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BREAKFAST HABITS OF SOME UTAH SCHOOL CHILDREN

by

Marlene M. Stegelmeier

A thesis submitted in partial fulfillment
of the requirements for the degree

of

MASTER OF SCIENCE

in

Foods and Nutrition

UTAH STATE AGRICULTURAL COLLEGE
Logan, Utah

1957

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Marlene Stegelmeier

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INTRODUCTION

During the last 10 years, much emphasis has been placed on the importance of breakfast for people of all ages. Nutritionists have pointed out that persons who eat a hearty breakfast show fewer signs of mid-morning fatigue, have or develop better work habits, and do not get as hungry as those who eat little or no breakfast.

Many people do not realize the importance of starting the day with a good breakfast. The 12 to 13 hour fast which the body undergoes from the evening meal until breakfast time requires the consumption of an adequate breakfast. Many poor breakfasts may be attributed to either failure to take the time to eat, or to not understanding the necessity of an adequate breakfast.

Nationwide surveys report that a large number of adolescents and adults fail to receive the recommended $1/4$ to $1/3$ of their caloric and nutrient needs at breakfast. A basic breakfast pattern has been developed to aid in planning an adequate breakfast that will supply $1/4$ to $1/3$ of the calories and other nutrients needed each day. It includes fruit, cereal and/or egg, milk, bread and butter, yet it allows for a wide variation in menus. It is economical and can be easy to prepare. A breakfast of these foods insures one of less morning fatigue and better feeling during the morning and all day long.

Studies show that breakfast is the most frequently missed meal. Many of the subjects who did not eat breakfast had a total day's intake that was classified as poor. Eating two meals a day failed to make up for the deficiency in nutrients. Breakfast consumption shows a direct relationship to the diet score, proof of the fact omitting breakfast is a poor start for the day.

At the ages when an individual needs a larger intake of calories and nutrients, many times there is an actual decrease in the intake of nutritious food. The adolescents are noted for this inverse relationship between their nutritive needs and their actual intake. Galloway and Wilcox (1954), in a Utah study of school children, found that the breakfast meal did not furnish the recommended $1/4$ to $1/3$ of the day's allowance of calories and many of the other nutrients. The noon and evening meals furnished a larger percentage of most nutrients to their diets.

The number of children in the study by Galloway, et al., (1954) was somewhat limited. To obtain a better picture of Utah school children's breakfast habits, 799 dietary records on file in the Foods and Nutrition Laboratory and 495 records collected this school year (1956-57) were evaluated.

The objective of the present study was to determine the adequacy of breakfasts of approximately 1,000 school children.

REVIEW OF LITERATURE

Many recent studies have been made on the importance of a good breakfast. The findings indicate the necessity of eating a well-balanced breakfast every day.

When the word breakfast is broken down, it becomes "break—fast" and its meaning is just that. For some 12 or 13 hours, the body has been running on the food consumed during the dinner meal of the previous evening. When breakfast is omitted due to lack of time, appetite, or other reasons, the period of fasting is increased to some 18 hours. Physiologists have found that the human body cannot operate efficiently for this length of time without food.

Nutritionists have shown that people feel better and work better after a breakfast containing $1/4$ to $1/3$ of the total day's intake. Tuttle, et al., (1952) in a study with 10 men of ages ranging from 60 to 83 years of age showed that the choice reaction time was not affected by the omission of breakfast except by one subject. But the omission of breakfast did cause muscle tremor and weakness in most of the cases. The grip strength was less for most of the men when the breakfast was omitted, and also their grip strength endurance was cut down.

When breakfast was omitted, one-half of the men needed more oxygen to walk up a treadmill with a 2 percent grade at a rate of 2 miles per hour for 3 minutes. The subjects in the other half of the group did not show any noticeable differences.

Every subject showed a marked decrease in the maximum work output when he had no breakfast as compared with the period when he ate a basic breakfast (Tuttle, et al., 1954).

In a 14-week study by Tuttle, et al., (1954), 25 school boys ranging in age from 12 to 14 years were reported by school authorities to have better attitudes and scholastic records on days when they had eaten breakfast. When they omitted breakfast, some of the boys became careless and inattentive in the late morning hours. Tuttle and his associates also found the maximum work output of the boys was markedly less in the late morning hours on days when the breakfast had been omitted.

Whether a basic or a heavy breakfast was consumed did not seem to make any difference in the tremor magnitude or choice reaction time of young men in a study made by Daum, et al., (1955) at the University of Iowa.

The effect of a large breakfast of 1200 calories or a smaller or basic breakfast of 750 calories was also studied by these workers (Tuttle, et al., 1951, 1953). They found no difference in either the tremor magnitude or the choice reaction time in young men after a large breakfast of 1200 calories or the basic breakfast of 750 calories. But when they studied the effect of these same breakfasts on a group of men 60 to 83 years of age, they found that the basic breakfast was better for promoting both physical and mental efficiency of the older men in the late morning hours than the large breakfast.

They found that the effect of the contents of a breakfast built around bacon, eggs, and milk, and containing 750 calories was equally

effective in promoting physical and mental efficiency in the late morning hours in both young and old men.

The basic breakfast (Tuttle, et al., 1951) was the one that contained 25 percent of the total daily caloric intake. The heavy breakfast furnished 40 percent of the total calories eaten each day. Among the older men, 75 percent of the subjects did more work after the basic breakfast than after a heavy breakfast, whether the protein was of plant or animal origin.

As the size of the breakfast increased, the blood sugar levels increased (Tuttle, et al., 1953). But it was concluded that a basic breakfast of cereal and milk or of bacon, egg, and milk, equal in protein and caloric value, were equally effective in promotion of mental and physical efficiency in the late morning hours.

Several workers have found that there is a more constant blood sugar level following a breakfast containing a large amount of protein. Bryant, et al., (1952) found in their studies that 10 grams of protein was not sufficient to maintain the level of the blood sugar for 3 1/2 hours after breakfast. However, 25 grams was adequate whether it was of plant or animal origin. They also found that the young as well as the old person had the same blood sugar changes after eating similar breakfasts.

When a high carbohydrate breakfast was fed to subjects in the study made by Clayton and Randall (1955) the subjects complained of being hungry. A breakfast high in protein seemed to be best for preventing these hunger pangs. One which contained a moderate portion of fat (30 to 40 percent of the total calories), a high proportion of protein and a low proportion of carbohydrate was found to be most satisfactory in preventing hunger symptoms.

Coleman, et al., (1953) found that a combination of the two sources of protein in a breakfast was as effective in raising and maintaining the blood sugar level as a breakfast which was almost wholly of plant or of animal protein.

The eating of regular breakfast by older men in the study by Bryant, et al., (1952) resulted in an improvement of health, their infirmities became less apparent. Many of them had lived alone for years and others lacked the conveniences of modern day living. These men had been consuming a poor diet as well as eating irregularly. However, during this experiment the attractively prepared meals were eaten with regularity. Breakfast was the only meal altered in the total day's diet.

Studying the food habits of Iowa children, Sidwell and Eppright (1953) found that girls missed the breakfast meal more than boys did and that the town children missed the meal less frequently than children living in rural areas. They found that on the average, boys drank more milk than the girls did at breakfast. More eggs were consumed by boys than girls, and the boys tended to increase the number of eggs consumed as they grew older.

The intake of foods in the citrus group was low. Thirteen percent of the boys and 20 percent of the girls had no cereal. More sweet rolls and coffee cakes were eaten by the children in town than by the rural children. Meals missed on weekends were more frequent than on school days.

When the food value of the breakfasts eaten by these Iowa children was calculated for nutrient content, the meals were not too poor (Eppright and Swanson, 1955). A good supply of all nutrients except

vitamin A and niacin was noted. However, the breakfasts supplied only about 1/5 of the day's total calories instead of the recommended 1/4 or 1/3. The study also showed the infrequent use of eggs at breakfast.

A little more than half of the children with fair breakfasts in this Iowa study (Sidwell and Eppright, 1953) received good diets for the entire day. A good breakfast seemed to be a good insurance against a poor diet for the day. Only 1 out of 5 of the children who ate poor breakfasts made up for the deficiency in the other meals of the day. Poor food habits were not limited to any one group.

Steele, et al., (1952) found that Main, New York, and Rhode Island students who always ate breakfast more nearly met the daily requirements for nutrients than those who missed breakfast once a week or more. Similar findings were shown in the food habits of freshmen at Oregon State College by Young and Storvick (1949). Forty-three percent of the students who omitted breakfast had poor daily diets. The eating of breakfast had a direct relationship to the score of the total day's diet.

A number of studies, including those in New York state (Trulson, et al., 1949 and Young, et al., 1951), in Utah (Wilcox and Galloway, 1954), in Iowa (Sidwell and Eppright, 1953), and in New Mexico (Beaver, 1956), have shown that children under 10 years of age have a more adequate total day's nutrient intake or better breakfasts than do the older boys and girls.

In this adolescent group many more of the girls 13 to 15 years of age had breakfasts with poor ratings than did boys in the New Mexico study (Beaver, 1956). This trend continued in the 16+ age

group. It is at these ages that girls become conscious of their weight, possibly accounting for the larger number of poor breakfasts.

The adults studied in Iowa by Eppright (1950) did not have better breakfast habits than the younger subjects. The food habits did not seem to improve with age. Bread and beverages, other than milk, were listed choices for most meals. Less than half of the people had fruit, cereal, or eggs. Fruit was eaten for breakfast by more women than men, but the men drank more milk. Eppright also found that the younger people usually had better diets than subjects of their parents' age. This was attributed to the larger consumption of milk by the young people.

Milk, a vitamin C-rich food as citrus fruit or tomato juice, bread, cereal and/or egg or any other protein-rich food constitutes a good basic breakfast. It can be a simply-prepared meal, thus it seems lack of time to prepare and to eat breakfast should not be a factor for omitting it from the day's diet.

The breakfast picture here in Utah among adolescents was explored to a limited degree by Galloway and Wilcox, (1954). One hundred and fifty-two boys and girls at Logan and Wellsville Junior High Schools cooperated in the study. Many of these teenagers began the day with a poor breakfast. Often the meal did not contain enough milk or citrus fruit. One group of 13-to-15-year-old girls had as many as 70 percent who were consuming poor breakfasts. However, the number of girls of this age was not as large as it might have been.

METHOD OF PROCEDURE

Dietaries of the breakfast meal and any food eaten between the time of rising and lunch time for 3 consecutive school days were obtained and evaluated for 1,291 school children and college students between the ages of 5 and 25.

Some of the records used had been on file prior to the beginning of the present study. Additional records were obtained to increase the number of subjects from 5-to-9-years and 17-to-25-years of age.

The number of subjects, by age and sex, are shown in Table 1. The four groups of subjects included in the present study are:

1. The 1950 study in Ogden with 130 children in the rheumatic fever group and 135 in the control group (children who did not have a record of rheumatic fever).

2. The 1953 study in Logan and Wellsville with 152 junior high pupils.

3. The 1954 study in Cache and Box Elder Counties with 382 elementary school children.¹

4. The 1956-57 study of 60 kindergarten and 22 first grade children, 72 senior high school girls, and 341 college students.

1. Dietary records of these children were on file in the Foods and Nutrition Laboratory at Utah State Agricultural College and used for the present study by the permission of E. B. Wilcox and L.S. Galloway for the 1950 and 1953 studies and of E. B. Wilcox, G. G. Myers, and V. Miller for the 1954 study.

Table 1. Distribution of age and sex of Utah subjects in breakfast study

Age	1950 Study		1953 Study	1954 Study	1956-57 Study				Total Number
	R.F.*	Control			Col-lege	High School	Kinder-garten	First Grade	
Males									
5	4	1	--	--	--	--	25	--	30
6	1	4	--	2	--	--	--	10	17
7	3	3	--	62	--	--	--	8	76
8	5	6	--	66	--	--	--	--	77
9	6	6	--	64	--	--	--	--	76
10	3	2	--	12	--	--	--	--	17
11	5	7	--	2	--	--	--	--	14
12	8	6	3	--	--	--	--	--	17
13	2	6	42	--	--	--	--	--	50
14	11	9	21	--	--	--	--	--	41
15	7	7	5	--	--	--	--	--	19
16	3	7	--	--	--	--	--	--	10
17	3	--	--	--	--	--	--	--	3
18	--	--	--	--	22	--	--	--	22
19	1	--	--	--	37	--	--	--	38
20	--	--	--	--	20	--	--	--	20
21	--	--	--	--	16	--	--	--	16
22	--	--	--	--	9	--	--	--	9
23	--	--	--	--	10	--	--	--	10
24	--	--	--	--	15	--	--	--	15
25	--	--	--	--	14	--	--	--	14
Total Males	62	64	71	208	143	--	25	18	591
Females									
5	2	1	--	--	--	--	20	--	23
6	2	4	--	1	--	--	--	15	22
7	4	3	--	51	--	--	--	4	62
8	6	6	--	56	--	--	--	--	68
9	2	4	--	55	--	--	--	--	61

* R.F. - Rheumatic fever group.

(Table 1 conc.)

Age	1950 Study		1953 Study	1954 Study	1956-57 Study				Total Number
	R.F.	Control			Col-lege	High School	Kinder-garten	First Grade	
10	5	5	--	10	--	--	--	--	20
11	7	5	--	1	--	--	--	--	13
12	5	7	1	--	--	--	--	--	13
13	7	6	37	--	--	--	--	--	50
14	10	11	34	--	--	--	--	--	55
15	6	5	8	--	--	17	--	--	36
16	6	13	1	--	--	5	--	--	24
17	5	1	--	--	--	46	--	--	52
18	1	--	--	--	124	4	--	--	129
19	--	--	--	--	42	--	--	--	42
20	--	--	--	--	20	--	--	--	20
21	--	--	--	--	10	--	--	--	10
22	--	--	--	--	--	--	--	--	--
23	--	--	--	--	--	--	--	--	--
24	--	--	--	--	1	--	--	--	1
25	--	--	--	--	1	--	--	--	1
Total									
Females	68	71	81	174	198	72	20	19	703

Total Subjects in Each Study

Male	62	64	71	208	143	--	25	18	591
Female	68	71	81	174	198	72	20	19	703
Total									
Sub-jects	130	135	152	382	341	72	45	37	1294

Collecting the Data for the 1956-57 Study

Arrangements were made with the Physiology and Home Economics instructors at Utah State Agricultural College and with Home Economics teachers at North Cache and Logan High Schools to obtain three-day dieteries of the breakfast meals of their students. The forms for the dieteries were distributed during the regular class period (Appendix, Exhibits 1 and 2). At this time general directions included in the booklet were reviewed and any questions answered. They were asked to measure their food accurately and keep a record of all food eaten from the time they arose in the morning until noon. The dieteries were kept for three consecutive school days. Arrangements were made with the instructor of each class to gather the dieteries the day after they were completed.

With the permission and cooperation of the principal and teachers of the Adams School in Logan, the dieteries were sent home to the parents of kindergarten and first grade pupils. A letter explaining the intentions of the survey and asking their cooperation accompanied the dietary sheet. The same general instructions were sent with these dieteries as those included in the booklet for older subjects. The parents were asked to fill out the dietary sheet for three consecutive days with the amount and kind of food eaten by the child from the time of waking in the morning until noon. Self-addressed and stamped envelopes were stapled to the dieteries for the convenience of the parents in returning the completed dieteries.

Calculation of Dieteries

The records of each study were sorted according to sex and age, and then evaluated. Numerical values used by Beaver (1956) with slight modifications were assigned the common breakfast foods. These values

were as follows:

Milk -----	1 cup -----	2.0
Cocoa -----	1 cup -----	1.0
Egg -----	1 -----	1.0
Meat -----	1 serving -----	1.0
Non citrus fruit --	1 serving or $\frac{1}{2}$ cup -----	1.0
Citrus fruit -----	1 serving or $\frac{1}{2}$ cup -----	2.0
Bread -----	1 slice -----	0.5
Cereal -----	$\frac{1}{2}$ cup -----	1.0
Butter -----	1 tablespoon -----	0.5
Sugar -----	2 tablespoons -----	0.5
High energy foods--	(Measured by 100 cal. portions)-----	0.5

Allowances for foods not ordinarily eaten at breakfast were made under the heading of "Other Foods." The value of the food was based on the calorie content and the amounts of valuable nutrients supplied. Jellies and other high energy foods were listed under "High Energy Foods" and figured on the 100 calorie basis.

A rating of "good" was given for a breakfast ranging from 5.6 to 8.0; "fair" for one from 3.6 to 5.5; "poor" for one from 0.0 to 3.5. If breakfast was omitted, the score was indicated with zero. However, many students would eat large amounts of some foods while omitting other of the important foods from their meal. Though the score would be high, the actual value of the breakfast might be inadequate. Consideration had to be given, then, to what foods were necessary for a good breakfast and the amount of each food. Maximum ratings for each of the foods were selected, which are as follows:

Milk -----	4.0
Cocoa -----	2.0
Eggs -----	2.0
Non citrus fruit -----	1.5
Citrus fruit -----	3.0
Bread and cereal together -----	3.0
Butter -----	0.5
Sugar -----	0.5
High energy -----	0.5
Other foods -----	1.0

In order to evaluate the breakfast completely, it was also necessary to consider a basic breakfast which would be:

Fruit or juice, preferably citrus	-----	$\frac{1}{2}$ cup
Cereal	-----	$\frac{1}{2}$ cup
or		
Egg	-----	1
Bread (enriched, white)	-----	1 or more slices
Butter	-----	1 teaspoon
Whole Milk	-----	1 cup

These foods were grouped as follows: (1) milk; (2) citrus or non citrus fruits or tomato juice; and (3) bread and cereal or eggs or meat. If the breakfast rating was high, but lacked one of these food groups, it was classed as a "fair" breakfast. If it lacked two, it was rated as a "poor" breakfast.

RESULTS AND DISCUSSION

Evaluation of Breakfast for Each Group1950 study

The dietaries of 265 subjects 5-to-19 years of age were evaluated. Over half of the boys (ages 5-9, 10-19) in the rheumatic fever and control groups had a fair breakfast rating (Table 2). Considerably more of the younger boys in the rheumatic fever group ate good breakfasts than did the control boys (26 vs. 15 percent). The reverse was true for the older boys. When the percentages of boys consuming fair and good breakfasts were considered, the better eating habits of the younger boys as compared to the older boys (ages 10-19) became apparent. That is, more boys under 10 years of age in either group had fair and good breakfast ratings than did the older boys.

Table 2. Breakfast ratings for 1950 study

	Breakfast Rating	Boys		Girls	
		5-9 Yrs.	10-19 Yrs.	5-9 Yrs.	10-18 Yrs.
Rheumatic fever group	poor	16	23	44	46
	fair	58	63	44	35
	good	26	14	12	19
Control group	poor	20	29	17	47
	fair	65	48	66	42
	good	15	23	17	11

Approximately the same percentage of girls were consuming poor breakfasts as were eating fair breakfasts in all groups of girls with the exception of the 5-to-9-year-old control group. When the younger girls were compared to the older girls, the differences in

percentages of fair plus good breakfasts were much greater in the control group than in the rheumatic fever group. This occurred because the younger control girls (ages 5-9) were consuming better breakfasts than the rheumatic fever girls of the same age or the older girls in either group.

When the boys were compared with the girls, the percentages of fair plus good breakfasts were much greater for the boys in each group except for the younger control children (ages 5-9). In general, these results indicated that the boys were eating better breakfasts than the girls. The majority of boys and girls in both groups were consuming only fair breakfasts.

1953 study

Twenty-eight percent of the 152 junior high school subjects had poor breakfast ratings (Table 3). An almost equal number had breakfast ratings of good and poor, however, 50 percent of them had fair breakfasts. Most of the girls had either a poor or a fair breakfast rating, and a very few had good breakfast ratings. As in the 1950 study, fair was the rating for the majority of the breakfasts of the boys and the girls.

Table 3. Breakfast ratings for 1953 study

Breakfast Rating	Boys (%)	Girls (%)
Poor	20	36
Fair	51	52
Good	29	12

1954 study

All the subjects in this study were younger in age, 6 to 11 years of age. Seventy-three percent of the boys and 74 percent of

the girls had fair breakfasts (Table 4). A higher percentage of the boys had good breakfast ratings when compared to those rating poor, however, the percentages were similar for the two ratings of the girls. These younger children had somewhat better breakfasts than the children in the 1950 and 1953 studies.

Table 4. Breakfast ratings for 1954 study

Breakfast Rating	Boys (%)	Girls (%)
Poor	7	14
Fair	73	74
Good	20	12

1956-57 study

Kindergarten and first grade. More kindergarten girls than boys were eating better breakfasts; a higher percentage of the girls' breakfasts rated good than of the boys' (Table 5). The majority of the boys had breakfasts of fair rating. Only a small percentage of the boys ate poor breakfasts, and none of the girls.

A higher percentage of first grade boys were eating good breakfasts than were the girls (60 vs. 27 percent). (40 vs. 60 percent for the boys and girls, respectively.)

Table 5. Breakfast ratings of kindergarten and first grade children in 1956-57 study

	Breakfast Rating	Boys (%)	Girls (%)
Kindergarten	Poor	4	0
	Fair	64	35
	Good	32	65

(Table 5 conc.)

		Breakfast	
		Boys	Girls
Breakfast Rating		(%)	(%)
First grade	Poor	0	13
	Fair	40	60
	Good	60	27

High school. Evaluation of the dietaries kept by North Cache and Logan High School girls showed definitely a trend toward poor breakfasts. Over half of the girls (57 percent) ate breakfasts which rated poor. The next largest percentage (38 percent) had breakfasts rating fair, whereas only 3 percent had good breakfasts. Two percent of these girls did not eat breakfast or any food before noon.

College. As shown on Table 6, in this group there was an equal percentage of girls who were consuming poor and fair breakfasts (41 percent). Approximately the same percentage of boys had fair breakfast ratings (45 percent). Only a few girls ate breakfasts that rated good (15 percent), while the boys had nearly twice that many. In the poor rating group the reverse was true, with many more girls than boys rating poor. Four percent of both boys and girls did not include breakfast in their menus for the three days.

Again, as in the other studies, the boys were eating better breakfasts when compared to the girls. Slightly less than half of the girls were eating poor breakfasts.

Table 6. Breakfast ratings for college students in 1956-57 study

Breakfast Rating	Boys (%)	Girls (%)
Poor	25	41
Fair	45	41
Good	26	15
No breakfast	4	3

Comparison of Breakfast Ratings at Individual Ages

The percentage of subjects eating breakfasts in the three rating groups were plotted against age in Figures 1 and 2. The data is tabulated in the Appendix, Table 7. These figures show that age had less effect on the rating of the breakfast for the boys than for the girls. Although the curves of both boys and girls showed considerable fluctuations, the boys' curves for each age and rating tended to remain near the same percentage. However, the girls showed a sharp decrease with age in the percentage that ate a good breakfast with a corresponding increase in those consuming poor breakfasts.

At the age of 5 there was a larger percentage of the girls eating good breakfasts than boys (64 vs. 33 percent). However, this percentage for the girls decreased sharply by the age of 7 and remained below 22 percent thereafter. The percentage of boys who ate a good breakfast showed considerable fluctuation, but it stayed about 22 percent except in a few instances. Hence, after 7 years of age, more boys were consistently eating good breakfasts than girls.

The reverse of this pattern was shown by those eating poor breakfasts. That is, few boys or girls ate poor breakfasts at the age of 5. Then the numbers increased for both boys and girls to the age of

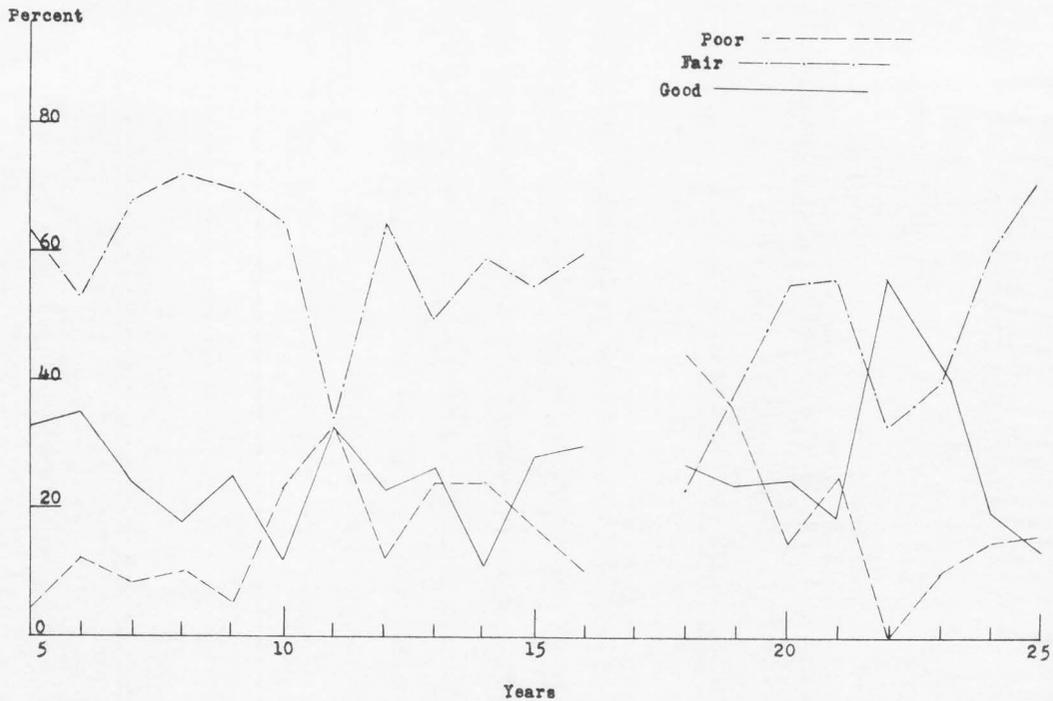


Figure 1. Distribution of each breakfast rating for boys at different ages

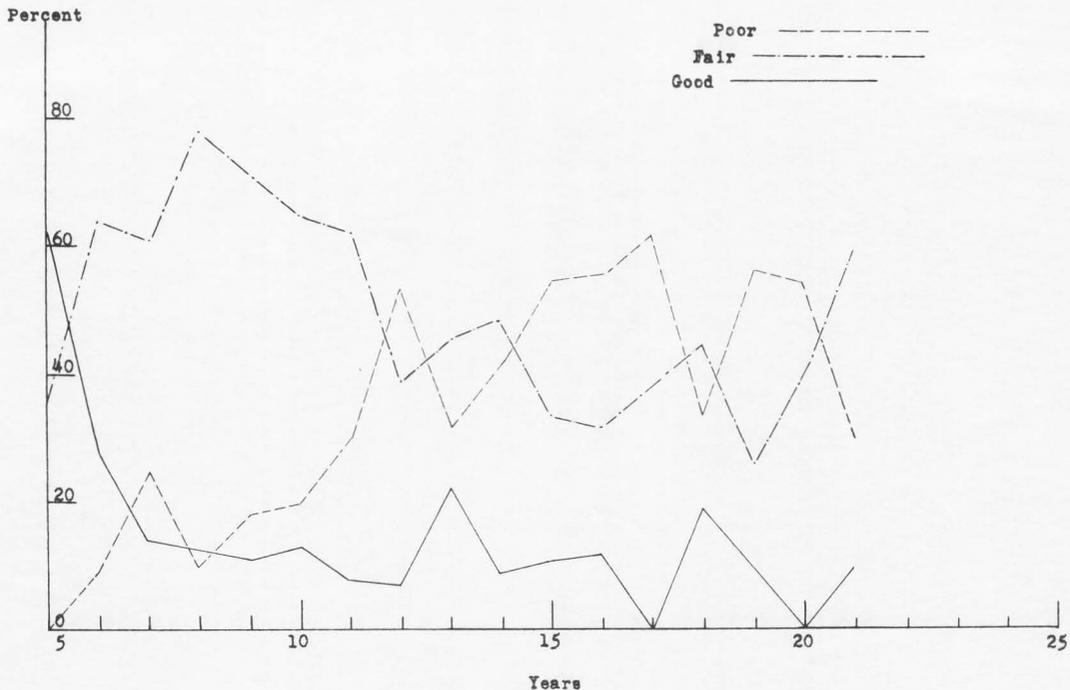


Figure 2. Distribution of each breakfast rating for girls at different ages

11 (34 and 30 percent). Thereafter, the percentage of girls eating poor breakfasts doubled while that of the boys fluctuated.

In general, there was a larger percentage of boys and girls at all ages consuming fair breakfasts than either good or poor breakfasts. The percentage of breakfasts that rated fair tended to be highest at the younger ages (5-to-10 years). Thereafter, the percentage decreased somewhat for the girls, and after 12 years for the boys.

Comparison of Breakfasts by Age Groups

Boys

Tabulation of the data by age groups, which represents ages that have similar nutrient needs, is shown in Figure 3. In the 5-9-year-old group only about 6 percent of the boys had poor breakfasts. Two-thirds of these boys had breakfasts which rated fair and one-fourth of the boys had good breakfasts.

The percent of fair breakfasts dropped in the 10-to-12-year-old group while the poor and good breakfast ratings were equal (22 percent).

With only slight changes in the percentages, the same picture is true for the 13-to-15-year olds.

The breakfast ratings for the 16-to-20-year-old group were similar to that of the 13-to-15-year olds except that more boys were consuming poor meals. In this age group, 3 percent did not eat breakfast or any food before noon.

Better breakfasts (that is fair plus good ratings) were eaten by the 21-to-25-year-old group as compared to the boys 16-to-20-years of age. The majority of boys in this age group had fair breakfasts.

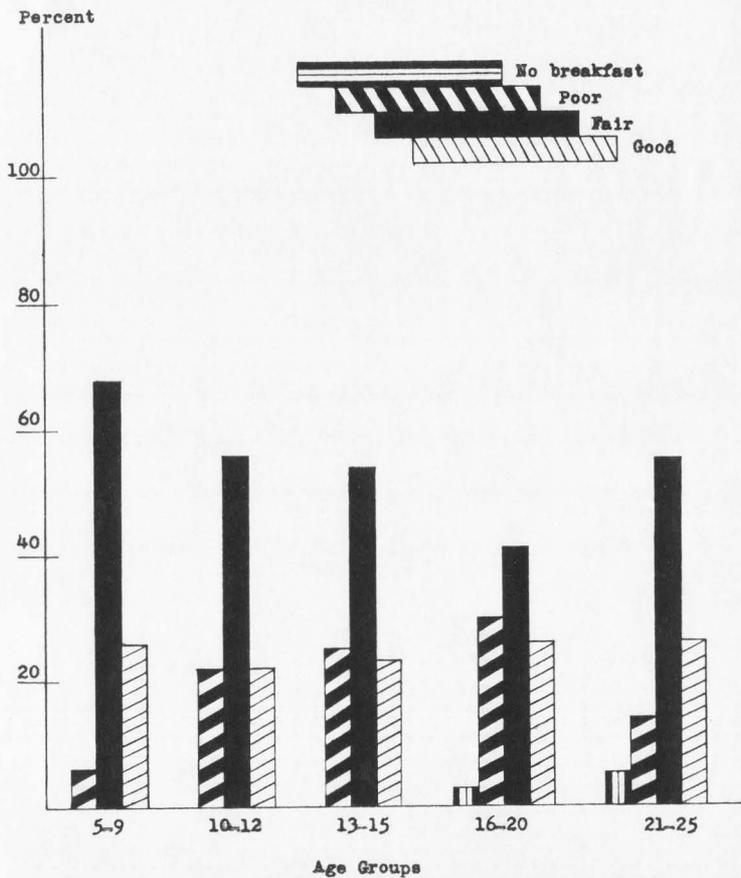


Figure 3. Distribution of breakfast rating for boys of different age groups

About the same percentage (less than 5 percent) had no food before noon.

Similar percentages of boys in each breakfast rating for each age group were found in this study as Beaver (1956) found in her New Mexico study.

Girls

Over half of the girls from 5-to-9-years old had breakfasts that rated fair, while less than one-fifth had good breakfasts, Figure 4. However, there was a slightly larger percentage having good breakfasts when compared to those having poor breakfasts.

This does not hold true in the 10-to-12-year-old group. A majority were eating fair breakfasts, however, the percentage eating poor breakfasts is considerably higher than for those eating good breakfasts.

Almost equal numbers of girls 13-to-15-years of age consumed poor and fair breakfasts (42 and 44 percent). This left 14 percent who had good breakfasts.

Girls from 16-to-20 years of age had breakfast ratings which were even poorer when compared to the 13-to-15-year-old girls. Forty-six percent had poor breakfasts with a slightly smaller percent of girls at this age having fair breakfasts. Less than one-fifth of the girls were eating good breakfasts.

Trulson, et al., (1949) and other workers have shown that there is a tendency for adolescent girls to have relatively poor dietary habits. Breakfast had a direct effect on the score for the day's diet in the study by Young and Storvick (1949). The poor ratings of the adolescent girls in this study would seem to indicate a tendency for relatively poor dietary habits for the whole day.

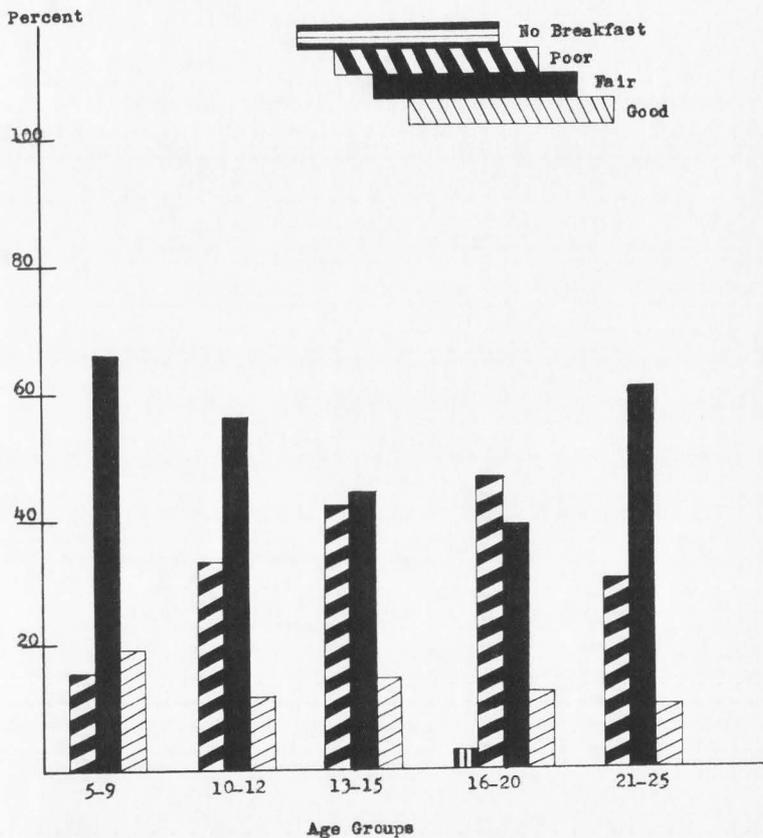


Figure 4. Distribution of breakfast rating for girls of different age groups

Breakfasts improved somewhat in the 21-to-25 age group. Sixty percent of the girls had fair breakfasts, while only 10 percent had good breakfasts.

The breakfast ratings for girls in Utah as compared to the girls in the New Mexico studies showed slight variation for all age groups. There was a tendency for more Utah girls than New Mexico girls in all age groups to have fair breakfast ratings.

Foods Frequently Missing from the Poor and Fair Breakfasts

Very few boys and girls missed breakfast for all three days of the dietary, but most of the breakfasts were not adequate enough in the necessary food to be rated good.

Basically the foods important in a good breakfast are milk, fruit, preferably vitamin C-rich fruits or tomato juice, cereal and/or eggs, and bread or toast. A good, but light breakfast could contain milk, vitamin C-rich fruit, cereal and/or bread. With the addition of more cereal, egg, or other high protein food, the breakfast could become more satisfying. Depending upon the needs of the individual, either one of these might work equally well. Galloway (1954) found that the junior high students could improve their breakfasts by including more protein foods; a feeling of satiety and well being is obtained by eating a breakfast which includes enough protein (Orent Keiles, et al., 1949).

Citrus fruit was the food most frequently missing from the inadequate breakfasts of boys and girls included in this study. However, fruits other than citrus were often used by these children. With the exception of girls younger than 10 years of age, milk ranked next in low consumption by the girls. More cereal and/or egg and bread was needed by many of the girls. In general, the foods lacking in the

inadequate breakfasts of the boys over 10 years of age followed the same pattern. However, the deficiencies were not as great for the boys as for the girls.

Many of the boys and girls had adequate breakfasts on one or two of the three days, while many had inadequate amounts of the essential foods each of the three days.

SUMMARY

Three-day dietaries of 1,294 Utah school children (ages 5 to 25) were evaluated for the adequacy of the breakfast meal.

Breakfast ratings for the children, ages 5-to-19 years, in the 1950 study, showed that over half of the boys were consuming breakfasts that rated fair. Differences between the rheumatic fever and control groups in breakfast ratings were slight for either the boys (ages 5 to 9, 10 to 19) or the girls (ages 10 to 18).

The control girls, 5-to-9-years of age had better breakfasts than any of the other girls. The older boys were eating much better breakfasts than the girls, however, in the younger age group, differences were slight.

The majority of 13-to-15-year-old junior high boys and girls in the 1953 study were eating fair breakfasts. However, more boys had good breakfasts than did girls. A greater number of girls had poor than good breakfasts.

Three-fourths of the boys and girls, 6-to-11-years old, had fair breakfasts. More boys from this 1954 study had good breakfasts than had poor. However, the girls had approximately the same number eating poor breakfasts as good.

The majority of kindergarten girls in the 1956-57 study ate good breakfasts. When the girls were compared to the boys of this age, more girls were in the good breakfast category. The reverse was true for the first graders, that is, the boys were eating better

breakfasts than girls. Only a few of the children at this age were eating poor breakfasts.

Over half of the high school girls were eating poor breakfasts. This was more than for any of the other groups of children studied. Only 4 percent had good breakfasts.

The majority of college boys consumed fair breakfasts. About one-fourth of the boys had poor and good breakfasts; whereas an equal percentage (41) of college girls ate poor and fair breakfasts. Less than 5 percent of both boys and girls entirely omitted food from their diets before noon on the three days.

Comparing the different ages, the majority of boys and girls ate fair breakfasts. The average percentage of girls in the good breakfast category was lower than for boys. On the average, more girls ate breakfasts of poor rating at all ages. There were no subjects under 17 years who did not eat any food before the noon meal, and less than 5 percent after this age.

As an overall picture, there seemed to be a tendency toward a steady increase in the total percentage of boys and girls consuming poor breakfasts with advancing age up to 20 years old.

In all groups studied, citrus fruit was the most frequently missing food from the inadequate breakfasts. Milk, bread, cereal and/or egg ranked next. The addition of these foods would improve the breakfasts.

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APPENDIX

Table 7. Percentage of breakfast ratings by age and sex

Age		Breakfast Score			
		No Breakfast (%)	Poor (%)	Fair (%)	Good (%)
5	Boys	0	4	63	33
	Girls	0	0	36	64
6	Boys	0	12	53	35
	Girls	0	9	64	27
7	Boys	0	8	68	24
	Girls	0	25	61	14
8	Boys	0	10	72	18
	Girls	0	10	78	12
9	Boys	0	5	70	25
	Girls	0	18	71	11
10	Boys	0	23	65	12
	Girls	0	20	65	15
11	Boys	0	34	33	33
	Girls	0	30	62	8
12	Boys	0	12	65	23
	Girls	0	54	39	7
13	Boys	0	24	50	26
	Girls	0	32	46	22
14	Boys	0	24	59	17
	Girls	0	42	49	9
15	Boys	0	17	55	28
	Girls	0	55	34	11
16	Boys	0	10	60	30
	Girls	0	56	32	12
17	Boys	0	66	33	0
	Girls	4	62	38	0
18	Boys	5	45	23	27
	Girls	2	34	45	19
19	Boys	3	35	38	24
	Girls	7	57	26	10

(Table 7 conc.)

Age		Breakfast Score			
		No Breakfast (%)	Poor (%)	Fair (%)	Good (%)
20	Boys	5	15	55	25
	Girls	5	55	40	0
21	Boys	0	25	56	19
	Girls	0	30	60	10
22	Boys	11	0	33	56
	Girls	--	--	--	--
23	Boys	10	10	40	40
	Girls	--	--	--	--
24	Boys	7	13	60	20
	Girls	--	--	--	--
25	Boys	0	14	72	14
	Girls	--	--	--	--

Table 8. Percentage of breakfast ratings by age groups

Age groups		Breakfast Score			
		No Breakfast (%)	Poor (%)	Fair (%)	Good (%)
5-9	Boys	0	6	68	26
	Girls	0	15	66	19
10-12	Boys	0	22	56	22
	Girls	0	33	56	11
13-15	Boys	0	25	54	23
	Girls	0	42	44	14
16-20	Boys	3	30	41	26
	Girls	3	46	39	12
21-25	Boys	5	14	55	26
	Girls	0	30	60	10

Exhibit 1. General information booklet distributed with dieteries

RECORD OF FOOD EATEN AT BREAKFAST FOR THREE DAYS

by

From _____ 1956

To _____ 1956



UTAH STATE AGRICULTURAL COLLEGE

Foods and Nutrition Department

VITAL STATISTICS

Sex _____

Age (last birthday) _____

Birth Date _____

Height _____

Weight _____

Home Town or City _____

State _____

Present Address _____

Telephone Number _____

Name of School _____

Grade or Year _____

GENERAL INFORMATION ON DIETARY STUDY

We would like a record of what you eat for three school days.*

The following rules will help you in keeping your breakfast record. please follow these rules to the best of your ability.

1. Carefully list exactly the foods eaten and give the amounts you eat at breakfast and during mid-morning snacks. Referring to the record you will see there is a space to put down anything you eat. Keep the record as you go along, because it is much easier for you. If you wait until evening to remember everything you have eaten at breakfast, it will be quite difficult to remember all the foods and impossible to remember the amount of each food you have eaten.

2. Write down everything that you put in your mouth and swallow. If you miss a breakfast, write "nothing" in the space for that meal. Don't eat any different than usual. Just remember to write it all down, and the time of the morning it was eaten.

3. BE SURE TO WRITE DOWN THE KIND OF FOOD YOU EAT. Specify the kind of food such as:

Bread: whole wheat, white, rye

Meat: sausage, bacon, broiled or fried, hamburger

Milk: whole, skim, canned, etc.

Cereal: oatmeal, cooked (whole wheat), prepared (refined)

Fruits and juices: plums, peaches, pears or orange, apple, tomato juice, or any other fruits and juices that you eat.

4. TELL HOW EACH FOOD IS COOKED.

If you eat an egg, write whether it is fried, scrambled, or boiled.

For meats, give such information as: fried sausage, broiled or fried hamburger, fried bacon.

For fruits and juices, state whether they are fresh, frozen, or canned.

If the food is not cooked, but eaten raw, write "raw" after it.

5. WHEN YOU EAT TWO OR MORE FOODS COMBINED? WRITE DOWN EACH FOOD INCLUDED AS:

Scrambled eggs and bacon, 1 egg and 1 slice of bacon.

Cheese sandwich, 2 slices of white bread, 1 slice cheese, and 1 tsp. butter. (These are examples, be sure and

list the amount and kind of food in each combination dish.)

6. WRITE DOWN THE EXACT AMOUNT OF EACH FOOD YOU EAT. You will use a standard measuring cup, level teaspoon and tablespoon and the sample sizes listed below to measure your food. Tell how many level

* A slight revision of words was made on General Information Sheet sent to parents; such as, "We would like a record of what your child eats for 3 consecutive days."

teaspoons (tsp.) or tablespoons (tbsp.) you eat or whether you eat 1/2, 1/3, or 1 cup. Tell how many slices or pieces of food, such as pineapple, canned, 1 slice; or apple, raw, 1 whole (small, medium, or large.) DO NOT WRITE DOWN "servings," "glasses," or "plates" for such foods as milk, fruits, or cereals. Since these utensils can be of any size, large or small, it is not very accurate.

MEASURE WITH THE STANDARD MEASURING CUP OR LEVEL TEASPOONS OR TABLESPOONS THE AMOUNT OF FOOD THAT GOES INTO THE SERVING, WHETHER IN A GLASS, BOWL, OR ON A PLATE.

By level it means to scrape off the excess with the edge of a knife or spatula, because a "spoon" could mean heaping or scant, and it is important to know the exact amount.

Use the sample sizes that follow to tell the size of serving of foods not accountable in measuring cups, teaspoons, or tablespoons. Use it for foods of which you determine the size, such as cake, meat, pancakes, rolls, meat patties, or doughnuts. Observe the length, width, and thickness with a ruler to help you determine the size.

Large serving meat= $6 \times 3 \frac{1}{2} \times \frac{1}{2}$ inch thick or approx. $\frac{2}{3}$ cup

Med. serving meat= $4 \frac{1}{2} \times 3 \times \frac{1}{2}$, approx. $\frac{1}{2}$ c.

Small serving meat= $3 \times 2 \frac{1}{2} \times \frac{1}{2}$ or approx. $\frac{1}{3}$ cup

Cake =
 medium serving
 2 layers with icing.
 If larger than this, call large
 serving, if smaller, call small
 serving. If no icing
 on cake, list "no
 icing."

Cake (loaf type)
 2 1/2 x 2 1/2 x 2
 inches

Hamburger or sausage:
 Small serving, under 3 inches
 in diameter.
 Medium serving, 3 inches in
 diameter.
 Large serving, over 3 inches
 in diameter.

Diameter

Cookies: Small cookie, under 2 inches
 in diameter.
 Medium cookie, 2 1/2 inches
 in diameter
 Large cookie, 3 inches in
 diameter.

Pancakes: Small, under 4 inches in diameter.
 Medium, 5 inches in diameter.
 Large, 6 inches in diameter.

Dietary record pages like this one were also included in booklet for the second and third days.

FIRST DAY DIETARY

Time of day	Place	Kind of food and description	Amount

SAMPLE RECORDING

Time of day	Place	Kind of food and description	Amount
8 a.m.	Home	Orange juice, frozen Cornflakes Cream, thin Sugar Soft boiled egg Toast, whole wheat Butter Jelly, grape Milk, whole	$\frac{1}{2}$ cup 1 cup $\frac{1}{4}$ cup 1 tsp. one 1 slice 1 tbsp. 1 tbsp. 1 cup
10 a.m. (snack)	Lunch Counter	Doughnut Milk, whole	3" diam. 1 cup

Exhibit 2. Dietary record used for kindergarten and first grade children

DO NOT FEED YOUR CHILD ANY DIFFERENT THAN
YOU ORDINARILY DO. INCLUDE SNACKS.

Dietaries

Time of day	Place	Kind of food and description	Amount
FIRST DAY			
SECOND DAY			
THIRD DAY			

Vital Statistics

Name _____ Birthdate _____
 (of child)
 Age _____ (last birthday) Grade or year in school _____
 Height _____ Sex of child _____
 Weight _____
 Your Logan Address _____
 Telephone _____

Thank you very much. Will you please mail this in the stamped envelope that is attached.