IMPROVING THE FOOD SKILLS AND FOOD LITERACY OF MANITOBA'S CHILDREN AND YOUTH:

A POPULATION HEALTH APPROACH

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The Winnipeg Regional Health Authority (WRHA) is one of the largest and most diverse health regions in Canada. It is responsible for providing health care to more than 700,000 people living in the City of Winnipeg as well as the surrounding Rural Municipalities of East and West St. Paul and the Town of Churchill, located in northern Manitoba.
http://www.wrha.mb.ca/index.php
Food Matters Manitoba is a non-profit organization invested in food security. Food Matters Manitoba partners with communities to make food more available and affordable. Through local greenhouses and gardens and teaching kids and families how to prepare healthy meals at community cooking classes, Food Matters Manitoba believes that together we can make Manitoba a healthier and happier place.
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EXECUTIVE SUMMARY

There is evidence suggesting that there is a global decline in basic food skills and that these essential skills are no longer being passed on to children. Additionally, it is reported that children are growing up in complex food environments that normalize the use of pre-prepared, convenience foods, making it increasingly difficult for them to make informed choices around food. This is concerning as evidence supports that there is a known relationship between food skills, and outcomes related to dietary habits and food security, which can ultimately impact health and well-being. The purpose of this report is to discuss the current state of food literacy in Canada and Manitoba and explore potential population-level strategies to improve the food skills and food literacy of Manitobans. Using a snowballing approach, key documents were reviewed to determine evidence-based strategies to improve food literacy and food skills. Evidence suggests that children and youth are an ideal population to target strategies to improve food skills and food literacy. Habits formed in childhood are more likely to last into adulthood, and therefore childhood is a critical period to cultivate health-promoting habits. Literature reports that the home has traditionally been the primary place of exposure to food skills and that the school system is the secondary place of exposure, yet the passing on of food skills in both these areas has been in decline. Although literature suggests that the school system is an ideal place to each food skills, currently in the province of Manitoba food skill and food literacy education, under the umbrella of human ecology/home economics food and nutrition courses, is not mandatory for students within the education system. Food skills and food literacy are essential to create dietary resilient individuals who are able to navigate complex food environments and use adaptive strategies to maintain a healthful diet and support school security. Conclusions from this report suggest that the school system is an ideal place to reach all children, regardless of social background or life circumstance, and teach them these essential skills in order to support healthy, food secure populations into adulthood.

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INTRODUCTION

There are many factors that influence food choice and behaviors related to food. The teaching and passing on of food skills to children and youth is essential for them to be able to prepare meals and make healthful choices regarding food (1). Recent evidence suggests that there has been a global decline in food skills, indicating that the passing on of "from scratch" cooking skills between generations has been decreasing and that the majority of children, youth and young adults lack the knowledge, food skills and confidence necessary to provide healthy meals for themselves (1,2). This is of growing concern, as adequate food skills are correlated with the consumption of healthy foods necessary to reduce one's risk of diet-related chronic disease (3) and food insecurity (4). This report intends to: a) review the evidence regarding the importance of food skills and food literacy to support overall health and food security, especially in children and youth; b) explore the evidence supporting the mandatory provision of food skills and food literacy education throughout primary and secondary school as an equitable, population-level strategy to support the health and food security of Manitobans.

FOOD SKILLS INCLUDE (1):

Knowledge regarding:
- ***Food nutrition/label reading.***
- ***Food safety.***
- ***Ingredient substitution.***

Planning regarding:
- ***Prioritization of tasks.***
- ***Purchasing food on a budget.***

Conceptualizing food regarding:
- ***Adjusting recipes.***
- ***Creative use of available ingredients/leftovers.***

Mechanical techniques regarding:
- ***Preparing meals.***
- ***Chopping and mixing etc.***
- ***Cooking.***
- ***Following a recipe.***

Food Perceptions regarding:
- ***Use of senses. i.e. texture, taste, look of the food.***

Definition of Food Skills and Food Literacy

There are an array of varying definitions and interpretations of food skills and food literacy (5). Vanderkooy (2009) offers a comprehensive definition of food skills stating that: "At an individual and household level, *food skills* are a complex inter-related, person-centred, set of skills that are necessary to provide and prepare safe, nutritious, and culturally acceptable meals for all members of one's household" (6). The term "food skills" refers to more than the mechanical act of cooking, such as chopping, mixing, cooking and following a recipe, but also encompasses an individual's knowledge around food such as food safety, nutrition, label reading, and appropriate ingredient substitution (1). It also refers to the ability to plan meals through budgeting, shopping for food and prioritizing tasks

related to food preparation (1). Additionally, food skills also refer to one's perceptions around food and being able to use the senses (i.e. texture, taste, smell sight etc.) in order to properly assess and prepare food (1).

While most definitions of *food literacy* include components of food skills and nutrition, it also includes the ecological and social contexts related to food (4).Cullen et al. (2015) report that food behaviours and skills cannot be separated from their environmental and social context and that food literacy is not just about food skills, but also includes integral knowledge of the global and local food system and how they can work together to support food security through an equitable, safe and healthy food supply (4).

Food literacy requires knowledge of food in three main areas (4):

1) Understanding the impact of food on one's health and well-being;
2) Understanding the food system from field to plate to garbage; and
3) Understanding the influences and key factors that affect the food system, such as the social, cultural, economic, political and environmental factors.

Cullen et al. (2015) write that as the term *health literacy* has advanced understandings of literacy as a social determinant of health, *food literacy* also contributes to understandings of health equity and population health. In order to incorporate this definition of food literacy, Cullen et al. (2015) propose the Food Literacy Framework for Action:

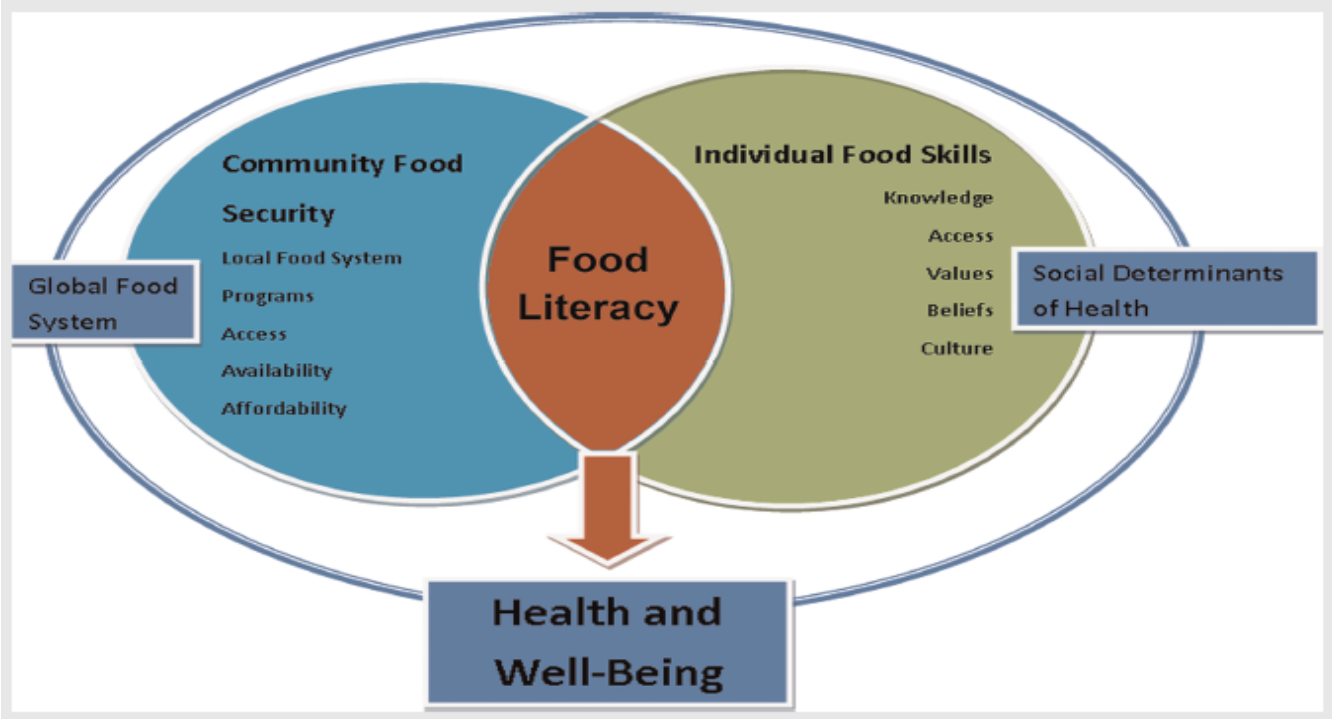

FIGURE 1. THE FOOD LITERACY FRAMEWORK FOR ACTION
TAKEN FROM *FOOD LITERACY: DEFINITION AND FRAMEWORK FOR ACTION (2015). USED WITH PERMISSION*

The Food Literacy Framework for Action shows the interconnectedness of food literacy to community food security, the global food system, individual food skills and the social determinants of health, all which ultimately influence health and well-being. Health and well-being only exist when the population is food secure through the availability and affordability of food within the local food system (or the ability to access programs which provide adequate food resources in this absence) AND have the individual knowledge and food skills necessary to prepare food in a manner that aligns with one's values, beliefs and cultural preferences (4). Community food security is also greatly influenced by local and global food systems, and both can be stressed by environmental and economic factors. One's ability to acquire knowledge and skills related to food and the food system – *food literacy* - is greatly influenced by the social determinants of health, as well as environmental, social, economic, cultural, and political factors (4). The Food Literacy Framework for Action is a comprehensive food system approach to support food literacy, and throughout this report the term *food literacy* will be used in reference to the comprehensive definition offered by this framework.

"Food literacy is the ability of an individual to understand food in a way that they develop a positive relationship with it, including food skills and practices across the lifespan in order to navigate, engage and participate within a complex food system. It's the ability to make decisions to support the achievement of personal health and the sustainable food system considering environmental, social, economic, cultural, and political components" (4).

Community Food Security

The most commonly accepted definition of *community food security* (CFS) is that proposed by Hamm & Bellows (2003), which states that *community food security* is "a situation in which all community residents obtain a safe, culturally acceptable, nutritionally adequate diet through a sustainable food system that maximizes community self-reliance and social justice". Within Canada, approximately 2.7 million individuals (or 9% of Canadian households) experience food insecurity, meaning they have a lack of access to food that meets both dietary needs to promote health and also cultural preferences (8). In the province of Manitoba, approximately 56,500 (or 10% of Manitoban households) are estimated to be food insecure (9–11). Households that are food insecure are more likely to experience lower amounts of adequate nutritional intake for fruits and vegetables, milk products and vitamins (8), and instead tend to rely on cheaper energy-dense foods (12). Energy-dense foods are often associated with negative health consequences and contribute to higher rates of chronic disease such as heart disease, hyperlipidemia, diabetes, dental caries and obesity (8,10,12–16). As well, there is significant psychological stresses associated with a lack of resources to procure food, and food insecurity has been associated with negative mental health outcomes (12,16).

Access to food is a key determinant of health, well-being and human dignity (8), yet there can be multiple barriers to acquiring food, which contributes to food insecurity. A major barrier is a lack of *geographic food access*, i.e. living in a remote community, having a lack of reliable transportation to food retailers, or living in a "food desert"

There are key inter-relationships between food skills and health disparities and the acquisition of food skills relies on structural factors such as educational policies and cultural norms *(1).*

(a community area that has a lack of accessible and affordable quality food sources) or even a “food swamp” (a community area that an excess of poor quality, caloric-dense foods) (17). Another significant barrier is *economic access*; food insecurity often occurs due to an inability to purchase food because of inadequate income or high costs of food (17). Lastly, another substantial barrier is an inability to prepare nutritionally adequate food due to a lack of food literacy or *food skills and training*.

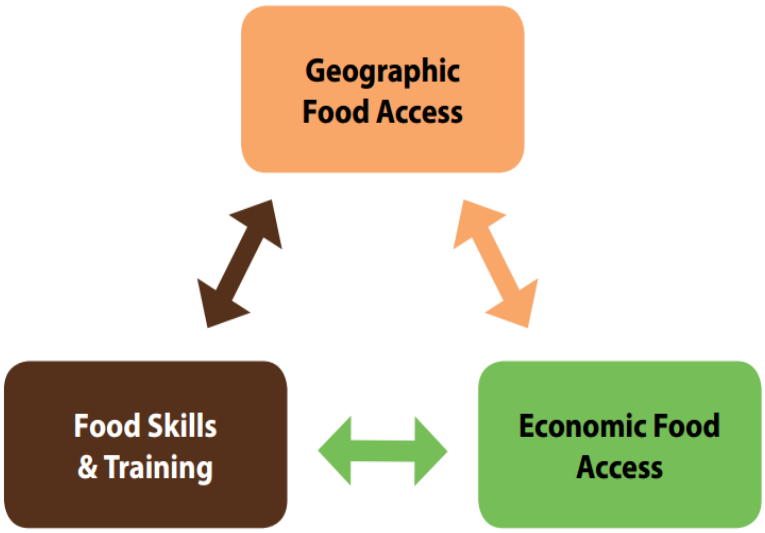

FIGURE 2. THE FOOD SECURITY TRIAD TAKEN FROM *FOOD MATTERS MANITOBA: DOWNTOWN WINNIPEG COMMUNITY FOOD ASSESSMENT* (N.D)
USED WITH PERMISSION

In order to achieve food security, all elements of the food security triad (*Figure 2*) must be in play. One must be able to access food retailers, one must be able to purchase food, and one must also know what to do with the food once it is purchased. While no one element of the triad takes precedence over another, the purpose of this report is to discuss how the food skills can be increased in order to support food literacy, food security and overall health and well-being of Manitobans.

LITERATURE REVIEW

Food Skills, Food Literacy and Health

Engler-Stringer (2010) reports on the 2005 Agriculture and Agri-Foods *Canadian Food Trends to 2010: A Long Range Consumer Outlook,* and suggests that Canadians are continuing to become more disconnected from food and its preparation, and that consumption of semi-prepared or fully prepared meal items is becoming the norm (1,5). There is a body of literature which explores the transition of hunting and gathering and cooking from raw, whole ingredients, to the consumption of pre-prepared food, and suggests that this transition was initiated by the post-World War II period when women began to spend more time outside the home and the food industry took note of this trend and began advertising “pre-prepared” meals to women (5). The demands of work and life, household tasks, and the rise of convenience foods has created food environments that are complex and often difficult to navigate. The literature describes this as the *nutrition transition*, in which the increased use of pre-packaged foods has led to a global decline in cooking and food preparation skills, as convenience

foods requires fewer skills than preparing meals from raw ingredients (1). Additionally, literature suggests that the nutrition transition is characterized by dietary habits that are now lower in fruit and vegetable and whole grain consumption, and are higher in foods that are energy-dense, fat (total and saturated), sodium, sugar and simple carbohydrates (1). The Government of Canada (2010) in the report *Improving Cooking & Food Preparation Skills: A Synthesis of the Evidence*, reviews the current evidence related to food skills and suggests that there are several economic, social, technological, environmental and global factors that have contributed to the current scape of food environments and food consumption patterns. These factors are (1):

- technological advances in how food is produced, packaged and sold;
- the increased availability of food commodities, ranging from raw whole foods to those that are processed and pre-packaged;
- changes in the both local and global food systems;
- shifting priorities and the influence of current social and cultural norms around food;
- increasing demands on time, especially with the increased labour market participation of women, and strains on financial resources; and
- decreased opportunities to learn cooking skills in both the home and in schools.

While there is limited quantifiable data to make generalizations about the current state of food skills and food literacy within populations, literature suggests that the nutrition transition has resulted in a *culinary transition*: in which shifting societal norms around food and the increased availability and use of pre-packaged convenience foods has led to an inevitable loss of basic cooking skills (1,18). As certain pre-made foods have become more readily available for purchase, it has created less of a need to know how to make it from scratch, and as a result certain food skills are being lost.

Other literature suggests that there has been a "deskilling" of populations and that "significant and planned restructuring within the agri-food industry and food systems has resulted in both worker deskilling in food manufacturing and food-related consumer deskilling, which […] will have significant consequences on consumer choice, diet and health" (1). This theory suggests that the food industry is intentionally seeking to keep consumers at bay from the processes of food production so that it may continue to promote the profitable consumption of pre-made products (1,19,20). This theory attests that consumers are losing touch with the processes of how food is produced, processed, distributed and sold, and therefore lack the food literacy skills to make informed food choices within the context of local and global food systems (19).

Food Skills, Food Literacy and Food Security

There is a positive relationship between the complexity of food preparation activities and household food security (5). Higher level of confidence related to food skills and using "from scratch" ingredients is associated with higher levels of food security (64,65).

It is also important to recognize that cultural food preferences have a direct effect on food choice and the types of meals cooked (21). Food choice is complex and is also influenced by food preferences such as taste, as well as factors such as time, income and cost, and individual or family value placed on food and cooking and social norms (1). The Conference Board of Canada (2013) also notes that self-motivation in an important element of food skills and food choice, and that in the absence of self-motivation, even when one has geographic access to food, economic access to food, and the necessary skills to prepare food, dietary outcomes may not improve (22). Additionally, there are also both gender and social divisions regarding cooking skills (1,23). Women are primarily noted to be responsible for food preparation in the home and also report greater confidence in their food skills compared with men (1,3). Literature has shown that a higher diet quality is associated with a higher socio-economic status (SES), and that those with lower SES tend to consumer low-nutrient, energy-dense foods due to limited economic means (24). However, across all levels of income, participation in the preparation and cooking of family meals from raw ingredients improves nutritional status (1).

Literature has shown a strong correlation between nutritional knowledge and healthy eating, especially for children as they grow older (22). A lack of food skills and food literacy is known to limit food choice (22). There is some evidence to support that a decline in food skills is linked with poor dietary behaviours and the consumption of pre-prepared and pre-packaged foods, which are often energy-dense and lack nutritional value (1,22). There is a clear link between food and health, and poor dietary habits are a known modifiable risk factor for many chronic diseases such as diabetes, cardiovascular disease, chronic respiratory disease, diseases of the bones and joints and some cancers (22).

While there is debate about whether or not populations have experienced a culinary transition due changes in the food skills required to prepare foods, or a mass deskilling from the intentional efforts of the food industry to create a reliance of prepackaged foods, there is no debate around the potential diet-related health consequences that can result from the consumption of highly processed, energy-dense, high fat packaged and pre-prepared foods (5). A lack of ability of individuals to make informed food choices in a world filled with complex food environments will have negative impacts on overall health and well-being (1). Food skills, food literacy and health are all linked, and improving food literacy offers an opportunity to also improve health and well-being.

How are Food Skills and Food Literacy Learned?

Traditionally, the home has been the primary mode through which children learn basic food skills (1,5). Children often learn these skills from their parents, usually their mothers, and other extended family members such as grandparents (1,5). Evidence suggests that in some populations, there has been limited exposure of children to basic food skills within the home and this is contributing to the deskilling of this population and also limiting the ability of children to make healthful food choices, even into adulthood (1). The education system has been reported as the secondary place in which children learn food skills (1). Stitt (1996) also suggests that the decline of home economics and food and nutrition curricula and polices related to food literacy education within the school system has also contributed to the loss of food skills in children and youth (1,25). The work of Caraher et al. (1999) found that for individuals who were considered to be low income, school cooking classes were reported as the most important place to learn food skills, whereas higher income individuals expressed doing the majority of their learning from cook books (26). Within the context of health equity, undervaluing the importance of learning food skills within the school system may have the potential to contribute to the burden of diet-

related chronic disease, which is experienced more greatly among those who are socio-economically disadvantaged (5).

THE FOOD SKILLS AND FOOD LITERACY OF CANADIANS

Measuring Food Skills and Food Literacy

The measuring of food skills in the Canadian population, especially in children and youth, is essential in order to understand the food literacy of Canadians. While a decline in cooking skills has been reported in literature, it is difficult to compare trends across studies as there are major methodological differences in definitions and indicators (4–8). The work of Desjardins & Azevedo (2013), in a study funded by Public Health Ontario entitled *"Making Something Out of Nothing": Food Literacy among Youth, Young Pregnant Women and Young Parents Who are at Risk for Poor Health*, sought to evaluate the food literacy of three populations in Ontario who were at risk for poor dietary health. This study offers suggestions for measuring food literacy, which are similar to the principles of the Food Literacy Framework for Action, by including both personal skills and external factors related to socio-cultural environments and the social determinants of health. The measures suggested by Desjardins & Azevedo (2013) are:

Personal skills and attributes related to food preparation:

- food skills;
- self-efficacy and confidence;
- ability to improvise and problem solve; and
- ability to find and use social & other supports.

External determinants should also be examined, such as:

- socio-cultural environments;
- learning environments;
- food access, cooking facilities; and
- Living conditions (i.e. income, employment, housing).

The Canadian Community Health Survey (CCHS) took at different approach to measuring the food skills of Canadians by collecting self-reported data in 2012 on food skills related to meal planning, transference of food skills to children and youth, and nutrition knowledge (n = 9,559) (3). In 2013 the CCHS also collected data on self-assessment of mechanical cooking skills and food conceptualization (n = 10,156) (3). Data each year was collected throughout a two month period from a representative sample from the Canadian population aged 12 and over from all provinces (3). Additionally, the Conference Board of Canada also released a report in 2013 regarding the state of food literacy in Canada. Some of the food literacy trends in Canada from these two reports are described below.

MEAL PLANNING

The Conference Board of Canada (2013) states, "Household food-related decisions demonstrate households' knowledge, attitude, and skills in relation to food production, processing, distribution, and waste" (22) and used budgeting skills as one proxy measure of food literacy. They report that the majority of Canadians do seem to have some type of meal budget, but not all stick to their budget (22). Additionally, their review of the food budgeting practices of Canadians suggested that those of lower SES were better at sticking to a budget and getting more for their dollar through creative meal planning and cooking from scratch (22).

The 2012 CCHS from a sample of 9, 559 respondents aged 12 and up found that (3):

- 74% of Canadians write a grocery list before going out and purchasing food;
    - 78% of women compared with 70% of men write a grocery list before going shopping,
    - 76% of Canadians living in higher income household write a grocery list compared with 70% of Canadians living in a lower income household;
- 62% of Canadians engage in meal planning before going out and purchasing food;
- 59% of Canadians with secondary education engage in meal planning compared with 45% of Canadians with less than secondary education.

Fruit and vegetable consumption is also often used as a proxy measure for food skills, as evidence suggests that food skills influence food choice and healthy eating behaviours (1,3,22,30). The CCHS survey also found that "Canadians who reported writing a grocery list were more likely to consume five or more vegetables and fruit per day compared with those who do not" (3).

TRANSFERENCE OF FOOD SKILLS

Evidence is suggesting that there is a decline in the transference of food preparation activities and food skills to children and youth in both the home and also in schools (3,22,31). This is concerning as there is an association between food preparation skills and food choices (22,30). In a study conducted by Larston et al. (2006) adolescents who were confident in food preparation also reported higher intake of fruit and vegetables, vitamin A, fiber and folate (3, 22).

The Conference Board of Canada (2013) found that while adolescents were more likely to help in the kitchen than young adults, surveys indicate that adolescents are only helping out in the kitchen once or twice a week (22). As well, the Conference Board of Canada (2013) writes that according to a study conducted by the Dairy Farmers of Canada, parents report that they would like to make cooking

"Canadians who reported writing a grocery list were more likely to consume five or more vegetables and fruit per day compared with those who do not" (3).

with their children a routine family activity but felt that time was a common prohibitive factor (22). There were also differences noted between socio-economic groups; children and adolescents from lower SES families were more likely to help out with food preparation in the home compared with their peers in higher SES groups (1,22). However, to note, there is a lack of information to describe if these activities involved the preparation of foods from scratch, or from pre-made, convenience foods.

The 2012 CCHS reported that (3):

- 68% of Canadian children help with grocery shopping;
- 67% of Canadian children suggest ideas for menu planning;
- 59% of Canadian children assist with meal preparation and cooking;
- 31% of Canadian children are able to engage in meal preparation and cooking on their own.

NUTRITION KNOWLEDGE

According to the CCHS, 65% of Canadians make food choices based on the information provided on nutrition labels and that "Canadians who reported selecting foods based on nutrition labels were more likely to consume five or more vegetables and fruit per day compared with those who did not" (3). The Conference Board of Canada (2013) found that according to the Canadian Council of Food and Nutrition Tracking Nutrition Trends (TNT) surveys, in general, the nutritional knowledge of Canadians has remained relatively consistent over the years. However, there were noted differences in self-reported nutrition knowledge by gender and social class, with women and those of higher SES reporting higher levels of nutrition knowledge (22). Additionally, the Conference Board of Canada (2013) found that only a small majority of Canadians, 56% in 1997, and 41% in 2001, could accurately name all 4-food groups listed in the Canada Food Guide (22).

MECHANICAL COOKING SKILLS

In the 2013 CCHS (n = 10,156), self-reporting of mechanical food skills varied significantly by the complexity of the task (3):

- 68% of respondents reported to be "very good" at safely using a kitchen knife, compared with 26% who reported themselves as "good" and 5% as "basic or limited".
- 50% reported being "very good" at cooking stew, soup or a casserole from scratch, compared with 22% as "good" and 25% as "basic or limited".
- 39% reported to be "very good" at safely freezing raw vegetables or fruit, while 30% reported "good" and 31% reported "basic or limited".
- 41% reported being "very good" at baking a cake or muffins from scratch by following a recipe, compared

"Compared with those with basic or limited mechanical cooking skills, those who reported having very good skills were more likely to also report:
Higher frequency of vegetables and fruit consumption
Better self-perceived eating habits
Higher levels of perceived health" (3)

with 26% “good” and 33% “basic or limited”.

- 18% reported to be “very good” at canning with raw ingredients, compared with 19% “good” and 53% “basic or limited”.

In the CCHS, the most commonly cited barriers to cooking meals included insufficient food skills, insufficient time and cooking not being a designated role or responsibility within the family (3). Similar to the findings of the Conference Board of Canada (2013), the CCHS also noted significant differences between the self-reported mechanical skills of women compared with men. Only 19% of men reported that they prepare most meals in the household, and they were also more likely to report being “very good” at more basic levels of cooking skills (3).

FOOD CONCEPTUALISATION

The CCHS found that being a women, having higher education, higher income, consumption of five or more vegetables and fruit per day, and having higher perceived health status, eating habits and cooking skills, was associated with being able to adjust a recipe and substitute ingredients in order to make it healthier (3). These findings suggest that higher rates of food literacy influence one’s ability to make healthier food choices, which has important implications for one’s health and well-being.

Making the Connection

Evidence is suggesting that there has been a decline in the food skills of Canadians (1) and that the nutritional knowledge of Canadians is somewhat limited (22). Research has shown that there is a relationship between self-reported cooking skills and intention to eat health promoting foods, with higher levels of nutrition knowledge and cooking skills being linked to more healthful behaviours (22). There is also evidence to suggest that cooking skills are no longer being transferred to children and youth in the home and school, which has a direct impact on food choice (3,22,31). Dietary habits are a modifiable risk factor for many chronic diseases and there is growing evidence to suggest that increasing the food literacy of Canadians could help reduce the growing burden of chronic disease in Canada (22).

In the CCHS having a insufficient food skills is was cited as one of the most common barriers to meal preparation and cooking (3)***.***

THE OVERALL POPULATION

The CCHS also measured the fruit and vegetable consumption of Manitobans aged 12 and up. Combined data from the 2007 – 2008, 2009 – 2010 and 2011 – 2012 CCHS suggest that only 37% of Manitobans consume five or more fruits and vegetables a day. This data can be further broken down by health region (33):

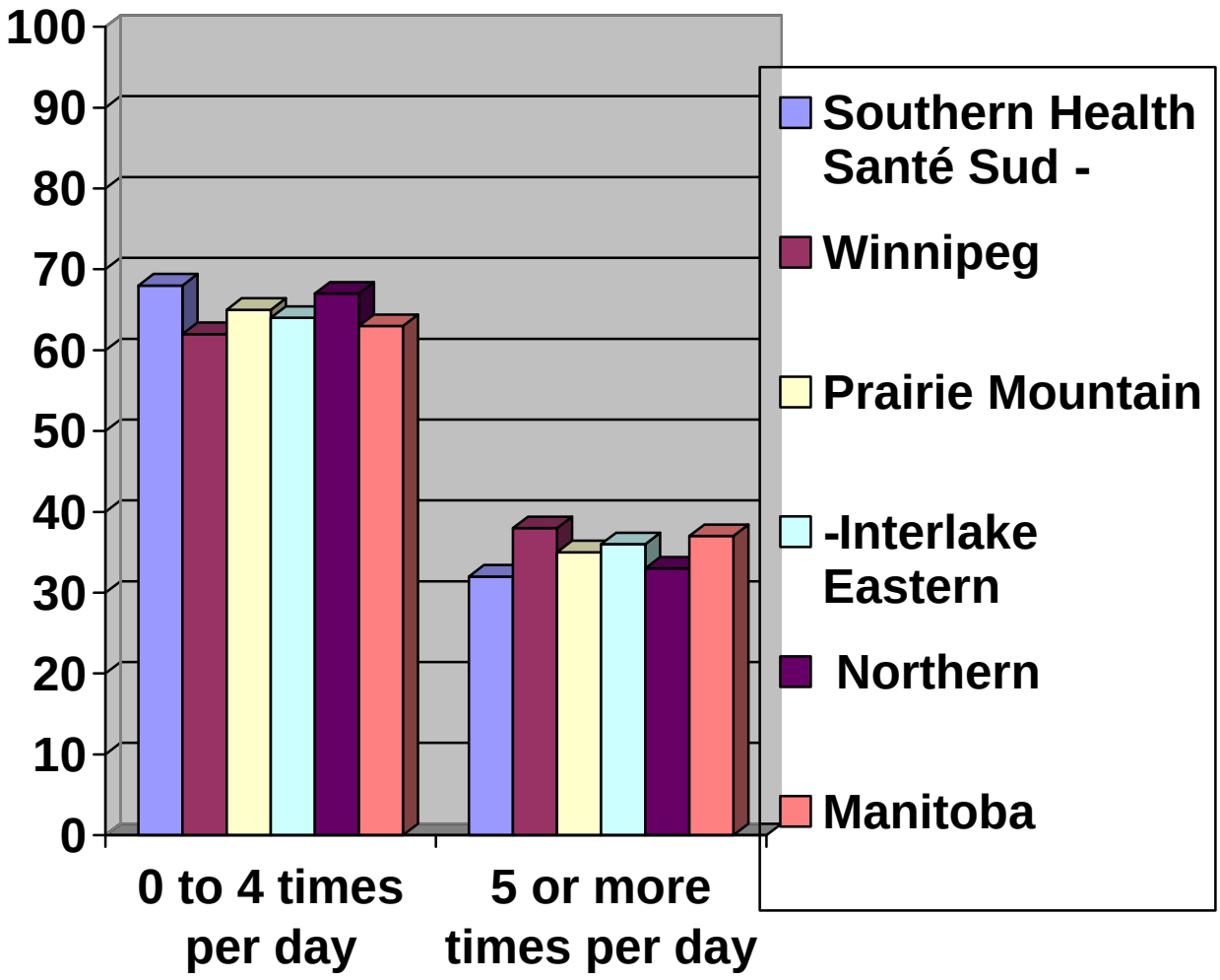

FIGURE 3. AVERAGE DAILY CONSUMPTION OF FRUITS AND VEGETABLES BY RHA, COMBINED CCHS CYCLES 2007 - 2008, 2009 - 2010 AND 2011 – 2012
TAKEN FROM *SOUTHERN HEALTH-SANTÉ SUD: COMMUNITY HEALTH ASSESSMENT (2014)*

Data from Statistics Canada for 2014 indicate that consumption of five or more fruits and vegetables a day by Manitobans has gone down to 31.0%, which is lower than the national average of 39.5% (34). Again, noting the connection between food skills, nutrition knowledge and dietary habits, these data are an indicator that there is still much work to be done to improve the overall health and well-being of Manitobans in regards to nutrition promotion.

The fruit and vegetable consumption of Manitobans (five or more times a day) is 31.0%, which is lower than the national average of 39.5% (34)

CHILDREN AND YOUTH

The Manitoba Youth Health Survey

The second cycle of the Manitoba Youth Health Survey was completed in 2012/2013 by students in Grades 7 to 12 in publically funded schools, with 476 schools and 64,218 students participating (35). While the survey did not specifically measure food skills and food literacy, it used a food frequency questionnaire for youth to report the frequency of various foods consumed which was used as a proxy for measuring eating habits (35). The Canada Food Guide recommends that youth aged 14 – 18 consume the following servings from each category every day (36):

TABLE 1. CANADA FOOD GUIDE RECOMMENDATIONS FOR YOUTH AGED 14 – 18
TAKEN FROM *HEALTH CANADA . FOOD AND NUTRITION: HOW MUCH FOOD YOU NEED EVERY DAY (2007)*

Youth: 14 – 18 years olds		
	Females	**Males**
Vegetables & Fruit	**7**	**8**
Grains	**6**	**7**
Milk & Alternatives	**3 - 4**	**3 - 4**
Meat & Alternatives	**2**	**3**

In brief, findings from the Manitoba Youth Health Survey show that (35):

- 38% of students reported eating vegetables or fruit seven or more times a day, with the lowest number seen in Grades 9 – 12;
- 58% of students reported consuming milk and alternatives three or more time a day;
- 84% of students reported eating meat and alternatives two or more times a day;

- 56% of students reported to eat sugary/salty snacks one to two times per day, with 25% reporting to eat these three or more times a day;
- 30% of students reported to eat fast food one to two times per day, with 8% reporting three or more times a day;
- 34% of students reported to drink non-diet pop, soda, slurpees or slushies one to two times per day, with 12% consuming these three or more times per day;

MAKING THE CONNECTION

Literature has shown that in adolescents the frequency of eating fruits and vegetables declines with age (37). Other research has also shown that there is a positive correlation between food choice, meal patterns and fruit and vegetable consumption (30,38). Findings from the Manitoba Youth Health Survey suggest that only 38% of Manitoban youth are getting their recommended daily intake of fruits and vegetables while the other 62% are falling short. This evidence should be alarming when considering the connection between fruit and vegetable consumption, food choice, cooking skills and health. Minaker and Hammond (2016) in *Low Frequency of Fruit and Vegetable Consumption Among Canadian Youth: Findings from the 2012/2013 Youth Smoking Survey* write that schools are an ideal place to promote the consumption of fruit and vegetables and other healthy foods (39). Improving the fruit and vegetable consumption of youth is linked with improved food skills, and multicomponent programs involving healthy food environments and food skill and food literacy education are required in order to promote increased fruit and vegetable intake among children and youth (30,40). Minaker and Hammond (2016) suggest that this intervention could avert or delay an estimated 22,000 deaths due to diet-related chronic disease in Canada (39).

FOOD LITERACY EDUCATION IN MANITOBA

Human Ecology/Home Economics Food and Nutrition Curriculum in Manitoba

In the province of Manitoba, kindergarten to grade 12 groupings are divided into three categories (41):

- The Early Years – Kindergarten to grade 4
- The Middle Years – Grade 5 to grade 8
- The Senior Years – Grade 9 to grade 12

Currently in Manitoba, human ecology/home economics food and nutrition (HEFN) education is not mandatory but is offered through either subject area time allotments in the early and middle years, and as either optional full (110 hours) or half (55 hours) credit course in the senior years (41).

In grades 1 to 6, 11% of compulsory education time is dedicated to physical education and health education (41). HEFN education is not specifically offered for grades 1 to 5, but elements of HEFN education may be provided at the discretion of individual teachers within other subject areas such as science, physical education or health. In grades 1 to 6, 9% of time is dedicated to optional subject areas (41), and in grades 5 or 6 this may include HEFN education, but the decision to offer human

ecology/home economics at the grade 5 and 6 level is left to the discretion and resources available individual schools.

In grades 7 and 8, 9% of compulsory education time is allotted to physical education and health education (41). Again, while elements of health and nutrition are generally incorporated within science, physical education and health curriculum at these grade levels, the integration of concepts related to food skills and food literacy into these subjects is generally left to the discretion of individual teachers and is not uniform. In grades 7 and 8, 13% of time is dedicated to optional subject areas, of which HEFN education may be offered an exploratory program, but this again depends on the discretion and resources available to individual schools.

In the senior years, students are required to complete a minimum of 30 credits to graduate, 17 of which are compulsory and 13 which are optional (42). Of the 13 optional credits home economics food and nutrition is generally an elective available to students, but once again this depends on the discretion and resources available in individual schools (42). As well, in the seniors years there are often other elective courses that compete with HEFN classes for students choice, such as technical-vocational education, business and marketing and industrial arts, as well as an array of other additional courses in English, mathematics, sciences, social studies, career development, psychology and other languages, etc. (42).

Human Ecology/Home Economics: Grades 5 to 8

In Manitoba, the grades 5 to 8 human ecology curriculum was recently updated in 2015 to replace the home economics curriculum from 1982. The human ecology curriculum is designed to be “a holistic, multi-dimensional systems approach that empowers individuals to create thriving families and dynamic communities” (43). Human ecology/home economics is an umbrella term; the curriculum is divided into two courses and children may take one or both of the courses, depending on the school. The curriculum is divided into clothing and textiles, and food and nutrition, with concepts of human development integrated into both courses (43). The vision of the human ecology curriculum is to enhance the personal well-being of students, help students develop and apply technical, communicative, and thinking skills and cultivate skills to help students participate in a dynamic society (43). The curriculum is designed to be flexible and meet the needs of all learners in Manitoba, and is intended to be exploratory/introductory for grades 5 and 6 and intermediate for grades 7 and 8 (43). This allows each school to determine the implementation level that best works for their educational setting as the time allotment for this curriculum varies between schools, e.g. some divisions offer human ecology starting in Grades 5/6 while others only offer it starting in Grades 7/8 (43).

The food and nutrition curriculum has detailed learning objectives in several key areas (44):

- food safety and sanitation;
- the relationship between food and health;
- label literacy for achieving and maintaining health and wellness;

The full curriculum can be found on the Manitoba Education and Advanced Learning website under Technology Education – Middle Years Human Ecology – Manitoba Curriculum Framework of Outcomes (http://www.edu.gov.mb.ca/k12/cur/teched/human_ecology/food_nutrition.pdf)

- understanding the factors that can influence food choice;
- the relationship between human needs and lifestyle practices;
- the social context of food and nutrition;
- food literacy (i.e. reading a recipe) and food numeracy (i.e. measuring ingredients, adjusting recipe quantities);
- food preparation fundamentals and skills;
- food technology and trends in the food industry;
- the current context of food security and food issues and sustainability;
- social justice and human rights as they relate to food;
- food and the environment;
- personal development.

The goal of the food and nutrition curriculum is to teach "about healthy relationships with food through theoretical and practical food experiences. A study of food and nutrition can expose students to accurate information and provide opportunities for them to gain competence in making informed choices. The learning outcomes develop skills, knowledge, and understanding of basic food preparation and nutrition" (44). Overall, this curriculum includes key food skill and food literacy concepts and appears promising for developing food literate students who have the skills necessary to navigate the complexities of current food environments. However, exposure to these essential skills may be limited for students as this curriculum is not mandatory in the province of Manitoba for students grade 5 through 8.

Human Ecology/Home Economics: Grades 9 to 12

In Manitoba, for the senior years (grades 9 to 12), the grade 9 home economics curriculum was last released in 1993, and the grade 10 to 12 curriculum in 1988. However, work will start in the fall of 2016 with the intent to release an updated curriculum that is more reflective of current nutrition knowledge and the modern food environment. The senior 1, or grade 9 home economics curriculum, is an umbrella term for three separate courses: food and nutrition, clothing, housing and design, and family studies (45). The curriculum is designed to allow teachers to select learning concepts that are most relevant, and also adapt the learning concepts to their local circumstances in order to allow students to make connections to their current environment and community (45).

The grade 9 food and nutrition curriculum has detailed learning objectives in three key areas (45):

- **the individual and food needs**:

- basic food needs,
    - nutritional and caloric needs;

- food intake patterns,
    - lifestyles;
- sensory influences of foods,
    - new and creative experiences;

- **the consumer and food**:

- becoming an informed consumer,
    - shopping practices;
- consumer rights and responsibilities,
    - laws and consumer agencies;

- **the preparation and service of food**:

- management in food preparation,
    - plan, organize and control,
    - health and safety;
- preparation of food,
    - methods, time and special needs;
- food service and social practices,
    - occasion, lifestyle, away from home.

***The full curriculum can be found at the Manitoba Education and Advanced Learning website under Technology Education – Senior Years Curriculum – Senior 1 Home Economics* (http://www.edu.gov.mb.ca/k12/cur/teched/docs/home_economics_s1.pdf).**

The grade 10 to12 home economics curriculum also offers a food and nutrition course, which builds on concepts presented in the middle years and in grade 9:

- **Grade 10:**

- significance of food;
- consumer aspects of food and nutrition;
- planning, preparing and serving food.

- **Grade 11:**

- factors affecting family food and health;
- Canada's food supply;
- Canadian Mosaic.

- Planning, preparing and serving food

- **Grade 12:**

- Canada and world food problems;

- careers in food;

- planning, preparing and serving food.

***The full curriculum can be found at the Manitoba Education and Advanced Learning website under Technology Education – Senior Years Curriculum – Grades 10 – 12 Food and Nutrition* (http://www.edu.gov.mb.ca/k12/cur/techned/docs/food_nutrition_10-12.pdf).**

Overall, while outdated, this curriculum does appear to have key concepts related to food skills and food literacy that will help create students who have the skills necessary to navigate the complexities of current food environments. However, again exposure to these essential skills may be limited as this curriculum is not mandatory for students grades 10 through 12.

The State of Food Literacy Education in Manitoba

There has been some work in the province of Manitoba to review the state of food skill and food literacy education in the province of Manitoba. Slater (2013) conducted a study to examine the current state of Home Economics Food and Nutrition (HEFN) education in the province of Manitoba (31). Through the examination of administration data capturing HEFN enrollment rates from 2000 – 2010, some observations by Slater (2013) were made:

- HEFN enrollment increased from 25.67% in 2000 to 29.75% in 2010, with an average of 26.90% enrollment between 2000 and 2010. However, enrollment has been decreasing by grade level, with highest numbers seen in grade 7 (48.74% in 2010) compared with lowest numbers seen for grade 12 (10.55% in 2010).

- There were differences seen in enrollment numbers within the province depending on region, with Winnipeg having the highest enrollment numbers between 2000 – 2010 at 27.80%, followed by Rural and Other Urban areas at 25.50%, and Northern and Remote Regions at 17.63%. It is noted that throughout the study period, the gap between HEFN enrollment in Winnipeg and other areas did start to narrow.

- There were also noted differences between female and male enrollment numbers in HEFN education, with females having higher enrollment, especially in higher grades, but with this gap slowly closing throughout the study period.

The most recent data from Manitoba Education and Advanced Learning, *Table 3 and Table 4*, shows the provincial enrollment for human ecology/home economics[1] education for the 2014 – 2015 school year:

[1] Throughout this report human ecology/home economics Food and Nutrition will be used to describe HEFN education in the province of Manitoba. HEFN education in Manitoba was traditionally termed 'home economics' however, with the release of new middle years "human ecology" curriculum in 2015 there has been a switch of terms. The new middle years "human ecology" curriculum will not be fully implemented system wide until fall 2016, and some schools are still currently using the middle years "home economics" curriculum from 1985. Grades 9 – 12 currently still use the term "home economics" (62).

TABLE 2. 2014 - 2015 HUMAN ECOLOGY/HOME ECONOMICS[1] ENROLLMENT GRADES 6 - 8 IN THE PROVINCE OF MANITOBA.

	Number of Students Enrolled in Human Ecology/Home Economics[2]	Total Number of Students within the Provincial School Divisions[3] (46)	Percentage of Students Enrolled in Human Ecology/Home Economics
Grade 6	1,059	12,751	8.3%
Grade 7	7,203	12,759	56.4%
Grade 8	6,656	12,926	51.5%

TABLE 3.2014 – 2015 HOME ECONOMICS FOOD AND NUTRITION ENORLLMENT GRADES 9 -12 IN THE PROVINCE OF MANTIOBA.

	Number of Students Enrolled in Food and Nutrition	Total Number of Students within the Provincial Schools Divisons[3] (46)	Percentage of Students Enrolled in Home Economics Food and Nutrition
Grade 9G[4] (half credit)	1,564	13,770	11.6%
Grade 9G (full credit)	1,170	" "	8.4%
Grade 10G (half credit)	234	14,004	1.7%
Grade 10G (full credit)	2,912	" "	20.8%
Grade 11G (full credit)	1,040	14,076	7.4%
Grade 11S[5] (full credit)	973	" "	6.9%
Grade 12G (full credit)	198	16,554	1.2%
Grade 12S (full credit)	1,495	" "	9.0%

[2] Human Ecology/Home Economics enrollment numbers includes possible electives of clothing and textiles, food and nutrition and human development in combination with other practical arts programming such as Industrial Arts and other subject areas. The amount of time dedicated to these subjects will vary per school.

[3] Enrollment numbers are an estimation. Actual enrollment numbers would include +/- registration from independently funded schools.

[4] General (G): General educational experiences or courses with no Department-developed curricula such as School-Initiated Courses (SICs), Student-Initiated Projects (SIPs), Special Language Credits or Non-Manitoba Credits (63).

[5] Specialized (S): Educational experiences in specialized areas leading to further studies beyond the Senior Years (e.g., apprenticeship, college, and university). When a subject area is compulsory and there is more than one option, the designation will be S (63).

The data in *Table 3 and Table 4* show similar trends to those of Slater (2013), suggesting that province wide enrollment in human ecology/home economics food and nutrition peaks in grade 7, with 7,203 (56.4%) students enrolled, and then steadily declines as grade level increases, with only 198 (1.2%) grade 12 students enrolled in a full credit generalized food and nutrition course. This trend may suggest that HEFN education is undervalued among other competing priorities and electives at higher-grade levels.

The work of Slater (2013) also suggests that HEFN education may be undervalued within the Manitoba education system. In qualitative interviews with human ecology/home economics teachers and school administration, Slater (2013) found that HEFN education was generally viewed by administration within the school system as "lower-level skill", with a lack of value placed on the curriculum (31). Participants also reported that they felt that their role as human ecology/home economics teachers was undervalued as human ecology/home economics training programs have significantly decreased in number, and that while some gender stereotypes about HEFN education were disappearing, this was still seen as a role primarily for women (31). A common theme that also arose was that because HEFN is thought to be undervalued within the school system, the curriculum remains outdated and does not reflect current nutrition knowledge, trends within the food system, and does not address food challenges experienced today (31). Participants also noted that it is becoming more and more difficult to teach children about making healthy food choices in current food environment that are over-saturated with unhealthy food options (31). Many participants also anecdotally reported that students who enroll in HEFN classes are coming in with less and less basic food knowledge and basic food skills, such as reading a recipe or using a stove, and emphasized the importance of HEFN education in schools as children are receiving less and less of this type of education in the home (31). Lastly, another key theme discussed by Slater (2013) was the integral connection of food literacy to health, and that children need food literacy skills in order to navigate the complexities of today's mixed messaging regarding nutrition information (31).

Food Literacy Education in Canada

Across Canada, the state of food literacy education varies, and there appear to be no agreed upon terms used to describe HEFN education. Terms range from Home Economics and Human Ecology to Career and Life Management, Family Studies or Consumer Studies. In 1997, Quebec cancelled home economics but there are elements of the curriculum found in other areas such as Personal Development and History and Citizenship Education (47). Other provinces continue to offer HEFN education under their different terms of reference and is generally, like Manitoba, offered as a time allotment or elective course for credit hours. In some schools across Canada, HEFN is mandatory for all students at certain grade levels but this decision is left to the discretion of the school. Searching through each province's curriculum information related to HEFN is incredibly challenging due to the diversity of terminology and learning concepts, and it is apparent that there is no uniform consensus on the value of HEFN education within the school system. The decision to offer HEFN as an elective or mandatory course, and at what grade levels, is a decision that varies between provinces, school divisions and even individual schools, and may contribute to learning inequities regarding these valuable life skills.

Why Make Food Literacy Education Mandatory throughout Primary and Secondary School?

Within the literature, school has been identified as a key place for children to learn food skills (22,25). For some children, human ecology/home economics food and nutrition classes may be only exposure to food skills and food literacy they receive (37). Additionally, the literature shows that when dietary habits are formed in childhood they are more likely to last into adulthood (37,48,49). Childhood is a critical period for creating a growing curiosity around food through experiential learning (1,50), and also cultivating health and wellness habits that will help prevent illness in the long term (37). The literature reports that nutrition and food skills education not only has the power to positively impact children's food knowledge and food skills, but also their eating habits, physical activity and overall health (22).

Children and youth are growing up in food environments that normalize the use of pre-prepared, pre-packaged convenience foods, and they need to learn how to make positive food choices in these complex environments (50). The school system is an ideal place to reach all children, regardless of social background or life circumstance, and teach them skills regarding food and food literacy in order to support their health and well-being into adulthood (37). Øvrebø (2013) suggests that food and nutrition education has the greatest impact when there is constant repetition of the learning concepts over months and years (37). There is also a body of literature which suggests that the more hours spent learning about nutrition, the more likely there will a positive response with dietary habits (37), making schools an ideal place to establish positive, reinforced learning environments around food starting a young age.

A review of the literature shows that the call for mandatory food skills and food literacy education within the school system is not new. The Conference Board of Canada (2013) has called for greater federal, provincial/territorial initiatives to incorporate food literacy in to school curricula (22). The work of Desjardins & Azevedo (2013) found that youth in their study identified basic food skills as a mandatory life skill and that youth themselves suggested that mandatory school programs to teach food skills should be essential to all schools (50). Stitt (1996) also advocates for making HEFN education mandatory in schools, suggesting that teaching valuable food skills is one of the most efficient health promotion strategies to help children and families make informed food

A LOOK AT FOOD LITERACY EDUCATION IN OTHER COUNTRIES:

Japan is an example of a country that has made home economics education mandatory for all students. Twenty-two years ago home economics became mandatory for all students in grade 5 through high school and is highly valued among other subjects such as math and science *(66,67)****. Anecdotal reports suggest that the mandatory introduction of home economics within the Japanese school system is perhaps one of the reasons why Japan has one of the lowest pediatric obesity rates in the industrialized world*** *(66,67)****. One interview with a health education planner with Japan's Education Ministry suggests that Japan used an purposeful and aggressive approach to food education within the public school system in order to curb rates of childhood and adult obesity in Japan*** *(67)****. South Korea and Finland are other countries known to have mandatory home economics education within their public school systems*** *(66)****.***

choices (1,25). Additionally, Engler-Stringer (2010) and Slater (2013) also call for policies to support the integration of greater HEFN education within the primary and secondary school system as solution that could have the widest impact to benefit individuals, communities and the environment (5).

Teaching children valuable food skills will shape more than just their individual ability to make food choices. Children will bring the food knowledge learned in schools back to their family and help create positive food environments in their home and communities (23,25,51). As well, food skills are known to boost self-efficacy; studies have shown that developing cooking skills at a younger age improves self-esteem and confidence (23,50). Lastly, it is also thought that a greater emphasis on food literacy education within the school system will help create a common culture around food regardless of social status, which may help reduce health inequities and negative social norms around food (23).

DISCUSSION

Why should Public Health and Food Advocates Invest in Food Skills and Food Literacy?

People make over 200 food related decision every day (52). The relationship between food knowledge, skills and practices is complex and is influenced by personal, social, economic and environmental factors, such as food knowledge, self-motivation, the accessibility and affordability of food, and social norms around food (5,22). However, not having basic food skills makes the preparation and consumption of nutritious foods that support health, well-being and food security a near impossible task (31). While the factors that influence food choices are complex, the connection between food and health is clear, and when an individual's food skills are limited it also limits the types of food they are able to prepare, often creating a reliance on pre-prepared and pre-packaged foods, which are often associated with negative health outcomes (5,53). Additionally, eating on limited budget is a significant challenge and often requires creativity and inventiveness around acquiring food (through shopping or food banks) and its preparation (50). Eating *healthfully* on a limited budget and with limited food knowledge is nearly impossible (24). Having food skills and food literacy creates dietary resilient citizens who are able to use adaptive strategies to maintain an adequate, healthful diet, despite experiencing stress on food resources (50,54). Food skills and food literacy provides individuals with the knowledge, planning and abilities necessary to improvise and problem solve food related challenges and these adaptive skills can also be used to promote food security and also help solve other life challenges (50).

Food skills and food literacy offer more than just benefits for the individual, the "sharing and preparing of food is an essential component of a vibrant food system and community" (55). As discussed, food skills and food literacy have important health benefits, but they can also improve the health of the overall community – food is part of our everyday lives and a positive relationship with it can positively impact the physical, emotional, social and economic well-being of community members (55). A comprehensive, upstream public health approach, that focuses on food skills and food literacy as a strategy for health, also has the potential a social strategy (i.e. change negative norms around food), an economic strategy (i.e. allow individuals to do more with less) and an environmental strategy (i.e. increase understanding of the food system and the environment) to improve the overall health of Manitobans (55).

As well, extensive community food assessments completed by Food Matters Manitoba between 2012 and 2014 in four areas of Winnipeg (Downtown, Inkster, St. Vital and the North End) found that community members are calling for universal access to food skills and knowledge, and identified schools as an avenue to provide food skill programming to both students and the greater community (56). Additionally, *The Future of Food Winnipeg* (2015), proceedings from a community discussion forum hosted by Food Matters Manitoba in 2015, also identified the strengthening of food skills as a key theme important to a thriving food system in Winnipeg (55). Manitobans are identifying food skills as a current knowledge gap, which can also create significant health gaps, and there is opportunity to lessen this gap through the provision of food skills and food literacy education within the school system as a population-level strategy.

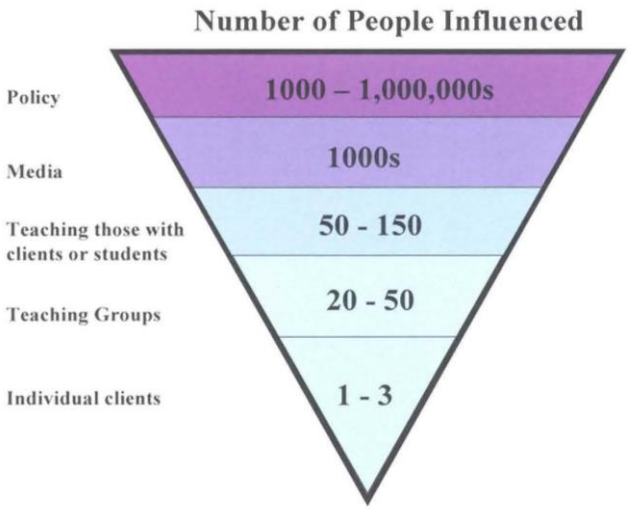

FIGURE 4. PYRAMID OF PROFESSIONAL INFLUENCE. TAKEN FROM *PUBLIC HEALTH NUTRITIONISTS OF SASAKATCHEWAN WORKING GROUP (N.D.)*

Ensuring that that Manitobans are provided with the resources necessary to learn food skills and food literacy, regardless of life circumstance, should be on the agenda of public health. Food skills and food literacy are important to field of public health; they create populations who can navigate some of life's challenges related to food in order to support health and food security (23). Similar to the principles found in the Food Literacy Framework for Action, Desjardins (2015) writes that food literacy is only made possible through '"external support with healthy food access and living conditions, broad learning opportunities, and positive socio-cultural environments" (50). The Government of Canada also writes that there are key inter-relationships between food skills and health disparities and the acquisition of food skills relies on structural factors such as educational policies and cultural norms (1). Establishing proper policies and structural supports to provide food skill and food literacy education within the school system is necessary to affect positive change.

Influencing policy change has the great potential to positively impact the greatest number of individuals. The *Pyramid of Professional Influence* (Figure 4) shows that policy has the potential to influence 1000s to millions of individuals, while more traditional means used to elicit individual behavior change, such as media messaging, training "the trainer", voluntary community-based education classes, or individual client interactions, have significantly less influence. As well, influencing policy change is a strategy that is not solely focused on behavior change, but rather seeks to provide wider system level change that supports overall health.

Cultivating food skills in children and young adults to promote health and reduce food insecurity is by no means a single solution to improve the health of Manitobans; changes within food education and the food system must be comprehensive, integrated and multi-sectorial to result in significant change

(1,31). Improving food literacy will require accessible food and learning environments, reinforced learning, and opportunities for practical application, which will require the cooperation of the education system, the food system, as well as policy change. In order to improve food security it is essential that food literacy education also help the learner to develop skills to address and overcome the broader physical and social barriers to acquiring healthy and culturally appropriate food. Additionally, food literacy curricula should be tailored to meet the learning needs of specific populations and incorporate teaching around important local cultural and social influences surrounding food. While this is no easy task, if the passing on of essential food skills and food literacy to children and youth is left to chance, this key population will lack the skills necessary to engage in healthy living and a huge opportunity for health will be missed (31).

The mandatory provision of food skills and food literacy knowledge to all children in Manitoba within the school system is a population health approach rooted in health equity that will ensure that all children, no matter what life circumstances, will be given the opportunity to learn essential and valuable life skills that will help support them to become healthy adults *(58).*

RECOMMENDATIONS

No one single intervention will initiate change; strategies to improve food skills and food literacy need to be integrated and comprehensive to address the complexities that influence knowledge around food and food choice (1). It is recommended that:

- **A food literacy study specific to Manitoba be conducted**.
  Due to variations in measuring food literacy and current knowledge gaps, it is recommended that in order to fully understand the current state of food skills and food literacy in Manitoba, a study on the food literacy of Manitobans should be conducted in the province of Manitoba (22). Additionally, there is potential opportunity to study and evaluate the effectiveness of mandatory food literacy education through pilot projects within the Manitoba education system.

- **Ensuring that Manitobans are provided with the resources necessary to learn culturally appropriate food skills and food literacy, regardless of life circumstance, should be on the political agenda.**
  It is time to consider what critical food scholar Jennifer Sumner (2015) terms the “politics of the possible” (57) and call for the Manitoba Government and education system to acknowledge the value of food literacy education to support the growth and development of healthy Manitobans. Similar to policies in Manitoba that support healthy eating in schools, there needs to be a coordinated effort to advocate for policies and adequate funding and resources that will support the mandatory integration of food literacy education throughout primary and secondary school curricula. Evidence from this report has suggests that the mandatory provision of food skill and food literacy education, with culturally appropriate content, will create resilient, problem solving, food literate young adults who will be better equipped to navigate the complex realities of current food environments in order to support positive health outcomes and greater food security. The mandatory provision of food skills and food literacy education to all children in Manitoba within the school system is a population health approach rooted in health equity that will ensure that all children, no matter what life circumstances or background, will be given the

opportunity to learn essential and valuable life skills that will help support them to become healthy adults (58) . Advocating for educational policies which require mandatory food skill and food literacy education throughout primary and secondary education, and partnering with the school system to help provide this essential education, are major contributions that public health can offer to equitably improve the food skills, food literacy, overall health and food security of Manitobans.

- **The formation of key partnerships to support food skills and food literacy education within the Manitoba education system.**
  The creation of policies regarding the mandatory integration of food skill and food literacy education within the Manitoba education system is no simple task and will require considerable time, funding, and resources, and will also require sizable effort on the part of Manitoba Education and Advanced Learning to implement these policies. Manitoba Education and Advanced Learning must be well supported in order to make these policies a success. There is potential that the formation of key partnerships between Manitoba Education and Advanced Learning, and other key stakeholders who are also invested in food skills and food literacy, may help ease this transition and also increase the feasibility of mandatory food literacy policies. There is potential for the development of a key partnerships between Manitoba Education and Advanced Learning and other stakeholders both within and outside of the school system, such as:

- **The Winnipeg Regional Health Authority and other health regions.**
  The public health dietitian workforce within the WRHA (and other health regions) is an incredibly valuable resource, which could potentially work in partnership with curriculum

THE CULINARY COMMUNITY AS A FOOD SKILL AND FOOD LITERACY PARTNER:

Other literature has shown that the local professional culinary community can be a useful resource for teaching food literacy within the education system. The work of Caraher et al. (2013) reviewed the UK based Chefs Adopt a School Program, where professional chefs partnered with schools to deliver food literacy education (68). The UK program is based on the Cooking Matters program out of the United States, where the program is jointly run in schools by both a professional chef and a registered dietitian (68).The UK program was successful in increasing the food knowledge, cooking confidence, and fruit and vegetable consumption of 9 – 11 year old school children involved in the school-based program (68). A key strength of this program is its adaptability; chefs were able to modify programming based on the resources available at individual schools. If cooking facilities were not readily available, the chefs used simple healthy recipes, such as a pasta salad, that requires minimal resources and could be easily made in a classroom setting (68). A partnership between the Manitoba education system and the professional culinary community within Manitoba, including trainees in culinary education programs, could be a potentially valuable resource in helping deliver mandatory food literacy education within the Manitoba school system

developers and teachers within the Manitoba education system to help develop, and on occasion, also help deliver curricula focused in food skills and food literacy. Literature has shown that dietitians are an untapped resource who have a comprehensive understanding of nutrition, food skills and the food system and could offer valuable assistance within the school system to develop and deliver food literacy education (59,60).

- **Dairy Farmers of Manitoba**.
  There is also potential opportunity for a greater partnership between Dairy Farmers of Manitoba and the school system. Dairy Farmers of Manitoba have developed programs and resources and education sessions to help teachers and students learn about food and nutrition. Their Nüton programs are delivered by registered dietitians and, "provides free or low cost nutrition education resources and training to Manitoba educators and health professionals", including teaching resources for kindergarten to grade 12 (61). To scale up this impact and support food literacy within the education system, dietitians from Dairy Farmers of Manitoba could partner with the school system to deliver regularly scheduled mandatory professional development sessions to assist teachers in integrated food skills and literacy into everyday school curricula.

- **Other key stakeholders invested in food skills and food literacy.**
  Other partners such as: the local culinary community, the Nutrition Council of Manitoba, the Department of Nutritional Sciences at the University of Manitoba, Food Matters Manitoba etc.

FOOD MATTERS MANITOBA:

Food Matters Manitoba is a key organization for food advocacy within the province of Manitoba. Food Matters Manitoba is engaged in promoting accessible and healthy food for all Manitobans and supports the sustainability of the local food system through the Manitoba Food Charter (http://www.foodmattersmanitoba.ca/about/supporters/manitoba-food-charter/) (69).

Food Matters Manitoba also (69)***:***

- Provides a common focus for action for food system stakeholders through the Manitoba Food Charter;

- Raises public awareness about the importance of good food and sustainable food systems;

- Strengthens networks and partnerships to work together to address local food insecurity issues;

- Strengthens the capacity of food-related organizations to advance food security work across Manitoba; and

- Provides community-based food skill programming in both urban and remote (northern) settings.

As Manitoba's local food security champion, Food Matters Manitoba could be a valuable partner in advocating for food skill and food literacy education for all Manitobans.

In order to initiate the conversation regarding the development of policies to make food skill and food literacy education mandatory within the Manitoba education system, there is potential for the findings of this report to be disseminated to key decision and policy makers within the Manitoba government, health researchers, and other groups such as the professional culinary community of Manitoba, parents

and students involved in the Manitoba education system, the general public, as well as the following key stakeholders and organizations:

- Manitoba Education and Advanced Learning and the Minister of Education;
- Food Matters Manitoba;
- Dairy Farmers of Manitoba;
- Manitoba Health, Healthy Living and Seniors;
- Healthy Child Manitoba;
- Child Nutrition Council of Manitoba;
- Manitoba Association of Home Economists;
- College of Dieticians of Manitoba;
- Dietitians of Canada;
- Manitoba Teachers Society; and
- Manitoba Home Economics Teachers Association.

CONCLUSIONS

Food skills are essential for making healthy food choices and supporting food security. Traditionally, nutrition promotion strategies have focused on individual-level behavior change, which evidence shows does little for influencing the health of populations. This report is intentionally ambitious, and has offered a review of current evidence that supports the mandatory introduction of food literacy education into the Manitoba education system as a population-level strategy that could support both the health and food security of Manitobans. With current evidence indicating that children are no longer learning basic foods skills in the home and in schools, and the growing accessibility and consumption of energy-dense pre-packaged convenience foods, being able to make healthful choices within our current food environments has become more complicated than ever. The mandatory provision of food skills and food literacy education to all children in Manitoba within the school system is a population health approach rooted in health equity that will ensure that all children, no matter what social background or life circumstance, will be given the opportunity to learn valuable and necessary life skills that will help support them to become healthy adults. Of note, the creation of policies related to mandatory, culturally appropriate food skill and food literacy programming within the Manitoba education system is not an a stand alone strategy that will improve the health and well being of Manitobans in isolation of other comprehensive and supportive food and health policies. However, it is time to dream of the politics of the possible and invest in advocating for policy change regarding food skill and food literacy education in order to take positive action towards creating a more equitable, healthy and food secure Manitoba for all.

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