

Exploring the Nutritional Vulnerability of Homeless Solvent and Non-Solvent Using  
Men in a Canadian Urban Setting

Submitted by

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## **Abstract**

This research aimed to explore the nutritional vulnerability of homeless adult men. Using a mixed methods approach, risk factors for chronic illness, food security status, dietary intake adequacy, and how the study participants navigate the food supply system to obtain food were investigated. This study assessed differences in nutrition vulnerability between participants that use solvents and those that do not.

The findings reveal that all participants were nutritionally vulnerable. A majority was overweight or obese; nearly all experienced food insecurity; and most did not meet the daily food intake guidelines established by Canada's Food Guide. Daily efforts by participants to obtain food from charitable meal programs helped to meet physiological needs, as well as social, economic, safety and security needs. Participants using solvents had different nutritional and food experiences than non-solvent users. This was identified by a higher prevalence of severe food insecurity and social exclusion compared to non-solvent using homeless participants.

This study provides important information to program planners and policy-makers necessary in order to help meet the food and nutritional needs of adult homeless populations. Findings may be translated into policies and programs aimed at improving accessibility to healthy foods.

## **Acknowledgements**

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## **Dedication**

Alyx,  
The love of my life.

## Chapter 1: Theoretical Perspective

This research aimed to explore the nutritional vulnerability experienced by one of the most marginalized population groups in Canada, homeless men (Goering, Tolomiczenko, Sheldon, Boydell, & Wasylenki, 2002; Human Resources and Skills Development Canada, 2010; Hwang, 2001). The determinants of health indicate that many of the life circumstances of these men contribute to food insecurity, which ultimately leads to an increased risk of poor health. The determinants include unstable housing, little to no income, Aboriginal status, social exclusion, and for some, addictions (Raphael, 2004). Figure 1 illustrates the factors identified as antagonist to the nutritional well-being of homeless individuals. Due to the multiple factors that interconnect to create nutritional vulnerability, any efforts to improve the situation for this population group will require significant commitment from decision-makers coupled with supportive public policies to address these underlying factors. The positive impact to health care costs and individual quality of life are well worth the effort.

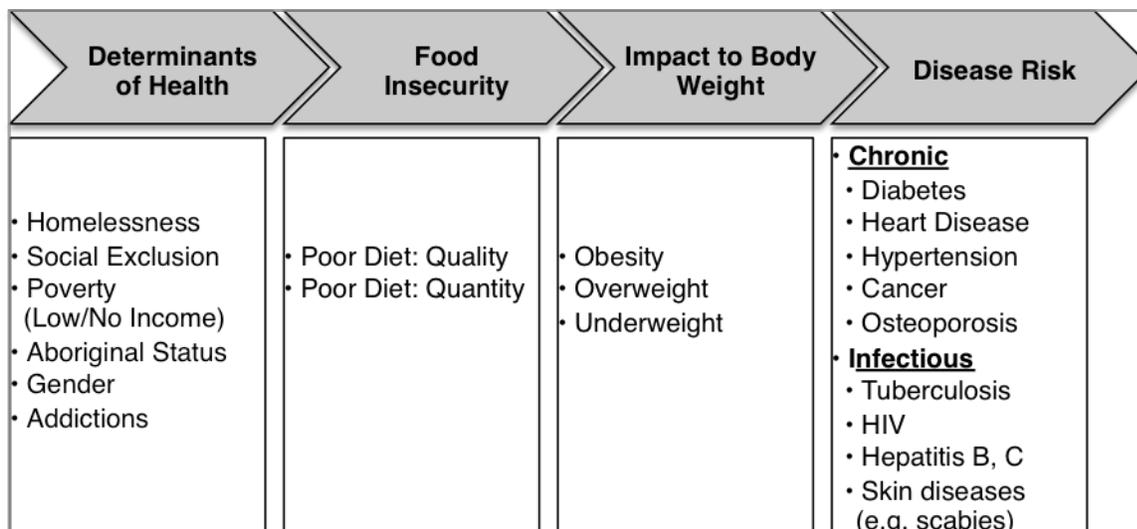


Figure 1: Factors that contribute to the nutritional vulnerability of homelessness, leading to increased nutrition-related health risks.

The determinants of health identified in Figure 1 lead to a high probability of chronic physical and psychosocial stress for individuals living under these conditions. This stress may be experienced as a result of continuous threat to housing, food security, and income. It has been demonstrated that chronic stress can weaken the immune system (Arranz, et al., 2009). A compromised immune system that is further impacted by food insecurity heightens the risk for chronic and infectious diseases (Figure 1) that are prevalent among homeless adults (Frankish, Hwang, Quantz, 2005; Murphy, 2006; Seligman, Bindman, Vittinghoff, Kanaya, & Kushel, 2007; Wiecha, Dwyer, & Dunn-Stohecker, 1991). Further exacerbating health risks for some individuals may include a coping response to the chronic stress with health-threatening behaviours such as poor diet and/or substance abuse (Murphy, 2006; Raphael, 2004). This research explored the food behaviours, dietary intake and chronic disease risks of homeless adult men.

The complex interplay between the determinants of health, food insecurity, and health outcomes for this population group, suggest that the simple provision of food, while providing short-term relief, is not an effective approach to improving or alleviating long-term food insecurity. A population health approach supports the reduction of health inequities via social justice as a means to improve healthy eating and the food environment (Dietitians of Canada, 2005). Collective determinants of healthy eating in Canada have been identified and are illustrated in Figure 2 (Power, 2004; Raine, 2005; Tarasuk, 2005). Many of these determinants intersect with factors contributing to the nutritional vulnerability outlined in the theoretical framework of this study, specifically the economic, physical, and social environments.

Inadequate income (economic environment) has been repeatedly identified as the most significant barrier to healthy eating and overall health (Mikkonen, et. al, 2010; Power, 2004;

Raine, 2005, Tarasuk, 2005). Even for those receiving social assistance, the money available for food is limited or non-existent. Fixed costs, such as shelter, take precedence over food purchases, especially when charitable food programs can assist with attending to hunger (Power, 2004). Furthermore, economic deprivation does not often present the luxury of nutrient-dense food, which consequently increases the nutritional vulnerability of the homeless.

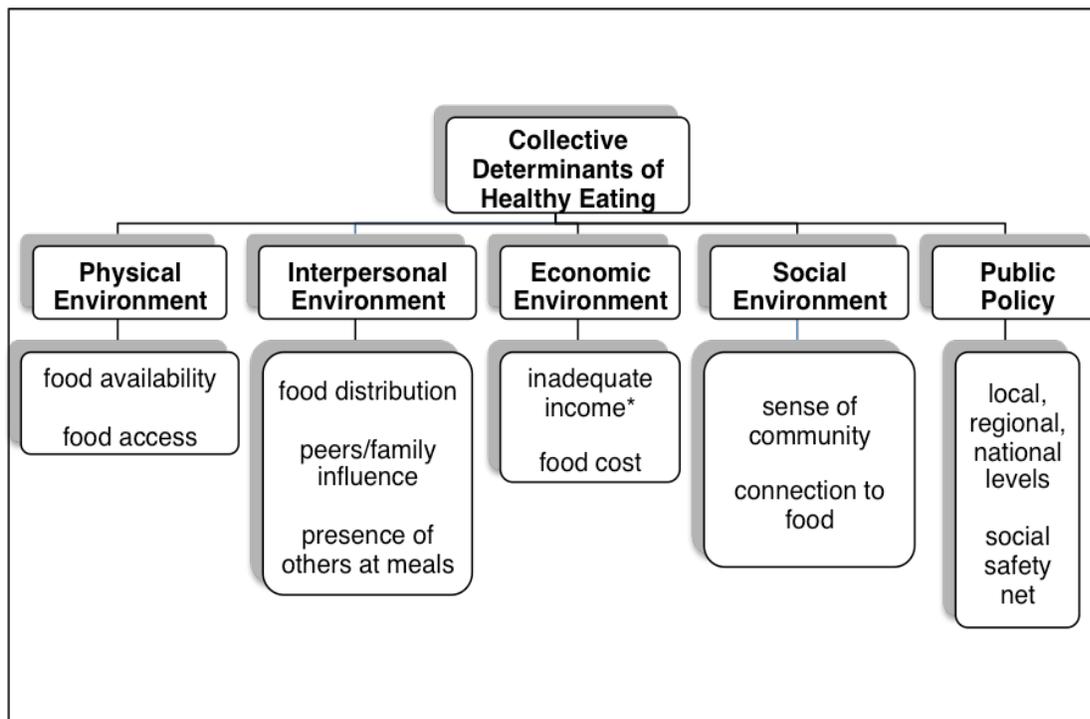


Figure 2: The collective determinants of healthy eating impacting homeless adults.  
 \*most significant barrier to healthy eating in Canada (Power, 2004; Raine, 2005; Tarasuk, 2005)

Food availability and accessibility, a component of food security, is highly influenced by the physical environment of the homeless and is largely determined by a system of charitable donations occurring at the community level (Dietitians of Canada, 2005; Tarasuk, 2001a). The unique circumstances of the interpersonal environment of the homeless are unlike most population groups: food intake typically occurs within a large group setting amongst complete strangers. Congregate meal programs leave the individual to accept food regardless of the quality, thus perpetuating nutritional vulnerability and further exacerbating the risk of poor

health with exposure to communicable disease and infections.

Social exclusion is represented in the social environment of homelessness. A sense of community, if it is to exist, must be created with a group of people that are typically identified as transient (Murphy, 2006). Furthermore, with a lack of personal housing, the individual is limited if not completely unable to experience the connection to food that may be experienced with the purchase, preparation, serving and consumption of a meal within one's home environment.

Homelessness creates unique circumstances for food and health. Daily survival hinders on the achievement of basic physiological needs for food and water. Consequently, individual determinants of healthy eating such as nutrition knowledge, food preferences, and perceptions of healthy eating, are outweighed by the collective determinants identified. This research explored the complex interactions experienced by homeless men in relation to their food environment and how it influences their nutritional vulnerability and risk of poor health. The information gathered is intended to add to the limited literature about the food experiences of these individuals as they relate to being homeless in a large urban centre. It is hoped that this will allow policy makers the opportunity to listen and respond to the underlying circumstances affecting the nutritional vulnerability that leads to increased health risks for this population group. Sustainable, population-level approaches addressing the determinants that are impacting the health of the homeless are needed.

## **Chapter 2: Review of the Literature**

### **2.1 Introduction**

Nutritional vulnerability results from a cascading effect of factors that contribute to a poor diet and lead to suboptimal health as outlined in Figure 1. These circumstances act as independent or collective risk factors of food insecurity. Poor diet quality, associated with food insecurity, compromises body weight and nutritional health leading to an increased risk for many chronic health problems (Health Canada, 2003; Lau, et al., 2007).

In order to understand the complex interplay between life circumstances and the nutritional vulnerability of the homeless, a review of the literature will establish a link between specific determinants of health that contribute to food insecurity and subsequent ill health. The reader will be informed of the current prevalence of homelessness and food insecurity in Canada, establishing the importance of addressing these issues. Finally, this chapter discusses gaps in the literature that are addressed by the study.

### **2.2 Social Determinants of Health**

Social determinants of health are the life circumstances or living conditions, which one experiences, and are a major predictor of health status and outcome (Raphael, 2004). Food security and housing are represented as social determinants of health, along with income and income distribution, education, unemployment and job security, employment and working conditions, early childhood development, social exclusion, social safety network, health services, ethnicity and racism, gender, and disability (Mikkonen & Raphael, 2010). Inequalities in health have a stronger link to the determinants of health than scientific evidence suggesting that health disparities are due to lifestyle behaviours including tobacco use, diet, and physical activity (Power, 2004; Raphael, 2004). An individual's living conditions predict the likelihood of

experiencing chronic health issues, which include depression, diabetes, food allergies, heart disease, high blood pressure, infections, and obesity (Che & Chen, 2001; Fernandez, MacKinnon & Silver, 2010; Mikkonen, et al., 2010). Nutritional vulnerability is directly affected by the determinants illustrated previously in Figure 1. An overview of these specific determinants of health, as they contribute to nutritional vulnerability of the homeless is described below.

Income is a powerful health determinant, predisposing individuals to material and social deprivation. The quality of shelter and food are affected by income; as income goes down, the quality of housing and diet deteriorates (Mikkonen, et al., 2010). According to Power (2004), “those who are poorer tend to eat less healthily.” Specifically, lack of financial resources interferes with the ability to purchase healthful foods such as fruit, vegetables, and milk products due to lack of money to buy these foods once all other living expenses are accounted for (Power, 2004).

Poverty leads to the deterioration in diet and the emergence of food insecurity as a determinant of health (Mikkonen, et al., 2010). Dietitians of Canada (2005) a national body of nutrition experts, identifies poverty as the underlying cause of food insecurity. As long as poverty exists, food insecurity will remain a threat. The Statistical Profile of Poverty in Canada (2009) states that in 2007 there were 2.95 million people (9.2% of the population) living below the poverty line. The presence of poverty is unequally distributed among population groups. Unattached individuals experience poverty at a substantially higher level (27.4%) than the general Canadian population (Library of Parliament, 2009).

Ethnicity, specifically related to Aboriginal peoples in Canada, suggests an increased prevalence of poverty, social exclusion, physical disabilities, food insecurity, lower income potential, and poorer housing conditions (Mikkonen, et al., 2010; Raphael, 2004). Each of these

determinants intersects to create a substantial impact to nutritional vulnerability and poor health in comparison to non-Aboriginal Canadians (Mikkonen, et al., 2010; Willow, 2005).

Female gender has been linked with poorer quality of health determinants than male gender (Mikkonen, et al., 2010). This is attributed to women carrying a greater responsibility for child rearing, resulting in less opportunity for employment or lower wages if a job is obtained. However, men do experience greater health risks from higher rates of homelessness, addictions, and social exclusion (Mikkonen, et al., 2010; Raphael, 2004).

Each of these determinants acts independently, or more powerfully in combination with one another to worsen nutritional vulnerability, which consequently increases the risk of poor health. The cost associated with inadequately addressing the underlying causes of poor health is shared across the country. Poor health status of an individual has consequences at the community level (Tadros, 2012). This is presently expressing itself via an overburdened physical and mental health care system (Che, et al, 2001; Raphael, 2003). Serious attention must be given when health services are unavailable or incapable of meeting the needs of our citizens. Addressing health inequities via an effective social safety net (a population health approach) is viewed as the best response to reducing or eliminating threats to food security and overall health in Canada (Dietitians of Canada, 2005; Mikkonen, et al., 2010).

## **2.3 Homelessness in Canada**

### **2.31 Defining “homeless”.**

A single definition of homelessness does not exist in Canada (Social Planning Council of Winnipeg, 2012). Absolute homelessness refers to individuals living on the street or in a shelter. A broader scope to homelessness includes the hidden or concealed homeless. These are individuals that do not have a permanent dwelling and may find they are living in a vehicle, or

living with family or friends (Echenber & Jensen, 2008). For the purpose of this research, the definition of homelessness will include absolute and concealed homeless populations.

### **2.32 Incidence and prevalence.**

In Canada there are an estimated 150,000 to 300,000 homeless people that live in shelters or on the streets (Human Resources and Skills Development Canada, 2007). The number of Canadian shelters in existence that assist the homeless population has increased approximately 20% from 2006 to 2007 (Human Resources and Skills Development Canada, 2010). In the 2001 Census report, Manitoba was noted to be the fifth highest in provincial and territory ranking for number of persons in shelters, surpassed by Ontario, Quebec, Alberta and British Columbia. The city of Winnipeg has 87% of those using shelters in the province of Manitoba.

### **2.33 Characteristics of the homeless.**

Homeless adults are prone to a family history of mental illness, substance abuse and childhood abuse (Goering, Tolomiczenko, Sheldon, Boydell, & Wasylenki, 2002). Aside from experiencing homelessness, their life circumstances typically include unemployment with lack of income other than social assistance, lifetime substance abuse and mental illness, and chronic physical problems (Goering, et al., 2002). Single, Aboriginal men represent the largest group of homeless people in Canada (Goering, et al., 2002; Human Resources and Skills Development Canada, 2010; Hwang, 2001). These men, typically ranging in age from 25-44 years, utilize shelters where they tend to stay for periods of a year or more (Hwang, 2001).

#### ***2.331 Solvent abuse in the homeless population.***

A significant population of homeless individuals inhales solvents to get “high”. Rough estimates range from 13-20% and prevalence has been reported to be higher among men (May & Del Vecchio, 1997; Wiecha, et al., 1991). Abused inhalants have been defined by the U.S.

Department of Health and Human Services (1992) as volatile substances that can only be administered by inhalation and subsequently result in altered mental status of the user. This practice is referred to as “sniffing” or “huffing”. Solvent abusers can be identified by the chemical odors on the breath or clothing as well as stains on clothing or around the mouth. Many solvents are widely available, readily accessible, cheap and legally obtained. The list of volatile substances include glue, gasoline, hair spray, cleaning agents, nail polish remover, whipped cream, paint remover and even fire extinguishers. The poor are the most prominent users of volatile substances for inhalation purposes (U.S. Dept of Health & Human Services, 1992). Substance abuse has been negatively linked with influencing diet, health and use of charitable food services for the homeless that are using these volatile substances (Wiecha, et al., 1991).

## **2.4 Food Security in Canada**

### **2.41 Defining “food security”.**

A widely accepted definition of food security has been scripted by the Food and Agriculture Organization of the United Nations (1996); “when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life”. Individual and household food security in Canada is typically categorized using one of three established levels. These are food secure, food insecure-moderate, and food insecure-severe (Health Canada, 2007b). The distinction between these levels will be explained further in this section.

The Canadian literature reveals that household income and food security share an inverse relationship. The lower the household income, the higher the prevalence of food insecurity (Health Canada, 2007b). The presence of food insecurity suggests that individuals and/or

families may find themselves attempting to meet dietary needs via emergency food programs such as food banks, or in more severe situations, through socially unacceptable ways including begging, stealing or scavenging (Holben, 2002).

#### **2.42 Incidence and prevalence.**

Collaborative efforts between Health Canada and Statistics Canada have made it possible to measure food insecurity status in our nation. In 2004, the Canadian government conducted the Canadian Community Health Survey (CCHS) Cycle 2.2 to gather nutrition data from across the ten provinces (Health Canada, 2006). Results revealed that 9.2% of the Canadian population experienced some level of food insecurity. That translates to 1.1 million food insecure households, or a total of 2.1 million Canadians (Human Resource and Skills Development Canada, 2010). Characteristics of adult-only households that experience moderate and severe food insecurity include Aboriginal status, receiving social assistance, and those that do not own their own dwelling (Health Canada, 2007b).

The results reported by the CCHS should be interpreted with caution, as the prevalence of food insecurity listed within these documents is an under-representation of the true picture in Canada. The results would indicate a much greater presence of food insecurity if the statistics were to include some of the most marginalized populations that were not part of the data collected. These include homeless individuals, people living on First Nation Reserves or Crown Lands, in prisons, or some remote areas of Canada (Health Canada, 2006).

#### **2.43 Measuring food security.**

There are direct and indirect measures of food security that have been presented in the literature. The direct measures involve the use of validated questionnaires while indirect measures focus primarily on food bank usage (McIntyre, 2003).

### **2.431 Direct measures.**

The measurement tool utilized for determining the food security status of the Canadian population, as reported in the Canadian Community Health Survey Cycle 2.2, Nutrition was adapted from the US Food Security Survey Module (Health Canada, 2007b). The adapted tool, the Household Food Security Survey Module (HFSSM) gathered data on food security related to what is considered the most important determinant of health, income (Che, et al., 2001; Mikkonen, et al., 2010). Household, adult and child food insecurity prevalence in 2004 is reported in the findings, with the study sample representing 98% of the Canadian population (Health Canada, 2007b). The administration of the questionnaire was dependent on the initial screening question (see below) to first determine if the respondent was food sufficient. Only those that responded to the initial question with a “3” or “4” were asked the subsequent stages of the questionnaire as appropriate:

*Which of the following statements best describes the food eaten in your household in the past 12 months, that is since [current month] of last year?*

- 1. You and other household members always had enough of the kinds of food you wanted to eat.*
  - 2. You and other household members had enough to eat, but not always the kinds of food you wanted.*
  - 3. Sometimes you and other household members did not have enough to eat.*
  - 4. Often you and other household members didn't have enough to eat.*
- Don't know / Refuse to answer*

*(CCHS HFSSM Q1, Health Canada, 2007b)*

One of the significant adjustments made to the HFSSM tool from the original US FSSM is the branching of the two scales to assess adult and child food security separately. The adult scale comprises of a 10-item questionnaire, the child an 8-item questionnaire after the screening question is administered. The distinction between a category level of moderate versus severe food insecurity is dependent upon the number of affirmative responses to the 10-item or 8-item questionnaire for adults and children respectively. Despite the best efforts to revise the original US food security measurement tool to a more appropriate questionnaire for use in the Canadian Community Health Survey focus on nutrition, a potential limitation has been recognized. The tool does not separate out the food security status of each member within a household. It is quite possible that food security could vary within a household (Health Canada, 2007b).

As identified earlier, a further limitation of the CCHS results published on food security is the lack of representation of the homeless (Health Canada, 2007b). One reason suggested for this may be uncertainty about the correct measurement tool to accurately assess food security in the homeless (Holland, Kennedy, & Hwang, 2011).

The CCHS, Cycle 2.2 follows a precedence of omitting homeless individuals in food security data collection efforts both in Canada and the United States (Alaimo, Briefel, Frongillo, & Olson, 1998; Che, et al., 2001; Health Canada, 2007b). Some of the longer standing food security measurement tools that have been in use over the decades appear to be limited in their applicability to the homeless population (Alaimo, et al., 1998; Health Canada, 2007b). Some efforts to design a food security measurement tool that allows for consideration of the unique circumstances of the homeless and their food environment have been attempted. An example of such a tool is the US Current Population Survey (Tarasuk, 2001b). This tool was designed with

consideration for some of the socially unacceptable ways the homeless may acquire food (“dumpster diving”, stealing, use of charitable food assistance). However, it was determined that “these items...did not relate in a systematic, predictable manner to other indicators of the severity of household food insecurity” and were removed from the now prominent food security measurement tool in the United States, the Food Security Core Module (Tarasuk, 2001b).

Despite the fact that the very nature of homelessness would suggest that it is an inherent expectation that these persons experience food insecurity to some degree, it should not negate the idea of assessing food security among homeless. Bickel, Nord, Price, Hamilton, and Cook (2000), stress that there is some value to formally documenting the existence of food insecurity of needy populations. The validation of the presence and magnitude of food insecurity is critical for bringing the discussion forward to policy makers to address. Stated in a report from the Commission on Social Determinants of Health (2008): “no data often means no recognition of the problem.” At this time, there is clearly a gap in the direct measurement of food insecurity levels of the homeless within Canada. A tailored measurement tool that encompasses the unique food environment of the homeless is needed.

#### **2.432     *Indirect measures.***

Food security questionnaires are only one approach to measuring the prevalence of food insecurity. A less direct measure can include the presence of social programs and services available within Canada that aim to address food insecurity (McIntyre, 2003). Examples include federal and provincial social assistance, food banks and other community initiatives such as collective kitchens, community gardens, farmers’ markets, which are all responses to food insecurity in Canada (Dietitians of Canada, 2005; Tarasuk, 2001a). Their usage and prevalence offers proxy information pertaining to food insecurity experienced by the people in the

communities in which they operate.

Food bank usage, considered the major response to food insecurity in Canada, is monitored and tracked throughout the country (Dietitians of Canada, 2005; McIntyre, 2003; Tarasuk, 2005). A national organization, Food Banks Canada creates an annual report, “Hunger Count” to provide an ongoing indirect measure of food insecurity (Food Banks Canada, 2011). This indirect measure of food insecurity quantifies usage levels and confirms that food insecurity exists (Tarasuk, 2001a). The most recent statistics show that food bank usage for the year 2011, was the second highest on record. From 1997 to 2002 there were 1,800 newly established food banks that opened (McIntyre, 2003).

Despite efforts to track the usage of food banks, there are many limitations to the usage reports. Tarasuk (2001a) identifies a number of cautionary factors to consider. Firstly, these values are an underestimation at best. Data regarding food bank usage is strictly voluntary for each establishment. Secondly, quality of the data may be speculative dependent on the tracking system and the abilities of the individual(s) to accurately account for all the people who use the specific food bank (Tarasuk, 2001a). Thirdly, not all persons that experience food insecurity access charitable food assistance (McIntyre, 2001; Tarasuk, 2001a). Che and colleagues (2001) state that only 20% of those experiencing food insecurity are utilizing food banks as a coping strategy.

The users of food banks in Canada appear to have specific characteristics and demographic attributes that must be considered. With respect to housing, according to Food Banks Canada (2011), the largest segment of food bank users are those accessing market rental housing (63.5%). Individuals that are homeless or having limited mobility are less likely to utilize food banks (Tarasuk, 2001a). This is supported with data released by Food Banks Canada

(2011), reporting that food bank usage for the absolute and relative homeless populations are 2.5% and 3.3% respectively. At the provincial level, 3.1% and 6.6% of Manitoba food bank users are those who are experiencing absolute and relative homelessness (Food Banks Canada, 2011). Other factors that suggest food bank usage counts are too conservative include the common food bank practice of turning clients away due to running out of food, setting limits on frequency of use in order to accommodate the growing numbers of people turning to food banks, and the lack of access or lack of a presence of food banks in some communities (Tarasuk, 2001a).

Regardless of the accuracy of food bank usage as an indirect measure of food insecurity, the homeless are again one of the most excluded in the data collection process. The food security management strategies of the homeless do not typically involve food bank attendance, as expressed above. This seems logical when one considers that the homeless have significant barriers to using food banks including the lack of cooking and/or food storage facilities (Richards & Smith, 2006). A more likely approach for the homeless to access food includes attending soup kitchens, homeless shelters, and/or food pantries (Ora, Mouttapa, Weiss, & Weissmuller, 2008). This population group may also turn to managing food insecurity through strategies such as stealing food, scavenging in garbage dumpsters, pawning personal items to buy food, begging, donating blood, and prostitution (Richards, et al., 2006).

The literature suggests that the homeless are essentially unrepresented in the statistics on food security in Canada. It is a disservice to this country to release data on the presence of food insecurity while knowingly excluding one of the most food insecure population groups. The challenge now is to develop methods that not only quantifies the presence of food insecurity among the homeless but also gathers information related to the food environment that is unique

to this population. Both of these forms of measurement are necessary in order to conduct valid and reliable assessments, and to improve the food security status for these people.

## **2.5 Food and the Homeless**

### **2.51 Defining nutritional vulnerability.**

The term nutritional vulnerability has been defined as simply as, “the presence of risk factors for malnutrition” (Hewitt, Ismail, Patterson, & Draper, 2006) or as, “a state of high probability that available food will not meet minimum needs for a normal life” (Alwang, Briefel, Frongillo, & Olson, 2001). This latter description further suggests that the probability of a negative outcome such as malnutrition and poor health is likely to occur over time. Based on either of these understandings of nutritional vulnerability, homeless adults would seem likely candidates to fit within this definition given that their life circumstances include food insecurity (Seligman, 2007; Wiecha, 1991). A contextualized description of nutritional vulnerability is needed to create a proper understanding of homelessness and subsequent health consequences related to their food environment.

### **2.52 Food sources.**

As presented in this review, the acquisition of food from food banks for those experiencing homelessness is minimal (Che, et al., 2001; Food Banks Canada, 2011; Tarasuk, 2001a). Studies from a variety of developed countries have identified that homeless adults are most likely to frequent soup kitchens or other charitable, prepared meal services to obtain food on a daily basis (Darmon, Coupel, Deheeger, & Briend, 2001; Dietitians of Canada, 2005; Johnson & McCool, 2003; Rushton & Wheeler, 1993; Wiecha, et al., 1991). Other common approaches to obtaining food have been documented to include begging for food or money to buy food, asking for help from family or friends, or “welfare hotel” garbage bins (Booth, 2006; Strasser, Damrosch, &

Gaines, 1991). When the homeless person is able to purchase food, these items typically include fast-food, vending machine items, and ready-prepared food from stores (Gelberg, et al., 1995).

### **2.53 Assessing dietary intake.**

Specific population groups have higher rates of chronic, poor nutrient intakes that do not meet the established healthy food intake guidelines typically published in developed countries. In Canada these include low-income, lone-parent (particularly lone-female) families with children, homeless youth, Aboriginal peoples (First Nations, Metis, and Inuit), and new immigrants to Canada (Bocskei, 2011; Dachner, Gaetz, Poland, & Tarasuk, 2009; Drake, 1992; Evans & Dowler, 1999; Rush, Ng, Irwin, Stitt, & He, 2007; Willows, 2005). Despite the absence of homeless men within this list, it has been suggested that intake is perhaps more compromised for this population group due to a number of factors unique to their gender. These factors include increased difficulties obtaining shelter. It is common practice that shelters offer priority to women and women with children (Burt & Cohen, 1989). When space has been acquired at a shelter, meals may be provided three times daily (Burt, et al., 1989). Men that are denied access to a shelter experience a reduced frequency of food offering as alternate food sources, such as soup kitchens often provide food or meals only once daily (Burt, et al., 1989; Strasser, et al., 1991; Wiecha, et al., 1991).

#### **2.531 *Dietary data collection methods.***

Dietary intake assessment of the homeless population has been attempted in many countries. Dietary collection tools used with the homeless must be selected with careful consideration. Challenges to consider when obtaining dietary intake of the homeless include: limited literacy level; a transient lifestyle that does not lend itself to repeat data collection opportunities from any one individual; and low participant burden during the interview in order

to increase the chances that the individual will remain to complete their data collection (Johnson, 2002; Smith & Richards, 2008).

One of the most consistent approaches to gathering food intake from members of this population group has been via the use of the 24-hour food recall (Ceysens-Okada, Koren-Roth, Luder, & Martinez-Weber, 1990; Derrickson & Gans, 1996; Malmauret, Leblanc, Cuvelier, & Verger, 2002; Rush, et al., 2007; Starkey, Johnson-Down, & Gray-Donald, 2000; Rushton, et al., 1993; Wolgemuth, Myers-Williams, Johnson, & Henseler, 1992; Wiecha, et al., 1991). This is supported by Johnson (2002) who states that the 24-hour food recall requires only short-term memory, has low participant burden in comparison to some other diet intake tools (e.g. food records), and is appropriate for low-income and low-literacy populations. The author identifies the problem of underreporting as a limitation to the 24-hour diet recall, or any dietary recall method. This can be remedied by applying a multiple-pass 24-hour recall. This approach involves the interviewer gathering food intake in successive passes, which are intended to extract intake that has been forgotten and to confirm portion sizes (Johnson, 2002).

### **2.532      *Food quantity and quality.***

A comparison approach using Canada's Food Guide to assess food intake quality and quantity has been used repeatedly in studies aimed at assessing dietary habits and intake of Canadians (Rush, et al., 2007; Starkey & Kuhnlein, 2000; Starkey, et al., 2001). Consistent food group inadequacies have been identified from dietary intake of the homeless. Overall, consumption of fruit, vegetables, dairy, and whole grains are all below acceptable intake levels for adult populations (Derrickson, et al., 1996; Evans, et al., 1999; Johnson, et al., 2003; Rushton, et al., 1993). Despite the limited intake of the above listed foods in the diets of the homeless, total calorie intake has been found to be at or above daily energy need

recommendations (Drake, 1992; Smith, et. al., 2008). This paradox may be explained with a high consumption of “other foods”, which has been identified in the literature using both quantitative and qualitative approaches to assessing the diet of the homeless (Derrickson, et al., 1996; Richards, et al., 2006). Other nutrients that have been found in higher than acceptable daily intake levels include cholesterol, total fat, saturated fat, sodium and alcohol (Ceysen-Okada, et al., 1990; Darmon, et al., 2001; Darnton-Hill & Ash, 2008; Malmauret, et al., 2002; Rushton, et al., 1993).

These nutritional inadequacies can be considered a reflection of the quality of food provided at many of the charitable food programs assisting the homeless (Dachner, et al., 2009; Evans, et al., 1999; Wolgemuth, et al., 1992). Limited or non-existent provincial standards and regulations for the quality of food served by these establishments exacerbate the situation. Consequently, nutritional vulnerability remains a persistent reality for the homeless, despite community efforts at providing charitable food programs.

## **2.6 Health and the Homeless**

### **2.61 Accessing health care.**

The homeless have been identified as an underserved, understudied population group with regards to health conditions and risk factors for ill-health (Vredevoe, Brecht, Shuler, & Wood, 1992). Access to health care and willingness to attend to medical issues is limited regardless of universal health care for the urban homeless (Tadros, et al., 2012; Wiecha, et al., 1991). Efforts have been made to identify the barriers associated with health care services for those experiencing homelessness. Issues identified include lack of transportation, mistrust of health care providers, belief that the medical issue is not serious enough to warrant attention (Wiecha, et al., 1991). The absence of health service means that many diseases and conditions

remain undiagnosed or poorly managed.

Despite the limited use of health services by the homeless, acute health services such as hospital emergency departments, are disproportionately over-utilized by homeless men (Tadros, et al., 2012). The use of the health care system for an emergency or on an urgent basis has shown to impact negatively on the health outcomes among homeless individuals. Specifically, the care received has been reported to be less effective and more costly with an increased mortality rate (Tadros, et al., 2012).

## **2.62 Measuring risk of chronic health problems.**

An individual's body weight along with waist circumference, are indicators of chronic health risk (Health Canada, 2003; Lau, et al., 2007). As with any adult population group, an elevated body weight and/or waist circumference reportedly increases risk for chronic diseases such as type 2 diabetes, dyslipidemia, heart disease, and hypertension (Health Canada, 2003, Lau, et al., 2007). The literature on body weight status and its association with homelessness is inconsistent. There is evidence to support the prevalence of underweight or wasting-malnutrition as well as increased risk for obesity (Bouvier, 2008; Schwarz, Garrett, Hampsey, & Thompson, 2007; Wiecha, et al., 1991; Wolgemuth, et al., 1992). Obesity does appear to be more prevalent in homeless women compared to men (Ceysens-Okada, 1990; Drake, Henseler, 1992; Seligman, Laraia, & Kushel, 2010; Wiecha, 1991). The increased risk for obesity has been linked to the type of food consumed, typically high in fat and calories, while low in fiber (Cohen, Chapman, & Burt, 1992; Wiecha, et al., 1991). The threat of elevated body weight is further compromised by the nature of feast-or-famine that the some homeless individuals encounter as a result of food scarcity or substance abuse (Bouvier, 2008). A pattern of binge eating when food is available may be followed by periods of very low or no food intake when food is not as readily available

or during active substance use (Bouvier, 2008). There is minimal research on waist circumference and increased health risk of the homeless. One study by Lee and colleagues (2005), did not report any significant findings related to waist circumference of the 202 homeless participants residing in Toronto, Canada. A more recent study conducted by Kaldmae and colleagues (2011), reported normal waist circumference values for most of the homeless participants ( $N = 51$ ). Further research is needed to determine how nutritional vulnerability associated with homelessness, affects body mass and waist circumference. Additionally, this information is important in determining whether these anthropometric measures are valid markers for health risk of the homeless.

### **2.63 Health problems.**

The most common physiological health problems present in the homeless include alcoholism, anemia, dental issues, gastric ulcers, general gastrointestinal problems, malnutrition, cardiovascular disease, hypertension, high cholesterol, chronic or acute infectious diseases (respiratory, skin, HIV), skin and foot problems (Frankish, Hwang, & Quantz, 2009; Hwang, 2001; Wiecha, et al., 1991). The unique connection between all of these conditions is chronic, poor dietary intake, which which precipitates or perpetuates the health conditions or the poor management and/or outcome (Seligman, et al., 2010).

Homelessness and food insecurity are both independent risk factors of poor health. The compounding effects has grim health consequences as illustrated above. The diet of homeless individuals has been shown to be chronically deficient in fruit, vegetables, dairy, and whole grains, combined with high intakes of fat, salt, sugar and calories (Johnson, et al., 2003). However, much of the Canadian population also experiences these same dietary shortcomings (Starkey, et al., 2001; Statistics Canada, 2006). Many successful strategies have been developed

to assist people with preventing or managing chronic disease through dietary measures (Post, Mainous, Diaz, Matheson, & Everett, 2010; Seligman, et. al., 2010). However, these approaches often include recommendations for the ongoing purchase and consumption of specific healthful foods that are likely to be unaffordable and unavailable to the homeless, thus rendering the strategies useless for this population group. Significant work is required to explore creative ways of improving the diet of the homeless population, beyond individual knowledge transfer and dietary recommendations that are impossible for people living in extreme poverty. Without these efforts, nutritional vulnerability among the homeless will remain a threat to their health.

#### **2.64 Unique dietary considerations.**

Special dietary needs for adults attending charitable meal programs are rarely, if ever accommodated (Ceysen-Okado, et al., 1990). The characteristics associated with being homeless; limited interaction with the health care system, inconsistent dietary intake, and a high probability of substance abuse suggest that deterioration in any known or unknown health condition would be likely.

##### **2.641 *Micronutrient deficiencies.***

Zinc and vitamin C are micronutrient deficiencies overwhelmingly present in the diets of the homeless adult (Darmon, 2009; Henseler, Johnson, Myers-Williams, & Wolgemuth, 1992). The significance of these specific nutrient deficiencies is the link to a compromised immune system. Vitamin C and zinc are paramount to the body's ability to heal. Zinc deficiency compromises the individual further with side effects such as altered taste, decreased appetite and decreased lean body mass (Henseler, et al., 1992).

The high level of alcohol intake that is found among homeless men may lead to an increased risk for alcohol-related micronutrient deficiencies (Darmon, 2009). Severe vitamin B

deficiency is associated with high, chronic alcohol consumption. This may increase the risk for Wernicke-Korsakoff syndrome and pellagra in this population group (Darton-Hill, et al., 2008). Specifically, excessive alcohol intake interferes with food consumption when an individual ceases food intake in order to continue drinking (Darton-Hill, et al., 2008).

#### **2.642      *Solvent abuse.***

There is limited research on the health impacts of solvent use in adult populations. However, substance abuse is considered by some to be associated with many of the health problems of the homeless (Wiecha, et al., 1991). Implications for diet and food service use of the homeless have been documented (Wiecha, et al., 1991). Acute or chronic solvent use has been associated with loss of appetite resulting in weight loss and weakness, renal and/or liver toxicity, and electrolyte imbalances (Ballard, 1998; May, et al., 1997).

### **2.7      Gaps in the Literature**

This research identifies the gaps in the literature on homelessness and nutritional vulnerability and aims to uncover information that may assist with improving the situation locally and nationally. One of the major gaps to address is the lack of formal documentation on the prevalence of food insecurity of homeless persons in Canada, specifically using the CCHS food security measurement tool. This is a starting point for establishing validity and reliability of the tool with this population group, which has yet to be determined. The implications of this could lead to a more inclusive approach to establishing the prevalence of food insecurity in our country.

Inconsistent findings about the presence of elevated body mass index and waist circumference of the homeless individual presently exist. The anthropometric results of this study will add evidence to the literature in one respect or another. In addition, information about

the food environment, including intake and acquisition practices, of homeless men in Winnipeg, Canada does not exist in the literature. Dietary intake assessment of homeless populations has been typically reported for urban locations that do not experience prolonged harsh, cold weather that is consistent with living in Winnipeg. The results of this study may unveil unique information that could be used to better address the needs of our local homeless population, as well as other similar urban settings.

There is very scant research on the dietary implications resulting from solvent use. Due to the phenomenon of volatile substance abuse, the sparse information that does exist is primarily focused on younger populations (Ashton, 1990). This study will aim to uncover any information that may offer insight into the nutritional vulnerability of the homeless adult solvent user.

## **Chapter 3: Research Methods**

### **3.1 Introduction**

This research aimed to explore and describe the nutritional vulnerability experienced by homeless men that are or are not using solvents. The results were used to further assess the risk for chronic health issues among the study population. This study utilized a concurrent mixed methodology research approach as outlined by Creswell (2009). This approach allowed for the integration of how and why the participants behave in a certain way regarding their food environment (Swift & Tischlert, 2010). This may not have been captured with quantitative survey data alone.

#### **3.11 Community-based research partnership.**

This study was conducted in collaboration with Sunshine House, a community based, non-profit, volunteer organization offering basic support services (meals, laundry, shower facilities, etc.) for populations identified as transient, drug using, homeless, low-income, and/or street-involved (Healthy House.ca, 2010). Sunshine House is geographically located in the core, or central area of Winnipeg made up of mixed commercial and residential space. This is prime location for the homeless adult to traverse in most urban locations due to the high concentration of services offered here such as shelters, charitable meal programs, and social assistance offices (Hulchanski, 2009; Wolch & Rowe, 1992).

The study was embedded in a larger community development project conducted at Sunshine House, which promoted food security through a variety of initiatives. The project was conducted in partnership with the University of Manitoba (Dr. Joyce Slater, Department of Human Nutritional Sciences) between January 2010 and May 2012.

Creswell (2009) identifies the importance of the researcher establishing a relationship or

familiarity with the potential research clients in order to gain a deeper understanding of the organization and its people prior to initiating a project. The principal investigator of this study volunteered with Sunshine House for weekend meal service and special events (focus group) prior to the onset of this study. The volunteer work included assisting with meal preparation and service of the brunch meal offered on Sundays.

For this research, the participative approach consisted of:

- i) conducting an exploratory focus group with Sunshine House clients to determine areas of focus and inquiry;
- ii) designing open-ended questions for the interview questionnaire, based on the focus group and discussions with Sunshine House staff;
- iii) approaching potential candidates to participate in the research interview; and
- iv) reviewing, discussing, and providing feedback related to the thematic analysis results of the open-ended interview questions.

Three Sunshine House clients tested the face validity of the interview questionnaire (Palys & Atchison, 2008). The researcher pilot-tested the questionnaire with these clients to determine whether appropriate terminology was used and to assess whether the clients were able to comprehend each question item. This information was used to revise the interview questionnaire prior to the official data collection commencing.

### **3.2 Research Design**

The research conducted for this study was informed by the findings from an initial focus group coordinated and facilitated by staff at Sunshine House, a Kali-Shiva AIDS service offered in Winnipeg, Canada. The focus group was conducted in order to explore the food environment

of homeless adults that frequent Sunshine House for meal service. The focus group was audio recorded and manually documented by the principal investigator of this study. The researcher then transcribed and coded the data thematically. Using a participatory approach, the principal investigator and the Sunshine House focus group staff reviewed the themes and collaborated to design the open-ended questions used for this study.

A concurrent, triangulation strategy, as explained by Creswell (2009) was utilized for this study (Figure 3). This approach allowed for the qualitative data to contextualize and build on the results of the quantitative data. The mixing occurred after data collection and analysis, and is presented within the discussion section of this report.

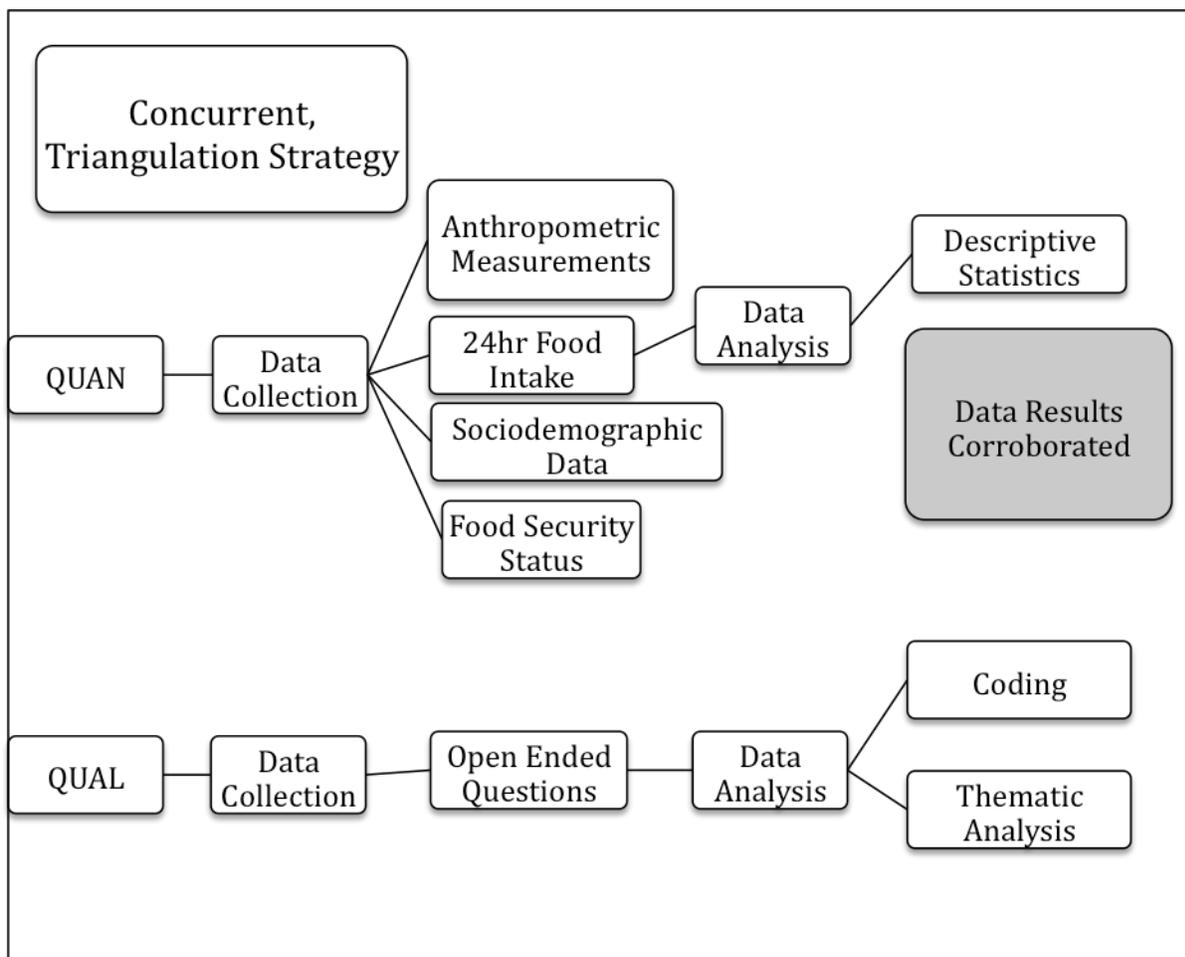


Figure 3: Mixed methodology, concurrent, triangulation research strategy. Reference: Creswell (2009).

### **3.21 Research questions.**

This study sought to answer the following:

1. What is the food security status of the study participants?
2. What is the dietary intake of the study participants?
3. What are the nutritional and anthropometric risk factors for chronic, nutrition-related illness in the study population?
4. How are the study participants navigating the food supply system to obtain food?
5. Is the CCHS HFSSM measurement tool valid for measuring food insecurity of the study participants?

### **3.22 Ethics.**

Ethics approval was obtained from the University of Manitoba Joint-Faculty Research Ethics Board, Fort Garry Campus on February 14, 2011 (Appendix A). An amendment was requested and approval obtained on March 11, 2011 (Appendix B). The amendment consisted of one question, which asked the age of each participant on the interview questionnaire. The age omission was an oversight on the initial questionnaire.

During drop-in hours at Sunshine House, staff or the principal investigator provided a verbal explanation of the study to potential participants in order to determine participation interest. If a candidate expressed interest, informed, voluntary consent was obtained prior to involvement in the study. A written as well as a verbal informed consent was offered in consideration of candidates that may have literacy issues (Appendix C and D). All of the signed consent forms are located in a secure cabinet in a locked room. The consent forms will be destroyed on or before September 30, 2015.

### **3.23 Study participants and sampling.**

The purposive sample consisted of 40 adult men that met the following self-identified criteria:

- English speaking;
- 18 years of age or older;
- absence of dependent children;
- accessed a soup kitchen, mission, or shelter for meals within the past 12 months; and
- an active user of Sunshine House.

All study participants were recruited during drop-in hours by Sunshine House staff and/or the principal investigator. Efforts were made to include an equal division of participants that were solvent and non-solvent users. Individuals that self-identified as a solvent user were asked to refrain from solvent use for 24 hours prior to the interview being conducted. Further, any participant that stated he had used solvents within the past 24 hours was scheduled for the next drop-in date. This was requested in order to obtain research data that was not provided while under the influence of chemical substances.

### **3.3 Data Collection**

Once an individual provided consent to proceed with their participation in the study, the principal researcher conducted individual, confidential interviews at Sunshine House. Participants' confidentiality and privacy was further maintained by the use of numerical codes on the interview questionnaire, in place of names. These interviews were approximately one hour in duration and were audio and manually recorded by the researcher. Audio recordings were used to provide clarification as needed during the data analysis phase of the research. A \$20 cash honorarium and ticket for a Sunday brunch (at Sunshine House) was provided to all participants

in compensation for their time to complete the interview.

### **3.31 Data collection tool: Interview questionnaire.**

An interview questionnaire (Appendix E) that consisted of closed and open-ended questions, was utilized to collect data. The questionnaire was divided into sections, which allowed for logical flow of data collection (Palys, et al, 2008). The interview sections captured information related to each of the following areas:

- i) **socio-demographic information:** this section asked questions on age, gender, cultural identify, health problems, housing status, and solvent use;
- ii) **food security status:** this section utilized the methodology developed for CCHS HFSSM adult-scale;
- iii) **food environment:** this section utilized a series of questions on use of charitable meal programs, perception of their food situation, special dietary needs, and if the participant used solvents, a question on changes to diet experienced with solvent use;
- iv) **dietary intake:** this section used a 24-hour diet recall; and
- v) **anthropometric risk factors:** participant body weight, height and waist circumference were taken.

### **3.32 Socio-demographic data.**

Closed-ended questions were used to screen for the inclusion criteria established at the outset of the study including; being over the age of 18 years, no dependent children, and having used a soup kitchen, mission, or shelter to obtain food in the past year. Additionally, a series of closed-ended questions were utilized to gather data on participant characteristics (i.e. age), as well as housing status, income source, and solvent use.

### **3.33 Food security status.**

Food security status was assessed using the tool developed for the Canadian Community Health Survey Cycle, 2.2, Nutrition (2004), known as the Household Food Security Survey Module (HFSSM). The study sample did not have any dependent children therefore the 10-item adult food security scale was employed, omitting the 8-item child food security questions (Appendix F). This tool was used by Health Canada (2007b) to establish the food security status of the Canadian population for 2004, however the homeless population was not included. Another food security measurement tool designed specifically for homeless adults or children did not exist to the best of the investigator's knowledge.

In addition to determining food security status, this research intended to assess the applicability of the HFSSM tool with the homeless study population. The approach used to determine the effectiveness of this tool, while continuing to assess food security status, involved adjusting the algorithm established in the CCHS use of the HFSSM tool. The original HFSSM questionnaire (Appendix F) was separated into stages that included "internal screens" requiring specific responses to closed-ended questions to determine whether the interview proceeded to the next stage or stopped. The questions were listed in order of increasing severity of food insecurity. If responses to the less severe questions did not indicate that the individual would respond affirmatively to the more severe questions, the interview ceased at the end of that particular stage (Health Canada, 2007b). The study disregarded the use of the "internal screens" and proceeded with asking all participants the entire list of ten adult food security questions. This approach was used because the tool had not been previously used with homeless populations and thus validity of each question could not be assumed. Should any question prove to be invalid, adhering to the CCHS administering protocol may exclude

some participants from being food insecure. This approach allowed for testing the validity of each question and the “internal screens” when used with the homeless participants in the study.

### **3.34 Food environment.**

Data examining how participants interact with formal and informal food systems was collected using open-ended questions. The series of questions was designed to elicit information about the participants’ food intake from charitable and non-charitable food sources as well as individual perception about what would improve their food situation (Appendix E). One question was included to explore any possible dietary changes resulting from solvent use.

### **3.35 Dietary intake.**

The researcher was well-trained in dietary assessment, having been a registered dietitian for the past decade. A modified multiple-pass approach was used to gather food intake details from participants (Conway, Ingwersen, & Moshfegh, 2004). Responses were recorded directly on the interview questionnaire (Appendix E). The initial pass consisted of participants verbalizing all food and beverages consumed the previous day. The second pass involved the researcher probing for any food groups, including “other” foods that may have been forgotten at each intake time identified by the participant. Probing for between meal food and beverage consumption occurred as well. Food replica models, available from Nasco (2012) and common household food measures were used during the interviews to confirm portion sizes for all food and fluid listed on the dietary recall sheets. Lastly, a final review of each participant’s dietary recall was conducted.

### **3.36 Anthropometric measurements.**

The final stage of the participant interview consisted of obtaining weight (to the nearest 0.1kg) height (to the nearest 0.1cm), and waist measurements (to the nearest 0.1cm). The

measurement instruments included a digital scale, a portable stadiometer, and a soft tape measure respectively. Measurements were taken in the order of weight, height and waist circumference. This approach was used to obtain two measurements for all categories. A third measure was taken if the first two readings of a category varied by more than 1%. Measurement results were listed as “declined” for any participant that did not want their measurements taken.

To obtain accurate anthropometric results, all participants removed their footwear, jackets, snow pants, hats, and emptied their pockets prior to taking measurements. In order to obtain waist circumferences, unless a participant was wearing a single layer shirt, they lifted their shirt to above their belly button in order for the researcher to measure waist circumference.

### **3.4 Data Analysis**

After all of the participant interviews were completed, two methods for data analysis were employed. The first was descriptive statistics. The quantitative data was entered into Microsoft Excel 2008 for Mac (version 12.0) and imported into Statistical Package for Social Sciences (SPSS, version 19), for analysis. The second analysis involved coding and thematic analysis of the qualitative data.

#### **3.41 Socio-demographic data.**

Socio-demographic data were analyzed using descriptive statistics to determine frequency distribution for each of the characteristics included on the interview questionnaire (Appendix E).

#### **3.42 Food security status.**

Food security status was defined according to the scale used for the CCHS HFSSM 10-item adult questionnaire, which was validated using the Rasch measurement model (Health Canada, 2007b). Based on the total number of affirmative responses to the questions, indicating

the presence of food insecurity, the participant was identified as food secure, food insecure-moderate, or food insecure-severe. Severity of food insecurity increased as the number of affirmative responses increased (Table 1).

Table 1. *Food Security Score and Corresponding Status<sup>a</sup>*

<b>Food Security Score</b>	<b>Adult Food Security Status</b>
<b>0 – 1</b>	<b>Food secure</b>
<b>2 – 5</b>	<b>Food insecure, moderate</b>
<b>6 – 10</b>	<b>Food insecure, severe</b>

<sup>a</sup>*Adapted from CCHS 2004 HFSSM survey, (Health Canada, 2007b)*

Several approaches were used to analyze the data on food security status of the study participants. Firstly, the affirmative responses for all ten questions, for each participant were added to reveal a number between 1-10, (identified as the “Adjusted Food Security Results” for the remainder of this report). The results were used to determine the food security status for each participant using the scale illustrated in Table 1. Secondly, the 10-item interview questions were assessed retrospectively using the two “internal screens” as they were applied during the CCHS in 2004, adult scale. Any participants that did not respond affirmatively to at least one of the first 4 questions listed on the survey module (Appendix F) were screened out of the questionnaire. The participant’s responses to subsequent questions were not considered in calculating their food security status. This same process was applied for the second “internal screen” consisting of five questions (Appendix F). This was done as a means of assessing whether the “internal screens” were appropriate for use with this population group. Data were analyzed for consistency in the numbers of participants identified as food insecure using both approaches. Lastly, the data were analyzed using Fisher’s exact test to assess for statistical significance between solvent using versus non-solvent using study participants.

### **3.43 Food environment.**

Responses to the open-ended questions were coded and analyzed thematically by the

researcher. Data validity strategies included triangulation with results from the quantitative data to give a richer account of the research findings, and descriptive text from study participants to support the identified themes and to add context (Creswell, 2009).

### 3.44 Dietary intake.

A 24-hour diet recall was conducted with each participant to obtain data on food intake the day before the research interview. Due to the sample size and the limited burden on participants, this method was the most appropriate (Health Canada, 2006; Johnson, 2002).

Dietary data was classified into food groupings according to Canada’s Food Guide and further sub-grouped in order to distinguish between healthier and less healthy categories (Table 2).

Table 2. *Food Group Categories with Corresponding Sub-Groups Used to Assess Quality of Dietary Intake*

<b>Food Group Category<sup>a</sup></b>	<b>Sub-Groups</b>
Vegetables & Fruit	<ul style="list-style-type: none"> <li>• Vegetables</li> <li>• Fruit</li> <li>• Whole Fruit</li> <li>• Fruit Juice</li> </ul>
Grain Products	<ul style="list-style-type: none"> <li>• Unrefined</li> <li>• Refined</li> </ul>
Milk & Alternatives	<ul style="list-style-type: none"> <li>• n/a</li> </ul>
Meat & Alternatives	<ul style="list-style-type: none"> <li>• Fresh</li> <li>• Processed</li> </ul>
“Other” Foods	<ul style="list-style-type: none"> <li>• Salty Snacks</li> <li>• Sweet Snacks</li> <li>• Sweetened Beverages</li> <li>• Coffee/Tea</li> <li>• Alcohol</li> </ul>

<sup>a</sup>Canada’s Food Guide category groupings (Health Canada, 2007a).

Once all interviews were completed, the researcher manually assessed intake data for food group representation, including “other” foods that are not represented in the four basic food groups of Canada’s Food Guide (Health Canada, 2007a). Table 3 provides a list of items categories as “other” in accordance with the food guide.

Table 3. *A List of “Other” Food and Beverages in Accordance with Canada’s Food Guide<sup>a</sup>*

<b>“Other” Food</b>	<b>“Other” Beverages</b>
<ul style="list-style-type: none"> <li>• Cakes and pastries</li> <li>• Cookies</li> <li>• Chocolate</li> <li>• Candies</li> <li>• Donuts</li> <li>• French fries</li> <li>• Frozen desserts</li> <li>• Nachos</li> <li>• Potato Chips</li> </ul>	<ul style="list-style-type: none"> <li>• Alcohol</li> <li>• Coffee/Tea</li> <li>• Fruit flavored drinks</li> <li>• Soft drinks</li> <li>• Sports and energy drinks</li> <li>• Sweetened hot or cold drinks</li> </ul>

<sup>a</sup>Canada’s Food Guide category groupings (Health Canada, 2007b).

Intake data were captured in Excel 2008 for Mac (version 12.0) then exported into SPSS (version 19) for analysis. Data were analyzed for descriptive statistics including means, ranges, and standard deviations. Independent samples *t*-tests were conducted to assess for any statistically significant differences between solvent and non-solvent users’ dietary intake.

Participant food group intakes were further compared to the 2004 Canadian averages for each category. The 2004 Canadian averages pre-dated the release of the 2007 Canadian food guide. For direct comparison purposes, food intakes were compared using the 1992 Canada’s Food Guide (Health Canada, 1992).

### **3.45 Anthropometric measurements.**

Height and body weight were used to calculate the body mass index (BMI) of each participant ( $BMI = \text{weight (kg)} / \text{height (m)}^2$ ). The BMI values were categorized according to the BMI standards established by Health Canada (2003) to identify health risk classification (Table 4).

Table 4. *Health Risk Classifications According to Body Mass Index (BMI)*

<b>BMI</b>	<b>Risk of developing health problems</b>
< 18.5	Increased
18.5 – 24.9	Least
25.0 – 29.9	Increased
30.0 – 34.9	High
35.0 – 39.9	Very high
>= 40.0	Extremely high

*Adapted from: WHO (2000) Obesity: Preventing and Managing the Global Epidemic: Report of a WHO Consultation on Obesity.*

Waist circumference (WC), an indicator of excess abdominal fat, was used to determine increased health risk in accordance with the WC cut-off value (102cm) for adult men (Health Canada, 2003). Anthropometric readings were further analyzed using descriptive statistics including means, ranges, and standard deviations. Independent samples *t*-tests were conducted to assess for any statistically significant differences between solvent and non-solvent users' BMI and waist circumference values.

## Chapter 4: Results

### 4.1 Participant Characteristics

Among the 40 male participants aged 23-59 years who completed the individual interviews a majority were between the ages of 30-49 years (62.5%) with a mean age of 39 years (Table 5). A total of 85% of the study group self-identified their cultural background as Aboriginal. Thirty-two percent ( $n=13$ ) of participants reported the use of solvents for the purpose of sniffing or huffing.

Table 5. *Characteristics of Men Having Accessed Charitable Meal Programs (N=40)*

Characteristic	n (%)
<b>Age (years)</b>	
20-29	6 (15)
30-39	12 (30)
40-49	13 (32.5)
≥50	6 (15)
not provided	3 (7.5)
<b>Self-Identified Cultural Identity</b>	
Aboriginal	34 (85)
Non-Aboriginal	6 (15)
<b>Solvent Use</b>	
Solvent user	13 (32.5)
Non-solvent user	27 (67.5)
<b>Self-Reported Health Problems</b>	
Hepatitis C	8 (20)
Limb and Joint pain	6 (15)
Diabetes	5 (12.5)
Alcoholism	4 (10)
Mental Illness	4 (10)
HIV	2 (5)
Kidney disease <sup>a</sup>	1 (2.5)
Liver disease	1 (2.5)
STI (sexually transmitted infection)	1 (2.5)
Tuberculosis (inactive)	1 (2.5)
Food Allergy	1 (2.5)
No health problems	17 (42.5)
<b>Housing Situation</b>	
Street or shelter	14 (35)
Family or friend's place	12 (30)
Rooming house or hotel	8 (20)
Apartment	3 (7.5)
House	4 (10)

<sup>a</sup>unrelated to diabetes

More than a third of the participants (35%) described their current housing status as a state of absolute homelessness. Another 30% of the men reported a state of concealed homelessness, sleeping in a vehicle or at a family/friend's place most nights. All other participants described a state of relative homelessness. This type of homelessness is defined by the Canadian Library of Parliament (2008), as being at risk of losing one's home or living in substandard housing such as a rooming house, hotel, apartment or a house. Despite the request for a single response to the current state of housing for each participant, it was common for participants to indicate that they fluctuated between the varieties of homelessness (absolute, concealed, and/or relative) during any given time period.

Fifty-seven percent of the participants reported some type of health problem. The most prevalent conditions included hepatitis C (20%), limb and joint pain (15%), diabetes (12.5%), alcoholism (10%), mental illness (10%), and HIV (5%). Other less frequently reported health concerns included kidney or liver disease, inactive tuberculosis, sexually transmitted infection, and food allergies. Caution should be used when interpreting the data related to present health issues. Due to the nature of self-reporting, it is possible that there may be some under-representation of health problems due to lack of disclosure or a lack of participant awareness that a medical condition exists (Tadros, et al., 2012; Wiecha, et al., 1991).

The use of a soup kitchen, mission or shelter in order to obtain food within the past year was an inclusion criteria for this research. The data obtained from the participants assisted with identifying frequency of use for these specific charitable meal programs (Figure 4). The majority of the respondents ( $n = 24$ ) reported having obtained food from a soup kitchen, mission or shelter on a daily basis. The remaining men were using these charitable food programs as

often as four times per week ( $n = 10$ ) with a smaller proportion attending once per week ( $n = 4$ ) and once per month ( $n = 2$ ).

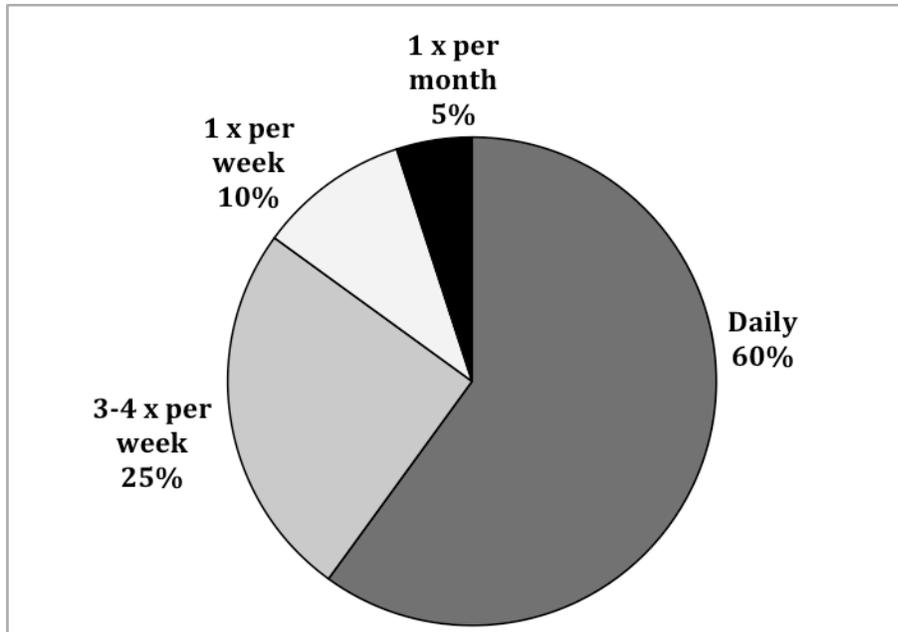


Figure 4: Frequency of charitable meal program usage.

#### 4.2 Food Security Status

Food security status of the study participants was established using the CCHS Household Food Security Survey Module (HFSSM) compared to an adjusted version of the survey module (i.e. removal of the “internal screens”), summarized in Table 6.

Table 6. Food Security Status of the Study Participants Established Using the CCHS HFSSM<sup>a</sup> Compared to an Adjusted Version of the Tool.

Category Labels	Food Security Status (N = 40)	
	CCHS Household Food Security Survey Module Results	Adjusted Food Security Results
	<i>n</i> (%)	<i>n</i> (%)
Food Secure	4 (10)	2 (5)
Food Insecure Moderate	9 (22.5)	11 (27.5)
Food Insecure Severe	27 (67.5)	27 (67.5)

<sup>a</sup>Canadian Community Health Survey, Household Food Security Survey Module

The food security status at the most severe end of the scale remained consistent for both food security measurement tools. A difference is found in the number of homeless men that experienced moderate food insecurity and those that were food secure. The CCHS HFSSM tool identified a greater number of study participants that were food secure compared to the adjusted tool. This further translated into a lower number of participants that experienced moderate food security compared to the results of the adjusted tool. Overall, there was a very high prevalence of food insecurity among the study participants. The CCHS HFSSM measurement tool reported that 90% of the study participants experienced food insecurity compared to a 95% prevalence of food insecurity with the adjusted tool.

Solvent-using participants had a higher prevalence of severe food insecurity compared to non-solvent users when using the adjusted food security measurement tool (Figure 5). The results were consistent with the CCHS HFSSM measurement tool. However, there was not a statistically significant relationship between solvent use and food security status using the adjusted tool ( $p = 0.71$ ).

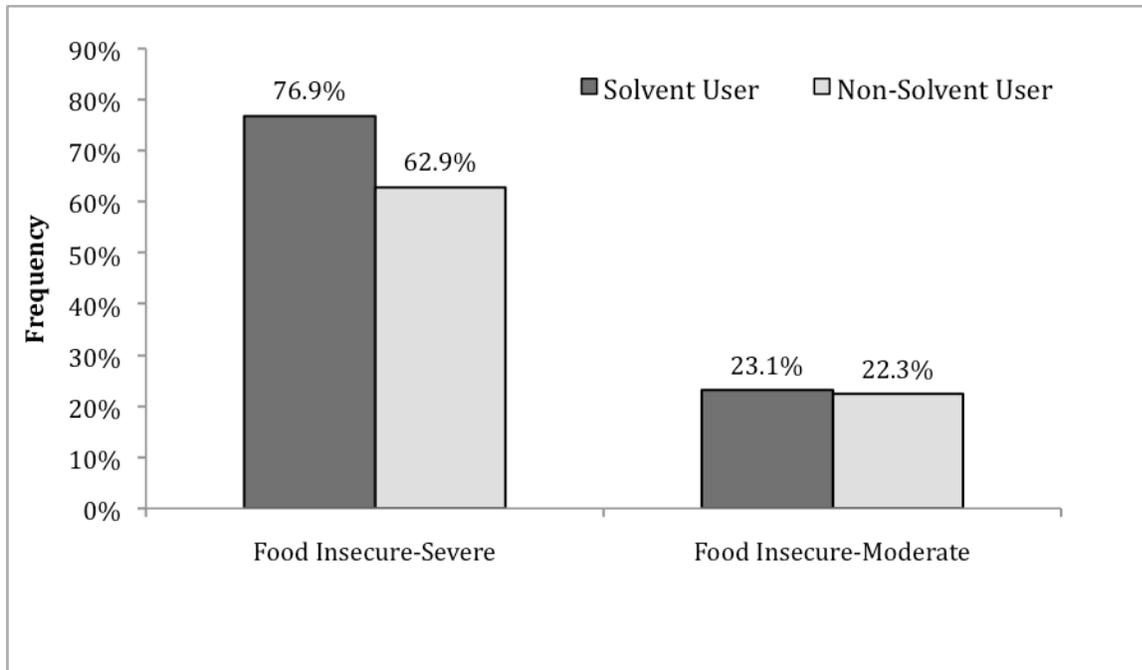


Figure 5: Food insecurity status of homeless men that are solvent users compared to non-solvent users. (Results from the adjusted food security measurement tool.)

Note:  $p > 0.05$

### 4.3 Dietary Intake

Results of the 24-hr food recall are shown in Table 7. Intake recommendations according to Canada's Food Guide (2007a) were not met for any of the four major food group categories (vegetables and fruit, grain products, milk and alternatives, meat and alternatives). Most of the participants consumed less than the daily serving requirements for the vegetables and fruit as well as the milk and alternatives food group categories. Nearly half of the participants were below the intake recommendations for grain products. Consumption of meat and alternatives was reported in similar proportions below (42.5%) and above (37.5%) the recommendations for this age and gender category.

Table 7. *Food Group Intake Obtained from 24-hr Dietary Recalls of Study Participants (N = 40)*

Food Group Category <sup>a</sup>	Recommended Daily Servings <sup>a,b</sup>	Reported Intake Mean(SD)	Range (Median)	% Consuming < CFG
Vegetables & Fruit	7-10	3.4 (3.2)	0-15.75(3)	92.5
Vegetables		2.1 (1.9)		
Fruit		1.1 (1.9)		
Grain Products	7-8	6.4 (8.3)	0-32(7)	47.5
Refined		7.3 (6.3)		
Unrefined		1.0 (2.2)		
Milk & Alternatives	2-3	0.9 (1.3)	0-4(0.25)	77.5
Meat & Alternatives	3	3.2 (2.5)	0-9.25(3)	42.5
Fresh		1.8 (1.9)		
Processed		1.4 (1.5)		
“Other” Food				
Salty snacks	--	0.7 (1.7)	0-8(0)	--
Sweet snacks		3.2 (4.0)	0-20(2.25)	--
“Other” Beverages				
Sweet	--	1.5 (1.9)	0-8(0.5)	--
Coffee/Tea	--	3.4 (4.6)	0-26(3)	--
Water	--	2.9 (3.9)	0-11(1)	--
Alcohol	≤ 2	4.2 (11.8)	0-67(0)	--

<sup>a</sup> categories and recommended daily servings are based on Canada’s Food Guide (2007) for men aged 19-50 years

<sup>b</sup> intake recommendations do not exist for “other” foods and beverages, with exception of alcohol (Centre for Addiction and Mental Health, 2012)

#### 4.31 Vegetables and fruit.

Participants consumed double the intake of vegetables in comparison to fruit servings (Figure 9). The fruit consumed was most often (51%) in the form of fruit juice. Four participants reported that they did not consume any vegetables or fruit during the 24-hr intake period.

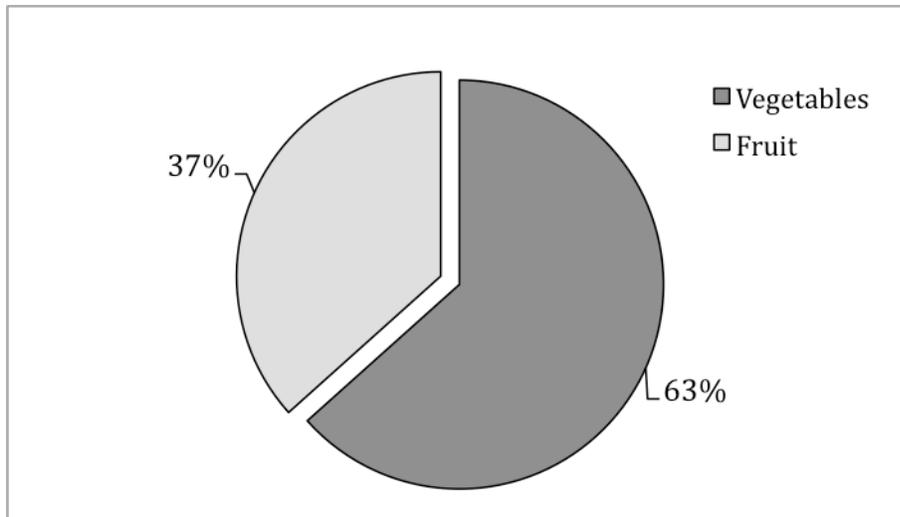


Figure 6. Comparison of vegetables and fruit intake from 24-hr dietary recall of study participants ( $N = 40$ ).

#### 4.32 Grain products.

A majority of the grains consumed by participants were lower fiber, refined foods including white bread, rice, and noodles (Figure 7). Two participants did not consume any grain products during the 24-hr dietary recall date.

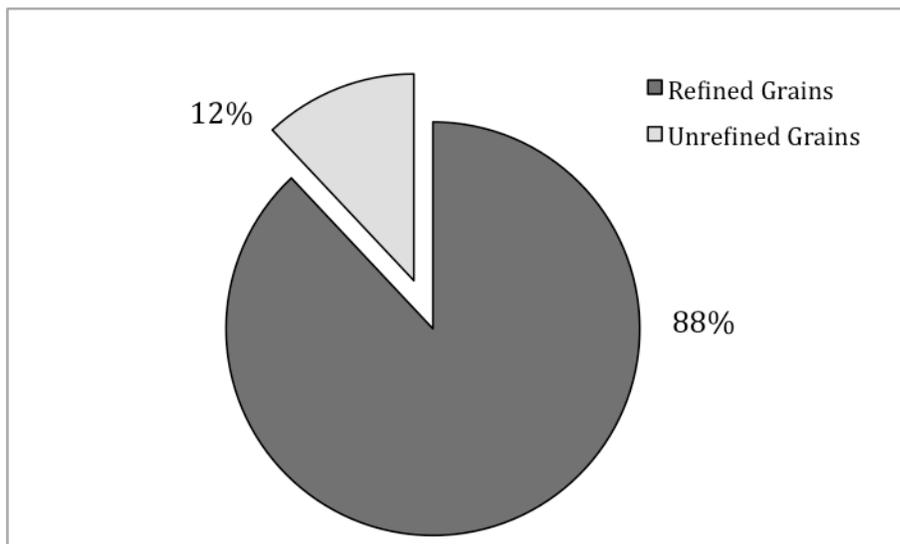


Figure 7. Comparison of refined and unrefined grain intake from 24-hr dietary recall of study participants ( $N = 40$ ).

#### 4.33 Milk and alternatives.

Fifteen percent of the participants ( $n = 6$ ) met the daily serving recommendations for milk and alternatives. Nearly half of the participants ( $n = 17$ ) reported that they did not consume any milk and alternatives during the dietary recall period.

#### 4.34 Meat and alternatives.

More than half of the meat and alternatives consumed were fresh compared to processed servings (Figure 8). Fifteen percent of the participants reported no intake of meat and alternatives during the 24-hr food intake period.

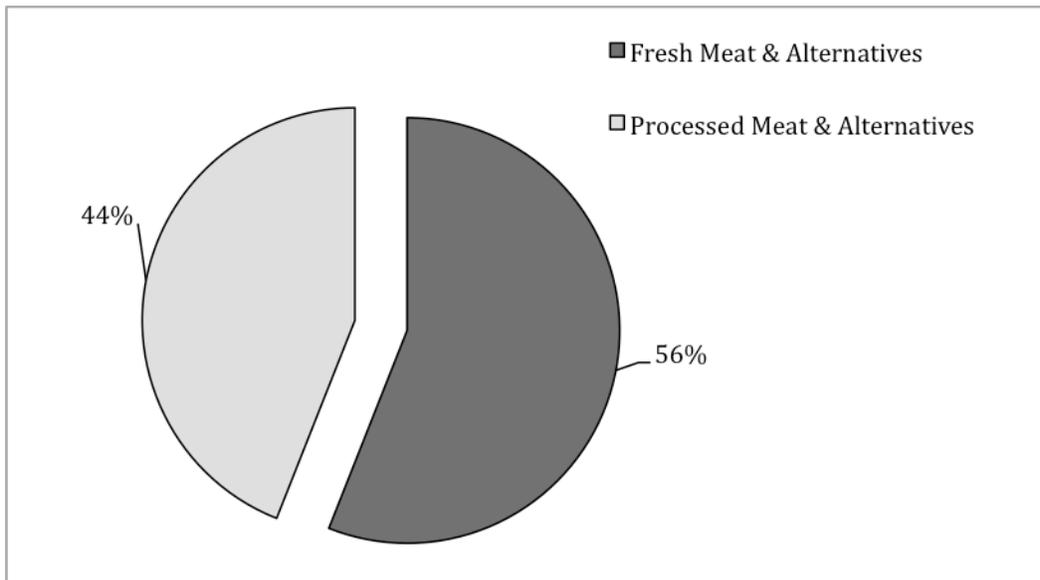


Figure 8. Comparison of fresh and processed meat and alternatives intake from 24-hr dietary recall of study participants ( $N = 40$ )

The limited finances of the participants did allow for purchase of some meat items from commercial outlets. In order to stretch their dollar, participants purchased restaurant foods such as fast food beef burgers, fried chicken, and pizza with processed meat. The choice to purchase these specific items was driven by the cheap cost of the fast food meals and/or the “buy-one-get-one” discounts offered at some take-away restaurants. Meat acquired from non-restaurant sources (grocery, discount, convenience stores), were frequently processed meats such as

bologna, Klik™, ham, garlic sausage. Unprocessed meat and alternative choices from commercial channels included eggs, ground beef, and a few reports of canned or frozen fish.

#### 4.35 “Other” food and beverages.

“Other” food and beverages contributed significantly to the 24-hr food intakes for most of the study participants. Figure 9 illustrates the distribution of “other” food reported by participants during the 24-hour dietary intake. Consumption of sweet snacks (donut, cake, cookie, chocolate, candy) was five times more common than salty snacks (potato chips, French fries). The average intake of alcohol was double the current daily intake limitations.

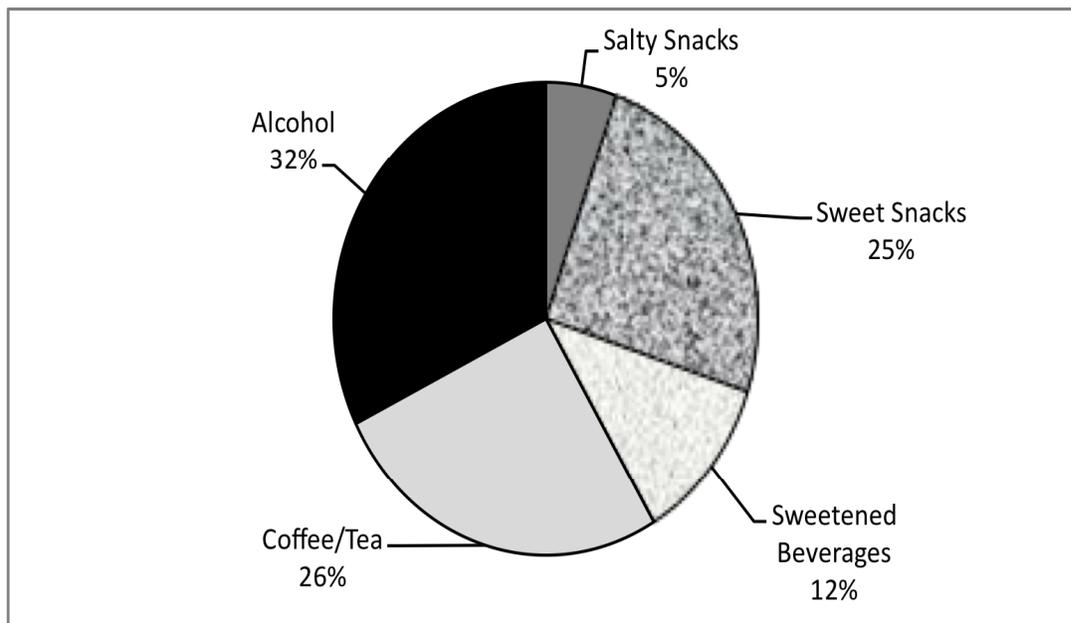


Figure 9. Percentage distribution of “other” food and beverages consumed by participants

#### 4.4 Solvent Use and Food Intake

Solvent users consumed a greater number of servings of vegetables and fruits, grain products and “other” food and beverages categories compared to the non-solvent using men (Table 8). This difference approached statistical significance ( $p < 0.05$ ). Solvent use did not impact dietary intake of milk and alternatives and meat and alternatives.

Table 8. *Dietary Intake Comparison of Solvent Using and Non-Solvent Using Study Participants (N = 40)*

Food Group Category <sup>a</sup>	Solvent Users <i>n</i> = 13 Mean(SD) [range]	Non-Solvent Users <i>n</i> = 27 Mean(SD) [range]	<i>p</i> -value <sup>b</sup>
Vegetables & Fruit	5.3(4.5) [0.5-15.75]	2.5(1.9) [0-6.5]	0.054*
Grain Products	11.75(8.7) [4.5-25]	6.6(4.3) [0-14.5]	0.064**
Milk & Alternatives	1.1(1.5) [0-4]	0.8(1.1) [0-4]	0.480
Meat & Alternatives	3.9(2.5) [0-8.5]	2.8(2.4) [0-9.25]	0.187
Other Foods & Beverages	6.1(6.1) --	2.6(2.1) --	0.064**

<sup>a</sup> categories are based on Canada's Food Guide (2007)

<sup>b</sup> Fisher's exact test

\*significant,  $p \leq 0.05$

\*\* approaching significant,  $p \leq 0.05$

## 4.5 Food Environment

### 4.51 Reasons for attending soup kitchens, missions or shelters for meals.

Reasons for attending soup kitchens, missions and shelters to obtain meals were categorized into four themes: basic physiological, social, economic, and safety needs. Detailed descriptions for each theme are provided below.

#### 4.511 Physiological needs.

Basic needs identified by participants were food, water, shelter, and clothing.

Participants expressed the need to obtain food and fluids as a necessity in order to survive, “*I go because I am hungry*” [participant #19, #21 and #22]. Charitable meal services were recognized as a requirement, a result of being homeless with no place to go. For participants with access to shelter, the requirement resulted from lack of food to prepare and eat or cooking equipment; subsequently some participants attended free meal services to take food away with

them that could be consumed at a later time.

Some participants identified having attended charitable meal programs to satisfy a basic need for shelter, particularly during the colder months. A less frequent reason for attendance at charitable meal programs was to obtain resources such as clothing and hygiene products.

#### ***4.512 Social needs.***

Socializing was a factor that brought many of the participants to soup kitchens, missions, and shelters to eat. Some participants reported that they had made friends with others on the streets and charitable meal programs allowed them to stay connected and enjoy meals with people they considered their friends. A sense of belonging, or the ability to socialize, outweighed the food aspect for some of the men, *“I go to be around people”* [participant #27].

#### ***4.513 Economic needs.***

Lack of money to purchase food was recognized as a reason for having attended charitable food programs over the past year. Absence of employment income and/or exhausting money available from assistance programs before another payment arrived, were identified as reasons for the lack of money to buy food. Participants that reported running out of money from social assistance sources typically identified the problem to occur in the later half of each month. A coping strategy included using free meal programs during the gap between running out of money and receiving the next payment. Additionally, lack of money for food was identified by some participants as a result of funds being spent on addictive substances, such as alcohol, in place of food.

#### ***4.514 Food safety needs.***

Food quality and adequate quantity were acknowledged as positive reasons for having attended charitable meal programs. Several participants felt confident that the meals provided

were nutritious and safe to eat, unlike what they may have experienced from sources such as garbage dumpsters.

The themes identified as reasons for attending charitable meal programs within the past year are listed in Table 9. Each theme listed includes supporting quotes from participant interviews.

Table 9. *Reasons for Attending Charitable Meal Programs: Selected Quotes from Participants by Theme*

<b>Themes</b>	<b>Supporting Quotes from Participant Interviews [participant #]</b>
<b>Physiological</b>	<ul style="list-style-type: none"> <li>▪ <i>“When I’m starving I go to eat.” [24]</i></li> <li>▪ <i>“I go to survive.” [10]</i></li> <li>▪ <i>“Because I don’t have the supplies to eat.” [38]</i></li> <li>▪ <i>“To get out of the cold.” [21]</i></li> <li>▪ <i>“Sometimes I go to get other resources like clothing or hygiene products.” [25]</i></li> </ul>
<b>Social</b>	<ul style="list-style-type: none"> <li>▪ <i>“I love the company and I just love the places I go to. [7]</i></li> <li>▪ <i>“I sit down and talk to friends and have a meal with them. Talk about old times and catch up.” [32]</i></li> <li>▪ <i>“It’s fun. I like the atmosphere because it feels like a good day.” [30]</i></li> </ul>
<b>Economic</b>	<ul style="list-style-type: none"> <li>▪ <i>“So we can have enough food for a month between what we bought and the shelter.” [11]</i></li> <li>▪ <i>“I go because I don’t have enough funds to buy groceries to last me throughout the month.” [25]</i></li> <li>▪ <i>“I spend more of my money on booze than food.” [1]</i></li> </ul>
<b>Safety and Security</b>	<ul style="list-style-type: none"> <li>▪ <i>“Because of the meals they give out. It’s filling, tasty and they give you enough food.” [9]</i></li> <li>▪ <i>“I’m guaranteed a more healthy, balanced diet...I don’t worry about food being off, unsafe.” [4]</i></li> </ul>

#### **4.52 Non-charitable food.**

Most participants reported that they obtained food for consumption from other sources in addition to the charitable meals offered at soup kitchens, missions and shelters. Detailed information about the food obtained and the acquisition practices were explored.

##### **4.521 Other food sources.**

Food obtained from non-charitable sources included family and friends, convenience

stores, discount stores (e.g. Dollarama, Giant Tiger), grocery stores (e.g. Extra Foods, Safeway), garbage dumpsters, low-end hotels offering lodging, inclusive of a daily buffet meal, and restaurants.

Participants enjoyed consuming meals at a family or friend's place with an added benefit reported, not having to cook and clean up afterwards. Convenience stores and grocery stores were considered higher cost food sources but were used because of the close proximity for some participants. When utilizing stores to obtain food, convenience stores offered an added benefit over other stores, the ability to purchase a food item and use the establishment's microwave to heat the food.

Garbage dumpsters were identified as a great source for obtaining food for some participants. It was reported that desirable food items were often found in dumpsters, "*People in Winnipeg throw good stuff away*" [participant #20], (referring to Chinese food, boxes of chicken, Pizza Pops™). Some of the men created relationships with staff members at convenience stores or fast food establishments, which resulted in improved access to disposed food. When a participant familiar to a staff member frequented a particular establishment, the employee would verbally inform the participant when food was going to be discarded that day. The participant would then aim to arrive to obtain the food items immediately upon entrance into the garbage bins.

Meals purchased from restaurants were a source of non-charitable food for some participants. These purchases occurred upon receiving money from social assistance or occasional employment, and were considered a treat.

The most prevalent restaurant establishments frequented by participants were Chinese food and fast food burger places. The reasons for these choices reflected participant perceptions

of value for money and the high quality of food offered:

- *“Value menus are cheap and they taste good” [participant #27]*
- *“I get anything on their \$1.39 menu” [participant #31]*

High food quality was also identified as another reason for selecting meals from fast food or Chinese food restaurants:

- *“They have good, healthy meals” [participant #26]*  
(referring to a hot meal of chicken balls and fried rice)
- *“I get a good breakfast and good lunch [when I go there]” [participant #7]*  
(referring to a breakfast of bacon, eggs, toast, coffee and a lunch consisting of soup, cheeseburger, French fries with gravy, coffee)

#### ***4.522 Types of food and beverages consumed.***

Table 10 illustrates the most prevalent food and beverages consumed outside of community charitable meal programs. Participants stated that the items were selected due to one or several factors including, low cost of the specific food, availability, ease of stealing, and/or a preference for the food item itself. Some participants reported using alcohol and toxic substances (e.g. hand sanitizer, hairspray).

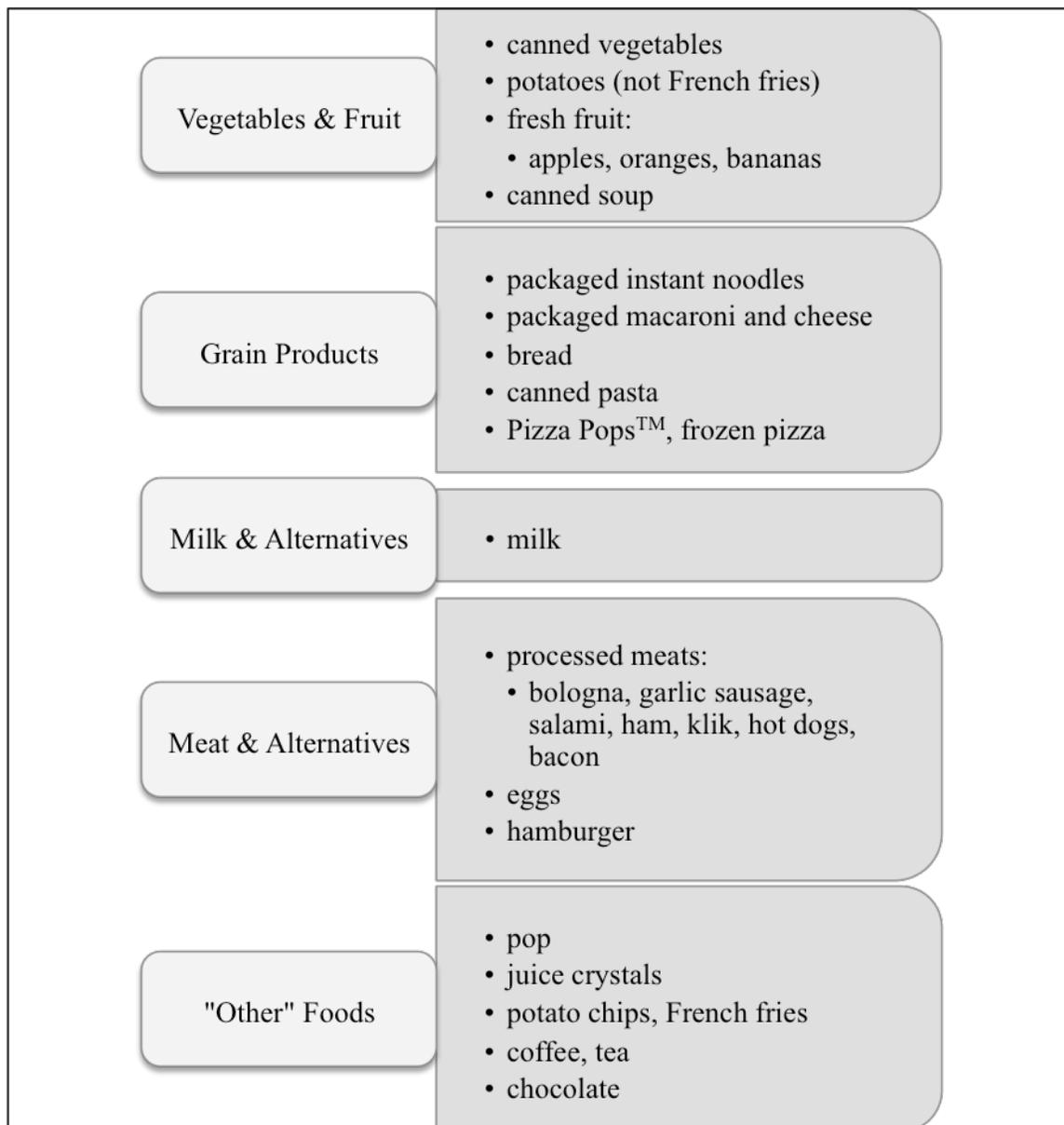


Figure 10. Non-charitable food and beverage sources consumed by study participants.

#### 4.523 Food acquisition.

A majority of participants reported paying for non-charitable foods they consumed. Some participants stated that they both paid for and stole food. A few individuals reported panhandling for money to buy food and others stated they borrowed money from friends and family to purchase food.

One participant had a personal vehicle to use for obtaining food and beverages. The

remaining participants reported that they walked or used the city bus to transport themselves to locations to obtain non-charitable food items. The bus was more frequently used in the winter months as a result of the cold weather.

#### **4.53 Improving the food situation.**

Themes identified by participants that would improve their food situation included housing, money, and addiction management. A small number of participants expressed that their food situation was fine without any changes.

##### ***4.531 Housing.***

Housing was identified as key to improving the food situation for several of the participants. Having one's own place to live was viewed as a means to be able to eat whatever food desired and personally cook the food. Housing was considered an opportunity to lodge equipment needed for cooking, such as a microwave, a "normal" fridge and stove, pots, pans, and utensils. A home to live in would also allow for the use of the food bank:

- *"I can't go to the food bank. I can't carry it all, can't make anything, can only use the stuff you can eat right away without preparing and cooking." [participant #14]*
- *"If I had a stable place to live I could make and cook whatever I wanted to eat. I would use the food bank." [participant #23]*

One participant stated that a steady home was ideal to improve his food situation because when you drink (alcohol) you are not able to attend charitable meal programs.

Some participants identified affordable housing as crucial. This did not include low-end hotels. The perception was that these facilities house "addicts". Stable, affordable housing was viewed as an important contributor to improving overall life situation:

- *"Live in a place so you could work and get your G. E. D." [participant #30]*

#### **4.532 Money.**

Many participants identified money as a requirement to improve their food situation. A number of participants stated that having a consistent, steady income was a means to financial security. Others stated that having more money was needed however, did not identify how or where that money would come from. One participant did offer a way to increase the money situation without having to work:

- *“People on disability have it better because you get more money than those that don’t [have a disability]” [participant #27]*

Having more money available was viewed as an opportunity to purchase desired foods. Foods reported by participants that would be purchased if their financial situation would allow included: meat (pork chop, steak, bologna), bread, cereal, fruit (apples, bananas, oranges), vegetables (tomatoes, carrots, potatoes), and convenience foods: *“pizza every day if I could afford it” [participant #7]*. Additionally, others acknowledged that with more money this would create an opportunity to budget to purchase their own food, which would alleviate the need for obtaining food from charitable meal programs.

#### **4.533 Addiction management.**

The freedom from addiction (alcohol, drugs) was identified by a small number of participants as a way to improve their food situation. Without an active addiction, it was expressed that money would be spent on food instead of addictive substances. One participant stated that even if having everything that he needed, living without an addiction was necessary because *“with an addiction it can control you” [participant #4]*.

#### **4.534 “Nothing.”**

A few participants reported that their food situation did not require anything for improvement:

- “I got everything I need.” [participant #34]
- “I think everything is okay.” [participant #32]
- “Nothing. No one’s gonna starve in this city.” [participant #2]
- “My food situation is alright I guess. Haven’t been to the point of starving. That’s good enough for me.” [participant #18]

#### **4.54 Addressing special dietary needs.**

Special dietary needs were identified by some of the study participants. These included high protein, high protein/high calorie, low sodium, low sugar, low fat, low potassium, no alcohol, food allergy, and lactose intolerance. The men that reported following their special diet needs were purchasing some of the compliant food items themselves. These included diet pop, artificial sweeteners, meat, and liquid nutritional supplements. Some participants stated that extra funding was provided from social assistance to buy food if medical documentation identified and explained the need for a special diet.

Charitable meal programs appeared to accommodate special dietary needs for food allergies and lactose intolerance, according to participants. However, in most cases, this was simply a matter of not consuming the food item if it was offered at a meal. A substitute item is not provided in place of a food that cannot be consumed, “*either you eat it or don’t eat it*” [participant #38].

Some participants reported that they do not follow their special diet recommendations. The main reason identified was the perception that charitable meal programs did not have the food items that the individual was able to eat.

#### **4.55 Changes to dietary habits resulting from solvent use.**

Solvent-using participants identified that the main impact on dietary habits when actively using included changes to the quantity and the types of food consumed. This was perceived to

be a result of the physiological and social side effects that occurred with solvent use.

#### ***4.551 Quantity of food consumed.***

Altered food intake was expressed by most of the participants, with a majority experiencing decreased food consumption associated with sniffing or huffing solvents. The decrease in food intake was a result of a variety of reasons, including changes to physiological status, observable negative physical characteristics, and the power of the addiction over the individual.

The physiological changes that were reported by participants to reduce food intake included predominantly vomiting, as well as altered taste, and in some cases seizures. In an effort to reduce or prevent the occurrence of these side effects from solvent use, participants ate smaller amounts of food prior to and during episodes of sniffing or huffing. Reduced intake was also reported to result from a loss of appetite or simply forgetting to eat when actively using solvents. In some cases, the desire to eat was outweighed by the desire to continue to sniff.

Physical characteristics that interfered with food intake when using solvents included an unsteady gait and the release of unpleasant chemical odors from the clothing and/or body. These sensory indicators of solvent use decreased food intake for some participants as a result of social exclusion. The men reported that charitable meal programs do not allow entrance or will remove and possibly ban any person that smells of having used solvents.

There were a limited number of participants that reported an increased intake when sniffing or huffing. This increase was often followed by episodes of vomiting, *“it seems like I eat more...it will make me vomit if I have too much solvents”* [participant #7]. Some men reported that they do not experience any change to their food intake when using solvents.

Table 10 provides participant quotes for each of the side effects reported to alter food intake during solvent use, that were reported during participant interviews:

Table 10. *The Impacts of Solvent Use On Food Intake*

<b>Causes of Altered Food Intake</b>	<b>Participant Quotes [participant #]</b>
<b>Vomiting</b>	<ul style="list-style-type: none"> <li>▪ <i>“If I forced food down then I’ll throw up.” [32]</i></li> <li>▪ <i>“I can’t keep things down.” [8]</i></li> <li>▪ <i>“I eat less. I don’t feel like eating. When I do I throw it up.” [10]</i></li> </ul>
<b>Altered Taste</b>	<ul style="list-style-type: none"> <li>▪ <i>“My taste buds change. Things taste funny or I can’t taste the food so I wait until the solvents are out of my system before I eat again.” [32]</i></li> <li>▪ <i>“It [solvents] sometimes wrecks the taste of food. Can’t taste it.” [10]</i></li> </ul>
<b>Loss of Appetite</b>	<ul style="list-style-type: none"> <li>▪ <i>“I forget to eat. I have gone several days [without eating] when sniffing. I don’t feel hungry.” [16]</i></li> </ul>
<b>Power of Addiction</b>	<ul style="list-style-type: none"> <li>▪ <i>“I can go up to a whole week without eating. I choose to sniff instead of eating.” [29]</i></li> <li>▪ <i>“Sometimes I can’t eat when sniffing because I want to sniff more.” [24]</i></li> </ul>
<b>Social Isolation</b>	<ul style="list-style-type: none"> <li>▪ <i>“I will have up to 6 cans of Boost if I am sniffing because I smell and will get kicked out [of charitable food programs].” [3]</i></li> </ul>

#### **4.552 Types of food consumed.**

Several participants reported consuming a very limited range of foods when using solvents. These foods were identified as candy, coffee, pop, water, juice, and fruit.

Food selection was also adjusted when physical characteristics (identified above) prevented the men from using charitable food programs. In order to accommodate denied access to charitable meal services, one participant reported the use of liquid nutrition supplements (e.g. Boost™) as a food source when using solvents.

## **4.6 Anthropometric Measurements**

All participants cooperated to have their anthropometric data (height, weight, and waist circumference) measured by the principal investigator. Due to the significant layers of clothing many of the participants were wearing, a 5 lbs (2.27 kg) reduction to the body weight was applied to all readings. The height and adjusted body weight measurements were used to calculate the body mass index for each participant.

### **4.6.1 Body Mass Index (BMI).**

Body mass index values for the study group ranged between 17.6 – 42.5 kg/m<sup>2</sup>. The mean BMI values for solvent and non-solvent users were 26.0 kg/m<sup>2</sup> (*SD* = 6.1) and 26.1 kg/m<sup>2</sup> (*SD* = 5.5) respectively. Approximately half of the participants (52.5%) were within a normal body weight category (Figure 11). Forty-five percent were within the overweight or obese class categories. One participant was underweight. A statistically significant relationship did not exist between BMI and solvent use (*p* = 0.932).

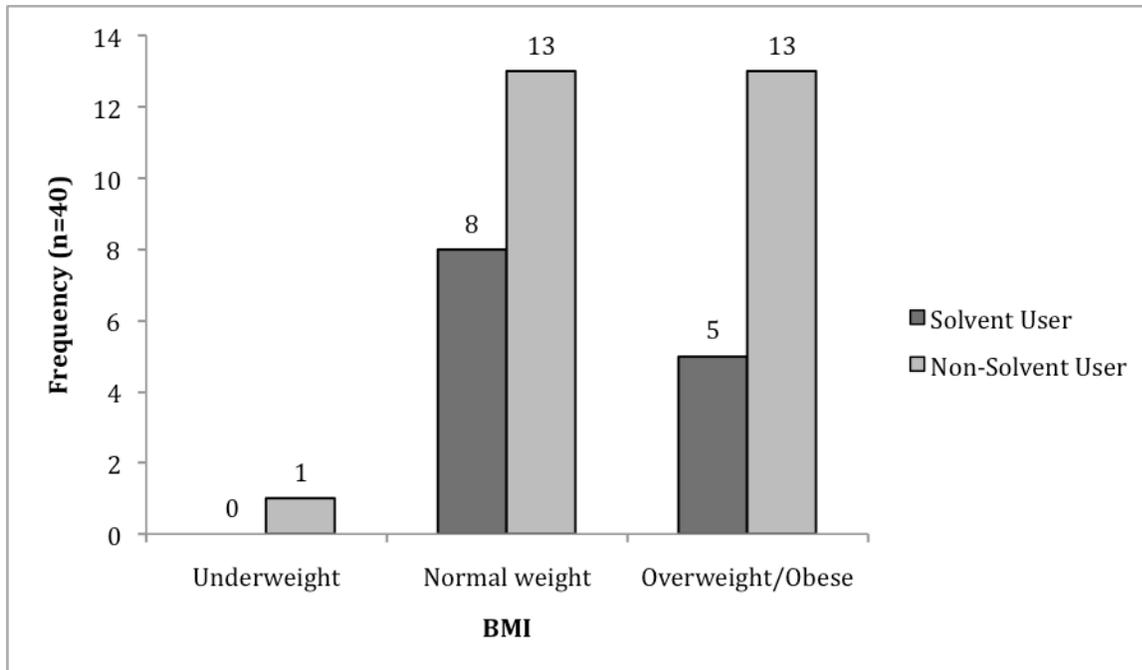


Figure 11. Comparison of body mass index categories for solvent and non-solvent using participants.

Note. Body mass index recorded in  $\text{kg}/\text{m}^2$

$<18.5$  = underweight

$18.5-24.9$  = normal weight

$\geq 25.0$  = overweight or obese

#### 4.62 Waist circumference (WC).

The WC values for the study participants ranged from 81.6 cm – 125.7 cm. The mean WC values for the solvent and non-solvent users were 98.8 cm ( $SD = 14.1$ ) and 96.6 cm ( $SD = 10.7$ ) respectively. Thirty percent of the men ( $n = 12$ ) were above the WC cut-off value (Figure 12). A statistically significant relationship did not exist between WC and solvent use ( $p = 0.600$ ).

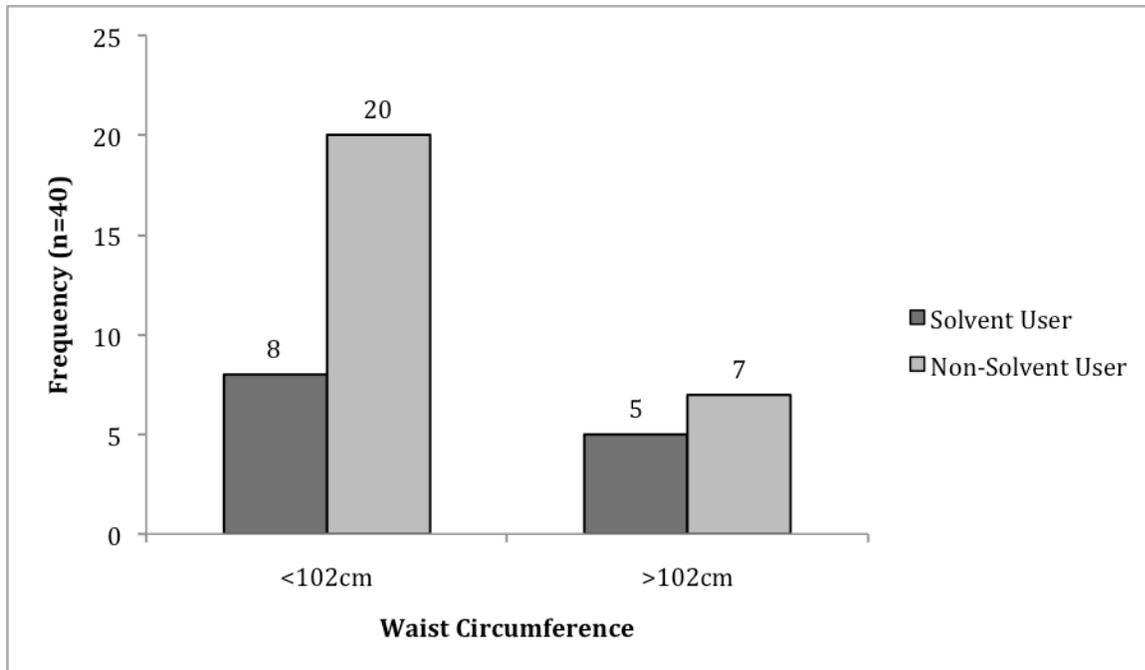


Figure 12. Comparison of waist circumference cut-off values for solvent and non-solvent using participants.

## **Chapter 5: Discussion**

The study examined the nutritional vulnerability of homeless men in Winnipeg, Canada utilizing a mixed methods approach. The results provided invaluable knowledge and insight about the nutritional landscape of the study participants. The negative interplay between life circumstances and nutrition appeared to create a substantial burden on these men. A high probability of poor health outcomes existed for these participants, as indicated by their anthropometric measurements, food security status, and dietary intake. These results were interpreted and further enriched through the qualitative findings, which allowed for an in-depth, sometimes difficult, look at the nutritional vulnerability experienced by this group, which could not be captured from quantitative measures alone. These mixed methods results created a powerful understanding of nutrition and health risk for these participants and their contextual life circumstances. Government level support via effective policies and adequate program funding are desperately needed to address the nutritional needs and socio-economic disparities of homeless men in order to improve health status and health outcomes for this population group.

### **5.1 Ethnicity and Housing Status Contributed to Nutritional Vulnerability**

The demographic make-up of the study sample provided important clues to their nutritional vulnerability, including cultural identity and housing status. Aboriginal ethnicity was highly prevalent within the study population. The housing situation described by many participants illustrated a transient existence. These two characteristics were indicative of food insecurity and increased risk for poor health and health outcomes.

#### **5.11 Cultural identity.**

The majority of the participants self-identified as Aboriginal; this is reflective of the homeless population in Winnipeg. A recent report from the Social Planning Council of

Winnipeg (2012), states that more than half of the homeless population in 2011, were of Aboriginal decent. This is further supported by Raphael (2004), who reported that Aboriginal people are at the greatest risk for homelessness due to multiple factors including poverty, unemployment, substance abuse, physical, and mental health problems. Furthermore, food insecurity in the Aboriginal population was reported at four times the rate than in non-Aboriginal households in Canada (Health Canada, 2007b).

The adverse health of Aboriginal peoples dates as far back as colonization, and continued with more recent history, including the establishment and negative impact of residential schools on cultural traditions and family/social relationships (Mikkonen, et. al., 2010). Systemic racial issues in our country continue to exist, placing Aboriginal people at a disadvantage for most of the determinants of health. Inequities in income, job insecurity, social exclusion, overcrowded housing, food insecurity all contribute to a rather dismal picture of health. Aboriginal ethnicity and homelessness appear to be a potent combination for the presence of food insecurity and the subsequent increased risk for chronic health problems.

### **5.12 Housing status.**

Financial insecurity strongly influenced the immediate housing situation for homeless men. The housing status of the study participants was categorized based on their housing situation at the time of the interviews. A pattern of movement through a variety of housing possibilities within a relatively short time frame was typical, rotating between staying at a shelter, on the street, at a low-end hotel, and a family or friend's place. This movement was reflective of the daily fluctuations in life circumstances and exacerbated the need for charitable meals in order to eat.

Temporary financial security that occurred with the receipt of social assistance or

employment income allowed for the luxury of lodging in a low-end hotel for some. For others, efforts to obtain occasional work for money created a barrier for obtaining shelter. Acceptance of temporary paid work was made with the knowledge that a place in a homeless shelter would not be available at the end of that specific day. This was because it was impossible to transport from the work site back to the shelter entrance hours in time to secure a bed for the night. Until a solution can be established that allows for impoverished men to be able to secure affordable housing, current practices for obtaining charitable shelter, especially for men, should be reviewed. A system that penalizes efforts to gain employment at the expense of a safe place to sleep requires rethinking.

Charitable, transient housing options for the homeless, such as shelters or rooming houses did not typically offer the facilities to prepare, cook or store food. This lack of appropriate housing created a barrier for utilizing community-based hunger reduction initiatives, such as food banks, which offer food that must be prepared and stored by the recipients. This resulted in the need for daily charitable meal program usage as a primary source of nutrition for a majority of the study participants. The results of this study illustrated that the food provided at soup kitchens, missions, and shelters was not nutritionally balanced, consistently lacking key food group representation identified in the Canadian food guide (Health Canada, 2007a).

Considerable time has passed since the “temporary” need for charitable meal programs began in Canada. Nutritional standards and regulations that must be followed by these services, guaranteeing the basic nutrient recommendations according to Canada’s Food Guide, should be established. This must be coupled with financial support from government in order to allow charitable meal programs to meet the standards for healthy food provision. Such services should

also be supported to provide services in job training, mental health, addictions counseling and housing.

This transient way of living is important to consider, when attempting to reach this population group for enumeration purposes, potential research, community outreach programs and government assistance efforts. Lack of housing contributes to poverty by negatively impacting the ability to obtain consistent income. This in turn creates a barrier for adequate food acquisition, which leads to food insecurity, and increases the risk for nutritional vulnerability and poor health. Efforts aimed at addressing the underlying cause of the lack of housing may have the most sustainable effect on the lives of the homeless.

## **5.2 BMI as an Indicator of Nutritional Vulnerability**

Overweight and obesity present increased risks for nutrition-related health problems. Nearly half of the study participants were overweight or obese. The high volume of nutrient-poor food consumed by study participants may explain this paradox. Low cost foods with limited nutritional value beyond calories were readily available and accessible among the homeless participants. Financial constraints inherent with a volunteer-driven charitable meal program lend itself to accepting and serving food that is affordable in exchange for low nutritional value. What little money participants may have had was easily able to purchase high fat, sugar, and/or salt items at any local food establishment. Consequently, the participants in this study that were within the overweight and obese class categories, combine with their nutritionally-inadequate diet, are at an increased risk for type 2 diabetes, heart disease, hypertension, gallbladder disease, sleep apnea and some cancers (Health Canada, 2003; Hwang, 2000; Statistics Canada, 1999). For all of these participants, factors such as Aboriginal ethnicity, unstable housing, low or no income, social exclusion, and food insecurity exacerbate the risk for

poor health (Raphael, 2004).

### **5.21 Solvent use and anthropometric measurements.**

Solvent use was not a statistically significant contributor to anthropometric results. However, a higher percentage of solvent users were within the normal body mass index range compared to non-solvent users. This may be a result of the behaviours that accompany solvent use, such as temporary food avoidance, which ironically led to more normal body weights. Further study would be required to explain this divergence and assess whether body mass index is a good predictor of weight-related chronic health risk for solvent using individuals.

### **5.3 Measuring Food Security of the Homeless**

The widely accepted definition of food security, "...when all people, at all times, have access to sufficient, safe and nutritious food that meets their dietary and food preferences for an active and healthy life", Food and Agriculture Organization (1996), would indicate that all of the participants in this study experienced moderate or severe insecurity levels over the past year. The measurement tool used to determine food security prevalence in Canada, the CCHS HFSSM, had validity issues when used to assess food security status in the study population. This section will identify the key aspects of the CCHS food security measurement tool that created concerns when applied to the study participants.

#### **5.31 Food sufficiency.**

The initial HFSSM survey question about food sufficiency; "Which of the following statements best describes the food eaten in your household in the past 12 months, that is since [current month] of last year?" (Appendix F: Q1), posed a concern when initially administered to the homeless men in this study. More than half ( $n = 21$ ) of the participants qualified as food sufficient over the past year based on their response to this question. This did not seem possible

considering all of the study participants had attended charitable meal programs in order to obtain food within the past year. The participant responses suggested that perhaps the interpretation of the question might be influenced by the unique frame of reference for the homeless individual and their distorted standards for food quantity and quality. For example, the perception of being food sufficient, extracted from the qualitative data for this study, revealed that for some participants this was simply meant as “*not starving*”. With an understanding that “*starving*” was the measure for food insufficiency, the questionnaire response options did not capture their food insufficiency. The validity of this question, with this particular population group, appeared to be an ineffective measure for assisting with determining food security status. Any future efforts to measure food security of the homeless would require the food sufficiency question to undergo substantial rewording or possibly omission from the data collection tool.

### **5.32 CCHS HFSSM Stage 1 Screen.**

The first-level screening questions that followed the food sufficiency item were used to identify any participant that may have otherwise been categorized as food secure. At least one affirmative response, to the 3 first-level screen questions is required in order to be considered food insecure. If a participant was food insecure the questionnaire continued; if not, no further questions were asked. After the first-level screen, the number of participants that were identified as food secure with the food sufficiency question, decreased from 21 participants to four. This did not seem valid considering that all study participants had used a charitable meal program over the past year. The researcher adjusted the protocol of the CCHS HFSSM by administering the questionnaire in its entirety, regardless of participant responses within the screen levels. The prevalence of food insecurity with the researcher-adjusted version of the HFSSM, was all but two participants were food insecure. This was established by calculating the affirmative

responses to the survey questions according to the CCHS 10-item food security scale point system.

All three questions within the first-level screen on the HFSSM questionnaire posed a concern about the ability to measure the underlying existence of food insecurity of the homeless adults in this study. The authors of the CCHS, cycle 2.2 previously identified one of the concerns. This author identified the remaining concerns during the data collection and analysis phases of the study.

The report on household food security identified that the HFSSM survey question related to “affording a balanced meal” was recognized as an item that was not consistently understood by participants and should be improved or omitted; “This question is either less consistently understood than other questions or is less consistently related to the underlying condition of food insecurity...Further development work on this question may be indicated.” (Health Canada, 2007b). During the data collection in the study presented here, the researcher found that body language and a delayed response to the “balanced meal” question was a possible indication of uncertainty. Furthermore, the qualitative results suggested that participant perceptions of a balanced meal did not correspond with the definition of a balanced meal in accordance with most health provider recommendations or Canada’s Food Guide (Health Canada, 2007a). For instance, one participant [#26] defined a good, healthy meal as “*fried rice and chicken balls*”.

The two remaining questions included in the first-level screen were related to “worry about running out of food” (Appendix F: Q2) and “food not lasting and lack of money to buy more” (Appendix F: Q3). These questions were not relevant to the study population given their unstable housing. In addition, they were not valid for measuring food insecurity of the homeless because the primary source of food came from charitable meal programs. Triangulation of the

quantitative data analysis related to food intake and the qualitative interviews, supported that money to buy food was considered a luxury and participants usually had no place to store food. Hence, lacking funds to buy more food and worrying about food running out did not apply. The need for carrying and storing food as well as buying food does not appear to be a valid measure of food insecurity for this population group.

#### **5.4 Food Insecurity: Comparisons with the Canadian Population**

Food insecurity for the study participants was substantially higher than the Canadian population as a whole, with most (90%) of the study participants found to have experienced some level of food insecurity over the past year. This differs drastically from the results of the CCHS, at a reported 9.2% prevalence of overall food insecurity for the Canadian population in 2004. This disparity may be partly explained by the practice of excluding homeless individuals in the data collection, which occurred with the CCHS, cycle 2.2 (Health Canada, 2007b). Consequently, exclusion of one of the most vulnerable population groups in the national food security results, likely severely underestimates the true prevalence of food insecurity in Canada.

Furthermore, the HFSSM identified a 90% prevalence of food insecurity, while the researcher-adjusted tool found the prevalence to be 95%. While this difference was not tested for statistical significance and the study sample was not necessarily representative, it does suggest that if applied on a large-scale survey, using the CCHS HFSSM tool may significantly underestimate the number of individuals experiencing food insecurity. There are estimated to be 150,000 upwards of 300,000 homeless people in Canada (Human Resources and Skills Development Canada, 2007). A 90% prevalence of food insecurity translates into 135,000 – 270,000 people, while 95% prevalence suggests 142,500 – 285,000 food insecure individuals. Food security measurement questions utilized in the CCHS HFSSM require further development

and testing to be valid and used with confidence with the homeless population.

### **5.5 Solvent Use and Food Security Status**

Severe food insecurity, in comparison to moderate food insecurity, appeared to be more prevalent for participants that were solvent users, however this was not statistically significant, given the small sample. These results suggest, however, further examination of the severity of food insecurity in solvent using populations may be warranted. Severe food insecurity may be associated with participant exclusion from meal programs, a major food source, when smelling of solvents. Another consideration may be related to the behaviour changes that take place when sniffing or huffing volatile substances. Triangulation of the 24-hour food intake data and the open-ended responses to changes in food consumption that result from solvent use identified a pattern of fasting, lasting days up to a week, followed by elevated food intake, “...so I wait until the solvents are out of my system before eating again” [participant #32]. Further research utilizing a larger sample size is required in order to uncover the impacts that solvent use has on individual food security status.

In conclusion, all participants indeed qualified for the definition of food insecurity at the moderate and, more often, at the severe level. Overall, food insecurity is a major issue in the homeless population and substance abuse may exacerbate the severity. Being homeless or in an unstable housing situation and a lack of other determinants of health, compound food insecurity and increase risk of nutrition-related chronic disease. Issues with the survey tool demonstrated that valid and reliable assessment tools are required, as the frame of reference for the homeless population related to their food situation may be distinctly different from those not experiencing homelessness.

## 5.6 Dietary Intake Contributes to Nutritional Vulnerability

The dietary assessment results for the study participants revealed that food intake did not meet the standards established by Canada's Food Guide (Health Canada, 2007a). There was an unbalanced distribution of food consumed from each of the food groups, including the "other" foods (sweet or salty snacks and beverages, alcohol) category. A poor diet combined with the other social determinants of health experienced by these individuals, such as unstable housing, low or no income, social exclusion, and for some addictions and Aboriginal status, indicated that these participants are at a high risk for food insecurity and chronic health problems with poor health outcomes (Raphael, 2004). Aboriginal men living off-reserve, made up a significant proportion of the participants in this study. The combination of ethnicity and geographical location is indicative of a four-fold increase in the presence of food insecurity for these men in comparison to non-Aboriginal Canadians (Mikkonen, et al., 2010). The alarming presence of food insecurity and homelessness experienced by Aboriginal men in this study, demonstrates a critical need to understand the circumstances that are disproportionately impacting this particular ethnic and gender group.

The nutritional vulnerability experienced by the study participants was reflected in the poor diet quality and an unbalanced quantity of food consumed compared to the Canadian guidelines for healthy eating (Health Canada, 2007a). Living in poverty did not offer the participants the liberty of choice when accepting food. As expressed by one participant [#23]: "*I just eat whatever*" and another participant [#2]: *don't look at the food, EAT!*" Consequently, some consideration must be afforded to the source of the foods and beverages consistently available and consumed by participants, which are outlined below.

## **5.61 Diet quality.**

Meals offered at charitable food programs were a major contributor to the diets of the study participants. Most of the participants utilized charitable meal programs on a daily basis. Other food came from a family, friend, or low-end hotel buffet. Their diet quality was reflective of the food being offered and consumed through these charitable venues.

The dietary intake of the study participants did not meet Canada's Food Guide recommendations for vegetables and fruit, grain products, and milk and alternatives. Meat and alternatives was the most likely of the food groupings to achieve the recommended daily serving needs. An assessment of the food quality for each of the specific food group categories is offered below. Overall, the nutritional quality of the foods that were consumed from the food group categories were found to be lacking in variety, low in dietary fibre and high in salt, fat, and/or sugar. Outdated and spoiled foods were sometimes consumed, further compromising food quality and increasing risk of food-borne illness.

### ***5.611 Vegetables and fruit.***

Most of the study participants consumed substantially less than the minimum daily intake recommendation of eight vegetables and fruit (Health Canada, 2007a). A majority of the servings that were consumed from this food group category were vegetables. There are a number of reasons to consider for the severely deficient intake of this food group. The low intake could be attributed to food access and availability. For participants utilizing charitable meal programs, produce was typically offered at meals. Potatoes (not French fried), corn, mixed vegetables, carrots, and salad (often with no dressing or excessive dressing) were the main types of vegetables consumed. Fruit juice was the primary form of fruit for the participants. The findings for fruit juice intake should be viewed with caution. Some of the participants were

unable to distinguish between 100% fruit juice and sugared fruit beverages made with drink crystals. Other fruit served consisted primarily of apples, oranges, bananas, and mixed fruit. However, the men obtained a majority of their fruit servings away from charitable meal programs. This could be a result of the fact that fruit was most often served at breakfast meals if at all, and less frequently at lunch and supper meals.

There were several reports from participants that it was not unusual to find the produce served was old and slimy. The limited variety and spoiled produce may be attributed to the charitable nature of soup kitchens, missions, and shelters. Food distributed from local food banks to charitable meal programs does not offer a nutritional quality guarantee due to the donation restraints of the food supply. Fresh produce may undergo a significant amount of maturing during storage, transport, and service to the participants. Food served is reflective of the community donations that are received at any given time and the knowledge and training of staff related to food safety.

The fact that all of the participants were consistently consuming very low intakes of vegetables and even lower intake of fruit indicated an increased risk for nutrition-related health problems. Nutrient-dense produce offers dietary fibre, vitamins, minerals, and antioxidants. The severely low intake of produce is suggestive of higher risks for chronic health problems related to poor bowel health, micronutrient deficiencies, heart disease, hypertension and cancer (Bazzano, 2002; Hwang, 2000; Marlett, 2002, Sacks, 2001).

#### ***5.612 Grain products.***

Nearly half of the study participants did not meet the daily recommendation of eight grain products, in accordance with Canada's Food Guide (Health Canada, 2007a). Of the grains that were consumed, most were low in fibre. The grains offered at charitable meal programs, as well

as those purchased by participants were typically refined white bread, pasta, and rice. For the few participants that consumed whole grains, the sources were either hot oatmeal offered at charitable breakfast programs or “brown” bread purchased by the participant.

The lower fibre content of the grain products is again reflective of food that is donated to the charitable meal programs. The donations are subsequently a reflection of mainstream consumers who typically choose refined versions more often as well. However, the choice to consume lower fibre bread outside of the charitable meals may be attributed to participant familiarity and/or preference for this variety of bread. Current bread costs are similar for white and whole wheat bread, thus eliminating this as a barrier.

Low dietary fibre intake attributed to a diet consisting of refined grains as well as deficient intake of vegetables and fruit previously identified, is suggestive of chronic health concerns related to poorly managed diabetes, bowel irregularity, which result in constipation, hemorrhoids, and possibly diverticular disease (Hwang, 2000, Marlett, 2002).

#### ***5.613 Milk and alternatives.***

The majority of the study participants were consuming less than the recommended intake of two servings of milk and alternatives daily. Consistently participants indicated that milk and milk products were not common foods provided at charitable meal programs. Participants were most likely to have access to milk at charitable breakfast meals, but only if used on cereal. Some participants reported that milk is a commodity that is offered strictly to put in coffee when at meal assistance programs. “Sneaking” a glass of milk from the coffee supply area, was identified as a means of obtaining a serving of milk occasionally. Yogurt and pudding (containing milk) were offered inconsistently at charitable programs. However, food purchased or obtained by participants outside of charitable services, almost never included any milk and

alternatives.

The limited provision of milk at charitable meal programs is consistent with current local food bank practices, which do not provide milk to charitable meal programs (S. Malo, personal communication, November 5, 2012). Consequently, any milk offered at these meal sites would have to be purchased within the budget constraints of the individual charitable food programs. Furthermore, the homeless individual may encounter barriers such as high purchasing cost and limited or lack of storage capacity for milk or milk products. The high prevalence of Aboriginal ethnicity of the study participants suggested an increased possibility of lactose intolerance that may interfere with the desire to consume dairy. However, most participants did not identify this condition during their research interview. Chronically low intake of milk and alternatives is indicative of an increased risk for nutrition-related health problems such as osteoporosis and hypertension (Lich, 2000; Sacks, 2001).

#### ***5.614 Meat and Alternatives***

Meat and alternative intake proved to be the food group that most consistently met the daily serving recommendations of Canada's Food Guide. However, the meat and alternative items offered and consumed within this food group category lacked variety. Availability, convenience, affordability, and familiarity may have played a role in the limited options. For example, charitable breakfast programs typically offered egg as the meat alternate item. High sodium, high fat cold cuts such as salami, ham and bologna were frequently offered as the meat serving in sandwiches at lunch. Each of these meat and alternative options listed above is far more economical than cooking whole, fresh meat, both in terms of food cost and staff labor due to the limited preparation and skill required. Additionally, local food banks provide eggs, shelf-stable meat and alternatives or as stated by one participant [#38], "*mystery meat*". Fresh meat is

not routinely provided (S. Malo, personal communication, November 5, 2012).

Obtaining a hot meal (meat, vegetable, starch) was highly desired by participants when attending soup kitchens, missions or shelters for food. However, the meal often contained ground beef. In comparison to other healthier meat options such as poultry, pork, and fish, ground beef is less costly. It also can be prepared relatively quickly and with ease, thus requiring less of a burden on meal program staff to have advanced cooking skills.

The types of foods purchased by participants may be attributed to convenience, ease of preparation, and familiarity. With limited cooking skills and/or equipment, cooking basic food items such as eggs and ground beef may be the few whole food options that some participants are able to prepare and eat. In addition, a life of poverty exposes these participants to heavily processed convenience foods that are high in fat and sodium yet are low in cost and are shelf-stable, which are both desirable when considering financial insecurity and lack of refrigeration that often accompanies homelessness. The frequent access to these foods occurred both at charitable meal programs and within the geographical areas frequented by these participants, which include inner city convenience stores and fast-food restaurants. The persistent exposure to these unhealthy foods fosters a relationship of familiarity and comfort that consequently contributes to the nutritional vulnerability of these individuals. This includes nutrition-related problems such as heart disease, hypertension, cancer, and anemia (Hwang, 2000; Sacks, 2001; Wiecha, 1991).

#### ***5.615 “Other” food and beverages.***

“Other” foods, identified by Canada’s Food Guide (2007a), are those categorized outside the four basic food groups, including cakes and pastries, chocolate, candy, potato chips, sugared beverages, energy drinks, coffee, tea, and alcohol. Intake of “other” foods was very high,

contributing an average of thirteen servings daily for the study participants. This included consumption of salty and sweet snacks, sweetened beverages, coffee and tea, and alcohol. The intake values for sweetened beverages should be viewed with caution. Participants were not always able to distinguish between sweetened beverages versus 100% fruit juice.

Salty snacks (e.g. potato chips, French fries) were the least likely of the other foods to be consumed by participants. This value may be a reflection of the fact that these foods had to be acquired individually by participants and were not offered at the charitable meal programs. However, sweet snacks (e.g. pastries, pies, cake, cookies, donuts) were more frequently served and consumed at soup kitchens, missions, and shelters. These items were most often provided as the dessert component at meals.

Alcohol contributed the most significantly to the intake of “other” foods. While a majority of the participants (72.5%) did not report consuming any alcohol during their 24-hour food intake periods, the remaining participants (27.5%) had mean consumption levels above the current safe intake guidelines (Centre for Addiction and Mental Health, 2012), and several had extremely high intakes. For some participants, as the level of alcohol consumption increased, food intake decreased. This may be attributed to a number of reasons, including the lack of desire to eat or perhaps a result of being banned from charitable meal programs due to being inebriated. Participants identified that it is standard practice to exclude individuals that are intoxicated or high from attending meals at soup kitchens, missions, and shelters. Further research investigating alcohol use and dietary consequences to the homeless male would be required to confirm any speculation.

The dietary intakes assessed for this research indicated that the participants are very nutritional vulnerable and, if continued it suggests an increased risk for diseases related to

chronic low vitamin and mineral intake, low dietary fibre, high salt, fat and sugar consumption and for some, an added risk for illnesses related to high alcohol consumption.

### **5.62 Solvent use and dietary intake.**

There are almost no studies that have explored the dietary impacts on homeless adults that use solvents. The exploratory work achieved in this study identified some unique circumstances related to solvent use and food. These included a higher prevalence of normal body mass index ranges with higher dietary intake from all of Canada's Food Guide groupings, in comparison to the homeless men in this study that did not use solvents.

Participants, that self-identified as solvent users, consistently reported higher overall servings from each of the food groups, including "other" foods. Evidence from the qualitative data suggests that perhaps this might be attributed to a binge-starvation phenomena that accompanies pre and/or post-solvent use. Participant reports of ceasing food intake for a day, up to a week or more when using solvents, would create a scenario for increased hunger when waiting extended days without eating. Due to the study participation requirement of abstaining from solvent-use, the dietary intake data reflects the binge-cycle. Further longitudinal research utilizing a larger sample size would be needed to determine the underlying circumstances that appear to contribute to an overall higher quantity of food intake associated with solvent use.

### **5.63 Dietary intake: Comparisons with the Canadian population.**

The CCHS, cycle 2.2, Nutrition (2004) released statistics on the food intakes of the general Canadian population in comparison to the 1992 Canada's Food Guide (Health Canada, 2006). The results were compared to the 1992 food guide because the current version of the food guide (2007) had not been developed and released. In order to establish a direct comparison, the food intake of the participants in this study, were compared with the same food guide used in the

CCHS, 2004 report.

When participants' intake was compared to Canadian population averages, the dietary intakes of the homeless men in this study were worse (Figure 13). Study participants consumed less food from the four food groups and more from the less nutrient-dense "other" foods category when compared to the Canadian average.

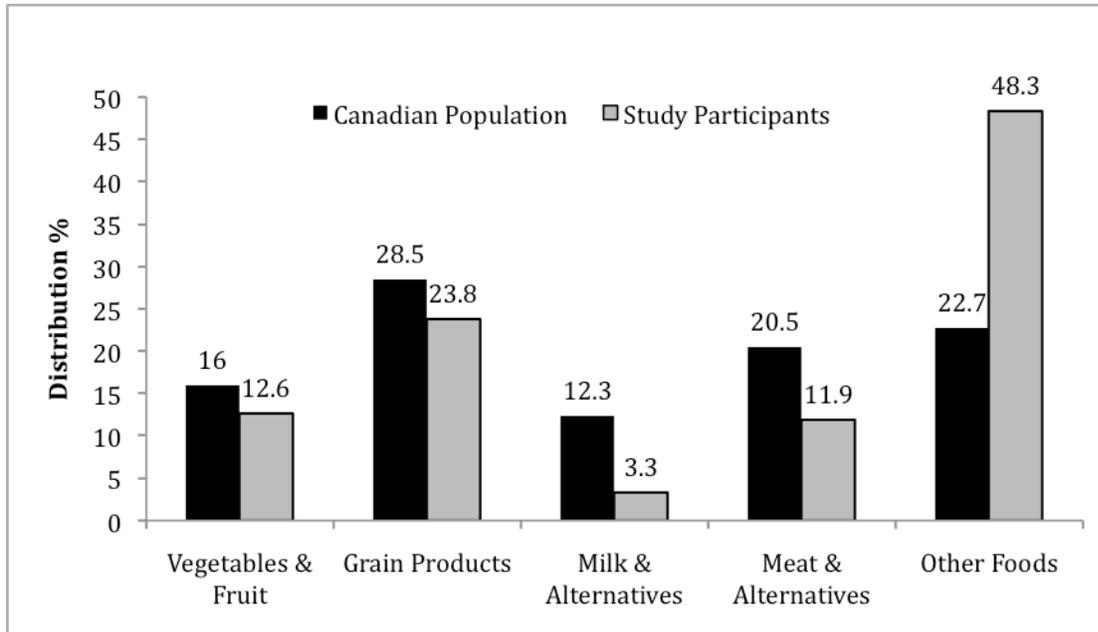


Figure 13. Percentage distribution of food intake by food group and "other" foods for Canadian adults (2004) compared to study participants.

Further comparison of the four food groups (Figure 14) indicated that overall dietary intakes of the study participants were less likely to meet the daily adult food group serving recommendations in accordance with Canada's Food Guide (1992). For the grains that were consumed, the study participants consumed higher intakes of refined varieties in comparison to the Canadian average (Statistics Canada, 2006). The fruit and vegetable intake illustrated in Figure 14 represents a daily serving recommendation of at least five vegetables and fruit. With the release of the new food guide (Health Canada, 2007a), the recommended vegetables and fruit intake was revised to include at least seven servings daily. When comparing the current study's

findings to the more recent minimum serving recommendation for vegetables and fruit, an increase from 77.5% of the study participants to 92.5% were not meeting the guideline.

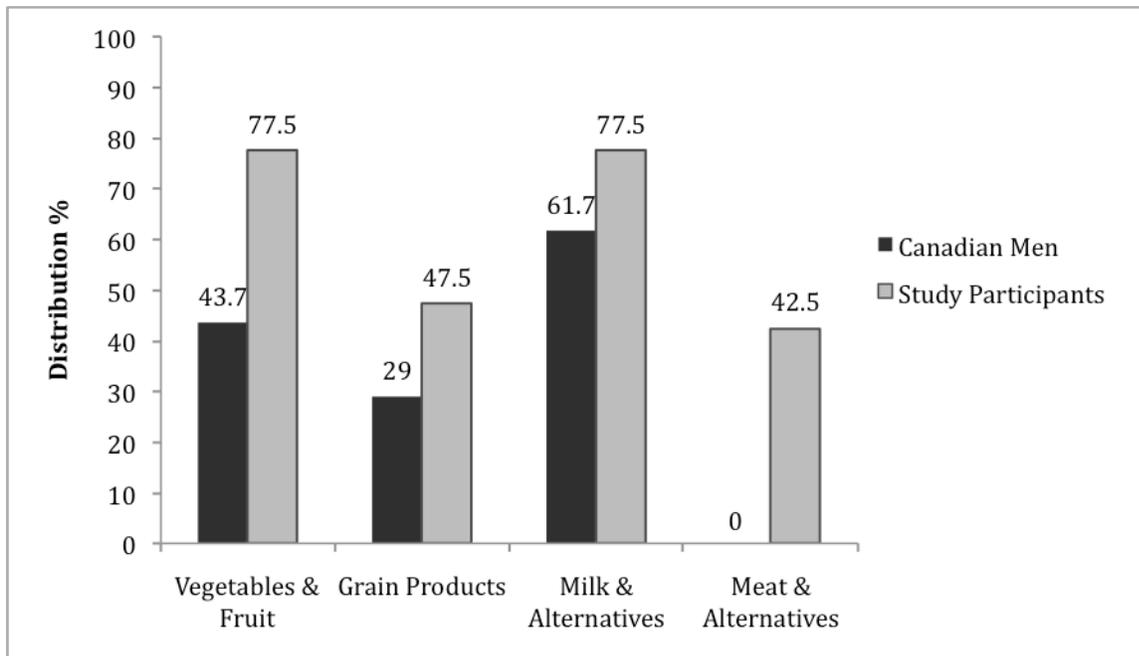


Figure 14. Percentage of Canadian men (2004) versus study participants not meeting Canada's Food Guide daily intake recommendations<sup>a</sup>.

<sup>a</sup>1992 Canada's Food Guide vegetables and fruit intake recommendation of 5-10 servings/day used for comparison purposes

In summary, the dietary intake of the study participants proved to be very poor and much worse than the Canadian average. The social determinants of health related to poverty and social exclusion that are rooted in the life of the homeless, adds to the negative impacts on the nutritional vulnerability of these men. The chronically poor diet quality and quantity consumed by the study participants must be considered in order to improve the increased health risks attributed to the homeless adult. A significant influence on the diet of the study participants was the food they consumed from charitable meal programs.

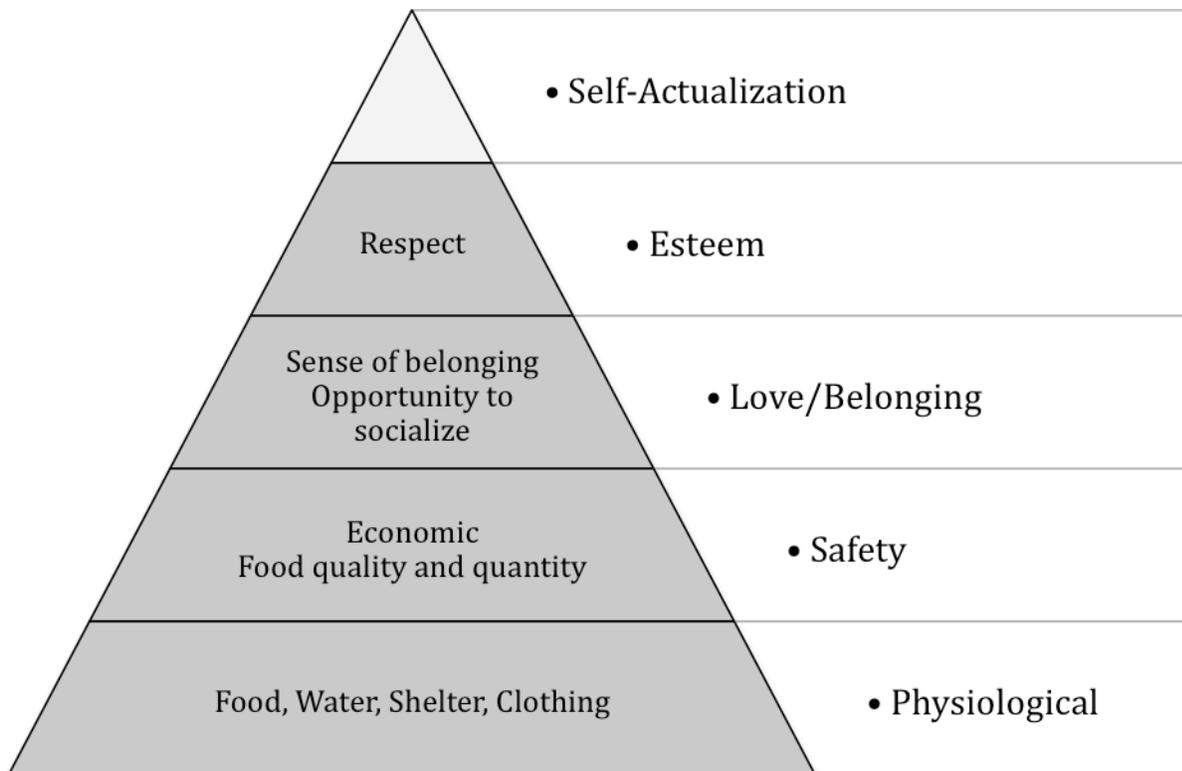
## 5.7 Food Environment: Influences on Nutritional Vulnerability

### 5.71 Charitable meal programs: More than food.

Meal acquisition from soup kitchens, missions and shelters satisfied a variety of

individual needs, beyond hunger prevention or relief. The themes presented by the study participants reflected the basic needs identified by Maslow's hierarchy of needs, which associates individual motivation with determining behaviour (Simons, 1987). The hierarchy of human needs model suggests individuals are motivated to satisfy basic needs (physiological, safety, love/belonging) in order to progress to secondary needs (esteem, self-actualization). Once basic physical needs are satisfied, the individual is able to pursue higher level needs. The progression through the levels of needs is linear. Only once one level is satisfied can one move to the next. This theory of motivation can be applied to the themes developed from the participants' reasons for attending charitable meal programs.

Figure 15 illustrates the hierarchy of needs as it is applied to the information gathered from study participants, when asked about their reasons for attending charitable meals. Participants clearly identified that the acquisition of charitable meals provided at soup kitchens, missions, and shelter was a means to satisfy physiological needs. The most basic of needs were food and water (fluid), however clothing and shelter were also identified.



*Figure 15. Basic human needs that were achieved from the use of charitable meal programs*  
*Note: shaded area represents the basic needs that were met for participants when using charitable meal programs*  
*Reference: Boeree, 2006*

Along with physical needs, some participants reported that obtaining food from charitable services was motivated by safety needs, specifically economic safety and health and wellbeing. Economic safety for the study participants reflected circumstances related to social assistance payments and casual employment. The income from either of these sources did not provide sufficient funds between each payment to afford daily living needs, therefore participants were motivated to increase their economic security by turning to charitable meals for food in order to free up money otherwise needed for food, to get them through until the next payment arrived.

Health and wellbeing was also identified by some participants as motivation for attending charitable meals: *“I’m guaranteed a more healthy, balanced diet. Don’t worry about food being off, unsafe.”* [participant #4]. The perception of guaranteed safety from food-borne illness coupled with the perception that the food provided was healthy, nutritious, and distributed in

sufficient quantity, created a sense of health assurance.

Individuals strive to overcome loneliness and alienation when lower level needs have been met (Simons, 1987). Numerous study participants were motivated to attend charitable meal programs in order to socialize with people that they considered friends. In some cases, participants reported the need for socializing (belonging) outweighed other motivations for attending charitable meal programs. As expressed by one participant [#7], *“I will go even if its bad food because friends are there.”* Perhaps this is a reflection of esteem needs being met as well. Further research to uncover possible respect, self-respect, and individual value would be required to establish whether study participants achieved the fourth level of human needs.

In this study, self-actualization did not appear to present itself from any of the dialogues with participants. The hierarchy of needs indicates that self-actualization can be difficult to achieve because of the obstacles and burdens of society on an individual. However, this study did not apply nor investigate any specific human motivation theory related to the behaviours of the participants in this study. Future research would be required to investigate the application of this theory with this population group.

The application of Maslow’s hierarchy of needs model, suggests that the study participants spent considerable effort trying to satisfy the most basic human needs. The inability to proceed with satisfying higher level needs indicated that much of the participants’ daily efforts were focused on survival. Furthermore, the reasons identified for attending charitable meal programs emphasized the nutritional vulnerability of these men, despite meeting some social needs. Economic instability, intrinsic with a life in poverty and experienced by all of the participants, created the need for charitable food. The lack of insight about what a healthy diet

entails and the practice of consuming a meal even if the food safety was compromised are important displays of the vulnerability experienced by these men.

#### **5.72 Non-charitable food: Selection and acquisition practices.**

The types of food obtained by participants, outside of charitable meals were consistent with the food offered at soup kitchens, missions, and shelters (Figure 10). Non-charitable foods selected were convenient, low cost, and familiar to participants. The foods required limited cooking skills, were transportable without requiring any storage constraints, and were easily acquired within a reasonable location from where the participant traversed on a daily basis.

The financial and living constraints experienced by homelessness forced individuals to select ready-to-eat or microwavable foods such as pre-packaged, highly processed items. Very few participants reported purchasing fresh produce. When produce was purchased, the varieties selected were consistent with what was occasionally available at soup kitchens, missions, and shelters and included apples, bananas, grapes, and carrots. This choice may have been a reflection of food cost, availability, and/or familiarity.

Non-charitable food choices were further influenced by geographical location. The primary modes of transportation for participants included walking and the city bus, referred to by many participants was a free service that allowed for transportation in the downtown area of Winnipeg only. Participants purchased food and frequented restaurants that were within close proximity to their daily routines. This list consisted of convenience stores, discount stores, local, and fast food restaurants. A higher concentration of affordable, ready-to-eat, whole foods including fruit, vegetables, whole grains, lower fat dairy and fresh, cooked meat available within core areas of urban locations may prove influential on the dietary behaviours among the homeless. Additionally, government (provincial or federal) subsidizing of charitable meals

programs in order to provide these food items should be initiated. This in turn may result in improved nutrient intake and a positive influence on the health risks for these individuals.

Stealing food was a means of economic survival on the streets. Freedom from having to spend money on food allowed for any other money (e.g. social assistance or employment income) to be used for non-food purchases such as temporary housing, drugs, or alcohol. Additionally, stolen food assisted with increasing the immediate financial situation for some participants. The food was “boosted” (sold for cash or traded for other food or non-food items that could also be sold) on the street or at low-end hotels.

Food selection and acquisition practices appear to be rooted in a life of poverty that requires resourcefulness to navigate within the constraints of the environment in order to survive. This reality further intensifies the nutritional vulnerability of the homeless through the consistent consumption of foods that contribute to less than optimal health, yet are all that can be afforded, are available, and are familiar to these individuals.

### **5.73 Making the food situation better.**

Participants overwhelmingly identified that stable affordable housing would assist with improving their food situation. Having this type of personal housing was viewed as an opportunity to select and prepare food that the individual desired. However, much of the food items participants listed as desirable were consistent with what they were receiving at the soup kitchens, missions, and shelters. The foods continued to include highly processed, convenience foods requiring minimal cooking skills and equipment. Food choices may have been a reflection of other factors that contribute to the nutritional vulnerability of the participants, including poor cooking skills and lack of nutritional knowledge, and a “food culture” specific to certain life circumstances that cannot be reversed merely by providing money and stable housing, though

these are admirable starts.

A small minority of participants felt their food situation did not require any improvement. Further investigation revealed that as long as they were not starving, there was no need for improvement to the food situation. However, the details of the participants' diets and food acquisition practices uncovered during this study would suggest, that in order to achieve even a modestly nutritious diet, there is much improvement to be had. Perhaps these were a reflection of self-worth or lack of nutritional knowledge from these participants. Regardless, these perceptions indicate that nutrition professionals are desperately needed to champion the basic nutritional needs of the homeless which must include lobbying for regulations that guarantee the provision of a balanced meal (foods from all food groups according to Canada's Food Guide), when accessing charitable meal programs. The homeless may not know or believe that they have a right to adequate nutrition and food security.

### **5.8 The Food Environment and Solvent Use**

An interesting behaviour described by solvent-using participants, involved a starvation-binge eating cycle that was essentially required while actively using solvents. Food intake during solvent use was extremely restrictive or absent as a way to prevent vomiting for most participants. However, data obtained from the dietary recall and the qualitative reports from participants, suggested that food intake increased when solvent use was not active. This may reflect an unconscious, physiological response to the fasting that occurred while using solvents, which in some participant reports, lasted days or up to a week.

The nutritional impact from the use of solvents created an additional influence on the nutritional wellbeing of the participants. Further longitudinal study with a larger sample size is needed to establish an understanding of the nutritional behaviours and subsequent health

implications, solvent use has on homeless adults.

In conclusion, the increased nutritional vulnerability experienced by the homeless men in this study resulted from multiple, interconnected factors that are inherent with a life of poverty and lend itself to chronic malnutrition (Darmon, 2008). Poor diet quality of the food available resulted from unstable housing, insufficient income, substance abuse, and social exclusion. Participants simply aimed to meet their basic survival needs on a daily basis. As a consequence of poverty, the means to that end are not adequate for promoting optimal health.

## **Chapter 6: Study Limitations and Future Research**

### **6.1 Study Limitations**

This research has several limitations that are important considerations for the interpretation of the results. Firstly, body mass index may be slightly overestimated and waist circumference values experienced some measurement error. This study took place during the winter months in Winnipeg, Canada. As a result of the extremely cold weather, many participants wore multiple layers of clothing. However, as explained in the methodology section of this research, a reasonable adjustment was made to accommodate this unexpected variable. Future research with this population group, requiring body weight readings could be conducted in warmer months to alleviate this issue. Waist circumference may not be a valid or reliable measurement to obtain because of measurement error due to clothing barriers, coupled with the social uneasiness experienced when attempting to obtain readings from participants.

The 24-hour dietary intake results for the participants may not be reflective of their usual nutrient intake, particularly for solvent users. Criteria for participation in the study required refraining from solvent use for at least 24-hours prior to the research interview. The qualitative results indicated that food intake ceased or was significantly reduced when using solvents. These potential dietary discrepancies would not have been captured in the single dietary recall from the study participants. For ethical reasons, conducting interviews while participants were under the influence of volatile substances was not an acceptable approach.

Finally, the food security measurement tool was a limitation of this study. A detailed analysis of these limitations was provided in the discussion section of this report. Specifically, appropriate terminology and questions that capture the unique food situation of the homeless are needed. Despite the limitations of the tool, in absence of another tool, the HFSSM was an

appropriate choice. The food security results of the study participants could be compared against the results of the CCHS to provide an understanding of the prevalence of food insecurity in comparison to the rest of Canada. Further research is needed using a modified version of the CCHS HFSSM tool, addressing the identified shortcomings, in order to create a valid measurement tool that can be used with the homeless population.

## **6.2 Future Research**

### **6.21 Micronutrient assessment.**

Future efforts to identify the nutritional impact to homeless men utilizing charitable food programs should consider biochemical analysis for underlying nutrient deficiencies. This may uncover important information not yet discovered and/or lend support to the impact that poor diet quality has on this population group. Further, this approach should be coupled with multiple 24-hr dietary recalls on a larger sample to establish potential longer-term nutrient deficiency that may corroborate food intake results without having participants return for multiple dietary intake interviews.

### **6.22 Geographical environment.**

The setting for this study did not consider the potentially unique circumstances that may exist for homeless men residing in rural or remote environments. Nor did this research explore the impact that weather contributed to the food environment and nutritional vulnerability of the study participants. Future research that takes place in rural or remote areas of Canada should be explored. The effect of seasonal climate changes on nutritional vulnerability among the homeless should be further investigated.

## **Chapter 7: Conclusion**

This study demonstrated that homeless men are at significant risk of nutritional vulnerability due to elevated body mass index, high rates of food insecurity, poor dietary intake, and sometimes degrading food acquisition practices. These factors unite to increase their risk for acute and chronic health problems with subsequently poor health outcomes. The inequalities of the social determinants of health experienced by these men underpinned their nutritional vulnerability.

Food insecurity resulted from the compounding effects of life circumstances experienced by all of the participants, most prominent being unstable housing and inadequate income. The role of gender, Aboriginal ethnicity and substance abuse compound the severity of food insecurity. Future research exploring these determinants in relation to food security, may uncover important information that can be used to further illustrate the effects of food environment on nutrition vulnerability. The unique food experiences of the homeless adult are crucial to understand in order to be effective with any efforts to address food insecurity.

This study uncovered flaws in the CCHS HFSSM food security measurement tool when applied to the homeless men in this study. The development of a measurement tool that is valid for use with the homeless population is needed. Coupled with the design of an effective tool, is the need for Canadian food security surveys to include the homeless in the results. Otherwise, the ongoing publication of data that excludes the homeless creates a very inaccurate prevalence of food insecurity experienced in our country.

A combination of low nutrient quality and over- or under-consumption of specific food groups contributed to the poor diet of the participants and a high prevalence of overweight and obesity. Results suggest that charitable meal programs operate in ways that are out of step with

the nutritional needs of the homeless adult, in large part due to financial resource constraints.

There were several food initiatives that appeared to satisfy the hunger that was experienced with homelessness, however these same efforts were ineffective at meeting nutritional needs for optimal health. Continuation of this practice exacerbates the nutrition-related health risks of the participants.

A more immediate response to this nutrition vulnerability falls on the provincial and federal governments. The well-intentioned efforts displayed by charitable food programs are diluted by the nutritionally deficient food supplied. The government needs to step in and establish guidelines and regulations for charitable food programs in accordance with Canada's Food Guide and acceptable food safety standards. This must be backed with financial support for these organizations to be able to adhere to these regulations. This would include sufficient funds to obtain nutrient-dense foods as well as training and education for staff related to healthy foods, balanced meals, and food safety.

Beyond immediate efforts to address the nutritional needs of the participants, sustainable strategies need to be developed to tackle the underlying reasons for the nutritional vulnerability of these homeless men. A life of poverty, consisting of unstable housing and limited financial resources, exacerbated the nutritional vulnerability experienced by the study participants. This included undignified, sometimes illegal behaviours in order to obtain food. Nutrition and public health professionals are critical to championing the cause for these participants because of the powerlessness, alienation, and unawareness that persistent social exclusion and poverty appeared to bring to these men. Government level (provincial and federal) support is needed to regulate and support efforts at the community level to provide safe, nutritious food offered at these meal programs. In addition, serious governmental efforts are needed to address the underlying causes

of poverty (social inequities resulting from political, social, economic and environmental factors; mental health issues; addictions) that lead participants to these programs in the first place (Darmon, 2008).

In conclusion, nutritional vulnerability for the study participants was a result of many complex, interrelated factors that go beyond dietary intake. This research confirmed that the theoretical perspective that informed the study was appropriate for consideration of the nutritional vulnerability of homeless men in an urban setting. The efforts that have been and continue to be displayed by the many people that work tirelessly to provide food for the homeless men in this study should be applauded. However, it is time that a more serious commitment and action be undertaken by provincial and federal governments, to address the underlying causes of poverty that result in poor health and health for the most vulnerable sector of society. Government engagement with key stakeholders at the individual, community, and population level to establish sustainable strategies to improve the circumstances of the homeless is desperately needed.

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## Appendix A



UNIVERSITY OF MANITOBA | Ethics  
Office of the Vice-President (Research)

CTC Building  
208 - 194 Dafoe Road  
Winnipeg, MB R3T 2N2  
Fax (204) 269-7173  
[www.umanitoba.ca/research](http://www.umanitoba.ca/research)

### APPROVAL CERTIFICATE

February 22, 2011

**TO:** Carla D'Andreamatteo (Advisor - Joyce Slater)  
Principal Investigator

**FROM:** Brian Barth, Chair  
Joint-Faculty Research Ethics Board (JFREB)

**Re:** Protocol #J2011:014  
"Assessing nutritional vulnerability in homeless/nearly homeless,  
solvent/non-solvent users"

Please be advised that your above-referenced protocol has received human ethics approval by the **Joint-Faculty Research Ethics Board**, which is organized and operates according to the Tri-Council Policy Statement. This approval is valid for one year only.

Any significant changes of the protocol and/or informed consent form should be reported to the Human Ethics Secretariat in advance of implementation of such changes.

**Please note:**

- If you have funds pending human ethics approval, the auditor requires that you submit a copy of this Approval Certificate to the Office of Research Services, fax 261-0325 - please include the name of the funding agency and your UM Project number. This must be faxed before your account can be accessed.
- if you have received multi-year funding for this research, responsibility lies with you to apply for and obtain Renewal Approval at the expiry of the initial one-year approval; otherwise the account will be locked.

The Research Ethics Board requests a final report for your study (available at: [http://umanitoba.ca/research/ors/ethics/ors\\_ethics\\_human\\_REB\\_forms\\_guidelines.html](http://umanitoba.ca/research/ors/ethics/ors_ethics_human_REB_forms_guidelines.html)) in order to be in compliance with Tri-Council Guidelines.

## Appendix B



UNIVERSITY OF MANITOBA | Ethics  
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[www.umanitoba.ca/research](http://www.umanitoba.ca/research)

### AMENDMENT APPROVAL

March 11, 2011

**TO:** Carla D'Andreamatteo  
Principal Investigator

**FROM:** Brian Barth, Chair   
Joint-Faculty Research Ethics Board (JFREB)

**Re:** Protocol #J2011:014  
"Assessing Nutritional Vulnerability in Homeless/Nearly Homeless, Solvent/Non-Solvent Users"

This will acknowledge your request dated February 26, 2011 requesting amendment to your above-noted protocol.

Approval is given for this amendment. Any further changes to the protocol must be reported to the Human Ethics Secretariat in advance of implementation.

## Appendix C

### CONSENT FORM



### Faculty of Human Ecology Human Nutritional Sciences

310 Human Ecology Bldg.

University of Manitoba

Winnipeg, MB, R3T 2N2

Phone: (204) 474-7322

Fax: (204) 474-7592

Email : [slater@cc.umanitoba.ca](mailto:slater@cc.umanitoba.ca)

**Research Project Title:** “Exploring the nutritional vulnerability of homeless solvent and non-solvent users.”

**Researchers:** Carla D’Andreamatteo, RD

This consent form, a copy of which will be left with you, is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. Please take the time to read this consent form carefully and understand any accompanying information provided. If you would like more information, please contact me at (204) 269-4595 or [info@thefoodlady.ca](mailto:info@thefoodlady.ca) or my supervisor Dr. Joyce Slater at (204) 474-7322 or [slater@cc.umanitoba.ca](mailto:slater@cc.umanitoba.ca).

This research project is being conducted in partial fulfillment of the requirements for a Master’s degree in Human Nutritional Sciences from the University of Manitoba.

The purpose of this study is to examine (a) how and where you get food, (b) what you eat and drink, and (c) your health risk for chronic disease.

The study involves the following:

*Individual Interview:* The single session you will be attending with the researcher will be no longer than 1 hour. The session will be recorded with the researcher taking notes, and digitally for clarification if needed when reviewing the results. The individual interview will include:

a) *Questionnaire:* A series of pre-determined questions relating to your health, food security and food environment will be asked by the interviewer.

b) *24-hour Food Recall:* Your food intake for the past 24 hours will be requested. The interviewer will assist you with recalling what you ate and drank.

c) *Body Measurements:* Height, body weight and waist circumference will be measured at the end of the interview if you are willing. Height will be obtained using a stadiometer,

weight will be taken using a scale and a soft tape measure will be used to obtain waist circumference. You will remain clothed with exception of removing your footwear and jacket.

After completion of the study, you will receive an honorarium of \$20 for your participation and a ticket for a brunch at Sunshine House. If you are unable to abstain from solvent use for 24-hours prior to the interview, a meal ticket will still be provided in absence of the honorarium.

To receive a summary of the results from the interviews complete the section at the end of this consent form.

No names will be associated with the information you give, and the results will be reported for the group. Some quotes may be used, but these will be anonymous. Data related to personal information and results obtained including audio tapes will be kept in a locked cabinet in a locked room for 5 years or until data are published, whichever comes first. All data and information of a personal nature will be shredded after the time has expired.

The information that you share with me during our session may provide important information to policy-makers in order to help meet the food and nutritional needs of adult homeless/nearly homeless, solvent/non-solvent users.

There is also a risk that you may become self-conscious or embarrassed by sharing information on your food and eating experiences. I will take special measures to avoid this risk from occurring. There are no right and wrong answers for you to provide. Responses are confidential and you are free to withdraw from the study at any time without prejudice. Other than these mentioned above, the overall level of risk associated with this study is considered minimal.

Your signature on this form shows that you understand the information regarding participation in the research project and agree to serve as a participant. This does not waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time, and/or refrain from answering any questions you prefer to omit, without prejudice or consequence. Your continued participation should be as informed as your initial consent, so feel free to ask for clarification or new information throughout your participation. This study is being conducted by Carla D'Andreamatteo (269-4595 or [info@thefoodlady.ca](mailto:info@thefoodlady.ca)) under the direction of Dr. Joyce Slater of the Department of Human Nutritional Sciences at the University of Manitoba (474-7322 or [slater@cc.umanitoba.ca](mailto:slater@cc.umanitoba.ca)).

This research study has been approved by the Joint-Faculty Research Board of Ethical Review at the University of Manitoba. If you have any concerns or complaints about this project, you may contact the above-named persons or the Human Ethics Secretariat at 474-7122 or e-mail [margaret\\_bowman@umanitoba.ca](mailto:margaret_bowman@umanitoba.ca). A copy of this consent form has been given to you to keep for your records and reference.

---

Participant's Signature

Date

---

Researcher and/or Delegate's Signature

Date

**FOR A COPY OF THE STUDY RESULTS, PLEASE COMPLETE THE FOLLOWING:**

---

Name (Please Print)

I would like to receive the results by (check one of the following):

**E-mail**

**Regular Post**

---

E-mail Address

---

Street Address

**Pick up at Sunshine House**

---

City/Town

---

Postal Code

## Appendix D

### VERBAL CONSENT FORM



### Faculty of Human Ecology Human Nutritional Sciences

310 Human Ecology Bldg.

University of Manitoba

Winnipeg, MB, R3T 2N2

Phone: (204) 474-7322

Fax: (204) 474-7592

Email : [slater@cc.umanitoba.ca](mailto:slater@cc.umanitoba.ca)

**Research Project Title:** “Exploring nutritional vulnerability of homeless solvent and non-solvent users.”

**Researchers:** Carla D’Andreamatteo, RD

#### **Verbal Script for Obtaining Informed Consent:**

“Hello, my name is Carla D’Andreamatteo, I am a graduate student at the University of Manitoba in the Faculty of Human Nutritional Sciences. This research project is being conducted in partial fulfillment of the requirements for my Master’s degree.

This consent form, a copy of which will be left with you, is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more information, please contact me at (204) 269-4595 or [info@thefoodlady.ca](mailto:info@thefoodlady.ca) or my supervisor Dr. Joyce Slater at (204) 474-7322 or [slater@cc.umanitoba.ca](mailto:slater@cc.umanitoba.ca).

The purpose of this study is to examine (a) how and where you get food, (b) what you eat and drink, and (c) your health risk for chronic disease.

The study involves the following:

An *Individual Interview* session for you to attend with me, (the researcher) and it will be no longer than 1 hour. I will take notes during our session to gather information that you are providing. I would also like to tape record our discussion so that I can review it for clarification if needed. Your individual interview with me will include:

- a) A *Questionnaire* with a series of pre-determined questions relating to your health, food security and food environment.
- b) A *24-hour Food Recall* which is your food intake for the past 24 hours. I will assist you with recalling what you ate and drank.
- c) *Body Measurements* will be taken by me to obtain your height, body weight and waist circumference. I will do this at the end of the interview if you are willing and I will use a

stadiometer to obtain your height, a scale for your weight and a soft tape measure for your waist circumference. You will remain clothed with exception of removing your footwear and jacket.

After completion of the study, you will receive an honorarium of \$20 for your participation and a ticket for a brunch at Sunshine House. If you are unable to abstain from solvent use for 24-hours prior to the interview with me, a meal ticket will still be provided in absence of the honorarium.

If you would like to receive a summary of the results from the interviews please inform me. A copy will be provided to you as requested either electronically, by regular mail or for pick up at Sunshine House.

No names will be associated with the information you give, and the results will be reported for the group. Some quotes may be used, but these will be anonymous. Data related to personal information and results obtained including audio tapes will be kept in a locked cabinet in a locked room for 5 years or until data are published, whichever comes first. All data and information of a personal nature will be shredded after the time has expired.

The information that you share with me during our session may provide important information to policy-makers in order to help meet the food and nutritional needs of adult homeless/nearly homeless, solvent/non-solvent users.

There is also a risk that you may become self-conscious or embarrassed by sharing information on your food and eating experiences. I will take special measures to avoid this risk from occurring. There are no right and wrong answers for you to provide. Responses are confidential and you are free to withdraw from the study at any time without prejudice. Other than these mentioned above, the overall level of risk associated with this study is considered minimal.

Consent to serve as a participant in this research does not waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time, and/or refrain from answering any questions or refrain from having body measurements taken by me, without prejudice or consequence. Your continued participation should be as informed as your initial consent, so feel free to ask for clarification or new information throughout your participation. This study is being conducted by me (Carla D'Andreamatteo) and I can be reached at 269-4595 or [info@thefoodlady.ca](mailto:info@thefoodlady.ca), under the direction of Dr. Joyce Slater of the Department of Human Nutritional Sciences at the University of Manitoba (474-7322 or [slater@cc.umanitoba.ca](mailto:slater@cc.umanitoba.ca)).

This research study has been approved by the Joint-Faculty Research Board of Ethical Review at the University of Manitoba. If you have any concerns or complaints about this project, you may contact the above-named persons or the Human Ethics Secretariat at 474-7122 or e-mail [margaret\\_bowman@umanitoba.ca](mailto:margaret_bowman@umanitoba.ca). A copy of this consent form has been given to you to keep for your records and reference.

Do you have any questions about this research? Do you agree to participate?"

---

Participant's Signature (if willing/able)

Date

---

Researcher and/or Delegate's Signature

Date

**FOR A COPY OF THE STUDY RESULTS, RESEARCHER TO COMPLETE THE FOLLOWING:**

---

Participant Name (Please Print)

How the participant would like the results to be provided (check one of the following):

**E-mail**

**Regular Post**

---

E-mail Address

---

Street Address

**Pick up at Sunshine House**

---

City/Town

---

Postal Code

## Appendix E

### INTERVIEW QUESTIONNAIRE



### Faculty of Human Ecology Human Nutritional Sciences

310 Human Ecology Bldg.

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Winnipeg, MB, R3T 2N2

Phone: (204) 474-7322

Fax: (204) 474-7592

Email : [slater@cc.umanitoba.ca](mailto:slater@cc.umanitoba.ca)

ID #: \_\_\_\_\_

Interview Date: \_\_\_\_\_

Interviewer: \_\_\_\_\_

#### INCLUSION CRITERIA QUESTIONS

1. How old are you (in years)?

\_\_\_\_\_

2. Do you have any dependent children under the age of 18?

- a) yes
- b) no
- c) don't know / refuse to answer

3. Have you gone to a soup kitchen/mission/shelter to obtain food in the past 12 months?

- a) yes
- b) no
- c) don't know / refuse to answer

\*\*If question 1 is less than 18 years, or question 2 recorded as (a) or (c) or question 3

recorded as (b) or (c) please end interview.

**SOCIO-DEMOGRAPHIC QUESTIONS**

4. What is your gender?

- a) male
- b) female
- c) other

5. Which of the following describes your cultural background/identity?

- a) Aboriginal
- b) Non-Aboriginal

Describe: \_\_\_\_\_

6. Do you have any health problems?

- a) yes
- b) no
- c) don't know / refuse to answer

If yes, describe: \_\_\_\_\_

7. How would you describe your current housing situation?

- a) apartment
- b) family/friend's place
- c) hospital
- d) hotel
- e) house
- f) jail
- g) shelter
- h) street
- i) don't know / refuse to answer

How long have you lived there? \_\_\_\_\_

8. Do you have a source of income?

- a) yes
- b) no
- c) don't know / refuse to answer

If yes, describe: \_\_\_\_\_

9. How often do you sniff or huff?

- a) never
- b) once in a while
- c) all the time
- c) don't know / refuse to answer

## **FOOD SECURITY QUESTIONS**

Adapted from Health Canada (2007). Canadian Community Health Survey, Cycle 2.2, Nutrition (2004)-Income-Related Household Food Security in Canada.

The following questions are about the food situation for you in the past 12 months.

**10.** Which of the following statements best describes the food you have consumed in the past year/12 months?

- a) You always had enough of the kinds of food you wanted to eat.
- b) You had enough to eat, but not always the kinds of food you wanted.
- c) Sometimes you did not have enough to eat.
- d) Often you did not have enough to eat.
- e) Don't know / refuse to answer

**11.** Now I'm going to read you several statements that may be used to describe the food situation for you. Please tell me if the statement was often true, sometimes true, or never true for you in the past 12 months.

You worried that food would run out before you got money to buy more. Was that often true, sometimes true, or never true in the past 12 months?

- a) Often true
- b) Sometimes true
- c) Never true
- d) Don't know / refuse to answer

**12.** The food that you bought just didn't last, and there wasn't any money to get more. Was that often true, sometimes true, or never true in the past 12 months?

- a) Often true
- b) Sometimes true
- c) Never true
- d) Don't know / refuse to answer

**13.** You couldn't afford to eat balanced meals. In the past 12 months was that often true, sometimes true, or never true?

- a) Often true
- b) Sometimes true
- c) Never true
- d) Don't know / refuse to answer

STAGE 2: Questions 14–17

The following few questions are about the food situation in the past 12 months for you.

**14a.** In the past 12 months, since last [current month] did you ever cut the size of your meals or skip meals because there wasn't enough money for food?

- a) Yes
- b) No (Go to Q14)
- c) Don't know / refuse to answer

**14b.** How often did this happen?

- a) Almost every month
- b) Some months but not every month
- c) Only 1 or 2 months
- d) Don't know / refuse to answer

**15.** In the past 12 months, did you (personally) ever eat less than you felt you should because there wasn't enough money to buy food?

- a) Yes
- b) No
- c) Don't know / refuse to answer

**16.** In the past 12 months, were you (personally) ever hungry but didn't eat because you couldn't afford enough food?

- a) Yes
- b) No
- c) Don't know / refuse to answer

**17.** In the past 12 months, did you (personally) lose weight because you didn't have enough money for food?

- a) Yes
- b) No
- c) Don't know / refuse to answer

STAGE 3: Question 18

**18a.** In the past 12 months, did you ever not eat for a whole day because there wasn't enough money for food?

- a) Yes
- b) No
- c) Don't know / refuse to answer

- 18b.** How often did this happen?
- a) Almost every month
  - b) Some months but not every month
  - c) Only 1 or 2 months
  - d) Don't know / refuse to answer

#### **OPEN-ENDED QUESTIONS**

- 19.**
- a) Why do you go to a SK/mission/shelter to eat?
  - b) What do you eat when you go to a SK/mission/shelter?
- 
- 20.**
- a) What do you eat when you are not at a SK/mission/shelter?
  - b) Where do you get this food?
  - c) How do you get this food?
- 
- 21.** What would make your food situation better?

22. If you have any special food needs, how do you meet those needs?  
(probe: food allergies, diabetes, heart disease)

23. If you use sniff/solvents, how does it change the way you eat?

## 24-HOUR FOOD RECALL

ID #:	Date Taken:	Takes Nutritional Supplements <input type="checkbox"/> Yes <input type="checkbox"/> No  If "Yes" List Type:																					
<b>MEAL TYPE</b> Morning = 1 Midmorning = 2 Noon = 3 Afternoon = 4 Evening = 5 Late Evening = 6		<b>SERVING ABBREVIATIONS</b> TBSP = tablespoon c = cup tsp = teaspoon lb = pound oz = ounce sl = slice fl oz = fluid ounce																					
<b>CANADA'S FOOD GUIDE (CFG) GROUP</b> Fruits & Vegetables = 1 Grains = 2 Milk & Alternatives = 3 Meat & Alternatives = 4 Oils & Fats = 5 Other Foods = 6																							
<b>CONVERSION TABLE</b> <table style="width: 100%; border: none;"> <tr> <td>1/16 = 0.06</td> <td>1/3 = 0.33</td> <td>3 tsp = 1 TBSP</td> <td>16 TBSP = 1 c</td> <td>1 c (liquid) = 8 fl oz</td> </tr> <tr> <td>1/8 = 0.12</td> <td>1/2 = 0.50</td> <td>2 TBSP = 1 fl oz</td> <td>1/2 pint = 1 c</td> <td>1 dash = 1/8 tsp</td> </tr> <tr> <td>1/6 = 0.16</td> <td>2/3 = 0.66</td> <td>4 TBSP = 1/4 c</td> <td>1 liter = 4 c</td> <td>30 drops = 1/2 tsp</td> </tr> <tr> <td>1/4 = 0.25</td> <td>3/4 = 0.75</td> <td>1 quart = 4 c</td> <td>16 oz. = 1 lb</td> <td></td> </tr> </table>				1/16 = 0.06	1/3 = 0.33	3 tsp = 1 TBSP	16 TBSP = 1 c	1 c (liquid) = 8 fl oz	1/8 = 0.12	1/2 = 0.50	2 TBSP = 1 fl oz	1/2 pint = 1 c	1 dash = 1/8 tsp	1/6 = 0.16	2/3 = 0.66	4 TBSP = 1/4 c	1 liter = 4 c	30 drops = 1/2 tsp	1/4 = 0.25	3/4 = 0.75	1 quart = 4 c	16 oz. = 1 lb	
1/16 = 0.06	1/3 = 0.33	3 tsp = 1 TBSP	16 TBSP = 1 c	1 c (liquid) = 8 fl oz																			
1/8 = 0.12	1/2 = 0.50	2 TBSP = 1 fl oz	1/2 pint = 1 c	1 dash = 1/8 tsp																			
1/6 = 0.16	2/3 = 0.66	4 TBSP = 1/4 c	1 liter = 4 c	30 drops = 1/2 tsp																			
1/4 = 0.25	3/4 = 0.75	1 quart = 4 c	16 oz. = 1 lb																				

What did participant eat or drink in the past 24 hours? (To be completed by researcher.)					
FOOD ITEMS AND DESCRIPTION List all foods and beverages. List separately main ingredients in mixed dishes.	Where food obtained (O) and consumed (C).	Meal Type	Amount Eaten	AMOUNT EATEN (in CFG servings)	CFG Group

What did participant eat or drink in the past 24 hours? (To be completed by researcher.)					
FOOD ITEMS AND DESCRIPTION List all foods and beverages. List separately main ingredients in mixed dishes.	Where food obtained (O) and consumed (C).	Meal Type	Amount Eaten	AMOUNT EATEN (in CFG servings)	CFG Group

## HEIGHT, WEIGHT, WAIST MEASUREMENTS

At the **end** of each interview, participant height, weight and waist circumference will be taken. If a participant does not wish for any or all of these measurements to be taken, the results will be recorded as “declined”. Measurements will not be taken for pregnant women.

Measurement Protocol:

-obtain two readings of each measurement: height, weight and waist, then height, weight and waist again. If the two readings of each measurement vary by more than 1%, a third reading will occur.

<b>Height Readings</b> Recorded to the nearest 0.1cm	
1 <sup>st</sup> reading:	_____
2 <sup>nd</sup> reading:	_____
3 <sup>rd</sup> reading:	_____ (only if needed)

<b>Weight Readings</b> Recorded to the nearest 0.1kg. The scale weighs to a maximum of xx kilograms. If a participant weighs more than this, the weight will be recorded as “xx+ kg”.	
1 <sup>st</sup> reading:	_____
2 <sup>nd</sup> reading:	_____
3 <sup>rd</sup> reading:	_____ (only if needed)

<b>Waist Circumference Readings</b> Waist circumference will be recorded to the nearest 0.1cm, at the end of a normal expiration.	
1 <sup>st</sup> reading:	_____
2 <sup>nd</sup> reading:	_____
3 <sup>rd</sup> reading:	_____ (only if needed)

**INTERVIEW COMPLETED**

## Appendix F

# CCHS Household Food Security Survey Module

The following questions are about the food situation for your household in the past 12 months.

- Q1.<sup>20</sup>** Which of the following statements best describes the food eaten in your household in the past 12 months, that is since [current month] of last year?
1. You and other household members always had enough of the kinds of food you wanted to eat.
  2. You and other household members had enough to eat, but not always the kinds of food you wanted.
  3. Sometimes you and other household members did not have enough to eat.
  4. Often you and other household members didn't have enough to eat.
- Don't know / refuse to answer (Go to end of module)

### STAGE 1: Questions 2–6 — ask all households

Now I'm going to read you several statements that may be used to describe the food situation for a household. Please tell me if the statement was often true, sometimes true, or never true for you and other household members in the past 12 months.

- Q2.** The first statement is: you and other household members worried that food would run out before you got money to buy more. Was that often true, sometimes true, or never true in the past 12 months?
1. Often true
  2. Sometimes true
  3. Never true
- Don't know / refuse to answer
- Q3.** The food that you and other household members bought just didn't last, and there wasn't any money to get more. Was that often true, sometimes true, or never true in the past 12 months?
1. Often true
  2. Sometimes true
  3. Never true
- Don't know / refuse to answer

---

<sup>20</sup> Question Q1 is not used directly in determining household food security status.

- Q4.** You and other household members couldn't afford to eat balanced meals. In the past 12 months was that often true, sometimes true, or never true?
1. Often true
  2. Sometimes true
  3. Never true
- Don't know / refuse to answer

---

IF CHILDREN UNDER 18 IN HOUSEHOLD, ASK Q5 AND Q6;  
OTHERWISE, SKIP TO FIRST-LEVEL SCREEN

---

Now I'm going to read a few statements that may describe the food situation for households with children.

- Q5.** You or other adults in your household relied on only a few kinds of low-cost food to feed the children because you were running out of money to buy food. Was that often true, sometimes true, or never true in the past 12 months?
1. Often true
  2. Sometimes true
  3. Never true
- Don't know / refuse to answer
- Q6.** You or other adults in your household couldn't feed the children a balanced meal, because you couldn't afford it. Was that often true, sometimes true, or never true in the past 12 months?
1. Often true
  2. Sometimes true
  3. Never true
- Don't know / refuse to answer

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FIRST-LEVEL SCREEN (screener for Stage 2):  
If AFFIRMATIVE RESPONSE to ANY ONE of Q2–Q6 (i.e. "often true" or "sometimes true")  
OR response [3] or [4] to Q1, then continue to STAGE 2; otherwise, skip to end.

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**STAGE 2:** Questions 7–11 — ask households passing the First-Level Screen

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IF CHILDREN UNDER 18 IN HOUSEHOLD, ASK Q7;  
OTHERWISE SKIP TO Q8

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- Q7.** The children were not eating enough because you or other adults in your household just couldn't afford enough food. Was that often, sometimes or never true in the past 12 months?
1. Often true
  2. Sometimes true
  3. Never true
- Don't know / refuse to answer

The following few questions are about the food situation in the past 12 months for you or any other adults in your household.

- Q8.** In the past 12 months, since last [current month] did you or other adults in your household ever cut the size of your meals or skip meals because there wasn't enough money for food?
1. Yes
  2. No (Go to Q9)
- Don't know / refuse to answer
- Q8b.** How often did this happen?
1. Almost every month
  2. Some months but not every month
  3. Only 1 or 2 months
- Don't know / refuse to answer
- Q9.** In the past 12 months, did you (personally) ever eat less than you felt you should because there wasn't enough money to buy food?
1. Yes
  2. No
- Don't know / refuse to answer

**Q10.** In the past 12 months, were you (personally) ever hungry but didn't eat because you couldn't afford enough food?

1. Yes
2. No
- Don't know / refuse to answer

**Q11.** In the past 12 months, did you (personally) lose weight because you didn't have enough money for food?

1. Yes
2. No
- Don't know / refuse to answer

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**SECOND-LEVEL SCREEN (screener for Stage 3):**  
If **AFFIRMATIVE RESPONSE** to **ANY ONE** of Q7–Q11,  
then continue to **STAGE 3**; otherwise, skip to end.

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**STAGE 3: Questions 12–16 — ask households passing the Second-Level Screen**

**Q12.** In the past 12 months, did you or other adults in your household ever not eat for a whole day because there wasn't enough money for food?

1. Yes
2. No (IF CHILDREN UNDER 18 IN HOUSEHOLD, ASK Q13; OTHERWISE SKIP TO END)
- Don't know / refuse to answer

**Q12b.** How often did this happen?

1. Almost every month
2. Some months but not every month
3. Only 1 or 2 months
- Don't know / refuse to answer

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IF CHILDREN UNDER 18 IN HOUSEHOLD, ASK Q13–16;  
OTHERWISE SKIP TO END

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Now, a few questions on the food experiences for children in your household.

**Q13.** In the past 12 months, did you or other adults in your household ever cut the size of any of the children’s meals because there wasn’t enough money for food?

1. Yes
2. No
- Don’t know / refuse to answer

**Q14.** In the past 12 months, did any of the children ever skip meals because there wasn’t enough money for food?

1. Yes
2. No
- Don’t know / refuse to answer

**Q14b.** How often did this happen?

1. Almost every month
2. Some months but not every month
3. Only 1 or 2 months
- Don’t know / refuse to answer

**Q15.** In the past 12 months, were any of the children ever hungry but you just couldn’t afford more food?

1. Yes
2. No
- Don’t know / refuse to answer

**Q16.** In the past 12 months, did any of the children ever not eat for a whole day because there wasn’t enough money for food?

1. Yes
2. No
- Don’t know / refuse to answer

**End of module**