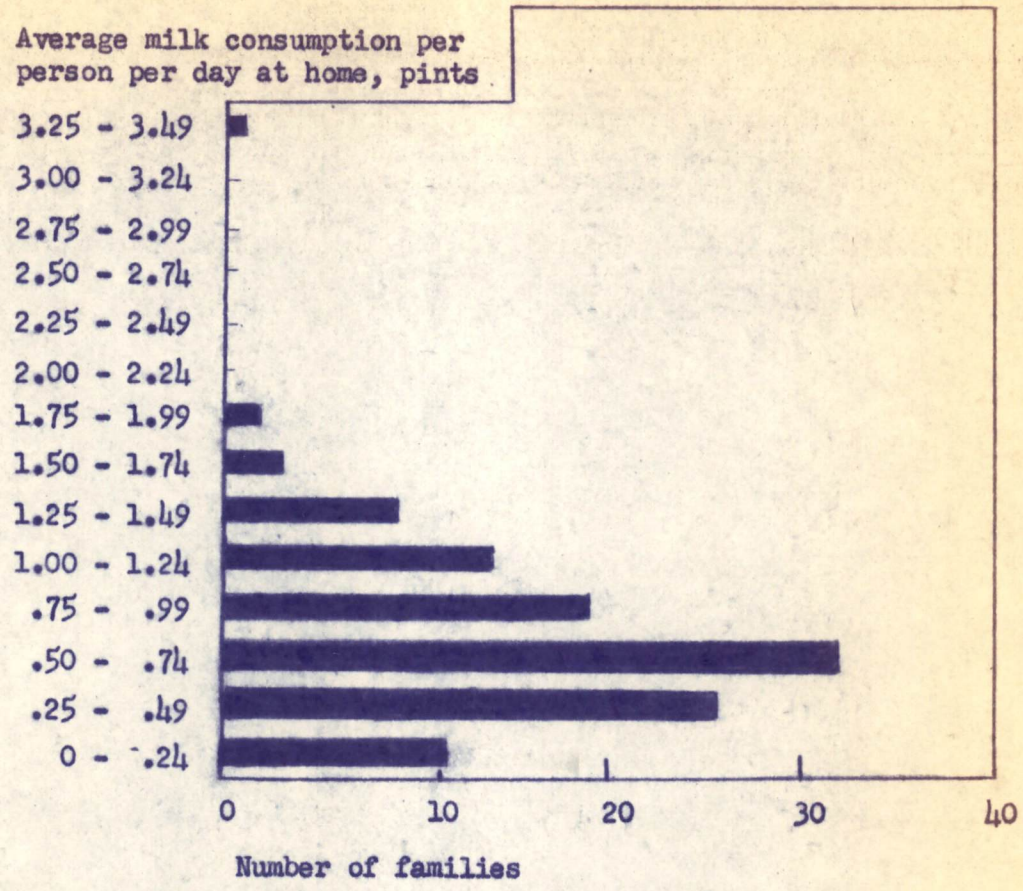


Figure 5. Frequency distribution of 120 families according to their average milk consumption per person per day at home during September, 1956, Dyersburg, Tennessee.

Milk Consumption at School

The families which had children in Jennie Bell also had children in Alice Thurmond, Hollis Powell, Nell Thomas, and Dyersburg High and Central Grammar. All of these schools except Dyersburg High and Central Grammar were on both the National School Lunch Program and the Special Milk Program. Dyersburg High and Central Grammar, which used the same lunchroom, were on the Special Milk Programs only.

For the school months of May and September the amount of milk the children from the families surveyed consumed in each of these schools was found. The method for doing this is shown in Table X.

In computing the amount of milk consumed at school by these children, no adjustment was made for the children who came home for lunch. Even though these children consumed no milk at school on the National School Lunch Program, there was no way of knowing how much milk they consumed on the Special Milk Program. It was assumed that milk consumption at school and the number of lunches consumed at school per child was the same for the children for whom we have no data as it was for those in the families which were surveyed.

When the number of times children came home for lunch was correlated with average milk consumption per person per day at home, no significant relationship was found.

Average Milk Consumption per Person per Day for Each Month Studied

The amount of milk consumed at school by the children from the families surveyed was then added to the total amount of milk consumed at home during each month studied. This total was then divided by the number

TABLE X

MILK CONSUMPTION AT SCHOOL DURING MAY AND SEPTEMBER BY THE CHILDREN FROM THE FAMILIES WHICH WERE SURVEYED DURING MAY, JUNE, AUGUST, AND SEPTEMBER, 1956, DYERSBURG, TENNESSEE

	School					
	Jennie Bell	Alice Thurmond	Hollis Powell	Nell Thomas	Dyersburg High and Central Grammar	Total
	May					
1. Dates[a]	4/21-5/24	4/21-5/24	5/1-25	4/21-5/24	4/21-5/18	NA
2. Total enrollment[b]	281	389	622	178	910	NA
3. Children in survey[c]	234	9	6	63	19	NA
4. Percent of enrollment[d]	83.27	2.31	0.96	35.39	2.09	NA
5. Milk consumption[e]	4,580	6,115	12,658	1,668	3,650	NA
6. Number of days[f]	23	23	19	23	19	NA
7. Total adjusted consumption[g]	3,800	5,054	12,658	1,368	3,650	NA
8. Partial adjusted consumption[h]	3,164	117	122	484	76	3,963

TABLE X

MILK CONSUMPTION AT SCHOOL DURING MAY AND SEPTEMBER BY THE CHILDREN FROM THE FAMILIES WHICH WERE SURVEYED DURING MAY, JUNE, AUGUST, AND SEPTEMBER, 1956, DYERSBURG, TENNESSEE (continued)

	School					
	Jennie Bell	Alice Thurmond	Hollis Powell	Nell Thomas	Dyersburg High and Central Grammar	Total
	September					
1. Dates[a]	9/5-28	9/5-28	NA	9/5-28	9/5-28	NA
2. Total enrollment[b]	293	382	614	181	1016	NA
3. Children in survey[c]	178	2	6	67	23	NA
4. Percent of enrollment[d]	60.75	0.52	0.98	37.02	2.26	NA
5. Milk consumption[e]	3,242	4,621	1,899	1,864	5,395	NA
6. Number of days[f]	17	17	3	17	17	NA
7. Total adjusted consumption[g]	3,242	4,621	10,761	1,864	5,395	NA
8. Partial adjusted consumption[h]	1,970	24	112	690	122	2,918

[a]Dates for which figures on milk consumption in the schools were obtained. These are the days for which the school's monthly report on milk consumption on the National School Lunch Program and Special Milk Program were submitted.

[b]Total enrollment of the school during the month.

[c]Number of children from the families surveyed who were enrolled in each school.

[d]Children from the families surveyed as a percent of total enrollment in the school.

[e]Milk consumption in the school for the days for which figures were obtained during the month, in one-half pints, (see row 1).

[f]Number of school days during which lunches were served included in these dates.

[g]Milk consumption at school adjusted from the days for which figures were obtained to the calendar months, i.e., May 1-31 and September 1-30, in one-half pints. This was done on the basis of nineteen school days during which lunches were served in May and seventeen in September. This adjustment was made by finding milk consumption per day for the period for which figures were obtained and multiplying this by nineteen for May and seventeen for September.

[h]Milk consumption at school by the children from the families which were surveyed adjusted to the calendar months of May and September, in one-half pints, (row 4 multiplied by row 7).

of person days during the month to find average milk consumption per person per day (including consumption at school and at home) for all of thefamilies surveyed during each month studied. These figures were shown in Table VI.

Effect of Seasonality

In this study no adjustment was made for the effect of seasonality upon variations in average milk consumption per person per day from month to month.

MacLeod et. al.[1] found that people drink more milk in warm weather but that this is not always apparent in metropolitan areas since many people go away on vacations during the summer.

An attempt was made to find the effect of seasonality on fluid milk sales for home consumption only in the Dyersburg area. This was done by putting the average daily sales, for one milk plant in the area, of sweet milk and buttermilk in quart and half-gallon containers on an index basis. Sales in pint and half-pint containers were omitted in order to eliminate school consumption. The index numbers were May = 100, June = 108, July = 106, August = 107, and September = 117. Sales for home consumption only increased after school was out in May but increased rather than decreased after school started in September. The increase from August to September may have been due to persons coming back home from vacation. These index numbers cover only a five month period and may be clouded by

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[1]Alan MacLeod, et. al., "What Makes the Market for Dairy Products" (Madison: University of Wisconsin, Agricultural Experiment Station, Bulletin 477, September, 1948), p. 18.

the effect of vacations on milk consumption at home. For these reasons it is difficult to determine if the month to month variations in milk sales were due to the effect of seasonality or not.

The data on milk consumption for the families which had children in Jennie Bell were in disagreement with the findings of MacLeod, et. al. Many of the women who answered questions concerning their milk purchases remarked that their families drank less milk during warm weather. This is borne out by the data for milk consumption at home in Table IX. In these data the effect of members of the family going away on vacation or of persons visiting was eliminated by finding average milk consumption per person per day at home. For the 120 families which were surveyed all four months there was a decrease in average milk consumption per person per day at home of twelve percent from May to June and an increase of three percent from August to September. These changes may indicate that seasonality did have some effect on average milk consumption per person per day at home.

There were several small grocery stores in the community. It was observed that many of the children in the neighborhood of these grocery stores visited them frequently and bought soft drinks. Thus some of the difference in average milk consumption per person per day at home between May and June and August and September may have been accounted for by an increase during June and August in the consumption of soft drinks and other cold beverages.

Conclusion

Average milk consumption per person per day at home for 158 families

(See Table IX) was 0.08 pint or twelve percent higher during the school month of May than during the non-school month of June and for 120 of these same families it was 0.02 pint or three percent higher during the school month of September than during the non-school month of August. The cause of these changes in milk consumption at home could not be determined. Seasonality may have been partially responsible.

When the amount of milk consumed at school was added to the amount consumed at home, the changes in average milk consumption per person per day from school to non-school months were much greater. Average milk consumption per person per day, including consumption at home and at school, for 158 families (See Table VI) was 0.17 pint or twenty-six percent higher during the school month of May than during the non-school month of June and for 120 of these same families it was 0.10 pint or fifteen percent higher during the school month of September than during the non-school month of August.

As the month to month difference in average milk consumption per person per day, including milk consumed at school and at home, was much greater than the difference in average milk consumption per person per day of milk consumed at home only, it appeared that some of the change in milk consumption from May to June and August to September was due to the fact that the children from the families surveyed stopped consuming milk at school after May and started again in September.

It appeared, therefore, that most of the milk which was consumed at school on the National School Lunch Program and the Special Milk Program was in addition to, and not substituted for, milk which normally would have been consumed at home.

CHAPTER V

THE EFFECT OF CERTAIN VARIABLES ON AVERAGE MILK CONSUMPTION PER PERSON PER DAY AT HOME AND AT SCHOOL

At Home

The data were analyzed to determine if income, size of family, or the number of lunches eaten at home by children in school had an effect on average milk consumption per person per day at home.

This study was a case study of all of the families which had children in Jennie Bell School and the data gathered were not from a randomly selected sample. However, in order that statistical tests for significance could be applied to these correlations, the data were treated as if they came from a randomly selected sample of a population.

Income

The monthly incomes of 129 of the 158 families which were surveyed during May were obtained. These incomes were put on a per capita basis for each family. The monthly income per person for each family was then correlated with the average milk consumption per person per day at home for each family. The coefficient of correlation, r, thus obtained was 0.22.

At the .05 level of significance, with a sample size of 129 and a coefficient of correlation of 0.22, the confidence limits for the true

correlation in the universe would be from 0.02 to 0.37.[1]

Thus at the .05 level of significance it may be assumed that there is at least a slight positive relationship between per capita income and average milk consumption per person per day. Figure 6 is a scatter diagram of this relationship.

The coefficient of determination, r^2, is 0.047. Therefore, approximately five percent of the variation in milk consumption per person per day at home can be accounted for by variation in monthly per capita income.

The coefficient of regression, b, is 0.0035. Therefore for each ten dollar increase in monthly per capita income, there was an increase of 0.035 pint in average milk consumption per person per day at home.

In other studies it has been found that, in general, as income increases, per capita milk consumption also increases. The increases are most significant in the lower income brackets. These studies have indicated that there is a point above which an increase in income will not cause an associated increase in per capita milk consumption. Instead, there may be a decrease in per capita milk consumption.[2]

During 1948 the United States Department of Agriculture found that the income elasticity of demand for whole milk was +0.412.[3]

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[1]W. J. Dixon and F. J. Massey, Introduction to Statistical Analysis (New York: McGraw-Hill, 1951), p. 327.

[2]Alan MacLeod, et. al., "What Makes the Market for Dairy Products" (Madison: University of Wisconsin, Agricultural Experiment Station, Bulletin 477, September, 1948), p. 16.

[3]Warren C. Waite and Harry C. Trelogan, Agricultural Market Prices (New York: Wiley, 1951), p. 41.

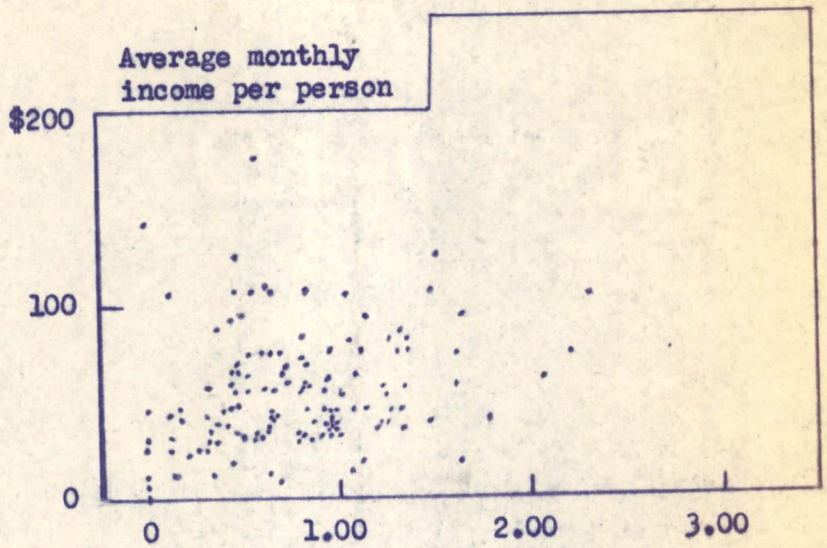


Figure 6. Relationship between average monthly income per person and average milk consumption per person per day at home for the 129 families whose incomes were obtained for the month of May, 1956.

Assuming a straight line relationship, the income elasticity of demand for fluid milk and fluid milk substitutes for the 129 families which gave their incomes when they were surveyed in Dyersburg, Tennessee, during May, 1956 was +0.272. This was computed by using the average milk consumption per person per day at home and the average monthly per capita income for these 129 families. Average milk consumption per person per day was 0.74 pint and the average monthly per capita income was fifty-seven dollars.

Size of Family

When the number of persons in the family for each of the 158 families surveyed during May was correlated with the average milk consumption per person per day at home for the family, the coefficient of correlation was -0.31.

At the .05 level of significance, with a sample size of 158 and a coefficient of correlation of -0.31, the confidence limits for the true correlation in the universe would be from -0.13 to -0.44.[4]

Thus at the .05 level of significance it may be assumed that there is a small negative relationship between the number of persons in the family and average milk consumption per person per day. Figure 7 is a scatter diagram of this relationship.

The coefficient of determination, r^2, is 0.097. Therefore approximately ten percent of the variation in average milk consumption per person per day at home can be accounted for by variations in the number of persons

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[4]W. J. Dixon and F. J. Massey, op. cit., p. 327.

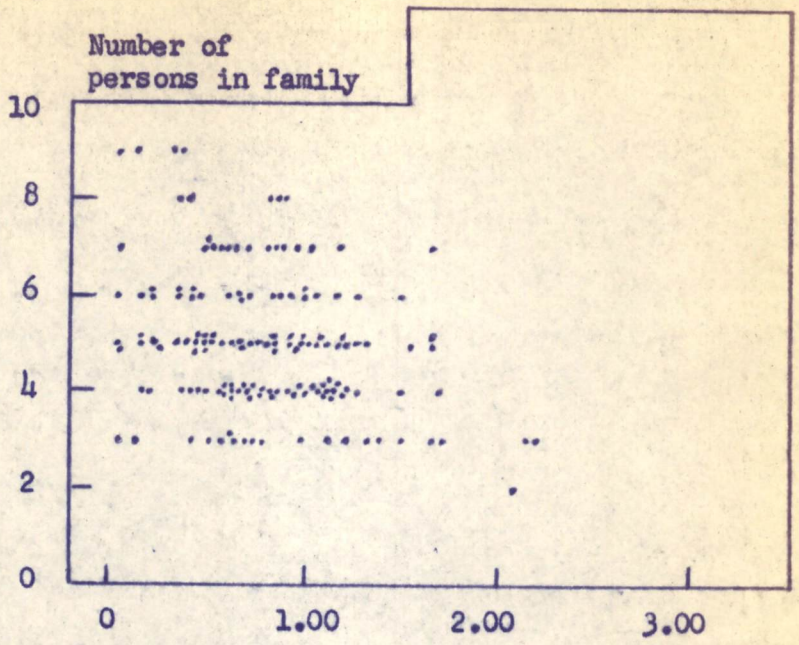


Figure 7. Relationship between size of family and average milk consumption per person per day during May, 1956.

in the family.

The coefficient of regression, b, was -0.1004. Therefore for each increase in family size of one person, there was a decrease of approximately 0.10 pint in average milk consumption per person per day at home.

Number of Lunches Eaten at Home by Children in School

Some of the children from the families which were surveyed came home for lunch often. When the number of lunches eaten at home by the children in each family during May was correlated with the average milk consumption per person per day for the family, no significant relationship was found.

At School

In other studies the effect of certain variables on milk consumption per student per day at school has been studied. This section is a summary of the results of some of these studies on some of the most important of these variables.

Income

When schools in Chicago were classified according to the level of consumer income in the area in which the school was located, milk consumption per student per day at school was slightly higher in the high income areas.[5]

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[5] S. W. Williams, et. al., "Increasing Milk Consumption in Schools" (East Lansing: Michigan State University, Agricultural Experiment Station, Special Bulletin 403, August, 1955), p. 34.

The estimated average effective buying income per capita for the families which had children in Jennie Bell School during May, 1956 was fifty-seven dollars per month. The 1955 annual average for Dyersburg was one-hundred fifteen dollars per month. The 1955 Dyer County average was eighty-two dollars per month and for Tennessee the 1955 average was ninety-six dollars per month.[6]

Average milk consumption per student per day for Jennie Bell, which was on both the National School Lunch Program and the Special Milk Program, was 0.96 half-pint during March, 1956. For other Tennessee schools on both programs it was 0.92 half-pint and for other Dyer County schools on both programs it was 0.91 half-pint.[7] Although monthly per capita income in Jennie Bell School was lower than the State and the Dyer County averages, average milk consumption per student per day at school was higher than the State and the Dyer County averages for schools on both programs. This seems to be in disagreement with the findings of the Chicago study. However, the difference in milk consumption was not very great and these data were only for one school. Also it is possible that the average family in the higher income bracket has fewer children in school.

When the 1955 annual average effective buying income per capita for each of the ninety-five counties in Tennessee[8] was correlated with the

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[6] Sales Management, May 10, 1956, pp. 721-724.

[7] M. L. Downen, Consumption of Milk in Tennessee Schools, March, 1956 (Knoxville: University of Tennessee, Agricultural Experiment Station, Department of Agricultural Economics and Rural Sociology, Rural Research Series Monograph 275, February, 1957), pp. 49-50.

[8] Sales Management, op. cit., pp. 720-724.

average milk consumption per student per day at school during 1955 for each of the counties,[9] no relationship was found.

Price

The effects of the price charged for milk in school and of the income area in which the school is located are closely related. When the Special Milk Program first went into operation in St. Louis, Missouri during the 1955-1956 school year, the average decrease in the price of milk in schools on the Program was about fifty percent. There was an associated increase, over the previous year, in average milk consumption per student per day at school of fifty percent in elementary schools and 100 percent in high schools on the program.[10] For elementary schools serving low income districts the increase was 171 percent, for those serving middle income districts it was 157 percent, and for those serving high income districts it was only forty-four percent. The increase was 147 percent in high schools serving low income districts, 118 percent in those serving middle income districts, and sixty-four percent in those serving high income districts.[11]

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[9]M. L. Downen, Consumption of Milk in Tennessee Schools, March, 1955 (Knoxville: University of Tennessee, Agricultural Experiment Station, Department of Agricultural Economics and Rural Sociology, Rural Research Series Monograph 274, March, 1956), pp. 2-4.

[10]Agricultural Marketing Service, "The Special School Milk Program in St. Louis, Missouri" (Washington: U. S. Department of Agriculture, 1956), p. 3.

[11]Ibid., p. 7.

Studies in Michigan[12] and Wisconsin[13] showed that as the price of milk to students decreased, milk consumption per student per day increased. This was also shown in a Tennessee study[14] for schools in which previous consumption was high. However, for schools in which previous consumption was low, a greater decrease in price was not accompanied by a greater increase in consumption. On the other hand the Wisconsin study showed the greatest increase in consumption in the schools with the lowest previous consumption.[15]

Educational Level in the School District

When the Special Milk Program was begun in St. Louis, there was an inverse relationship between the educational level of persons twenty-five years old and over in the school district and the amount of increase in average milk consumption per student per day. This was true for both elementary and high schools.[16]

Educational level and income level are probably very closely associated.

In 1950 the median number of school years completed was 8.6 for

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[12] S. W. Williams, et. al., op. cit., p. 36.

[13] "Pupil Response to Experimental Pricing of Milk" (Madison: University of Wisconsin, Agricultural Experimental Station, Research Bulletin 190, January, 1956), p. 1.

[14] M. L. Downen, "Pricing of Milk in Tennessee Schools" (Knoxville: University of Tennessee, Agricultural Experiment Station, Department of Agricultural Economics and Rural Sociology, Farm Economics Bulletin 10, April, 1956), p. 10.

[15] "Pupil Response to Experimental Pricing of Milk," op. cit., p. 10.

[16] Agricultural Marketing Service, op. cit., p. 7.

Dyersburg, 8.0 for Dyer County and 8.4 for Tennessee.[17]

Availability

Cook and Halvorson[18] found that increased availability of milk at school caused an increase in average consumption per student per day at school. Downen[19] found that schools which made milk available before school and in combination with other times experienced the highest increase in milk consumption.

Size of School

Studies in Michigan, Ohio, Illinois,[20] and Tennessee[21] showed that average milk consumption per student per day was higher in small schools than in large schools. Williams et. al. gave the following possible explanations for this.

> (1) Among the schools in Michigan, Ohio, and Wisconsin, there was an inverse relationship between school size and the proportion of the children who stayed at school during the lunch hour. In schools serving complete lunches, this relationship apparently helped to account for the decline in milk consumption per pupil as enrollment increased.[22]

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[17]U. S. Bureau of the Census, Census of Population 1950, Vol. II, Characteristics of the Population, Part 42, Tennessee (Washington: Government Printing Office, 1952), pp. 31-33.

[18]"Pupil Response to Experimental Pricing of Milk," op. cit., p. 12.

[19]M. L. Downen, "Pricing of Milk in Tennessee Schools," op. cit., p. 13.

[20]S. W. Williams, et. al., op. cit., pp. 29-32.

[21]M. L. Downen, Consumption of Milk in Tennessee Schools, March, 1955, op. cit., p. 5. M. L. Downen, Consumption of Milk in Tennessee Schools, March, 1956, op. cit., p. 5.

[22]S. W. Williams, et. al., op. cit., pp. 29-32.

Quakenbush also found that as school size increased the percentage of students eating lunches on the National School Lunch Program decreased. He listed two conditions which might give a partial explanation for this. First, large schools in general had a lower percentage of students living more than a mile from the school than did small schools. Second, there was a tendency for large schools to charge more for lunches than small schools.[23] (2) "In Michigan and Ohio, there also was a tendency for the price charged students for milk or the complete meal - whichever was served - to be higher in large schools than in small schools." (3) A more impersonal relationship between principal and students exists in large schools. (4) There is less flexibility in operations making for greater difficulty in scheduling milk service in large schools. (5) In large schools there may exist more competition from other beverages and food service.[24]

Downen found that average milk consumption per student per day was highest, on the average, in the smallest schools. During March, 1956 "Milk consumption per student per day was 0.97 half-pint in schools with average daily attendance of less than 100, compared with 0.56 half-pint in schools with average daily attendance of 1000 or more."[25] Jennie Bell fit into this distribution very well. During March, 1956 average daily

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[23]G. G. Quakenbush, "Student Participation and Use of Milk in School Lunches" (East Lansing: Michigan State University, Agricultural Experiment Station, Technical Bulletin 252, September, 1955), pp. 12-13.

[24]S. W. Williams, et. al., op. cit., pp. 29-32.

[25]M. L. Downen, Consumption of Milk in Tennessee Schools, March, 1956, op. cit., p. 5.

attendance for Jennie Bell was approximately 260 and average milk consumption per student per day was 0.96 half-pint.[26]

Grade Level of Pupils

In schools serving only milk in Michigan and in schools serving only complete lunches in Michigan and Ohio, average milk consumption per student per day was higher in elementary than in high schools. However, in schools serving complete lunches and milk alone in Michigan and Chicago, the reverse seemed to be true. There were limitations to these data because the number of junior high schools and high schools included in the study was small and most of these schools were larger than the elementary schools.[27]

In St. Louis when the Special Milk Program was placed in operation, the grade level of pupils did not appear to affect average milk consumption per student per day in a consistent manner.[28]

Jennie Bell included grades one through four. During March, 1956 average milk consumption per student per day for Jennie Bell, which was on both the National School Lunch Program and the Special Milk Program, was 0.96 half-pint. For other Tennessee schools on both programs it was 0.92 half-pint.[29] Thus Jennie Bell, which was a low grade level elementary school, had higher than average milk consumption per student per day.

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[26] Ibid., p. 49.

[27] S. W. Williams, et. al., op. cit., p. 33.

[28] Agricultural Marketing Service, op. cit., p. 8.

[29] M. L. Downen, Consumption of Milk in Tennessee Schools, March, 1956, op. cit., pp. 49-50.

Rural or Urban School

After the Special Milk Program went into operation in Tennessee, rural schools experienced greater increases in average milk consumption per student per day than did urban or urban-rural schools.[30]

Jennie Bell was an urban school. As was stated above, average milk consumption per student per day for Jennie Bell was higher, during March, 1956, than the State average for schools on both the National School Lunch Program and the Special Milk Program.

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[30] M. L. Downen, "Pricing of Milk in Tennessee Schools," op. cit., p. 14.

CHAPTER VI

SUMMARY

The legislative beginning of Federal assistance to school lunch programs was in 1933 with the passage of the Federal Emergency Relief Act of 1933.[1] The Agricultural Adjustment Act of 1935 provided for duties collected under the customs laws to be used for diverting products and commodities "from the normal channels of trade and commerce."[2] Part of this money was used for aid to the school lunch programs.

The National School Lunch Program originated with the passage of the National School Lunch Act in 1946.[3] The Special Milk Program was established in 1954 by an amendment to the Agricultural Adjustment Act of 1949.[4] Both of these programs provide for Federal reimbursement for a part of the cost of milk sold to children in nonprofit schools; and the Special Milk Program provides for reimbursement for a part of the cost of milk sold to children in nonprofit institutions devoted to the care and

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[1]Seventy-third Congress of the United States, United States Statutes at Large, Vol. 48, Part 1, Public Acts and Resolutions (Washington: Government Printing Office, 1934), Public Law No. 15, pp. 55-58.

[2]Seventy-third Congress of the United States, op. cit., Public Law No. 320, p. 774.

[3]Seventy-ninth Congress of the United States, United States Statutes at Large, Vol. 60, Part 1, Public Laws and Reorganization Plans (Washington: Government Printing Office, 1947), Public Law No. 396, p. 230.

[4]Eighty-third Congress of the United States, United States Statutes at Large, Vol. 68, Part 1, Public Laws and Reorganization Plans (Washington: Government Printing Office, 1955), Public Law No. 465, p. 86.

training of children.

During the 1955-1956 school year the expenditure for the National School Lunch Program was approximately eighty-two million dollars and for the Special Milk Program it was approximately forty-six million dollars.[5] Part of the expenditure for the National School Lunch Program was reimbursement for milk and all of the expenditure for the Special Milk Program was reimbursement for milk sold to children.

In order to get an estimate of the effects of these programs on total milk consumption by children in school, a study was made of the milk consumption habits of the families which had children in Jennie Bell School during May and September, Dyersburg, Tennessee, 1956.

There were 190 families which had children in Jennie Bell during May. One-hundred fifty-eight of these families were surveyed during May and June and 120 of these same families were surveyed during August and September. The amount of fluid milk and fluid milk substitutes consumed at home by these families was found for the non-school months of June and August. The amount of fluid milk and fluid milk substitutes consumed at home and at school was found for the school months of May and September.

Average milk consumption per person per day at home for 158 families was 0.08 pint or twelve percent higher during the school month of May than during the non-school month of June and for 120 of these same families it was 0.02 pint or three percent higher during the school month of September

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[5]Agricultural Marketing Service, "Selected Statistics on Operation of Food Distribution Programs During Fiscal Years 1954, 1955, and 1956" (Washington: U. S. Department of Agriculture, October 2, 1956).

than during the non-school month of August. The cause of these changes in milk consumption at home could not be determined. Seasonality may have been partially responsible.

When the amount of milk consumed at school was added to the amount consumed at home, the changes in average milk consumption per person per day from school to non-school months were much greater. Average milk consumption per person per day, including consumption at home and at school, for 158 families was 0.17 pint or twenty-six percent higher during the school month of May than during the non-school month of June and for 120 of these same families it was 0.10 pint or fifteen percent higher during the school month of September than during the non-school month of August.

As the month to month difference in average milk consumption per person per day, including milk consumed at school and at home, was much greater than the difference in average milk consumption per person per day of milk consumed at home only, it appeared that some of the change in milk consumption from May to June and August to September was due to the fact that the children from the families surveyed stopped consuming milk at school after May and started again in September.

It appeared therefore, that most of the milk which was consumed at school on the National School Lunch Program and the Special Milk Program was in addition to, and not substituted for, milk which normally would have been consumed at home.

The monthly incomes of 129 of the 158 families which were surveyed during May were obtained. For these 129 families it was found that for each ten dollar increase in monthly per capita income, there was an asso-

ciated increase of 0.035 pint in average milk consumption per person per day at home.

Assuming a straight line relationship, the income elasticity of demand for these 129 families during May, 1956 was +0.272.

The number of persons in the family for each of the 158 families surveyed during May was correlated with the average milk consumption per person per day at home for the family. It was found that for each increase in family size of one person, there was a decrease of approximately 0.10 pint in average milk consumption per person per day at home during May.

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APPENDIX

TENNESSEE

Consumption of Milk in Homes with Children in School

May Schedule No. _____

Interviewer _____

1. Name _____

2. Address _____

3. Number of persons living in household in May 1956:
   Total number _____.
   Pre-school children ___, boys ___, girls ___.
   School children, grades 1-4 ___, boys ___, girls ___.
   School children, grades 5-8 ___, boys ___, girls ___.
   Name of school _____
   School children, grades 9-12 ___, boys ___, girls ___.
   Name of school _____
   Adults (persons no longer in school) ___, men ___, women ___.

4. Do your children usually - come home from school for lunch _____; take lunch with milk _____; take lunch and buy milk _____; buy lunch at school _____.

5. Did you have a cow during May? _____.

6. Did you buy any milk from a neighbor during May? _____. How much? _____.

7. Did you buy any milk for home use during May 1956 from a store? _____.
   Name of store _____ Address _____
   Name of store _____ Address _____

8. Did you have milk delivered by a dairy for home use during May 1956? _____.
   Name of dairy _____
   Name of dairy _____

9. Household purchases of milk in May 1956.

Item	Size of Container	Delivered to Home: Glass	Delivered to Home: Paper	Purchased at Store: Glass	Purchased at Store: Paper
Sweet Whole Milk (Homo., Std., Extra Rich)	qt.				
	1/2 gal.				
	gal.				
Buttermilk (Plain or creamed)	qt.				
	1/2 gal.				
	gal.				
Other Milk (Skim, Choc., Fortified)	qt.				
	1/2 gal.				
	gal.				

10. Did you use any fluid milk substitutes in May?

Item	Number of Units	Size of Package or Container	Percentage Used for Drinking
Evaporated or canned milk		Tall can (14 1/2 oz.)	
		Small can (6 oz.)	
Dried whole milk			
Non-fat-dry milk-solids			

11. Were there any unusual events during May, such as vacations, that would have influenced your milk purchases? Describe _____

_____

12. Household income bracket (take-home pay):

Dollars per month:

Under $50 _____
$50 - $99 _____
$100 - $149 _____
$150 - $199 _____
$200 - $249 _____
$250 - $299 _____
$300 - $349 _____
$350 - $399 _____
$400 - $449 _____
$450 - $499 _____
Over $500 _____

TENNESSEE

Consumption of Milk in Homes with Children in School

June Schedule No. _____

Interviewer _____

1. Name _____

2. Address _____

3. Number of persons living in household in June 1956:
   Total number _____.
   Pre-school children ___, boys ___, girls ___.
   School children, grades 1-4 ___, boys ___, girls ___.
   School children, grades 5-8 ___, boys ___, girls ___.
   Name of school _____
   School children, grades 9-12 ___, boys ___, girls ___
   Name of school _____
   Adults (persons no longer in school) ___, men ___, women ___.

4. How much milk did you buy from a neighbor during June?
   Sweet milk _____; Buttermilk _____.

5. Household purchases of milk in June 1956.

Item	Size of Container	Delivered to Home: Glass	Delivered to Home: Paper	Purchased at Store: Glass	Purchased at Store: Paper
Sweet Whole Milk	qt.				
(Homo., Std., Extra Rich)	1/2 gal.				
Buttermilk	qt.				
(Plain or creamed)	1/2 gal.				
Other Milk	qt.				
(Skim, Choc., etc.)	1/2 gal.				

6. Name of Dairy _____. Name of Store _____.

7. Did you use any fluid milk substitutes in June?

Item	Number of Units	Size of Package or Container	Percentage Used for Drinking
Evaporated or canned milk		Tall can (14 1/2 oz.)	
		Small can (6 oz.)	
Non-fat-dry milk-solids			

8. Did you have any babies going off or starting on evaporated milk in May or June? _____. Explain _____

_____.

9. Were there any unusual events during June, such as vacations or visitors, that would have influenced your milk purchases? _____. Describe _____

_____

10. Did you (wife) work during June? _____.

If yes, did your children stay with a neighbor and eat lunch there? _____.

11. Did you (wife) work during May? _____.

(Ask only if there were pre-school age children in May)

If yes, did your pre-school age children stay with a neighbor and eat lunch there? _____.

12. Will you have a child in Jenny Bell School in September? _____.

TENNESSEE

Consumption of Milk in Homes with Children in School

August Schedule No. _____

Interviewer _____

1. Name _____

2. Address _____

3. Number of persons living in household in August 1956:
   Total number _____.
   Pre-school children ___, boys ___, girls ___.
   School children, grades 1-4 ___, boys ___, girls ___.
   School children, grades 5-8 ___, boys ___, girls ___.
   Name of school _____
   School children, grades 9-12 ___, boys ___, girls ___.
   Name of school _____
   Adults (persons no longer in school) ___, men ___, women ___.

4. How much milk did you buy from a neighbor during August?

   Sweet milk _____; Buttermilk _____.

5. Household purchases of milk in August 1956.

Item	Size of Container	Delivered to Home: Glass	Delivered to Home: Paper	Purchased at Store: Glass	Purchased at Store: Paper
Sweet Whole Milk (Homo., Std., Extra Rich)	qt.				
	1/2 gal.				
Buttermilk (Plain or creamed)	qt.				
	1/2 gal.				
Other Milk (Skim, Choc., etc.)	qt.				
	1/2 gal.				

6. Name of Dairy _____. Name of Store _____.

7. Did you use any fluid milk substitutes in August?

Item	Number of Units	Size of Package or Container	Used for Drinking
Evaporated or canned milk		Tall can (14 1/2 oz.)	
		Small can (6 oz.)	
Non-fat-dry milk-solids			

8. Did you have any babies going off or starting on evaporated milk in August? _____. Explain _____

_____.

9. Were there any unusual events during August, such as vacations or visitors, that would have influenced your milk purchases? _____.

Describe _____

_____.

10. Did you (wife) work during August? _____.

If yes, did your children stay with a neighbor and eat lunch there?

_____.

TENNESSEE

Consumption of Milk in Homes with Children in School

September Schedule No. _____

1. Name _____

2. Address _____

3. How much sweet milk did you get each week from someone from the country during September? ____gallons. Buttermilk? _____gallons.

4. How much sweet milk, buttermilk, and chocolate milk did you buy from store or milk man each week during September?

Item	Size of Container	Delivered to Home		Purchased at Store	
		Glass	Paper	Glass	Paper
Sweet Milk	Quart				
	1/2 gal.				
Buttermilk	Quart				
	1/2 gal.				
Chocolate milk	Quart				
	1/2 gal.				

5. Weekly purchases of evaporated (canned) milk and non-fat-dry milk-solids.

Item	Number of Units	Size of Package or Container	Percentage Used for Drinking
Evaporated or canned milk		Tall can (14 1/2 oz.)	
		Small can (6 oz.)	
Non-fat-dry milk-solids		_____Quart Size	
		_____Quart Size	

6. During September did you have any visitors for any length of time? Number of visitors_____. Number of days they stayed _____.

7. During September was anyone in the family gone for any length of time? Number of people gone _____. Number of days they were away _____.

8. Did you have a baby starting on evaporated milk during September? _____

9. Did you have a baby going off evaporated milk during September? _____

10. Did you (wife) work during September? _____. If yes, did your pre-school age children stay with a neighbor and eat lunch there? _____.