



SKATE: Recognition, experience, willingness, and intake of fruit and vegetable snacks in rural school aged children at risk for obesity

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ABSTRACT No. 8207:

School Kids Access to Treats to Eat (SKATE) was a fruit and vegetable snack feeding study that assessed food recognition, food experience, and willingness to try specific fruits and vegetables of 186 elementary school children in Grades 4-6 at high risk for obesity. This rural school had a 100% free breakfast and lunch program, averaging 95% daily participation. Fruit and vegetable snacks were offered as an integral part of the school day and were available to all consented, assented children. Study participation was over 84 percent. A food recognition and experience checklist was used at baseline and at week nine to assess changes in a pilot fruit and vegetable snack program that offered pre-weighed gram portions and post-weighed refuse of 13 fruits and 5 vegetables snacks. Willingness to try new foods was measured by interviews using flash cards of specific foods. Teachers served as role models by consuming snacks with their classes and by incorporating food facts sheets into lesson plans. Children who initially recognized the foods were more willing to try and also consumed higher percentages of the snacks. While the majority reported being willing to try the snacks, even more actually tried the snacks, demonstrating fruit and vegetable snacks as a feasible approach to promote healthier food choices among children at high risk for obesity. Supported by USDA, ARS #6251-53000-004-00D.

PURPOSE

This study examined the relationships among food recognition and food experience self reports, willingness to try new foods questionnaire, and actual weighed fruit and vegetable snacks integrated into the regular school day of 4th-6th grade students in a rural elementary school.

BACKGROUND

The Mississippi Delta region of Arkansas, Louisiana, and Mississippi have often led the nation in the increase of obesity among its rural populations. These populations are largely African Americans, low income with limited access to health care, supermarkets and recreational facilities.¹⁻³ FOODS 2000 data revealed low Healthy Eating Index scores for adults and especially among food insecure households and especially low intakes of fruits and vegetables.⁴⁻⁵ Encouraging fruit and vegetable intakes is one strategy that may protect against the development of obesity and other chronic disease states. Previous community workshops had identified unwillingness to try new foods as a cultural factor in lack of intake of healthy foods.⁶

METHODS

The setting for the study was the only elementary school in a rural school district in Hollandale, MS and six surrounding communities (population ~ 4500) The school had 100% eligibility for free lunches and breakfasts with a daily participation rate of 95%.

A food recognition and food experience checklist assessed the children's awareness of selected fruits and vegetables by use of flash cards at baseline and at the end of the nine-week study. WillTry, a 22 item questionnaire, was used to determine if children were willing to try a series of fruits and vegetables upon viewing flash cards and then offered as a small snack as an integral part of the school day. Children were offered pre-weighed snacks and snack refuse was measured to determine the percentage of the snack actually consumed each day. Teachers served as role models by consuming the snacks with their respective classes. Teachers were also provided with fact sheets about the fruits and vegetables being offered and asked to incorporate these into their teaching plans however they chose.

RESULTS

One hundred eighty-six elementary school children in Grades 4-6 (84%) were consented and completed the study. Table 1 presents the food recognition percentages (correctly naming the specific foods) by grades. Recognition of specific fruits and vegetables varied greatly. Recognition of apricots ranged from a low 3.0% recognition by 4th graders to a high of 13.6% by 5th graders. Recognition of red and green apples were basically 100% for all 3 grades, fruits served frequently in the cafeteria. Pears were recognized by over 90% of students regardless of grade level. Recognition of baby carrots was 100% across all grades. Table 2 presents a Chi-square comparison of willingness to try food responses if the 13 fruits were or were not recognized by grade level. Students who said yes they were willing to try a fruit were more likely to recognize the fruit and those who said no were more likely to not recognize a fruit. A similar pattern is seen for vegetables. Figure 1 illustrates proportion intake of foods compared by answer (WillTry) and grade adjusted for food type. Fourth graders ate significantly lower for portion intake by all willingness answers (yes, maybe and no). The data suggest a steep increase in proportion intake between 4 and 5th graders but less so between 5th and 6th graders.

Table 1. Food Recognition of Specific Fruits and Vegetables by Grade Levels

Specific Foods	4th Grade		5th Grade		6th Grade										
	No Recognition	Recognition	No Recognition	Recognition	No Recognition	Recognition									
	N	%	N	%	N	%									
Fruits															
Apricots	67	65	97.0	2	3.0	44	38	86.4	6	13.6	72	65	90.3	7	9.7
Cantaloupe	69	19	27.5	50	72.5	44	6	13.6	38	86.4	72	14	19.4	58	80.6
Green Apple	65	1	1.5	64	98.5	43	3	7.0	40	93.0	72	2	2.8	70	97.2
Kiwi	67	13	20.9	53	79.1	38	6	15.8	32	84.2	71	8	11.3	63	88.7
Pear	66	5	7.6	61	92.4	41	1	2.4	40	97.5	71	1	1.4	70	98.6
Red Apple	67	0	0.0	67	100.0	40	1	2.5	39	97.5	71	0	0.0	71	100.0
Red Grapes	64	0	0.0	64	100.0	42	0	0.0	42	100.0	72	0	0.0	72	100.0
Tangerine	70	37	52.9	33	47.1	43	15	34.9	28	65.1	70	31	43.1	41	56.9
Vegetables															
Baby Carrots	63	0	0.0	63	100.0	42	0	0.0	42	100.0	72	0	0.0	72	100.0
Grape Tomatoes	59	25	42.4	34	57.6	42	14	33.3	28	66.7	72	13	18.1	59	81.9

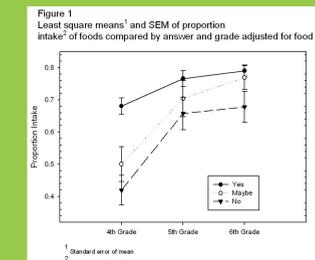


Table 2. Chi-Square^a Comparison of Willingness to Try Food Responses if the fruit was recognized controlling for Grade and Type (Fruit)

Fruit	Grade 4		Grade 4		Grade 5		Grade 5		Grade 6		Grade 6	
	Not Recognize	Recognize										
WillTry Answer	N	%	N	%	N	%	N	%	N	%	N	%
No	21	4.0	14	2.6	35	6.6	15	4.8	15	4.8	30	9.7
%	60.0		40.0		50.0		50.0		36.0		64.0	
Maybe	17	3.2	24	4.5	41	7.7	9	2.9	19	6.1	28	9.0
%	41.5		58.5		32.1		67.9		53.3		46.7	
Yes	101	19.1	353	66.6	41	13.2	211	68.1	252	81.3	90	16.8
%	22.3		77.8		16.3		83.7		18.7		81.3	
Total	139	26.2	391	73.8	530	100.0	65	21.0	345	79.0	310	100.0
X ² Square	1		29.21		0.0001		1		20.65		0.0001	
Df	1		1		1		1		1		1	
Prob												

^aMantel-Haenszel Chi-Square

CONCLUSIONS

These data suggest that food recognition appears to have a largely positive impact on likelihood of reporting willingness to try a specific food and on the proportional intake of the foods when offered. Food recognition and food experience increase with grade level as does willingness to try new foods. Children consumed a higher percentage of the snacks offered than their reported willingness. This might be due to the teachers' role modeling consumption and providing food facts about the foods. It has been suggested that children eating in larger groups will also consume more food.⁷ Children were offered each food only one time The increase in willingness as grades increase suggest that repeated exposures of unfamiliar foods such as apricots, tangerines, kiwi, and grape tomatoes might improve both recognition and willingness to try.

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