THE BENEFITS OF BREAKFAST

Current scientific thinking

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The Board of Directors of Kids Eat Smart Foundation Newfoundland and Labrador wishes to thank Andrea Noftall, Dietetic Intern, the primary researcher and primary author of this report.

(I) A Review of the Benefits of School Nutrition Programs and Student Health & Wellness

School nutrition programs have been a part of Canadian schools for a number of years. Recently, they have become even more commonplace as schools and communities recognize the importance of providing their students with nutritious foods during school hours. To date, there are no nationally funded nutrition programs in Canada. Because of this, schools have had to create and develop nutrition programs on their own with help for funding from local businesses, community members or government grants. In Newfoundland and Labrador, the Kids Eat Smart Foundation exists to help organize and fund volunteer-run nutrition programs, called Kids Eat Smart Clubs, across the province. The goal of the Foundation is to provide children with the nutrition they need to learn, to grow, and to be their best. Specifically, funding is provided to schools or community centres with an academic component. The Foundation is funded largely by the provincial government, charitable foundations and the corporate sector, but also through the donations of many individual community members.

Much anecdotal evidence exists about the immediate positive changes seen in students after the implementation of school nutrition programs. National breakfast club supporters, such as Breakfast Clubs of Canada (BCC), list the many benefits of breakfast from a social, physical and academic standpoint on their websites (not all claims, however, are referenced to available research). Some of the benefits listed on the BCC website are:

- improved attendance and punctuality
- renewed interest in curriculum subjects

- increased understanding of how healthy eating habits affect energy levels
- improved behaviour and increased concentration, leading to greater achievement
- improved social skills and confidence to interact with other children and adults
- reduced bullying through increased cross-age and peer-group interaction and communication
- enhanced relationships with family members and the wider community (Breakfast Clubs of Canada, 2009).

Breakfast for Learning (BFL), another national supporter of breakfast programs, also cites the benefits of a nutritious breakfast in school-aged children on their website (Breakfast for Learning, 2011). Visitors to the website can access links to the research that Breakfast for Learning uses to support its position.

Supporters of Kids Eat Smart Foundation seek evidence from scientific research to validate the importance of their contributions. In particular, many supporters are interested in the effects of nutrition programs on students from an academic standpoint. Numerous studies, both well- and poorly designed, have been conducted to investigate the complex relationship between nutrition and various measures of health and well-being. For the purposes of this review paper, only studies that are considered to be well-designed were used. Well-designed studies supplied their findings from randomized controlled trials, in the case of quantitative research, or demonstrate trustworthiness, in the case of qualitative studies, as defined by Lincoln and Guba (1985).

(II) Nutrition for Children and Adolescents

Before focusing on school nutrition programs and their effects, it is important to recognize how overall nutrition affects both children and adolescents. Children need more nutritious foods in proportion to their size than do adults because they are growing and developing (Mahan & Escott-Stump, 2008). It is common knowledge that a child's overall diet quality affects the child's physical health (specifically the absence of disease). Malnutrition in childhood, both overnutrition and undernutrition, can have lasting effects into adulthood. Overnutrition generally means the intake of more nutrients, usually calories, than needed, and undernutrition generally refers to the intake of fewer nutrients, usually calories or protein, than needed. Children who are overweight or obese, which can be a result of overnutrition, often continue to be overweight or obese as adults. This is problematic because obesity can lead to further health problems such as diabetes, cardiovascular disease, some cancers, and reduced quality of life (Public Health Agency of Canada, 2004; Spiker, 2010). Undernutrition is often coupled with vitamin or mineral deficiencies, which can affect a child's growth, development and mental capacity. As with overnutrition, the effects of undernutrition in childhood can have long lasting effects. In the case of adolescents, their nutrient needs are dependent on their body composition, their degree of physical maturity, and level of physical activity (Mahan & Escott-Stump, 2008). Nutrient needs, especially vitamin and mineral requirements such as for calcium and iron, are still elevated compared with adults, as adolescents have not yet finished their physical maturation.

When children and adolescents eat the appropriate balance of foods for their age, their immune systems are stronger and can thus resist more diseases than their malnourished peers (Mahan & Escott-Stump, 2008). It is important to note that children are not capable of choosing a balanced nutritious diet on their own: they can only do so when they are presented with a variety of nutritious foods (Mahan & Escott-Stump, 2008). Most adolescents are aware of the importance of nutrition and the components of a healthy diet, but there are many barriers to choosing healthy foods and beverages (peer influences, media exposure, etc) (Story et al., 2002). From a developmental standpoint, the majority of adolescents lack the ability or insight to associate their current eating habits with future disease risk (Mahan & Escott-Stump, 2008).

Schools are an ideal environment for promoting healthy eating behaviours by providing nutritious foods since they already play a significant role in educating children about healthy eating and lifestyle choices (Story, Kaphingst & French, 2006; Jaime & Lock, 2009). Children tend to believe that school, and anything permitted at school, is essentially healthy (Hesketh et al., 2005). Because of this, schools stand to be role models for healthy eating. Since many children spend up to half of their waking hours during the week in a school environment, schools have an acknowledged position to influence the eating habits of school-aged children (Public Health Agency of Canada, 2010; Story, Kaphingst & French, 2006).

Now more than ever, it is acknowledged that the concept of "health" is more than just the absence of disease. Smith (2005) has discussed the relevance of this concept in nutrition

research. This concept has expanded to include terms such as "quality of life" and other terms that relate to the ability to function well (physically and mentally) and to have a positive mood state. The following sections address research findings that not only highlight the effects of breakfast consumption on academic performance, but on other measures of well-being such as social, emotional and behavioural changes.

(III) Academics

In a recent Nova Scotia study conducted by Florence, Asbridge and Veugelers (2008), the researchers investigated the effect of overall diet quality on the academic performance of children. The test taken by the children during the study was the Elementary Literacy Assessment, which is similar to the Criterion Reference Tests (CRTs) for English Language Arts held annually in Newfoundland and Labrador. In their study, when grade 5 children had an increased fruit and vegetable intake and a lower caloric intake of fat, they were significantly less likely to fail the assessment.

A research review article by Howard Taras (2005) sought to interpret the findings from other published studies about the association between nutrition in school-aged children and their performance in school and on tests of cognitive functioning. Taras reviewed studies from all over the world, but the studies chosen for reference here in this current paper were published either in Canada, the United States or United Kingdom. This is because the food culture, socioeconomic status, and lifestyles of the people in those countries are most similar to

the Newfoundland lifestyle. Taras reviewed studies which looked at children with iron deficiency and their cognitive abilities. Studies from the United States and United Kingdom indicate that children with anemias were significantly more likely to have poor academic achievements (Lynn et al., 1998; Halterman et al., 2001). Other American studies found an association between children who experience intermittent food insufficiency and poor academic functioning (Murphy et al., (1988) as reviewed by Taras). Overall, Taras reviewed more than 50 research papers and articles and concluded that the provision of a healthy breakfast through school breakfast programs is effective in improving cognitive functioning and academic performance.

Another study that linked breakfast consumption with academic success was research conducted by Kleinman et al. (2002). In that study, the researchers gathered information prior to and after the implementation of a breakfast program at an elementary school in Massachusetts. Six months after the start of the free school breakfast program, those students who had decreased their nutritional risk (risk of hunger or inadequate intake of nutrients) showed significantly greater improvements in math grades compared with students who did not decrease their nutrition risk. An American study that has been frequently referenced was conducted by Meyers (1989). The researchers tested 1000 school-aged children using the Comprehensive Test of Basic Skills (CTBS) both before the implementation of a school breakfast program and one year after the implementation. It was found that participation in the school breakfast program contributed significantly to higher CTBS scores in comparison to the previous year.

(IV) Behaviour, Attendance and Social Measures

In a research study by Murphy et al. (1998), the researchers investigated the relationship between school breakfast and the academic and social functioning of children and adolescents. The study found that those students participating in the breakfast program not only had significantly higher math grades, but significantly better attendance, significantly less tardiness, and were significantly less hyperactive than their peers who did not participate or rarely participated in the breakfast program. In another research study conducted by Murphy et al. (1998) as reviewed by Taras (2005), it was found that hungry and at-risk-for-being-hungry children were twice as likely to have impaired psychosocial functioning. The researchers elaborated that 'impaired psychosocial functioning' meant that children had higher levels of hyperactivity (as reported by teachers), absenteeism and tardiness compared with non-hungry children. Kleinman et al. (1998) while researching the correlation between child hunger, behavior and emotions, found that there was a statistically significant association of aggression and anxiety to experiences of hunger. In a later study by Kleinman et al. (2002), the researchers found that the students who achieved significant improvements in their math scores also showed significantly greater improvements in attendance. The study by Meyers (1989), previously mentioned, also reviewed data on tardiness and attendance both prior to and after the implementation of a school breakfast program. The researchers found that both tardiness and absence rates were significantly lower after the implementation of the breakfast program. Another study by Smith (2010) conducted research about the perceptions of children's well-

being for children who regularly ate breakfast cereal compared with those who did not regularly consume breakfast. It was found that the regular consumption of breakfast cereal was associated with greater alertness, lower levels of anxiety and depression, and a more positive mood.

(V) Recent Media Coverage

Recently, a journalist at the Globe and Mail dedicated a week's worth of articles to the topic of school nutrition programs and their impacts on students. The articles covered topics including reducing anger and aggression by feeding hungry students in a Toronto-based school; a farm to school program that helps students make the connection between eating healthy foods and buying locally; the lack of nationally funded nutrition programming in Canada; and how feeding students in school helps to contribute to healthier students both physically and emotionally (The Globe and Mail, 2011). Each article attempted to concisely capture the essence of the current efforts of Canadians to bring nutritious foods and food awareness into schools. Despite the differing topics covered in each article, the underlying theme remains that Canada lacks a national framework to support the provision of school meals. These articles aim to bring awareness that Canada is the only G8 country that does not have a national meal program. The current efforts to provide nutritious meals in Canadian schools are successful only as long as funding is available. Much feedback was generated on the Globe and Mail's website from on-line readers, with comments generating discussion around parental, provincial and

federal responsibilities for feeding children. Regardless of whether or not the articles address each of the topics in their entirety, it is important to recognize the debate that exists in Canada about funding a nationally organized school nutrition program.

More recently again (June, 2012) national media reported the results of a two-year study conducted by the Toronto and District School Board, which study was designed to investigate any association between school breakfast programs and school performance and behavioural outcomes. Consistent with results seen in other studies and in other jurisdictions, the Toronto and District School Board reported statistically positive correlations between these school nutrition programs and academic performance, school attendance and improved behaviour at school.

(VI) Conclusions

For the purposes of this paper, research articles referenced here specifically sought to examine how child nutrition is connected with overall well-being and school outcomes. Factors beyond the control of any of these studies also influence child health and well-being, including physical activity and socioeconomic factors. A research review paper, "What is the relationship between child nutrition and school outcomes?" written by Sorhaindo and Feinstein (2006), takes a comprehensive look at factors that influence child nutrition and how the resulting nutrition status affects school outcomes. The review highlights how children's food preferences are shaped, the role of parents, and the media's influence on childhood nutrition. The

researchers involved in this review ultimately came to the same conclusion that many other reviewers have: that providing nutritious meals to children during school hours helps students to perform at their best. This is one of the reference papers used by Breakfast for Learning (2011) in support of school breakfast programs.

After reviewing multiple research studies and anecdotal experience offered by school teachers, principals and staff, there does not appear to be any downside to providing children with one nutritious meal per day. Nationally funded school nutrition programs, whether lunch programs or breakfast, have existed in the United States since the 1960's (Meyers, 1988). Based on a number of studies and evaluations that have been undertaken to examine the success of these nutrition programs, the results have been favorable.

The Kids Eat Smart Foundation in Newfoundland and Labrador has been successful in its efforts to promote and support nutrition programs across the province. Every year, more and more schools apply for funding to begin their own breakfast, lunch or snack programs for their students. Currently, over 220 Clubs are receiving funding annually from Kids Eat Smart. Year end reports from schools that have Kids East Smart Clubs correspond with the evidence from research: that the provision of school nutrition programs has helped students to perform better in school, concentrate on tasks, miss fewer school days, and show a more positive mood. Considering the fact that there are only favourable outcomes to providing nutritious foods to children during the school day, it is reasonable to conclude that continuing to support such efforts can only benefit children across the province.

While there is currently no nationally funded nutrition program in Canada, Newfoundland and Labrador continues to be a step ahead of many other provinces by choosing to fund local nutrition programming. On a national scale, Newfoundland and Labrador is only surpassed by the City of Toronto for its annual investments in school meal programs (Centre for Science in the Public Interest, 2009). The support of countless local businesses, community members and provincial grants in addition to the tireless efforts of volunteers helps to make Newfoundland and Labrador a model province for school nutrition programming.

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