# INTEGRATION OF NUTRITION EDUCATION CLASSES INTO ENGLISH AS SECOND LANGUAGE CLASSES FOR REFUGEES

by

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# ABSTRACT

Integration of Nutrition Education Classes into English as Second Language Classes for Refugees

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Utah State University, 2012

Major Professor: Dr. Nedra K. Christensen
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Recently resettled refugees are at high risk for food insecurity and its health consequences. This observational study evaluated the effectiveness of integrating nutrition lessons into English as a Second Language (ESL) classes at a work-site training center for refugees. The lessons focused on making healthy choices with a limited budget. Through the assistance of ESL teachers, nutrition educator assistants (NEAs) from the Supplemental Nutrition Assistance Program (SNAP) taught nutrition lessons to 98 refugees from 17 different countries for 12 weeks. Food frequency questionnaires (FFQ) for 49 participants were matched pre and post 12 weeks of class. A Wilcoxon test was used to determine differences in intake of fruits, vegetables, meats, whole grains, refined grains, dairy, sugar, fat, and alcohol. No significant difference was found between median intake for fruit, vegetables, whole grains, refined grains, sugar, and alcohol. The median intake of meat (2.5 to 1 servings per day, p=0.006), dairy (2.5 to 1 servings per day, p=0.013), and fat (1 to 0.7 servings per day, p=0.01) significantly decreased.

Food purchase receipts were gathered to evaluate feasibility of assessing food expenditures in this population. Fifty percent (49/98) of the refugees completed all 12 lessons. Receipts were collected from 59 different participants and 93% (55/59) of the participants had receipts that used SNAP funds. Receipts reflected food purchased from supermarkets and ethnic food stores by 92% (54/59) and 59% (35/59) of the participants.

The model of delivering nutrition education through ESL classes addressed barriers refugees face. Further research is needed to develop culturally sensitive nutrition education and validated assessment tools for refugees.

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# PUBLIC ABSTRACT

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Each year approximately 73,000 refugees are resettled into the United States because it is unsafe for them to return to their country of origin. Resettlement agencies help refugees learn about their new environment and provide assistance with housing, food, English classes, and job skills training. The goal of resettlement programs is to help refugees become self-sufficient as quickly as possible.

Recently resettled refugees face many challenges that make it difficult to eat healthy food. Transportation, English skills, and conflicting work hours are some of the barriers to receiving nutrition education. This research evaluated the integration of nutrition lessons into English as a Second Language (ESL) classes at a work-site training center for refugees. The lessons focused on making healthy choices with a limited budget. Through the assistance of ESL teachers, nutrition educator assistants (NEAs) from the Supplemental Nutrition Assistance Program (SNAP) taught nutrition lessons to 98 refugees from 17 different countries.

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Sarah Gunnell

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# INTRODUCTION

## Background

The United Nations High Commission for Refugees (UNHCR) was established in December 1950 by the United Nations General Assembly to serve Europeans displaced as a result of World War II. Nearly sixty years later, it continues to serve refugees with a goal of providing a safe environment and coordinating efforts for refugees. A refugee is defined as "a person who is outside his/her country of origin and is unable or unwilling to return to that country because of a well-founded fear that he/she will be persecuted because of race, religion, nationality, political opinion, or membership in a particular social group."[1]

Under the direction of the UNHCR, 76,654 refugees were resettled in United States of America in 2009 of which 1,265 were placed in Utah.[2] In order for a refugee to be placed in the United States, he or she must pass an interview by an officer of the United States Citizenship and Immigration Services. Upon arrival to the United States, a refugee is lawfully able to obtain employment. He or she is able to apply to become a permanent resident after one year of arrival and is eligible to apply for citizenship after five years. During 2009, refugees in Utah resettled from Burma (360), Iraq (252), Bhutan (286), Somalia (180), and several other war-torn countries.[3] Many of them had spent 15 to 20 years in refugee camps with dependence on international food aid or had been victims of war and experienced long periods of time with no food or water. Refugees often arrive in a poor nutrition status. A survey of five refugee camps in East and North

Africa found acute child malnutrition ranging from 9 to 21% and iron deficiency as high as 75%.[4]

Reception and placement agencies are responsible for assisting refugees with resettlement. This includes arranging for housing, furnishings, clothing, food, employment, and social services for the first 30 days after arrival. Federal funding through the Refugee Cash Assistance (RCA) provides financial assistance for job searching, adult education, skill training, and English as a Second Language (ESL) for up to eight months after arrival. The Utah Refugee Resettlement Program provides case managers, medical coordinators, and job developers to meet the requirements of the U.S. Department of State. Those who do not meet eligibility requirements for Medicaid qualify for federal funds for up to eight months through the Refugee Medical Assistance program. After federal funds are exhausted, state and local agencies are responsible for assisting refugees resettle.

In the state of Utah, the International Rescue Committee (IRC), Catholic Community Services (CCS), the Asian Association of Utah (AAU), and Lutheran Social Service of Utah (LSSU) provide services to facilitate the employment and integration of refugees. The IRC assists refugees for the first two years and then refers them to the AAU for assistance up to five years. CCS is involved in assisting during the first six months of arrival and then refers the case to the AAU. The goal of these agencies is to help refugees to become self-sufficient. Trained case managers focus on helping refugees obtain skills necessary for employment through training and ESL classes.[5]

The IRC supports post-arrival resettlement and coordinates the following services within 30 days of arrival: assessment, employment planning, Match-Grant orientation,

Supplemental Nutrition Assistance Program (SNAP), Medicaid, Cash Assistance, Social Security, Selective Service, Health Screening, school enrollment for children, and ESL enrollment for adults. The Match Grant Program administered through the Department of Health and Human Services Office of Refugee Resettlement helps provide funding for three to four months to assist with housing, bus passes, pocket money, and job development.[5] Clients in the Match Grant receive Medicaid and food stamps but not cash assistance. Refugees also benefit from other services such as Women Infants and Children (WIC) and Home Energy Assistance (HEAT).

The Supplemental Nutrition Assistance Program, formerly the Food Stamp Program, operates under the United States Department of Agriculture (USDA) and provides resources for healthy eating for low-income families. Participants receive a certain amount of money to be used for groceries based on income level and household size. Another component of SNAP is nutrition education. Funding for SNAP nutrition comes through the Food and Nutrition Services and land-grant universities in many states. In Utah, the SNAP-Ed Nutrition Education program is administered through Utah State University Extension.

The goal of SNAP-Ed is to provide low-income families with knowledge to live a healthy lifestyle, including healthy eating and physical activity in a cost-effective manner. Nutrition education programs have been found to be cost-beneficial and increase the amount of time in the month that households do not run out of food.[6] Education may be provided in homes, schools, community centers, churches, and other locations suitable for participants to meet. Curriculum includes topics such as food safety, comparative

shopping, physical activity, and fruit and vegetable intake. Food frequency questionnaires are used to measure the impact of nutrition education for participants.

Many recently resettled refugees have experienced food insecurity and traumatic experiences that have put them in poor nutrition status. Several challenges with resettlement including limited financial resources and English skills put refugees at continued risk for poor nutrition health. The goal of refugee resettlement organizations is to provide tools to help refugees become self-sufficient as quickly as possible. Nutrition education programs are needed to provide refugees with skills to make healthy nutrition choices in their new food environment and decrease risk of chronic diseases such as diabetes and cardiovascular disease. Further research is warranted to identify effective and efficient methods of implementing culturally sensitive nutrition education for refugees.

## Hypothesis and Objectives

### Hypothesis

Refugees who participate in nutrition education classes integrated into English as a Second Language (ESL) classes will improve nutrition choices and food purchasing practices.

### Objectives

The objectives of this study include:

1. Evaluate the feasibility of integrating nutrition education classes into ESL classes for recently resettled refugees.

2. Identify the key elements necessary to form a collaborative partnership in providing nutrition education classes for refugees, and determine if there are barriers.
3. Determine if refugees change nutrition choices after participation in a series of nutrition education classes.
4. Evaluate the feasibility of using food purchase receipts to measure differences in money spent on food before and after nutrition education classes.

The results of these objectives will be discussed in chapters two and three.

## Review of Literature

### Food Insecurity

The 2010 report of food security in the United States showed that 14.5% of the households in the U.S. experienced food insecurity, meaning a lack of access to adequate nutritious food in a culturally acceptable and safe manner.[7] The United States Department of Agriculture (USDA) food security survey focused on five main areas: anxiety surrounding whether or not the food budget will meet basic needs; running out of food with no money to purchase more; adjustments to normal food use to compensate for lack of food; decreased food intake by adults because there is not enough food; and decreased food intake by children because there is not enough food. Households go through experiential and behavior changes as food insecurity becomes more severe. In the first stage, adjustments are made to normal food use. As the situation becomes more severe, adults decrease food intake to spare children of hunger. Then in the third stage child hunger occurs indicating a high level of food insecurity. Food insecurity results in poor

nutrition status, poor health, and decreased overall personal well-being. Children living in food-insecure households have been found to be at increased risk of growth stunting, impaired cognitive development, and iron deficiency anemia.[8] Food insecurity in adults has been associated with type-2 diabetes and obesity.[8]

While household income levels have been found to be one of the largest influences on food security, several other environmental factors influence food security. The purpose of federal assisted nutrition programs is to decrease food insecurity; however, not all food insecure households participate in these programs. One month prior to the 2010 Household Food Security survey, 59% of food insecure households participated in three of the largest federally funded nutrition programs.[7] An extensive review of 78 quantitative and qualitative studies of persons living in the United States and five other developed countries identified the following as environmental factors that influenced food security: income, living expenses, health, household facilities, transportation, rural/urban location, home garden, government policy, cooking and nutrition knowledge, education level, household composition, immigration and acculturation, media, social networks, and embarrassment.[9] Many of these environmental factors specifically influence food insecurity of resettled refugees more than non-refugee populations.

Refugees and immigrants are at a significantly higher risk for food insecurity than are non-refugees.[10,11,12] In a pilot assessment of 30 refugee families in East London, all 30 families were food-insecure with 60% reporting child hunger.[13] Food insecurity was assessed using the Radimer/Cornell Hunger Scale. A questionnaire was developed based on formative research conducted with key informants who worked with refugees. A

stratified random sample of ten mothers each from Somali, Albania, and Columbia or Ecuador for a total of 30 participated in semi-structured interviews in their native languages. All of the families reported they worried about running out of food. Families that had been in the United Kingdom for longer (10.9 versus 16 months, p =0.02) and received benefits had less child hunger than families that had just arrived. There was no difference in the level of mother's education between families with and without child hunger. Similar levels of food insecurity have been reported in the U.S. Sixty percent of 60 resettled refugees from Sudan living in Atlanta, Georgia reported food insecurity within the first year of arrival.[10] In another study of 35 resettled refugees from Somalia living in Maine, 72% reported food insecurity.[11] Hadley and colleagues found 77% of 281 resettled refugees living in the U.S. from Sierra Leone, Liberia, Ghana, Somalia, Togo, and Meskhetian Turks reported food insecurity.[12] Overall food insecurity is prevalent for recently resettled refugees.

Food insecurity among resettled refugees has been associated with a lack of resources in the U.S. In a study describing the availability of resources relating to nutrition for new and recent immigrants, only 2 of 17 direct assistance programs focused on nutrition.[14] A two-stage eco-mapping approach was taken to evaluate programs and services for immigrant clients and clients with limited English proficiency. Sixty-five programs were identified as cultural adaptation resources to immigrants and refugees in Guilford County, North Carolina, one of the largest refugee resettlement counties in the state.[14] Only 22 (33.8%) of the providers offered support to immigrants who were in need of food and nutrition education and two addressed food insecurity problems.[14]

Ethnographic work was conducted to gather information related to food insecurity

in Liberian refugees living in the USA.[10] This included participant observation in several health meetings, discussions with a nurse and social worker that were active in the community, informal interviews with refugees, and 15 in-depth interviews with women who met the study criteria. Inclusion criteria was defined as a woman 18 years or older with a child less than 5 years of age who lived in the USA for less than four years and claimed Liberia as country of birth. Interviews were conducted by female West African interviewers in English in the homes of the women. A standardized data collection instrument was used to gather information on migration history, current household composition and economics, participation in food assistance programs, and perceived difficulty in shopping and language. Transcripts were entered into a qualitative data analysis software program, and key themes and illustrative quotes were collected including details relevant to dietary acculturation. Three common themes emerged from the interviews: the causes of food insecurity, coping mechanisms, and consequences of food insecurity.

Income level has been associated with food insecurity; however, other factors also influence food insecurity among refugees. In a study of 281 resettled refugees, 72% of those whose income was less than $500 per month reported high food insecurity, however when income increased to greater than $2000 per month, 31% still reported high food insecurity.[12] Interviews with refugees have identified some of the possible non-income influences on food insecurity as difficulty in identifying foods, challenges in finding stores that carry desired ethnic foods, and not knowing how to cook “American” foods.[15] Refugees are not accustomed to processed and packaged foods. Foods intended for human consumption and those intended for animals such as cat food are packaged the

same. When refugees have limited literacy skills, it makes it difficult to correctly identify appropriate foods, especially when pictures on labels are misleading. Shopping at a large supermarket may be an overwhelming experience for many refugees who have come from refugee camps and agriculture backgrounds. Some refugees are fearful of whether or not the food is safe to eat because it is not in its natural form; for example a whole chicken versus marinated chicken strips.[16] The food in the supermarkets is unfamiliar, and oftentimes the refugee feels more comfortable shopping in smaller stores where prices of food are higher. Another barrier to shopping and preparing food is lack of transportation.

Refugees also desire to eat foods they are familiar with from their own culture. In interviews with 31 refugees from Bosnia, Iran, and Cuba, 26% reported eating less healthy food choices and refugees from Bosnia and Iran attributed it to the lack of availability of fresh fruits and vegetables from gardens.[17] While their ethnic foods may be healthier choices, the price of obtaining some of these foods is much higher. There is also a lack of knowledge of how to prepare more affordable foods. Refugees who once were able to spend time cooking and preparing meals now work outside of the home and there is less time to prepare healthy meals. Another challenge to food security may be refugees are trying to support relatives living in their native country. Finally, significantly higher rates of food insecurity were associated with inability to read and speak English and level of acculturation.[12]

**Acculturation**

Dietary acculturation is the process that takes place when immigrants adopt the eating practices of their new environment. A study of acculturation and environmental change on dietary habits of adult Hmong was conducted in Minnesota.[18] This study looked at length of time in the U.S., language usage, and eating behaviors to assess acculturation level. Ten focus groups were conducted by two trained researchers with four of the groups conducted in English and Hmong. Degree of acculturation was assessed using an adapted instrument that had been tested for validity and reliability for Hispanics. Participants were categorized into three groups: participants born in Thailand or Laos and lived in the U.S. for less than five years; participants who were born in Thailand or Laos, spent their developmental years there, could recall food memories from Thailand or Laos during focus group interviews and had been in the U.S for greater than five years; and participants who were born in the U.S. or were born in Thailand or Laos but could not recall food memories because of the short time spent there. Participants who were either born in the U.S. or who were born in Thailand or Laos and could not recall food memories reported less usage of food assistance programs and were found to have higher acculturation scores. Those who lived with extended family had lower acculturation for language and consumed more Hmong food versus American food. Traditional eating patterns consisted mainly of rice, vegetables, and a meat dish. As acculturation took place, rice consumption decreased and intake of high-fat, high-sugar, processed and convenience foods increased. Participants in the focus groups reported that eating behavior changed in the U.S. because there was more food available on a consistent basis. There was no significant difference found in body mass index (BMI) among the groups; however, U.S. born group had a higher percentage of adults who were

overweight and obese. Acculturation influenced dietary choices and eating patterns of the Hmong population in this study. Similar eating patterns were seen among Cambodian refugees who consumed high amounts of white rice, and a higher acculturation level was associated with increased brown rice consumption.[19]

To further understand the link between acculturation, weight gain, and disease risk, Crystal Patil and colleagues studied the details of diet and activity for new refugee arrivals to the USA.[20] Availability of calories from various food sources for Liberia, Somalia, and the USA were compared based on data from the United Nations Food and Agricultural Organization. It was found that in Liberia and Somalia, more than 92% of calories come from vegetable products compared to 72% in the USA. There was a greater availability of meat, dairy, and sugar in the USA. In face-to-face interviews regarding migration patterns, shopping practices, dietary intake, food insecurity, and end-point measures of acculturation, Liberians reported eating more soda, fruit, vegetables, milk, and meat in the USA than in Liberia.[20] Other challenges reported included the high cost of African foods, transportation, food preferences of children, and time restraints related to work schedules.

In another study of resettled refugees in Australia from sub-Saharan Africa, similar themes of food prices, food status, and children influencing food choices were identified.[21] Certain foods carried a social status and indication of wealth and even health. Children of refugees are enrolled in schools and often have better English speaking and writing skills than parents, which adds a different dimension on food choices. Children are introduced to American food and social pressures related to food choices at school. Expanded media influence aimed towards children also impacts food choices. Survey

results of 150 Cambodian refugee women in Massachusetts found those with children in the home reported eating fast food two or more times per month significantly more compared to those without children at home.[19]

In the development of culturally relevant nutrition education for Vietnamese immigrants, researchers found that acculturation had a negative impact on dietary quality.[22] The longer Vietnamese immigrants lived in the U.S., the fewer grains, fruits and vegetables they consumed. Their diets became higher in fat, cholesterol, sodium, soft drinks, and candy. Vietnamese paraprofessional nutrition education assistants conducted interviews in the homes of participants including a 24 –hour food recall prior to the completion of nutrition education sessions and after six to eight weeks of the classes. Positive improvements in dietary quality were made, suggesting the benefits of culturally adapted material.[22] Cambodian women who had received nutrition education chose brown rice more often than those who had not received nutrition education.[19] These studies demonstrated the benefits of nutrition education on dietary behaviors. The increased prevalence of food insecurity and challenges with acculturation in resettled refugees raise concern for health consequences and the need for nutrition education programs.

**Nutrition-Related Health Concerns**

Refugees have higher rates of hypertension, diabetes, and cardiovascular disease compared to US-born residents and first generation immigrants.[19] These chronic diseases are affected by diet and physical activity. In a national longitudinal study of adolescent health, adolescents born in the U.S. with one or more parent born in Cuba or Puerto Rico had a higher prevalence of being overweight than adolescents born in Puerto Rico and

Cuba.[23] Foreign-born adolescents had a higher consumption of rice, fruits, and vegetables compared to second -generation U.S.-born counterparts.[23] The same study found foreign-born Mexicans watched less TV than U.S.- born Mexicans demonstrating a decrease in physical activity. Acculturation factors were not found to be statistically significant in this study. However when acculturation was added to the probability prediction model for being overweight, an increase in being overweight was seen. There was some indication that social economic status influenced prevalence of obesity. However, if participants lived in a low-income neighborhood with a high density of immigrants, they seemed to be buffered from adapting unhealthy American lifestyle patterns.

Higher rates of obesity have been seen in households of lower social economic status.[24] Reasons for this may include the high cost of healthy foods and decreased availability and selection in low-income neighborhoods. One study investigated the past–month food purchase behaviors of low-income, urban Minnesotan women and the relationship between factors of race, living situation, utilization of food pantries, and types of food stores where food was purchased.[25] A quantitative survey was given to a convenience sample of 448 women recruited from community sites and homeless shelters in Minnesota. Inclusion criteria for participants was a woman 18 years or older, English speaking, primary grocery shopper, mother/caregiver of at least one 2-18 year old child living in home, and use of a food assistance program. Food-security status was assessed using the complete U.S. Department of Agriculture's 18-item Food Security Model. The convenience sample was 44% African American, 35% American Indian, 10% white, and 11% other/mixed race; 37% were homeless. Seventy-six percent of participants were overweight or obese which compares to national obesity trends. Rates of less healthy

food group purchases were higher compared to healthy food group purchases. Rates of food group purchases varied by race with a significant difference found between the healthy protein food groups but not fruits, vegetables, or whole grains. Homelessness decreased the odds of purchasing most healthy food groups. Utilization of food pantries increased the odds of purchasing less healthy food groups. Results provided a background of where to focus nutrition education for low-income households and possibly prevent obesity.

A qualitative study regarding health needs assessment of refugees who resettled in San Diego, California included 40 in-depth interviews with refugees, representatives from voluntary resettlement agencies, personnel of mutual assistance agencies, and health care providers.[26] Trained interpreters conducted the interviews that were audio taped, transcribed into text, and then translated into English. The study was not designed to focus on nutrition, but nutritional issues emerged. Unhealthy weight gain was one of the most frequently reported nutrition related themes. Reasons given for this weight gain included the kinds of foods that are readily available in the U.S. and the ease of consuming too much food and making poor food choices. Many of the refugees had starved in the past and did not know how to handle the amount and type of food available in the U.S. Refugees also expressed concern over children eating more fast food instead of the food parents prepared at home. A lack of the availability of foods refugees were accustomed to in their native country was also a reported concern. The lower income neighborhood environments negatively affected physical exercise and probably contributed to weight gain. These in-depth interviews showed some of the possible contributors to overweight seen in refugees.

While refugees may arrive in the USA undernourished, many become overweight after a period of time. Hervey and colleagues evaluated the impact of arrival age and weight of 69 African refugee children on subsequent weight gain.[27] In particular, they wondered if refugees had a greater risk of obesity based on the fetal programming theory, a metabolic predisposition towards energy conservation when children are conceived during famine. Fifty-seven percent of underweight children reached a normal weight within 1.3 years of arrival and only two percent of normal weight children became at risk for overweight. On the other hand, children who were overweight upon arrival in the United States remained overweight. A multivariate model showed a trend that children aged 6-12 years upon arrival were more likely to become overweight over time compared to children less than six years old, but these results were not statistically significant.

A school-based cross-sectional study compared food and weight-related patterns and behaviors of 649 Hmong adolescents to 2,260 white adolescents who participated in Project EAT (Eating Among Teens).[28] Male Hmong adolescents were significantly more likely to be at risk for overweight or overweight compared to white adolescents. A significant difference existed in the BMI of US-born male Hmong adolescents and foreign-born male Hmong adolescents. Twenty-nine percent of US-born male adolescents had a BMI $\geq 95^{th}$ percentile compared to 13 percent among the foreign-born ($p<0.006$). Another study of 68 Hmong children living in Minnesota showed a significant difference between the percent of children with BMI $\geq 85^{th}$ percentile of those born in the US and those born in Thailand or Laos (63% compared to 19%).[29]

**Literature Review Conclusion**

Research has shown that resettled refugees face challenges in obtaining and eating a healthy diet. Food insecurity has been found to be high among refugees and puts them at risk for poor nutrition and further health-related complications. Refugees have minimal resources to meet the basic needs of life and unique challenges adapting to their new culture. The acculturation process has a large influence on dietary patterns, and the adoption of poor American lifestyles. The prevalence of overweight has been found to be high among some refugee populations and puts them at higher risk for developing chronic diseases such as diabetes. Studies have identified a gap in nutrition related resources for refugee populations. This literature review supports the need for further development of nutrition education materials and programs for refugees to support healthy nutrition.

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# CHAPTER 2

# EVALUATION OF A COLLABORATIVE TRANSFERABLE MODEL OF PROVIDING NUTRITION EDUCATION TO REFUGEES

## Abstract

Recently resettled refugees are at high risk for food insecurity and could benefit from nutrition education. This pilot study evaluated the feasibility of integrating nutrition lessons into English as a Second Language (ESL) classes at a work-site training center for refugees. With the assistance of ESL teachers, nutrition education assistants (NEAs) from the Supplemental Nutrition Assistance Program (SNAP) taught nutrition lessons to 98 refugees from 17 different countries for 12 weeks. Food purchase receipts were gathered to evaluate feasibility in assessing food expenditures of this population. Fifty percent (49/98) of the refugees completed all 12 lessons. Receipts were collected from 59 different participants and 93% (55/59) of the participants had receipts that used SNAP funds. Receipts reflected food purchased from supermarkets and ethnic food stores by 92% (54/59) and 59% (35/59) of the participants. The model of delivering nutrition education through ESL classes addressed barriers refugees face. Further research is needed to develop culturally sensitive nutrition education and assessment tools for refugees.

## Background

A refugee is a person who "owing to a well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political

opinion, is outside the country of his nationality, and is unable to, or owing to such fear, is unwilling to avail himself of the protection of that country."[1] The United States resettled 74, 654 refugees from 73 different war-torn countries with the majority coming from Bhutan (13,317), Burma (18,295), and Iraq (18,709) in 2009.[2] The goal of the Office of Refugee Resettlement (ORR) is to provide resources for refugees to become self-sufficient within a short time after arrival.

Refugees arrive with limited financial resources and English skills. They struggle to obtain adequate nutritious foods in a safe and socially accepted manner. High rates of food insecurity have been reported among recently resettled refugees.[3,4,5] Seventy-two percent of 35 refugees from Somalia resettled in Maine reported food insecurity.[6] The consequences of food insecurity include nutrition deficiencies, higher rates of chronic diseases, higher risk of being overweight, and overall decreased well-being.[7] Refugees face several challenges that may contribute to food insecurity including low income, difficulty in obtaining employment, cultural barriers, and language challenges. In a survey of 281 resettled refugees, there was a significant difference in food insecurity between income levels less than $500 per month (72%) and income greater than $2000 per month (13%).[8] While income level has a large influence on food insecurity, other factors also play a role. In interviews with recently resettled refugees from Liberia, higher levels of child hunger were associated with difficulty in identifying foods in the store and lack of knowledge of how to prepare non-Liberian food recipes.[9] Decreasing food insecurity in refugee populations is a public health interest and involves more than increasing income. Food budgeting, identifying healthy foods, and learning how to

prepare new foods all need to be part of the focus of nutrition education programs for refugees.

Federally funded nutrition education programs have been found to be effective in decreasing family food expenditures, increasing food security, and improving nutrient intake.[10] Refugees could benefit from these nutrition education programs. During in-depth interviews conducted in San Diego, refugees reported concerns regarding nutrition-related health issues including overweight and diabetes.[11] Higher rates of obesity and diabetes have been reported in the refugee population.[12,13] Nutrition education programs aim to decrease food insecurity and prevalence of chronic diseases.

The ORR provides funds for programs to support the integration of refugees through organizations such as the Department of Workforce Services (DWS) and agencies that provide English as Second Language (ESL) classes. Through the DWS, refugees have access to the Supplemental Nutritional Assistance Program (SNAP). The SNAP program operates under the United States Department of Agriculture (USDA) and is run through DWS, land-grant universities, and public health agencies. SNAP-Ed is the division that provides nutrition education for persons qualifying for SNAP services. The goal of SNAP-Ed is to provide nutrition education for low-income families to help them make healthy choices within limited budgets. While refugees usually meet criteria for SNAP, there are challenges in obtaining nutrition education services: conflicting work hours, lack of transportation, lack of childcare, low literacy, cultural differences, and language barriers. Nutrition education programs serving refugees must consider these challenges. Limited nutrition education programs exist that address the specific needs of refugees.[14]

In October of 2009, a partnership coordinated through the Utah Refugee Service Office was formed with DWS, a worksite-training center, and a local school district to provide job skills training and English language classes for refugees in Salt Lake City, Utah. This partnership has provided refugees with tools and resources to overcome the barriers of unemployment and limited English skills that contribute to food insecurity. While improving job skills and language skills are important, obtaining nutrition education is another key element in decreasing food insecurity and its consequences.[15] Nutrition education classes focused on the specific needs of refugees are warranted.

Little research has been done on effective methods of nutrition education delivery to refugees and evaluation tools are limited.[16] Refugees are eligible for SNAP-Ed and participate in ESL classes as part of the resettlement process. The objective of this study was to develop a transferrable model of providing nutrition education for recently resettled refugees. This pilot study investigated the feasibility of integrating SNAP-Ed nutrition lessons into ESL classes taught at a work-site training program. It also assessed if information obtained from food purchase receipts might be used as an evaluation tool. Assessment of barriers to refugees receiving nutrition education was used to establish content validity of the model.

## Methods

This study was conducted from February 2011 to May 2011 in a worksite- training program for recently resettled refugees and approved by the Utah State University Institutional Review Board. At the beginning of the study, 98 refugees from 17 different countries were enrolled in the work site- training program. Refugees participated in the

work-site training program for 12 months. Refugees would enter and exit the program continuously. The integration of nutrition education lessons into ESL classes for refugees required three main steps: 1) collaboration of organizations, 2) delivery of nutrition education lessons in a method to address barriers identified in the literature and an exploratory evaluation, and 3) evaluation of food purchase receipts.

**Collaboration**

The integration of nutrition education classes into ESL classes for refugees required collaboration with three different organizations: SNAP-Ed program, worksite-training center, and ESL program (see Figure 1). The common goal for the organizations was to provide refugees with skills to become self-sufficient. The SNAP-Ed program operated through the land-grant university Extension Services funded two designated nutrition education assistants (NEAs) to teach the nutrition classes to refugees at the worksite-training center. The NEAs had been trained to teach nutrition courses to persons with a low income and low literacy. The SNAP-Ed nutrition curriculum served as a basis for the lessons. Supplies for cooking demonstrations were provided by the SNAP-Ed program and the worksite-training center. ESL teachers designated for each class assisted the NEAs and provided feedback on how to teach concepts to refugees with limited English skills. The worksite-training center provided the facility and paid wages to refugees as part of ESL job skills training.

**Nutrition Education Classes**

Ninety-eight refugees were divided into four groups based on English skill levels: (1 = 24 participants, 2 = 23 participants, 3 = 25 participants, 4 = 26 participants). Those

in the lowest level were not literate in their native language while those in the highest level were literate in their native language. Each day the refugees spent four hours in ESL training totaling 20 hours per week. For 12 weeks, NEAs provided one-hour nutrition lessons during ESL classes. ESL teachers were present during the nutrition instruction to provide assistance in teaching concepts at the appropriate level.

Nutrition lessons included food safety, grains, fruits and vegetables, protein, and dairy. Information typically taught in one lesson for other SNAP-Ed participants was divided into two lessons to adjust to the needs of the refugees. Cooking demonstrations and budgeting concepts were incorporated into each lesson. Recipes were based on simple low-cost ingredients. Participants were able to taste new foods each week.

**Evaluation**

The SNAP-Ed program had evaluation tools and was required to document defined parameters. This included the SNAP-Ed Food Frequency Questionnaire-2011 (FFQ), behavior checklist, and class participant form. Adaptations were made to these forms for refugees to complete. Instead of the individual participants completing the FFQ, NEAs familiar with the form interviewed the participants and used pictures of food from a picture-sort food frequency.[17] Then based on the refugee responses, the NEAs assisted the refugees in filling out the FFQ. The behavior checklist was completed for the highest English level. Information required for the class participant form was taken from ESL class rolls. Data included gender, ethnic background and country of origin, qualification for food stamps, and number of lessons attended. Table 2-1 lists gender and country of origin. NEAs recorded reflections after each nutrition lesson.

**Food Purchase Receipts**

The feasibility of using food purchase receipts for an evaluation tool was assessed. Participants were asked to bring receipts from all food purchases 1 week before nutrition lessons started, the first 3 weeks of nutrition lessons, the last 3 weeks of nutrition lessons, and 1 week after completion of nutrition lessons. Participants turned receipts into a designated envelope available daily at the work-site training facility. Receipts were sorted by week of food purchase for each participant. Food expenditures were recorded per week. The types of stores where food was purchased were categorized by supermarket, ethnic food store, fast food, and convenience store. Whether or not receipts from each participant reflected a purchase using the federally funded nutrition programs SNAP and Women, Infants, and Children (WIC) was identified. Foods listed on the receipts were entered into a database to be used for future development and validation of nutrition evaluation tools for recently resettled refugees.

**Barriers**

During an exploratory evaluation, barriers to providing nutrition education to refugees were identified. Directors of a community center and a school with ESL classes for refugees were contacted. Two pilot nutrition classes were taught at one of the community centers. Refugees at the community center had different levels of English skills, which made adapting the material difficult. There was also lack of consistency of refugees who participated in the ESL program due to work schedule conflicts and childcare challenges. Observations of ESL classes were conducted to identify potential delivery methods and assessment tools. Pictures were needed to identify foods and illustrate concepts. The integration of nutrition lessons into ESL classes at the worksite-

training center addressed the barriers identified in the exploratory assessment and literature review (see Table 2-2).

## Analysis

Data was collected and entered into PASW Statistics v 18, SPSS Inc., Chicago, IL, 2010. Descriptive statistics were used to analyze nominal data from the participant forms. Receipts for food purchases outside of the defined time frame were not included in the analysis. The collaboration was evaluated based on how it addressed the barriers to refugees obtaining nutrition education and reflections from the NEAs. The food expenditure data was coded according to whether or not the participant turned in a receipt for food purchased 1 week prior to classes, the first 3 weeks of classes, the last 3 weeks of classes, and the week after classes. Frequencies were done to describe the types of stores where food was purchased and if the receipts reflected SNAP and WIC purchases. Comparison before and after nutrition education lessons was not done due to lack of receipts turned in after completion of nutrition education classes.

## Results

Fifty percent (49/98) of the participants completed 12 nutrition education lessons and another 17% (17/98) completed 11 lessons. Seventeen of the participants finished the work-site training program before the 12 nutrition lessons were given. When these participants left the program, new participants entered. Information for new participants was not included because a letter of information was not obtained. Thus the final participation rate for the entire 12 weeks was 50% (N=49). Of these participants, 57%

(28/49) were female and 43% (21/49) were male. All of the participants qualified for SNAP and 78% (38/49) used SNAP benefits to purchase food.

Receipts were collected from 60 participants. One participant's receipts were excluded because receipts were for food purchased outside of the defined time frame. Receipts identified food purchased by 25 of the participants 1 week prior to nutrition lessons, 49 of the participants the first 3 weeks of lessons, 18 of the participants the last 3 weeks of lessons, and 2 participants 1 week after lessons were completed. Ninety-three percent (55/59) of participants turned in receipts that identified use of SNAP funds, and only 15% (9/59) turned in receipts that identified use of WIC funds. Receipts identified 92% (54/59) of participants purchased foods from supermarkets. Fifty-nine percent (35/59) of participants had receipts for food purchased at ethnic food stores. Two and one of the participants turned in receipts from fast food and convenience stores. There were 211 different foods identified on the receipts (see Table 2-3). The list included foods not common in the typical American diet such as vermicelli, cassava, and beef heart.

## Discussion

The collaboration of the worksite-training center, ESL program, and SNAP-Ed provided nutrition education to refugees in a structured and consistent environment. This model addressed some of the contributors to food insecurity for refugees: employment, language, and nutrition education.[4] Since refugees were required to attend the ESL classes where the nutrition lessons were integrated as part of the work-site training program, there was more consistency with participation and work hours did not conflict. However, attrition was still a problem in comparing pre and post data. The division of

refugees into different English levels helped in being able to adapt the lessons to the appropriate level.

Since the refugees came from 17 different countries and interpreters were not readily available, the material was not delivered in their native language. However the refugees received the nutrition lessons with the assistance of certified ESL teachers. Pictures, taste tests, and cooking demonstrations were used to overcome some of the language barriers. Comments from the NEAs reflections included examples of when the ESL teachers helped explain concepts.

There were also cultural differences regarding food and nutrition unique to each refugee depending on his or her country of origin, religious background, and past experience. A program specialist from the Utah Office of Refugee resettlement provided cultural training for the NEAs. While some of the cultural differences were recognized by the NEAs, the nutrition lessons were presented for a more general audience. The ESL instructor also coached the NEAs in presenting concepts in a culturally sensitive manner. The use of food demonstrations and taste testing helped address some of the cultural barriers. In a focus group study of women from Somali, cooking demonstrations and food tasting were noted to be desired methods of learning.[18] The NEAs also took into consideration religious practices regarding use of animal products and fasting when preparing the cooking demonstrations and taste tests.

The SNAP-Ed Program behavior checklist was determined to be too complex by the ESL teachers and NEAs to administer to the participants in the level 1, 2, and 3 classes. The participants in the level 4 class attempted to complete the behavior checklist, but also found it challenging due to language and cultural barriers. Although the

information was not quantifiable, the comments matched previous research where refugees reported concern about weight.[19] When asked about what they liked about the class, one refugee said, learning about fat. Another refugee expressed interest in learning more about weight control and exercise.

It was difficult to identify measurable outcomes due to the lack of validated measurement instruments for nutrition education programs for refugees. Assessing nutrient intake and food related behavior of participants in SNAP-Ed needs to be easy to administer, have a low response burden, and be meaningful.[16] The integration of nutrition education lessons into ESL classes for refugees is an effective model for delivering nutrition education to refugees. It addresses the food insecurity contributors of employment, language skills, and nutrition education.

Although collection of receipts has been found to underestimate food purchases in previous studies, it had not been tested as a method of assessment among refugees.[10] This study did demonstrate refugees were able to bring receipts with minimal explanation and no incentive. Comparison between food purchases before and after nutrition classes was not done because of the lack of receipts received at the end of the study. There also was not always a clear distinction between food and non-food purchases. Further information was needed to adequately assess food expenditures.

Not all foods may have been captured on the food list created from the receipts due to lack of ability to identify specific names of foods, especially receipts from ethnic food stores. This food list may be used as a basis for developing and validating a culturally sensitive food frequency questionnaire for refugees. Bilingual refugees and experts working with refugees need to establish face validity for the use of food receipts as an

evaluation tool. Interviews with refugees could help narrow the list of foods for easier administration and less response burden.

Parameters in future research using food purchase receipts need to identify how many people live in the household and the age of persons for which food is being purchased. Focus group interviews could be conducted to validate information obtained from receipts and identify other sources of food such as gardens and friends.

While this study was conducted in Utah, elements are transferable to other SNAP-Ed programs. Extension specialists may use this model to develop collaborations with ESL programs and reach more refugees. A network of Extension SNAP-Ed Directors working in areas with refugees may be developed to share evaluation tools and curriculum. This group meets annually and conducts conference calls throughout the year. The topic of refugee nutrition is an exciting topic and the model of integrating nutrition education with ESL classes is of interest. The picture-sort food frequency may be further adopted and validated for use in refugee populations across the country to provide needed evaluation tools.

Not all ESL programs for refugees are integrated into a worksite training program. Therefore it is important to consider the frequency and length of time nutrition education classes are taught. Evaluation tools will need to be adapted to measure short-term and long-term nutrition related behaviors. Nutrition lessons will need to be developed so that the lessons do not necessarily build on each other in order to accommodate inconsistent participation. Evaluation of food related behaviors will need to focus on specific aspects of what is being taught. SNAP-Ed classes may need to be assessed at six weeks instead of 12 weeks due to attrition common in this population. Future development of culturally

sensitive education material and evaluation tools may be shared on a website.

Refugees are at high risk for food insecurity and its consequences. Resources for providing nutrition education for refugees are limited. This study provided a transferable model to deliver nutrition education to refugees in a collaborative and efficient manner. It addressed some barriers (see Table 2-2) of becoming food secure specific to refugees. Information gained from food purchase receipts may be used to further develop reliable, valid, and sensitive nutrition evaluation tools for refugees.

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Table 2-1 Demographics of refugees

| **Gender** | |
|---|---|
| Female =28<br>Male=21 | |
| **Country** | **Number of Participants** |
| Bhutan | 11 |
| Burundi | 7 |
| Congo | 6 |
| Iraq | 5 |
| Karenni | 4 |
| Armenia | 2 |
| Burma | 2 |
| Iran | 2 |
| Sudan | 2 |
| Central Africa Republic | 1 |
| Eritrea | 1 |
| Honduras | 1 |
| Mexico | 1 |
| Nepal | 1 |
| Pakistan | 1 |
| Peru | 1 |
| Somalia | 1 |

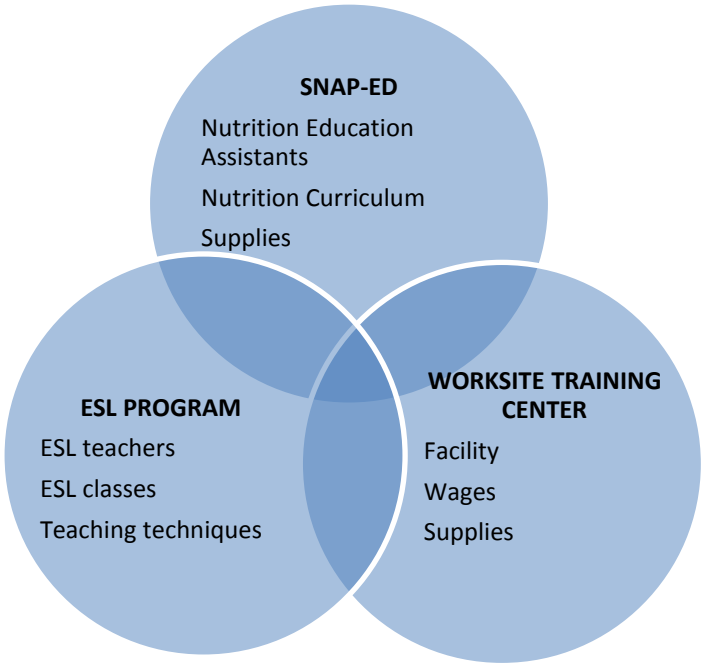
Table 2-2 Barriers to nutrition education and instruments to overcome barriers

| **Barrier** | **Instruments** |
|---|---|
| Conflicting work hours | Nutrition classes taught as part of work training skill development |
| Lack of transportation | NEAs travel to where refugees meet |
| Low literacy | Pictures and certified ESL instructors |
| Cultural differences | Cultural training and certified ESL instructors |
| Language | Certified ESL instructors |
| Food identification | Taste tests and pictures |
| Lack of knowledge of how to prepare food | Cooking demonstrations |

Table 2-3 Food list from receipts

| | | | | |
|---|---|---|---|---|
| Anchovy | Celery | Gai Choy | Onion | Soybean paste |
| Apple | Cereal, Kix | Garbanzo beans | Orange | Soybeans |
| Apple juice | Cereal, Toasted Oats | Garlic | Orange Juice | Spaghetti |
| Applesauce | Cereal, Trix | Ginger Root | Pakasmit | Spinach |
| Apricot | Chayote | Gizzard Hearts | Panela | Splinter Caparid |
| Asian Chili | Cheese, mozzarella | Grapefruit | Papaya Salad | Star fruit |
| Asparagus | Cheetos | Grapes | Parsley | Strawberry |
| Avocado | Chicken | Green jackfruit | Pasta | Sugar |
| Baby formula | Chicken Drums | Green Peppers | Peaches | Sweet Chili Sauce |
| Bamboo | Chicken, deli | Greens | Peanut Butter | Tamarind |
| Bananas | Chile Anaheim | Guava | Peanuts | Tangerine |
| Bean vermicelli | Chile Serrano | Gum | Pear, Barlett | Tea |
| Beef bones | Chili Beans, can | Habanero Pepper | Peas, canned | Thai Chile |
| Beef feet | Chili, dried | Ham | Pediasure | Tilapia |
| Beef ground | Chimchang | Hamburger | Pineapple | Tofu |
| Beef heart | Chinese radish | Honey | Pinto Beans | Tomato Paste |
| Beef ox tail | Chips | Hot dogs | Pistachios | Tomatoes |
| Beef ribs | Cilantro | Ice cream | Pizza | Tortillas |
| Beef roast | Cipolline | Juice, Tampico | Platano | Trout |
| Beef tripe | Clementine | Ketchup | Popcorn | Turmeric |
| Beer | Cocoa mix | Lamb chops | Pork belly | Tuna, can |
| Beets | Coconut | Leeks | Pork hocks | Turnip |
| Black Beans | Coconut juice | Lemon | Pork tongue | Vermicelli |
| Bok choy | Coffee | Lemon grass | Pork, ground | Wai Wai Noodle |
| Bolillios | Condensed milk | Lemon Juice | Portable jelly | Water |
| Bread | Cookies | Lemon Leaves | Potato | Water cress |
| Bread, Focaccia | Corn | Lentils | Pozole | Water, bottled |
| Bread, French | Corn Dog | Lettuce | Pretzels | Watermelon |
| Bread, rolls | Crackers | Lima Beans | Punch | White Bread |
| Brisket | Cream cheese | Limes | Radish | White wine |
| Broccoli | Cucumbers | Ma-Lou | Ramen Noodles | Yampi |
| Brownies | Cupo noodles | Malanga | Rapini | Yogurt |
| Butterfish | Daikon | Mango | Rice | Yogurt, drinkable |
| Buttermilk | Dok Kra Jiew | Milk | Rice noodle | Yucca/Cassava |
| Cabbage | Donut | Minneolas | Rice vermicelli | Zucchini |
| Cake | Éclairs | Mint | Rice, Jasmine | |
| Calab Mexicana | Eggplant | Mushrooms | Roti Canai | |
| Candy Bar | Eggs | Mutton | Salad, green | |
| Cantaloupe | Energy Drink | Ngo Gai | Salt | |
| Capri Sun | Fish | Noodle (Wai Wai) | Sardines | |
| Carnitas | Flour | Noodles | Shallot | |
| Carrots | French Fries | Oatmeal | Shrimp | |
| Catfish | Frog | Oil, salad | Sirloin Tip | |
| Cauliflower | Frozen Dinner | Okra | Soda Pop | |

Figure 2-1 Nutrition Education Collaboration



# CHAPTER 3

# ADAPTING FOOD FREQUENCY QUESTIONNAIRE FOR REFUGEES PARTICIPATING IN NUTRITION EDUCATION CLASSES

## Abstract

Recently resettled refugees are at high risk for food insecurity and its health consequences. This observational study evaluated the effectiveness integrating nutrition lessons into English as a Second Language (ESL) classes at a work-site training center for refugees. The lessons focused on making healthy choices with a limited budget. Through the assistance of ESL teachers, nutrition education assistants (NEAs) from the Supplemental Nutrition Assistance Program (SNAP) taught nutrition lessons to 98 refugees from 17 different countries for 12 weeks. Food frequency questionnaires (FFQ) for 49 participants were matched pre and post 12-weeks of class. A Wilcoxon test was used to determine difference in food intake of fruits, vegetables, meats, whole grains, refined grains, dairy, sugar, fat, and alcohol. No significant difference was found between median intake for fruit, vegetables, whole grains, refined grains, sugar, and alcohol. The median intake of meat (2.5 to 1 servings per day, $p=0.006$), dairy (2.5 to 1 servings per day, $p=0.013$), and fat (1 to 0.7 servings per day, $p=0.01$) significantly decreased. Further research is needed to develop evaluation methods for nutrition education of refugees.

## Introduction

Under the direction of the United Nations High Commission for Refugees (UNHCR), 76,654 refugees were resettled in the United States in 2009 of which 1,265 were placed in Utah.[1] A refugee is defined as " a person who owing to a well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion, is outside the country of his nationality, and is unable to, or owing to such fear, is unwilling to avail himself of the protection of that country."[2] Refugees face a myriad of challenges when resettling into a new country. The U.S. Department of Workforce Services and non-profit resettlement agencies provide support for refugees during the resettlement phase. The goal of these organizations is to provide resources and skills for refugees to become self-sufficient as quickly as possible. Refugees participate in job skills training and English as Second Language (ESL) classes as components of their path to self-sufficiency.

Financial resources are limited and it is difficult for refugees to obtain well-paying jobs; this leads to high rates of food insecurity. [3,4,5,6] In a survey of 281 resettled refugees in Midwestern United States, there was a significant difference in food insecurity between income levels less than $500 per month (72%) and income greater than $2000 per month (13%).[5] While income level has a large influence on food insecurity, other factors also play a role. In interviews with recently resettled refugees from Liberia, higher levels of child hunger were associated with difficulty in identifying foods in the store and lack of knowledge of how to prepare non-Liberian food recipes.[6] Decreasing food insecurity in refugee populations is a public health interest and involves

more than increasing income level. Food budgeting, identifying healthy foods, and learning how to prepare new foods all need to be part of the focus of nutrition education programs for refugees.

Food insecurity and lack of understanding of the new food environment laden with high-fat, high-sugar, and packaged foods creates difficulties for limited English-speaking refugees to make healthy choices. Interviews with 40 refugees resettled in California reported common barriers to health care were transportation, cultural beliefs, acculturation, and language.[7] Many refugees have expressed concern about nutrition related problems, but there are limited resources available to address the specific needs of refugees.[8]

The consequences of food insecurity include nutrition deficiencies, higher rates of chronic diseases, higher risk of being overweight, and overall decreased well-being.[9] The prevalence of hypertension and diabetes has been found to be higher among refugees.[10]

Federally funded nutrition education programs have been found to be effective in decreasing family food expenditures, keeping the family from running out of food before new funds are available, and improving nutrient intake.[11] The Office of Refugee Resettlement provides funds to programs supporting the integration of refugees including the Department of Workforce Services (DWS) and (ESL) classes. Through the DWS, refugees have access to the Supplemental Nutritional Assistance Program (SNAP). The SNAP program operates under the United States Department of Agriculture (USDA) and is run through DWS and land-grant universities. SNAP-Ed is the division that provides nutrition education for persons qualifying for SNAP services. The goal of SNAP-Ed is to provide nutrition education for low-income families to help make healthy choices within

limited budgets. Recently resettled refugees typically qualify for SNAP services. The purpose of this research is to evaluate the effectiveness of nutrition education lessons integrated into ESL classes for recently resettled refugees in making healthy food choices.

## Methods

### Subjects

Participants were recruited using a convenience sample of 101 refugees enrolled in ESL classes as part of a worksite-training program in Salt Lake City Utah. Criteria for participants enrolled in the worksite-training program included greater than 18 years of age, low-income, case managed through a refugee resettlement agency, need to improve English skills, ability to work Monday through Friday 7:00 AM to 4:00 PM, and generally in good health.[12] Participants spent four hours per day in job skill training and another four hours per day in language skills training. The majority, 71% (72/101), of the participants had been in the United States for less than two years prior to enrolling in the work-site training program.[12] Participants came from 17 Asian and African countries and spoke 19 different languages.[12] Prior to arrival in the United States, 40%(40/101) had received one year or less of formal education.[12] Approval for this study was received through the Utah State University Institutional Review Board. SNAP-Ed Program nutrition education assistants (NEAs) informed the participants of the study through assistance of the ESL instructor in each of the classes. All participants received SNAP-Ed nutrition education classes as part of their language skills training, but data was only

reported for those participants who signed a letter of information. Basic demographic information and attendance was obtained as a regular part of the SNAP-Ed Program.

**SNAP–Ed Classes**

Nutrition education was provided by SNAP-Ed conducted through Utah State University Extension. Participants at the worksite training facility met the SNAP eligibility requirements. Each day the refugees spent four hours in ESL training. One day of the week during the four hours of ESL training, NEAs provided one-hour nutrition lessons in English for 12 weeks from February 2011 to May 2011. The classes were divided into groups based on English ability: level 1 (n=24), level 2 (n=23), level 3 (n=25), and level 4 (n=26). The participants in level one group had no previous education and were not literate in their native language. The participants in level four reading group had previous education and were literate in their native language. A few had completed secondary education and had college degrees.

Certified ESL teachers were present during nutrition education classes and assisted the NEAs in teaching nutrition concepts according to the English ability level of the refugees. Lessons were developed using the objectives of the SNAP-Ed curriculum for adults and youth. Topics included food safety, fruits, vegetables, protein, dairy, and grains. Food demonstrations were utilized to introduce new foods and teach preparation techniques. Budgeting concepts were integrated into each lesson. This included identification of different forms of foods, comparative shopping, and menu planning. NEAs met with ESL teachers and discussed different methods to teach concepts. A program specialist from the Utah Refugee Services Office provided training on the cultural background of refugees for the NEAs.

**Food Frequency Questionnaire**

The SNAP-Ed of Utah Food Frequency Questionnaire-2011 (FFQ) was used to obtain dietary intake data. Categories on the FFQ include fruits, vegetables, meats, dairy, whole grains, refined grains, sugars, alcohol, and fat. Frequencies were categorized as: never or less than 1 serving per week, 1 to 3 servings per week, 4 to 6 servings per week, 1 serving per day, 2 to 3 servings per day, 4 to 5 servings per day, and 6 servings per day. NEAs familiar with the FFQ interviewed refugees two weeks before and one week after implementation of nutrition education classes. Pictures from a picture-sort food frequency were used to illustrate the different food categories on the FFQ.[13] Interviewers showed pictures in the different food categories and asked how often the participant ate that food. Then the interviewer assisted the participant in marking the corresponding frequency. Refugees were interviewed grouped according to native language spoken. Persons from the higher English ability levels assisted those in the lower English ability levels.

## Data Analysis

The FFQ data was originally categorized as ordinal data (1= never or less than 1 per week, 2=1 to 3 per week, 3=4 to 6 per week, 4=1 per day, 5=2 to 3 per day, 6=4 to 5 per day, 7=6 per day). Then the data was recoded into ratio data (1=0(0/7), 2=0.3(2/7) 3=0.7(5/7), 4=1, 5=2.5, 6=4.5, 7=6 serving per day) by converting food intake servings per week to food intake servings per day. The midpoint of the number of servings per week was divided by 7 days per week. For the number of servings per day, the midpoint value was used. Pre and post class FFQ data were matched. Data was analyzed using

PASW Statistics v 18, SPPS Inc., Chicago, IL, 2010. Distribution of the data was assessed using frequencies and histogram charts. The data was found to be nonparametric, thus the Wilcoxon Signed Ranks test was used to measure the difference between diet intake before and after nutrition education classes.

Analysis of variance test was not used to determine if there was significant difference of food intake between the four different English ability groups because the sample size of each of the groups was less than 30.

## Results

FFQ were completed by 87% (85/98) of participants prior to the start of the 12-week nutrition education classes. The mean attendance was 10 nutrition classes; 50% (49/98) of the participants attended all 12 sessions and 17% (17/98) attended 11 of the classes. Pre and post FFQs were matched for 49 participants (level 1=9, level 2=14, level 3= 12, level 4=14). Seventeen of the participants finished the work-site job-training program before receiving all 12 nutrition education classes and thus did not complete post data. As people left the program, new people participated in the nutrition education classes; however, food frequency information from these people was not included in this study. Participants came from 17 different countries (see Table 3-1). Fifty-seven percent (28/49) of the participants were female and 43% (21/49) were male. While all participants qualified for SNAP, 22% (11/49) reported that they did not receive SNAP benefits.

The results of the FFQ are found in Table 3-2. Prior to nutrition education classes, the median intake of fruits and vegetables was 2.5 and 2.5 servings per day respectively.

There was no significant difference in intake of fruits (1 serving per day) and vegetables (2.5 servings per day) after the nutrition education classes. While there was not a significant difference of intake overall for whole grains before and after nutrition education classes, there was a decrease from 18 to 10 in the number of participants who reported zero intake. There was not a significant change in the reported intake of refined grains. Median intake of alcohol intake before and after nutrition classes was 0 drinks per day. The median intake of meat significantly decreased from 2.5 servings per day to 1 serving per day. Dairy intake significantly decreased from median intake of 2.5 servings per day to 1 serving per day. Fat intake also significantly decreased from median intake of 1 serving per day to 0.7 serving per day.

## Discussion

The participants represented the demographics of recently resettled refugees in Utah.[1] However, they may have been different than other refugees because they were enrolled in the worksite -training program and were able to consistently attend the nutrition education classes. Thus results of this study may not apply to all nutrition education programs for refugees.

The USDA recommends fruit intake of 1.8 servings per day and vegetable intake of 2.6 servings per day.[14] The participants in this study met the recommended servings of fruit and vegetable intake. The traditional diet of some refugee populations focuses on fruits and vegetables, which may explain why fruit and vegetable intake for the refugees in this study was above the U.S. average intake of other low-income persons of 0.96 servings per day of fruit and 1.43 servings per day of vegetables.[14]

The nutrition curriculum included lessons on fat, and the cooking demonstrations emphasized low-fat cooking which may have influenced the decrease in fat intake. However, the decrease in meat, milk, and fat intake may have been related to the FFQ itself. There has not been a validated FFQ for the refugee population. Refugees may not have been able to identify the foods prior to the nutrition classes and over reported intake and the decrease after was a result of actually being able to identify the foods. Pictures were used when administering the FFQ; however, the pictures may not have included foods refugees commonly eat. Further research is needed to develop a validated food intake assessment tool for refugees and include foods they are more likely to eat.

Providing nutrition education for recently resettled refugees has some unique challenges. Previous research regarding nutrition education has focused on specific refugee populations.[15,16,17] The participants in this study were from 17 different countries and access to interpreters was limited. The SNAP-Ed nutrition education curriculum was written for low-income and low-literacy populations; however, it was not validated for cultural sensitivity in the refugee population. Though access to interpreters and culturally sensitive material was limited, the combination of the NEAs and ESL teachers helped overcome some of these barriers. Material focused on issues all of the refugee groups had in common: limited prior exposure to packaged foods, lack of availability of familiar foods in the resettled country, learning how to prepare new foods, and learning to implement food safety techniques.[4,3,5]

Budgeting concepts were integrated into the curriculum; however, it was difficult to assess the effectiveness. Refugees have limited experience in managing money and often do not understand the different values associated with money. Specific

measurement tools need developed to assess understanding and practice of budgeting concepts.

## Implications for Research and Practice

Combining SNAP-Ed nutrition lessons and ESL classes is a unique approach. Resources for recently resettled refugees are limited, and combining nutrition education with ESL classes is an opportunity to maximize the use of funds and resources. Training members of each refugee community to teach nutrition education lessons could be an effective way to bridge the cultural and language barriers. A study in Minnesota focused on the Somali refugee population and recommended that women educators teach women and if possible women from the Somali community.[18] Programs could be created to train refugee community members to be NEAs to their own communities.

Further research needs to be done to adapt SNAP-Ed curriculum and to develop valid measurement instruments regarding nutrition education for refugees. Federally funded nutrition education programs such as SNAP-Ed would benefit from effective evaluation tools. The process for developing and validating nutrition measurement tools is rigorous and involves multiple phases. In particular, evaluation instruments for SNAP-Ed need to be brief, easy to administer, and focus on low-literacy levels.[19] The validation process for evaluation instruments used for refugees may include content validity, face validity, internal consistency, convergent validity, criterion validity, and sensitivity.

The process of creating a culturally sensitive FFQ assessment tool for refugees would require several steps. First of all, experts working with refugees would determine content validity in a FFQ and nutrition behavior questionnaire for recently resettled

refugees. A review of the literature would also be used to determine content validity and ensure specific areas of concern for refugees are evaluated in the measurement instruments. The next step would be to test face validity of the FFQ and nutrition behavior questionnaire to evaluate if the instruments ask the questions in a manner understood by the refugees.

The process described in assessing the face validity of a food behavior checklist for Spanish speakers may be used as a model.[20] This study used native Spanish bilingual speakers with expertise in the field of nutrition to evaluate the translation of the food behavior checklist. Cognitive testing was done for the text and photographs. Modifications were made to ask questions in a different format. Photographs were changed to include more familiar foods and cultural practices. Words were eliminated and replaced with photographs to adapt for low-literacy. Some challenges using this model to assess face validity for recently resettled refugees will be finding bilingual speakers with expertise in the field of nutrition and adapting the instrument for several different cultural backgrounds. A stratified sample in a focus group setting would help represent the different cultural backgrounds of refugees.

The assessment of dietary intakes of Filipino-Americans may be used as another model for improving face validity of nutrition measurement instruments among refugees.[21]A focus group of 35 Filipino-Americans were asked questions about food consumption practices and also rated the Fred Hutchison Food Frequency Questionnaire. This study identified foods commonly eaten by Filipino-Americans that were not included in the food list. Focus group interviews and inventory of food in refugee homes would improve the list of foods in a FFQ for refugees.

The typical method for establishing convergent validity in a FFQ is to compare the results of 24-hour dietary recall with the foods listed in the food frequency. The lack of translators and low-literacy in native language proposes a challenge in completing 24-hour dietary recalls in the refugee population. The typical 24-hour dietary recall may be adapted by capturing intake through photographs.

Criterion validity uses a biomarker such as hematocrit and compares this to intake of iron containing foods. Common confounding factors that influence biomarkers would need to be evaluated for refugees before criterion validity could be established.

Finally, sensitivity is tested to see if the evaluation tool does detect changes in food related behavior and nutrition status. This would require a longitudinal design where two independent methods are used to measure change and the results compared.

Developing valid nutrition evaluation tools for recently resettled refugees has many challenges. However, there are different models that could be utilized in creating new evaluation tools. New assessment tools could benefit program development in refugee nutrition education and help decrease food insecurity and development of nutrition-related chronic diseases.

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Table 3-1 Refugees and Native Country

| **Country** | **Number of Participants** |
|---|---|
| Bhutan | 11 |
| Burundi | 7 |
| Congo | 6 |
| Iraq | 5 |
| Karenni | 4 |
| Armenia | 2 |
| Burma | 2 |
| Iran | 2 |
| Sudan | 2 |
| Central Africa Republic | 1 |
| Eritrea | 1 |
| Honduras | 1 |
| Mexico | 1 |
| Nepal | 1 |
| Pakistan | 1 |
| Peru | 1 |
| Somalia | 1 |
| **Total** | 49 |

Table 3-2 Food Frequency Questionnaire Responses Before and After 12- Week Nutrition Education Classes for Refugees

| | Servings Per Day | Pre Frequency | Post Frequency | Z | p value |
|---|---|---|---|---|---|
| Fruit | | Median=2.5 servings/day | Median=1 serving/day | -0.286 | 0.775 |
| | 0.3 | (4/49) 8% | (1/49) 2% | | |
| | 0.7 | (4/49) 8% | (4/49) 8% | | |
| | 1 | (13/49) 27% | (23/49) 47% | | |
| | 2.5 | (26/49) 53% | (18/49) 37% | | |
| | 4.5 | (2/49) 4% | (2/49) 4% | | |
| | 6 | | (1/49) 2% | | |
| Vegetables | | Median=2.5 servings/day | Median=2.5 servings/day | -0.264 | 0.792 |
| | 0 | (2/49) 4% | (2/49) 4% | | |
| | 0.3 | (2/49) 4% | (2/49) 4% | | |
| | 0.7 | (2/49) 4% | (2/49) 4% | | |
| | 1 | (11/49) 22% | (10/49) 20% | | |
| | 2.5 | (27/49) 55% | (28/49) 57% | | |
| | 4.5 | (5/49) 10% | (3/49) 6% | | |
| | 6 | | (2/49) 4% | | |
| Meat | | Median=2.5 servings/day | Median=1 serving/day | -2.48 | 0.013* |
| | 0 | | (1/49) 2% | | |
| | 0.3 | (4/49) 8% | (4/49) 8% | | |
| | 0.7 | (5/49) 10% | (9/49) 18% | | |
| | 1 | (10/49) 20% | (21/49) 43% | | |
| | 2.5 | (28/49) 57% | (13/49) 27% | | |
| | 4.5 | (2/49) 4% | (1/49) 2% | | |
| Dairy | | Median=2.5 servings/day | Median=1 serving/day | | 0.006* |
| | 0 | (2/47) 4% | (2/49) 4% | | |
| | 0.3 | (5/47) 11% | (11/49) 22% | | |
| | 0.7 | | (4/49) 8% | | |
| | 1 | (12/47) 26% | (16/49) 33% | | |
| | 2.5 | (27/47) 57% | (15/49) 31% | | |
| | 4.5 | (1/47) 2% | (1/49) 2% | | |
| Whole Grain | | Median=0.3 serving/day | Median=0.3 serving/day | -0.206 | 0.837 |
| | 0 | (18/46) 39% | (10/48) 21% | | |
| | 0.3 | (7/46) 15% | (15/48) 31% | | |
| | 0.7 | (3/46) 7% | (9/48) 19% | | |
| | 1 | (10/46) 22% | (7/48) 15% | | |
| | 2.5 | (7/46) 15% | (7/48) 15% | | |
| | 4.5 | (1/46) 2% | | | |
| Refined Grains | | Median=2.5 servings/day | Median=2.5 servings/day | -0.394 | 0.693 |
| | 0 | (5/47) 11% | (2/48) 4% | | |
| | 0.3 | (4/47) 9% | (9/48) 19% | | |
| | 0.7 | (3/47) 6% | (3/48) 6% | | |
| | 1 | (7/47) 15% | (6/48) 13% | | |
| | 2.5 | (25/47) 53% | (26/48) 54% | | |
| | 4.5 | (2/47) 4% | (2/48) 4% | | |
| | 6 | (1/47) 2% | | | |
| Sugar | | Median=0.7 serving/day | Median=1 serving/day | -1.2 | 0.23 |
| | 0 | (6/47) 13% | (8/47) 17% | | |
| | 0.3 | (16/47) 34% | (5/47) 11% | | |
| | 0.7 | (2/47) 4% | (5/47) 11% | | |
| | 1 | (9/47) 19% | (12/47) 26% | | |
| | 2.5 | (11/47) 23% | (13/47) 28% | | |
| | 4.5 | (2/47) 4% | (4/47) 9% | | |
| | 6 | (1/47) 2% | | | |
| Alcohol | | Median=0 servings/day | Median=0 servings/day | -0.046 | 0.963 |
| | 0 | (42/48) 88% | (42/49) 86% | | |
| | 0.3 | (4/48) 8% | (5/49) 10% | | |
| | 0.7 | | (1/49) 2% | | |
| | 1 | (1/48) 2% | (1/49) 2% | | |
| | 2.5 | (1/48) 2% | | | |
| Fats | | Median=1 serving/day | Median=0.7 serving/day | -2.538 | 0.011* |
| | 0 | (3/48) 6% | (4/49) 8% | | |
| | 0.3 | (9/48) 19% | (17/49) 35% | | |
| | 0.7 | (3/48) 6% | (4/49) 8% | | |
| | 1 | (14/48) 29% | (17/49) 35% | | |
| | 2.5 | (18/48) 38% | (5/49) 10% | | |
| | 4.5 | (1/48) 2% | (2/49) 4% | | |

*Wilcoxon Sign Ranked Test significant ($p<0.05$) pre versus post FFQ

# CHAPTER 4

# CONCLUSION

Refugees continue to be resettled in the United States and face a myriad of challenges. The U.S. Department of Workforce Services and non-profit resettlement agencies provide support for refugees during the resettlement phase. The goal of the Office of Refugee Resettlement (ORR) is to provide resources for refugees to become self-sufficient within a short time of arrival. Refugees participate in job skills training and English as a Second Language (ESL) classes as components to their path to self-sufficiency.

Refugees arrive with limited financial resources and English skills. Higher rates of food insecurity have been found among resettled refugees. [1,2,3] The consequences of food insecurity include higher rates of overweight and obesity and nutrition-related chronic diseases. There is a public concern with the higher prevalence of diabetes and hypertension seen among the refugee population.[4] Refugees face several challenges that may contribute to the higher rates of food insecurity and nutrition-related chronic diseases.

Decreasing food insecurity in refugee populations is a public health concern and involves more than increasing income level. Federally funded nutrition education programs such as Supplemental Nutrition Assistance Program (SNAP) have been found to be effective in decreasing food insecurity and improving nutrient intake. However, little research has been done regarding effective methods to provide nutrition education to

the refugee population. There is a lack of validated culturally sensitive nutrition assessment tools for refugees.

This study demonstrated a transferrable model to provide nutrition education to refugees. The integration of nutrition education classes into English as a Second Language (ESL) classes at a worksite -training center decreased some of the barriers for refugees to receive nutrition education. The collaboration of Supplemental Nutrition Education Program-Education (SNAP-Ed), ESL program, and worksite training center maximized use of limited resources for supporting resettlement of refugees. The nutrition educator assistants (NEAs) were able to adapt nutrition lessons for the appropriate English ability level through the assistance of certified ESL teachers. The worksite-training center provided a facility for the nutrition education classes, and NEAs were able to travel to the location. This eliminated the barriers of conflicting work hours and lack of transportation for the refugees. Cooking demonstrations and taste tests addressed the barriers of food identification and lack of knowledge of how to prepare new foods.

Fifty percent (49/98) of the participants completed 12 nutrition education lessons. Of these participants, 57% (28/49) were female and 43% (21/49) were male. All of the participants qualified for SNAP and 78% (38/49) used SNAP benefits to purchase food. Participants came from 17 Asian and African countries and spoke 19 different languages.

Receipts identified food purchased by 25 of the participants one week prior to nutrition lessons, 49 of the participants the first three weeks of lessons, 18 of the participants the last three weeks of lessons, and two participants one week after lessons were completed. Ninety-three percent (55/59) of participants turned in receipts that identified use of SNAP funds, and only 15% (9/59) turned in receipts that identified use

of Women, Infant, Children (WIC) funds. Receipts identified 92% (54/59) of participants purchased foods from supermarkets. Fifty-nine percent (35/59) of participants had receipts for food purchased at ethnic food stores. Two and one of the participants turned in receipts from fast food and convenience stores. There were 211 different foods identified on the receipts.

Prior to nutrition education classes, the median intake of fruits and vegetables was 2.5 and 2.5 servings per day. There was no significant difference in intake of fruits and vegetables after the nutrition education classes. The median alcohol intake before and after nutrition classes was 0 drinks per day. The median intake of meat significantly decreased from 2.5 servings per day to 1 serving per day. Dairy intake significantly decreased from median intake of 2.5 servings per day to 1 serving per day. Fat intake also significantly decreased from median intake of 1 serving per day to 0.7 serving per day.

Outcome measurements for this study were limited and validated instruments were not available. Little research has been done regarding nutrition education programs for recently resettled refugees. There is a paucity of evaluation tools of nutrition education programs and further development is warranted.[5]

Previous research has been done with specific refugee populations. The participants in this study were from 17 countries and spoke 19 languages. This made validation of the results difficult. However, certified ESL teachers were integral in overcoming some of the literacy and language barriers. Future studies could use stratified focus groups to establish validity of evaluation tools.

Overall, the integration of nutrition education into ESL classes for refugees is a transferrable model. As part of the resettlement process refugees participate in ESL

classes and qualify for SNAP-Ed. Further development and validation of the picture sort food frequency questionnaire will be available for SNAP-Ed programs in different states. Collaboration with ESL teachers and Extension specialists working with SNAP-Ed will enhance the delivery of nutrition education to more diverse populations.

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# APPENDIX

Participant Initials _____
Participant B Day Month _____

# Food $ense Food Frequency Questionnaire-2011

Before ○
After ○

Instructions: Please report about how often you usually ate the following in the **previous month.** If you did not eat a certain food at all during the specified period, please fill in the bubble that corresponds to the **"never"** category. Please do not leave any item blank. The response choices are listed below:

| | Never or less than 1 per week | 1-3 per week | 4-6 per week | 1 per day | 2-3 per day | 4-5 per day | 6 per day | |
|---|---|---|---|---|---|---|---|---|
| **FRUITS (includes juices, fresh, canned, frozen or dried)** | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |

**Red:** cherries; cranberries; pink grapefruit; pomegranates; raspberries; apples; grapes; strawberries; watermelon
**Orange:** apricots; cantaloupe; grapefruit; lemons; mangos; nectarines; oranges; papayas; peaches; pineapple; tangerines; yellow apples
**Green**: avocados; green apples; grapes; honeydew; kiwi; limes
**Blue/Purple:** blackberries; blueberries; elderberries; black currants; plums; prunes; grapes; raisins
**White:** bananas; pears

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **VEGETABLES (includes juices, fresh, canned, frozen or dried)** | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |

**Red:** beets; red lettuce; red onions; red peppers; red potatoes; rhubarb; tomatoes; salsa
**Orange:** carrots; corn; pumpkin; sweet potatoes (yams); rutabagas; winter squash (acorn, banana, butternut, spaghetti, etc); yams; yellow peppers
**Green**: asparagus; beans; broccoli; brussels sprouts; cabbage; celery; peppers; cucumbers; lettuce; okra, peas spinach; swiss chard; zucchini; winter greens
**Blue/Purple:** eggplant; purple potatoes; purple asparagus; purple cabbage; peppers
**White:** cauliflower, corn; garlic; jicama; kohlrabi; mushrooms; onions; potatoes; radishes; shallots; turnips

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **MEATS** | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |

**Eggs:** whole, egg whites, egg beaters
**Beans:** black, kidney, lentils, red, pinto, white, dried peas
**Beef**: hamburger; jerky; roast; steak
**Pork:** bacon, chops, loin, roast
**Poultry:** fried, with or without skin, baked, grilled
**Fish/Seafood:** clams, fish, lobster, mussels, shrimp, scallops
**Other Meats:** hot dogs, lunch meats

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Out of all the meats—how many times a week do you select lean cuts?** | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |

Participant Initials _____
Participant B Day Month _____
Participant B-Day Date _____

# Food $ense Food Frequency Questionnaire-2011

Before ○
After ○

| | Never or less than 1 per week | 1-3 per week | 4-6 per week | 1 per day | 2-3 per day | 4-5 per day | 6 per day | |
|---|---|---|---|---|---|---|---|---|
| **DAIRY** | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| milk (skim, 1%, 2% or whole) creamer; frozen yogurt, ice cream, cheese (by itself or part of a meal | | | | | | | | |
| **Out of the dairy you eat in a week, how many times do you select a low or non-fat choice** | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| **WHOLE GRAINS** | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| bread, bulgur, cereals, crackers, kasha, oatmeal, pancakes or waffles, pasta, pop-corn, rice, wheat berries, quinoa | | | | | | | | |
| **REFINED GRAINS** | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| Bread, cereal, couscous, crackers, pancakes or waffles, pasta, pretzels, rice | | | | | | | | |
| **DISCRETIONARY CALORIES** | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| sugary drinks such as regular sodas, Hawaiian punch; kool-aid or other similarly sweetened fruit flavored drinks; sweets such as candy bars; other candy; desserts; brownies; cake; pie; cookies | | | | | | | | |
| Beer, wine, liquor | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| Other fats such as butter, margarine, mayonnaise, salad dressing and other oils; fatty foods such as potato chips, fries and donuts | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |

**NEA** _____ **COUNTY** _____



**To receive a personal dietary analysis go to http://www.mypyramidtracker.gov/**

# VITA

**SARAH GUNNELL, MS, CNSD, RD, CD**
2012

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## EDUCATION:

**Ph.D. Candidate in Food and Nutrition Sciences**
Utah State University, Logan, UT August 2008 to present
Integration of Nutrition Education into English as Second Language Classes for Refugees
**Masters of Science, Nutrition and Food Science**
Utah State University, Logan, UT, December 2002
Percutaneous Endoscopic Gastrostomy Placement Time in People with Cystic Fibrosis
**Bachelor of Science, Family and Consumer Sciences, Food and Nutrition, Dietetics**
University of Idaho, Moscow, ID, May 1998

## PROFESSIONAL COLLABORATIONS:

**Integration of Nutrition Education into English as Second Language Classes for Refugees**

- Coordinated partnership between Utah State University Extension Food $ense (Supplemental Nutrition Assistance Program), Granite School District English as Second Language, Department of Workforce Services, and work-site administrators
- Provided cultural background for nutrition educator assistants
- Established continuing program with ability to expand services and provide employment opportunities for refugees

**Utah Regional Leadership Education Neurodevelopment Disabilities**

- Instigated multi-disciplinary health screening for refugee families
- Piloted nutrition education classes in English as Second Language Classes through Granite School District in an on-site community center, Hser Ner Moo
- Coordinated sustainable system for continued health care and expansion of services for recently resettled refugees

## TEACHING EXPERIENCE:

**Nutrition Instructor**

**University of Wisconsin Stevens Point, Health Promotion and Human Development**
Stevens Point, WI August 2011 to present

- **Research in Community Nutrition,** Food and Nutrition 760
- **Program Organization and Management**, Human Community Resources 755
- **Contemporary Nutrition**, Food and Nutrition 151

**Instructor**

**Brigham Young University**, Salt Lake City, UT January 2011 to April 2011

- **Essentials of Human Nutrition,** Nutrition, Dietetics & Food Science 100

**Adjunct Faculty**

- University of Utah, Salt Lake City, Utah
- Utah State University, Logan, Utah

**PUBLICATIONS:**

Gunnell, S., Nordgren, M., Stewart, C., Willahan, J. (2011). Converting to a closed enteral feeding system in a pediatric hospital. *ICAN: Infant, Child, & Adolescent Nutrition*, 3(5), 296-299.

McDonald, C.M., & Gunnell, S. (2010). Pediatric nutrition risk screening: reliability of a standardized procedure. *Nutrition in Clinical Practice,* 25(1), 40-41S.

Gunnell, S., Whipple, M., McDonald, C.M., Bishop, R. (2009) Implementing an evidenced-based enteral nutrition formulary. *Nutrition in Clinical Practice,* 24 (1), 122.

Gunnell, S., & McDonald, C.M. (2009). Pediatric nutrition screening risk and length of stay. *Nutrition in Clinical Practice,* 24 (1),146-147.

Gunnell, S., Christensen, N.K., McDonald, C., Jackson, D. (2005) Attitudes toward percutaneous endoscopic gastrostomy placement in cystic fibrosis patients. *Journal of Pediatric Gastroenterology and Nutrition,* 40(3),334-8.

Gunnell, S., Christensen, N.K., McDonald, C. Perceptions of percutaneous endoscopic gastrostomy (PEG): Persons with cystic fibrosis vs. health care professionals. Abstract accepted for poster presentation at North American Cystic Fibrosis Conference 2002, New Orleans, LA and Utah Dietetics Association Annual Meeting, Lehi, UT, 2003.

**COMMUNITY SERVICE:**

**Utah Dietetic Association**, Secretary 2008 to 2010

- Served on Executive Board, provided decision making guidance, and coordinated communication

**Big Brother Big Sisters,** 2007 to 2011

- Provide mentoring and role modeling for "little brother"

**Epic Summer Film Festival**, 2003 to 2010

- Coordinate VIP Dinner for Camp Hobe staff
- Review menus for Camp Hobe

**PROFESSIONAL PRESENTATIONS:**

**Clinical Nutrition Management Dietetic Practice Group Symposium**, Boston, Massachusetts, March 2009
"Nutrition Screening: How Clinical Dietitians Can Build an Evidence-based Valid Process—and Why They Should"
**Brigham Young University Professional Seminar**, Provo Utah, February 2006, 2007, 2008, 2009, 2010
"Running a Clinical Nutrition Team"
**Utah Dietetic Association**, Layton, Utah, April 2007
"PES or Bust, Nutrition Diagnosis"
**Utah State University**, Murray, Utah, September 2005, 2004
"Nutrition and Hematopoietic Stem Cell Transplant"
**Mission Possible Cystic Fibrosis Super-trainer Workshop,** Primary Children's Medical Center, Salt Lake City, UT, June and August 2005
"Why Nutrition in Cystic Fibrosis"

**Cancer Wellness House Caregivers Workshop,** Cancer Wellness House, Salt Lake City, UT, April 2005
"Nutrition and Surviving Cancer"
**Cystic Fibrosis Foundation,** Baltimore, MD, January 2004
McDonald, Catherine; Chatfield, Barbara; Richards, Kathleen; Haberman, Diane; Gunnell, Sarah. Quality Improvement: Attaining normal nutrition status and appropriate growth in children with Cystic Fibrosis.

**St. Luke's Cystic Fibrosis Clinic,** Boise, ID, September 2001
"Cystic Fibrosis and Nutrition Care"

**EMPLOYMENT EXPERIENCE:**

**Clinical Nutrition Manager**
**Primary Children's Medical Center**, Salt Lake City, UT November 2005 to July 2011

- Provide value-based leadership for 18 members of the inpatient clinical nutrition team
- Facilitate human resource functions including hiring, training, evaluating, and conflict resolution
- Instigate and develop department strategic plans to improve efficiency and provide quality medical nutrition therapy
- Assist in budget planning, forecasting revenue, and measuring productivity
- Initiate and collaborate research and continuous quality improvement
- Serve as a liaison, communicating nutrition expertise and providing nutrition education
    - Clinical Operations Committee
    - Women's and Newborn
    - Coordinate dietetic clinical rotations for 12 to 16 students/interns
- Participate in the Intermountain Clinical Nutrition Management Task Force
    - Co-chair 2006 to 2008

**Bone Marrow Transplant/ Medical/ Surgical Unit Dietitian**
**Primary Children's Medical Center,** Salt Lake City, UT July 2000 to November 2005

- Provide pediatric nutrition expert review of hematopoietic transplant protocols and standards of care
- Participate in cystic fibrosis quality improvement team and development of cystic fibrosis care process
- Developing cystic fibrosis and cystic fibrosis related diabetes standards of care
- Provide medical nutrition therapy and nutrition education for pediatric patients in the 65 bed medical/surgical unit
- Serve as preceptor and mentor for intern level nutrition students

**Clinical Nutrition Dietitian and Manager**
**Diversified Health Services, Hillside Rehabilitation**, Salt Lake City, UT, January 1999 to August 1999

- Provided leadership and management for nutrition services of a 120-bed long-term care facility
- Managed budgeting of dietary funds, interviewing of candidates, scheduling of kitchen staff, procuring of food, and planning of menus
- Provided training and education for staff
- Developed and implemented job descriptions and production sheets
- Participated on nutrition intervention team and created nutrition care plans for residents

**CERTIFICATIONS:**

**Registered Dietitian**, Commission on Dietetic Registration, 1998 to present
**Certified Dietitian**, State of Utah, 1999 to present
**Certified Nutrition Support Dietitian**, Commission on Dietetic Registration, April 2007 to April 2012