Snacks and Schools

An Evaluation of the Fresh Fruit and Vegetable Snack Program
In Bellingham Title I Elementary Schools

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I. Introduction

This report summarizes an implementation monitoring and formative evaluation of the Fresh Fruit and Vegetable Snack Program in Title I Bellingham public elementary schools. Evaluators Chris Kiser and Kiira Heymann (both M.Ed. graduate students) planned this observational study, designed the observation methods and protocols, conducted observations in classrooms, compiled and described the resulting data, and prepared this report while working closely with Bellingham Public District stakeholders, Whatcom Farm-to-School partners, and Professor Gene Myers of Western Washington University.

Observational data were gathered in two Title I elementary schools: Alderwood, which has been participating in the federal Fresh Fruit and Vegetable Snack Program for two years, and Cordata, which officially began implementing the snack program on February 4th, 2013. Comparison between schools regarding the Fresh Fruit and Vegetable Snack Program is further used to describe the effectiveness and best practices of the program over time. This evaluation also draws on anecdotal evidence transcribed from discussion with teachers, students, school principals, and staff around snack time.

While only two schools are emphasized in this study due to limited resources and timing, this short-term evaluation is designed specifically to aid the Bellingham Public School District stakeholders in understanding and describing how well the snack program is delivered, whether student and teachers are satisfied with the program, and the overall effectiveness of the Fresh Fruit and Vegetable Snack Program across Title I schools.

History of Fresh Fruit and Vegetable Snack Program

The *Fresh Fruit and Vegetable Snack Program* (FFVP) has evolved out of a National USDA Fresh Fruit and Vegetable Grant that is funneled through participating State Departments of Education and allocated across school districts. The FFVP is intended to create healthier school environments by providing healthier food choices to participating students, expand the variety of fruits and vegetables that children experience, increase student consumption of fruits and vegetables, and make a difference in children's diets in order to impact their present and future health. This program is regarded by the USDA Department of Agriculture as a "catalyst to combat childhood obesity by helping children learn more healthful eating habits. The FFVP has been successful in introducing school children to a variety of produce that they otherwise might not have the opportunity to sample."[1]

[1] http://www.fns.usda.gov/cnd/ffvp/ Fresh Fruit and Vegetable Snack Program. Accessed 9 Feb. 2013.

Over the last few years, funding for this snack program has become more and more restricted and the requirements for eligibility have increased. Today, only schools with 76-78% or more students on free and reduced lunch are eligible to receive federal funding for the FFVP in Washington State. This means that in Whatcom County only two schools are eligible to participate in the FFVP, and in Bellingham School District specifically the only school eligible to receive this federal assistance is Alderwood Elementary, currently in its second year of implementation in every school classroom. In addition to the actual snack delivery, the FFVP program at Alderwood also includes a mandated nutrition education component.

Dr. Greg Baker, Superintendent of the Bellingham School District, recently stated his goal that the FFVP be implemented in all 13 Bellingham public elementary schools so that every student, regardless of their status, will have access to fresh fruits and vegetables between meals. As a first step towards this realization, Dr. Baker allocated $41,000 for the 2nd half of the 2012-2013 school year to extend the FFVP to all five of the Title I public schools: Roosevelt, Cordata, Carl Cozier, Sunnyland, and Alderwood. [*Because Alderwood already receives funding under the federal FFVP grant, it was not included in the allocation of this $41,000 fresh snack fund. It is, however, included in this evaluation study in order to provide a broader context for understanding the FFVP over multiple years of implementation. Thus, the allocation of funds across the four remaining Title I schools roughly equates to $10,000 per school (food + labor: 1 hr. extra of staff time per day, or 33 cents per kid per day*]. Implementation of this program in these four remaining Title I schools is not reimbursable through the current federal FFVP grant, and will not include the mandated nutrition education component currently being implemented at Alderwood. Because of these factors, there is no guaranteed financial sustainability for the FFVP in Title I schools, or the remaining eight Bellingham public elementary schools, after this initial implementation year.

Steve Clark, Ron Cowan, and Mark Dalton, and all Title I school administrators and teachers have been charged with the implementation of the FFVP at Carl Cozier, Cordata, Roosevelt, and Sunnyland. As stated earlier, the FFVP was officially implemented on February 4th, 2013. Letters about the new snack program were sent to all teachers and parents to explain the goals of the program as outlined by the original FFVP grant, provide a calendar menu, and explain that while students are encouraged to partake in the snack, they may choose to opt out if they wish. Teachers are responsible for choosing how to deliver the snacks to their students, as well as how to monitor student engagement and interest in the program. Teachers are also responsible for guiding conversations about healthy snacks and food waste during snack time.

STAKEHOLDERS

The stakeholders identified as being affected by this evaluation or as having a use for this evaluation are as follows:

- ***Bellingham School District (BSD)*** – Including administrators, food services staff, schools, teachers, students, and parents. The BSD is concerned with the allocation of resources towards this evaluation in schools, particularly people (teachers/administrators/staff). They hope that the evaluation will involve minimal if zero impact on the part of BSD, as their teachers and schools are already limited in their ability to fit all of the educational requirements into the school day.
- ***Funders*** – The cost of running this program is substantial, with 13 public elementary schools in Bellingham eventually targeted for the Fresh Fruit and Vegetable Snack Program

and five currently in the program (Only Alderwood in the federal program) – No future funders have yet been identified to support this program in the coming 2013-2014 school year.

- ***Whatcom Farm-to-School*** – A program that brings fresh, healthy, and locally produced foods into school cafeterias, reinvigorates local and regional farm economies, and fosters lifelong healthy eating habits among children and their families, is considered a stakeholder in this snack program evaluation because of their interest in supporting fresh, healthy foods in public schools.[2] Administrators of this broader program supported by the Whatcom Community Foundation will need to be convinced that a snack program is a valuable use of financial resources. Currently, Whatcom Farm-to- School is focusing its efforts towards a substantial healthy breakfast and lunch program that can be widely applied to all students of Bellingham public schools rather than unevenly implemented across Title I schools and districts. Findings from this observational study may help to convince Whatcom Farm-to-School partners that the snack program should be emphasized in public schools. Furthermore, this Farm-to-School stakeholder may have the capacity to advocate for the program and to rally champions around it.

II. Evaluation Goals and Questions

Evaluation design and questions were developed with BSD stakeholders based on their interest in comparing schools that have been running the program in the past and schools that are new to the Fresh Fruit and Vegetable Snack Program as of this year. A stakeholder meeting was held with Steve Clark (Executive Director of Teaching and Learning), Ron Cowen (Assistant Superintendent), and Mark Dalton (Food Services Manager) of the Bellingham School District, along with Professor Gene Myers, on February 6, 2013.

BSD stakeholders state that their intentions for the Fresh Fruit and Vegetable Snack Program are fairly simple; they do not believe that students are getting enough fresh fruits and vegetables in their daily lives, and they are confident that these healthy snacks will make a difference not only in student health, but in student concentration levels and achievement in the classroom achievement because blood sugar levels will be maintained consistently throughout the day without a spike from sugary snacks. These beliefs are partially supported by literature and other broad studies evaluating the effects of healthy, fresh food in schools. Pertinent literature to this evaluation are discussed in length near the end of this report. In the short-term, BSD stakeholders hope that this formative and implementation-monitoring evaluation will:

- Serve as an important first step towards understanding the FFVP by providing observational data and anecdotal evidence about program delivery and effectiveness
- Contribute towards a description of 'best practices' to help guide future expansion and implementation of the FFVP into all 13 of Bellingham public elementary schools

Interest in continuing the Fresh Fruit and Vegetable Snack Program is not dependent upon evaluation results, but will enhance the ability of BSD stakeholders to pursue further funding, as this snack program (in all but Alderwood) is currently being supported by a one time grant that is not

[2] http://www.whatcomfarmtoschool.org/posts/learn-more/whatcom-farm-to-school/ Whatcom Farm-To-School Program. Accessed 18 Feb. 2013.

guaranteed year to year. Other stakeholders in the program, including the Whatcom Farm-to-School Program, are similarly invested in starting to measure the impact and success of the FFVP with this initial evaluative study.

In the longer-term, this evaluation could contribute to the future sustainability of the Fresh Fruit and Vegetable Snack Program in the following ways:

- Help BSD to write grant applications for future funding and sustainability
- Enable PTAs to fundraise for a program with known and proven effectiveness – BSD may wish to make a case to parents in the future that this program is a good use of time, resources, and investment
- Assist in designing a longer-term, more substantial evaluation formally linking the Fresh Fruit and Vegetable Program to student achievement in Bellingham schools (ability to focus and concentrate on school because children are not hungry and are being provided with healthier food choices).
- Benefit stakeholders in securing future funding

In order to address the specific goals of the BSD stakeholders outlined above, evaluators Chris and Kiira designed the study around the following questions (developed out of the February 6th meeting):

- How is the Fresh Fruit and Vegetable Snack Program administered and delivered in schools?
- What ways of delivering the snack are associated with high or low student interest and engagement?
- Does engagement in the program differ between schools?
- What are teacher impressions of the success of the program?

See LOGIC MODEL in Appendices that was created to guide the evaluators in understanding the different factors influencing program implementation, as well as different outputs that measure short-term and long-term success of the program. From this logic model, evaluators designed a study that fit appropriately with the goals and questions of the stakeholders, being considerate of BSD time and resources.

III. STUDY DESIGN AND METHODS

This study looked at the implementation of the Bellingham School District Fresh Fruit and Vegetable Snack Program at Cordata and Alderwood elementary schools. This observational study will serve as a formative evaluation, and the information gathered will be used in the continuing development of 'Best Practices' for the FFVP.

Evaluators worked with principals Micah Smith of Cordata, and Stephanie Korn of Alderwood, to set an observation schedule. Principles were able to alert all school staff about the evaluation process, and made snack time accessible to evaluators. Throughout the evaluation, attention was paid to Human Subjects Rights; evaluators were as unobtrusive as possible in the classroom setting and recorded all observations and note taking in the backs of classrooms. Names were never

attached to students, and classroom teacher names were used only for the purposes of data organization.

Since the FFVP is being implemented in all Title 1 elementary schools within the Bellingham School District, evaluators strove to conduct sampling across grade levels to get a broader sense of what is working well in the program as a whole. At both schools, evaluators visited various grade levels from first through fifth grades. In total, 17 classroom snack times were observed, with an average of 20 students per classroom. Observations were conducted on different days of the week when different snacks were being served to ensure that trends noted were independent of food preferences.

Evaluators designed observational protocol that focused on student engagement and consumption of the snack, as well as student reaction. Each observation period lasted the entire snack time at each given classroom, unless the snack was left in the back of the classroom where students knew to self-monitor their consumption over a longer period of time. Snack times observed occurred between 10 and 11:30am, and evaluators watched snack time in its entirety to the extend possible. Observational protocols were developed and data gathered regarding number of students, percent who ate firsts, seconds, or thirds, percent who tasted and wasted food, and overall percent of total snack consumed. In addition to these metrics, it was noted whether students ate other food than that offered (food brought from home) or if some students chose not to involve themselves in the FFVP at all.

In addition, narrative event sampling methods were used to capture student responses to snack time. Detailed records of student behavior and student comments were kept during each observation period. Socialization around the snack that occurred and impacted overall student engagement and consumption of the snack was recorded. THE BELLINGHAM SCHOOL DISTRICT SNACK TIME OBSERVATION FORM that guided evaluators in recording these observations at Cordata can be found in appendices.

Informal teacher interviews were conducted with teachers when their students were not with them. A LIST OF QUESTIONS was developed by evaluators and is attached in the appendices to the Snack Time Observation Form, yet the majority of these conversations were recorded as narratives rather than quantifiable data sets.

Information about teacher presentation styles was also gathered during this study. In anticipation of varying types of presentations, evaluators described three categories of teacher styles (formal, semi-formal, and informal) that are described in detail below. It was expected that the way in which teachers set-up and framed the snack would have a direct impact on student consumption and participation in snack time.

Data gathered at Alderwood were used as a control group to inform the interpretation of new practices being formed at Cordata, who have only been part of the program for a month. Using the metrics above, as well as the event sampling and anecdotal information gathered from informal teacher interviews, evaluators created a list of suggested best practices based on student engagement and understanding of the FFVP as seen in the classroom.

IV. RESULTS and ANALYSIS

Data Interpretation

After visiting 10 classroom snack times at Cordata, and 6 at Alderwood, the evaluators noticed significant trends in the amount of food consumed and the presentation style of the teachers (See tables 2 and 3 below). *Table 1* illustrates the number of students who engaged in the first round of snack at Cordata Elementary, and is broken up by the three styles of presentation: formal, semi-formal, and informal (described below). When teachers set aside time for formal, focused snack time, all students participated and at least tried the snack. With the opportunity to socialize and discuss what they were eating, students positively re-enforced a culture of trying new food and eating the healthy snacks. Trends in consumption decreased when moving into the semi-formal category, and were significantly lower when looking at the informal presentation style data. Where "n/a" shows up in the table, observations were not collected as teachers opted to leave the rest of the snack available to students throughout the day until it was completely consumed. Multiple teachers employed this strategy.

Observations at Alderwood were all identified in the semi-formal presentation style (*described below*). Across the board, 100% of students tried and engaged in the first round of snacks. While the semi-formal strategy predominated here, the amount of structure to the snack delivery was evident. According to informal teacher interviews, since the snack program is so well established at Alderwood, students understand expectations and are more familiar with the fruit and vegetable offerings. Students are also more eager to participate in eating the snack as a result of this familiarity.

Healthy Snack Observation Styles

During this observational study and event sampling surrounding the BSD FFVP, evaluators were able to identify three styles of teacher presentation that influenced the way that the students received and consumed the fruits and vegetables offered. Snack presentation style correlated directly with the amount of snack consumed.

- *Formal*

  Teachers who pause class and take time separate from other learning to eat the snack were categorized as "formal." In these settings, teachers generally call students up to get snack from the communal bowl, offer instructions as to how much each student is allowed to consume, provide guidance on sanitary practices (i.e. the use of tongs or napkins), and allow a certain amount of time for student discussion around the snack. In certain instances, teachers guided this discussion while in others social interaction around the snack was simply allowed to occur.

- *Semi-Formal*

  Teachers who paused class to explain the parameters of snack time or took time to explain the basic guidelines for eating the snack before resuming other activities while snack was being consumed fall into the "semi-formal" category. Primary class activities varied in these semi-formal environments from teacher reading time, student reading time, or other independent student work, including spelling, mathematics, or science work books. During any of these activities, students were free to get up for snack and serving themselves as necessary. If there was a designated student leader for snack time that day, then this student was in charge of serving 1sts, then 2nds, and then 3rds until all of the snacks were

consumed. When snack is introduced in this semi-formal category, there may be some time for student discussion around food.

- *Informal*

  Teachers who chose to place snack at the back of the classroom and continue with classroom activities without any or with little instruction as to the snack time protocol fall into the "informal" category. Teachers observed in this style simply told the class that snack was available at the back of the classroom and then proceeded with reading time or with another planned activity. There is no discussion around food or time for students to talk about the snack offered that day in the "informal" category.

See FLOW CHART depicting a visual representation of presentation styles and their relations to observed student actions in the classroom and outcomes met in regards to program success.

SOCIALIZATION

The evaluators used an event sampling method of gathering all verbal anecdotes and noting student interactions with each other and with their teacher(s) in order to collect data on the role of socialization in overall consumption and interest. This type of socialization occurred primarily in settings where teachers decided to hold a "formal" snack time.

Socialization around the snack was strongly correlated with increased consumption and willingness of students to try new foods. In all Cordata classrooms where formal methods of presentation were used, 100% of students engaged in the first round of snacks. In this setting, when students were served snack, students were not given the option of casually serving themselves at their leisure. Semi-formal presentation methods at Cordata produced varied results from 100% eating a 1st round of snacks to 63% eating 1sts. Student participation dropped off at each successive round of snack time until either the students were satiated or the snack was completely finished. In contrast, in one classroom where informal methods were used, only 20% of students engaged in the first round of snacks. The highest number of empty snack bowls occurred in formal presentation classrooms.

Alderwood's set routine and methods for snack delivery were standardized across grades and classrooms. Evaluators classified these practices in the semi-formal category because teachers continued to instruct or facilitate educational activities during this time (there was not a complete stop in the day for snack time). Students, however, showed a clear understanding about expectations and engagement in the snack program. In every semi-formal presentation observed at Alderwood, the teacher designated a student (who rotated each day) to be in charge of passing out the snack and ensuring that all students had access to 1sts, 2nds, and 3rds, when available. In these instances, evaluators observed that 100% of students engaged in the first round of snacks, and 100% of students who were offered seconds ate them (with only one discrepancy where one student chose not to participate at all).

Presentation Style	% 1sts	% Eaten from bowl
Formal		
3rd Grade	100	100
4th Grade	100	100
4th Grade	100	84
4th Grade	100	100
Semi-Formal		
3rd Grade	63	50
4th Grade	100	n/a
5th Grade	100	n/a
Informal		
4th Grade	88	10
5th Grade	20	80
5th Grade	43	n/a

Table1. Percent student engagement and percent snack consumed in each classroom by presentation style at Cordata Elementary.

Based on these finding, new and best practices from Cordata and Alderwood are compared and interpreted below.

CORDATA AND NEW PRACTICES

Cordata Elementary has only been participating in the FFVP since February 4, 2013. As such, without much direction in terms of protocol, teachers have been implementing the program as per their discretion. Each day, snack is delivered to a central location in the hallway, from where students from individual classrooms can come retrieve it when requested by the teacher. If snack is not picked up by a certain time, the Key Program students (leadership club members) deliver snack to all remaining classrooms and then return carts and service items to the cafeteria.

During the observation period, evaluators were able to see multiple different types of teacher presentation of the snack. As described above, these three categories (formal, semi-formal, and informal) were used interchangeably without any pattern between grade levels. In analyzing the data around how many students were participating, and then how much of the snack was actually consumed, there was a direct correlation between formal snack time (with socialization) and student snack consumption.

While event sampling, evaluators were able to record the discussion generated by students and teachers around food. Following is a range of examples explicating the trends.

- *Formal*
  Students watch other students eat the snack, and engage in conversation regarding taste (i.e. "Is it good?"). Students talk about favorite snacks, and describe how they are experiencing the food (i.e. "It's sweet"). Students ask teacher about the food (i.e. "Is this a fruit or a

vegetable?"). Teachers model the eating behavior and engage in snack with students, and in dialogue about the food.

- *Semi-formal setting*
  One student would get up for seconds and other students would notice this behavior and follow suit. Students would watch other students eat, observe how they ate it (one bite, small bites, etc.) and then make a decision about further eating by copying behavior. Students monitored each other to ensure that they were following sanitary practices.

- *Informal*
  No social context for snack, the nature of the class experience is such that there is no discussion around food. No behavior modeling occurs.

Presentation Style	Number of Students	Snack Type	%1sts	%2nds	%3rds	% who throw some away	% total snack eaten	Alt Snack?	No Snack
Formal									
3rd	19	Tomato	100	50	25	5	100		
4th	19	Pear/Apple	100	n/a	n/a	0	100		
4th	16	Tomato	100	50	0	30	84		
4th	16	Apple Slices	100	50	0	30	84	1	
Semi-Formal									
3rd	19	Tomato	63	20	20	0	50		
4th	22	Apple Slices	100	n/a	n/a	0			
5th	23	Apple Slices	100	87	n/a	0			
Informal								4	2
4th	17	Apple Slices	88	88	n/a	0			
5th	24	Tomato	20	8	0	0	10	16	3
5th	23	Apple Slices	82	43	n/a	0	80		

Table 2. Snack data collected over 10 snack-time observations from Cordata Elementary School.

Alderwood and Best Practices

Alderwood Elementary, having been participating in the snack program for the past 2 years, has a very distinct set of practices associated with daily snack that varied minimally from classroom to classroom. All of the classrooms observed had student leaders who were designated as the snack deliverer and were in charge of ensuring that every student got an equal amount of food. These snack time leads knew to use sanitary practices, including serving the snack with tongs onto individual napkins. Hands were washed before serving. This process was only subtly initiated by teachers, as the students understood the protocol and routine of snack time from a 2 years of prior experience.

From classroom observations, it is clear that teachers have set expectations for students during snack time. At this stage of program implementation, students largely self-monitor snack delivery and consumption themselves. Teachers have set expectations for the students, including manners, behavior, and how to say yes, no, and thank you when they are given a snack. Students learn about the benefits of each healthy snack every day from a flier noting health benefits of each fruit or vegetable. Because of the "semi-formal" nature of the Alderwood snack program, there was often other activity happening concurrent to the delivery and consumption of snack. This did not provide much or any time for discussion of the food or for consideration of the healthy snacks. It appeared that snack time was habitual and students knew when it was going to occur and expected to eat, try, and consume the snack. One teacher commented that student palates had broadened over the course of the two-year program, mostly because of increased exposure and thus comfort with different foods.

Evaluators classified nearly all snack activity at Alderwood as "semi-formal", as the snack program was initiated while other class activities, including silent self-study or reading time, were in progress. Additionally, the students were all accustomed to the snack hour and knew to expect it at the designated time. They were also aware that snacks were being simultaneously being consumed by their peers whether actively talking to them or not. In some instances, after the lead student delivered a 1st round of snack to the class, bowls with leftover snack remained in the back of the classroom. In informal questioning with teachers, it was revealed that all snacks were consumed on a regular basis by the end of the day, although not always during the initial hour of snack time. Some teachers shared that at most one student might opt out of eating snack at all.

Presentation Style	Number of Students	Snack Type	%1sts	%2nds	%3rds	% throw some away	% total snack eaten	Alt Snack?	No Snack
Formal									
Semi-Formal									
1st	24	Apple Slices	100	n/a	n/a	0	100%		
2nd	27	Apple Slices	100	n/a	n/a	0	100%		
3rd	12	Apple Slices	92	100	n/a	0	100%		
5th	19	Apple Slices	100	100	n/a	5	100%		
5th	18	Apple Slices	100	100	n/a	0	100%		
Informal									
3rd	24	Apple Slices	100	n/a	n/a	0	100%		

Table 3. Data collected during 6 snack-time observations at Alderwood Elementary.

TEACHER AND STUDENT QUOTES COMPILED FROM EVENT SAMPLING OF VERBAL COMMENTS AT BOTH ALDERWOOD AND CORDATA

During event sampling at Alderwood and Cordata, evaluators were able to capture nearly 100% of the verbal comments made by both teachers and students around snack time. Overall there was a positive trend (close to 100%) in comments concerning snack consumption and excitement around eating and trying new fruits and vegetables, with exclamations such as: "These snacks are good!" "I'm definitely having seconds!" "We try every snack!" There were virtually no negative comments, and when there were they were focused around specific preferences for vegetables/fruits (ie. No

kids like cauliflower). There was one student who made the comment to a classmate: "I don't like [cherry] tomatoes!" while simultaneously trying a tomato amongst his peers during the 1st round of formal snack time. This suggests that while students might have a personal dislike for a fruit or vegetable, socialization may still persuade those students to try a snack that they might not otherwise try in their homes. The following comments (both positive and negative) were recorded during the 16 snack times in formal, semi-formal and informal environments and are captured below in no particular order.

Students:

Student 1: "What do you think [*about the cherry tomatoes*]?" *Student 2:* "They are sweet!"
"I don't like tomatoes!"
"I guess this is a day we will have lots of leftovers." (*Snack was cherry tomatoes*)
"The [pears] should come in little slices."
Student 1: "I wish it were chocolate cake today." *Student 2*: "No, but these [*pears*] are better!"
"I wish the snacks were more predictable; you never know what you are going to get!" (*Teacher then reminds students that they have the snack calendar on their wall.*)
"I'm definitely having seconds."
"These [*pears*] are so good!"
"Yum, remember when we had watermelons?"
"Just so you know, the snacks are awesome!"
"I love that first bite [*of the apple*] when it's just so juicy."
"We try every snack."
"I want snack! I want snack!"
"This snack is healthy."
"I wish they only did fruit."

Teachers:

"You [*students*] take what you touch."
"They were the best green beans I have ever had."
"I am curious as to whether the amount of vegetables/fruits snacks are actually sustaining enough for student hunger levels."
"A handful of my students really depend on this snack as their only food before lunch."
"Kids are hungry. There are fewer and fewer leftovers as students get more comfortable with regular, daily snack time."

Teacher and Student Interactions:

Student: "Are tomatoes fruits?" *Teacher*: "Well, how would you figure that out?" *Student*: "It has seeds inside the skin, which means it's a fruit!"

RECOMMENDATIONS AND FURTHER CONSIDERATIONS FOR BEST PRACTICES

Evaluators recognize the importance of setting up a foundation for the snack program in all Title 1 Elementary schools that have only just begun to implement the program in their schools. After having observed the practices at Alderwood, it is clear that there will be a transitional phase of "Best Practices" implementation at each school. While the formal approach was successful in student engagement in the program at Cordata, if the goals of the FFVP are to be fully integrated into daily

classroom routines, there are strategies that can be borrowed from established programs like those at Alderwood. Once expectations are clear, student roles are established, and the snack program becomes familiar to students, implementing a semi-formal approach with clear expectations that allows for the delivery of food to occur simultaneously to other classroom activity will be possible.

Going forward, evaluators might recommend a re-evaluation of goals for the program in order to ensure that best practices observed and implemented are matching the needs of the Bellingham School District. If the goals of the program continue to be exposing students to new fruits and vegetables and encouraging healthy eating behavior, then using these semi-formal approaches will continue to serve the FFVP. If the program continues to develop and the BSD has further interest in the educational and curricular potential of the snack program, more formalized and detailed delivery will need to be planned and coordinated.

Further study might be conducted on the relative value of the FFVP in the classroom in regards to sustenance, as well as the snack's ability to enhance student focus and performance in the classroom. Informal teacher interviews revealed that the calories or protein content of the current snack offerings might not be enough to have a huge impact in this area. Further research will be needed if this continues to be a goal the BSD stakeholders in regards to the FFVP.

After seeing the snack program in action, there is no doubt that students are engaging in and eating more fruits and vegetables by simply having this option integrated into the daily routine at school. As the FFVP continues to be newly implemented at Title I schools, stakeholders should continue to consider programmatic goals and decide which avenues for impact and expansion ought to be followed.

Farm-to-Table and Healthy Snack Literature Review

Other school districts have implemented and measured the impacts of their farm-to-school lunch and snack program with different success. A review of evaluations completed and results compiled helped to flesh out the evaluators' scheme for conducting an observational study of the Fresh Fruit and Vegetable Snack Program in the Bellingham School District.

A report entitled, "A Growing Movement: A Decade of Farm to School in California" was published in 2007 by the Urban & Environmental Policy Institute at Occidental College. The report looked at the history of implementation of the statewide farm-to-school program, and considered analysis and observational studies about the impacts of their fresh foods programs in schools.

One of the first farm-to-school programs began in California's Santa-Monica/Malibu school district in 1997. Other districts, such as Berkeley, soon followed suit. The program is now statewide and is funding in part by a grant from the W.K. Kellogg Foundation. The program partnered with organizations like the Community Alliance with Family Farmers and the California Food and Justice Coalition to distribute food and advocate for healthy foods in schools. By 2007, 85 school districts in California were participating and a national Farm-to-School network had been established.

During the 2004-2005 school year, local salad bar programs were evaluated in the Compton Unified School District. Analysis of student participation found that when given the choice between salad bar and hot lunch, on average the salad bar was slightly more favored. Salad bar schools had a higher

consumption of fruit and vegetables compared to non salad bar schools (182% compared to 71%). Analysis of meal tray photographs at various schools also revealed that schools without the salad bar program were not providing the recommended daily intake of fruits and vegetables.

Davis Joint Unified School District's Farm-to-School Program has also been studied extensively. Similar results were found in the Compton School District when it came to consumption of fruit and vegetables with the salad bar option, suggesting that given the option, students would consume their daily-recommended intake of that food group. Plate waste studies were also conducted showing that more students consumed vegetables taken from the salad bar (fresh vegetables) than from the hot lunch option. Similar findings were documented in other California school districts including Winters Joint Unified School District, Rivers Unified School District, and the Ventura Unified School District.

Potential applications for the Bellingham School District include the types of analyses conducted. Observational studies that look not only at the amount of overall fresh snack consumed but also at the amount served and wasted could prove to be a revealing longitudinal study to assess the overall acceptance and impact of introducing fresh vegetables into student diets. Due to time and resources constraints in this particular evaluation, the snack waste was at best estimated but not calculated.

An article entitled, "Do Farm-to-School Programs Make a Difference? Findings and Future Research Needs" was published in the Journal of Hunger & Environmental Nutrition in 2008. The article surveyed 38 farm-to-school programs across the country and looked at potential impacts, including increasing fruit and vegetables in student diets and decreasing the childhood obesity epidemic. When compiled, the overall increase in fruit and vegetable servings consumed by students participating in farm-to-school programs nationwide rose from 0.2 to 0.99 servings a day. Research also confirmed that the increase in variety of fruit and vegetables served led to the greatest number of servings to be consumed, revealing that access to *more* and a *greater diversity* of fresh foods is important. The study also looked at the impact for farmers in terms of having a local demand in which to market their produce.

In their review of the literature, the authors of this particular article found that most studies look at the increase in fruit and vegetable consumption, meal participation, lifestyle changes, knowledge regarding healthy foods, attitudinal changes, and change in body mass index in students. Most studies report positive impacts in all categories. Of all the studies, only three considered changes in teacher and administration behaviors in schools, though a clear preference for farm-to-school programs was shown in this sector.

This article further acknowledges the need for more longitudinal studies to confirm positive results, and recognizes existing biases on the part of evaluators, who often conduct "empowerment evaluation" plans designed to assist and aid in the implementation of the program while also recording impacts. The authors conclude that more research ought to be done on the role of teachers in distributing food and nutrition information to increase impact of the programs. Authors also advocate for measuring other outcomes of success outside of the behavior change realm, including leadership development of the programs, partnerships between local stakeholders, and an evaluation of the resourceful use of assets.

Implications for the Bellingham School District include adding some of these higher-level metrics to future, additional studies.

Different measurement techniques have been developed by in-house evaluators of Farm-to-School Programs. The *Coordinated Approach to Child Health Group* developed student questionnaires to assess engagement and understanding of healthy snack and lunch programs in schools. CATCH is an initiative started in Texas that has been modeled in other states to implement healthy behavior education in schools. The survey was designed to look specifically at food preferences, dietary behaviors, social norms, and current behaviors of students, and is in the form of a self-test administered by teachers. The survey includes pictographic answers to ensure student understanding. Over a longer-term period, tools like the CATCH survey might be used to inform a future evaluation of the Bellingham School District's farm-to-school programs. Source: https://sph.uth.edu/catch/catch_em/HBQ%201993.pdf

Interest in the epidemic of childhood obesity has also driven impetus to evaluate farm-to-school programs nationwide. Various studies have looked at this dimension of the issue and provide interesting insight and background information that may be useful (though not always relevant) in conducting future studies of the Bellingham School District farm-to-school programs:

A review of the current evaluation literature on Farm to School Programs reveals that the approach of this observational study to address behavior change as a result of the Fresh Fruit and Vegetable Snack Program is an appropriate starting point for the Bellingham School District.

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LOGIC MODEL FOR FRESH FRUIT AND VEGETABLE SNACK PROGRAM

SITUATION	INPUTS	OUTPUTS	
	RESOURCES	ACTIVITIES: What We Provide	PARTICIPATION: Who We Reach
THE FRESH FRUIT AND VEGETABLE PROGRAM in Bellingham Title I Public Elementary Schools is designed to create healthier school environments by providing healthier food choices to participating students, expand the variety of fruits and vegetables that children experience, increase student consumption of fruits and vegetables, and make a difference in children's diets in order to impact their present and future health. This program is regarded by the USDA Department of Agriculture as a "catalyst to combat childhood obesity by helping children learn more healthful eating habits. In the BSD, Title I schools have been provided with daily fresh fruit and vegetables as of February 4, 2013, with the exception of Alderwood that is in is 2nd year of the snack program under the Federal Fresh Fruit and Vegetable grant.	• **Money** - Federal FFVP Money - State funding - Grants - Private Donors • **Staff** - BSD Superintendent Greg Baker, Steve Clarke, Ron Cowen and BSD administrators - Mark Dalton and all BSD food services staff - Title I schools - All BSD elementary schools - Classroom Teachers • **Students** - Consume the snack and/or take the lead in distributing the snack to fellow classmates • **Partnerships** - Whatcom Farm-to-School Program - Local farms and fresh fruit and vegetable distributors who provide to school food services • **Facilities** - School classrooms where delivery and consumption of snacks occur - Kitchen for minor preparation of snacks and distribution to bowls and delivery carts	The Fresh Fruit and Vegetable Program provides students with daily access to healthy snacks, helping to curb student hunger at critical times of day between major meals. Snack items vary throughout the month, and include such fruits and vegetables as apples, pears, grapes, carrots, tomatoes, green beans, melons, broccoli, cauliflower, watermelon, and cucumber. Some of these items vary seasonally depending on distributor access. In addition to physically delivering the snack to classrooms, Alderwood also provides educational materials and food education lessons to complement the snack program itself.	• All Title I elementary school students in Bellingham Public Schools • Classroom Teachers, TAs, and volunteers • School administrators • Food services staff • Parents and families of school children

Desired Outcomes		
Short-term Exposure and Familiarity	**Medium-term** Action and Ownership	**Long-term** Impact to Students, Schools, Communities
- Student hunger is satiated by fresh fruit and vegetables ⇓ - Students no longer eat unhealthy snacks brought from home because they have access to fresh snacks provided by the schools ⇓ - Students are introduced to new fruits and vegetables unfamiliar in their homes ⇓ - Students learn why their schools are providing them with fresh fruits and vegetables rather than unhealthy alternatives ⇓ - Students learn, through teacher modeling and clear "snack time" expectations, how to eat snacks and use proper behavior during snack time (i.e. how to distribute snack, how to take a snack from a bowl, how to share, etiquette around food and between peers) ⇓	- Students demonstrate their knowledge, skills and evolving taste for healthier fruits and vegetables by eating more of the snacks during snack time ⇓ - Students begin to expand their palettes and appetites for healthier foods ⇓ - Students ask for more fruits and vegetables and begin to prefer these healthier food choices over the alternatives some may be offered from their homes ⇓ - Students begin to self-monitor etiquette around snack time in the classroom (ie. proper snack delivery and manners, cleanup and composting, sanitary practices) ⇓	- Student behavior, attention spans and concentration levels are increased and teachers no longer see spikes in blood sugars levels during critical times of day ⇓ - Classroom environment is improved because students are no distracted by hunger ⇓ - Test scores and academic achievement is improved because student due to the above changes in the classroom environment ⇓ - Healthier school environment is created ⇓ - Student present and future overall health is improved ⇓ - Obesity rates are mitigated across schools and communities

Bellingham School District Snack Time Observations

Date_____ Time_____ Grade _____
Teacher_____ # Students_____
Duration of Snack Time_____

Snack Delivery

Trait	Description
Teacher Introduction of Snack	
Teacher Conversation around snack	
Student conversation around snack	
Location of snack	

Student Engagement Observations During Snack Time

Action	% of students Engaged (visual estimation at 2 - minute intervals)							
Waiting in line								
Choosing a piece of snack								
Completing snack								
Setting snack aside								

SNACK SAFETY AND WASTE

Classroom Maintained Sanitary Practices

N/A 0 1 2 3

COMMENTS (*Tongs? Teacher management? Student adherence to sanitation policies?):*

Amount of overall snack consumed (*based on estimated total snack and leftovers*):
Left over food dealt with by: Compost? Trash? Saved for future snack?

COMMENTS:

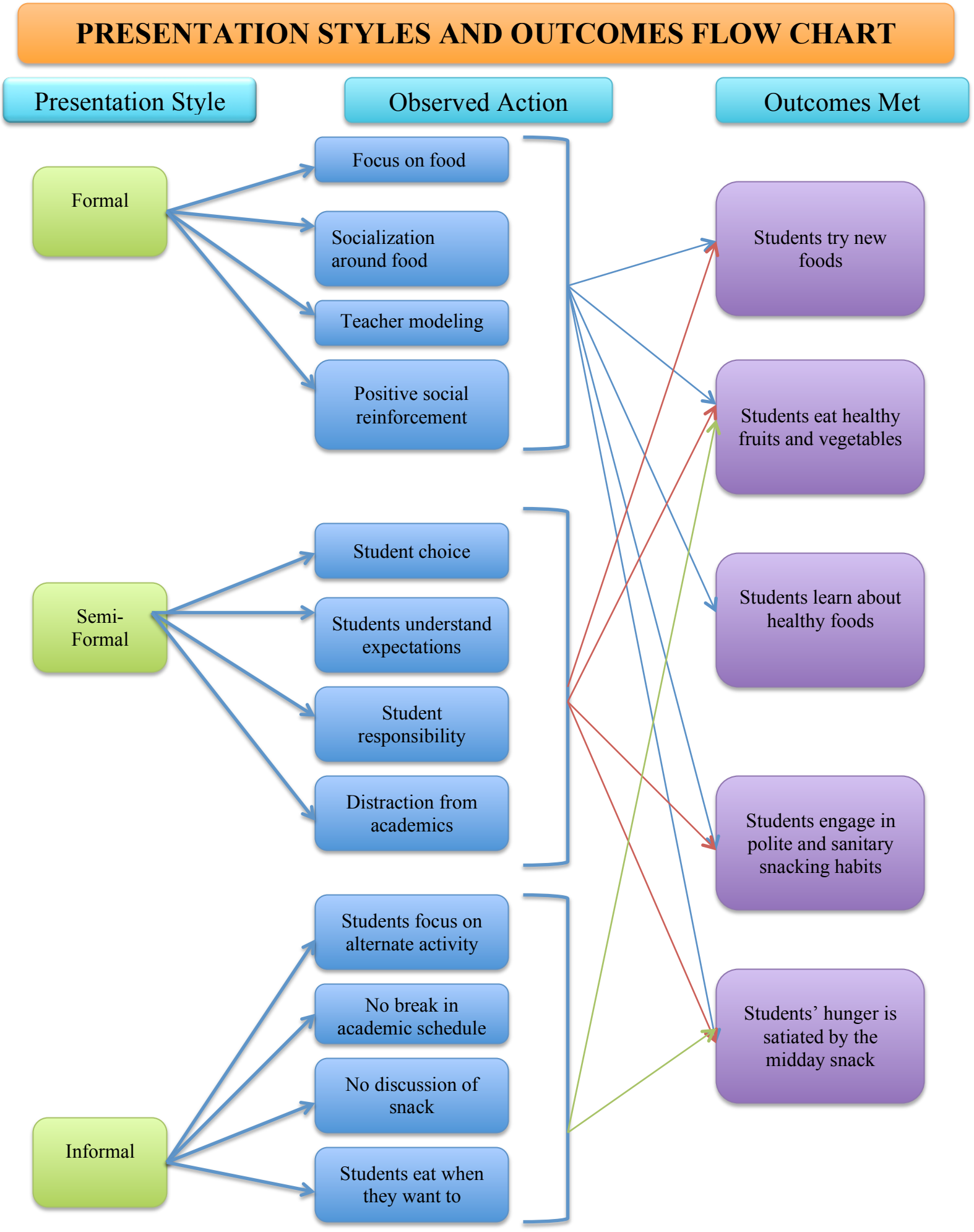
INFORMAL TEACHER QUESTIONNAIRE

In your experience, how receptive are students to the healthy snacks? How many students are typically not at all interested, somewhat interested, very interested in the snack?

How are the logistics of delivering the snacks impacting your classroom routine?

What do you find is the most effective way to present the snack to students in your class? What factors have led you to present the snack in this way?

How much difference does the particular food offered make in how students react to and consume it? Which foods are well received and which are least?


PRESENTATION STYLES AND OUTCOMES FLOW CHART
Presentation Style
Observed Action
Outcomes Met
Formal
Focus on food
Socialization around food
Teacher modeling
Positive social reinforcement
Semi-Formal
Student choice
Students understand expectations
Student responsibility
Distraction from academics
Informal
Students focus on alternate activity
No break in academic schedule
No discussion of snack
Students eat when they want to
Students try new foods
Students eat healthy fruits and vegetables
Students learn about healthy foods
Students engage in polite and sanitary snacking habits
Students' hunger is satiated by the midday snack