

Process Evaluation of the School Fruit and Vegetable Snack Pilot Program

by

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BA., University of Waterloo, 2004

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### ABSTRACT

The purpose of this study was to investigate the issues surrounding implementation of a School Fruit and Vegetable Snack Program (SFVSP). Ten schools were selected to participate in the SFVSP, nine schools were elementary schools (kindergarten to grade seven), and one school was a comprehensive school (kindergarten to grade 12). These schools were selected by the project Provincial Advisory Committee to provide maximal variation across schools on geographical location and socioeconomic status (SES). Free fruit and vegetables (F&Vs) were delivered twice a week to the schools, combined with educational materials promoting locally grown produce. Data were collected by focus groups and interviews with teachers, administrators, and in-school coordinators (ISC). Facilitators, barriers, and other issues regarding the program were explored to provide insight on the implementation of the program. Fidelity and feasibility of the program were also examined. Results were analyzed using Nvivo qualitative software. Line by line coding, and memoing was conducted. Themes emerged from the qualitative data collected. Teachers, administrators, and ISCs expressed the same key facilitators, and barriers to implementation. There were 18 key themes that

emerged and they could be organized into three higher order themes: observability, complexity, and compatibility. Themes were consistent with components of implementation and diffusion of innovations theory. Data also revealed that the response to the program was mostly positive, was feasible as it was implemented, and fidelity to the program was maintained at a high level. Recommendations for future research are presented and suggestions to improve the current program are also discussed.

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This thesis is dedicated to my family who have inspired me to fulfill my dreams and be all that I can be.

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## CHAPTER ONE

### INTRODUCTION

Inadequate fruit and vegetable (F&V) consumption is associated with an increase in chronic diseases such as cardiovascular disease (CVD), obesity, early onset of type two diabetes, strokes, hypertension, and cancer (Lang & Rayner, nd; Long & Stevens, 2004; Perry et al., 1998). Unfortunately, the number of adult Canadians who know the amount of recommended servings of F&V a day, and the health benefits of eating F&Vs is low (Connolly, 2005). Specific to British Columbia (BC), the BC nutrition survey showed that 64.5% of adults do not meet the recommendations for F&V intake (BC Ministry of Health Services, 2004). Eighty-four percent of BC females aged 18-34 did not meet the recommendation for F&V intake, and 62.3 of males aged 18-34 do not meet the recommendations for F&V intake. However, F&V intake in BC increases with age (BC Ministry of Health Services, 2004). Forty-one percent of Canadians aged two to 17 eat five or more servings of F&Vs a day, 37% eat between three and five, and 21% eat less than three (Canadian Community Health Survey, 2004). International data also suggest that many children also fall short of meeting the recommended consumption of five servings of F&Vs a day (Lytle et al., 2004; Patrick et al., 2001; Perry et al., 1998; and Sallis et al., 2003). Fewer than 20% of two to 15 year-olds in the United Kingdom eat more than one serving of F&Vs a day (Lang & Rayner, nd).

Increasing F&V consumption could decrease chronic disease risk (Perry et al., 1998). The World Health Organization (WHO) predicts that if people consumed the recommended five servings of F&Vs a day there could be a 20% decrease in deaths from

chronic disease. The World Cancer Research Fund estimates that increased F&V consumption could prevent 20% or more of all cases of cancer (Lang & Rayner, nd). Obesity, a chronic disease risk factor, is also a major concern in Canada, as 26% of Canadian children aged 2-17 are overweight or obese (Sheilds, 2005). F&V consumption contributes to a decrease in caloric density and decreased total caloric intake, thus playing a potential role in weight management (Rolls, Ello-Martin, & Tohill, 2006; Thomas et al., 2004). Thus, increasing F&V consumption and decreasing risk factors like obesity could potentially improve public health through reductions in chronic disease (Lang & Rayner, nd).

Many major risk factors related to disease in adulthood have their roots in childhood (Manios, Moschandreas, Hatzis, & Kafatos, 1999). Establishing healthy eating habits in early life may contribute to healthy eating in later life (Holcomb et al., 1998). Thus, interventions should be focused on prevention that begins in childhood (Baxter et al., 1997). Health promoting activities in the school setting can contribute to the total impact of population health (Baxter et al., 1997). The majority of children can be reached through elementary schools, which provides an opportunity to enhance future health and well-being of children (Carter & Swinburn, 2004; Meininger, 2000; Thomas et al., 2004; Veugelers & Fitzgerald, 2005). Schools are ideal settings for promoting healthy dietary behaviours because of the amount of time that children spend in school (Donnelly et al., 1996; Luepker et al., 1996).

Research on increasing F&V consumption through school interventions has had mixed results to date. Interventions and results vary from study to study; some studies have shown increases in F&V consumption as a result of intervention, whereas other

interventions have not been effective in increasing F&V consumption. However, a systematic review by French and Stables (2003) concluded that multi-component school interventions are effective in increasing fruit consumption by .2 to .6 of a serving per day, and vegetable consumption by 0 to .3 of a serving per day. Similarly, a subsequent systematic review conducted by Knai, Pomerleau, Lock and McKee (2006) concluded that interventions had a significant effect on increasing F&V consumption by .3 to .9 of a serving per day. Few studies have provided children with F&Vs as an intervention component; however, those that did, demonstrated an impact on consumption.

The “Cookshop Program”, developed in New York, aimed to increase the consumption of processed whole grains and vegetables by elementary school children. There were three components to the Cookshop Program; a school lunch program, a F&V tasting in the classroom component, and a parent and community component. The lunch program focused on increasing the variety of whole grains and vegetables in the cafeteria. The parent component included newsletters, information updates related to the program, and involvement of willing parents as Cookshop instructors. The classroom component involved children in the preparation and tasting of different foods, and a Food and Environment Lesson (FEL), which included activities that were about food, but did not include preparation or tasting of food. Their study evaluated four conditions: 1) Cookshop and FEL, 2) Cookshop only, 3) FEL only, and 4) control. The Cookshop Program had a positive impact on intake of whole grains and vegetables. The results indicated the FEL component of the intervention had no main effect. Children who received both the Cookshop Program and the FEL component had the largest change in

intake of the targeted foods. These results supported the thought that experience with, and tasting foods may increase preference and intake of those foods (Liquori & Koch, 1998).

In 2004, England implemented a National School Fruit Scheme, where children between the ages of four and six were given a free piece of fruit everyday (Lang & Rayner, nd). This program was not formally evaluated but anecdotal reports of its effectiveness led others to implement similar interventions, providing children with food.

The Norwegian School F&V program was an intervention in which students received a free piece of fruit or a carrot in conjunction with their lunches. Baseline data indicated that control and intervention groups showed no differences in F&V consumption. At the conclusion of year one of the intervention, children in the intervention schools had a significantly higher F&V intake (0.6 of a portion) than those in the control schools. Bere and colleagues concluded that, "providing students with a piece of fruit or a vegetable at school at no cost to their parents is an effective strategy to increase children's F&V intake" (Bere, Veierod, Bjelland, & Klepp, 2005, p.7).

The Mississippi Fresh Fruit and Vegetable Pilot Program was designed to 1) increase student access to fresh F&Vs, 2) increase preference for F&Vs, and 3) increase F&V consumption. The study included 25 schools, with 660 students participating in a survey regarding F&Vs, and 191 participating in the 24-hour Food recall interview. The program included the distribution of fresh F&Vs free of charge during the school day to the 25 schools. Nutrition education activities aimed to promote and support consumption of F&Vs were also implemented; specifics of the activities were not given. The length of the program was one year. The number of days that F&Vs were distributed was not indicated. Evaluation involved students from grades five, eight, and ten. The design of

the study was a one group no comparison design, with a pre-test before the program was implemented and posttest at the end of the school year. Results showed that the variety of F&Vs ever eaten increased significantly among students in all three grades. The degree of preference for fruit increased among 8<sup>th</sup> and 10<sup>th</sup> graders, but decreased for 5<sup>th</sup> graders. The degree of preference for vegetables decreased for 5<sup>th</sup> and 8<sup>th</sup> graders, and remained the same for 10<sup>th</sup> grade students. Fruit consumption increased significantly by .34 servings per day for grade eight students, and .61 for grade 10 students. Consumption of vegetables decreased for both grade eight and ten students. Grade five students were not included in the 24- hour recall interviews, because the researchers felt this younger grade may not be able to provide reliable data on the recall interviews. The results from this study show that providing F&Vs may be effective in increasing fruit consumption (Schneider et al., 2006).

To date there are no published studies in Canada that have explored providing F&Vs to students as part of an intervention. Because the evidence is sparse, replication of these early studies across a variety of settings and contexts is necessary to ensure that such interventions are valid in Canada. It is also important to research the implementation of such programs.

Implementation research can provide in-depth information pertinent to improving implementation of programs and interventions. Past research has focused on program outcomes with little attention being paid to program implementation (Story et al., 2000). Story emphasizes a “need to document and analyze the process of program implementation to interpret program outcomes and failures to guide future intervention efforts” (Story et al., 2000, p. 187). Process evaluations provide the in-depth information

that will help researchers improve and understand what occurred during an intervention.

Process evaluations typically address measurement of: dose - is the amount of intervention adequate?; feasibility - is it possible to continue to implement the intervention in the context?; and fidelity – accuracy of implementation, was the program implemented as planned? These factors can help to explain the effects of the program.

Process evaluations also help the researcher identify and understand whether the intended target audience has been reached (McGraw et al., 1994). If program implementation is not evaluated it is difficult to accurately determine the impacts of a program. A program may not have an impact if it was not implemented as planned, thus, “unless one knows that a program is operating according to design, there may be little reason to expect it to produce desired outcomes” (Patton, 1990, p.104). Therefore, the consequences of not researching implementation of a program are vast.

Nutrition evaluations and research in Canada are limited (Connolly, 2005). There is an urgent need to simultaneously evaluate programs and their implementation; this is a high priority for future research (Ciliska et al., 2000; Stokols, 1995). A School Fruit and Vegetable Snack Pilot Program is currently being implemented in BC, which provides F&V snacks in the schools. This program provides a unique opportunity to explore implementation issues surrounding the provision of F&Vs in the Canadian classroom.

### Purpose Statement

The purpose of this study was to explore the implementation of the School Fruit and Vegetable Snack Pilot Program in BC. Specifically, the objectives were: 1) to identify factors that influenced the implementation of the intervention, and 2) to enhance our knowledge of how to implement these types of interventions in the school setting.

### Research Questions

The following questions were addressed in this research study:

1. How was the school fruit and vegetable snack pilot program implemented?  
(What was its fidelity and feasibility of implementing?).
2. What are the issues, barriers, and facilitators that influence the implementation of school-based F&V schemes where F&Vs are provided?

### Assumptions

1. F&V campaigns are not being implemented in any of the schools or communities where the School Fruit and Vegetable Snack Pilot Program is being implemented.

### Delimitations

1. Ten schools were selected by the Provincial Advisory Committee, thus there may be selection bias, as schools were not randomly selected.

### Limitations

1. Key stakeholders may not be available for interviews.

## Definitions

1. **Focus Group:** A small group of individuals interviewed together concerning a specific topic as a method of qualitative research (Thomas & Nelson, 2001, p.336).
2. **Healthy Eating:** Eating practices and behaviours that are consistent with improving, maintaining, and/or enhancing health (Taylor, Evers, & McKenna, 2005).
3. **Food Insecurity:** The limited or uncertain availability of nutritionally acceptable foods in socially acceptable ways (Anderson, Peterson, & Beaton, 1982).
4. **Food Security:** A condition in which all people at all times can acquire safe, nutritionally adequate and personally acceptable foods that are accessible in a manner that maintains human dignity. These are conditions that promote health by providing essential nutrients and minimizing food related stress (Anderson et al., 1982).
5. **Fruit and Vegetable Consumption:** the numbers of F&Vs consumed in a day.
6. **Feasibility:** The possibility to continue to implement the intervention in the same context.
7. **Fidelity:** The extent to which the program was implemented as planned.

## CHAPTER TWO

### LITERATURE REVIEW

This review of literature provides the background and rationale for the study by addressing the following: the importance of fruit and vegetable (F&V) consumption and healthy eating in childhood, the types of approaches that have been used to increase F&V consumption, and the school as a setting for health interventions. Process evaluation, and the benefits and issues surrounding process evaluations and its relevance to F&V initiatives will be discussed. Finally, implementation research and the diffusion of innovation theory will be discussed.

#### *Importance of F&V Consumption and Healthy Eating*

Inadequate F&V consumption is associated with an increase in chronic diseases such as CVD, obesity, early onset of type two diabetes, strokes, hypertension, and cancer (Lang & Rayner, nd; Long & Stevens, 2004; Perry et al., 1998). The relationship between F&V consumption and risk of cancer is one of the most established associations in the nutrition field; thus, people who regularly consume F&V have a lower risk of developing certain cancers than those who do not (Nicklas et al., 1997). The World Cancer Research Fund estimates that increased F&V consumption could prevent 20% or more of all cases of cancer (Lang & Rayner, nd). The link between diet and CVD is also well understood, indicating that F&V consumption protects against both CVD and cancer (Ciliska et al., 2000; Lang & Rayner, nd). Results of a systematic review conducted in 1997 indicate that F&V consumption provides a protective factor against strokes (Ness & Powles, 1997).

There are high costs of obesity to the health care system, and this economic burden is expected to rise (Canadian Institute for Health Information, 2004; Swinburn, Gill, & Kumanyika, 2005; Thomas et al., 2004). For example, the direct cost of obesity in Canada in 1997 was 1.8 billion dollars (Birmingham, Muller, Palepu, Spinelli, & Anis, 1999). F&V consumption contributes to a decrease in caloric density and decreased total caloric intake, thus playing a role in weight management (Thomas et al., 2004). Increasing F&V consumption can have an impact on reducing the risk of obesity (Epstein et al., 200; Rolls et al., 2006).

The World Health Organization (WHO) predicts that if people consumed the recommended five servings of F&Vs a day there could be a 20% decrease in deaths from chronic disease. Increasing F&V consumption could also decrease chronic disease risk (Perry et al., 1998), and therefore improve public health (Lang & Rayner, nd).

#### *Importance of Fruit and Vegetable Consumption in Children*

Many children in the United States do not meet the recommended consumption of five servings of F&Vs a day (Lytle et al., 2004; Patrick et al., 2001; Perry et al., 1998; Prochaska & Sallis, 2004; Sallis et al. 2003). Many Canadian children are also making unhealthy eating choices, by consuming low amounts of F&Vs (Taylor et al., 2005). Poor eating habits may have implications for growth and development in children (Taylor et al., 2005). Many risk factors for disease in adulthood have their roots in childhood (Manios et al., 1999). The structure of children's diets needs to change. Children need to consume less fat, saturated fat, carbohydrates, meat and dairy products, and increase their F&V consumption (Holcomb et al., 1998; Lang & Rayner, nd). Poor childhood diet may

be a considerable risk that could lead to CVD in adulthood (Simons-Morton, Parcel, Baranowski, Forthofer, & O'Hara, 1991).

Obesity is the most prevalent nutritional disease in children and leads to long-term health complications (Sallis, Chen, & Castro, 1995). Obesity is related to CVD, type 2 diabetes, and cancer (Canadian Institute for Health Information, 2004). Obesity rates in Canada are high and increasing at such a rate that obesity has been labeled an epidemic in Canada (Canadian Institute for Health Information, 2004; Thomas et al., 2004). Data from the Canadian Fitness Survey from 1981 to 1996 indicated that obesity rates in males increased from 2.0% to 10.2%, and 1.7% to 8.9% for females. Over the same period rates also increased for overweight children from 13.1% to 26.6% for females, and from 10.6% to 32.6% for males. The greatest increases occurred for children ages seven to nine (Tremblay & Willms, 2000). Recent data from the Canadian Community Health Survey showed that 26% of Canadian children aged 2-17 are now overweight or obese (Sheilds, 2005). Poor nutrition is the focus of some health promotion initiatives because poor nutrition can lead to becoming overweight (Veugelers & Fitzgerald, 2005). Increasing F&V consumption can help to decrease weight (Rolls et al., 2006). There is a need to develop effective approaches for the prevention of obesity in children (Sallis et al., 1995), and increasing F&V consumption is one component of this.

It is evident that intervening and establishing healthy eating habits in early life could have substantial public health benefits by decreasing the risk of chronic disease in adult life and contributing to enhancing healthy eating in later life (Holcomb et al., 1998; Meininger, 2000). Promoting a healthy diet is a public health priority (Long & Stevens, 2004; Simons-Morton et al., 1991), and a diet high in F&Vs may contribute to the

improvement of public health (Bruijn, Kremers, van Mechelen, & Brug, 2005). A need for effective interventions to increase the consumption of F&V in children has been identified (Sallis et al., 2003). The focus of these prevention strategies for children should target the population as a whole and not just those who are at risk. The entire population then has the opportunity to receive the potential health benefits of the intervention (Thomas et al., 2004). There are some strategies in place in Canada to try to increase F&V consumption to five servings a day; please refer to Connolly (2005) for a complete list of these strategies. Few of these strategies are school based (Taylor et al., 2005).

#### *Food Access and Security*

When examining F&V consumption societal barriers such as, income, food supply, partnership, and local buying of foods should be taken into account. There is evidence that eating behaviours are linked to socio-economic status (SES). Many people with lower SES have decreased access to food, and lower food security (Lang & Rayner, nd). This is an emerging issue for researchers. There are many societal barriers to healthy eating (Vecchiarelli, Prelip, Slusser, Weightman, & Neumann, 2005). Food security is defined as “enough of the kinds of food we want to eat”, whereas moderate food insecurity is defined as “sometimes not enough food to eat”, and severe food insecurity is defined as “often not enough to eat”. (Canadian Institute for Health Information, 2004). Based on the 1998/1999 National Population Health Survey, over ten percent of Canadians were defined as living in food insecure households (BC Ministry of Health Services, 2004). Diet related inequalities need to be reduced to combat social exclusion and poor access to healthy foods (Lang & Rayner, nd). Food costs are higher in lower

income neighbourhoods and there is less access to supermarkets in lower income areas (Canadian Institute for Health Information, 2004; Sturm & Datar, 2005). Many people suffer from inadequate diet due to low income, and people on low incomes eat less F&V (Winkler, Turrell, & Patterson, 2006). There is a need to monitor and increase access to safe and healthy foods, as well as develop plans to overcome food inequalities. Healthier foods cost more, and thus policies to make healthy foods affordable are recommended (Lang & Rayner, nd). In addition, proponents of food security suggest that the food supply needs to change to deliver health-enhancing and accessible food for all and not just those who can afford it. Food security can also incorporate the idea of sustainability and the idea that food supply chains need to be as local and short as possible (Lang & Rayner, nd).

Food price is the most important consideration in food choice when income is restricted (Taylor et al., 2005). High priced foods may limit the ability of people with low incomes to eat a healthy diet (Jetter & Cassady, 2006). Access to healthy food is essential to achieve physical and intellectual potential (Lang & Rayner, nd). Research is needed on the impact of access to safe, and secure foods and how the physical availability of healthy foods affects one's diet (Morland, Wing, Diez Roux, & Poole, 2002).

Food access and security relates to the SFVSP as it is important to realize that children in Canada may not have access to fresh foods. The SFVSP is not intended to tackle economic issues related to food consumption, however, it should be noted that food access and security play a role in F&V consumption, and thus may affect the participants in this study. Thus, this further supports the need for interventions such as the SFVSP.

## *Partnerships*

The importance of partnerships is growing in the health promotion field. Gillies (1998) suggests that partnerships across sectors to promote health are effective, because they help tackle broader determinants of health in a sustainable manner. There has been a call for government to take a lead in promoting and supporting these partnerships and interventions (Connolly, 2005; Canadian Institute for Health Information, 2004; Thomas et al., 2004). For instance, health and farming sector partnerships can potentially help decrease health inequalities, as this integrated system can help to decrease the cost of food (Lang & Rayner, nd). Partnerships between the ministries of education, environment, agriculture, and business sectors are key to health promotion in the area of food consumption (Connolly, 2005; Lang & Rayner, nd). The need for partnerships is further emphasized by the WHO definition of national nutrition strategy.

The WHO emphasizes the need for collaboration between the health sector and other sectors such as agriculture and education (Connolly, 2005). A synthesized version of the WHO national nutrition strategy is described below:

National strategies on diet (and physical activity) describe the measures to promote healthy diets (and physical activity) that are essential to prevent disease and promote health, including those that tackle all aspects of unbalanced diets, including under-nutrition and over-nutrition. Nutrition strategies should include specific goals and objectives, and actions, similar to those outlined in the global strategy. Of particular importance are the elements needed to implement the plan of action, including identification of necessary resources and national focal points

(key national institutes); collaboration between the health sector and other sectors such as agriculture, education, urban planning, transportation and communication and monitoring and follow-up (Connolly, 2005, p. 11).

The SFVSP has adopted a partnership approach, as it includes partnerships with the Ministry of Health, Ministry of Education, and Ministry of Agriculture. These are important partnerships in the area of food production and consumption.

Local food partnerships can also be encouraged as they can help integrate local food planning and health improvement planning (Lang & Rayner, nd). The promotion of buying local foods is also important for sustainability, for example, it reduces the amount of pollutants required to transport the products. Connolly (2005) believes that the role of the food industry is critical, but in what capacity is uncertain. Collaborative partnerships are also a networking strategy that help promote goals; partnerships then also help to enhance the health and well-being of an entire population (Levesque, Guilbault, Delormier, & Potvin, 2005).

There is little or no published research in Canada on school-based interventions that link F&V consumption to access to food supply, food security, and local buying of F&Vs and utilize multi-level partnerships. Thus, the SFVSP is unique in that it provides snacks to students, promotes local purchase of F&Vs, and utilizes a partnership approach.

### *School Setting*

Schools are the ideal setting for intervention and promoting healthy eating (Donnelly et al., 1996; Luepker et al., 1996; Simons-Morton et al., 1991), because schools offer promise for influencing the greatest number of children (Sallis et al., 1995).

The majority of children in developed countries can be reached for long periods of time through elementary schools, which provides an opportunity to enhance future health and well-being of children (Carter & Swinburn, 2004; Donnelly et al., 1996; Meininger, 2000; Thomas et al., 2004; Veugelers & Fitzgerald, 2005).

The school setting also provides the opportunity to intervene in early life, which may enhance health during critical periods of development and decrease the risk for chronic diseases in adulthood. Establishing healthy behaviours at an early age can also lead to life long healthy habits (Veugelers & Fitzgerald, 2005). However, more research is needed on how eating behaviours change over time (Lytle, Seifert, Greenstein, & McGovern, 2000).

The school setting provides access to children, professionals, and resources for affecting behaviour change (Donnelly et al., 1996). With the potential extended exposure over a period of time, interventions may help achieve long-term behaviour changes (Sallis et al., 1995). Schools provide a setting for effective implementation of health intervention programs; however, there have been some disappointing results from school-based health programs (Sallis et al., 1995) largely due to limitations in the implementation of these health interventions.

#### *Limitations of the School Setting:*

Implementation issues in the school setting include: lack of teacher training, priority and time issues, competition between programs, and staff and students characteristics. Vecchiarelle et al., (2005) emphasized that teachers do not receive sufficient training in topics such as nutrition and these topics are not prioritized for

testing like other academic subjects. These factors reduce the likelihood of implementation. Staff time is often listed as a limitation to school based interventions both in terms of the measurement when researchers are competing for their time, and in terms of interventions, where other curriculum components take precedence (Luepker et al., 1996; Thomas et al., 2004). Or implementation of interventions can be affected by other competing interventions. Both staff and student characteristics can impact the outcomes and implementation (Manios et al., 2002; McGraw et al., 1994). Staff in a study conducted by Killen et al. (1989) indicated that they felt discomfort with non-lecture teaching methods such as interactive and active learning. It is also unclear what adaptations are needed for interventions in the schools to address differences in SES and ethnicity (Sallis et al., 1995). There may be problems with curriculum implementation because teachers may not want to teach a curriculum that emphasizes their own personal risk factors, for example, being overweight (Bush et al., 1989). Teacher job satisfaction and school climate had a direct relationship with program effectiveness in the study conducted by Peterson, Goodwin, and Ellenberg (2004). Lastly, many studies have not made full use of school staff and facilities (Sallis et al., 1995).

### *School Fruit and Vegetable Interventions*

There is evidence to suggest that intervening in schools can be effective, specific to healthy eating and F&V consumption (Donnelly et al., 1996; Luepker et al., 1996; Simons-Morton et al., 1991). In 2003 a systematic review conducted by French and Stables concluded that multi-component school interventions are effective in increasing fruit consumption by .2 to .6 of a serving per day, and vegetable consumption by 0 to .3

of a serving per day. A more recent systematic review conducted by Knai et al. (2006) revealed that multi-component interventions had a significant effect on increasing F&V consumption by .3 to .9 of a serving per day. In the Knai et al. (2006) systematic review, four of the 15 studies had taste testing or food preparation involved in the intervention. Both the Girl Scouts Eat 5, and the Integrated Nutrition Project involved food preparation as part of their intervention. The food dude healthy eating program from the UK, provided F&Vs, as did the TEEN study, where taste testing occurred. One finding of the systematic review was that exposure to F&Vs is one of the key success factors to F&V interventions. This is important to note, as the SFVSP increased exposure to F&Vs by providing the students with F&Vs. However, consistent with other studies, the results from the systematic review lead to the conclusion that multi-component interventions are strongest for increasing F&V consumption (Knai et al., 2006).

The following section will provide an overview of the types of multi-component interventions that have been implemented with a particular emphasis on those which offered tasting, as tasting F&Vs was the emphasis of the School Fruit and Vegetable Snack Program (SFVSP). As well, studies have shown that direct experience and preparation of foods may increase the preference and intake of those particular foods (Liquori & Koch, 1998). Please refer to Appendix A for a summary of the studies.

#### *Multi-component Interventions*

5-A-Day Power Plus was a multi-component school intervention for grade four and five students, in 20 elementary schools (Story et al., 2000). The intervention included both classroom curriculum interventions (lessons and resources), and food service

interventions (e.g. increased variety and attractiveness of F&Vs in the cafeteria at school, as well as point of purchase promotion of F&Vs), and a parental component (e.g. recipe card). One year after intervention there was no significant difference in F&V intake, for both students and families. Students, did however, consume more F&Vs at school than at home and knowledge of F&Vs was increased. The parental component of the intervention had low levels of participation, dose, and fidelity. The other intervention components had high levels of participation, dose and fidelity. These process data helped the researchers understand potential reasons why the consumption of F&Vs occurred mostly at school lunch and not at home (Story et al., 2000). The intervention to parents may have had insufficient content, potency, and dose. These researchers concluded that finding effective ways to involve families remains a challenge for school-based health promotion interventions. Story and colleagues suggested continuing process evaluations to assess the extent to which families are involved, whether compliance level is related to outcomes, and what characteristics of families predict compliance; and when, how and why families adopt new behaviours (Story et al., 2000).

The “Cookshop Program” developed in New York, aimed to increase consumption of processed whole grains and vegetables by elementary school children (K-6). The Cookshop Program intervention had three components; a school lunch program, a classroom component, and a parent and community component. The lunch program focused on increasing the variety of whole grains and vegetables in the cafeteria. The parent component included newsletters, information updates related to the program, and involvement as Cookshop instructors if parents were willing. The classroom component had the Cookshop component where children could prepare and taste different foods, and

the Food and Environment Lesson (FEL) which included activities that were about food, but did not include preparation or tasting of food. There were four conditions for the classroom component: 1) Cookshop and FEL, 2) Cookshop only, 3) FEL only, and 4) control. Consumption was measured by plate waste visual estimate. Children who received both the Cookshop and FEL component had the largest change in intake of targeted foods, with 79% and 74% of targeted foods remaining on plates, for younger and older children respectively. The Cookshop Program had a positive impact on intake of whole grains and vegetables, with 84% and 78% of targeted foods remaining on the student's plates. The results indicated the FEL component of the intervention had no main effect, with 90% of targeted foods remaining on the plate. The control group left 94% and 97% of targeted foods on their plates. These results support the thought that experience with, and tasting foods may increase preference and intake of those foods (Liquori & Koch, 1998). Experience with and tasting of foods may increase preference and intake of those foods because children may not have tried the foods before and then once exposed to the food it increases their preference and thus intake of that food. Therefore when designing F&V interventions it may be advisable to ensure that one component of the intervention provides direct experience and tasting of F&Vs.

Auld, Romanielle, Heimendinger, and Hambidge (1998) conducted a quasi-experimental study that consisted of an integrated nutrition program, for grade three, four and five students. The intervention was 24 weeks long, and consisted of classroom activities, lunchroom sessions taught by parents, newsletters sent home to parents, and a family fun night. The results showed that at posttest the intervention group consumed significantly more (0.4) servings of F&Vs on a daily basis than the control group.

Gimme 5 is a nutrition intervention that has been implemented in the United States. Domel, Leonard, Baranowski, and Baranowski (1993), examined grade four and five students in 16 classes (10 classes in the experimental group, and six classes in the control group), in a randomized trial. The intervention consisted of things such as recipe preparation, taste testing, goal setting, and a weekly newsletter to parents. The intervention was six weeks long, with three sessions per week. The post-test results indicated that there was no difference in total F&V serving per day. This could partly be due to the short duration of the intervention. There was a significant increase in fruit servings per day (0.3) for the intervention group.

Baranowski et al. (2000) studied Gimme 5 Primary School. There were 16 intervention schools, and 16 control schools, the aim was to increase F&V intake, as well as juice intake. The intervention was six weeks long, with 12 sessions, for two years. Teachers taught classroom activities, after six hours of training. Newsletters, videotapes, and home assignments were sent to the parents. Results indicated that there was a significant effect on vegetable intake (0.2), but not fruit intake. Nicklas et al. (1997), examined ways to improve the Gimme 5 intervention. Student input was gathered through four focus groups (n=55). Data from these focus groups identified barriers to increased F&V consumption. These barriers were: lack of availability, variety, and inconsistency in taste. The authors concluded that this information was valuable for program development as barriers to consumption were identified. Thus, student input on interventions should be used in further research. Process evaluation data on Gimme 5 Georgia conducted by Davis et al. (2000) indicated similar disappointing results. However, the process data revealed that the intervention was not implemented as

planned, which may explain the variable results. For example, only half of the curriculum activities were implemented, there was only modest parental involvement in the parental activities planned, and there was minimal participation in point-of-purchase education. Lastly, the Davis et al. (2000) Gimme 5 intervention was with fourth and fifth graders, whereas the Nicklas et al. (1997) Gimme 5 program was with high school students. This could also affect the varying results because the researchers were looking at students of different age levels.

California 5-A –Day Power Play was a quasi-experimental study conducted by Foerster et al. (1998). This study used both school curriculum and community activities as interventions. The intervention was eight weeks long. The students were from grades four and five from 49 different schools. There was 0.2 serving increase F&V consumption in the school only group. The school and community intervention group showed 0.4 serving increase in F&V consumption in the second testing period compared to the control group. This increase is significant, however, the data were self-reported which has limitations as people sometimes over-report their consumption. Also, the area where the control schools were located had substantial flooding during the study period and availability of F&Vs in this area was affected, thus this may have impacted consumption of F&Vs for the control group.

A study conducted in Greece by Hassapidou, Fotiadou, and Maglara (1997) consisted of two secondary schools, with students aged 13 and 14. The focus of the study was on increasing F&V consumption for prevention of cancer. The intervention took place from September 1994 to June 1995. The students received classroom interventions,

workbooks to complete, and pamphlets were given to students and parents. This was a pilot test of the intervention, and no significant changes in intake were found.

High 5 is another multi-component nutrition intervention that Reynolds et al. (2000) examined. The study consisted of 28 schools, intervening with the grade four students. Classroom activities were conducted, cafeteria food services were involved and parents were involved with seven homework assignments, and a family kick off night. The overall outcome was that mean intake in daily F&V consumption was higher in the intervention group than the control group. In year one F&V consumption was 3.96 for the intervention group and was 2.28 for the control group. In year two F&V intake was 3.2 for the intervention group and 2.21 for the control group. Consumption of F&Vs for parents in the intervention group was higher than the parent control group, however, this effect was not maintained at a two year follow up. The process data on High 5 showed that the program was implemented as expected, however, taste testing activities were not implemented as frequently as planned due to the increased effort required to complete these activities. Thus, when planning interventions for school, it may be important to design activities in a manner that requires little effort by teachers, as they may find activities such as taste testing more time consuming to implement and thus, they are not implemented as often.

TEEN was another nutrition intervention used in the United States. Lytle et al. (2004) conducted this group randomized trial with 16 schools of grades seven and eight. The intervention was two years long, and consisted of curriculum sessions, peer led classroom sessions, activities sent home to be done with parents, and F&Vs were promoted in the cafeteria, as well as taste testing, and posters. Outcomes of the study

revealed that there was an increase in mean daily intake of F&V (.16), however results were not maintained at follow-up. The authors state maintenance of the increased F&V consumption may not have been maintained at the two year follow-up because peer leaders were not used in the second year of the intervention, as well there was poor response to TEENS group projects. Thus, the maintenance of outcomes of this intervention was an issue.

APPLES was conducted in the United Kingdom and included 636 children in the fourth and fifth grade, from ten primary schools (Sahota et al., 2001). The intervention was implemented over one year and consisted of modification of school meals, and school action plans to promote healthy eating and physical activity. The intervention used a population approach and targeted the whole school community, including parents, teachers, and catering staff (Sahota et al., 2001). Teachers were trained regarding the APPLES program, specific aspects of the training were not stated. The outcomes of the study showed that the children significantly increased their vegetable intake, this increase was 0.3 servings a day (Sahota et al., 2001).

CATCH is considered the largest and most rigorous school based comprehensive health promotion study that has been implemented to date in the United States (Luepker et al., 1996). Studies using the CATCH design for intervention have had mixed results. Process evaluations, as discussed in the following section have been done on various CATCH programs to help explain why there may have been mixed results and how those could be corrected (McGraw et al., 1994). The CATCH intervention consists of school based classroom curriculum, modification to lunch menus, recipes, and food preparation and production. There are also family based interventions and family fun nights and a

physical education component. Luepker (2003) conducted a randomized trial of grade three children in 96 elementary schools. Twenty-eight schools received the school-based intervention, 28 schools received the school-based intervention and the family based intervention, and 40 schools acted as control schools. Luepker (2003) did not measure F&V consumption, however, intervention groups had a significant reduction in total fat from school lunches, and a reduction in saturated fat. Perry et al. (1998) did, however, measure F&V consumption using the CATCH intervention. Grade three through five children were tested. Perry and colleagues concluded that there were no significant overall differences in F&V consumption at follow up. Given the rigor of the intervention, it is surprising that the results are mixed. However, detailed information explaining the possibilities for mixed results are outlined in the process evaluation section of this paper.

The Hopper Family Participation Project 2 included 97 grade two and four students. Hopper, Gruber, Munoz, and MacConnie (1996) implemented the intervention over ten weeks. The number of schools included in this project was not indicated. The intervention included physical activity initiatives, nutrition sessions in the classroom, and activity packages to be completed at home. The results indicated that the intervention group consumed significantly more F&Vs than the control group, this was not maintained at follow-up.

Warren, Henry, Lightowler, Bradshaw, and Perwaiz (2003) implemented the Be Smart Program in the United Kingdom. This intervention included three primary schools, consisting of 213 grade one and two students. The intervention included a family component, school based classroom component, and physical activity intervention. The

intervention was implemented over 20 weeks. The intervention group showed a significant increase in fruit intake.

PATHWAYS was a multi-component intervention that encompassed modifying food services, physical education, curriculum modifications, and a family component that focused on the parent of children in the intervention, creating a positive and supportive environment for modifying diet and physical activity. This program was targeted at school children in grades three, four and five, and included 775 boys, and 692 girls. This project was unique in that it was designed to reduce obesity specifically in American Indian children. The outcomes revealed that there were positive changes in some variables, however, there was no change in percentage of body fat. The authors stated that active family involvement deserves further research, and studies with more intense and broader reach of the intervention may be needed in order to impact physiological measures (Stevens et al., 2003).

#### *Interventions Providing Free F&Vs*

Although comprehensive multi-component interventions appear to be most effective, there is new emerging evidence that specific tasting and provision of F&V interventions may also be effective for increasing F&V consumption. This may be because direct experience with foods may increase preference for, and intake of those particular foods (Liquori & Koch, 1998). Three reported programs to date have had a significant focus on providing servings of F&Vs to children. One intervention was done in England, one in Norway, and one in Mississippi.

Few studies have provided food, such as F&Vs as part of the intervention. Studies that modified food services have been more focused on reducing dietary fat and sodium in school lunches in the United States (De Bourdeaudhuij and Brug, 2000; Sallis et al., 1995; Simons-Morton et al., 1991). In England however the National School Fruit Scheme was implemented in 2004 where children between the ages of four and six were given a free piece of fruit everyday (Lang & Rayner, nd). This program was not evaluated.

The Norwegian School F&V program (Fruit and Vegetables Make the Marks) was a multi-component intervention in which students (grades six and seven) received a free piece of fruit or a carrot in conjunction with their lunches, there was parental involvement, and a home economics classroom component. At the conclusion of year one of the intervention those in the intervention schools had increased their F&V consumption by 0.6 portions higher than in the control schools. However, after year one parents had to enrol and pay for their children to continue in this program, thus not making it accessible to all students. The conclusions of this research indicate that, “providing students with a piece of fruit or a vegetable at school at no cost to their parents is an effective strategy to increase children’s F&V intake” (Bere et al., 2005, p.7). Further research is needed to determine if long-term habits are created (Bere et al., 2005).

The Mississippi Fresh Fruit and Vegetable Pilot Program was designed to 1) increase student access to fresh F&Vs, 2) increase preference for F&Vs, and 3) increase F&V consumption. The study included 25 schools, with 660 students participating in a survey regarding F&Vs, and 191 participating in the 24-hour Food recall interview. The program included the distribution of fresh F&Vs free of charge during the school day to

the 25 schools. Nutrition education activities aimed to promote and support consumption of F&Vs were also implemented, specifics of the activities were not given. The program was implemented over the 2004-2005 school year. The number of days that F&Vs were distributed was not indicated. Evaluation involved students from grades five, eight, and ten. The design of the study was a one group no comparison design, with a pre-test before the program was implemented and posttest at the end of the school year. Results showed that the variety of F&Vs ever eaten increased significantly among students in all three grades. The degree of preference for fruit increased among 8<sup>th</sup> and 10<sup>th</sup> graders, but decreased for 5<sup>th</sup> graders. The degree of preference for vegetables decreased for 5<sup>th</sup> and 8<sup>th</sup> graders, and remained the same for 10<sup>th</sup> grade students. Fruit consumption increased by .34 servings per day for grade eight students, and .61 for grade 10 students. Consumption of vegetables decreased for both grade eight and ten students. Grade five students were not included in the 24- hour recall interviews, because the researchers felt this younger grade may not be able to provide reliable data on the recall interviews. The results from this study show that providing F&Vs may be effective in increasing fruit consumption (Schneider et al., 2006).

There are many known benefits to eating F&Vs, and maintaining a healthy diet in general. Thus, there has been extensive research done on healthy eating in the school setting. However, few of the interventions conducted have resulted in long term effects that are maintained at follow up testing. More research is needed on the process of implementation of such interventions to examine and understand the reasons why the results may not be as expected.

The majority of effective F&V studies to date have been multi-component, and have not focused just on the provision and tasting of F&V intake. There is a need for further research on F&V provision and on the local and provincial partnerships that are required to enhance access to F&Vs. Partnerships have been promoted as effective within the health promotion field and Gillies suggests that partnerships can help tackle broader determinants of health, such as access to F&Vs (Gillies, 1998). Partnerships help to increase the health and well-being of populations through integrated networking system (Levesque et al., 2005). Thus, the partnership between the Ministry of Agriculture, Ministry of Health, and Ministry of Education provided the SFVSP with a unique opportunity to provide F&Vs to elementary school children, using collaborative partnerships to ensure the F&Vs were delivered and received to the schools. A school-based healthy eating study using a partnership with three government ministries has not been conducted to date in Canada, and thus provided a unique opportunity for BC schools and researchers.

### *Process Evaluation*

The need for process evaluation in F&V interventions was highlighted in the literature. Process evaluations can provide in-depth information pertinent to improving implementation of programs and interventions. Health promotion intervention and evaluations should provide insight into program implementation and the social and environmental context in which implementation takes place (Lee, Cheng, & St Leger, 2005). "Process evaluations provide data to describe how a program was implemented, how well the activities fit the original design, to whom the services were delivered, the

extent the target population was reached, and factors external to the program that may compete with program effects” (McGraw et al., 1994, p. 5). Process evaluations typically assess measurements of: dose – the amount of intervention, fidelity – extent to which the intervention implemented as planned, and feasibility – is it feasible to continue the intervention in that context, and reach – was the target audience reached? (McGraw et al., 1994). Involving teachers by asking them what they think of certain programs can provide information about the effectiveness and how a program could be revised in order to enhance effectiveness (Holcomb et al., 1998). It is also important to note that if teachers implement the intervention in different ways, then the researcher may not be able to interpret the results, or this may affect the outcomes of the study because then the researcher does not know what the independent variable is.

Specific health intervention process evaluations conducted in the school setting have highlighted several limitations with that setting. These include things such as, teacher time constraints, competing interventions, student and teacher characteristics, and insufficient training in areas such as nutrition. Often teachers do not receive sufficient training in topics such as nutrition (Killen et al., 1989; Vecchiarelle et al., 2005). Healthy eating and nutrition are not given priority in testing, unlike other academic subjects (Vecchiarelle et al., 2005). Staff in a study conducted by Killen et al. (1989) indicated that they felt discomfort with non-lecture teaching methods such as interactive and active learning, this is unfortunate as active learning methods are more effective for behaviour change. Often staff time is listed as a limitation to school based intervention as other curriculum components take precedence (Luepker et al., 1996; Thomas et al., 2004). Implementation of interventions can be affected by other competing programs. As well,

both staff and student characteristics can impact the outcomes and implementation (Manios et al., 2002; McGraw et al., 1994). It is also unclear what adaptations are needed for interventions in the schools to address differences in socioeconomic status and ethnicity (Sallis et al., 1995). There may also be problems with curriculum implementation because teachers may not want to teach a curriculum that emphasizes their own personal risk factors, for example, being overweight (Bush et al., 1989). Teacher enthusiasm played a role in the study conducted by Peterson et al. (2004). Teachers who were more enthusiastic about the project followed the implementation of the intervention more exactly and had higher and more positive outcomes than teachers who were noticeable less enthused, this was determined by observations and interviews. Lastly, many studies have not made full use of school staff and facilities (Sallis et al., 1995).

The CATCH study did a comprehensive process evaluation that looked at school staff training, dose of intervention, fidelity of the protocol, and the compatibility of the program with the school needs, and their impacts on study outcomes (McGraw et al., 1994; Meininger, 2000). Poor fidelity in the CATCH study may explain small changes measured in outcomes, and the program may have failed to reach the target group (McGraw et al., 1994). Providing adequate dose is a challenge in health promotion, especially in schools because the intervention is competing with numerous programs and priorities (Resnicow, Robinson, & Frank, 1996). The CATCH process evaluation showed that school health programs may be more successful when complemented with messages from media, medical institutions, opinion leaders, businesses, and faith communities; however, this may be hard to evaluate (Resnicow et al., 1996). The CATCH process

evaluation also revealed that the parental component of the study may have not been implemented properly, and thus may have been the reason that it had no added impact (Edmundson et al., 1996). Despite these process evaluation issues, Perry et al. (1997) showed high levels of participation, dose, fidelity, and compatibility with the CATCH study. They concluded that CATCH is a feasible program to improve healthy eating and exercise behaviours for children in elementary schools.

TEENS was another major school based intervention in the United States. A process evaluation was conducted to determine if the intervention had fidelity. The TEENS researchers measured fidelity by having the teachers complete a checklist each day to see if the intervention was delivered each day in the classroom (Lytle et al., 2004). The process evaluation revealed that the implementation of the intervention in the classroom and the engagement of the families was incomplete, however the data from the evaluation did not reveal why the implementation was incomplete (Lytle et al., 2004). One hypothesis the researchers used to explain this was that the teachers may not view nutrition as important as, for example, alcohol and drug prevention, thus fidelity to intervention activities may decrease.

The Go for Health study included interviews with teachers, physical education teachers, food service workers, and managers in their process evaluation to gain insight into the program from the people who were implementing it (Parcel, Simons-Morton, O'Hara, Baranowski, & Wilson, 1989). The interviews showed differences in program implementation and a lack of time to adequately teach modules. The qualitative component of the process evaluation also gave information on the importance of staff training in the program implementation (Parcel et al., 1989). Perry et al. (1987) also did

interviews in their process evaluations, they asked students and teachers if they liked the program, and also asked them if they thought the program had affected their own eating habits. The outcome of the interviews indicated that females were more receptive than males to the intervention. Neumark-Sztainer, Story, Hannan, & Rex (2003) completed a process evaluation that evaluated feasibility of implementation, program satisfaction amongst students and staff, in order to gather information regarding program modification. They also chose interviews as their method of data collection.

A process evaluation was conducted on the Norwegian Fruits and Vegetables Make the Marks study. This evaluation revealed that there was variation in the implementation of the curriculum set forth for the program, this variation had no effect on increased F&V consumption. It may not be realistic to expect that curriculum would be implemented without variation, as teachers have different teaching styles, techniques, students, and commitments. Five of the nine intervention schools held parents meetings, these meetings showed no effect on increased F&V consumption (Bere, Veierod, Bjelland, & Klepp, 2006).

The amount of intervention a student receives can impact study outcomes; this information can be gathered through a process evaluation and other contextual issues can affect the level of implementation (Thomas et al., 2004). Nutrition research in this area is limited in Canada (Connolly, 2005). There is an urgent need to evaluate healthy eating programs and interventions. This is a high priority for future research because it will further our understanding of what interventions and what components of those interventions are effective in increasing F&V consumption (Ciliska et al., 2000; Stokols, 1995).

The SFVSP is a unique opportunity that provides children who may not have access to F&Vs otherwise, with free F&Vs twice a week. Providing snacks to the children in the classroom was made possible by utilizing a partnership approach, with the Ministry of Agriculture, Ministry of Education, and Ministry of Health, as well as various local and provincial food producers such as Save on Foods. Such extensive partnerships in F&V research in schools in Canada have not been used, thus making this pilot program unique and innovative.

This unique project explored the process of implementation in order to examine the strengths and issues (facilitators and barriers) of the program. This information will help promote the implementation of such a program in other schools, building on lessons learned from this project. Few studies have provided F&Vs to children in the schools, however, some studies have done taste testing with the children, thus the SFVSP is unique in that it delivers F&Vs to the students on a regular basis.

### *Theoretical Frameworks*

There are two theoretical frameworks that have been chosen to explore and analyze the data in this study: implementation theory and diffusion of innovation theory. These theories will help to explain what occurred during the process of implementation in the SFVSP. A brief description of the theories is discussed below.

### *Implementation Research*

Implementation theory explores how systems function, and is necessary to understand how a program works. Exploring implementation helps to understand how

things may be changed by front line staff in order to deal with their regular duties (Corbett & Lennon, 2003). Implementation helps to examine key aspects of a program and looks at organizational dynamics. It also examines economic, demographic, and the political climate that may shape the way a program is implemented (Holcomb & Smith Nightingale, 2003). Implementation focuses on internal dynamics and how a program is structured and managed. Macro-implementation perspective helps to understand how a program fits within the broader environment, whereas micro-implementation examines how a program operates internally (Holcomb & Smith Nightingale, 2003). The top-down approach is associated with macro-implementation, as it looks at a program or policy from a higher level and examines how lower levels respond, thus it is more associated with fidelity of implementation. A bottom-up approach is associated with micro-implementation, and it examines implementation from within the organizational context, and is associated with an adaptive perspective (Holcomb & Smith Nightingale, 2003).

Lipsky (1980) coined the term street level bureaucrats, referring to public service workers, such as teachers, “who work directly with citizens in their jobs, and have substantial discretion in the execution of their work” (p.3). Understanding street-level workers’ perspectives helps to understand gaps in policies and programs, as tension often arises when street level workers feel higher level bureaucrats do not understand their job commitments and the realities within which policy must be translated into practice (Brodkin, 2003). Street level workers have to adapt to conditions of the front lines. Thus, understanding the context and environment in which implementation occurs, will help to better understand the successes and shortcomings of the implementation of a program or policy (Brodkin, 2003). Implementation theory also suggests that implementation is more

likely to be successful when only marginal changes in street level work are necessary (Bergen & While, 2004). The implementation research literature can be used to help explain implementation successes and issues related to the SFVSP, drawing on the characteristics of successful implementation from this body of knowledge.

### *Diffusion of Innovations*

Diffusion of innovation (DOI) theory is a theory from the communications field and has been used to explain the adoption and implementation of innovations. DOI has four main areas of focus, these include: innovation, communication, time, and social systems. The following provides a brief description of each.

Innovation is defined as a new idea or practice, it is perceived as new to the individual who may be adopting it. Rogers (1983) describes innovations as having five main characteristics: relative advantage, compatibility, complexity, trialability, and observability (Rogers, 1983). Relative advantage is something that is perceived as having an advantage to the person who is adopting the innovation. “The greater the perceived relative advantage of an innovation, the more rapid its rate of adoption is going to be” (Rogers, 1983, p.15). Compatibility is the extent that an innovation is consistent with existing needs, values, and experiences of the adopter. An idea that is not compatible with the values and norms of a social system will not be as readily adopted. An adoption of an innovation can be greatly improved if one caters to and complements the societal norms of a community (Haider & Kreps, 2004). “Complexity is the degree to which an innovation is perceived as difficult to use and understand” (Rogers, 1983, p.15). The harder something is to understand and use the slower the adoption phase will be.

Trialability is the degree to which an innovation can be tried on a limited time basis. Innovations that can be tried on a trial basis are more likely to be accepted. The last characteristic of innovations is observability, which is the degree to which the results of an innovation are visible to others. "The easier it is for the user to see the results of an innovation the more likely it is to be adopted" (Rogers, 1983, p.16). An innovation can also be re-invented, which implies that an innovation is changed by a user in the process of implementation (Rogers, 2003).

The second component of DOI is communication. Important in this area is that information is shared to reach a mutual understanding by all parties involved. The best communication occurs when two individuals who are communicating are similar in certain attributes, such as beliefs, education, social status, and the like (Rogers, 2003).

Time is the third component of DOI. Time includes things such as, passing through the stages of adoption, the lateness or earliness of innovation adoption, and the number of members that adopt an innovation at a given time. The innovation-decision process is the process an individual goes through when adopting an innovation (Rogers, 2003). There are five main steps in the innovation-decision process: knowledge, persuasion, decision, implementation, and confirmation (Rogers, 2003). Knowledge refers to gaining understanding of an innovation. Persuasion is when an individual forms either a favourable or unfavourable attitude about an innovation. Decision occurs when an "individual engages in activities that lead to a choice to adopt or reject the innovation" (Rogers, 1983, p.20). Implementation happens when an innovation is used. Lastly, confirmation occurs when "an individual seeks reinforcement of an innovation decision that has already been made" (Rogers, 1983, p.21). A decision may be reversed if

conflicting messages arise. The innovation-decision process leads to either: adoption, rejection, or discontinuance of an innovation. There are five levels of adopter categories: innovators, early adopters, early majority, late majority, and laggards (Rogers, 2003). For the purpose of this discussion, they will not be described in detail.

The final component of DOI is the social system. A social system is defined as “a set of interrelated units that are engaged in joint problem solving to accomplish a common goal” (Rogers, 1983, p.24). The structure of a system is defined as the patterned arrangements of the units, a unit may be things such as individuals, or organizations. Systems come together to try to solve a problem or reach a mutual goal, this decreases the uncertainty of an innovation. System effect refers to the effect that a system can have on the behaviour of its members (Rogers, 2003). Norms are “the established behaviours for members of a social system” (Rogers, 1983, p.27). Opinion leaders are individuals who can influence someone else’s behaviour. Opinion leaders have influence on the acceptance of innovations (Barker, 2004). Lastly, a change agent is someone who influences another person’s decision in a way that is seen as desirable for the organization (Rogers, 2003). Drawing on the DOI literature will help to understand why or why not the SFVSP was successfully or not successfully adopted.

## CHAPTER THREE

### METHODOLOGY

In chapter three the methodology for this study is explained. It begins with the research design, then discusses the sample, details the intervention used, and explains procedures and data collection. The chapter closes with a discussion of data analysis and an explanation of the data quality.

#### *Research Design*

This study was embedded within the overall evaluation of the School Fruit and Vegetable Snack Pilot Program (SFVSP) that is currently underway and used a multi method approach. It was exploratory in nature and qualitative methods were chosen to provide insight into the implementation of the SFVSP.

Different terms are used in the literature to explain the research design of a study that examines a policy or program. For example, Patton (1990) uses the term formative evaluation, which relies on process studies, and implementation evaluations. Formative evaluations also rely primarily on qualitative methods. Posavac and Carey (1997) use the term evaluation of process which examines and documents the extent to which implementation has taken place, the nature of people being served, and the degree to which the program operates as expected. Grembowski (2001) describes implementation evaluation in terms of four different designs. This study aligns with what he describes as longitudinal and descriptive, meaning that it describes program activities, events, behaviours at two or more points in time.

Similar to many published process evaluations, my study adopted a micro-implementation approach, as the focus was on how implementation was carried out within the school environment (MacDonald, 1998). As such, the implementation was examined from a bottom-up approach, as this can be associated with micro-implementation. A micro-implementation orientation assumes that a program is implemented as closely as possible to its original intent while acknowledging that programs are modified during implementation for a variety of reasons (MacDonald, 1998). The examination of the SFVSP also investigated both fidelity and reinvention, which are factors associated with top-down macro-implementation. Macro-implementation focuses on a policy or program as it goes through multiple stages, for example, from the initial development of a policy to the implementation of a program carrying out that policy. The SFVSP is a blend of both macro and micro implementation, as the program was examined within the school environment (micro-implementation), and was examined as it went from an initiative developed by the government, then accepted by multiple government ministries, then through food suppliers, and finally to the implementation at the school level (macro-implementation).

### *Sampling*

Maximum variation sampling was used, as variation in demographics, geographic location, and socio-economic status (SES) were purposely selected (Patton, 1990). Schools were recruited based on recommendations from the BC Ministry of Education. The final selection of the ten intervention schools was made by the Provincial Advisory

Committee, based on variation in demographics, SES, and geographical location. Table 1 provides descriptions and details about the school sites.

Table 1

*Characteristics of the Ten Pilot Schools*

School	Enrolment	Urban/Rural	Grades	Median Total Income (15years old+)	Median Household Income
1	184	Rural	K-7	\$22, 048	\$50, 058
2	241	Rural	K-7	\$25, 898	\$55, 155
3	81	Rural	K-12	\$13, 977	\$31, 363
4	197	Rural	K-7	\$18, 490	\$32, 970
5	404	Suburban	K-7	\$24, 638	\$44, 013
6	344	Suburban	K-7	\$28, 675	\$61, 486
7	482	Urban	K-7	\$26, 004	\$55, 632
8	403	Urban	K-7	\$26, 004	\$55, 632
9	181	Urban	K-7	\$20, 988	\$42, 026
10	394	Urban	K-7	\$20, 988	\$42, 026

Source: Statistics Canada (2002) and The Ministry of Education (2006).

Purposive sampling is defined by Patton (1990) as, selecting a sample to gather in-depth information. By selecting this sample the researcher can learn about the issues that are central to the purpose of the research. In my research I used purposive sampling, as I was looking for information rich cases, and purposive sampling is a way to gather in-depth information central to the purpose of the research (Guba & Lincoln, 1989; Patton, 1990).

All schools that participated were registered with Action Schools! BC and BC Agriculture in the Classroom schools. Action Schools! BC is a best practices model

designed to assist schools in creating individualized action plans to promote healthy living (Action Schools! BC, 2006). BC Agriculture in the Classroom is a non-profit foundation that works with educators to bring programs, resources, and awareness regarding BC agriculture to students (Agriculture in the Classroom Foundation, 2006).

Participants were people who were in some way involved in the implementation of the SFVSP, including: teachers, administrators, and in-school coordinators (ISC). All participants resided in BC, Canada. Individuals who agreed to participate in the study signed an informed consent explaining procedures for protecting their anonymity and confidentiality (Appendix B).

Recruitment of the teachers was done through the school administrators at the ten schools across the province. The administrators either talked to their staff or put a letter in their mailbox asking them if they would like to participate in a focus group session over the lunch hour. The teachers were notified that lunch would be provided by the research team to those teachers who participated in the focus group. ISCs were asked to participate in interviews and teachers were asked to participate in a focus group session through the administrator at their school. Ten administrators, nine ISCs, and 102 teachers participated in the study. Thus, teachers participated in the focus groups, and administrators and ISCs participated in interviews, either phone or face to face.

There were a total of ten focus groups, and focus groups ranged from three to 15 people. The ideal number of people for a focus group is between four to 12 people (Krueger, 1998). However, because of the limited time that staff could get together for the focus groups, the numbers in the focus groups did not always adhere to these guidelines. If there were more than 12 people in the focus group fewer questions were

asked because response time to questions were longer. Also, it was noted that some people did not express their views, this may be because it is easier to not talk when a group is larger (Patton, 1990).

The information gathered through qualitative responses allowed me to gain insight and information through talking to participants (Thomas & Nelson, 2001). The qualitative method helped understand barriers to improving fruit and vegetable (F&V) consumption and may help to design relevant programs for increasing F&V consumption in children (Thomas et al., 2004).

### *Intervention*

In November 2004, the Select Standing Committee of Health recommended that a *Fruit in Schools Program* be fully explored and supported. In response, three government Ministries (Health, Education, Agriculture) came together with industry and non-government stakeholders to develop a SFVSP (SFVSP).

The SFVSP was developed based upon ActNow BC principles, one of which is to ensure that each government Ministry makes policy and program decisions that promote healthy growth and development in childhood and reduce the risk of chronic disease in later years. The pilot was administered by the BC Agriculture in the Classroom Foundation and provided children in ten elementary schools across the province with BC grown fresh fruits and vegetables twice a week.

The primary objective of the SFVSP was to increase the F&V intake of BC school aged children. Secondary objectives of the SFVSP were 1) to increase the willingness of BC school aged children to try fruits & vegetables; 2) increase student's knowledge of:

F&Vs that are grown in BC; the importance of purchasing locally grown F&Vs; the health benefits of consuming F&Vs; and increasing student knowledge of the connection between food and farming.

The SFVSP was not intended to replace or augment school meal programs, which are designed to feed students who would otherwise go hungry. However, the school meal programs and the SFVSP both have the goal of modelling good lifetime eating behaviours.

Educational and promotional posters, stickers, postcards, and newsletters which focus on increasing F&V consumption, healthy eating, and hand washing were given to each of the schools to distribute to students and send home to parents. There was one designated ISC at each school, the ISC was either a parent, or staff at the school. The ISC was paid four hours per week, and their job included, sorting the F&Vs into the bins provided and delivering them to the classrooms, as well as keeping track of product delivery issues, and quantities of products. The ISC reported any problems with delivery or products to the project coordinator.

There was no prescribed curriculum intervention, however, a teacher manual was developed to provide support to staff. The teacher manual had information on each of the snacks that was provided to the children, as well as a list of websites for the teachers to use to get more information on healthy eating. It was the teachers choice as to whether they discussed this in their class.

### *Data Collection*

All data collection procedures and sources are outlined in Table 2. Semi-structured focus groups were selected in order to obtain in-depth information from the teachers about the program (Appendix C). Focus groups allow insights to emerge regarding a program as people discuss the topic, such responses may not emerge without the focus group, as people tend to comment on what others have said and go beyond their original response (Patton, 1990). Focus groups are an effective way to collect data from multiple people in a timely manner, and are a good way to collect information on programs implementation successes and barriers (Patton, 1990). The focus group questions were designed to obtain information to help answer the research questions (Krueger, 1998). The research questions were 1) how was the school fruit and vegetable snack pilot program implemented? (what was its fidelity and feasibility of implementing?), and 2) what were the issues, barriers, facilitators, and constraints that influence the implementation of school-based F&V schemes where F&Vs are provided? Open ended questions were related to the implementation of the program, and allowed for exploration of threads that emerged from the responses to the questions. Questions were asked in an order to help enhance rapport with focus group participants, thus more difficult questions were asked near the end of the focus groups (Krueger, 1998).

Table 2

*Data Collection Methods and Sources*

<b>Method</b>	<b>Data Source</b>	<b>Frequency</b>	<b>N</b>	<b>Total Interviews</b>
Face to face interview	School Administrators	Once	9 (administrators)	9
Telephone interview	School Administrators	Once	1 (administrator)	1
Face to face interview	ISCs	Once	8 (ISCs)	8
Telephone interview	ISCs	Once	9 (ISCs)	10
Focus Group	Teachers	Once	102 (teachers)	10
Tracking Logs	ISCs	Weekly	9	n/a

One face to face interview was conducted with nine of the ten administrators, one telephone interview was conducted with one of the administrators as they were unavailable for a face to face interview on the day of data collection. As a requirement of the project the ISCs completed a weekly tracking log where they recorded issues related to delivery. A face to face interview was conducted with eight of the nine ISCs, the one ISC who was unavailable for a face to face interview on the day of data collection was interviewed over the phone the following week. All nine ISCs were also interviewed over the phone in order to gather more information. Interview questions posed to the ISCs and the administrators were not the same (Appendix D and E). Teacher focus groups ranged from three to 15 people.

### *Procedures*

Data were collected throughout the implementation of the SFVSP, from September, 2005 to May 2006. I was the primary data collection instrument (Guba & Lincoln, 1989; Sparkes, 1992; Thomas & Nelson, 2001). There are issues related to being the primary data collector. Different people may interpret things differently, and thus I had to be aware of my biases and how this may affect my interpretation (Patton, 1990). Before I entered a school I would think about how any of my potential biases may affect my experience at that school for the day. In preparing for this role I was aware that I was going to have to be sensitive to participants' responses and behaviours (Thomas & Nelson, 2001).

I was grateful to have access to the teachers, administrators, and ISCs to be able to collect data from them. Gaining access and entry to a school site is often an imposition on teachers and staff, as they have very busy schedules. Thus, when preparing for my time spent at the schools, I was conscientious to be pleasant, appreciative, and thankful for the time they spent with me. I wanted to gain rapport with the participants, so that they felt they could trust me and provide me with the information that I was seeking (Thomas & Nelson, 2001). Before I started collecting data for this program, I made sure that I was comfortable with conducting focus groups and interviews. I had practiced through various other research projects that I was working on. I felt comfortable that I had practiced the techniques necessary to conduct successful focus group sessions, and interviews.

Probes and prompts were used during the focus groups and interviews to elicit complete responses to the questions (Krueger, 1998). The focus group and interview

questions were pre-tested for comprehension and wording (Krueger, 1998), with colleagues at the University of Victoria. All focus group sessions were audio taped.

Focus group sessions were organized through the school administrator at each school. Semi-structured focus groups and interviews were held at each school in February. Focus groups took place during the school lunch hour. If an interview could not be scheduled when the researcher was visiting the school, a telephone interview was conducted. This only occurred twice (one for an administrator, and one for an ISC).

Focus groups were audio-taped, which allowed me to maintain rapport and observe body language instead of trying to keep a complete written record (Krueger, 1998). A fellow researcher was present taking written notes during the session. Body language was recorded on a notes sheet if I wanted to document any observable body language. For example, if participants from the focus group were nodding their heads in agreement this was noted. The notes from the body language were then inputted to Nvivo along with the data collected from the focus group, and then analyzed accordingly. The focus groups were used to explore the facilitators and barriers to implementation of the program. Participants in the focus group were given the opportunity to contact the researcher at a later date if they had any other comments or concerns regarding the implementation of the program or the results of the focus groups. This occurred three times. One teacher approached me after the focus group to discuss an issue that had been debated in the focus group, I recorded notes from this discussion, and the data were incorporated with the other data from that focus group. Two other teachers sent me e-mails with comments regarding the program, and again this was incorporated into the data collected from their focus group session. Anonymity was ensured by removing any

information from quotes that could be seen as identifying a participant, also instead of using names, numbers were assigned to each participant.

### *Data Analysis*

The data from the focus groups and interviews were used to assess feasibility and fidelity of the implementation of the SFVSP. Comments were sorted according to whether they aligned with characteristics associated with fidelity or feasibility. For example, comments made regarding if the delivery of the F&Vs to the classrooms arrived on the scheduled days would align with fidelity, and would be sorted accordingly. These data were then used to help determine the fidelity and feasibility of the program. ISC tracking logs were reviewed specifically examining fidelity. Focus group data were also used to assess the overall process of implementation and any barriers and facilitators to implementation.

Audiotapes were transcribed verbatim by myself. Tracking log information was entered into Excel, compared to the product list provided by the project team and then coded. Nvivo qualitative software was used to manage the focus group and interview data and assist with the analysis of the transcriptions and documents for content and themes (Neumark-Sztainer et al., 2003). Nvivo also creates a template for organizing data. A codebook was not made. Coding was first completed by using the research questions as a guide for analysis. Coding was done to assign meaning to the information collected, coding then allowed the data to be pulled together and analyzed. Line by line coding was then completed for all transcripts. Themes were then generated from these codes, and then coded again into three higher order themes. Throughout the coding process, code

names were reviewed and changed as the analysis process evolved. After reading and interpreting the comments, themes and ideas emerged from the interpretation of these comments from the focus groups and interviews (Russell and Phillips-Miller, 2002). Memoing was also done on an on-going basis throughout the analysis of the data (Miles & Huberman, 1994). The memos were used to help me explain the ideas that were emerging from the data. Quotes were used to provide understanding for themes, by providing examples of quotes related to the themes (Thomas & Nelson, 2001). Conclusions were made from those themes. As suggested by Patton (1990) I looked for negative cases and provided possible explanations when such cases arose. For example, one school was particularly upset with the plastic wrapping that was associated with some of the products, whereas most other schools were pleased with this convenience. Upon exploring this further, it was determined that the community this school was situated in was very eco-friendly. Clustering was also done by grouping subjects and words together that had like characteristics (Miles & Huberman, 1994). Data reduction was done as part of the analysis. Data were reduced through the formation of groups and clusters, and by discarding information that was not relevant to the research questions (Miles & Huberman, 1994).

### *Data Quality*

Trustworthiness, credibility, transferability, and dependability are four constructs that determine data quality in qualitative research (Guba & Lincoln, 1989; Thomas & Nelson, 2001). These four constructs are from one school of thought, there are other perspectives; however, I have chosen to use the constructs from Guba and Lincoln

(1989). Trustworthiness, also known as confirmability is defined by Guba and Lincoln (1989) as the extent that one can trust the data are correct. For example, have the conclusions that have been made based on the data collected from the participants (Miles & Huberman, 1994). Credibility, also known as truth value, is defined as the extent that the findings of the study make sense. Has an authentic portrait of what we have been studying been found? Are the results credible to the people that we study? (Miles & Huberman, 1994). Transferability is defined by Guba and Lincoln (1989) as the extent to which conclusions made from a study can be transferred to another context. Lastly, dependability is described as whether the process of the study is consistent over time and across researchers and methods (Miles & Huberman, 1994).

Trustworthiness was addressed by conducting focus groups with multiple stakeholders, across ten schools. This enabled me to check for accuracy of the data, by determining if views were consistent across individuals. It also provided clarity to issues as the focus groups were conducted, as I could probe for more responses on issues that kept arising. As well, upon conclusions made from the data, alternate explanations to findings were explored (Kirk & Miller, 1986) by examining possible reasons for certain issues. For example, delivery of the F&Vs to the classroom was sometimes late. This could be for many reasons, such as the delivery person was sick, it did not get delivered, or something happened at the school that caused the delivery to be late. Interviews were conducted multiple times with the same people (ISCs), and with multiple teachers, this helps ensure trustworthiness as you have data from multiple sources, multiple times. Lastly, quotes and descriptions were given in the findings to provide examples of where

conclusions were drawn from, which enhances the trustworthiness of the data by supporting the conclusions with evidence (Thomas & Nelson, 2001).

There are six basic strategies to ensure credibility: triangulation, member checking, long term data collection and repeated observations, peer examination and evaluation of the findings, involving participants in all phases of the research, and lastly self-reflexivity (Thomas & Nelson, 2001). Credibility was addressed using within method triangulation, using the same method with more than one source (Thomas & Nelson, 2001). Multiple method triangulation also contributed to the credibility by using a variety of methods to collect data, such as interviews, focus groups, and observations, which allowed for comparisons across data; this helps to improve the confidence in the research findings (Lee et al., 2005). Member checks were done, where I went back to the participants to verify, and validate whether the interpretation was correct, which adds to the credibility of the research (Russell & Phillips-Miller, 2002; Sparkes, 1992). Data were collected for 11 months, and schools were visited three times during that 11 month period. This helps enhance credibility by having repeated times to collect data and be engaged with participants. My supervisor and colleague reviewed the findings and conclusions that were made and verified the results from the study. Participants were involved in all phases of the research; they were involved before the program was implemented to after the school year had ended. Lastly, credibility was ensured by identifying biases that I may have had before entering the field. I did this by thinking about what potential biases I may have towards a particular school or location, and being aware of those biases before entering the school or interviewing a participant from that school.

Transferability of the research depends on each individual context. If the reader feels the research is applicable to their situation, they can then generalize the findings themselves, and to their particular setting. That being said, many schools operate in the same fashion, and if a similar F&V program was implemented the results may be applicable to other school settings. Please refer to Table 1 for descriptions and details of the school settings.

Dependability was ensured by documenting the decisions made during data collection and analysis (Guba & Lincoln, 1989; Thomas & Nelson, 2001). Data collection decisions were documented on sites, usually after a phone call to my supervisor, and tracked through e-mails. This ensures that data collection is consistent. Data analysis decisions were also documented as the analysis occurred. These decisions are in paper format and are stored in a locked cabinet at the University of Victoria. I reviewed my memos to determine if my interpretations of the context, data and quotes were consistent.

## CHAPTER FOUR

### RESULTS

This chapter describes the themes that emerged from the qualitative data that were collected from the teachers, in-school coordinators (ISC), and administrator focus groups and interviews from the pilot schools involved in the School Fruit and Vegetable Snack Program (SFVSP). Common themes emerged from the analysis of ten focus group interviews with teachers (n=102), ten phone or personal interviews with administrators, and nine phone and personal interviews with ISCs. Each table is organized by comments made by teachers, administrators, or ISCs; the comments represent views from different schools. Table 3 provides an overview of the 18 emerging themes. Also, the themes and meanings emerged from the data generated higher order themes, which are: observability, complexity, and compatibility, and are outlined in Chapter Five. Some of these themes may also be considered concepts, however; for the purpose of this paper they will all be referred to as themes. These higher order themes are not mutually exclusive, but are characteristics of the innovation and are integrally linked with feasibility.

Table 3

*Themes Emerging from the Qualitative Data Analysis*

<b>Themes</b>	<b>Description</b>
Theme 1: Quality	Freshness and taste of the F&Vs
Theme 2: Quantity	The amount of F&Vs delivered
Theme 3: Parental involvement	The role and potential role of the parent in this program
Theme 4: Acceptance	F&Vs that the children liked and did not like
Theme 5: Peer influences	How children influence other children's eating behaviours
Theme 6: Children's behaviour	Observed behaviours of the children in the program
Theme 7: Exposure to new foods	Observed exposure to new F&Vs
Theme 8: Need for the program	Need for the program based on SES and food access and security
Theme 9: Delivery	Delivery of F&Vs to both the schools and the classrooms
Theme 10: In-school Coordinator	The role that the ISC plays
Theme 11: Support	Financial and staff support
Theme 12: Materials	Use of current materials in the program and the potential for other educational materials
Theme 13: Frequency	The frequency of the delivery of F&Vs
Theme 14: Use of local produce growers	Potential for the use of local produce in the program
Theme 15: Waste	Waste from unconsumed F&Vs, and from packaging
Theme 16: Variety	Variety of the F&Vs received
Theme 17: Role of the teacher	The role the teacher plays in the program
Theme 18: Publicity and Communication	Publicity for the program and communication between parties involved in the program

*Theme 1: Quality*

High quality of the fruits and vegetables (F&Vs) was seen as a facilitator to the program.

When asked what helped with the implementation of the program, participants stated that having fresh, good quality produce enhanced both the implementation, acceptance of the

program, and the willingness of children to consume the F&Vs. Quality was a theme that emerged from nine of the teacher focus groups, seven of the administrators, and six ISCs. There was a range in the quality of the produce delivered and this elicited comments describing both their high and questionable quality. Nineteen positive comments (out of a total of 39 comments) were made concerning the quality of the F&Vs, and 20/39 comments were made expressing concern about the quality of the F&Vs. The following quotes and table presents examples of the theme Quality.

It was just very disappointing when the cucumbers were really sour or bitter, the apples are really soft, just the quality, when the quality isn't there it affects their [kids] attitude towards the program for the next time.

(Teacher)

The fruit and vegetable quality is outstanding.

(Administrator)

The only thing I can think of is the freshness of the fruits and vegetables. The cucumbers were not as fresh as they should have been, they were rubbery and looked old.

(ISC)

Table 4

*Theme 1: Quality*

Teachers	Administrators	ISCs
For instance, the kiwi and the cucumbers yesterday, they were fighting over them, so when the quality is there it's just awesome.	The produce is high quality, it is not mushy, and there are no fruit flies.	This is healthy food, and the food is good.
I've been impressed with the quality of the foods that we've been getting, I remember those plums. Those were just the most amazing plums, so were a lot of the foods.	The sliced pears, some thought they were great, others thought they tasted more like sawdust.	Sometimes the carrots are bitter, they are not fresh.
There were a few times when we had packages that didn't smell right. The products in the bags go bad quickly.	The carrots don't stay fresh for long.	Freshness was a problem a few times.

It is apparent that there were differences in the quality of the F&Vs received. This appeared to affect the children's acceptance of eating the F&Vs. Thus, when the quality was good, children ate the F&Vs, when the quality was not as fresh they tended to eat less of the products, and this may affect them trying the product when they get it the next time. Good and poor quality was evident at all schools. Responses regarding the quality of the produce varied considerably, this may be based on individual experiences. For

example, if one teacher had repeatedly bad experiences with a product, they may have commented on this, whereas if a teacher did not experience poor quality produce in their classroom, they would refer to their positive experiences, despite whether the whole delivery to the school was of good or poor quality. Thus, one comment regarding poor quality produce does not reflect a delivery of poor quality to the whole school, it could just be that particular teacher had poor quality produce delivered to their classroom.

### *Theme 2: Quantity*

The amount of F&Vs delivered to the schools appeared to be greater than the need at some particular schools. However, there were problems with the quantities that were delivered to the classrooms. One portion was delivered to every school for each student and teacher. Possible explanations for the variation in need for quantity may be that younger children are less willing to try new F&Vs, and eat less, therefore there may be more leftover in the younger classrooms. The older grades may tend to eat more, and therefore one portion for them is not enough, and thus this was expressed by the teachers of the older grades. Another possible explanation regarding the variation in quantity could be that those schools located in an area of low socio-economic status (SES) and with higher need for food, may have children who are hungrier than those schools that are located in higher SES areas, and thus report a higher need for more F&Vs to be delivered. This theme emerged from six teacher focus groups, two administrators, and six ISCs interviews. Fourteen positive comments and 11 negative comments out of 25 were made regarding issues of the amounts of F&Vs received. The following quotes and Table 5 provide excerpts on the theme of quantity.

What should we be doing with all of the leftovers? Sending it down the hall, because I never have any leftovers, and I didn't realize that others did (response).

(Teacher)

At the beginning there was a lot of extra, for example there were so many extra apples we had to make apple pies. So maybe there could be a better way of calculating the numbers better.

(Administrator)

The quantities of some of the products were too much. The plums were our first experience with the program and we had no idea how many the children were supposed to get. We had no idea where they got their numbers from, we had so many leftover. An idea would be to tell us how many each child is supposed to receive. The tomatoes, the little cocktail ones in the plastic containers on the vines, we had no idea how many to give out, it is not like the apples where you give each child one apple.

(ISC)

Table 5

*Theme 2: Quantity*

<b>Teachers</b>	<b>Administrators</b>	<b>ISCs</b>
<p>The point might be that I don't think anyone has sat down as a group like this, this is the first time I have ever heard that there are leftovers. So we haven't actually done that as a group.</p>	<p>Sending the right quantity, sometimes too much, like the plums, if you could say a primary student will eat only one plum, but a grade seven you could send two for.</p>	<p>There are a lot of extra apples.</p>
<p>Some of the things that have come up here with us is that some of the classes have different needs. And I wouldn't want smaller portions. But we have two different socioeconomic groups at this school. So I'm finding in my class, there is never enough, and maybe in some other classes there is more and maybe in the school we would recommend measuring that and putting less in some boxes and more in others, that might be something because I didn't know it was different in other classes.</p>		<p>The second delivery that we get to reduce costs, I think could be cut in half because we always have leftovers from the first delivery.</p>
<p>It's a quantity problem.</p>		<p>There is excessive products, and it is a lot of waste.</p>

Based on comments made by the teachers, administrators, and ISCs it appears that there were differing needs and awareness in terms of the quantity of F&Vs related to the grade and the age of the children. Some teachers felt there was too much and others felt there was not enough F&Vs. Therefore, quantity issues should be addressed at the school level by determining which classes need more F&Vs and which classes need less.

### *Theme 3: Parental Involvement*

Increasing parental involvement was discussed by seven of the teacher focus groups, ten administrators, and eight ISCs with the theme often occurring more than once throughout the focus group sessions. Thirteen of 36 comments were positive regarding parental involvement in the program, and 23/36 comments were made expressing the need for more parental involvement in the program. The following quotes and Table 6 explain how the schools feel about parental involvement in the program.

I think that if you don't implement some sort of home involvement that it is not going to be as successful as you want it to be, because it won't carry over besides the two days a week what happens at school. So, I think there has to be some way to start involving the home, instead of buying six boxes of fruit loops, can you please buy me a pineapple.

(Teacher)

Provide more information to parents, something that we can send home to the parents, or a flyer we can post for our parent notice board.

(Administrator)

The parents have thanked me, and said my kids are eating fruits and vegetables.

(ISC)

Table 6

*Theme 3: Parental Involvement*

Teachers	Administrators	ISCs
<p>I think it would be great to have more connection with the parents and information going home, because unless their child tells them what they've had and goes with them to the grocery store and an opportunity could be missed and their child is just tried a little mini cucumber, but mom doesn't know that doesn't even think to buy at the store. And if something had gone home maybe she would have.</p>	<p>We do not always have healthy choices in our lunch program, but we are working on this. The PAC group serves Boston Pizza every Thursday, and then other fast food once a week (A&amp;W, and Subway), I got them to stop serving KFC.</p>	<p>The parents are very happy.</p>
<p>I wonder if providing sample recipes that could be sent home. If we are encouraging families to participate, that might help incorporate it in their homes.</p>	<p>The parents are asking, will we be able to do this next year?</p>	<p>The parents are supportive.</p>
<p>It is a parent education thing to, and I think that is another really important piece of this, I mean I know we are doing this for the kids for the long term, but for now, as the generation of parents out there who they take their kids out to McDonald's 2 or 3 times a week if they ever take them</p>	<p>Once in a while a parent would say, if I want to send my child with chips to school that is no one's business but mine, so you have to be sensitive.</p>	<p>Things are working well, feedback from the parents and PAC is key, they have a big influence on school and teachers.</p>

<p>out, or they deliver it here, and that is not just here, that is at every school, you will see McDonalds arriving at lunchtime.</p>		
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The data suggest consensus on the need for more parental involvement in the program. Educating and providing information to send home to the parents should be part of the program to increase its success. This would be consistent with other multi-component school-based interventions that have been successful. Comments were also made that parents were happy and supportive of the program. This affects implementation because support of the program helps with its implementation. For example, if parents were not in support of the program they may not let their children participate and therefore this would be a barrier to implementation because if the parents do not let their children participate, the program could not be implemented, as parents must consent to their child's participation.

*Theme 4: Acceptance*

The teachers, administrators, and ISCs were able to provide valuable feedback based on the F&Vs that the children liked and disliked. The following is information from three of the teacher focus groups, four administrators and three ISCs. Few comments were made about what F&Vs the children did not like, and the majority of the comments were made on what F&Vs they did like. The quotes and Table 7 provide excerpts on the theme of acceptance.

The plums were a hit. They like the variety of apples. The tomatoes, many of the students tried them, they liked them. They like the whole pears and the sliced up ones. They like the oranges. They like the kiwi, but of all the things, that was the one that was leftover the most, and the carrots were okay, but too many in a bag, and the students were willing to try cucumbers and most of them liked it.

(Teacher)

The cucumbers in the bag, the kids loved them, they were gone, the kids were like, "Oh cucumbers, that rocks, they're my favourite".

(Administrator)

Carrots are not a hit, they are the least favourite.

(ISC)

Table 7

*Theme 4: Acceptance*

Teachers	Administrators	ISCs
Some of my kids wanted to come back for thirds (kiwi). My children like cucumbers too.	The kids liked the sliced apples more.	Mini cucumbers, they loved them.
My kids loved the cucumbers, they tried one and then bang, they were right back in line and wanted another one.	They liked the plums and kiwis.	They just loved the cucumbers.
I think also, once the children have had a variety it would be helpful for us to tell you what the children liked and what they didn't like, at this school the children don't like carrots. We had so many carrots left over, they just don't like them, and it wasn't that they didn't try them. They didn't like them.	The sliced apples and pears, the kids loved them.	

Based on the information above, mini cucumbers were well received, as well as plums, kiwis, and the sliced fruit. The least liked item was carrots. This relates to implementation because if too many products are delivered that the children do not like it may be considered a negative aspect to the program as it will increase waste. Further if more foods can be provided that the children do like, it could be seen as a facilitator to implementation of the program as it will be readily adopted by the children.

### *Theme 5: Peer Influences*

Eight of the teacher focus groups, five administrators, and two ISCs discussed the positive power of having the program implemented at school because of the positive effect that peer influences had on the children. In total 23 comments were made in this regard. The following quotes and Table 8 explain this theme.

There is this one boy who said you know I don't eat fruits and vegetables and I told his mom to sign the form just in case and that if he feels like it, at least he has a choice, and then when he saw all of his friends eating it, he joined in. I liked the way it was casual and not forced on them.

(Teacher)

It is almost the norm now, or maybe even peer pressure to eat it, because the other kids are eating them.

(Administrator)

A few moms have said there are fruits and vegetables the kids won't eat at home, but because of peer pressure they are trying it.

(ISC)

Table 8

*Theme 5: Peer Influences*

<b>Teachers</b>	<b>Administrators</b>	<b>ISCs</b>
<p>I think they're not bringing the pop that they used to bring in the cans and different sugary items because they have learned and other kids notice, oh that's healthy or that's not healthy.</p>	<p>They devoured the cucumbers, if a parent had put that in a kids lunch, it probably would have gone untouched, but because the kids see other kids eating and trying the fruits and vegetables they try them as well.</p>	<p>I guess the idea is that if they see other kids eating it they will too, but maybe they could hand it out before lunch.</p>
<p>Having it presented at school might have made a difference as well. I knew a little fellow who would never have a tomato, he ate about 18 of them, and I don't know if that would happen at home.</p>	<p>The kids are eating fruits and vegetables. As kids saw other kids eating fruits and vegetables they started eating them, there is more participation.</p>	
<p>I like the program, last week we had carrots, and everybody got their bag of carrots and one little guy said, I'm not going to have that. So he went and sat down on the floor, and he saw everybody else eating carrots. So he came back and got a bag of carrots and ate them. I found that quite good about it, because they follow each other's example, a good example.</p>		

Teachers, administrators, and ISCs felt that consuming the F&Vs in the classroom had a positive effect on children trying the products, because of peer influences. Seeing other children try the F&Vs enticed other children to try them as well. This shows that this is a positive component of the SFVSP, and furthers the evidence for support of providing children with food as a component of a healthy eating school-based program. Peer influences also affect implementation, as a program may be more readily adopted if more children are involved and supporting the program, this appears to be happening through peer pressure, and thus could be seen as a facilitator to the program.

#### *Theme 6: Children's Behaviour*

All teacher focus groups, administrators, and ISCs mentioned how the program had influenced the snacks that the children were bringing to school and how some of the general attitude towards healthy eating had changed at their schools. In fact there were 72 comments related to this impact. The following quotes and Table 9 reflect on comments made regarding this theme.

They started to choose healthier snacks on the days that we weren't having the snack provided. I started to see more fruit coming out during snack time on non-fruit and vegetable days.

(Teacher)

The children ask for more fruits and vegetables, we now have a basket of fruit in the office. The program has replaced our snack/treat day, which was sometimes an unhealthy food.

(Administrator)

They love it, parents can't believe it, when they go to the grocery store and go through the fruits and vegetables section the kids are asking for certain fruits and vegetables.

(ISC)

Table 9

*Theme 6: Children's Behaviour*

Teachers	Administrators	ISCs
<p>I think if you look around the school now you don't see a lot of the junk food that we used to see, the chips and the pop.</p>	<p>The kids will eat fruits and vegetables when they are accessible to them, and they will choose, if it is there they will eat it.</p>	<p>A couple of times the kids won't try the fruit or vegetable, but then the next time we have the same one they will try it. For the first two weeks in January when we didn't have the program, everyday, five times a day the kids would say, "Mrs. XX, when are we getting the snacks?" The kids anticipate it, they look forward to it, and they are disappointed when it is not snack day.</p>
<p>I've learned that the kids will eat fruits and vegetables. It's true, how many kids tell you they don't yet. I didn't know at the beginning, if they would eat as much as they eat. But I've seen them increase the amount that they eat.</p>	<p>If they are given the choice they will choose fruits and vegetables because they taste good. If they are given the option to eat healthy they will.</p>	<p>We don't have donut and chip days anymore, the fruits and vegetables have really taken over.</p>
<p>For some of the kids the snack fills the gaps in their lunches and overhearing a few conversations the past couple of months, there was a conversation about how they don't want to go and eat their candy because they've already</p>	<p>A lot more kids are trying things, they prefer healthy snacks.</p>	<p>Behaviours in the classroom have improved.</p>

<p>had their snack, so some of them bring a lot of sweets as snacks from home, whether they pack them or the parents do. So, some kids are substituting, some of the kids are saying, well I'm, going to have the cucumber not the candy and I've overheard those conversations.</p>		
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It is evident based on the comments above that staff had observed changes in the children's behaviour. They thought children were choosing healthier snacks on the days that F&Vs were not provided, as well they were asking for more F&Vs, and were disappointed if they did not get them. When the F&Vs were accessible and available to them they were choosing to eat them over unhealthy snacks. This is important information in relation to the outcomes of the study, in relation to dose and F&V consumption. Dose of the program could potentially be increased based on the above comments. Researchers could expect to see potential increases in F&V consumption also based on these comments.

*Theme 7: Exposure to New Foods*

All ten teacher focus groups, three administrators, and all ISCs involved in the program mentioned that the children at their schools were introduced to new foods that they had never tried before. A total of 64 comments reflected this theme which reoccurred throughout the focus group sessions with all of the schools. The following quotes and Table 10 further explore comments regarding this theme.

For me it was the prune plums, because I grew up with prune plums. And I was absolutely amazed and shocked that they had never tasted one. The stuff on the outside, the white they thought it must be dirt and it would have to be washed off. And why was that there, and we went from five or 10 people. The first time around, the classroom, taking one, to literally fighting over them, and there were lots in the school, and you couldn't have enough of them. If you brought in 20 for each of them every day the week, they would've eaten them all, and that was early. That was the first one. That's the one that sticks in my mind, because it was such a shock to me I didn't know that kids didn't know about these things and it's not a cultural thing. Some fruits or vegetables you think OK, culture wise, they wouldn't be eating that stuff, but this transcends culture. It's just they are not exposed to. That was my big thing.

(Teacher)

Through the year I have learned how little exposure many of our students have had to a variety of fruits and vegetables.

(Administrator)

The First Nations students, we are teaching them healthy nutrition, they just don't get that type of food, it gives them an opportunity to try things.

(ISC)

Table 10

*Theme 7: Exposure to New Foods*

Teachers	Administrators	ISCs
I think seriously most of them have never had kiwis before.	It has raised awareness that they are healthy and taste good.	The kids are excited and are trying things that they otherwise would not have tried. If we have a repeat of a fruit or vegetables they go, "oh ya, I love that".
I was really shocked this morning when I did the survey that half the kids had tried something they hadn't tried before. These are very common fruits and vegetables in B.C. and the fact that they had tried something new that was scary on one hand, but it's good they we are introducing it to them.	Kids have said this is better than candy, or I never knew I liked kiwis or tomatoes.	The fruits and vegetables are right there, they are being seen, and when the fruits and vegetables are there they get eaten.
You honestly do assume that the children do eat these things. And they have no idea and the first bite it's like oh wow. That's what it looks like inside, and I really wish it was cultural, but it isn't. So that has been something that we have learnt.		Things like kiwi, tomatoes, and cucumbers they have never seen them before.

It is clear that teachers, administrators, and ISCs perceived the program was beneficial for introducing students to F&Vs that they may not otherwise try. Many staff were

surprised by the number of students who had not tried the F&Vs that were provided in this program. Also, an important benefit that came from introducing the children to new foods, was that teachers were able to discuss this with the children and learn more about the children and become aware of possible disadvantages that they may have in their lives. It also raises awareness in regards to possible poverty issues as families may not be able to afford certain foods such as fruits and vegetables. This is an important variable to note in terms of determinants of health. Children that have not tried the F&Vs can have an impact on implementation in two ways; 1) it could be a facilitator to implementation, as they are excited and may want to try the new food, or 2) if a child has not tried a food they may be sceptical to try a new food. Thus, the program could be easily implemented if children are excited to try new foods, or implementation could be met with resistance if a child does not want to try a food.

#### *Theme 8: Need for the Program*

All ten teacher focus groups, eight administrators, and all ISCs indicated the need for this program based on poverty rates, lack of access to quality foods, and lack of nutritious foods being brought to school. This was a reoccurring theme throughout the focus group and interview sessions that was mentioned 60 times by all participants. The following quotes and Table 11 reflect on comments made regarding this theme.

I suppose this politically goes beyond the government rhetoric about children should be nourished properly. So it's nice to see there is actually funding going into trying out a program like this. It is successful, it fills the gap for some kids

that just don't have these kind of things in their lunches. Some of the lunches, nine-year-olds eight-year-old seven-year-olds making their own lunches to begin with, with the minimal amount of materials at home, probably for whatever reasons.

(Teacher)

We have a lot of impoverished kids here who have been raised on processed foods, and they will take the extras home at the end of the day, and that is gratifying to see.

(Administrator)

A lot of kids don't have fruits and vegetables at home and they have really taken to them. These kids get a lot of fast food at home.

(ISC)

Table 11

*Theme 8: Need for the Program*

Teachers	Administrators	ISCs
The kids are grateful to have that alternative as a food source in the school, especially in the community that we live in where nutrition is an issue, eating is an issue.	Having the fruits and vegetables in the school is very important. This community has low SES, food issues, so it is important for the kids to have this experience in school.	It is meeting needs of the students. It helps them get through the morning because a lot of them don't eat breakfast.
I think it does introduce kids to fruits and vegetables, and certainly in this community they would not otherwise try.	It is an appreciation for food because some of our kids buy groceries with their allowance.	Even if they aren't eating fruits and vegetables at home, they are getting them at school.
I think it's really important for these kids, a lot of them come to school without eating breakfast. And a lot of them have eaten their lunches by recess if they have a lunch at all. So as a school we've tried to provide as much healthy food as possible.	For some kids here it is the only fruits and vegetables that they get.	We give out leftovers individually, the kids from lower SES, fruits and vegetables are expensive, at least they are getting something healthy. It is a good message.

Teachers, administrators, and ISCs strongly articulated a need for this program, because of family and/or community SES some children do not eat breakfast, and have basic issues with food security. Without the school program, children would consume very few F&Vs. This could be seen as a determinant of health, because if families do not have enough money to buy fresh F&Vs, this will affect health, as outlined in the review of literature the benefits of eating F&Vs. This theme addresses implementation, as it is a

facilitator to implementation. For example if there was no need for the program the schools may not be receptive to it, and regard it as an extra task during the day to their workload. Thus, perceiving a need for the program can be seen as a facilitator to implementation as the program is readily accepted.

*Theme 9: Delivery*

Delivery of the F&Vs to the schools, as well as to the classrooms, emerged as a prominent theme from eight of the teacher focus groups, nine administrators' interviews, and all ISCs interviews discussed this theme. Delivery was used to assess the fidelity of implementation. Half of the comments related to delivery were positive and half spoke to challenges with the delivery. The following quotes and Table 12 provide a sample of comments that encompass Theme 1 - Delivery.

A big part of the success is that it's there and it's there regular and routine [delivery of the F&Vs]. You know, I walk into my classroom at 10:30 and it's always been there. It's always been routine, so I think for it to be successful is the routine and regularity of it.

(Teacher)

The only thing is that the odd time the delivery has not come, like it has come a day late or something, and the kids expect it on Tuesdays and Thursdays.

(Administrator)

The only problem was a local delivery problem, and that was that the delivery arrived on the wrong day, but I contacted [...] about that and [they] corrected the problem quickly. You just need to make sure that you have enough time to get them out and the kids can eat them.

(ISC)

Table 12

*Theme 9: Delivery*

<b>Teachers</b>	<b>Administrators</b>	<b>ISCs</b>
<p>We can focus on the teaching part. If we had to use the teaching time to grab the snack bring the snacks to the classroom, that would cut into the teaching time, because we would have to prepare before we do the teaching. Especially because this is fresh fruit, so it can't be prepared the day before. It has to be right there.</p>	<p>The bins make it easy.</p>	<p>Once the produce started getting delivered here, and the consistency of the delivery was a facilitator.</p>
<p>There was an inconsistency after Christmas, they missed two weeks before it got started. So even right after the break they were so used to Tuesdays and Thursdays, Tuesday they were looking for the snack and the other days they would bring snacks themselves, and when it wasn't there they were kind of put out, they said I don't have my snack.</p>	<p>Delivery, once it started to be delivered directly to the school it was okay.</p>	<p>The inconsistency of when the products are delivered. Usually they arrive the day before the scheduled day, and we don't know if they are coming at 9:00AM or 2:00PM.</p>
<p>It includes a place to come and deliver and you can't just dump it at the doorstep, and</p>	<p>The fact that it is provided right to the classroom.</p>	<p>Everything is running smoothly, we get the products delivered in the morning.</p>

<p>we have a place. We are lucky, but a lot of schools probably don't. And so in that respect, as long as our coordinator and everything is here and we have a place to put it, and the carts to take it around in the bins and things, we are all set.</p>		
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Having the F&Vs delivered both to the school and to the classrooms helped with the ease of implementation of the program. The blue bins provided an easy way to distribute the F&Vs to the classrooms. Delivery of the F&Vs to the school was also expressed as a barrier to the implementation of the program. The consistency of delivery of the F&Vs to the classroom appeared to be problematic in some schools while not at others. Delivery was problematic in that it did not always arrive on time or on the same day. This would then cause the program to be implemented when not intended, for example on a different day or a different time. The problem with this was that the children were disappointed when this happened, however the F&Vs were always delivered to the classrooms once they arrived. Delivery of the F&Vs to one schools was affected by their geographical location. Initially staff from one school picked up their delivery although at times the F&Vs were not ready and then they had to wait or come back at a later time. Based on feedback from the school to the project coordinator, F&Vs were subsequently delivered to the school. In some instances weather influences driving conditions which delayed delivery. Delivery is an important theme as it affects the ease or difficulty of implementation of the program. Direct delivery to the classrooms is convenient for

teachers who do not have to take the time to pickup the F&Vs, facilitating program implementation. Fidelity of implementation was high. When F&Vs were not delivered as scheduled, the program was not implemented for that day, however tracking logs from the ISCs showed that they were delivered to the school the next day and then subsequently delivered to the classrooms a day late. There was always two deliveries a week to the schools. There were notable differences in the responses from the teachers, administrators, and ISCs as teachers commented less frequently about scheduling difficulties. This may be an effect of the varying roles of the individuals involved. Teachers valued the ease of the program and may feel more ease of implementation because their role occurred once the F&Vs arrived at the classroom, whereas the ISCs were affected by it more as they had to report problems with delivery, wait for the delivery to arrive, and then deliver the produce to the classrooms.

#### *Theme 10: In-school Coordinators*

The ISC role was mentioned by all ten of the teacher focus groups, administrators, and ISCs as being a facilitator to the implementation of the program. Forty-two positive comments and three negative comments (out of 45 total comments) were made concerning ISCs. The following quotes and Table 13 exemplify this theme.

You'll be successful if you keep the support in place, for example to keep the coordinator in place, otherwise if that falls apart it goes as another job to the classroom teacher. I don't think it would be as successful.

(Teacher)

That's everything, we wouldn't do the program without that role.

(Administrator)

Being a coordinator and having one person in control I think works better than having multiple people in control.

(ISC)

Table 13

*Theme 10: In-school Coordinators*

<b>Teachers</b>	<b>Administrators</b>	<b>ISCs</b>
<p>The additional staffing is essential. There are too many things in the school's initiatives that come and they get additional resources, then those resources get pulled back, and it gets left up to the teachers to do and there just isn't enough manpower or the time in the school to run it.</p>	<p>It is pretty key, I don't know how you would do it without them.</p>	<p>I run the whole thing, I am the contact person for the school.</p>
<p>How easy the program is. And the fact that the in school coordinator brings everything. And there is nothing other than you having to have to pass it around, which takes a minimum amount of time. There is no worry, like has the food been washed.</p>	<p>The coordinator is what makes the program work.</p>	<p>You have to have somebody.</p>
<p>I don't think the program would work if there wasn't such a position.</p>	<p>It is very important, you could not do it without them.</p>	<p>It is necessary.</p>

Clearly all interviewed stakeholders involved in the program felt that having the ISC is essential for the program to be implemented successfully. Staff felt that the program could not be run without having a person to do the job of the ISC. Thus, this role is crucial to the sustainability of the program, and it appears that schools would not support the implementation of the program without this position.

*Theme 11: Support*

When teachers were asked what contributed to program success, nine teacher focus groups, ten administrators, and two ISCs indicated that support in various forms that was given to them enabled easy implementation of the program. They noted that without the funding provided the program would not be successful. All the responses to this query were positive in regards to the supports that the schools were receiving. The following quotes and Table 14 present focus group and interview comments that contribute to theme 11 – Support.

I think the success of the program depends on it being free and widely available and I know that will be difficult. It has to be equal access.

(Teacher)

The financial structure if it doesn't continue [would be a barrier].

(Administrator)

The two extra hours that are given are necessary.

(ISC)

Table 14

*Theme 11: Support*

<b>Teachers</b>	<b>Administrators</b>	<b>ISCs</b>
Money/funding is needed	Yes, we would continue the program provided there was funding and support.	The time provided is great.
I think the big thing is that it's self-sufficient program. It doesn't require additional resources, because that's when a lot of things run into problems because there's not a lot of extra time or staff. It would be a big obstacle if the coordinator was not there.	Reasonably priced fruits and vegetables (make it work).	
Just funding it. The smaller schools, we just don't always have extra money. We rely on donations and scraping together bits and pieces. So this is a program that is funded, that makes a huge difference.	Funding, some of this stuff is expensive, like the tomatoes on the vine, but this is up-front prevention that will help with long-term health costs.	

It is clear that all participants valued the support for this program. This includes financial support for the ISC, and having the F&Vs provided to children free of charge. With this support the schools were pleased that they did not have to search for funding to support this program.

*Theme 12: Materials*

During nine teacher focus groups, and interviews with ten administrators, and one ISC feedback regarding improving the program included requests for additional educational materials that accompanied the delivery of F&Vs. Seven of 39 positive comments were made on the resources provided, and 32/39 comments were made on ways to improve resources provided to the schools. The following quotes and Table 19 reflect the comments captured for this theme. Table 15 is organized into comments made from teachers and administrators. ISCs are not reflected in the table, as only one ISC commented on this theme, and their view is expressed below.

I don't have any stories, but the one thing that I do like is occasionally, there is some information about the product, like the nutritional quality. And we talk about it in class. There's a lot that I didn't know about it and the kids are interested in that as well. I suppose if we had more information about it. I could look it all up, but I frankly don't have the time, that was a plus for my class.

(Teacher)

The resources started out strong, but to maintain it there needs to be new things sent out every now and then to support, establish and complement.

(Administrator)

When the bins first came, they had pamphlets in them, the teachers didn't want to deal with them. Most of them ended up in the recycling bin, and that seems like a waste of money, maybe there is another way to get the same message across.

(ISC)

Table 15

*Theme 12: Materials*

Teachers	Administrators
<p>It's been mentioned, making sure that we get information about the fruits and vegetables. I don't know if it's the coordinator to get the information, or if it is part of the program, but I think it should be mandatory to have nutrition facts, what it does for you.</p>	<p>The map was a really good resource, there was one kid who thought the kiwi was fish eggs that we were getting him to eat, so I showed him on the map where kiwis were grown.</p>
<p>I like those ideas about the videos, if we could see some of the farms.</p>	<p>The posters and bins are attractive.</p>
<p>I like the idea posters and information coming and being dispersed periodically throughout the year, because the poster is used as a starting point for discussion for my grade ones, like the wash your hands posters, and that helped them to be more careful with their personal hygiene, that before you eat you make sure your hands are clean. So that spurred on other things from the poster, we got a bottle of waterless soap, germ blaster. I like the idea of every three months another poster arrives, so then you have a different angle to discuss.</p>	<p>If you had catchy songs for the kids, that could be fun and motivating, or a movie clip where you interview the kids about the benefits, little anecdotes.</p>

Teachers, and administrators liked the posters, and bins that were provided. However, they felt that materials provided to the teachers could be improved, by providing things such as nutritional facts, or a video or song that could be used in the classroom.

Moreover, providing information to the teachers periodically throughout the year would be beneficial in mitigating teachers feeling overwhelmed when reams of materials arrive at once. Providing information to the teachers also offers an opportunity for learning,

which is a benefit of the program. Providing the teachers with too much information may be seen as a barrier to implementation as teachers may feel overburdened with information and therefore not use the information. Therefore, information that can be easily used and does not overburden the teacher will be a facilitator to implementation.

*Theme 13: Frequency*

There were differing views on the frequency of serving F&Vs to the children. Six schools, one administrator, and three ISCs commented on this theme. Half of the comments made were on increasing the frequency, and the other half of the comments were made on reducing the frequency of the program. The differing views are expressed in the following quotes and Table 16, because only one administrator commented on this theme and their view is expressed below.

My biggest complaint is that it would be nice if it happened everyday instead of twice a week.

(Teacher)

Have it three times a week (Monday, Wednesday, Friday), rather than just Tuesday and Thursday.

(Administrator)

The kids in the beginning, on Tuesday and Thursdays were so excited, and were eager to eat, and go home and tell their parents, and they wanted to know what the

fruit and vegetable was going to be. Now it is the norm and the enthusiasm has dropped. It is too long of a program, having it two times a week, every week, maybe having it once a week or once every other week, because they eat more when they are enthusiastic, and they are becoming less enthusiastic.

(ISC)

Table 16

*Theme 13: Frequency*

Teachers	ISCs
I think having it twice a week is nice because it's a treat, and if we had it everyday, it would probably just be one more thing.	It is too long of a program, it is getting to be a bit much. It is time consuming in the classroom to have them eat it in the classroom.
I'm just wondering if it's too often, is twice a week too often? I don't know what the price is for the government or whoever is its footing the bill. Maybe once a week would be better. It might keep the interest up. Or maybe even less than that.	It takes a lot of time, once a week would be better. It takes time to count and deliver it, it takes time away from other kids when we leave the classroom, so I feel sorry for the teacher.  (Note: this comment was made by an ISC who was filling in and not getting paid, and was an educational assistant at the same time).

As indicated there are differing views as to how often the program should occur. Some participants perceived that the program could occur everyday, whereas others felt that the program should happen only once a week to ensure that enthusiasm for the program was maintained. This is an important implementation issue, as if some schools feel they want to increase the frequency, whereas others feel they want to decrease the frequency, there could be an issue at the schools who want to decrease the frequency with regards to the ease of implementation, or the need of the program. This has implications for dose of the program, as a common dose for the schools should be achieved, and there were differing opinions on the dose needed. Further examination of this may be needed. The difference in some schools wanting to increase the frequency of the program and other schools wanting to decrease the frequency of the delivery of the program may also be attributable to the need for the program at a particular school, for example if the school is located in an area of low SES.

*Theme 14: Use of local produce growers*

A theme that emerged from four of the teacher focus groups, one administrator and one ISC interview was that they felt that local growers in their area should be used to provide some of the F&Vs to the school; ten comments in total were made regarding this. This may be considered an implementation issue as some schools may not support the program if local growers are not utilized. The following quotes and Table 17 reflect on comments made in regard to the theme Support for Local Produce Growers. Table 17 reflects comments made by the teachers, as only one administrator, and one ISC commented on this theme, and their views are expressed in the quotes below.

Since we're supporting agriculture initiatives in B.C. I think [our area] was missing the boat here, because we were not able to get [our area's] fruit, and I think, if the program is done provincially next year local areas should have the chance to go to fruit stands and buy their produce somehow, but when you get [some other region's] apples and there are [our] apples sitting here.

(Teacher)

Provide foods from local suppliers whenever possible.

(Administrator)

You should look into local growers, what is right here in the community, that would help with sustainability.

(ISC)

Table 17

*Theme 14: Use of Local Produce Growers*

<b>Teachers</b>
We have a little grocery store just up the street that gets produce delivered two times a week. So it could incorporate all that together. It is easy to pick it up from there and would reduce the cost.
A little less [in some regions], but I would say starting off in September, October, use local purchase (of F&Vs).
I have a grade 6/7 class, they were very interested in where the stuff came from and asked why we didn't buy local. For example, you could have got baby cucumbers and tomatoes from our [...] greenhouse. So we are quite interested in why we had to go far away.
Making it cost effective, if you use local stores then you don't have to worry about delivery.

Although all of the produce was local to BC, teachers expressed a strong interest in using local growers to help supply F&Vs for the program. They felt it may reduce costs, and that it would be nice to use growers that were local to their community. This issue was prominent for the teachers and less for the ISCs and administrators. This may be because the administrators and ISCs did not feel comfortable bringing this issue up, whereas the teachers in a group setting felt more comfortable discussing the issue because they had support from their colleagues.

*Theme 15: Waste*

Waste of both the packaging of some of the F&Vs and that occurred because produce was thrown out (portion size) seemed to be a barrier for many of the school teachers. The children could not always eat all of the fruit or vegetable and thus, large portions were thrown out, and teachers felt that this waste was a negative aspect of the program. However, the teachers enjoyed the ease of the pre-packaged F&Vs, and they felt the pre-packaged items produced less waste of uneaten F&Vs. Eight teacher focus groups, five administrators, and seven ISCs commented on this theme. Just over half of the total comments made were concerning the amount of waste from the program, and a little less than half of the total comments made were supporting the packaging and waste (lack of) from the program. These differences may be because those who feel there is too much waste from leftover food are teaching younger children and they tend to eat less, and those who report little waste from leftover food teach the older grades whose students can eat more. Lastly, teachers who were concerned about the environmental impact appeared to be bothered more by the plastic packaging from some of the products whereas some teachers supported the snack despite the plastic packaging. This environmental orientation may explain the differences in the responses regarding waste from packaging. The following quotes and Table 18 provides excerpts from the transcripts regarding this theme.

The improvements going from whole apples and whole pears to the slices, I thought that was brilliant. It was just so much less waste.

(Teacher)

There is no waste, if there are any leftovers, the kids take them.

(Administrator)

Packaging, there is extra litter to be picked up.

(ISC)

Table 18

*Theme 15: Waste*

Teachers	Administrators	ISCs
<p>I think over time it has improved, when it first came out, there were whole apples, and whole pears, and a lot of it was wasted, and now we're getting them already cut up and in plastic bags, and I think that is better because you don't get the waste.</p>	<p>There is never any waste, not sure if that is because it tastes good, or they are hungry.</p>	<p>The whole fruits choices are inline with what people like here.</p>
<p>And we had a few little moulding problems. And I haven't seen it recently. The other big barrier for me is the plastic. I know there is some balance between having the kids enjoy the snack already cut up and prepared. But boy, I think this world that we live in that to have that plastic come out all the time. When nature provides the cover on the Apple is to me a tough one. But certainly, I believe, if you sat the pear there and the sliced pear there, they would choose the sliced pear.</p>	<p>The packaging, students often wouldn't eat the packaged fruits and vegetables.</p>	<p>The negative is too much packaging.</p>
<p>Packaging is a minor detail. The packaging can be irritating. But when I compare what the kids bring on their</p>	<p>The leftovers are consumed within one or two days.</p>	<p>The fruit that comes in the baggies is good because it is quick, clean, and it is cut up so it is easy to eat.</p>

<p>own for a snack, versus a pre-packaged bag of chips, there's a huge difference with the quality that they are getting, it really isn't a question.</p>		
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The data revealed that the sliced F&Vs that come pre-packaged were convenient for teachers, and produced less waste in terms of uneaten produce. However, the plastic in the pre-packaged F&Vs was perceived as a barrier for some participants, as they did not like the extra litter that it produced. Despite not liking the plastic wrapping of these products, participants felt having the children consume the F&Vs outweighed the negative aspects associated with the plastic wrapping. The issue of plastic packaging may have been a consequence of the program that the schools and the government had not prepared for.

*Theme 16: Variety*

Six of the teacher focus groups, four administrators, and four ISCs suggested that increasing the variety of F&Vs would be beneficial to the program, this comment was made 14/16 times. Only two of 16 comments coded for this theme expressed an adequate variety was provided. The following quotes and Table 19 provide excerpts on the theme Variety.

More variety, could you bring in blueberries or raspberries or Okanagan fruits, peaches and melons that grow down there.

(Teacher)

The choice of veggies is great, but maybe carrots arrived once too often, we had them three times.

(Administrator)

It is also good when the varieties are changed, for example, if you are having apples on Tuesday, they could be green, the Thursday red, because a lot of kids won't eat the green apples, so it is helpful to change the variety to get kids to try more.

(ISC)

Table 19

*Theme 16: Variety*

Teachers	Administrators	ISCs
<p>The mini cucumbers were popular, but more variety of the vegetables, because the kids are eating fruit all the time, and they will gravitate to the fruit, but with things like diabetes and stuff we have to move more away from the fruit and more towards the veggies. I would like to see more veggies coming through. It is just the carrots, they just don't eat them because they're used to getting carrots in their lunch.</p>	<p>Maybe try new foods, like raw peas in pods.</p>	<p>It would be better if they changed the fruit during the week, for example, we get kiwi's on Tuesday's and Thursday's, it would be better to change the fruit on the Thursday.</p>
<p>Watch that the same fruit is not sent twice in the same week, like apples Tuesday's and Thursday's.</p>	<p>Maybe some variety, like go outside of BC.</p>	<p>The same fruit or vegetables comes on Tuesday's and Thursday's, it should be a different one on Thursday, or only have it once a week.</p>
<p>There were too many weeks of kiwi fruit. The kids were fine to try it once, but three or four times is too much. I think we had two weeks of kiwis, and it was just a bit too much.</p>		<p>Could we get dip for the carrots? The grades six and seven's have been asking for celery.</p>

It is clear that teachers, administrators, and ISCs feel that different F&Vs should be provided in the same week, and that too many weeks of one product diminish children's

interest in the product. Also of interest is that one teacher felt that there should be more servings of vegetables than fruit because they felt that too much fruit was an issue regarding diabetes. This is an incorrect assumption and possibly nutrition education is needed.

*Theme 17: Role of the Teacher*

Nine teacher focus groups, ten administrators, and five ISCs mentioned how the program affected them as teachers, whether they felt it was their role to promote the consumption of F&Vs and other issues relating to them as teachers. The majority of the comments made were positive concerning the role of the teacher in promoting healthy eating at the schools. The following quotes and Table 20 explore these views.

Is it the role of the teacher to promote proper nutrition, or is it the job of the parent, should our tax dollars be going towards this program?

(Teacher)

The teachers have to buy in, because they will think, oh this is one more thing, it must be done during class time.

(Administrator)

The teachers are too busy, they would forget about it, but it has to be teacher initiated.

(ISC)

Table 20

*Theme 17: Role of the Teacher*

<b>Teachers</b>	<b>Administrators</b>	<b>ISCs</b>
<p>It's not a lot of work for the teachers, and it's helping with the success of the program.</p>	<p>Schools don't see it as their mandate to do this, it's not our job. There are too many things that we are supposed to do.</p>	<p>Support from the staff, they are cooperative, the teachers will cut up the fruit.</p>
<p>I have made some change in my classroom for Halloween. I didn't bring candy to my students they got something else, they will not get candy for Valentine's day, they will get something else. I have made a very big effort not to bring chocolate and candy in my class as a reward, I try to give them something else instead. And I have also when we have in-school activities like our Halloween party. I did not allow the kids to bring junk, it has to be healthy. As far as drinks and stuff to eat. And I have made a big turnaround in my class and the things that are the most impressionable, are the kids grumbled a little bit, but they were fine with it. They protest a little bit because they're</p>	<p>I am all for it, I think that it is important and should be part of the curriculum.</p>	<p>Teachers are talking more about nutrition, BC grown, and BC agriculture.</p>

teenagers, but other than that they were fine.		
I think that if it is optional, the minute it becomes part of the IEP [Individual Education Plan], guess what? Then it's going to feel like something that we have to have and cover, but if it's optional and if people want to share that information I think that would make sense.	Not all of the teachers want to talk about fruits and vegetables, they feel it is a time constraint to add it into the curriculum when there is already so much to cover.	The school is behind it, and some of the teachers really promote it and set good examples.

There were many different views from the teachers administrators, and ISCs concerning the role of the teacher in this program. Some people felt that it was not their role or their job to be implementing this program, whereas others felt that it should be added to the curriculum. Should a teacher not support the program they may not implement the program as it is intended to be implemented, thus affecting its fidelity. Teachers felt that the program's success hinged on its ease of implementation, withdrawal of the supports will weaken the facility to implement. Teacher support for the program, and teachers acting as role models were also mentioned as key to the program's success. Therefore having the teachers support the program was key to its successful implementation, because without teacher support there may be resistance to implementation and thus be a barrier to the proper implementation of the program.

*Theme 18: Publicity and Communication*

The theme of Publicity and Communication was only expressed by administrators. Seven of the administrators commented on the lack of publicity for the program, and commented on the communication between key stakeholders involved in the program. Half of the comments were made regarding the lack of publicity, and half of the comments were positive in regards to communication between key stakeholders in the program. The following quotes explore this theme.

There should be more publicity, and there should be more publicity now. We have mentioned it in our newsletters home, but that is low grade for something this exciting.

(Administrator)

Publicity, there hasn't been much. We could put something in our newsletter, but the communication about if we are allowed to do this has been unclear. Communication about how much publicity this program should get has been unclear.

(Administrator)

Communication is excellent.

(Administrator)

There should be more publicity for the program, we wanted to run something in our newsletter, but we were told we couldn't talk about it, but I don't think it's too late for that.

(Administrator)

The administrators expressed that communication was excellent between parties involved in the program. However, administrators noted that they were unsure of what they were allowed to do in terms of publicity for the program, and they felt that there was a lack of publicity for the program. It is interesting that only administrators expressed opinions on the publicity of the program, this may be because they had more direct contact with the project coordinator who instructed them not to talk about the program outside of the school. It may also be because they felt the program was beneficial and wanted to promote the school by telling the public about the F&V program that they were offering at their school. As an implementation issue, administrators were not sure what they could and could not say regarding the program. Increasing communication from the project coordinator as to what can be said about the program, may enhance the implementation of the program as their frustrations are diminished and can support the program more fully.

## **OTHER ISSUES**

The number of teachers, administrators, and ISCs that were familiar with Agriculture in the Classroom (AITC), one of the key sponsors of the program, are presented in Table 21. AITC produced information for teachers on a website to use during the implementation of the SFVSP. Table 21 also shows the number of teachers, administrators, and ISCs who

would like to continue the SFVSP. Note that there were only nine ISCs, as one ISC left half way through the program and was not replaced.

Table 21

*Agriculture in the Classroom and Program Continuity*

	<b>Familiar with agriculture in the classroom</b>	<b>Continue Program</b>
<b>Teachers</b>	4	102
<b>Administrators</b>	4	10
<b>ISCs</b>	2	9

Based on the numbers in Table 22, all teachers, administrators, and ISCs were in favour of continuing with the program. A limited number of people were familiar with AITC, and thus resources from the AITC website may not have been used in relation to the SFVSP.

Comments made by the teachers, administrators, and ISCs also indicated that there was a lack of availability of some of the products in the local grocery stores, such as the mini cucumbers, and tomatoes on the vines. Consequently, some children were asking for the products and they were unavailable. Therefore, there is a need to ensure that products given to the children are available from local grocery stores, as if they are not this is a missed opportunity to increase F&V consumption of the children.

There was indication that some schools may have problems with storage of the products and refrigeration issues, as some products need to be refrigerated. Therefore to ensure that the program is implemented without any storage problems, all schools should be equipped with the proper refrigerators and storage, to ensure that products are stored properly, because if products are going bad because of storage issues, this could be a barrier to implementation of the program, as F&Vs would not be of good quality, and thus would not be delivered, or if the poor quality products were delivered it may impact the consumption for that day, as children may not eat the poor quality products, as seen in the quality theme outlined earlier.

The majority of the themes were evident and common across the teachers, administrators, and ISCs. The only theme that was not evident across teachers, administrators, and ISCs was publicity and communication. This theme emerged only from the administrators.

### *Higher Order Themes*

Following the initial open coding of data into these 18 themes further analysis yielded three higher order themes based on diffusion of innovation theory (DOI) and implementation theory. A discussion of how these themes relate to implementation and outcomes is discussed in Chapter Five. Table 22 below shows the higher order themes and their sub-themes.

Table 22

*Higher Order Themes*

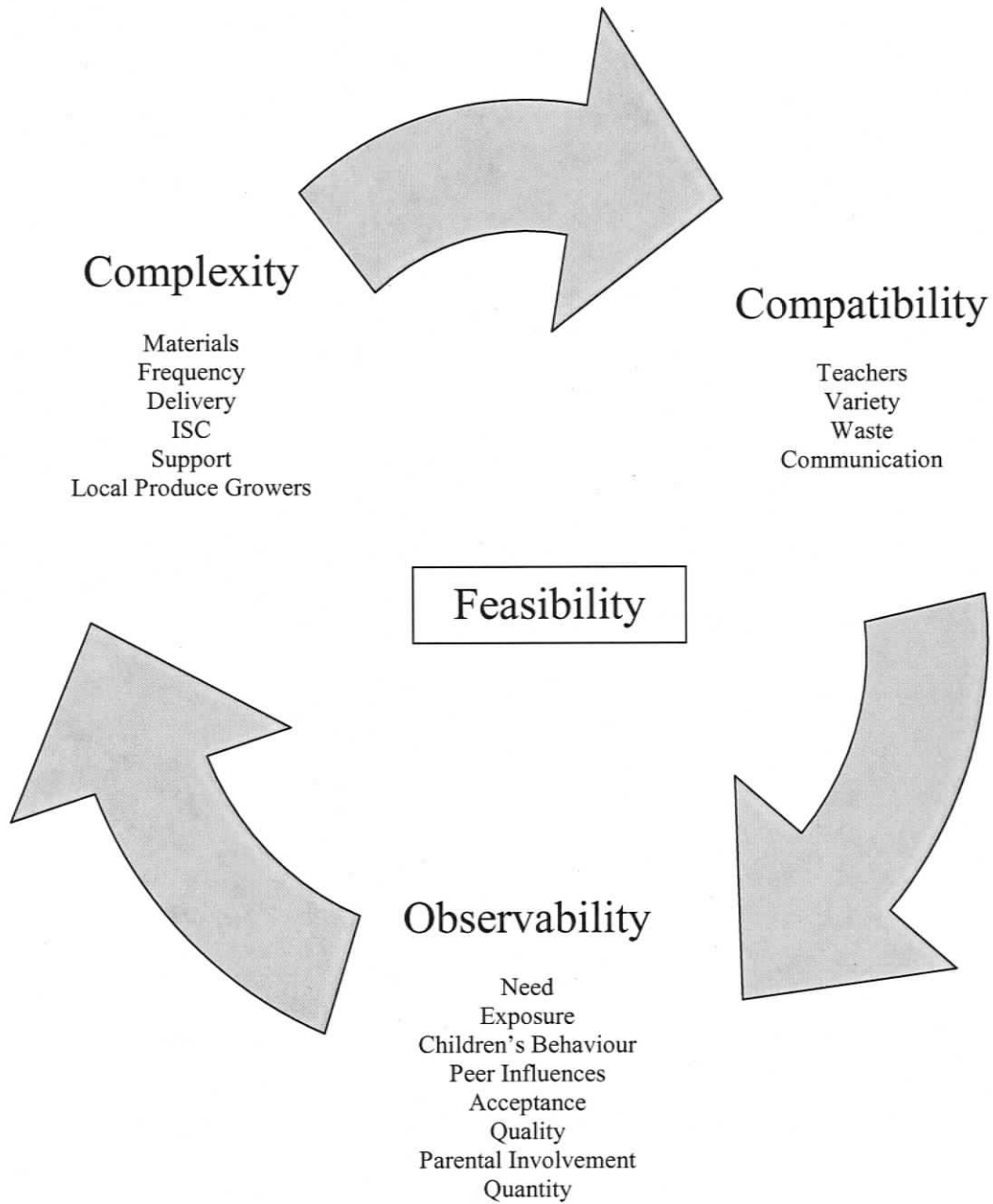
Observability	Complexity	Compatibility
<ul style="list-style-type: none"> <li>• Quality</li> <li>• Acceptance</li> <li>• Peers</li> <li>• Children</li> <li>• Need</li> <li>• Exposure</li> <li>• Quantity</li> <li>• Parental Involvement</li> </ul>	<ul style="list-style-type: none"> <li>• Frequency</li> <li>• Materials</li> <li>• Support</li> <li>• Delivery</li> <li>• ISC</li> <li>• Local Growers</li> </ul>	<ul style="list-style-type: none"> <li>• Teachers</li> <li>• Variety</li> <li>• Communication</li> <li>• Waste</li> </ul>

## CHAPTER FIVE

### DISCUSSION

This study explored the implementation of the School Fruit and Vegetable Snack Program (SFVSP), addressing facilitators, and barriers, and feasibility. Many themes emerged and were categorized into higher order themes. In this discussion these higher order themes and their sub-themes are compared and contrasted with existing research and findings on school fruit and vegetable (F&V) intervention implementations. Further, I discuss the higher order themes and sub-themes relative to implementation and diffusion of innovations theory (DOI). As shown in the previous chapter the 18 themes were organized into three higher order themes. These themes are not mutually exclusive, and they all relate to the feasibility of the program. Figure 1 provides an illustration of how this innovation is integrally linked with the feasibility of the program.

Figure 1: Feasibility Model



### *Observability*

Both positive and negative comments were made regarding the quality of F&Vs. To deal with poor quality F&Vs it may be viable to audit and track the consistency of product quality and discontinue suppliers who do not meet quality standards. Quality of the F&Vs has been monitored by the in-school coordinators (ISC), through product logs. These logs should be examined and continue to be used to better understand issues with quality, and make decisions regarding suppliers and the quality of their produce.

The amounts of F&Vs sent to the schools was an issue that emerged. Some teachers felt that they had too many F&Vs for their class (more typical in the younger grades), whereas others felt they did not have enough, and that their students could eat seconds. One piece of fruit or vegetable (one serving) per child and per teacher was sent to the school. It would be difficult to address the variability in child appetite, using the one serving per child and teacher guideline is probably the most feasible. The data showed that within the school, a system to deal with the extra F&Vs would improve the program. For example, having the fruit in the main hallway so children can pick up an extra when they want it, putting some in the staff room for the teachers to eat, and giving out extras to children that teachers know would benefit from having the extra food. If the school has a system in place to deal with the leftovers, this may minimize the operational issues related to quantity. The data collected are consistent with implementation theory, as it is important to understanding and modifying how a program works (Corbett & Lennon, 2003). The data show that the program may need to be modified to make it work most effectively at certain schools. From a micro-implementation perspective it allows us

to examine the program internally, and understand key aspects of the program, and how they need to be modified or adapted (Holcomb & Smith Nightingale, 2003). Allowing the schools to have the flexibility to distribute the extras as they see fit, aligns with implementation theory, in that they are dealing with circumstances as they best see fit at the 'street level' (Lipsky, 1980).

Parents play an important role in children's behaviour. Parents were pleased and supported this program. Parents may have been supportive of this program as they were able to observe their children enjoying F&Vs and asking for F&Vs that they tried. This reflects DOI theory, specifically the observability of an innovation (Rogers, 2003). Based on the literature and my data, a parental component to the SFVSP is important. However, this component should not be additional work for the teachers, it should be simple educational material that could be sent home with each child, or mailed to the family home by the project team. For example, recipe cards, or information on what their child has been eating at school, and where they can get the products. High 5, TEENS, and the Norwegian Fruits and Vegetables Make the Marks study all had parental components, with varying success. Parent meetings, and having parents help with homework assignments was shown to have no effect on F&V consumption (Bere et al., 2006; Reynolds et al., 2000). This is an area that needs further exploration to determine the outcomes of having parental involvement in F&V interventions.

Comments were made regarding foods that children did and did not like. There will always be foods that some children like and others do not. If it is possible to implement some of the suggestions in terms of variety, and reduce the number of weeks of F&Vs that are repetitive, this may be beneficial. The qualitative data that were

collected was important to collect as it provided descriptive information about the program (MacDonald & Green, 2001).

The influence that peers have on each other is unique, as people sometimes follow the behaviour of their peers. As indicated in DOI in a social system certain people, for example, opinion leaders can affect others' behaviours (Rogers, 2003). This occurred in the SFVSP, as data from teachers indicated that when children witnessed their peers eating the F&Vs, they also started to eat the F&Vs. This is an interesting interaction, and provides support for the importance of school based interventions, and the expansion of the program to other schools. Similar to the Cookshop program (Liquori & Koch, 1998), the SFVSP also emphasized the importance of tasting foods to increase the preference for and intake of those foods (Liquori & Koch, 1998). Although the SFVSP was not peer-led, results from peer-led interventions show that such influences have a positive effect on F&V consumption (Hamdan et al., 2005). More research is warranted on the interaction of peer influences and F&V consumption (Simons-Morton et al., 1991).

Children's attitudes towards the program were positive. Teachers reported that children acted like they wanted to eat F&Vs, and wanted to bring healthy lunches and snacks. It is possible that healthy eating became a norm at the school, meaning it became an established behaviour at the school (Rogers, 2003). Other explanations could be that children observed the benefits of the innovation, and thus adopted the program, or it could be that they were able to try the F&Vs, but were not forced to participate (Rogers, 2003).

A variety of perspectives were obtained in regards to the program, enabling strengths and weaknesses to emerge, thus giving confidence to support the program in

continuing and ways to make the program better (Holcomb and Nightingale, 2003). The micro-implementation perspective has allowed us to determine what is going on in the program, and will enable improvements (Holcomb and Nightingale, 2003). Through the focus group and interview process it was evident that many children were exposed to new F&Vs that they had never tried before. This finding may also reflect the culture and context where the implementation has occurred, for example a low-income area (MacDonald & Green, 2004). Exposure to new F&Vs will help promote both healthy eating and the consumption of local B.C. produce. The teachers were able to observe the benefits of this program, which is the observability component of innovation, a part of DOI, this enhances the adoption of an innovation (Rogers, 1983).

Eating healthy, and food security in general was a concern of the staff at many of the schools. This was a particular issue for the schools that were located in low socio-economic status (SES) areas. Based on findings of the process evaluation I recommend continuing the program at the ten pilot schools, and would support implementation at more schools in the province. Many people suffer from inadequate diet due to low income, and people on low incomes eat less F&V (Winkler et al., 2004). There is a need to monitor and increase access to safe and healthy foods, as well as develop plans to overcome food inequalities. Healthier foods cost more, and thus policies need to be created to make healthy foods affordable (Lang & Rayner, nd). This supports the continuation of the program, especially at those schools where there is lower SES and poverty issues, based on the basic need for access to healthy food. Assessing the school environment and dealing with issues related specifically to the school will help make the program sustainable for differing communities (Parcel et al., 2003).

### *Compatibility*

Increasing the variety of the F&Vs emerged from the data. The goal of the program is to promote local BC products, thus the variety that can be provided to the students is dependant on what is grown in BC, and when it is grown. For example, blueberries are grown in BC, however, they are grown in the summer when the children are not in school, therefore they were excluded in the product rotation. If the variety was increased to include products outside of BC, this would not align with the goals of the program. However, there were products that normally would be available but not included because of things such as weather that affected local crops. Increasing the variety may enhance the compatibility and therefore the adoption of the program, as based on the experiences of the teachers with this program, they feel that the variety should be increased, thus making it more compatible (Rogers, 1983). Perhaps the use of frozen or canned produce may need to be explored.

Waste from plastic packaging and excess products was a concern from many schools. Possible options for change are: 1) giving additional time to the ISC who can then cut up the F&Vs for the younger children, 2) providing the teachers with a knife and cutting board and they can then cut up the F&Vs for those that need it, or 3) engaging the older students in this process, by having groups of older children take turns preparing the F&Vs for the younger children. The issue of plastic packaging should be addressed because most schools were unhappy with the amount of waste it created, possibly offending their personal value system and therefore should be taken into consideration (Trnobranski, 1995). This issue is consistent with implementation theory where “school

programs are influenced less by program and implementer characteristics, and more by the interaction of the program with its organizational context and by the culture within which implementation occurs” (MacDonald & Green, 2001, p. 751). Again, it may then be important to adapt to local circumstances in order to have successful implementation (MacDonald & Green, 2001). Changing the plastic packaging may be more compatible and thus, the program adopted at a faster rate as they will be consistent with the existing values of the school (Roger, 1983). However, increased complexity, time, cost, and work associated with this may decrease adoption. As found in the High 5 intervention (Reynolds et al., 2000) taste testing activities were not implemented as frequently as planned because of the increased effort required to complete these activities.

Teachers commented that they felt they should model healthy eating behaviours, because they act as role models for the students. Sallis et al. (1995) suggest that teachers act as positive role models for children, and are encouraged to adopt a healthy lifestyle to maximize their effectiveness as role models. Some teachers resisted and expressed negative attitudes to the idea of integrating healthy eating into the curriculum. If teachers are not in support of the program, and do not feel it is their role to teach healthy eating, they may sabotage implementation (Trnobranski, 1995). However, other teachers were pleased with the support that they received for the program. We know from the school-based literature that staff time is often listed as a limitation to school based interventions as researchers are often competing for their time, and other curriculum components take precedence (Johnson et al., 2003; Luepker et al., 1996; Parcel et al., 1989; Thomas et al., 2004). It is likely that if healthy eating and this program was part of the curriculum, it could be met with resistance. Implementation is likely to be more successful when drastic

change is not required. Enforcing this program and healthy eating to be part of the curriculum would result in substantive change for the teachers, as they would be required to teach it as part of the curriculum (Bergen & While, 2004; Trnobranski, 1995). Also, if this was instituted as part of the curriculum, teachers may see this as a top-down approach, which as discussed in the implementation literature is often met with resistance (Brodkin, 2003). Teachers could however be provided with educational materials that they could use if they chose to talk about F&Vs in their classroom. The data from this study revealed that teachers welcomed such augmented resources. Some resistance is reasonable to expect as teachers indicated that they were overburdened and therefore would naturally resist another task being added to their day. However, the importance of healthy eating is crucial to the future of children's health, and therefore is a significant topic to be implemented in the schools in some format.

Administrators stated that communication from the F&V team was excellent. Thus, all people involved in communicating with the schools should continue with the same communication methods and tactics. Communication between parties may have been homophilous (Rogers, 1983), which enables effective communication, according to the DOI literature. Communication channels were also effective as information was shared to reach a mutual understanding of issues (Rogers, 2003). Publicity about the program was the only communication issue. Restrictions on communication prior to the release of the pilot findings instituted a top-down approach, where the policy was initiated from a "higher" provincial level, and street level teachers were expected to deal with this (Holcomb & Smith Nightingale, 2003).

### *Complexity*

Schools expressed a desire to use local produce growers to obtain the F&Vs for the program. Local food partnerships should be encouraged as they can help integrate local food planning, health improvement planning, and enhance collaborative partnerships with other sectors (Connolly, 2005; Lang & Rayner, nd). It would be beneficial to consider the use of local purchases to align with the interest of the participants (Trnobranski, 1995). This feedback is perhaps the most difficult to address in dissemination because the program complexity would increase as the project coordinator would have to deal with *many* more distributors, instead of one main distributor. This means that if problems arise, dealing with the problems will be more difficult. Having more partners increases the workload at the provincial coordinator level, and this may not be feasible. It may increase the potential for errors and increased complexity. During the pilot phase this was evident when special arrangements had to be made to deal with a school that was geographically remote from the supplier. Not using local growers may be met with resistance as it may not be as compatible with the participants' values (Rogers, 2003). They may also see this as a top-down approach to implementation, as the "higher" policy makers are mandating the street-level workers on what to do, which can often cause tension (Brodkin, 2003).

However, to accommodate street level choice and control which is central to the implementation literature, perhaps schools should be given the option to use a local grower. With such decision making authority would also come the responsibility for organizing and dealing with the distributor as problems arose. The program would provide the same amount of funding for the produce, as if they were using the main

distributor. This modification, however may decrease adoption as it is added work for the school, and increases the complexity of the innovation (Rogers, 1983). Understanding the context or environment in which implementation occurs is crucial for determining a solution for this issue (Brodkin, 2003). This gap has been identified and unfortunately at this point there is not an easy solution to deal with it.

Based on my analysis, delivering the F&Vs to the classrooms using bins should be continued. Delivery at some schools was sporadic, in terms of days and times of delivery. Delivery issues should continue to be examined by the project coordinator to determine if a more consistent pattern of delivery can be implemented. As well, schools may have to adapt to the circumstances of delivery and be flexible with delivery not *always* occurring at the same time, or may occasionally be a day late. "Programs are often modified or adapted during implementation for a variety of reasons" (MacDonald, 1998, p.56). Modifying the program falls in the reinvention realm of implementation, as modifying the program is necessary to continue with the program (MacDonald, 1998). When there are delivery problems, it increases the complexity of the program, which may decrease the rate of adoption (Rogers, 1983). This is an issue that with continuance of the program can be examined and further evaluated.

Delivery to the F&Vs to the classrooms was the main measure of fidelity. Through the focus groups and interviews it was determined that there was high fidelity. This is not surprising as delivery of the F&Vs was the only thing that had to be implemented to have fidelity and the ISC was paid to do this. High fidelity also occurred because there was no curriculum component. Fidelity was also related to the program being highly feasible, because it was an easy program to implement this increased the

fidelity. Lastly, the program was compatible with the participant's needs and values, thus they wanted the program to succeed, and therefore the program was implemented on a regular basis, thus achieving high fidelity.

The role of the ISC was critical to the success of the program. It was stated by all staff that without someone to do this job, the program would not have been implemented as smoothly. A few smaller schools indicated that it may not take four hours to do this job. It may be more efficient to allot four hours for the larger schools, and three hours for the smaller schools. This would need to be further evaluated. It appeared that the ISC role enhanced the relative advantage of the program, as schools received help for participating in the program (Rogers, 2003). Providing funding for this role could also be considered as an implementor motivator (MacDonald, 1998). Funding would have to be in place to ensure the sustainability of this role in the program, and this may be a difficult task. The ISC reduces the complexity of the program, making it easier to use and implement, and therefore enhancing the likelihood of adoption (Rogers, 2003). Lastly, having a person take on the role of the ISC means that there is little extra work for the teachers involved in the program. This is consistent with implementation literature, as implementation is likely to be successful when there is little change required (Bergen & While, 2004; Trnobrnski, 1995). Having little change required is beneficial to the implementation of the program but could affect the outcomes of F&V consumption, as the components of the program may not be of an adequate dose to see significant changes in consumption of F&Vs.

Financial support should be continued for the program; without this support the program would not be feasible for the schools and likely lead to its discontinuation. This

includes funding provided for the ISC. Support was seen as a facilitator to implementation as it provided the teachers with the necessary resources so that their job was not adversely affected by the program. This is consistent with implementation theory, as one view in the implementation literature states that implementation is likely to be successful when there is little change required (Bergen & While, 2004; Trnobranski, 1995). Teachers stated how much they liked the program because it was easy to implement. This aligns with DOI as there is little complexity to adopting this program, it is both easy to use and understand, thus helping to make it a success (Rogers, 2003). The schools appreciated the role of the ISC; this may be considered as an implementor motivator (MacDonald, 1998). The program is fortunate to have the resources to supply monetary funds as a motivator for the person doing the job of the ISC, as often, financial constraints prevent this from happening in school-based health research (Parcel et al., 1989).

However, often initial funding given for school-based programs is not sustained. If the program was not free it would not be equally accessible for all children, and some students may not be able to participate in the program. This view is consistent with the Norwegian School F&V program where students received a free piece of fruit or a carrot in conjunction with their lunches. After one year parents had to enroll and pay for their children to continue in this program, thus not making it accessible to all students. The conclusions of the Norwegian School F&V program research indicate that, "providing students with a piece of fruit or a vegetable at school at no cost to their parents is an effective strategy to increase children's F&V intake" (Bere et al., 2005, p.7). Thus, consistent with the views in this research, F&Vs should be free in order to provide equal

access to all children, with the goal in increasing F&V consumption. Having the support available is consistent with DOI compatibility component, as providing free F&Vs is consistent with the needs of many of the schools, where healthy eating and eating alone were stated as problems in their communities (Rogers, 2003).

Increasing the materials provided to the schools was a theme that emerged from the data. Continuing to provide the schools with posters and maps is important, as these appeared to be a success. Providing the schools with these user friendly materials should enhance the adoption success, because as stated in the DOI literature, initiatives that are perceived as simple, and can be tried on a limited time basis are often more accepted (Rogers, 2003). Creating materials that are teacher friendly may be a challenge. For example, in the CATCH study, providing teacher-friendly classroom materials was listed as a barrier to program implementation, as the teachers felt the resources provided to them were not teacher-friendly (Johnson et al., 2003). In addition, focus group data showed that the teacher manuals were not used. Thus, having materials that are not teacher-friendly is a barrier to the implementation of those resources, as teachers may not use them. In the Go For Health intervention (Parcel et al., 1989), process data showed that program implementation differed across staff as a lack of time to adequately teach the modules was listed as a barrier to implementation. Integrating modules into the curriculum may be met by resistance if teachers perceive it as significant change for their workload; the less change required the more successful implementation will be (Bergen & While, 2004; Trnobranski, 1995).

The feedback around frequency of F&V delivery was mixed. Some felt the frequency could be increased, others felt the frequency should be decreased. Further

evaluation is needed to determine if the frequency should be changed. From a feasibility perspective, increasing the frequency is costly and not possible. From a fidelity perspective, the program if increased may not be implemented as intended, as this may be increased work for all parties involved and may overburden staff. As stated in the implementation literature, the more change that is implemented, the tendency for implementation to be successful decreases (Bergen & While, 2004; Trnobranski, 1995). Providing an adequate dose is a challenge in health promotion, especially in schools, because the intervention is competing with numerous programs and priorities (Resnicow et al., 1996). Having the program twice a week decreases the complexity of the program, as it is easy to implement. Should the frequency be increased it might be perceived as more difficult to implement, thus decreasing the rate of adoption, as stated in the DOI literature (Rogers, 2003).

### *Conclusions and Recommendations*

The findings from this study may provide useful information for other schools who are considering implementing such a program, and may also be useful for adjusting the current program to meet the needs of the schools involved. Conclusions from my study reveal that there is a fine balance between feasibility, compatibility, observability, and complexity. Altering the current program may affect this balance and though it may be more compatible it may increase in complexity. Therefore if schools want to change things in the program, such as increase the frequency of the program, or add healthy eating to the curriculum, they will have to accept the increased complexity that comes with these changes. As stated in the DOI literature, increasing complexity of a program

may also increase problems associated with implementation and adoption. Complexity was the most salient characteristic of the DOI theory in this research project, as it appeared to be the most prominent in the themes. DOI theory did not provide an explanation for the variation in some of the responses. Consistent findings were found regarding implementation of the program across all schools.

There were limitations to the study. It would have been beneficial to have more access and time spent at the schools; however, this could not happen as the schools could only have the research team come at certain times. Another limitation was that interviews with administrators, teachers, and ISCs were not done at the end of the school year. It would have been beneficial to do this to obtain a final perspective on the facilitators and barriers to the implementation of the program. Lastly, more information could have been gathered that may have added to the depth of the data if more than one interview was done with the teachers, administrators, and more than two interviews for the ISCs.

Current interventions that are providing free F&Vs to students are lacking, thus the literature on studies such as this one are limited. This study validates the need for future research to focus on the process of implementation on such interventions. Future research should investigate how implementation is affected by the school environment, the community, job climate, and other issues such as the use of local produce growers. The effects of a curriculum component, and parental involvement should also be further researched in the context of the SFVSP, as multi-component interventions are effective, and this program was not multi-component. Thus, a parent component should be implemented. In addition some form of curriculum or classroom activities should be implemented and the fidelity of their implementation should be examined. From a macro-

implementation perspective the program creators should be included in the research and evaluation of the program to help understand their perspectives and how they see the program operating. Their views are important in regards to the sustainability of the program, as they fund the program and play an important role in the development of the program. Lastly, collecting more data in other formats would prove useful if the study was replicated, for example collecting data on the amount of F&Vs that were leftover, or surveying the children to see which F&Vs they would like to see more and less of.

The findings suggest that components of the SFVSP follow a macro-implementation approach and that such a program can be successfully implemented. Within the schools, or a micro-implementation approach, the program implementation was also successful; therefore the results of this study suggest that both a macro and micro approach to implementation of such a program can be successful when they collaborate together. The information gathered in this study has implications for current practice. It could be the basis to make alterations in the current program where necessary and provides the basis to design future school-based F&V intervention. The SFVSP is a feasible program to implement.

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**APPENDIX A**  
**Summary of Studies**

Author	Design and Theory	Components	Grade	N	Key Results	Length
Auld et al. (1998)  Integrated Nutrition Project	Quasi-experimental  Social Cognitive Theory	<ul style="list-style-type: none"> <li>▪ 1 classroom session for 24 weeks</li> <li>▪ Lunchroom sessions taught by parents</li> <li>▪ 12 bi-monthly newsletter to parents and 2 family fun nights</li> </ul>	Three Four Five	20 Intervention classes (n=226)  17 Control classes (n=219)	Intervention group consumed .4 more servings of FV than the control group in the lunchroom	2 years
Bere et al. (2005)  Fruits and Vegetables Make the Marks	Randomized Trial  Social Cognitive Theory	<ul style="list-style-type: none"> <li>▪ Free fruit or carrot everyday</li> <li>▪ 6 newsletters to parents</li> <li>▪ 7 lessons in home economics class over 7 months</li> </ul>	Six Seven	9 intervention schools (n=286)  10 control schools (n=231)	Intervention school increased FV consumption by .6 portions higher than control schools	1 year
Baranowski et al. (2000)  Gimme 5 Primary	Randomized Trial  Social Cognitive Theory	<ul style="list-style-type: none"> <li>▪ 12 classroom sessions over 6 weeks</li> <li>▪ Newsletters, homework, and videotapes sent home</li> </ul>	Four Five	16 intervention schools  16 control schools	Increase of .2 V servings per day, no change in F servings per day	2 years
Domel et al. (1993)  Gimme 5	Randomized Trial  Social Cognitive Theory  Reciprocal Determinism Theory	<ul style="list-style-type: none"> <li>▪ 3 classroom lessons per week over six weeks</li> <li>▪ Weekly newsletter to parents</li> </ul>	Four Five	2 schools  10 intervention classes (n=195)  6 control classes (n=106)	No differences in FV servings per day .3 increase in fruit servings per day for intervention group	6 weeks
Foerster et al. (1998)  California 5-A-Day Power Play	Quasi-experimental  Resiliency Theory  Reciprocal Determinism Theory	<ul style="list-style-type: none"> <li>▪ 10 to 14 classroom activities over 8 weeks</li> <li>▪ Community</li> </ul>	Four Five	49 schools (n=3966)	School and community intervention group showed .4 servings increase in FV consumption  .2 serving increase in the school only intervention	8 weeks
Hassapidou et al. (1997)	Randomized Trial  Theory unknown	<ul style="list-style-type: none"> <li>▪ 10 classroom lessons and workbooks</li> <li>▪ Pamphlets sent home to parents</li> </ul>	Age 13 -14	2 Schools intervention (n=73) control (n=53)	No significant changes in FV intake	1 year
Hopper et al. (1996)	Randomized Trial	<ul style="list-style-type: none"> <li>▪ 4 Physical activity</li> </ul>	Two Four	97 students Intervention	No significant differences in FV	10 weeks

The Hopper Family Participation Project 2	Theory unknown	<ul style="list-style-type: none"> <li>▪ sessions per week for 30 minutes</li> <li>▪ 2 classroom lesson for 30 minutes per week</li> <li>▪ Weekly activity packages sent home</li> </ul>		(n=48) Control (n=49)	consumption at follow up	
Lang & Rayner (nd)  National Fruit and Vegetable Scheme	Design and theory unknown	<ul style="list-style-type: none"> <li>▪ Free fruit everyday</li> </ul>	Age four to six	2 million	Not evaluated	Not indicated
Liquori & Koch (1998)  Cookshop Program	Quasi-experimental, pre/post intervention-comparison group design  Social Cognitive Theory	<ul style="list-style-type: none"> <li>▪ School lunch program</li> <li>▪ 10 cooking lessons 60-90 minutes each and 10 classroom lessons 45 minutes each</li> <li>▪ Newsletter each month sent to parents</li> <li>▪ Community newsletter sent out to households</li> </ul>	K-six	39 classes  590 students	Cookshop and FEL had the largest intake of targeted foods. Cookshop alone had a positive impact. FEL had no main effect.	1 year
Lytle et al. (2004)  TEEN	Group-randomized Trial  Social Cognitive Theory	<ul style="list-style-type: none"> <li>▪ 10 classroom lessons</li> <li>▪ Cafeteria healthy eating promotions</li> <li>▪ 3 newsletters sent home to parents</li> </ul>	Seven Eight	8 intervention schools (n=288)  8 control schools (n=167)	An increase in mean daily intake of FV .16  Results were not maintained at follow-up	2 years
Perry et al. (1998)  CATCH	Multi-site field trial  Social Cognitive Theory	<ul style="list-style-type: none"> <li>▪ 47 classroom lessons 40 minutes each</li> <li>▪ Food Service modifications</li> <li>▪ 15 Family packets to complete and 2 family fun nights</li> <li>▪ 6 Physical Education lessons 40 minutes each</li> </ul>	Three Four Five	56 intervention schools  40 control schools  1186 Childrens	No significant changes in FV consumption	3 years
Reynolds et al. (2000)  High 5	Randomized Trial  Social Cognitive Theory	<ul style="list-style-type: none"> <li>▪ 14 classroom lessons 30-45 minutes each</li> <li>▪ 10 cafeteria intervention activities</li> </ul>	Four	14 intervention schools  14 control schools	Mean intake in daily FV consumption was higher in the intervention group, than the control	2 years

		<ul style="list-style-type: none"> <li>Family kick off night and 1 weekly homework assignment for 7 weeks</li> </ul>		n=1698	group. Year one 3.96 and 2.28 respectively. Year two 3.2 and 2.21 respectively. Parental FV consumption increased in year one, but not year two.	
Sahota et al. (2001)  APPLES	Group randomized control trial  Health Promotion Schools Philosophy	<ul style="list-style-type: none"> <li>School meals modified</li> <li>School action plans, toolbox with activities</li> </ul>	Four Five	5 intervention schools (n=314)  5 control schools (n=322)	Vegetable intake increased by .3 serving per day	1 year
Schneider et al. (2006)  Mississippi Fresh Fruit and Vegetable Pilot Program	One-group no comparison pretest-posttest design  Theory unknown	<ul style="list-style-type: none"> <li>Free F&amp;Vs</li> <li>Nutritional education activities</li> </ul>	Five Eight Ten	25 schools  725 children	Fruit consumption increased by .34 for grade 8 and .61 for grade 10  Vegetable consumption decreased for grade 8 and 10  Grade five consumption was not measured	1 year
Stevens et al. (2003)  PATHWAYS	Randomized Trial  Theory unknown	<ul style="list-style-type: none"> <li>Curriculum</li> <li>Food service</li> <li>Family</li> <li>Physical Education</li> </ul>	Three Four Five	41 Schools  n=1467	No change in percentage of body fat	1 year
Story et al. (2000)  5-A-Day Power Plus	Randomized Trial  Social Learning Theory	<ul style="list-style-type: none"> <li>16 classroom lessons over 8 weeks 40-45 minutes each</li> <li>Food service promotion of healthy eating</li> <li>5 family activities sent home</li> </ul>	Four Five	10 intervention schools  10 control schools  1750 students	No significant difference after 1 year for both students and family. Students consumed more F&Vs at school than at home Knowledge of FV was increased	2 years
Warren et al. (2003)  Be Smart	Randomized Trial  Social Learning Theory	<ul style="list-style-type: none"> <li>1 classroom activity for 20 weeks, 25 minutes each</li> <li>Promotion of physical activity in daily life</li> <li>Newsletters sent to parents at the end of every term and weekly homework activities</li> </ul>	One Two	3 schools intervention (n=164) control (n=54)  213 children	Intervention group showed a statistically significant increase in fruit intake	14 months

## APPENDIX B

### **Consent Form for In-School Coordinators:**

Procedures:

- Telephone interviews (1 / every two months)

I understand that these personal interviews are a component of the School Fruit and Vegetable Snack Pilot Project evaluation research and focuses on the context for, and implementation of this program. I understand that I will be asked about my thoughts and experiences regarding the context for, and implementation of the School Fruit and Vegetable Snack Pilot Project in one telephone interview per month that will last approximately 30 minutes from a location of my choice.

I understand the information I provide will be confidential and that anonymity will be maintained by using code numbers to identify the information obtained in the interview. I understand that notes will be taken and the interview may be audio-taped and will be transcribed for further analysis. Only the researchers will have access to the tapes, transcripts and consent forms. I understand that the information I provide will be combined with other participants' data and at no time will individual names be used.

I know that all written notes that the researchers might take will be shredded after the researchers have put the information onto computer disk. I know that a summary of the interview results may be sent to me for review upon my request, and that I may change information that I feel identifies myself or my organization. I am also aware that tapes will be erased immediately after the interview has been transcribed. All information will be securely stored in a locked file cabinet for 5 years, after which it will be destroyed.

I understand my participation is completely voluntary and I may provide comments or withdraw at any time without penalty to myself or my organization. I understand that if I decide to withdraw from this study, my data will be removed and destroyed. I may also obtain a copy of this consent form to keep upon my request.

### **Possible Harms:**

None.

### **Benefits:**

If you choose to participate in the School Fruit and Vegetable Snack Pilot Project evaluation, you and your school will learn more about how healthy eating can contribute to improved health. It is our hope that through this program, your school will achieve the many benefits that accompany a healthy lifestyle. You will receive a summary of the findings at the end of the study.

### **Rights and Welfare of the Individual:**

You have the right to refuse participation in this program evaluation. It is understood that you are free to withdraw from any or all parts of the program at any time without penalty. Your identity will remain confidential as all individual records and results will be analyzed and referred to by number code only. Files are kept in a secure locked lab at the University of Victoria. The lab remains locked and only those directly involved in the study (namely, the School Fruit and Vegetable Snack Pilot Project Evaluation Team) will have access to your records and results. You or your school will not be referred to by name in any program reports or research papers. Reports or papers may be presented to education stakeholders and the agencies who funded the projects and to the research community.

Please be assured that you may ask questions at any time. We will be glad to discuss the results with you when they have become available and we welcome your comments and suggestions. Should you have any concerns about this program or wish further information please contact Dr. PJ Naylor 250.721.7844. You may verify ethical approval of this study or raise any concerns you might have by contacting the Associate Vice-President of Research at (250) 472-4545 or [opvprhe@uvic.ca](mailto:opvprhe@uvic.ca).

**Compensation for Injury:**

Signing this consent form in no way limits your legal rights against the sponsors, investigators or anyone else.

Your signature below indicates that you understand the above conditions of participation in this study and that you have the opportunity to have your questions answered by the researchers.

Name (please print) \_\_\_\_\_

Signature \_\_\_\_\_

Date \_\_\_\_\_

Principal Investigator:

Dr. PJ Naylor, School of Physical Education Assistant Professor, University of Victoria  
Box 3015, STN CSC, Victoria, BC, V8W 3P1

**Information to Administrators:**

I have been contracted by the BC Agriculture in the Classroom Foundation, to evaluate the School Fruit and Vegetable Snack Pilot Project. Your participation will be instrumental in helping us determine if the School Fruit and Vegetable Snack Pilot Project is a feasible and effective means to providing healthy eating in the schools. You are being asked to participate in this research because you are currently supporting the implementation of the School Fruit and Vegetable Snack Pilot Project and have special knowledge of the schools' environment, needs and challenges. Your participation will be instrumental in helping us determine if the Fruit and Vegetable Snack Pilot Project is a feasible and effective means to providing healthy eating in the schools.

The evaluation procedures will take place from June 2005 to June 2006. During this time period, we will ask you to take part in one in-person or telephone interview. At this time we would ask that you please consider your participation in the School Fruit and Vegetable Snack Pilot Project evaluation. We invite you to read, complete and sign the attached consent form. You may then return the consent form in the provided return envelope to Dr. PJ Naylor, Assistant Professor in the School of Physical Education at the University of Victoria, Box 3015, STN CSC, Victoria, BC, V8W 3P1.

We are excited to be working with the Administrators involved in the School Fruit and Vegetable Snack Pilot Project. Your involvement is appreciated. If you have any questions please contact Dr. PJ Naylor at 250.721.7844 [pjnaylor@uvic.ca].

Sincerely,

Dr. PJ Naylor  
University of Victoria  
School of Physical Education

### **Consent Form for Administrators:**

Procedures:

- In-person or telephone interview (1 / year)

I understand that this interview is a component of the School Fruit and Vegetable Snack Pilot Project evaluation research and focuses on the context for, and implementation of this program. I understand that I will be asked about my thoughts and experiences regarding the context for, and implementation of the School Fruit and Vegetable Snack Pilot Project in an interview that will last approximately 30 minutes at my respective school.

I understand the information I provide will be confidential and that anonymity will be maintained by using code numbers to identify the information obtained in the interview. I understand that notes will be taken and the interview may be audio-taped and will be transcribed for further analysis. Only the researchers will have access to the tapes, transcripts and consent forms. I understand that the information I provide will be combined with other participants' data and at no time will individual names be used.

I know that all written notes that the researchers might take will be shredded after the researchers have put the information onto computer disk. I know that a summary of the interview results may be sent to me for review upon my request, and that I may change information that I feel identifies myself or my organization. I am also aware that tapes will be erased immediately after the interview has been transcribed. All information will be securely stored in a locked file cabinet for 5 years, after which it will be destroyed.

I understand my participation is completely voluntary and I may provide comments or withdraw at any time without penalty to myself or my organization. I understand that if I withdraw from this study my data will be removed and destroyed. I may also obtain a copy of this consent form to keep upon my request.

### **Possible Harms:**

None.

### **Benefits:**

If you choose to participate in the School Fruit and Vegetable Snack Pilot Project evaluation, your students will learn more about how healthy eating can contribute to improved health. It is our hope that through this program, your school will achieve the many benefits that accompany a healthy lifestyle. You will receive a summary of the findings at the end of the study.

### **Rights and Welfare of the Individual:**

You have the right to refuse participation in this program evaluation. It is understood that you are free to withdraw from any or all parts of the program at any time without penalty. Your identity will remain confidential as all individual records and results will be analyzed and referred to by number code only. Files are kept in a secure locked lab at the

University of Victoria. The lab remains locked and only those directly involved in the study (namely, the School Fruit and Vegetable Snack Pilot Project Evaluation Team) will have access to your records and results. You or your school will not be referred to by name in any program reports or research papers. Reports or papers may be presented to education stakeholders and the agencies who funded the projects and to the research community.

Please be assured that you may ask questions at any time. We will be glad to discuss the results with you when they have become available and we welcome your comments and suggestions. Should you have any concerns about this program or wish further information please contact Dr. PJ Naylor 250.721.7844. You may verify ethical approval of this study or raise any concerns you might have by contacting the Associate Vice-President of Research at (250) 472-4545 or [opvprhe@uvic.ca](mailto:opvprhe@uvic.ca).

**Compensation for Injury:**

Signing this consent form in no way limits your legal rights against the sponsors, investigators or anyone else.

Your signature below indicates that you understand the above conditions of participation in this study and that you have the opportunity to have your questions answered by the researchers.

Name (please print) \_\_\_\_\_

Signature \_\_\_\_\_

Date \_\_\_\_\_

Principal Investigator: Dr. PJ Naylor, School of Physical Education Assistant Professor,  
University of Victoria  
Box 3015, STN CSC, Victoria, BC, V8W 3P1

## APPENDIX C

### TEACHER'S FOCUS GROUP INTERVIEW SCHEDULE

1. What do you think about the Fruit and Vegetables in the Classroom pilot project?
2. What factors do you think facilitated the implementation of the F& V in the classroom project?
3. What factors do you think were barriers to the implementation the F& V in the classroom project?
4. Are there milestones or achievements in the past year that you think are particularly important?
5. What do you think of the role of the school coordinator during implementation?
6. What do you think of the role of the Ag in the Classroom program team during implementation?
7. What are the major lessons you learned this year through participating in the SF&V project/
8. What is the likelihood that your school will continue implementing a school fruit and vegetable project? Describe why it is or is not likely.
9. What improvements could be made to the SF&V Snack project to enhance its chances of success in other schools and classrooms?
10. What factors do you think will facilitate the long-term sustainability of SFVSP
11. What factors do you think will be a challenge to the long-term sustainability of SFV?
12. What have we missed that you feel is important to say?

## APPENDIX D

### ADMINISTRATOR'S INTERVIEW SCHEDULE

1. What do you think about the Fruit and Vegetables in the Classroom pilot project?
2. What factors do you think facilitated the implementation of the F& V in the classroom project?
3. What factors do you think were barriers to the implementation the F& V in the classroom project?
4. Are there milestones or achievements in the past year that you think are particularly important?
5. What do you think of the role of the school coordinator during implementation?
6. What do you think of the role of the Ag in the Classroom program team during implementation?
7. What are the major lessons you learned this year through participating in the SF&V project/
8. What is the likelihood that your school will continue implementing a school fruit and vegetable project?
9. What improvements could be made to the SF&V Initiative to enhance its chances of success in other schools and classrooms?
10. What factors do you think will facilitate the long-term sustainability of SFV
11. What factors do you think will be a challenge to the long-term sustainability of SFV?
12. What have we missed that you feel is important to say?

## APPENDIX E

### IN-SCHOOL COORDINATOR INTERVIEW SCHEDULE

1. What do you think about the Fruit and Vegetables in the Classroom pilot project?
2. What factors do you think are helping with the implementation of the F& V in the classroom project?
3. What factors do you think were problems to the implementation the F& V in the classroom project?
4. Are there milestones or achievements in the past months that you think are particularly important?
5. How would you describe the response of your school's community to the project?
6. How would you describe your role during the past month?
7. What do you think of the role of the Ag in the Classroom program team during implementation?
8. What impact (+/-) has SF&V had in your school to date?
9. What are the major lessons you learned this month through participating in the SF&V project?
10. Is there anything else that you would like to add?