BREAKFAST CONSUMPTION AMONG ELEMENTARY AND SECONDARY SCHOOL STUDENTS IN SUBURBAN AND RURAL UTAH

by

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ABSTRACT

Consumption of a quality breakfast has been shown to benefit students academically, behaviorally, and in regard to overall health. School breakfast is offered at the majority of elementary and secondary schools in the state of Utah. However, Utah has the lowest participation rate in school breakfast programs in the United States, with only 33.9% of students who qualify for free and reduced lunch consuming school breakfast. The purpose of this pilot study was to determine if students generally eat breakfast, where they eat breakfast, and if they consume food from four defined food groups. Elementary and secondary students from two rural and two suburban school districts were surveyed using an United States Department of Agriculture (USDA) survey. Two elementary schools, two junior high schools, and one high school were used in the analysis of this study. A total of 154 students participated in the survey and data analysis was conducted using Fisher's Exact Test and two-tailed T-tests. Findings indicate that the majority of students (84.42%) consumed breakfast the day of the survey. Of these, 85.71% consumed breakfast at home. There was no difference in the consumption of breakfast in general or breakfast consumption at school when comparing rural and urban students. Most students surveyed expressed understanding of the benefits to consuming breakfast regularly. However, only 8.46% of students reported that they ate foods from the four food categories needed for a complete breakfast, as defined by USDA. Results of this pilot study can be used to further investigate school breakfast participation in the state of Utah.

TABLE OF CONTENTS

ABSTRACT iii

LIST OF TABLES vi

LIST OF FIGURES vii

Chapters

I. INTRODUCTION 1

Background 1
Participation in School Breakfast Programs 2
Nutritional Value 3
Breakfast Consumption 3
Food Security 4
Gap Analysis 4
Purpose of Study 5

II. METHODS 6

Overview 6
Survey 6
Participants 6
Statistical Analysis 7

III. RESULTS 8

Breakfast Consumption 8
School Breakfast 9
Food Groups 9
Free Response Questions 10

IV. DISCUSSION AND CONCLUSION 17

Discussion 17
Limitations 19
Implications of Research 20

Conclusion 20

APPENDIX: ELEMENTARY AND SECONDARY SURVEYS 21

REFERENCES 24

LIST OF TABLES

Tables

1. Participating Schools: Demographics 12

2. Differences Between Rural and Suburban Breakfast Consumption 13

3. Differences Between Rural and Suburban School Breakfast Consumption 13

4. Elementary Student Free Responses 14

5. Secondary Student Free Responses 15

LIST OF FIGURES

Figures

1. Comparison of Rural and Suburban Food Groups..... 16

2. Comparison of Students Eating at Home vs. School for Food Group Consumption .. 16

CHAPTER I

INTRODUCTION

Background

Consuming a quality breakfast benefits elementary and secondary students in two ways.[1] First, there is a positive impact on the overall health of the students. This impact includes improvements in nutritional status, maintenance of normal body weight, and a lower prevalence of overweight in all age groups.[2] Several studies have reviewed the relationship between breakfast consumption and body weight status. Such studies find a correlation between body mass index (BMI) and breakfast consumption, showing that students who typically consume breakfast present with a lower BMI than their peers who do not eat breakfast.[5,6,7] This association is hypothesized to be the result of a positive correlation between energy intake at breakfast with daily energy intake. Students consuming breakfast tend to get more fiber in their diet, which slows digestion and leads to longer periods of satiation.[6] The second benefit recognized with breakfast consumption is academic success. It is suggested that students who eat a well-balanced breakfast are less hungry and therefore can focus their attention on what is being taught.[4,8,9] It is also believed that consuming breakfast leads to a supply of nutrients to the central nervous system through short-term metabolism, positively affecting cognition.[10] These benefits are attributed to better behavior in the classroom,[4] memory recall, and both short-term and

long-term memory capacities.[11,12,13] For example, Wesnes et al. found that students who skipped breakfast showed an impairment in attention and episodic memory, while students consuming breakfast cereals had a reduction in impairment by over half, with memory recall showing no impairment.[13]

Societal benefits of breakfast were recognized and codified into national policy in 1975 when the United States Department of Agriculture (USDA) implemented the School Breakfast Program (SBP).[14] The SBP provides public and nonprofit private schools the opportunity to serve students breakfast at school. It operates by providing cash subsidies to participating schools following the standards set by the USDA Food and Nutrition Service and offering the option for free and reduced prices to eligible families.[14] Those families who have income at or below 130% of the national poverty level qualify for free breakfast, while families falling between 130 and 185% of the poverty level qualify for reduced priced breakfast (no more than 30 cents per meal).[14] Families with income over 185% of the poverty level do not qualify for free or reduced breakfast and must pay the full price set by the participating schools or districts.[14] In all cases, the USDA Food and Nutrition Service provides cash reimbursements for each breakfast served (free breakfast: $1.58, reduced: $1.28, and paid: $0.28).[14]

Participation in the School Breakfast Program

Participation in the School Breakfast Program is voluntary, with tracking at the state level. The SBP is utilized far less than the National School Lunch Program (NSLP).[15] Each year, the Food Research and Action Center (FRAC) ranks each state based on the participation of students in the SBP. Utah has the lowest participation rate in school

breakfast programs in the United States, with only 33.9% of students who qualify for free and reduced lunch consuming school breakfast.[3] Nutrition educators in the field report that Utahans perceive that parents are feeding students before they are sent to school; however, there is no evidence to support this self-report.[16] Furthermore, the nutritional quality of the breakfasts Utah children are consuming outside of school is unknown.

Nutritional Value

Evaluation research indicates that the SBP impacts the nutritional value of foods children are consuming, the frequency of breakfast consumption, and the availability of food for families suffering from food insecurity.[17] The SBP must abide by federal nutritional guidelines for foods being served; therefore, students who participate in the SBP are offered a wide array of nutritious foods.[18] It has been noted that students participating in the SBP consume less calories from fat, are less likely to have low serum levels of vitamins C, E, and folate, and are more likely to meet the Dietary Reference Intake values for fiber, potassium, and iron.[18]

Breakfast Consumption

It is estimated that 12-34% of children are skipping breakfast on any given day of the school week.[19] In one study, 9% of high school students reported skipping breakfast more than three times per week.[20] Additionally, 21% of students ages 8 to 9 years old and 42% of students ages 12 to 13 years old have reported that they do not eat breakfast every day.[9,21] In a study of fourth-grade students in Maryland, 17% of the students reported skipping breakfast.[22] Of these, urban students were more likely to skip breakfast than their suburban and rural peers. However, only 10% of rural students reported eating breakfast

at least one day per week, as compared to 50% of the urban and suburban students.[22] Another study focusing on the eating habits of inner city high school (9-12th grade) students located in San Diego, CA, found that 57% of the students surveyed did not consume breakfast on the day the survey was conducted. Additionally, only 14% of the students questioned reported eating breakfast at school.[23]

Food Security

In 2013, over 14% of households in the state of Utah were food insecure.[24] For many students, the SBP is a source of food at little or no cost. Therefore, the SBP allows individual students the ability to obtain a healthy breakfast while freeing up resources for the family to use at different meals.[25] It is often found that many of these students choose not to participate in the SBP due to time constraints, social stigma, and sociocultural beliefs.[26]

Gap Analysis

National studies have determined the role of school breakfast in the overall health and academic success of students.[1-13] Other studies conducted nationally have demonstrated that breakfast consumption is low overall and ascertain that social stigma plays a role in deciding whether or not students participate in school breakfast.[26, 27, 28] However, educators and stakeholders know little about the actual consumption of breakfast by Utah students. By surveying Utah students, we will collect information that helps us understand whether or not students are consuming breakfast at home, school, or abstaining completely. Furthermore, we will be able to assess any differences by school level (elementary and secondary) among the different geographical regions within Utah.

Finally, we will be able to compare the general nutritional quality of breakfasts eaten at school with those consumed at home.

Purpose

The purpose of this pilot-test is three fold: 1) determine how often Utah students typically eat breakfast; 2) determine where they typically eat breakfast; and 3) quantify the breakfast consumption of suburban and rural elementary and secondary school students in Utah and compare intakes to national nutrition recommendations.

CHAPTER II

METHODS

Overview

This pilot study used survey methodology to assess self-reported breakfast intake from elementary and secondary students in rural and suburban settings as defined by the National Center for Education Statistics (NCES). Surveys were delivered to a convenience sample of classrooms of elementary and secondary school age students by school nutrition directors of participating districts.

Survey

An Elementary Student Survey or Secondary Student Survey (USDA) for assessing breakfast consumption was used (Appendix). Age-appropriate, anonymous surveys evaluated if students ate breakfast, where they ate breakfast, and if their breakfast choices contained items from any of the four USDA required categories. Completed surveys were collected from schools by the School Nutrition Director and returned for use in the study.

Participants

Participants consisted of a convenience sample taken from two school districts in the state of Utah. Nebo School District in Spanish Fork, Utah served as the rural category

and Davis School District in Farmington, Utah served as the suburban location. Students from one elementary school (K-6) in each district were assessed using the Elementary Student Survey for a total of 65 responses. One junior high school (7-9) from each district and one high school from Nebo School District were assessed using the Secondary Student Survey for a total of 89 secondary school responses. Participation in the survey was completely voluntary and anonymous; students implied their consent by answering and turning in the survey. Parental permission was obtained via an opt-out method in which parents wishing not to have their child participate contacted the principle investigator; it was otherwise assumed that they gave their consent for participation. The study was approved by the University of Utah Institutional Review Board for Human Subjects. Participating schools were provided with a $150 grant for their participation in the study once surveys were completed and returned.

Statistical Analysis

Upon collection of the surveys, analysis of the data was conducted via Microsoft Excel Software (version 14.4.9, 2011, Microsoft, Redmond, WA). Univariate statistics were used to describe: 1) if students consumed breakfast and 2) if breakfast was consumed at school. Fisher's Exact Test was conducted to determine any differences between rural and suburban populations. Two tailed t-tests were conducted for each of the four food categories to test for any differences in consumption between suburban and rural students. Themes were created for free response questions and tallied for their respective category. Comments from students were selected to exemplify the types of responses falling into the categorical themes. Statistical significance was set to 95% with a p value equal to $<.05$.

CHAPTER III

RESULTS

A total of 154 students from two Utah school districts participated in the survey, with 88 students from the three rural schools and 66 students from the two suburban schools. School level demographics are listed in Table 1. The three rural schools were located in Utah County with city populations below 20,000; the two suburban schools were located in Davis County with city populations above 70,000. Demographics for the participating schools were obtained from the Utah State Office of Education (USOE). Similar to the overall student population in Utah, the majority of students from participating schools were Caucasian. Suburban schools were more likely to have a racially and ethnically diverse student body than rural schools. Suburban schools had more students who qualified for free and reduced school meals, reflecting a lower household median income in the neighborhood. Rural schools tended to have larger enrollments with a greater travel distance and slightly more males than females.

Breakfast Consumption

Surveys were analyzed to determine if students: 1) ate breakfast and 2) ate breakfast at school. Differences between rural and suburban breakfast consumption were then analyzed using Fisher's Exact Test. Results indicated a significant difference in the proportion of rural elementary students who ate breakfast when compared to rural

secondary students, with 94% of secondary students reporting breakfast consumption *v.* 73% of elementary students ($p = .0077$). Proportion of suburban elementary students compared to secondary students yielded no statistical significance. No differences were found between the proportion of either rural or suburban elementary and secondary students who ate breakfast (Table 2).

School Breakfast

Analysis of school breakfast consumption was conducted using Fisher's Exact Test to determine differences between rural and suburban SBP participation as well as elementary and secondary participation. Results are displayed in Table 3. School breakfast participation among surveyed elementary students was similar between rural and suburban cohorts. There were no differences in the proportion of rural and urban secondary students who ate breakfast at school ($p = .5703$). No differences were detected between rural elementary students and rural secondary students ($p = .3291$). Likewise, when comparison between elementary and secondary students in the suburban category was conducted, no statistical difference was found ($p = .0898$).

Food Groups

Four basic food groups were presented to students for selection of breakfast intake. These four groups fulfill the SBP categories as set by the USDA for milk, meat/meat alternative, fruit and vegetable, and grain servings. Students were able to select all of the categories that applied to what they ate for breakfast that morning. Comparison of these categories was conducted using two-tailed t-tests to determine any significance between the rural and suburban groups. The mean intake by food groups between rural and

suburban students showed that rural students were more likely to meet the USDA guidelines for milk, meat/meat alternative, fruit and vegetable, and grain intake when compared to suburban students. Intakes, however, were not statistically significant between the two groups. Figure 1 shows differences among categories. [18] Overall, 8.46% of the students surveyed chose foods from all four food categories. When comparing the consumption of foods from each of the four food categories in those who eat at home or eat at school, no significant difference was found ($p = .3371$). While there is no statistical significance, almost twice the number of students eating breakfast at school consumed food from all four food categories compared to those who ate breakfast at home. Figure 2 shows the differences in proportions for this finding.

Free Response Questions

Both elementary and secondary students were provided free response questions regarding breakfast intake. Responses to these questions were evaluated for themes and tallied for each category. Summary results are displayed in Tables 4 and 5.

Major themes included why students chose not to eat school breakfast, how they feel when they miss breakfast (elementary), how eating breakfast assists students (elementary), why students would choose not to eat school breakfast even if the foods they liked were offered (secondary), and their knowledge of the importance of eating breakfast (secondary). The majority of elementary students stated that they did not eat breakfast at school because they ate at home while a small amount of students stated that they never eat breakfast. Secondary students also indicated that they eat at home rather than school, with some indicating they do not like the taste of school breakfast. A large proportion of

elementary students indicated that they experience hunger when skipping breakfast. Students also cited understanding that eating breakfast helps them learn and focus. Secondary students put slightly less emphasis on learning and more on overall energy as a result of consuming breakfast (Table 5).

Table 1. Participating Schools: Demographics

Characteristics				
	Suburban		**Rural**	
	n	**%**	**n**	**%**
Elementary				
Gender	**450**	**--**	**525**	**--**
Male	241	53.56%	295	56.19%
Female	209	46.44%	230	43.81%
Ethnicity	**450**	**--**	**525**	**--**
American Indian	2	0.44%	1	0.19%
Asian	6	1.33%	4	0.76%
African American	1	0.22%	2	0.38%
Caucasian	368	81.78%	479	91.24%
Hispanic	47	10.44%	18	3.43%
Pacific Islander	10	2.22%	10	1.90%
Multiple Race	16	3.56%	11	2.10%
Low Income	**123**	**27.33%**	**91**	**17.33%**
Size	**450**	**--**	**525**	**--**
Secondary				
Gender	**1023**	**--**	**2327**	**--**
Male	510	49.85%	1170	50.28%
Female	513	50.15%	1157	49.72%
Ethnicity	**1023**	**--**	**2327**	**--**
American Indian	11	1.08%	4	0.17%
Asian	29	2.83%	5	0.21%
African American	38	3.71%	16	0.69%
Caucasian	661	64.61%	1994	85.69%
Hispanic	248	24.24%	249	10.70%
Pacific Islander	9	0.88%	24	1.03%
Multiple Race	27	2.64%	35	1.50%
Low Income	571	55.82%	650	27.93%
Size	1023	--	2327	--

Table 2. Differences Between Rural and Suburban Breakfast Consumption

	Rural n (%)		Suburban n (%)		
	Yes	No	Yes	No	p
Elementary	19 (73.08)	7 (26.92)	31 (79.49)	8 (20.51)	0.5631
Secondary	56 (94.92)	3 (5.08)	24 (80.00)	6 (20.00)	0.0562
p-value	0.0077		1.0		

Table 3. Differences Between Rural and Suburban School Breakfast Consumption at School

	Rural n (%)		Suburban n (%)		
	Yes	No	Yes	No	p
Elementary	2 (7.69)	24 (92.31)	3 (7.69)	36 (92.31)	1.0
Secondary	10 (16.95)	49 (83.05)	7 (23.33)	23 (76.67)	0.5703
p-value	0.3291		0.0898		

Table 4. Elementary Student Free Responses

Elementary	
Theme	Example Comment
Why didn't you eat breakfast at school?	
Eat at home (n = 29)	Because my mom makes me breakfast I have time to eat before school
Time constraints (n = 7)	I didn't have time My bus was late
Doesn't like school food (n = 6)	Because I've had breakfast and I don't like it Because it is better at my house
Cost (n = 5)	My mother doesn't want to pay for it It costs too much
How do you feel when you have missed breakfast?	
Hungry (n = 46)	Hungry Very Hungry
Fine (n = 4)	Fine The same as always
What does eating a full breakfast help you do?	
Think, learn (n = 36)	Focus Better Helps me think about school work
Strength (n = 7)	Physical activities Gives you strength
Energy (n = 4)	Stay awake through the day Stay up in class

Table 5. Secondary Student Free Responses

Secondary	
Theme	Example Comment
Why didn't you eat breakfast at school?	
Eats at home (n = 34)	I like the food at home better My mom made me breakfast
Time Constraints (n = 7)	No time I get to be home longer
Doesn't like school food (n = 8)	The food tastes weird I like homemade food better
Why not eat foods you like if they are offered?	
Taste (n = 7)	They would just ruin it I like homemade better always
Cost (n = 5)	Still cost too much Because I don't have money
Time Constraints (n = 4)	No time Too busy
What do you know about the importance of eating breakfast?	
Energy (n = 27)	Starts your day, most important energy needed Helps get the energy you need for the day
Think, learn (n = 20)	It helps you stay focused You can think better and learn
Weight/health (n = 14)	Lessens the chance of gaining weight Keeps you from being malnourished

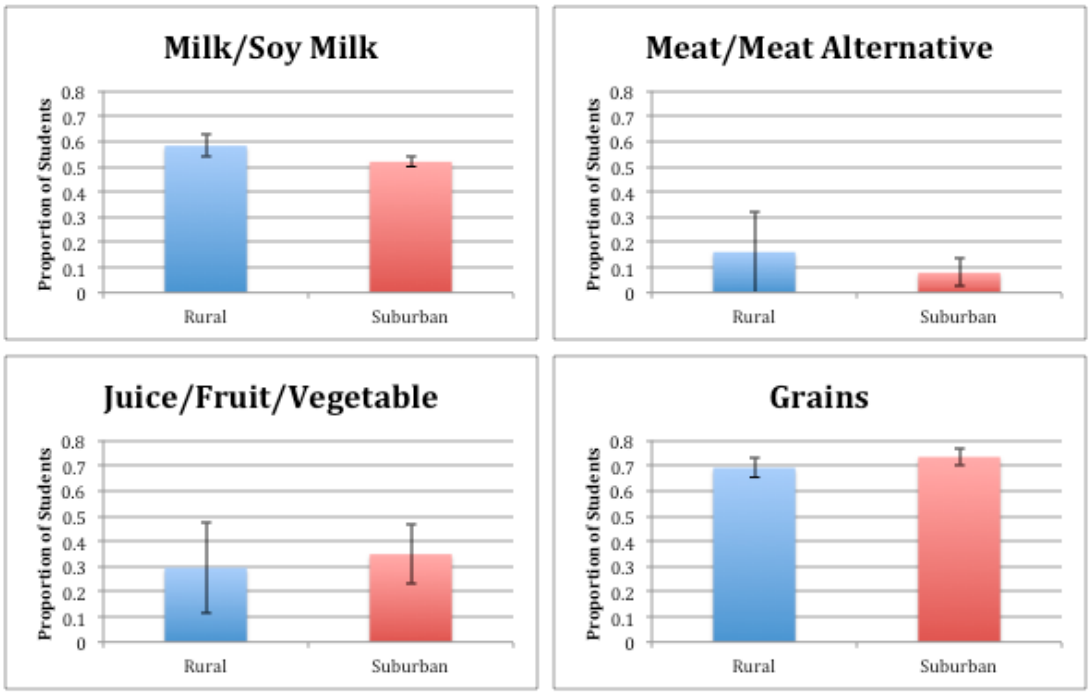

Figure 1. Differences in Food Group Intakes between Rural and Suburban Students

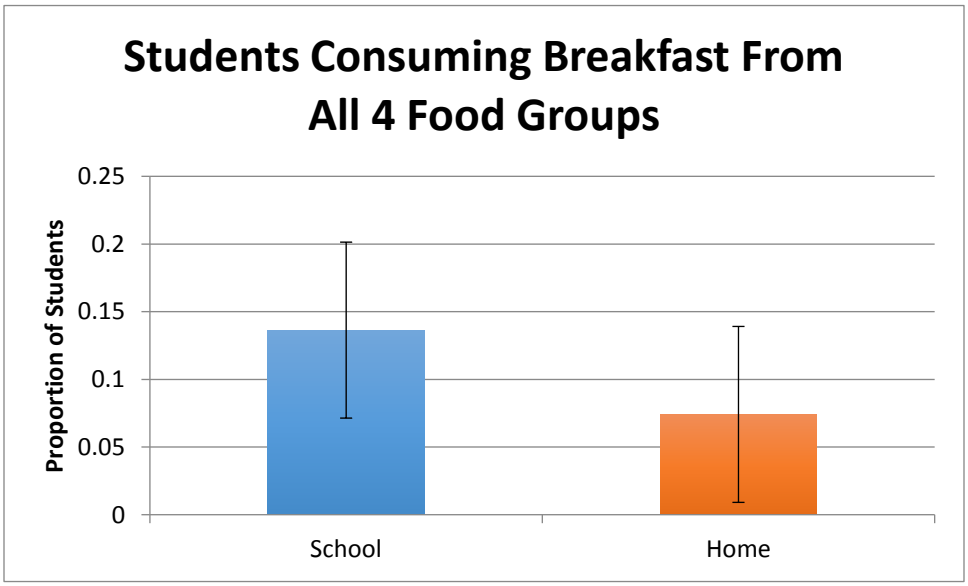

Figure 2. Comparison of Students Eating at Home vs. School for Food Group Consumption

CHAPTER IV

DISCUSSION AND CONCLUSION

Discussion

To our knowledge, this pilot study is the first of its kind to investigate participation in the SBP in the state of Utah using the USDA survey tool. This study was conducted to inform future research in Utah regarding school breakfast consumption. Utah continually ranks last in the nation for school breakfast participation, which raises questions about the breakfast behaviors of students.[3] Data presented here suggest that students are consuming breakfast at home before coming to school, with 84.42% of students surveyed saying they ate breakfast the day of the survey. Of these students, 85.71% indicated they had breakfast at home rather than school. There was no statistical significance with the differences between rural and suburban breakfast consumption either at home or school; however, there was a difference within the rural setting between elementary and secondary students with more secondary students consuming breakfast than elementary.

These results are similar to studies conducted in other states that report a small fraction of students eat breakfast at school.[19] One study evaluating the eating habits of inner city high school students in San Diego, CA found that 14% of the students surveyed reported eating breakfast at school, with an additional 3% eating both at home and school.[23] Although the overall sample size was different for this study, a similar 14% of

students reported consuming breakfast at school in Utah. Furthermore, results from students who reported barriers to eating school breakfast in this study are similar to research conducted on middle school students in an urban setting.[26] Major themes cited for school breakfast consumption among Utah students were similar to those in a focus group from this Philadelphia, PA study in that sociocultural preferences for eating at home including time constraints, availability of choices, appeal of school breakfast, and cost were all important factors in choosing to eat school breakfast. Utah students cited sociocultural preferences to eat at home as the number one reason they do not eat school breakfast (n = 63). It was also noted that time constraints play a role in their decision to participate in the SBP due to transportation or sleeping in longer (n = 14). Another possible barrier to SBP participation among secondary students is the quality of food being served. Students (n = 8) indicated that they do not like the taste of school food and thus prefer homemade or store-bought food.

Research suggests that rural students are more likely to consume a quality breakfast compared to suburban or urban students.[22, 23] There has yet to be any known research in the state of Utah regarding eating patterns between rural and suburban students, but the pilot study described here indicates there is no difference in the types of food consumed between the two groups. School breakfast programs are required to provide four categories of offerings (i.e. milk, meat/meat alternative, fruits and vegetables, and grains); therefore, it is assumed that students participating in the SBP are receiving a more nutritious offering than those who do not.[18] Few students surveyed indicated that they consumed breakfast items from all four major food categories. However, students consuming breakfast at school were more likely to eat from the four categories compared

to those eating breakfast at home. This association is an interesting finding and should be explored further.

It is known that consuming a quality breakfast leads to better overall student health, including maintenance of body weight, lower incidence of overweight and obesity, and improved nutritional status.[2] This study suggests that students are aware of these benefits whether they choose to eat breakfast or not. Furthermore, the vast majority of students indicated that eating breakfast helps with learning and focusing throughout the school day. This is congruent with national research regarding the benefits of consuming breakfast and academic success.[4, 8,9,10]

Limitations

This study supports the belief of nutrition educators that students in the state of Utah are consuming breakfast at home rather than school. Although it is the first known study to assess student breakfast habits in the state of Utah, there are limitations to the findings. First, a convenience sample from willing school districts was used in the data collection, as the original randomly selected schools were unwilling to participate. Second, a small sample size was obtained in the data collection process which limited the ability to make conclusions about school breakfast patterns in Utah. Third, secondary school responses were unequal due to the fact that two junior high schools were used, but only one high school was available. Finally, the surveys relied on self-reported behaviors of students and were therefore subject to recall and response bias.

Implication of Research

Students are aware of the benefits to eating a nutritious breakfast and in large part choose to consume breakfast outside of school. Nutrition professionals and stakeholders could use results from this survey in the development of school breakfast initiatives to increase the rate of participation in the SBP. Since this survey was a pilot study, it may be used in the development of future studies on breakfast consumption in the state of Utah for rural, suburban, and urban schools. Further research should address the differences in free and reduced participation rates and evaluate the quality of food consumed outside of school.

Conclusion

Students in both rural and suburban settings in the state of Utah choose to consume breakfast at home before going to school. Secondary students in the rural setting were more likely to consume breakfast than their elementary cohorts; no similar differences were found in the suburban setting. Most students are aware of the benefits to eating breakfast and choose foods from at least one of the four food groups set by the USDA regardless of eating at home or school. This pilot study provides a foundation to inform school breakfast initiatives in Utah.

APPENDIX

ELEMENTARY AND SECONDARY STUDENT SURVEYS

Elementary Student Survey – WITH Breakfast Program

1. Did you have breakfast this morning before you came to school?

   □ YES □ NO

2. Did you have any of these foods before school? Check which ones you had for breakfast this morning.

   □ Milk/Soy Milk
   □ Juice/Fruit/Vegetable
   □ Meat/Cheese/Yogurt/Eggs/Beans/Fish
   □ Cereal/Bread/Muffin/Rice/Bagel/Tortilla

   If no, what did you eat this morning? _____

3. Did you have breakfast at school this morning?

   □ YES □ NO

   If no, why not? _____

4. How do you feel when you've missed breakfast?

   _____

5. Do you get hungry before lunch?

   □ YES □ NO

6. What does eating a good breakfast help you do better?

   _____

Secondary Student Survey – WITH Breakfast Program

1. What do you know about the importance of eating a healthy breakfast?

   _____

2. Check any of these items you had for breakfast.

   □ Milk/Soy Milk
   □ Juice/Fruit/Vegetable
   □ Meat/Cheese/Yogurt/Eggs/Beans/Fish
   □ Cereal/Bread/Muffin/Rice/Bagel/Tortilla

   If none of the above, what did you eat?

   _____

3. Did you eat breakfast at school? YES/NO

   If no, why not?

   _____

4. Do you ever buy foods at a store, fast food restaurant or vending machine to eat for breakfast?

   If yes, what kinds of food do you buy?

   _____

5. How do you get to school and how long does it take?

   □ Bus ___ Min □ Car ___ Min □ Walk ___ Min □ Other ___ Min

6. What time do you get to school? _____ a.m.

7. Do you participate in before-school activities? YES/NO

8. List the kinds of foods you like to eat for breakfast.

   _____

9. If some of these foods were offered, would you eat breakfast at school, YES/NO

   If no, why not?_____

10. Would you purchase school breakfast if it cost less than $_____. YES/NO

    If no, why not?_____

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