

THE TEXAS DEPARTMENT OF AGRICULTURE PRESENTS

Farm Fresh

JUMP WITH JILL

LIVE TOUR

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### Texas Farm Fresh Jump with Jill Live Tour Performances and Taste Testings Findings



## EXECUTIVE SUMMARY

- *Jump with Jill* was an extremely popular strategy for teaching elementary school-aged children about healthy eating. School support for the performances was extremely strong, as illustrated by teacher willingness to use materials prior to the show (unexpected and contrary to most interventions) as well as through campus leader communications to students and the community prior to performance. This enthusiasm spurred:
  - **an overwhelming willingness to try healthy foods** - 94% of students trying foods presented to them,
  - **moderating extreme negative opinions of healthy foods** - the number of extreme negative responses decreased no matter which group students were in.
  - **and sustaining motivation over time** - changes recorded at the post-test remained at the follow-up test four weeks later.
- The downside to this initial enthusiasm for *Jump with Jill* was the high baseline scores left little room for improvement when most students' responses ranked 4 on a 5 point scale from the start.
- *Jump with Jill* showed strong improvements on willingness to try low fat cheese, a major Texas-produced commodity, and an important but often untouched area for a nutrition intervention. Students already enjoy many cheese-containing products – pizza, tacos, quesadillas, mac and cheese. If students accept lower-fat cheese products, use of these ingredients in school lunches and at home could help in reducing overall fat and energy intakes, thereby potentiating their role in child obesity prevention.
- *Jump with Jill* creates a positive learning environment. Over 95% of students reported enjoying their experience with *Jump with Jill* and teachers expressed their gratitude for bringing classroom lessons to life.
- *Jump with Jill* is a geographically smart way to reach pockets of Texas where there is highly engaged schools with a high need for quality nutrition programming.

## BACKGROUND

In support of the Texas Department of Agriculture (TDA) Commissioner Sid Miller's Farm Fresh Fridays initiative, the rock & roll nutrition show *Jump with Jill* performed at 20 schools and 20 child care centers in the Rio Grande Valley in September and October of 2016. *The Texas Farm Fresh Jump with Jill Live Tour* is designed to teach students about healthy eating and to draw their attention to Texas agricultural products including fruits, vegetables, and dairy. To increase impact, schools received "Texas CRATES" filled with follow-up educational materials for classroom teachers. In addition, taste tests were conducted with selected classrooms to give students a hands-on experience with the local foods featured in the show. With a multi-year approach in place, this program impact report was built into the execution of the live shows, material rollout, and taste testings to showcase the continued efficacy of the partnership.

## METHODS

### Sample

School districts that participated on this tour were selected based on an evaluation matrix that included criteria of: free and reduced percentage population of students (related to National School Lunch Program participation), participation in TDA’s Local Products Challenge, application to TDA’s Expanding 3Es of Healthy Living Grant, response to TDA survey indicating participation in Farm to School, participation in the 2015 and/or 2016 Fresh Fruit and Vegetable Grant Program and whether the county location is considered rural. School districts participating in the tour had a free and reduced percentage of 90 percent or higher.

For convenience, one 3rd, 4th, or 5th grade class at six elementary schools was randomly selected to participate as the “survey” classroom. For both the Intervention and Comparison Groups, the student population was a mix of 3rd through 5th grade, equally divided by gender. Table 2 details this breakdown.

**Table 2. Demographic Characteristics**

	INTERVENTION n = 61	COMPARISON n = 53	FOLLOW-UP		
			INTERVENTION n = 45	COMPARISON n = 38	COMBINED n = 83
Grade	38% - 3rd graders 62% - 4th graders	26% - 3rd graders 74% - 5th graders	49% - 3rd graders 51% - 4th graders	100% - 5th graders	27%- 3rd graders 28% - 4th graders 46% - 5th graders
Gender	44% Male 56% Female	50% Male 50% Female	48% Male 52% Female	47% Male 53% Female	48% Male 52% Female

In total, 106 students were surveyed with nine questions, using an interactive testing procedure that reflected the tone of the live show students would soon experience. Rather than written surveys, students answered questions by lining up behind an emoji (Figure 1) that best described their response to each question (Table 1). The emojis represented a Likert scale and were arranged from 1 to 5 to read negative (left) to positive (right). In addition to making the activity kinesthetic, lining-up rather than hand-raising prevented multiple voting by students. Before starting the survey, student participants made a “Promise to be Honest” as a commitment to share their true feelings about their answers. Students were guided to select their responses in their head before moving to their answers to further diminish the impact of peer influence.

Figure 2 details Study Design. Prior to *Jump with Jill* coming to any school, teachers were provided with the link to the *Jump with Jill* website and a custom designed “Texas Crate” that included danceable music videos, morning announcements, posters, and activity books with teacher guides. Three “intervention” schools were selected to complete a pre-survey, then watch the show, complete a taste test, and then take a post-survey. Their results reflect exposure to the materials and the live show. The three “comparison” schools were selected to

complete a pre-survey, complete a taste test, then take a post-survey. Following the post-survey, they watched the show. Hence, their pre- and post-survey results capture exposure to *Jump with Jill* through the materials and website only. The only difference between the comparison and intervention was the order that they saw the show.

As both the comparison and the intervention schools eventually saw the show, all were eligible to be follow-up schools. This was the first opportunity of *Jump with Jill* to be able to revisit schools to assess a more longterm impact. Four schools were selected for follow-up surveys to occur four weeks after seeing the show (2 from each study arm). During those four weeks, classroom teachers were asked to complete five hours (15-min per day) of follow-up activities from the CRATE.

Crate materials included cafeteria posters (in English and Spanish), educational materials, morning announcements, and the danceable music video series. Events included English and Spanish information for students. Teachers were provided with a detailed description of what to find in the box and were allowed to select whatever activities they wished. To motivate compliance, teachers were told they would be surveyed in four weeks time to report their experience with utilizing the provided tools. Figure 4 details the responses from the four teachers surveyed from the selected classrooms.

After the four weeks, the students retook the pre-survey, completed another taste test, and answered a second post-survey. These follow-up results attempt to capture the sustained impact of the shows and the resonance of the materials that complement the live show. Figure 2 details Study Design.

Taste tests serve to assist in TDA's program goals to increase awareness and exposure to *actual* Texas-grown agricultural products. Foods to sample were also chosen based on their emphasis in the show. Cucumbers are mentioned in Superpower Vegetables, "The Bone Rap" features a low fat cheese backbeat, and *Nature's Candy* song riffs on the word watermelon – who is also on stage next to the DJ wearing headphones of his own. In the same way that the show makes nutrition education a rock show and a survey into a game, *Jump with Jill* designed the guided taste tests to be like a character meet-and-greet. It was the goal to bias the experience in favor of the new, healthy foods so that kids would enjoy and engage. Jill & DJ served three sample foods: watermelon, cucumber, and low fat cheese either at lunch or in the classroom depending on availability. Jill & DJ recorded whether students tried or did not try the provided food so the "try rate" could be used as a measure of impact.

**Figure 1. Interactive Emoji Survey**

**ABSOLUTELY  
NO.**



**No.**



**Not Sure.**



**Yeah.**



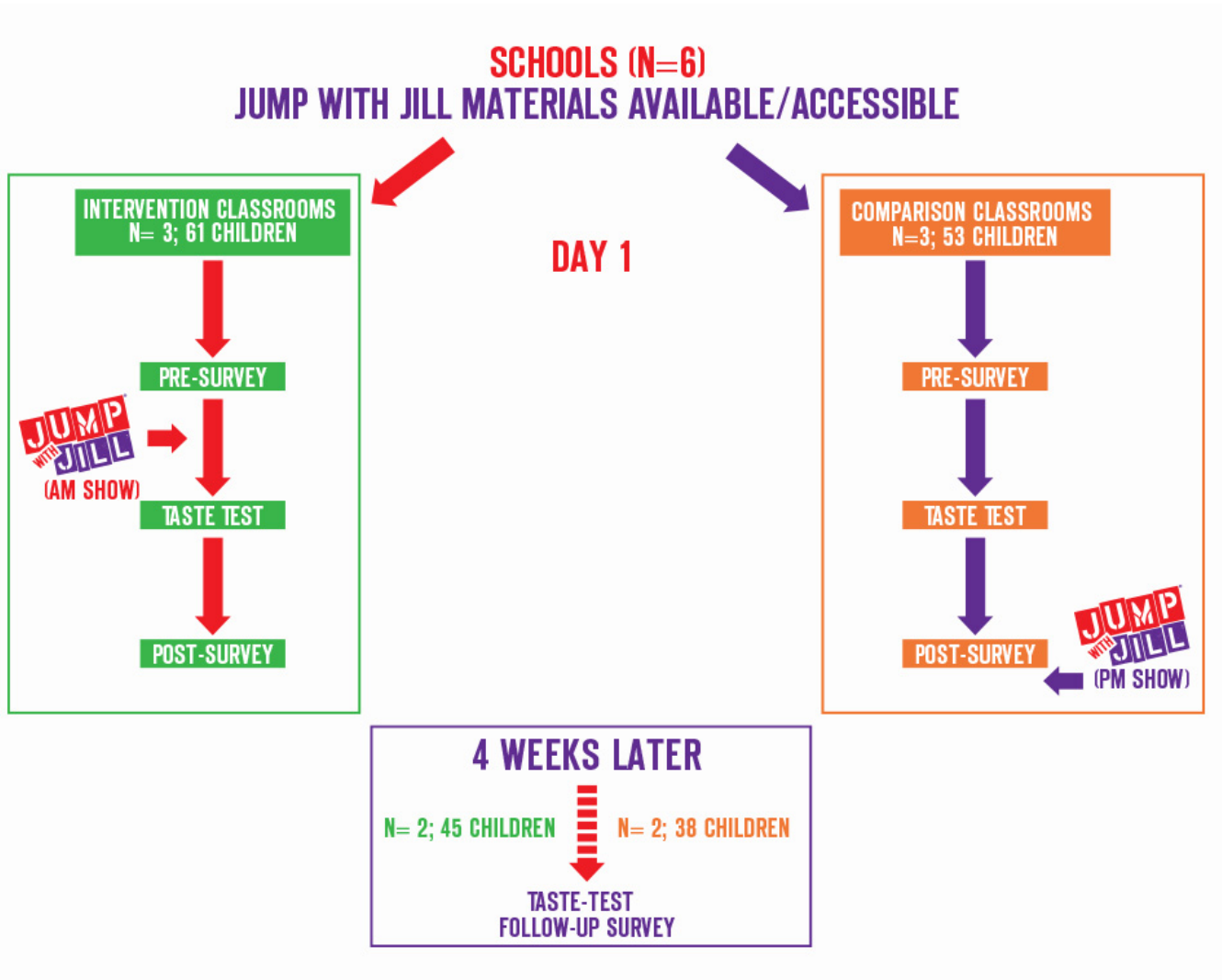
**YES!**



**Table 1. Questions**

	Pre-Survey	Post-Survey
1	I would eat watermelon.	Now that you've given it a taste, how would you answer the question: I would eat watermelon.
2	I would eat cucumber.	Now that you've given it a taste, how would you answer the question: I would eat cucumber.
3	I would eat low fat cheese.	Now that you've given it a taste, how would you answer the question: I would eat low fat cheese.
4	When I need something sweet, I will choose naturally sweet fruit.	When I need something sweet, I will choose naturally sweet fruit.
5	Vegetables give my body healthy skin, hair, muscles, eyes, and bones.	Vegetables give my body healthy skin, hair, muscles, eyes, and bones.
6	Calcium, which is found in foods like low fat milk and low fat cheese, is famous for making your bones and teeth strong.	Calcium, which is found in foods like low fat milk and low fat cheese, is famous for making your bones and teeth strong.
7	I can show my Texas pride by eating local foods.	I can show my Texas pride by eating local foods.
8	I feel confident that I can name a food that's grown in Texas.	I feel confident that I can name a food that's grown in Texas.
9	I enjoy the way <i>Jump with Jill</i> presents nutrition information.	I enjoy the way <i>Jump with Jill</i> presents nutrition information.

**Figure 2. Study Design**



**Data Analysis**

A series of independent sample non-parametric tests were conducted to examine the differences between the Intervention Group and Comparison Group on the pre-test, post-test, and follow-up surveys. Specifically, a Mann-Whitney test was conducted on each of the survey item scores at pre-test, post-test, and follow-up. The Mann-Whitney test assumes independent samples (Intervention and Comparison) and is used when there is non-normal distribution hence the need for a non-parametric test. Additionally analyses were conducted to examine the difference in pre- and follow-up surveys scores for the Comparison Group to explore a sustained impact. A p-value of  $\leq 0.05$  indicates significant differences between and within groups.

## RESULTS

### Survey Responses

Table 3 presents the distribution of responses to each question at pre-test for the Intervention Group. Table 4 displays the responses of the Comparison Group. Table 5 and Figure 3 displays the comparison at all time points for both groups. While there were initial differences between the two groups for some questions, the most significant sustained finding was the greater number of Intervention students willing to try low-fat dairy across the study. Findings may have been influenced by teachers' choice of activities, inconsistent exposure to materials, and mixed grade levels.

**Table 3. Intervention Group Response**

Survey Item	Yes			Yeah			Not Sure			No			Absolutely No		
	Pre	Post	F/Up	Pre	Post	F/Up	Pre	Post	F/Up	Pre	Post	F/Up	Pre	Post	F/Up
1. Watermelon	59.0%	84.7%	84.4%	36.1%	6.8%	11.1%	1.6%	3.4%	2.2%	3.3%	0	0	0	5.1%	2.2%
2. Cucumber	39.3%	47.5%	37.8%	26.2%	15.3%	24.4%	6.6%	8.5%	8.9%	13.1%	3.4%	8.9%	14.8%	25.4%	20.0%
3. Low Fat Cheese	36.1%	83.1%	88.9%	42.6%	8.5%	6.7%	4.9%	5.1%	0	0	0	0	16.4%	3.4%	4.4%
4. Fruits	88.5%	69.5%	73.3%	6.6%	22.0%	13.3%	1.6%	3.4%	6.7%	3.3%	0	0	0	5.1%	6.7%
5. Vegetables	70.5%	61.0%	75.6%	21.3%	27.1%	11.1%	3.3%	10.2%	4.4%	0	0	0	4.9%	1.7%	8.9%
6. Calcium	68.9%	76.3%	80.0%	19.7%	13.6%	13.3%	0	0	0	1.6%	5.1%	0	9.8%	5.1%	6.7%
7. Eat Local	77.0%	71.2%	62.2%	14.8%	22.0%	22.2%	4.9%	5.1%	13.3%	0	1.7%	2.2%	3.3%	0	0
8. Name Foods	73.8%	69.5%	71.1%	16.4%	27.1%	13.3%	6.6%	3.4%	6.7%	1.6%	0	2.2%	1.6%	0	6.7%

**Table 4. Comparison Group Responses**

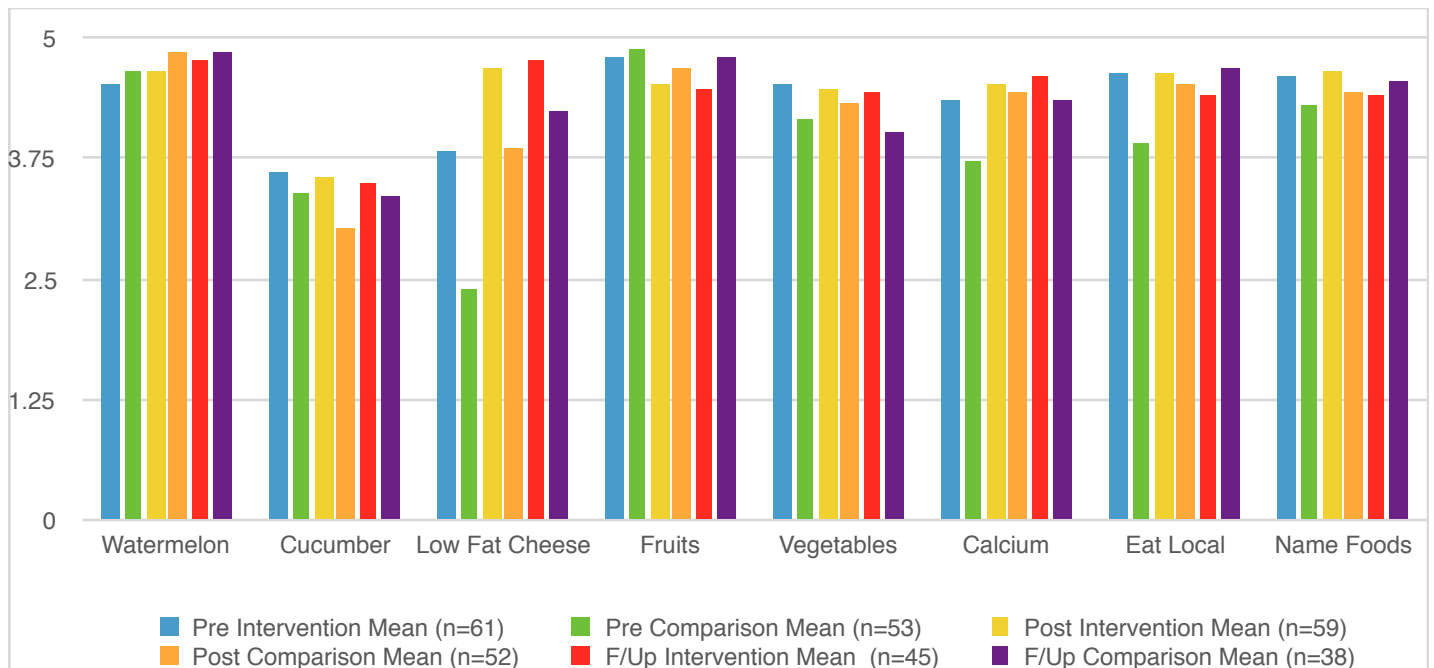
Survey Item	Yes			Yeah			Not Sure			No			Absolutely No		
	Pre	Post	F/Up	Pre	Post	F/Up	Pre	Post	F/Up	Pre	Post	F/Up	Pre	Post	F/Up
1. Watermelon	81.1%	92.3%	92.5%	11.3%	0	2.5%	1.9%	7.7%	2.5%	3.8%	0	2.5%	1.9%	0	0
2. Cucumber	32.1%	36.5%	31.6%	22.6%	11.5%	13.2%	11.3%	1.9%	34.2%	20.8%	19.2%	2.6%	13.2%	30.8%	18.4%
3. Low Fat Cheese	17.0%	61.5%	55.3%	9.4%	7.7%	28.9%	11.3%	5.8%	2.6%	20.8%	3.8%	10.5%	41.5%	21.2%	2.6%
4. Fruits	90.6%	83.0%	81.6%	7.5%	7.5%	15.8%	1.9%	5.7%	2.6%	0	1.9%	0	0	1.9%	0
5. Vegetables	58.5%	71.7%	57.9%	17.0%	5.7%	13.2%	11.3%	13.2%	10.5%	7.5%	1.9%	10.5%	5.7%	7.5%	7.9%
6. Calcium	47.2%	69.8%	63.2%	20.8%	17.0%	18.4%	9.4%	5.7%	10.5%	1.9%	3.8%	5.3%	20.8%	3.8%	2.6%
7. Eat Local	50.9%	81.1%	76.3%	5.7%	5.7%	21.1%	34.0%	3.8%	0	1.9%	3.8%	0	7.5%	5.7%	2.6%

8. Name Foods	66.0%	83.0%	81.6%	7.5%	1.9%	5.3%	20.8%	5.7%	5.3%	1.9%	5.7%	2.6%	3.8%	3.8%	5.3%
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**Table 5. Comparison between Pre-, Post- and Follow-Up Responses**

SURVEY ITEM	Pre-Test			Post-Test			Follow-Up		
	Intervention Mean (n=61)	Comparison Mean (n=53)	p-value	Intervention Mean (n=59)	Comparison Mean (n=52)	p-value	Intervention Mean (n=45)	Comparison Mean (n=38)	p-value
Watermelon	4.51	4.66	0.024	4.66	4.84	0.227	4.76	4.85	0.277
Cucumber	3.62	3.40	0.387	3.56	3.04	0.169	3.51	3.37	0.526
Low Fat Cheese	3.82	2.40	<0.001	4.68	3.85	0.005	4.76	4.24	0.001
Fruits	4.80	4.89	0.685	4.51	4.68	0.133	4.47	4.79	0.279
Vegetables	4.53	4.15	0.292	4.46	4.32	0.292	4.44	4.03	0.731
Calcium	4.36	3.72	0.011	4.51	4.45	0.486	4.60	4.34	0.091
Eat Local	4.62	3.91	0.001	4.63	4.53	0.400	4.42	4.68	0.115
Name Foods	4.59	4.30	0.209	4.66	4.45	0.263	4.40	4.55	0.320

**Figure 3. Comparison between Pre-, Post- and Follow-Up Responses**





**Figure 4. Teacher Fidelity and Materials Use**

	FOLLOW-UP TEACHER SURVEY n = 4	
	INTERVENTION n = 2	COMPARISON n = 2
How did you meet this goal?	We met the goal during recess time and at the end of the day.	Early morning during announcements 7:30-7:45 AM and brain breaks 2:30-3:00.
	We shared and danced first thing every morning during our health & wellness.	I used posters & activity books.
What barriers did you face in using the materials?	Time:(	None.
	None - the kids would have preferred having even more time!	Trying to incorporate it 15 minutes every day.
What was most useful about the <i>Jump with Jill</i> program?	The videos. The students love following along and releasing energy. They also enjoyed the nutritional message behind each video.	Great way to introduce new or uncommon fruits & vegetables.
	Making everything relevant and fun - thank you for sharing your expertise.	Teaching them about healthier food choices.
Did you use strategies or materials outside of the CRATE to reinforce the show, such as other cross-curricular units or the <i>Jump with Jill</i> website?	We talked about the healthy options that the students can choose instead of chips and candy. The cafeteria also provides snacks (healthy) twice a week so students can try out new things.	Occasionally used YouTube videos.
	We did visit the “Jump with Jill” website.	No.
How did <i>Jump with Jill</i> bring classroom health lessons to life?	By using music and fun activities.	After the show, students talked about family members.
	“Jump with Jill” made classroom health lessons fun, relevant and great edutainment.	Some students are willing to try things they never had before.
Describe some of the lasting impact of <i>Jump with Jill</i> on your students?	We were lucky enough to have been chosen to participate in the survey and had the staff join us in our classroom. Students love the <b>videos</b> most!!!	Students learned about new fruits and veggies. Learned of the dangers of not have a healthy lifestyle.
	Students who were close-minded about eating foods that they were unfamiliar with discovered they really enjoyed fruits and vegetables.	They enjoy trying the fruits and vegetables and giving their feedback.

## Taste Tests

A series of Chi Square tests for independence were conducted to examine the differences in the proportion of students who tried the selected foods. When examining the willingness of students to taste watermelon, cucumber, and low fat cheese, the Chi Square test examined the difference in proportion between the Intervention and the Comparison Groups from pre- to post- and follow-up. No differences were observed across all three taste tests. Across all time points and all groups, over 94% of the students tried the foods presented to them.

## DISCUSSION AND CONCLUSIONS

***Jump with Jill creates a positive learning environment. Over 95% of students reported enjoying their experience with Jump with Jill.*** A positive experience can have meaningful measurements for likelihood of healthy behaviors. Researchers have noted high intensity emotional experiences has an increased influence on behavior, so strong it can even overwhelm cognitive processing<sup>2</sup>. Nutrition education in the form of a rock show is a strategic choice to empower audiences to action.

All schools involved in the project were so ecstatic to be chosen for the tour that they started using the *Jump with Jill* songs, dance moves, and materials well before *Jump with Jill's* arrival. This was unanticipated event from a study design perspective because pre-materials are typically underutilized until the live show shocks staff into looking further into their mailroom. Instead, we were greeted at both intervention and comparison schools with welcome signs, fan mail, and general hysteria including group hugs, gift baskets, and CRATE materials on display.

These schools were pumped and it seriously impacted our study design - mainly that pre-test schools for both groups would come in unusually high which would not leave much room for measuring an improvement from the intervention. **We learned that this level of engagement has important implications for spurring an overwhelming willingness to try healthy foods, moderating extreme negative opinions of healthy foods, and sustaining motivation over time.**



**Students responded most strongly to foods and behaviors associated with songs. Low fat cheese was featured in “The Bone Rap” and a headphone wearing watermelon was prominently displayed on stage, which appear to have led to measurable differences between groups.**

**Improvements from *Jump with Jill* are highly impactful over time - changes recorded at the post-test remained at the follow-up test four weeks later.** Even more powerful, responses *never went down*.

**High baseline scores support that selecting engaged schools to be a part of the tour is an effective way to build momentum for a nutrition initiative** i.e. encourage acceptance of changes to the school lunch program, participating in farm-to-school, etc. Even after Jill & DJ have come and gone, students are still expressing the same level of enthusiasm.

***Jump with Jill* creates realistic impressions of healthy foods, moderating negative responses no matter what group students were in.** The number of extreme negative responses decreased no matter which group students were in. Kids define themselves by what they don't eat – that is until they enter the world of *Jump with Jill*. The intention of *Jump with Jill* is to deconstruct the framework that kids have built with their dislikes and break ground with newfound attitudes and aspirations.

***Jump with Jill* showed strong improvements on willingness to try low fat cheese, a major Texas-produced commodity, and an important but often untouched area for a nutrition intervention.** The Intervention Group showed sustained significantly higher scores throughout the study for willingness to try low fat cheese. This is an important finding in that there has not been much attention paid to changing students' acceptance of lower-fat cheese. Unlike other reduced-fat products that remove fat but add back sugars or other substances that maintain the energy level of the product, lower fat dairy products actually just remove the fat (and hence the calories). Students enjoy many cheese-containing products – pizza, tacos, quesadillas, mac and cheese. If students accept lower-fat cheese products, their use in school and at home could help in reducing overall fat and energy intakes, thereby potentiating their role in child obesity prevention.

***Jump with Jill* is a geographically smart way to reach pockets of Texas where there is highly engaged schools with a high need for quality nutrition programming.** Over the length of the study, almost all students in all groups tried every food presented to them! This is a powerful indicator that motivation can be cultivated with an engaged group of students and a character-guided experience can lead to *actually* trying a food, not just saying that they might.

***Jump for Jill* energizes students and teachers alike.** Teacher surveys reflect gratitude and enthusiasm for bringing classroom lessons to life.

**Despite our attempts to bridge cultural gaps, foods for sampling needed additional consideration.** Baseline results for cucumber are significantly lower than watermelon and low fat cheese, and did not improve with the intervention. While this is often true for fruits versus vegetables, we learned that most students hadn't ever eaten an unseasoned raw cucumber. Instead they preferred it served with Tajin, a brand name fruit and vegetable seasoning with mild chili peppers, lime, and sea salt.

## RECOMMENDATIONS FOR FUTURE STUDIES

- Schools on the tour were so enthusiastic, they contaminated the Comparison Group for this study. Utilization of provided tools before the show was extremely high and impacted baseline results to a level where increases were nearly impossible to measure because there was not much room for improvement. We consider the enthusiasm to be a huge asset to behavior modification, so we will consider other ways to create a more “true” Comparison Group.
- Data for this study was collected in a manner that did not track to an individual moving up or down the scale, but rather measured the group trends. To strengthen these findings, we will work on designing for paired data to use statistical analyses for stronger evidence of effectiveness.
- To allow for a more consistent data set, we will choose one grade for all Groups rather than a mix of grades.
- To uncover potential cultural blind spots, we will vet the taste testing foods with schools/ teachers/students to make sure the food choice doesn’t effect the results.

## FUNDING/SUPPORT

The Texas Department of Agriculture commissioned *Jump with Jill* to conduct this study. *Jump with Jill* accepted funds from the [Texas Department of Agriculture](#) to perform the shows and conduct this study. TDA projects require USDA approval. Jill Jayne MS RD was the principal investigator and study author. Renee Zelinski and Robert Pokrzywa conducted the evaluations and taste tests on sight, providing blinded data to the PI. Jennifer Salaway PhD NCSP at the University of Pittsburgh obtained IRB approval IRB#: PRO16120105 and provided statistical analysis. Madeleine Sigman-Grant PhD RD provided writing support. Laura Brown MS RD provided editing support.

## SOURCES

<sup>1</sup>Food and Nutrition Service. “Child Nutrition Programs: Income Eligibility Guidelines” <https://www.federalregister.gov/documents/2016/03/23/2016-06463/child-nutrition-programs-income-eligibility-guidelines>

<sup>2</sup>Davidson, RJ, Scherer, KR, & Goldsmith, HH. (2003). Handbook of Affective Sciences. Oxford University Press. Chapter 31.