



Garden To Café taste test using a scannable survey administered in the cafeteria during lunch at PSABX on 3/8/2018

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Introduction and summary

A taste test of the four dishes served at a Garden To Café (GTC) event using a scannable survey was administered in the cafeteria during lunch at a school in the Bronx. The dishes being tested were raw, sliced Crispin apples, raw, sliced Bosch pears, a roasted root vegetable dish and a Winter cole slaw using ingredients obtained from local farms. The survey was administered with the assistance of several teachers and para-professionals. The survey was completed by 176 students during the three lunch periods. The response rate was 35% of the 500 students who took at least one sample.

Selected results:

- 1) More students thought the apples were delicious (88% of all students) than thought the pears were delicious (33%).
- 2) More students thought the roasted root vegetable dish was delicious (21%) than thought the Winter cole slaw was delicious (19%).
- 3) More students were interested in trying different kinds of apples (91%) than in trying different kinds of pears (67%).
- 4) More students were interested in trying different kinds of root vegetable dishes at least once (49%) than were interested in trying different kinds of cole slaw at least once (41%).
- 5) Most students (86%) were interested in trying kinds of fruit they hadn't eaten before.
- 6) Two thirds of students (69%) were interested in trying kinds of vegetables they hadn't eaten before.
- 7) Twice as many students reported wanting to try different kinds of each dish compared to the percentage who said a given dish was delicious. This means that even if students didn't like the specific dish served at the event, they are likely to keep trying healthy dishes offered to them until they find some they like.

From a methodological perspective, the taste test was a success in that it rapidly produced usable results from a sufficiently sized sample of students surveyed during a regular Garden To Café event (approximately four business days from event to initial report). Based on this success, Garden To Café taste tests can be scaled up to more schools and tasting events.

Results

Results for all of the students who participated in the taste test are as follows.

Apples

The survey was designed for four dishes, but during the first lunch period, no apples were available. Therefore, it was impossible for a student to have tried an apple during Period 1. This means that if a student marked a taste response for apples in Period 1, that response should be considered invalid. In addition, if a student marked "Didn't try it" for apples in Period 1, this is due to the fact that the student couldn't have tried the apples, not that s/he chose not to try it. For all other taste questions, if a student marked "Didn't try it", s/he chose not to try it.

Looking at Table 2, 88% of students thought the apples tasted delicious.

Table 1: I think these *apples* taste... (all responses included)

					Cumulative
		Frequency	Percent	Valid Percent	Percent
Valid	Okay (Invalid question)	1	.6	.6	.6
	Delicious (invalid question)	8	4.5	4.8	5.4
	Didn't try it	33	18.8	19.9	25.3
	Nasty	3	1.7	1.8	27.1
	Okay	12	6.8	7.2	34.3
	Delicious	109	61.9	65.7	100.0
	Total	166	94.3	100.0	
Missing	System	10	5.7		
Total		176	100.0		

Table 2: I think these *apples* taste... (invalid responses set to missing)

					Cumulative
1		Frequency	Percent	Valid Percent	Percent
Valid	Nasty	3	1.7	2.4	2.4
	Okay	12	6.8	9.7	12.1
	Delicious	109	61.9	87.9	100.0
	Total	124	70.5	100.0	
Missing	Okay (Invalid question)	1	.6		
	Delicious (invalid question)	8	4.5		
	Didn't try it	33	18.8		
	System	10	5.7		
	Total	52	29.5		
Total		176	100.0		

Other dishes

Table 3: I think these *pears* taste...

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Didn't try it	57	32.4	37.3	37.3
	Nasty	23	13.1	15.0	52.3
	Okay	22	12.5	14.4	66.7
	Delicious	51	29.0	33.3	100.0
	Total	153	86.9	100.0	
Missing	System	23	13.1		
Total		176	100.0		

Table 4: I think this *roasted root vegetable dish* tastes...

					Cumulative
		Frequency	Percent	Valid Percent	Percent
Valid	Didn't try it	49	27.8	32.5	32.5
	Nasty	47	26.7	31.1	63.6
	Okay	23	13.1	15.2	78.8
	Delicious	32	18.2	21.2	100.0
	Total	151	85.8	100.0	
Missing	System	25	14.2		
Total		176	100.0		

Table 5: I think this *winter cole slaw* tastes...

					Cumulative
		Frequency	Percent	Valid Percent	Percent
Valid	Didn't try it	55	31.3	35.5	35.5
	Nasty	43	24.4	27.7	63.2
	Okay	27	15.3	17.4	80.6
	Delicious	30	17.0	19.4	100.0
	Total	155	88.1	100.0	
Missing	System	21	11.9		
Total		176	100.0		

Willingness to try different kinds of the dishes tasted

Table 6: I would like to try different kinds of *apples*...

					Cumulative
		Frequency	Percent	Valid Percent	Percent
Valid	Never	15	8.5	9.4	9.4
	1 time	26	14.8	16.4	25.8
	2 times	26	14.8	16.4	42.1
	3 times or more	92	52.3	57.9	100.0
	Total	159	90.3	100.0	
Missing	System	17	9.7		
Total		176	100.0		

Table 7: I would like to try different kinds of *pears*...

					Cumulative
		Frequency	Percent	Valid Percent	Percent
Valid	Never	48	27.3	33.1	33.1
	1 time	32	18.2	22.1	55.2
	2 times	20	11.4	13.8	69.0
	3 times or more	45	25.6	31.0	100.0
	Total	145	82.4	100.0	
Missing	System	31	17.6		
Total		176	100.0		

Table 8: I would like to try different kinds of *root vegetable dishes*...

					Cumulative
		Frequency	Percent	Valid Percent	Percent
Valid	Never	74	42.0	50.7	50.7
	1 time	33	18.8	22.6	73.3
	2 times	10	5.7	6.8	80.1
	3 times or more	29	16.5	19.9	100.0
	Total	146	83.0	100.0	
Missing	System	30	17.0		
Total		176	100.0		

Table 9: I would like to try different kinds of *cole slaw*...

					Cumulative
		Frequency	Percent	Valid Percent	Percent
Valid	Never	82	46.6	59.4	59.4
	1 time	17	9.7	12.3	71.7
	2 times	14	8.0	10.1	81.9
	3 times or more	25	14.2	18.1	100.0
	Total	138	78.4	100.0	
Missing	System	38	21.6		
Total		176	100.0		

Table 10:
I would like to try different kinds of *fruit*
that I haven't eaten before...

					Cumulative
		Frequency	Percent	Valid Percent	Percent
Valid	Never	21	11.9	14.2	14.2
	1 time	35	19.9	23.6	37.8
	2 times	15	8.5	10.1	48.0
	3 times or more	77	43.8	52.0	100.0
	Total	148	84.1	100.0	
Missing	System	28	15.9		
Total		176	100.0		

Table 11:
I would like to try different kinds of *vegetables*
that I haven't eaten before...

					Cumulative
		Frequency	Percent	Valid Percent	Percent
Valid	Never	47	26.7	31.3	31.3
	1 time	35	19.9	23.3	54.7
	2 times	23	13.1	15.3	70.0
	3 times or more	45	25.6	30.0	100.0
	Total	150	85.2	100.0	
Missing	System	26	14.8		
Total		176	100.0		

Demographics and prior experience questions

With at least some students, the teacher or para-professional administering the survey reminded students that they had participated in taste tests and Garden To Café events before. Even with this prompting, 52% of students reported that they had not participated in a taste test before (combining No and Maybe responses), and 70% reported that they had not participated in a Garden To Café event before. This means that either such students really did not participate previously, perhaps because they were absent on the day of the previous Garden To Café event, or that their recollection of such events they did participate in was not strong enough. Either way, it should be valid to consider these questions as measures of extent of prior participation in taste tests and Garden To Café events. It is also true that if taste tests or Garden To Café events were held in a given school with enough frequency, the previous participation questions would start to lose explanatory power because most students would have participated at least once. To adjust for this, the questions might be changed to the "3+, 2, 1, Never" format for future surveys. (A gender question was not asked. As discussed in a previous report, gender used to be a settled question for research, but now has become rather unsettled. Different research asks gender questions in several different ways. Even a researcher who specializes in gender agrees the gender questions on surveys are unsettled and in flux. In addition, the GTC four dish taste test survey wouldn't have fit on one letter size page if the gender question was included, which is another reason that in this case a gender question was not asked.)

The first lunch period was for 1^{st} and 2^{nd} grade students, and was from 10:00 am to 10:50 am. The second lunch period was for kindergarten and 4^{th} grade students, and was from 10:55 am to 11:40 am. The third lunch period was for 3^{rd} and 5^{th} grade students, and was from 11:45 am to 12:30 pm.

The lead teacher suggested that about 20 students would have benefited from a survey translated into Spanish, but the para-professionals for those students translated during this taste test, so we were still able to receive responses from those students.

Table 12: What grade are you in?

					Cumulative
		Frequency	Percent	Valid Percent	Percent
Valid	K	10	5.7	5.7	5.7
	1	5	2.8	2.9	8.6
	2	19	10.8	10.9	19.4
	3	47	26.7	26.9	46.3
	4	67	38.1	38.3	84.6
	5	27	15.3	15.4	100.0
	Total	175	99.4	100.0	
Missing	System	1	.6		
Total		176	100.0		

Table 13: Have you taken part in a taste test before?

					Cumulative
		Frequency	Percent	Valid Percent	Percent
Valid	No	72	40.9	42.4	42.4
	Maybe	17	9.7	10.0	52.4
	Yes	81	46.0	47.6	100.0
	Total	170	96.6	100.0	
Missing	System	6	3.4		
Total		176	100.0		

Table 14: Have you taken part in a Garden To Cafe event before?

					Cumulative	
		Frequency	Percent	Valid Percent	Percent	
Valid	No	95	54.0	56.2	56.2	
	Maybe	23	13.1	13.6	69.8	
	Yes	51	29.0	30.2	100.0	
	Total	169	96.0	100.0		
Missing	System	7	4.0			
Total		176	100.0			

Discussion

As has been seen before, apples were the most popular dish, with 88% of students thinking apples were delicious. Fewer students (33%) reported the pears as delicious. The roasted root vegetable dish was thought delicious by 21% of students. The Winter cole slaw was thought delicious by 19% of students. (The percentage of students who said a dish tasted Okay was roughly the same for each dish, so factoring Okay responses into a summary table wouldn't change the relative results much.)

On the other hand, about twice as many students reported wanting to try different kinds of each dish compared to the percentage who said a given dish was delicious. Since one goal of GTC is to encourage students to keep trying new healthy foods and new preparations until they find some they like, these willingness to try results are a sign that GTC, and any other related work being done at the school, is having a positive impact on the students.

Table 15: Summary	% of students who thought the dish was	N	% of students who would like to try different kinds	N
Dish	delicious		of the dish 1+ times	
Apples *	87.9% [65.7%]	124	90.6%	159
Pears	33.3%	153	66.9%	145
{Roasted} root vegetable dish	21.2%	151	49.3%	146
{Winter} cole slaw	19.4%	155	40.6%	138
Fruit that I haven't eaten before	NA	NA	85.8%	148
Vegetables that I haven't eaten before	NA	NA	68.7%	150

Notes: Words in curly brackets were part of the question stem for taste questions, but were not part of the question stem for willingness to try questions.

* For the Apples taste question, invalid responses & "Didn't try it" were set to missing (some students couldn't have tried apples). The percent in square brackets shows the result if "Didn't try it" is included, to make the apples result more comparable to the other dishes. For all other questions, "Didn't try it" was counted (students could have tried all other dishes, so not trying a dish was a student's choice; it is also possible that during some parts of some periods, apples or pears may have been in short supply, and therefore not trying one of them would not have been a choice, but we have no way of knowing whether this applied to a given survey response). One could also compute results setting "Didn't try it" to missing for all dishes, which would show the taste responses of students who did try the dish. Including "Didn't try it" measures the overall impact of the event, while setting "Didn't try it" to missing measures responses to the event separated from the question of how students were convinced to try the dishes.

Qualitative responses

Unlike the previous snack fruit taste test administered in classrooms, there was no qualitative discussion where students explained their responses. While it would theoretically be possible to also have a discussion in a cafeteria that elicited qualitative responses, given lunch period time and staffing constraints it would not have been feasible to both collect 176 quantitative responses and collect qualitative responses. It is also not currently possible with the resources available to collect qualitative written responses on a scannable survey in a way that would convert an image to text.

Next steps

We could try taste tests at other schools, either for regular GTC events or for snack fruit, and either during lunch or in classrooms.

In terms of analysis of data from this PSABX taste test, crosstabs could be run to find results by grade level and previous participation in taste tests. In the interest of speed of reporting, and also because such sub-samples will be small, such additional analyses have been left for a future report.

There may be a way to collect in-depth qualitative feedback from students after the event. PSABX has some culinary arts resources, such as participation in the GreenBeetz program, so it is theoretically possible for teachers and/or students at PSABX to recreate the dishes served, without needing to call on time from a GTC chef. Another option might be to ask on-site SchoolFood kitchen staff to recreate the recipes. A third option would be to have the GTC chef prepare extra of the dishes, perhaps enough for one to three classes to sample post-event. (All of the options would require resolving one or more practicalities before implementation.) We could then have students try the dishes in a classroom setting with less time pressure than a typical lunch period, and have students provide more in-depth feedback on why they liked or did not like each dish, either through a survey, a focus group or other methods. This would be a way of overcoming the limitation that surveying large numbers of students during a lunch period is not so conducive to qualitative data collection.

Appendix A: Methodology

Scannable survey technical issues

The kind of scannable survey we are using can be completed in either pencil or pen, but pencil is recommended because sometimes students make a mistake or change their mind and need to adjust their response. The survey was produced using the Flexi Capture software from Scantron.

Curricular relevance of scannable surveys

One of the reasons the teachers at the school appreciated the taste test survey was that it gave students a chance to practice bubble tests.

In the first lunch period, 23 students bubbled the entire survey correctly. Two students bubbled some of their responses incorrectly (the bubble was circled), and the rest correctly. One student didn't erase a response well enough.

In the second lunch period, 70 students bubbled the entire survey correctly. One student circled the bubble for some answers. Three students didn't erase a response well enough. Two students double marked a response (in this case, the scanner records the first response if two responses are the same darkness, or the darkest response, which for this survey is okay, but in other contexts a double marked item is often coded as missing or non-response).

In the third lunch period for 3rd grade students, 40 students bubbled the entire survey correctly. Two students circled answer bubbles. Four students didn't erase a response well enough. One student marked the survey with a light blue pencil (this was okay for this survey, but other scanned response sheets may not read such correctly). In the third lunch period for 5th grade students, 25 students bubbled the survey correctly. One student didn't erase a response well enough. One student double marked a question.

It should be noted that for this survey, if there was a light mark for a given question, such as a half erased mark, and there was no other darker mark for that question, the scanner would pick up the light mark as a response. This was discovered, and a small number of answers were corrected, because the scanner jammed for the first lunch period surveys, was run again, and the resulting data file had double the cases it should have had (which was also corrected). In this case, the initial problem helped to refine the methodology.

It should also be noted that the scanner jammed on the first lunch period surveys because there were a small number of surveys with bits of food stuck to them. The moral of this part of this story is that if a researcher is collecting data in a cafeteria, the surveys need to be cleaned, literally.

Briefly noted

The second lunch period was supposed to have apples, but not pears. However, pears were observed on the serving carts, so all apple and pear responses for the second lunch period were accepted as valid. In the third lunch period both apples and pears were available, and it was possible that a student could have tried both fruits, but was not likely. All apple and pear responses for the third lunch period were accepted as valid. As noted above, the lack of apples during the first lunch period created a mismatch between the dishes served and the survey questions. This caused some confusion for some students, but only nine surveys in the first lunch period had answers for apples other than "Didn't try it" or missing, so the amount of noise added to the results should be minimal.

One student was reported by a teacher to have explained that s/he marked "Never" to the try different apples question because s/he thought the apple served was so delicious that s/he didn't want to try any others.

Some students were reported by a teacher as being confused as to what was the cole slaw and what was the root vegetable dish.

The Winter cole slaw was served cold. The roasted root vegetable dish was supposed to be served hot. I picked a sample of the roasted root vegetable dish at random from a serving cart: it tasted cold. I also tried some straight from the serving pan (with a clean fork into a sample cup first, obviously), and this portion of the roasted root vegetable dish was hot, or at least warm. The temperature of the GTC dishes is an ongoing issue, although not necessarily a problem per se. While many of the dishes can be well received either hot or cold, some dishes come with an expectation, either explicit or implicit, that they should be served hot. In a restaurant with table service, each dish is cooked individually, and served individually or to groups of perhaps two to ten people, at which point people usually eat the dish immediately. In buffet style restaurants, the food is cooked and then placed into a warmer, so that guests can serve themselves and then eat the dish immediately. At this Garden To Café event, and similarly at most other GTC events, the chef has to prepare one or more dishes for 500 people, and then serve the dishes to groups of over 100 people each. In order to maintain the temperature of hot dishes, GTC would need both a warming station for the serving pans, and a warming solution for the serving carts with the sample cups. This is not impossible, but it is definitely a major challenge.

Fifth grade students helped serve the GTC dishes.

One teacher was observed commenting that she was very happy about the GTC food and wanted to make those dishes at home.

One 5th grade student suggested that SchoolFood serve different dishes every day for a month so that students can try them. Then, she suggested, SchoolFood could build a menu based on what the students at the school like.

Evaluating the evaluators

The lead teacher administering the surveys in the cafeteria chose para-professionals who she felt would help with the surveys. Thus, while the selection of staff to help administer the survey was not random, the students those staff work with were not included in the sample for any reasons related to the survey, so in this sense the sample was more random than not. We also made an effort to have surveys completed in each of the three lunch periods, and lunch periods were organized by grade level, so in this sense the sample was purposely stratified by lunch period and grade to ensure that the results were reasonably representative across grade levels.

The school has an enrollment of 832 students. The event coordinator estimated that about 500 students took at least one sample. We only printed 200 copies of the survey because the original plan was to administer them in classrooms right after lunch, and we thought that 200 was the maximum we had the capacity to administer, and the 200 included a margin of error. Therefore, the response rate was 21.2% of the school's total enrollment, 35.2% of the students who participated in the GTC event, and 88.0% of the maximum number of surveys we could have administered.

Overall, this was a very successful survey administration that succeeded because of the combined efforts of the team, some of whom were recruited at the last minute.

Appendix B: The recipes for the dishes served



Roasted Root Vegetable

Yield: 14 portions (4 oz)

<u>Ingredients:</u>

1 Lbs. Potatoes 1 Lbs. Carrots 1 Lbs. Turnips Oníons 1/2 Lb. Coriander, ground 1 Tosp. Cumín, ground 1 Tbsp. Papríka 1/2 Tbsp. Garlic Powder 1/2 Tbsp. Salt 1/2 Tbsp.

vegetable Oil

Method:

- 1) Trim and peel the carrots and other root vegetables. Cut into 2/3 inch dice.
- 2) Cut the potatoes into 1/2-inch dice.
- 3) Trim and peel the onions. Cut into 1/4-inch dice.
- 4) Mix the coriander, cumin, paprika, garlic powder and salt into a small bowl.
- 5) Add the carrots, potatoes, other root vegetables, onions and vegetable oil to the beets. Sprinkle with a spice mixture and stir to coat. Divide between sheet pans and spread evenly. Roast at 425 degrees, stirring once, until the vegetables are fork tender and begin to brown and crisp on the edges (40-45 minutes).

Recipe from New School Cuisine, Vermont School Food System (2014)



Winter (Savoy) Cabbage Cole Slaw

Yield: 4 Servings

<u>Ingredients:</u>

Savoy Cabbage, thinly sliced 1 head Carrots, shredded 1-2 Bosc pears, shredded 1-2 Red Radishes (Optional) 2 Lemon, juíced 1 Apple Cider Vinegar 2 Tusps. Mustard 1 Tsp. Salt 1/2 TSp. Pureed Apple 1 Tsp. Oil 1/3 Cup

Method:

- 1) Slice cabbage and place in a bowl.
- 2) Shred carrots and pears. Add to bowl and mix with lemon juice.
- 3) Squeeze water from apple puree and toss with cabbage mixture.
- 4) Mix vinaigrette in a blender or food processor.
- 5) Add to slaw and toss.
- 6) Season with salt and pepper.

Recipe inspired from New York Times (Kim Severson)

https://cooking.nytimes.com/recipes/1468-savoy-cabbage-slaw-with-applesaucevinaigrette-and-mustard-seeds

Appendix C: Photos of the dishes



Appendix D: The Garden To Café scannable four dish taste test survey

Garden To Cafe Survey

Tell us your opinion of today's Garden To Cafe dishes. There are no wrong answers. We want to know what you really think.

	Delicious	Okay	Nasty	Didn't try it
I think those anning toote				0
I think these apples taste	0	0	0	0
I think these manys toots	••			0
I think these pears taste	0	0	0	0
I think this	••			0
roasted root vegetable dish tastes	0	0	0	0
I think this winter cole slaw tastes				0
Turing writer cole slaw tastes	0	0	0	0
	Three times or more	Two times	One time	Never
I would like to try different kinds of apples	3	2	1	0
I would like to try different kinds of pears	3	2	1	0
I would like to try different kinds of root vegetable dishes	3	2	1	0
I would like to try different kinds of cole slaw	3	2	1	0
I would like to try fruit that I haven't eaten before	3	2	1	0
I would like to try vegetables that I haven't eaten before	3	2	1	0
1. What grade are you in? K 1 2 3 4 5 O O O O O	6 7	8 9	10 11	12 Adult
2. Have you taken part in a taste test before? Yes Maybe N				No No
3. Have you taken part in a Garden To Cafe event before?	Q	Yes [M	Maybe	No No