THESIS

ADDRESSING BARRIERS TO FOOD ACCESS AMONG UNIVERSITY EMPLOYEES: REDUCING STIGMA AND RAISING AWARENESS THROUGH A COMMUNITY-BASED PILOT INTERVENTION

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ABSTRACT

ADDRESSING BARRIERS TO FOOD ACCESS AMONG UNIVERSITY EMPLOYEES: REDUCING STIGMA AND RAISING AWARENESS THROUGH A COMMUNITY-BASED PILOT INTERVENTION

A significant portion of the global population experiences moderate to severe food insecurity, affecting individuals across cultures, regions, and socioeconomic backgrounds. The city of Fort Collins, Colorado is home to Colorado State University (CSU), which includes a large population of both university students and employees, making up a large proportion of the overall city population. While student food insecurity has been widely studied, there is far less research focused on the food insecurity of university employees. Evidence suggests that CSU employees, particularly those who are low-wage earners, primarily Spanish-speaking, or from historically marginalized communities, are at risk for food insecurity. Although CSU provides access to food through on-campus programs like the Rams Against Hunger (RAH) food pantry, employee utilization of the pantry remains relatively low compared to student usage. Given the need by campus partners to understand and address the barriers preventing employees from accessing available university resources, this study aimed to explore the barriers affecting food pantry utilization by CSU employees and examined if a community-specific nutrition intervention can address these barriers and lead to increased pantry utilization by CSU employees. In collaboration with CSU's Basic Needs program, a multipart community-specific intervention was implemented during the fall 2024 semester to address perceived barriers to food pantry usage by decreasing stigma and increasing awareness among a sample population of CSU employees. A post intervention survey assessed the impact of the intervention on the perceived barriers. Results showed regular emails with intentional messaging, nutrition education and resources were the most impactful in addressing lack of awareness. Additionally, most survey responses voiced themes of increased awareness (68%) while 31% of responses were

attributed to decreased stigma. Findings suggest that different methods of information dissemination, accessible nutrition education, and regular efforts that create a welcoming environment, could be helpful strategies in addressing barriers to employee usage of university food pantries. However, further research is needed to explore additional nutrition-based strategies that integrate culturally relevant education, foster social connection, and offer sustainable support to improve food security among university employees.

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CHAPTER 1

Introduction

Food insecurity is a persistent global issue that continues to impact individuals all over the world. A 2023 global report indicated that 28.9% of the world population (2.33 billion people) had experienced moderate or severe food insecurity.[1] Although some definitions of food insecurity may be limited in capturing the experiences of diverse populations, it is commonly described by the United States Department of Agriculture (USDA) as, "A household-level economic and social condition of limited or uncertain access to adequate food." [2] Individuals may move between varying degrees of food insecurity, such as experiencing periods of low food security and very low food security. According to the USDA, low food security is defined as "reports of reduced quality, variety, or desirability of diet," while very low food security refers to "reports of multiple indications of disturbed eating patterns and reduced food intake."[3] Individuals may experience food insecurity in different ways along this spectrum, but regardless of severity, this multifaceted issue can have a significant impact on human health and is often intensified by a range of contributing factors.

The severity of food insecurity is dependent on specific drivers that vary between countries and regions globally, such as economic instability, political conflict, climate change, access to healthcare, agricultural practices, and social safety nets, which do not allow for a one-size-fits-all approach. [4] Thus, there is a need for targeted efforts specific to the country, region and community, to relieve individuals experiencing food insecurity and hunger. Countries in particular can experience changes in population growth, consumption patterns, and food production that can be impacted by these drivers.[4] These global controls can impact food security and also exacerbate the disparities in food insecurity rates, all contributing to the contrasting magnitude of this issue impacting individuals. Although there are differences in influences and food insecurity rates between countries, there are notable similarities in

drivers that are globally involved. There is a great need for innovative, targeted solutions to address this issue, no matter what the magnitude or who is affected.

Causes of Food Insecurity

Historically the main causes of food insecurity have been rooted in poverty, conflict and climate-driven famine, however more recently, persistent global repercussions from the COVID-19 pandemic continue to impact many countries worldwide. Nearly 12% of the global population—about 928 million people—experienced severe food insecurity in 2020, an increase of 148 million people compared to 2019.[5] This is especially true for those countries considered low and middle income, which had largest increases in food insecurity rates during the global pandemic and continue to persist post-pandemic.[1,6] However, even high income countries like the United States continue to see high levels of food insecurity. During the pandemic, global trade restrictions, social distancing, school closures, and lockdown actions were experienced all over the world as a way for countries to reduce the amount of new cases.[6] This unfortunately initiated countless food access concerns including job loss, low tourism revenue, and rising food costs, ultimately making individual access to nutritionally adequate food difficult for many individuals.[6] Although current numbers have decreased substantially since then, according to the most recent report from the USDA in 2023, there were 6.8 million households that experienced very low food security and there are currently, 343 million people globally reported as experiencing acute hunger in 2025.[7,8]

Conflict, or the struggle between nations, groups, or ideologies that disrupts international peace and stability,[9] is also a major driver of food insecurity and can have lasting effects on the global population.[10] According to the World Food Program, conflict increased by 40% between 2020 and 2023, and approximately 65% of people facing acute food insecurity now live in fragile or conflict-affected regions.[11] The strong linkage between food and conflict can be seen in how the global food supply is impacted by current ongoing conflicts in places like Palestine, and Ukraine. It can cause reductions in food market production which can further cause shortages and food price inflation, impacting those of

lower socioeconomic status .[10] Not to mention, when conflict is present, it may take away individuals' ability to physically acquire food by either creating a dangerous environment or by destruction or contamination of self-reliant food production and agriculture, impacting people on a household level.[10] Additionally, climate change has also greatly impacted the agrifood system by affecting variables like rainfall patterns, soil quality, sunlight, and temperature sustainability.[12,13] Global warming has increased global climate disasters which can lead to negative impacts on agriculture and global trade of foods, negatively affecting the global economy.[14] These global imbalances impact overall food availability and access for individuals, households, and communities all over the world, ultimately affecting the well-being of the world's population.

Health Impacts of Food Insecurity

Mental, physical, social, and emotional consequences have been shown to develop as a result of food insecurity, and these impacts can significantly affect an individual's overall well-being, development, and quality of life.[6] It has been consistently documented that food insecurity can increase the prevalence of undernourishment, which in turn can increase the risk of malnutrition and diet-related diseases.[15] For children specifically, undernourishment can increase their risk for stunting and wasting, anemia, and illness.[16] Increased mortality can be a result of these health conditions and about 12% of deaths among children under age 5 were attributed to micronutrient deficiencies.[17] These negative health outcomes can impact childhood physical and cognitive development which leads to poorer school outcomes and a disadvantage for children being productive members of society as adults.[16,18] The negative health cycle of these effects can impact further generations as mothers that experience undernutrition can experience poor health outcomes for their themselves and children. [16,19] Additionally, adults experiencing food insecurity have been shown to have higher rates of mental health problems, diabetes, hypertension, hyperlipidemia, and poor sleep outcomes.[20] Research also demonstrates that food insecurity can influence mental wellbeing by impacting emotional stability, cognitive function, and stress levels.[21] When people experience these adverse effects, it can further negatively impact aspects of their wellbeing like personal

hygiene and overall mental health, while potentially contributing to disordered eating patterns.[21,22] Not having adequate access to food can also greatly impact a person socially. Since food is greatly tied to identities, it is a strong social factor that can contribute to relationships and cultural practices.[23] Food insecurity can lead to social exclusion, loss of self-affirmation, and deviation from culturally relevant foods and eating habits.[23] People living in low-income countries are especially impacted by these nutrition-related food insecurity outcomes and in turn negatively impacts the country's economic and societal wellbeing.[19] Although those living in low-and middle-income countries are affected more by the consequence of food insecurity, people living in higher-income countries are not immune to the impacts on health and well-being as a result of food insecurity.

Food Insecurity Nationally and Locally

Since the COVID-19 pandemic, persistently high rates of food insecurity in the United States have continued to negatively impact the overall population. Research has identified food insecurity as one of the most significant nutrition-related health challenges in the United States, with 13.5 % of households experiencing food insecurity in 2023.[7,24] This percentage has shown to be an increase in comparison to the 12.8 % of food insecure households in 2022.[7] Most notably, groups that are often marginalized or historically oppressed such as Black and Hispanic racial groups, as well as women and children, have generally higher rates of food insecurity.[15,18,25] According to the 2023 USDA Economic Research Service Report, people identifying as Multiracial, American Indian, and Alaskan Native, have the highest rate of food insecurity in the U.S, at 23.3%. [26] Additionally, Hispanic U.S households face disproportionately high rates, with a 17.2 % experiencing food insecurity in 2020.[27] Household food insecurity rates increased from 11 % in pre-pandemic 2018 to 38 % in 2020 with non-Hispanic black and Hispanic populations being most effected.[6] This high prevalence of food insecurity caused by the COVID-19 pandemic was caused by high unemployment, lower household incomes, and rising food prices.[6]

In the United States approximately 70% of total household income is spent on food within low-income households.[6] This high proportion, leads many households to rely on cheap, non-nutritious

convenience foods, increasing the risk for malnutrition - a common result of chronic food insecurity.[6] In the United States, efforts to address food insecurity and its subsequent consequence of malnutrition, include food assistance programs such as the federal Supplemental Nutrition Assistance Program (SNAP). First implemented in 1964, SNAP has been influential in addressing the issue of food insecurity among vulnerable populations. By providing food benefits to qualified individuals, SNAP has been an impactful safety net for many U.S. citizens at times when food access is difficult. However, only an estimated 58% of food insecure households in the U.S participate in federal food assistance programs such as SNAP, as the eligibility requirements for the program can often make qualifying for the program difficult for many individuals/households.[7] Specifically, the SNAP program has work requirements in place in order to maintain program benefits, which can be problematic when unemployment is a major contributor to food insecurity. These requirements are set-forth by the states and various state legislatures are passing stricter work requirements for SNAP eligibility, thus many individuals choose not to apply or are denied due to income requirements or by being unemployed due to barriers like transportation, previous incarceration, or limited education.[28] Eligibility requirements are consistently described as being difficult to understand, inconsistent, and unfair.[29] These negative perceptions and experiences of federal food assistance programs by those populations experience food insecurity, contributes to the poverty cycle by discouraging program participation, limiting access to essential nutrition, and reinforcing barriers to health, education, and economic stability that are necessary to break free from long-term hardship. In fact, research indicates that food insecurity rates are substantially higher among SNAP participants and that these individuals are among those that frequently utilize food banks.[20,30]

In the state of Colorado, currently 1 in 9 residents experience food insecurity including 1 in 7 children.[31] According to Food Bank of the Rockies, 21% of Latino and Hispanic individuals and 19% of black individuals experienced food insecurity in 2023, compared to 9% of white, non-Hispanic individuals. [32] According to data collected from the 2019 Colorado Health Access Survey, 22.2% of Black Coloradans and 25.4% of young adults in rural areas experienced food insecurity.[33] In addition, people

that have lower incomes, reside in rural areas, are women, or belong to a marginalized racial group, are more likely to experience this problem in Colorado.[33] It has been reported that Colorado residents experiencing food insecurity in 2019 were 3.2 times more likely to report fair or poor health regarding overall health status, compared to people who report being food secure.[33] Within Larimer County, which is situated on the front range in northern Colorado along the I-25 corridor, almost 10% of the population experiences food insecurity according to The Food Bank of Larimer County in 2023.[34] This prevalence equates to approximately 40,000 people and includes individuals at all life stages and backgrounds including parents, students, older adults, and employees.[34] Since food insecurity is most directly related with people not having sufficient money for food, the underlying issues contributing to this can include high rates of housing insecurity and transportation problems. [35] According to the 2023 Colorado Health Access Survey, 14.5% of Larimer country residents reported difficulty paying housing costs and 16.6% reported a lack of public transportation as a barrier.[35]

Food Insecurity at Colorado State University

The city of Fort Collins, the largest urban area within Larimer County with an average population of 174,871 in 2020, has a high percentage of student residents due to Colorado State University (CSU) being located within.[36] Of note: Countless studies have explored the high prevalence of food insecurity among university students in the United States, with an estimated 41% of college students experiencing food insecurity even if they receive benefits like financial aid.[37] It has been well documented that food insecurity within this population can greatly impact student wellbeing and academic success.[37] This can similarity be seen within the CSU student community, with 3 in 10 students experiencing food insecurity in 2024.[38] With this prevalence of food insecurity amongst CSU students, the university has created many programs to address this issue including the Rams Against Hunger (RAH) program which, provides food support by having coordinating food pantries on campus and managing an on-campus food bank for students, faculty, and staff to utilize.

While the prevalence of food insecurity among university students is well-documented, and thus many universities have responded like CSU by developing programs to combat the issue, there is limited research available that documents the prevalence and impact food insecurity has on university employees. Based on the information available, it's estimated that anywhere from 32% to 35% of university employees experience food insecurity[39,40] Although the exact proportion of CSU employees experiencing food insecurity is unknown, it can be estimated, based on national trends, local economic analysis, and food assistance use among Fort Collins residents, that there are a number of individuals that experience it. Additionally, university program coordinators of the Basic Needs at CSU program, which is a collective of CSU initiatives that aid students and employees with resources on aspects like housing, food security, and case-management, have voiced consistently hearing from employees about their food security struggles during events. With the focus being more so on addressing student food insecurity in recent years, information regarding programs and initiatives for food insecure university employees, is less abundant.

Food Banks and Food Pantries

There are many different approaches implemented in addressing food insecurity in different communities across the globe. One major endeavor that has gained popularity, especially since the COVID-19 pandemic, is the implementation and usage of food banks and food pantries. Food banks are facilities that house millions of pounds of food to either be picked up for free by people in need or delivered to smaller, local, distribution centers like food pantries.[41] [39]Originating in the United States in 1967, food banks and pantries were established as a way to combat temporary or continuing food insecurity.[42] Distributable food donations come from government programs, retailers, community organizations, industries, and other sources, and can operate independently or alongside other food assistance programs or within larger institutions like schools, churches and universities.[43] According to Feeding America, one of the main suppliers to food banks in the U.S, it distributes approximately 300 million pounds of food to over 200 food banks per year, and in 2021 it distributed 5.5 billion meals.[43,44]

This organization also reports that 53 million people relied on food banks and pantries in 2021, a one-third increase compared to pre-pandemic levels.[45] This upward trend of food bank and food pantry use post COVID-19 pandemic can be further seen in other areas of the world and countries similar to the U.S. For example, in the United Kingdom, around 3 million emergency food parcels were distributed between April 2022 and March 2023 and nearly 1.5 million people visited food banks in Canada in 2022.[43] This continuous high utilization of food banks within the U.S, which is considered a high income country, contributes to the need for additional food access resources, no matter the income of the country. With government food assistance often failing to fill the gap of food needs for many different communities, physical locations that people can utilize to pick up free food can be effective in combating this.[46] Although major shifts in food security have not been documented by food bank usage alone, It has been gathered that food insecurity rates can significantly decrease among individuals that have access to food banks.[47] By positively impacting food security, food banks can contribute to increasing the health and well-being of individuals and households by offering more than just food.

It has been reported that individuals experiencing food insecurity often have lower levels of social support contributing to lower levels of mental health.[21] Research suggests that greater access to social networks and perceived social support levels can contribute to lower levels of food insecurity.[21] Food banks and food pantries can offer a space for these social connections, and has the potential to act as a initial welcoming environment for new communities amongst people that share similar situations.[48,49] One study found that these particular attributes of food banks, helped alleviate feelings of stigma and encouraged a sense of community among participants.[49]

Additionally, many food banks are implementing efforts to improve access of nutritious food by increasing healthier food inventory, storage, and distribution, all which contribute to improving stigma of food banks and pantries.[50] Interventions conducted in a food bank and/or food pantry setting, have evaluated the effectiveness of efforts like nutrition education, cooking demonstrations, client-choice approaches, and nutritious food display strategies.[51] The results of these interventions showed positive

outcomes in participant nutrition and health literacy, cooking skills, healthy food choice and intake, and food security.[51] It is evident that efforts made by food banks and pantries continue to make a positive impact on not only food security but also through nutrition-related health behaviors and increased social connections. However, although these facilities are common in communities, and are usually widely accessible to anyone who wants to utilize them, there are still individuals that do not utilize these resources.

The Rams Against Hunger Food Pantry

The RAH Food Pantry is located on the CSU main campus within the General Services Building. The pantry obtains their food from a combination of local partnerships, donations, and grant-funded initiatives. The RAH Food Pantry serves an average of 2,919 individual people annually. From June to December 2024, Full time and part-time students combined, the RAH pantry had a total of 7,389 visits from new and returning students. Employees that are represented as state classified, faculty and administrative professionals, and "other" contributed to a total of 2,571 visits to the RAH pantry from new and returning employees. This data shows that far less employees use the on-campus food pantry than students. It has been documented prior, that although employed individuals have an income to spend on various life expenses and resources such as food, it doesn't necessarily equate to food security.[52] According to Larimer County, the average household income need for a household of four to live securely is $91,364, while the Health and Human Services poverty guideline for Colorado is $32,150 for a household of four.[53,54] At CSU, custodial personnel, making up 1,762 of employees, earn an average yearly income of $39,000.[55] This suggests, that not only does these CSU employees earn significantly less than the amount needed to live securely in Larimer County, their income also falls within the federal poverty guidelines. A 2023 report from the U.S Bureau of Labor indicated that Hispanic, Latino, Black, and African American racial groups have the lowest earnings in the U.S compared to White and Asian.[56] Given that a significant portion of CSU employees identify with these historically underrepresented racial and ethnic groups, these income disparities are likely reflected within this campus population as well. Not

surprising, RAH visitation records report that from June-December 2024 the RAH food pantry had 55 total new employee visitors and 312 returning employee visitors from those with an annual salary of $35,000 or lower.[57] Additionally, consistent messaging has been heard by the CSU Basic Needs program staff, that employees earning the lowest salaries, experience food insecurity. However, according to RAH data, the usage by this population is surprisingly low, demonstrating the apparent need. Therefore, the Basic Needs at CSU and RAH, are interested in finding solutions that can address the low use of the on-campus food pantry by CSU employees.

Barriers to Food Bank and Food Pantry Usage

Although food banks and pantries currently serve many individuals during times of need, there are various barriers that contribute to optimal usage for all individuals experiencing food insecurity. These barriers can look different depending on the location and community, but there are common themes reported in literature that should be explored further in order to discover potential solutions to increasing the use of these programs more broadly.

Stigma

One of the most widely documented and impactful themes in discussions surrounding food insecurity is the presence of negative stigma. Stigma refers to a socially constructed negative attitude, belief, or perception associated with a particular condition, identity, or circumstance.[58] It often manifests as disapproval, judgment, or marginalization from society toward individuals or groups who are perceived as different or struggling.[58] In the context of food insecurity, stigma is frequently tied to the use of food assistance programs, such as food banks or pantries. This stigma can have deep emotional and psychological consequences, contributing to feelings of shame, fear, embarrassment, or failure among individuals seeking help.[58] Many food-insecure individuals hesitate to access food banks or federal nutrition programs because they fear being judged by peers, staff, or even themselves. This sense of social disapproval can be so powerful that it prevents people from obtaining the help they need, even when

resources are available and accessible.[58] Conversely, individuals that experience negative stigma are often associated with poverty, race, gender, and other social characteristics which can play a role in food access inequalities.[59]

The most frequent occurrence of feelings of stigma are commonly experienced by individuals using the food bank for the first time or during the time leading up to using it for the first time.[49] With this, people that could potentially benefit from the usage of these food banks often avoid going, due to the presence of negative feelings regarding their identity, reputation, and self-esteem.[49] Often societal views that surround ideas of free markets, deregulation, individual responsibility, and privatization, influence food bank stigma by placing blame on food insecure individuals.[58] Further, this view is concentrated with perceived notions of these individuals as lacking budgeting skills or as being undereducated.[58] Feelings of being stigmatized are often created by the food bank user themselves through internalizing ideas of what a typical food bank user should look like - Often described as someone unemployed, homeless, or a welfare user.[49] Commonly, individuals associate food banks as only being for 'people in need', so they perhaps think of themselves as 'non-deserving' of food assistance.[49] Furthermore, these beliefs can contribute to food aid users' perception of how others view them, which is often lower in status compared to others.[58] Therefore, stigma itself can be a significant barrier to relieving food insecurity for many different populations.

Stigma is not just influenced by individuals and society, however. Food banks themselves reflect a form of stigma by often offering limited food choices which can ultimately lead to decreased feelings of autonomy.[58] Although not on purpose, the way of shopping that food banks hold is not a normative way to obtain groceries, in that users only have the ability to choose from what's offered, not what they want, which further pushes food insecure individuals away from the idea of social acceptability. Furthermore, some food bank users have reported that the quality and limited food choices of food banks and pantries also contributes to their negative feelings.[49] Often, food that can be found at these facilities is rescued or recovered, meaning from surplus stores or are close to their best-by date which leads to many foods

offered at food banks and pantries to be unhealthy, expired, or moldy.[49],[60] Unfortunately, this presentation may lead to negative feelings of self-worth for food bank users if they continuously perceive that this is the food they deserve to be offered.

Lack of Awareness

Although there has been an increase in food bank and pantry operations nationally, it is not uncommon that people are still unaware of their existence or availability. One study found that 59% of their sample population (n=2928), did not know when the food pantries in their location were open and 42% did not know of the pantry locations.[61] It is important to mention, that both of these findings were reported by mostly Latino individuals rather than white or black individuals.[61] Similarly, it has been noted that hours and location of food pantries are common barriers to access, and that many people find out about food pantries mostly through word of mouth.[62] With this, for people without social circles, it is difficult to know accurate information about food pantries and that it is even more pertinent to ensure other forms of communication that display accurate and up-to-date information.[62]

Lack of awareness can also be centered around not knowing the purpose of the food pantry and whether it is intended for a certain individual. In other words, it is common that individuals will not utilize the food bank because they think it is for people that are more "in need" than themselves, despite if they experience food insecurity or not.[62,63] Additionally, if people view themselves as not a pantry user, this may also lead them to not seeking out information or knowledge regarding food pantries.[63] This lack of awareness can lead to decreased pantry utilization and frequently increased sense of stigma, if for example, people go to a pantry and don't know how to use the food they pick up. This may also make people feel like this resource is not for them. It is important that food banks and pantries make efforts to communicate and raise awareness of food aid in their community, while paying special attention to their narrative or the message they are trying to convey. Providing nutrition information and education is essential to help individuals feel confident in preparing food from the food bank while encouraging mindful, nutritious eating habits.

Vulnerable Populations

Specifically in a high-income country such as the United States, food insecurity rates are high amongst immigrant populations.[64] Language barriers, high rates of poverty, loss of social support, and lack of access to culturally relevant foods, are just some of the barriers these individuals can experience.[64] The differences between food availability and food practices between countries can be greatly influential to immigrant people. Not being able to grow their own food or relying on transportation methods to access food, can heavily impact individuals and families.[64] Immigrant children are especially vulnerable to health consequences related to food insecurity and although federal food assistance is often granted to U.S immigrants, it commonly does not reach their children.[65] In many cases, U.S. citizens that speak both Spanish and English, or predominantly Spanish, have higher rates of food insecurity, especially if they were born outside of the U.S.[27] Literature suggests that this could be due to these individuals not being able to easily read nutrition labels or adequately understand nutrition information and education. With this, they may not relate to nutritional information due to the difference in food culture, which can further discourage healthy behavior change and access to food. Pertaining to stigma, individuals that predominantly speak Spanish, may experience some level of stigma because of their present accent when speaking English.[27] Lastly, it has been found that low-income Hispanic adults with limited English language skills are less likely to apply for SNAP, furthering their risk for food insecurity. All these factors that have been shown to greatly impact low-income Spanish speaking adults living in high income countries, have contributed to effectively identifying the target population of this pilot intervention.

Research Focus

CSU has many different organizations and initiatives that work together to address different issues for those belonging to the campus community. One initiative is the on-campus food pantry run by the RAH Program. This pantry is open to students, faculty, employees, and the public. It provides fresh produce and dry goods that are obtained either from the Feeding America Distribution service or a local

farm area in Fort Collins. The presented rates of food insecurity in Fort Collins are also reflected by high rates amongst CSU students and CSU employees. As previously mentioned, this on-campus pantry has a disproportional lower usage rate of employees compared to students. With many CSU employees belonging to a minority group, are Spanish-speaking, and/or are low-income, an intervention is needed to address food security barriers that are impacting CSU employees.

It was brought to the attention of the research team that more focus should be put on targeting food insecurity amongst CSU employees. Therefore, an inquiry regarding this discrepancy was brought forth by a community partner within the CSU Basic Needs program in order to collaboratively conduct research on the issue and ultimately provide a recommendation to the University to increase on-campus food pantry use by CSU employees and staff. To effectively address the issue, the researchers conducted surveys and guided conversations with a small group of CSU staff, to identify what barriers are contributing to the low RAH food bank usage among employees. These data elucidated that a lack of awareness and the presence of stigma were common barriers for employees in using the RAH food pantry. Thus, this study aimed to address the barriers contributing to low usage of the on-campus RAH food pantry by CSU employees through the creation of a pilot intervention targeting a sample population of employees. The intent of the pilot intervention was to increase awareness and decrease stigma to increase pantry usage among a sample of CSU employees and provide community partners with a recommendation plan for future initiatives focused on addressing food insecurity amongst CSU employees.

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CHAPTER 2

Introduction

Approximately 2.33 billion people, or 28.9% of the global population, experiences moderate or severe food insecurity impacting people across all regions and socioeconomic backgrounds.[1] While definitions may vary, food insecurity is defined by the United States Department of Agriculture (USDA) as "limited or uncertainty to access adequate and nutritious food, often driven by a combination of economic, environmental, political, and social factors."[2] These factors differ across geographic and cultural contexts, making targeted, region-specific approaches essential for meaningful and impactful solutions.[3]

While food insecurity has historically been driven by poverty, conflict, and famine, it can now also be attributed to other global challenges such as climate change, rising living expenses, and the lingering impacts of the COVID-19 pandemic.[4] Most notably, nearly 12% of the global population—about 928 million people—experienced severe food insecurity in 2020, an increase of 148 million people compared to 2019.[4] Although current numbers have decreased substantially since then, according to the most recent report from the USDA, in 2023, there were 6.8 million households that experienced very low food security and there are currently 343 million people globally reported as experiencing acute hunger in 2025.[5,6] These widespread disruptions to food systems reduce equitable access to adequate nutrition and in turn pose significant risks to the health and well-being of global populations. The health consequences of food insecurity extend beyond malnutrition, affecting both physical and mental well-being. Individuals facing food insecurity are at increased risk for chronic illnesses, psychological distress, and social isolation.[7–9] Despite abundant resources, food insecurity persists in high-income countries including the U.S., where 13.5% of households were affected in 2023—disproportionately impacting Black, Hispanic,

multiracial, and other vulnerable populations including children, immigrants, and low-income families.[7,10–12]

Food Insecurity at the Local Level

In Colorado specifically, these disparities persist with one in nine residents experiencing food insecurity including one in seven children.[13] According to the Food Bank of the Rockies, 21% of Latino and Hispanic individuals and 19% of Black Coloradoans experienced food insecurity in 2023, compared to 9% of White, non-Hispanic individuals.[14] Additionally, those living in rural communities and low-income households, face structural barriers such as housing costs and limited public transportation, which further contribute to food insecurity and poor health outcomes.

Within Larimer County, located in the northern region of Colorado, nearly 10% of residents experienced food insecurity in 2023.[15] According to the 2023 Colorado Health Access Survey, 14.5% of Larimer Country residents reported difficulty paying housing costs and 16.6% reported a lack of public transportation as a major barrier.[16] These challenges are likely contributing factors to the elevated rates of food insecurity in the region. The city of Fort Collins, the largest urban area within Larimer County, is home to Colorado State University (CSU), which makes up a large percentage of the overall city population of 174,871.[17] Both students and employees of CSU, make up about 21% of the city's population.[18]

Countless studies have explored the high prevalence of food insecurity among university students in the United States, with an estimated 41% of college students experiencing food insecurity even if they receive benefits like financial aid.[19] This can similarity be seen within the CSU student community, with three in 10 students experiencing food insecurity in 2024.[20] The university has created many programs to address food insecurity among students, most notably the Rams Against Hunger (RAH) program which provides support by coordinating small-scale food pantries around campus, food recovery programs, and managing an on-campus food pantry for students, faculty, and staff to utilize.

While considerable attention has been given to addressing food insecurity among university students, less research has focused on the prevalence and barriers experienced by university employees, although it has been estimated that anywhere from 32% to 35% of university employees experience food insecurity.[21,22] As such, national trends and local economic data suggest that a notable portion of CSU's workforce may be at risk as well, particularly among employees who are low-income, Spanish-speaking, or members of underrepresented racial or ethnic groups.[23] Despite the availability of on-campus resources such as the Rams Against Hunger (RAH) food pantry, there is a significantly lower usage rate among employees, compared to students, signaling an urgent need to explore the reasons behind this disparity.

Food Banks and Pantries

There are multiple strategies that can be used to address food insecurity, depending on the population and location. One needed effort has been the implementation of food banks and pantries, which are facilities and organizations that distribute free food donations to individuals that need food aid.[21,24] These facilities distribute up to 5.5 billion meals per year, and according to Feeding America, about 53 million people relied on food banks and pantries in 2021.[25] Although major positive shifts in food security have not been documented by food bank usage alone, it has been gathered that food insecurity rates can significantly decrease among individuals that have access to food banks.[26] It has also been shown that food banks have the potential to encourage social networks and support due to providing welcoming environments and bringing together people who share similar situations.[27,28] However, barriers do exist to their use, which are often specific to populations and regions.

Barriers to Food Pantry Usage: Stigma and Awareness

Prior to this study, colleagues conducted a preliminary exploratory assessment to understand the low utilization rates among staff. An exploratory assessment was conducted with a sample of the intended study population to provide insight to community researchers and community partners regarding the

intended objectives of the study and drive the development of the intervention materials. This assessment consisted of a facilitated discussion and an online survey conducted by the research team by asking HDS employees an array of questions regarding food pantry usage. Responses were recorded and analyzed. Stigma and Awareness were themes that emerged from this, aligning with findings in current literature. Stigma and lack of awareness are two major barriers that prevent individuals from utilizing food banks and pantries, even when experiencing food insecurity. Stigma in this case, is defined as a negative perception or sense of shame, embarrassment, or judgment—whether real or perceived—that individuals may experience or fear when seeking food assistance.[29] Stigma often stems from societal perceptions that associate food assistance with poverty, failure, or unworthiness leading to feelings of shame, embarrassment, and fear—especially among first-time users.[30] Internalized beliefs about what a "typical" food bank user looks like, coupled with the limited food choices and perceived lower quality of offerings, can further discourage use and damage self-esteem.[30] At the same time, many individuals are simply unaware of when, where, or for whom food pantries are available, particularly in marginalized communities.[31] For this research study, awareness was defined as the extent to which individuals recognize, understand, and have knowledge of the existence, purpose, accessibility, and benefits of food pantry services.[32] Misinformation or lack of clear communication often causes people to believe the resource is not intended for them, reinforcing underusage.[33] Thus, addressing these barriers through inclusive messaging, improved outreach, and nutrition education is essential to improve food pantry employee utilization.

The aims of this study were to first identify the barriers to food pantry usage among a small group of CSU employees from the department of Housing & Dining Services (HDS), then second, implement a targeted pilot intervention addressing these barriers. It was hypothesized that with an appropriate community-focused intervention that addresses the identified barriers prior to the intervention, there will be increases in awareness and decreases in stigma, leading to greater pantry utilization by the sample population of CSU employees. After evaluation of the impact of the intervention on the perceived

barriers, a recommendation will be provided to the community partners as a resource to help the university expand food security efforts and engage university employees regarding the RAH food pantry.

Methods and Intervention Design

This study was conducted at CSU at the Fort Collins, Colorado campus in the Rams Against Hunger (RAH) food pantry. The research was done in collaboration with the CSU Basic Needs program, the CSU RAH program, and CSU Housing and Dining Services Community partners provided initial input about the perceived barriers to food pantry utilization for CSU HDS employees, and this information was used to create an online survey and group conversation prompts used during the facilitated discussion. The data obtained from the initial needs assessment, in combination with information from various interviews with subject matter experts and community partners, along with an extensive literature, concluded that barriers contributing to lack of "awareness" and "stigma" could be contributing to the low utilization of the RAH food pantry.

Intervention

From September 2024 through December 2024, a 3-part intervention was implemented. This included: 1) weekly emails sent to all HDS employees including recipes, nutrition tips, pantry hours, and an overall change in messaging to focus on preventing food waste rather than food insecurity (see appendix A), 2) employee-only designated hours implemented every Tuesday from 9-11am (see Appendix B), 3) during employee-only hours, informational tables were hosted inside the pantry by the researchers, and recipes, nutrition educational materials, and informal conversation was provided to pantry users (see Appendix C). All materials were designed by a nutrition sciences graduate student and reviewed by a registered dietitian nutritionist, with all educational materials translated in English and Spanish provided by a university employed translator.

The intervention aimed to target the voiced barriers by using information and evidence from current literature and insight from the population and related personnel. In the process of increasing

awareness and decreasing stigma of the food pantry, discussion of where and how employees received CSU information and resources was explored. The general process and intention of each part of the intervention is shown in *figure 1*.

Study Participants

All Housing and Dining employees were the targeted population for this intervention due to it being the largest CSU department with a total of 1,762 employees. These employees were selected to participate in the post-intervention survey through a recruitment email. Inclusion criteria included being a current HDS employee, attendance of the RAH pantry during the fall 2024 semester, and agreement of the consent form. Institutional review board approval was obtained from CSU and all survey participants provided written informed consent.

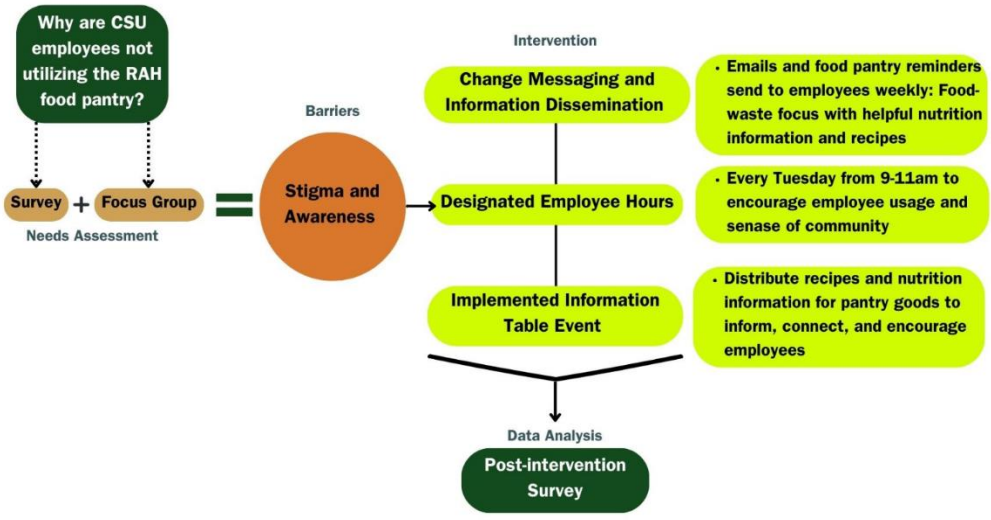

Figure 1: Intervention methods and rationale

Data Collection and Analysis

A post intervention survey was distributed from January 2025 until February 2025 to all CSU HDS employees via email listserv. The survey was used to collect data about whether the intervention

addressed the barriers of “awareness” and "stigma”. Employees that matched inclusion criteria were asked 17 questions including 10 multiple choice questions, and four open-ended questions - three of the four questions were intended to provide information about the three intervention methods and how they were helpful to participants, and the last question gave employees the opportunity to voice any other comments or concerns they found relevant. The survey was translated from English to Spanish. The total number of CSU HDS employees who completed the post-intervention survey was 27.

The post-intervention survey was analyzed using descriptive statistics and thematic coding. Thematic coding was carried out by inputting open-ended responses into NVivo 14 software and by identifying and coding themes and subthemes associated with each barrier.

Results

Survey Results

Out of the 27 participants that completed the online survey there were 17 participants that completed the English-version (62.9%) and 10 participants that completed the Spanish-version (37%). Based on results, four individuals reported they had not visited the pantry prior to the intervention period, with responses from two of the Spanish-version surveys and two from the English-version survey. The two participants from the English-version found out about the pantry through another coworker, while the two participants from the Spanish-version found out through bulletin board flyers at their place of work.

Of the 27 participants surveyed, 10 participants (37%), indicated they were aware of the designated employee hours on Tuesdays from 9-11a.m. A total of seven participants 26%—3 from the English-version survey and four from the Spanish-version—reported attending the pantry during that time. However, only five of the seven participants who reported attending the pantry during the designated employee hours, were aware that these hours were specifically designated for employees. Among the 17 English-version participants, eight participants (47%) did not visit the pantry during employee hours, compared to four of the 10 (40%) Spanish-version participants who did not attend during

that timeframe. Notably, of the 10 participants who were aware of the employee hours, eight reported that knowing about the designated employee hours influenced their decision to visit the pantry.

Of the 27 participants that took the survey, nine participants (33%) noticed the information table within the RAH pantry. Out of the seven participants that visited the pantry on Tuesdays from 9-11am, five participants indicated noticing the information table and found the information there to be 'very helpful', with two participants indicating that the information and people at the table were 'helpful', and five participants indicating the resources to be 'very helpful'. When asked how participants learned about the Rams Against Hunger (RAH) pantry, participants indicated multiple sources of information as shown in *Figure 2*.

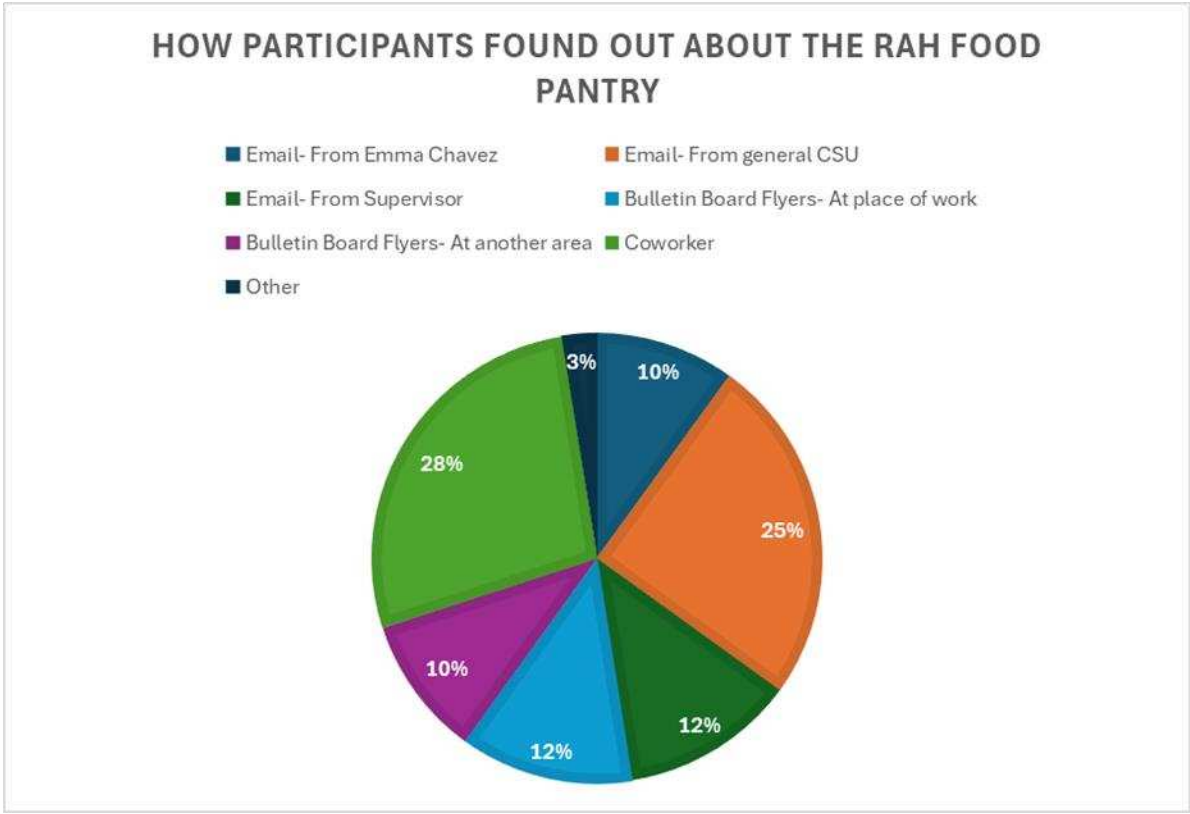

Figure 2: Survey results demonstrate ways in which participants found out about the RAH pantry

Of note, most participants (n=15) indicated email—either from the community partner, supervisors, or general CSU communications as their main method of finding out about the pantry—while 11 identified a coworker, and nine selected bulletin board flyers as their source of communication. Out of

the total 27 participants, two mentioned they did not receive any emails regarding the pantry. Among Spanish-version respondents, “coworkers” was the most frequently selected source (n=5), while “emails from general CSU” was most selected by English-version participants (n=7).

Overall, 10 of 27 participants (37%) found the emails to be “very helpful,” with responses evenly split between English (n=5)- and Spanish (n=5)-version participants. These results are demonstrated in *figure 3*.

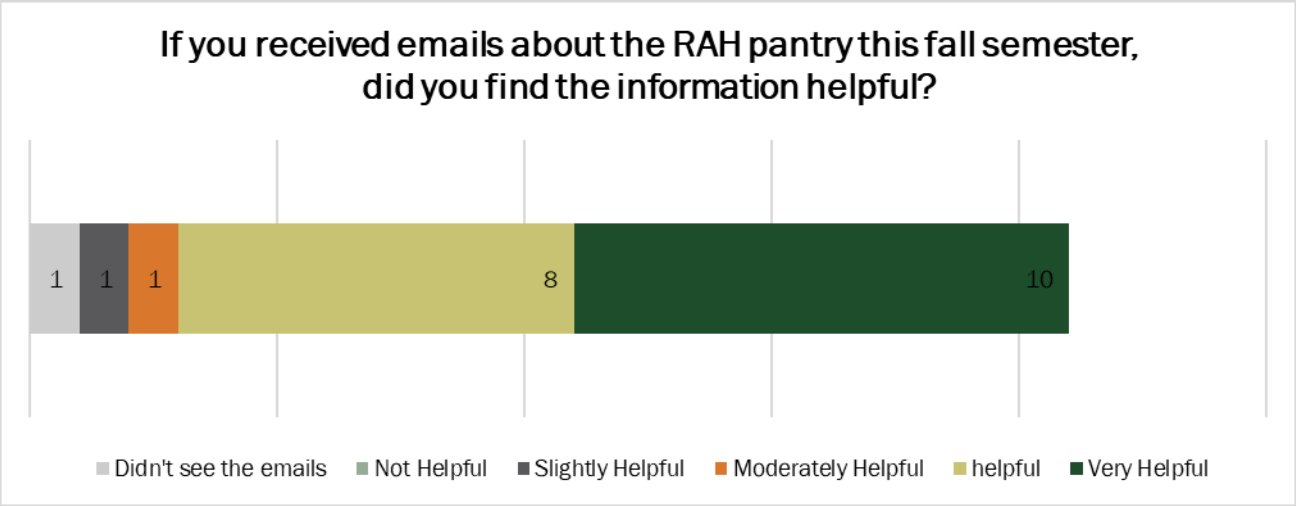

Figure 3: Survey results demonstrating how helpful participants found the emails to be

As previously mentioned, 10 participants reported being aware of the designated employee pantry hours on Tuesdays from 9-11a.m and of those 10 participants, seven participants indicated they had learned about the hours via email, with five of those seven stating the information provided in the emails influenced their decision to attend the pantry. When asked about the degree to which the information was helpful, five described the hours as “very helpful,” and four described them as “helpful.” In addition, five of these same seven individuals also reported noticing the information table at the pantry. Out of the 27 participants, 11 participants (47%) noted they had not yet tried the recipes shared through emails or at the information tables but expressed they planned to in the future. To add more context to results, thematic analysis was used to establish common themes and patterns among results.

Thematic Analysis

Thematic analysis was conducted by first identifying keywords and themes associated with each recognized barrier. Each response was then coded and categorized to assess the frequency of references to "stigma" and "awareness", and to identify any emerging patterns. Common key words pulled from literature to describe stigma included respect, respectful, fair, equal, dignity, grateful, comfortable, safe, support, inclusion, convenience, kindness, access, availability, welcome, privacy, attitude, and community.[27,29,30,32,34–37] Common keywords include resources, reminders, information, informative, updates, tips, and recipes.[31,33,38] Of the open-ended questions, three specifically asked about how each intervention method was helpful, while the fourth question provided an opportunity for employees to share additional thoughts. From this manual coding process, a total of 17 different references to reduced stigma and 37 references to increased awareness were identified.

NVivo 14 software was utilized to code survey answers regarding the entirety of the intervention and identify more detailed branching from the original coding themes of “stigma” and “awareness”. *Figure 4* and *figure 5* illustrate the code branching and the amount of coding references detected in all the survey answers indicating the number of times different themes were referenced.

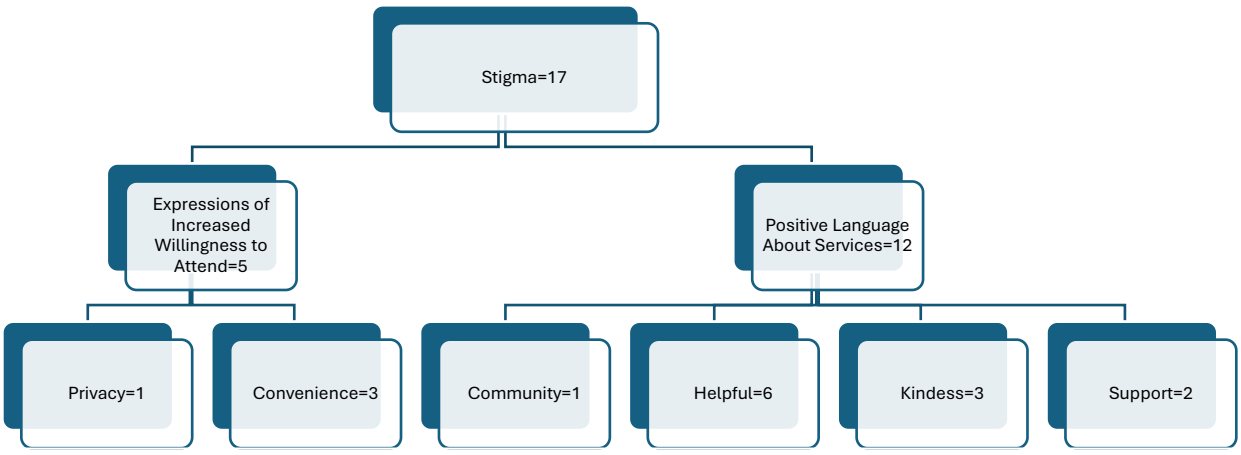

Figure 4: The amount of stigma theme and subtheme references in the survey results

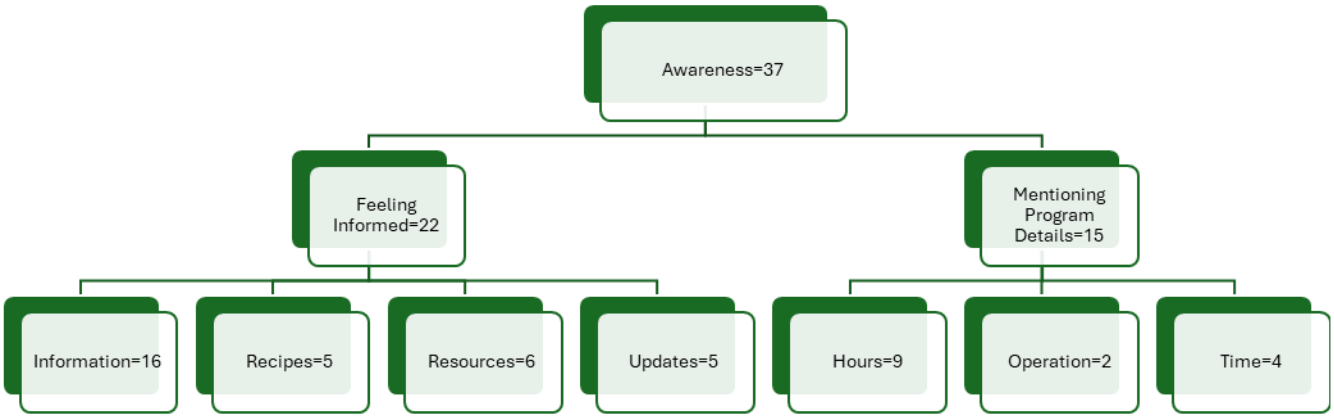

Figure 5: The amount of awareness theme and subtheme references in the survey results

Overall, there was a total of 54 references to the established barriers “stigma” and “awareness”. There were more references of increased awareness compared to decreased stigma, with 37 total references (68%) attributed to awareness and 17 total references (31%) to stigma.

In relation to the three-part intervention, open-ended responses related to emails and flyers frequently included themes of awareness, with 19 total references to awareness compared to two references to stigma. With this, "information" and "updates" were the most referenced codes for this part of the intervention. Responses to the table event questions also demonstrated more awareness, with 14 references, compared to nine total references to stigma. Most frequent codes included, "recipes," "information," and "resources." In contrast, responses related to designated employee-only hours included more themes of stigma with six total references, compared to four references of awareness, with most frequent words being, "convenience," "helpful," and "privacy."

Discussion

The results of this pilot intervention provide additional evidence that awareness and stigma represent two key barriers to food pantry utilization among university employees. It was found that email was the most used method of communication, and that participants found the material in the emails related to themes of increased awareness more than the other methods. The employee-only designated

hours and informational table were recognized as less impactful on the barriers presented but still showed promising implications. With this, there were findings of decreased stigma and increased awareness after the intervention, which supports continuing the intervention on an ongoing basis to increase CSU employee pantry utilization.

Awareness

Current literature highlights the lack of awareness regarding university food access resources as being a major contributor to student food pantry utilization, and a suggested contributor to university employee food pantry utilization.[39,40] Not having knowledge of campus food pantry existence, location, who it serves, or how to use food pantry items, are just some of the common awareness barriers that effect food pantry utilization.[38–40] Based on this evidence, it can be assumed that increasing awareness, by providing accessible information and reminders to university populations, could be helpful in increasing utilization. This intervention found that emails were the most effective tool in increasing awareness of the food pantry for targeted employee population, while the information tables also addressed this barrier, but not nearly as much. The emails not only provided information about the hours, but they also provided information about nutrition, affordable food shopping, and safe food storage. This aligns with suggestions in current research with multiple studies referencing the need for resources and nutrition education distribution among populations to increase pantry utilization.[39,41] Although there is a lack of literature that outlines how the specific strategies of emails and physical flyers directly increase food pantry utilization, many different food pantry-based studies demonstrate that nutrition education and resources dissemination can increase food security and health outcomes through increased participant knowledge.[42] Emails were the most successful method of communication because it is a convenient way for employees to get information and reminders regarding the university. In addition, emails and flyers contained information about how the pantry is intended for food waste reduction, thus changing the messaging, as referenced in literature as another way to increase utilization.[30] By changing the narrative it has been shown to reduce stigma amongst food insecure individuals.[30] In particular, this effort was shown to be one

of the strongest anti-stigma strategies in one study with the North East of England Independent Community Food Hub, with many participants voicing that they felt less stigmatized in relation to this change.[30]

In this intervention, emails and flyers mostly impacted the barrier of "awareness", but it should be mentioned that increased feelings of being informed related to the alternative narrative or because of nutrition education, may also lead to reduced stigma.

Stigma

Community-specific efforts addressing stigma reduction in current literature have shown to be effective in aiding food access. Although having designated employee hours did not appear to be the most effective intervention tactic during this pilot study, giving employees designated hours can provide a welcoming environment where people can share experiences and empathy ultimately affecting stigma. Studies have shown that drawing upon shared experiences between clients and volunteers could be useful in increasing mutual understanding which could in turn reduce stigma surrounding utilization of the food pantry.[43] In this same study, food pantry users shared that the transactional process within the food pantry by roles of giving and receiving contributed to connected social relationships within food pantries and made users feel less judged.[43] The specific designated hours were chosen due to voiced employee preference, but also with confirmation that a bilingual RAH pantry employee would be working during those hours. Evidence suggests that language barriers can contribute to stigma, so this contributing factor also could have supported this result.[35] Lastly, long lines have been shown to contribute to food pantry stigma, and it can also be suggested that designated hours could have alleviated some of this.[33] However, many employees voiced the inconvenience of the 'employee-designated' hours (Tuesdays 9-11am) and that this schedule wasn't suited for them. Thus, considering the restricted timeframe during the intervention for such hours, it is recommended that by enacting these hours for a longer period or over multiple days that work for more employees could be useful. The implementation of more or different

hours for employees could contribute to more shared experiences and community building for this population.

Considering the low impact that the employee designated hours had on stigma, and the fact that many people did not notice the information table, having an information table during these specific times may not be the best intervention to address barriers to usage in this population. Based on the post-intervention survey, this population values the operational characteristics of the RAH food pantry, such as it being a fast service-style with fresh produce choices and other staple ingredients they can easily utilize. Employees who reported visiting the information tables voiced liking the information provided, but perhaps the information provided could be sent via email instead for more accessibility and given how this communication strategy appeared more impactful as mentioned prior.

On the other hand, these table events did provide a way for researchers to interact and connect with the population, which in turn provides a personal connection and community building capacity. Having volunteers and food pantry personnel with shared experience can aid in the reduction of stigma among food pantry users.[30] Social networks and human-connection can have a great impact on accessing food, and with this in mind, a face-to-face interaction of some kind was deemed as an important part of this intervention.[44] Studies have shown that providing nutrition education within food pantry-based interventions can enhance participant knowledge, cooking skills, and food security status.[42] With this knowledge, in addition to survey results that suggest a positive response to nutrition education/information, universities should consider holding pantry-based cooking classes or information sessions to increase nutrition education, as well as social connection.

Limitations

While the findings of this pilot study are promising, it is important to interpret results with caution and consider the limitations. First, the small sample size of participants who completed the survey may not be generalizable to the entire CSU employee population and there is possibility of some self-

selection bias due to preexisting interest and knowledge of the RAH food pantry. Second, the length of the study may not have been long enough to determine behavior change among the sample participants, and with the lack of participant demographics provided, there could be other variables impacting results like education level, race, and ethnicity. Stigma may not have been shown to be impacted as much as awareness due to the possibility that individuals may not have the language to describe stigma, being that it is shame-based in nature and not easy to talk about. Lastly, although open-ended survey responses provided valuable data, one-on-one interviews and focus groups may have provided more detailed information about the overall impacts, both positive and negative, of the intervention.

Conclusion

Food insecurity continues to be a multifaceted, complicated public health issue that is influenced by a multitude of community-specific barriers. Employees that work for universities can often be overlooked, despite food insecurity being voiced by this population and represented in literature. This study highlights the importance of addressing barriers like stigma and awareness within a community-based intervention to encourage the usage of university food pantries. Universities can better support vulnerable populations by prioritizing long-term, equity-driven food aid strategies that foster empowerment and access to nutrition education within food pantries. More research is needed to discover different nutrition-based strategies for this population that integrate culturally relevant nutrition education, promotion of social connection, and sustained support for food access. With inclusive approaches, institutions can play an important role in reducing food insecurity and improving the well-being of all members of their campus communities.

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CHAPTER 3

Reflection

The overall goal of this community nutrition intervention pilot study was to examine the existing barriers that CSU employees experience regarding the on-campus food pantry. A program recommendation (see Appendix D) could then be provided to community partners that could increase the utilization of the pantry by CSU employees. Through the results, we found that "stigma" and "awareness" were the primary barriers amongst this population. Addressing these barriers through a community-based intervention was shown to be an effective effort in encouraging increased pantry utilization by employees. Our aim was to develop a study design that was relevant, practical, and likely to create meaningful change, which required extensive time, thought, and effort from the research team. The entire experience gave great personal and professional insight into the complexities of initiating community nutrition programs, as well as providing direction for future research in the field. There were challenges, considerations, and lessons learned throughout the process, particularly in designing an intervention that balanced feasibility with impact, addressed sensitive issues like stigma, and remained accessible to a diverse employee population. This chapter will explore the entirety of the research experience and how it has impacted me personally in my field, and how I see it contributing to my future endeavors.

How it Started

I have always been interested in community nutrition, and when I started graduate school, I hoped to find a research opportunity that aligned with this interest while also being new and challenging. This opportunity presented itself with the initial input of a community partner, Emma Chavez, the Community Resource coordinator of Basic Needs at CSU. She presented the problem of CSU employees not utilizing the on-campus RAH food pantry even though this population often voiced food insecurity. With this newly presented public health issue, my advisor and I decided that there was an opportunity for a pilot

intervention study to comprehensively address the issue by providing nutrition education, resources, and employee-focused operations, would make a measurable difference in employee food pantry utilization. With the implementation of different methods and the supporting findings, we could then provide the university with a future recommendation to ensure ongoing aid for this population. Although the community partner addressed stigma and awareness being possible barriers to pantry utilization for this population, we wanted to confirm this by holding focused conversations as a sort of needs assessment with a sample of the target population. We chose Housing and Dining Services (HDS) employees as our target population for the intervention because they are the largest CSU department, with many employees facing food insecurity and being considered low-wage earners, primarily Spanish-speaking, or from historically marginalized communities.

Through these focused conversations, HDS employees were given the opportunity to voice their own experiences concerning the RAH food pantry and any barriers to food pantry access. From these sessions, the research team was able to gather relevant, population-specific information to further identify the specific aims of the study. This experience allowed me to connect with the population and learn about them on a personal level, so I could better construct an intervention that was designed for them. I learned that every community has very specific needs and barriers. Conducting community nutrition research requires researchers to establish a shared understanding with their target population, built on collaboration, trust, and mutual respect.[1] This experience gave me insight into what this population needs and their daily experiences that could be potential barriers for them accessing food from the RAH food pantry.

To further understand the perceived barriers, I then conducted one-on-one interviews with selected personnel to help me gain more context about the potential setting of the intervention, particularly what nutrition education could be helpful for those utilizing a food pantry. I interviewed RAH pantry employees, the RAH pantry director Micheal Buttram, the Community Food Systems Program Coordinator of the Western Colorado Research Center Amanda McQuade, and Emma Chavez. These

conversations provided me with very valuable insight into what barriers they observe in their environment and the populations they serve, and what they think would be helpful for these individuals. These interviews helped me tailor the intervention to make it practical for the food pantry operation, and gave me deeper insight into the individual roles, operational components, and people involved in running a food aid program. I also gained experience communicating and asking questions about sensitive topics and how to collaboratively work alongside professionals that have extensive knowledge about the community they serve. Talking with the target population and other personnel involved, lead to the development of the intervention and the targeted barriers of "stigma" and "awareness".

The Development Process of the Intervention

Based on the input from the sample group of HDS employees, in addition to the insight provided by subject matter experts, I then conducted an extensive literature search to gather further direction for our intervention. To start, we knew we wanted to change the messaging and increase information dissemination about the pantry. From literature, it was evident that changing the narrative of the food pantry from food insecurity can aid in stigma reduction, and that better methods to increase awareness could encourage the usage of food pantries.[1] Thus, we wanted to encourage food waste reduction as the main message while also introducing and evaluating what communication method is the most effective for this population. Additionally, we wanted to add nutrition education into the messaging to provide employees with more knowledge on the food they receive from the pantry and increase their awareness of what they could find at the pantry and know how to use it. In turn, this awareness or gained knowledge could contribute to stigma reduction by increasing overall comfortability of utilizing a food pantry.

One tactic was to include recipes that utilize food pantry items with minimal resources required. I developed the recipes firstly based off what produce the food pantry had in abundance weekly. This produce "star" of the week would be used in multiple recipes to ensure employees had a choice of what they wished to prepare. I wanted the recipes to be easy to follow and understand, without too many ingredients or cooking utensils required. I conducted research on what recipes should include for low-

income populations, then searched multiple cooking blogs and websites to find appropriate recipes. Nutrition education topics were also included and focused on how to save money effectively while grocery shopping, storage tips, and nutrient retention. Initially, the research team discussed doing a series of tasting events at the RAH pantry, where the featured recipes could be sampled by the HDS employees as they utilize the pantry, but unfortunately, due to public health licensure complications, this was not doable. Instead, we decided to hold information tables at the pantry during employee hours to still allow for conversation and connection with employees and dissemination of nutritional information and recipes.

The intervention tactic focused on designated employee hours was brainstormed with the help of Amanda McQuade, who has extensive knowledge of and experience running food banks in Colorado. Deciding on the specific hours and day involved collaborating with the RAH pantry director and staff involved negotiation and discussion of what was most practical, while also being the most helpful for employees. Due to limited pantry personnel resources, employee-designated hours had to be held during a time included in the original hours of the pantry. Therefore, Tuesdays from 9:00-11:00am were chosen because of the high reported attendance of HDS employees during that time already, and the assurance of a varied and diverse group of employees working during that time.

This creation and implementation process of the intervention taught me a lot, but especially the importance of managing deadlines, organizing resources, and record keeping of methods and progress. It opened my eyes to the fact that community nutrition interventions often do not start without first having extensive conversation and collaboration with community partners. By working closely with multiple community partners, I learned how to effectively share decision-making by balancing research goals with community goals. I had to practice negotiation and clear, responsive communication with funding always in mind for what was possible and practical. These interventions also take time, extensive research, and constant thought throughout to consider the impact on the population. It made it clear that interventions may not always go according to plan and that they will involve constant reevaluation. In the future, this

experience will help me collaborate effectively with partners I work with, construct efficient and helpful interventions and programs, and approach community nutrition efforts with strategic and practical intent.

Considerations for Intervention Materials

Creating materials for this intervention was a fun yet challenging experience. It allowed me to think outside the box and focus on what would truly resonate with and support this population. I prioritized accessibility by using easy-to-follow formatting, keeping the reading level at or below 8th grade, and ensuring that all materials could be easily translated into Spanish. When developing recipes, I aimed for a balance of cultural diversity while ensuring minimal required cooking tools while also using ingredients commonly found in the pantry to encourage variety. Nutrition education materials were designed to be practical and actionable, focusing on topics like saving money, meal planning, and preserving nutrients when cooking.

Aesthetic elements were also carefully considered—vibrant colors, clean and simple fonts, and photos of pantry produce were used to make the materials both appealing and relatable. This process taught me the importance of thoughtful design, cultural relevance, and the value of communicating nutrition information in a way that feels approachable and empowering. It reinforced the need to always keep the audience at the center of the creative process and highlighted how strong visuals, and clear messaging can improve both understanding and engagement.

Professional Growth

As a future RDN, there are many notable experiences, skills, and gained knowledge from my research that will shape and inform my approach to community nutrition. I have learned how to assess needs, design a target intervention, and properly evaluate outcomes and future directions. This will allow me to contribute to community initiatives with compassion and evidence-based action. It has made me feel better equipped to work with diverse populations and the importance of meeting people where they are. It has taught me that there is always more to learn and that collaborating with others, whether from

the community or the healthcare field, is a very valuable asset. I hope to be an RDN that is adaptable, compassionate, and knowledgeable in the research field of nutrition. With this, I believe my research will push me to provide the best care I can for the people I serve.

Conclusion

This research project gave me the opportunity to advocate for a nutrition issue that I am passionate about. It connected me to a population I might not have had the opportunity to connect with. I hope to continue to have opportunities for learning and connecting with different populations and how their experiences and situations impact their nutrition and their wellbeing. I hope to gain new skills that will contribute to my career in community nutrition and help me to continue learning how to be a researcher that strives for equity, cultural humility, and meaningful impact within the communities I serve.

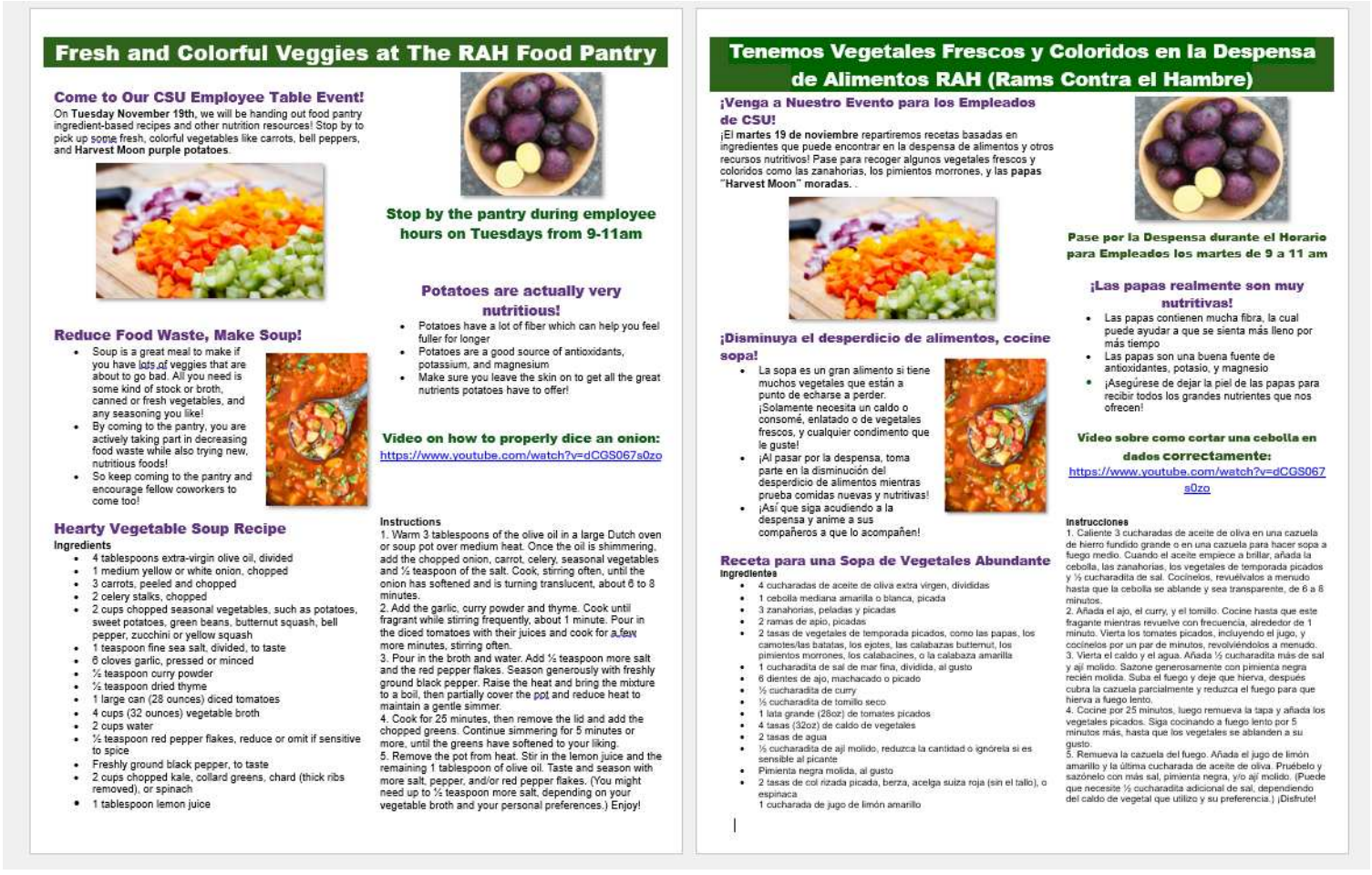
Resources

1. Bowe M, Wakefield JRH, Kellezi B, McNamara N, Harkin L, Jobling R. 'Sometimes, it's not just about the food': The social identity dynamics of foodbank helping transactions. *Euro J Social Psych*. 2019;49(6):1128-1143. doi:10.1002/ejsp.2558

APENDIX A

Changing Messaging and Information Dissemination

Figure A1. Example of an informative email sent to all HDS employees (English and Spanish versions)



Fresh and Colorful Veggies at The RAH Food Pantry

Come to Our CSU Employee Table Event!

On **Tuesday November 19th,** we will be handing out food pantry ingredient-based recipes and other nutrition resources! Stop by to pick up some fresh, colorful vegetables like carrots, bell peppers, and **Harvest Moon purple potatoes**.

Stop by the pantry during employee hours on Tuesdays from 9-11am

Reduce Food Waste, Make Soup!

- Soup is a great meal to make if you have lots of veggies that are about to go bad. All you need is some kind of stock or broth, canned or fresh vegetables, and any seasoning you like!
- By coming to the pantry, you are actively taking part in decreasing food waste while also trying new, nutritious foods!
- So keep coming to the pantry and encourage fellow coworkers to come too!

Potatoes are actually very nutritious!

- Potatoes have a lot of fiber which can help you feel fuller for longer
- Potatoes are a good source of antioxidants, potassium, and magnesium
- Make sure you leave the skin on to get all the great nutrients potatoes have to offer!

Video on how to properly dice an onion:
https://www.youtube.com/watch?v=dCGS067s0zo

Hearty Vegetable Soup Recipe

Ingredients

- 4 tablespoons extra-virgin olive oil, divided
- 1 medium yellow or white onion, chopped
- 3 carrots, peeled and chopped
- 2 celery stalks, chopped
- 2 cups chopped seasonal vegetables, such as potatoes, sweet potatoes, green beans, butternut squash, bell pepper, zucchini or yellow squash
- 1 teaspoon fine sea salt, divided, to taste
- 6 cloves garlic, pressed or minced
- ½ teaspoon curry powder
- ½ teaspoon dried thyme
- 1 large can (28 ounces) diced tomatoes
- 4 cups (32 ounces) vegetable broth
- 2 cups water
- ½ teaspoon red pepper flakes, reduce or omit if sensitive to spice
- Freshly ground black pepper, to taste
- 2 cups chopped kale, collard greens, chard (thick ribs removed), or spinach
- 1 tablespoon lemon juice

Instructions

1. Warm 3 tablespoons of the olive oil in a large Dutch oven or soup pot over medium heat. Once the oil is shimmering, add the chopped onion, carrot, celery, seasonal vegetables and ½ teaspoon of the salt. Cook, stirring often, until the onion has softened and is turning translucent, about 6 to 8 minutes.
2. Add the garlic, curry powder and thyme. Cook until fragrant while stirring frequently, about 1 minute. Pour in the diced tomatoes with their juices and cook for a few more minutes, stirring often.
3. Pour in the broth and water. Add ½ teaspoon more salt and the red pepper flakes. Season generously with freshly ground black pepper. Raise the heat and bring the mixture to a boil, then partially cover the pot and reduce heat to maintain a gentle simmer.
4. Cook for 25 minutes, then remove the lid and add the chopped greens. Continue simmering for 5 minutes or more, until the greens have softened to your liking.
5. Remove the pot from heat. Stir in the lemon juice and the remaining 1 tablespoon of olive oil. Taste and season with more salt, pepper, and/or red pepper flakes. (You might need up to ½ teaspoon more salt, depending on your vegetable broth and your personal preferences.) Enjoy!

Tenemos Vegetales Frescos y Coloridos en la Despensa de Alimentos RAH (Rams Contra el Hambre)

¡Venga a Nuestro Evento para los Empleados de CSU!

¡El **martes 19 de noviembre** repartiremos recetas basadas en ingredientes que puede encontrar en la despensa de alimentos y otros recursos nutritivos! Pase para recoger algunos vegetales frescos y coloridos como las zanahorias, los pimientos morrones, y las **papas "Harvest Moon" moradas.** .

Pase por la Despensa durante el Horario para Empleados los martes de 9 a 11 am

¡Disminuya el desperdicio de alimentos, cocine sopa!

- La sopa es un gran alimento si tiene muchos vegetales que están a punto de echarse a perder. ¡Solamente necesita un caldo o consomé, enlatado o de vegetales frescos, y cualquier condimento que le guste!
- ¡Al pasar por la despensa, toma parte en la disminución del desperdicio de alimentos mientras prueba comidas nuevas y nutritivas!
- ¡Así que siga acudiendo a la despensa y anime a sus compañeros a que lo acompañen!

¡Las papas realmente son muy nutritivas!

- Las papas contienen mucha fibra, la cual puede ayudar a que se sienta más lleno por más tiempo
- Las papas son una buena fuente de antioxidantes, potasio, y magnesio
- ¡Asegúrese de dejar la piel de las papas para recibir todos los grandes nutrientes que nos ofrecen!

Vídeo sobre como cortar una cebolla en dados correctamente:
https://www.youtube.com/watch?v=dCGS067s0zo

Receta para una Sopa de Vegetales Abundante

Ingredientes

- 4 cucharadas de aceite de oliva extra virgen, divididas
- 1 cebolla mediana amarilla o blanca, picada
- 3 zanahorias, peladas y picadas
- 2 ramas de apio, picadas
- 2 tasas de vegetales de temporada picados, como las papas, los camotes/las batatas, los ejotes, las calabazas butternut, los pimientos morrones, los calabacines, o la calabaza amarilla
- 1 cucharadita de sal de mar fina, dividida, al gusto
- 6 dientes de ajo, machacado o picado
- ½ cucharadita de curry
- ½ cucharadita de tomillo seco
- 1 lata grande (28oz) de tomates picados
- 4 tasas (32oz) de caldo de vegetales
- 2 tasas de agua
- ½ cucharadita de ají molido, reduzca la cantidad o ignórela si es sensible al picante
- Pimienta negra molida, al gusto
- 2 tasas de col rizada picada, berza, acelga suiza roja (sin el tallo), o espinaca
- 1 cucharada de jugo de limón amarillo

Instrucciones

1. Caliente 3 cucharadas de aceite de oliva en una cazuela de hierro fundido grande o en una cazuela para hacer sopa a fuego medio. Cuando el aceite empiece a brillar, añada la cebolla, las zanahorias, los vegetales de temporada picados y ½ cucharadita de sal. Cocínelos, revuélvalos a menudo hasta que la cebolla se ablande y sea transparente, de 6 a 8 minutos.
2. Añada el ajo, el curry, y el tomillo. Cocine hasta que este fragante mientras revuelve con frecuencia, alrededor de 1 minuto. Vierta los tomates picados, incluyendo el jugo, y cocínelos por un par de minutos, revolviéndolos a menudo.
3. Vierta el caldo y el agua. Añada ½ cucharadita más de sal y ají molido. Sazone generosamente con pimienta negra recién molida. Suba el fuego y deje que hierva, después cubra la cazuela parcialmente y reduzca el fuego para que hierva a fuego lento.
4. Cocine por 25 minutos, luego remueva la tapa y añada los vegetales picados. Siga cocinando a fuego lento por 5 minutos más, hasta que los vegetales se ablanden a su gusto.
5. Remueva la cazuela del fuego. Añada el jugo de limón amarillo y la última cucharada de aceite de oliva. Pruébelo y sazónelo con más sal, pimienta negra, y/o ají molido. (Puede que necesite ½ cucharadita adicional de sal, dependiendo del caldo de vegetal que utilice y su preferencia.) ¡Disfrute!

APENDIX B

Designated Employee Hours

Figure B1. Initial flyer sharing the initiation of designated employee hours at the RAH food pantry.

APENDIX C

Implemented Information Table Event

Figure C1. Squash recipe and nutrition education that were handed out to HDS employees within the RAH food pantry during designated employee hours.

Butternut Squash Pasta

Ingredients

- 1 medium butternut squash peeled and diced
- 3 tablespoons olive oil (or oil of choice)
- 12 ounces whole wheat linguine or any other pasta
- 1 1/2 cups water or vegetable broth
- 1 tablespoon olive oil
- 1/4 cup diced yellow onion
- 2 cloves garlic minced
- 8 sage leaves (or any other fresh or dried herb)
- 1/8 teaspoon ground nutmeg
- 1/4 cup grated parmesan cheese
- Salt and freshly ground black pepper to taste

Instructions

1. Bring a large pot of water to a boil. Salt the water and add the butternut squash. Cook until soft, for about 12-15 minutes. It can also roast in the oven at 400 degrees F for 15-20 minutes
2. Using a large, slotted spoon, carefully remove the squash from the water and place it in a large bowl. Add the pasta to the boiling water and cook according to package instructions.
3. Place the cooked butternut squash in a large food processor or blender. Puree the squash until smooth. Add water or broth and puree until the sauce reaches your desired consistency. You may need a little more or a little less water depending on the size of your squash.
4. In a large deep skillet, heat 1 tablespoon of olive oil over medium-high heat. Add onion and garlic and sauté until soft, 3-5 minutes. Add pureed butternut squash. Stir in the Parmesan cheese. Season with nutmeg, dried herbs, salt, and pepper. Add the pasta and stir until the pasta is well coated. Enjoy!

Squash Storing Tips

Squash can be stored in a cool, dry, and dark place for up to 6 months depending on the type

- Squash should not be stored next to fruit. Fruit can release certain gases that can cause squash to rot more quickly
- Avoid washing squash before storing it. Only wash squash before cooking or eating
- The storage area should have good air circulation
- Squashes with bruises, cuts or soft spots will not store for as long, so they should be used sooner
- Avoid stacking them, this can cause bruising

Squash can be stored in the freezer for 10-12 months

- Must have skin removed before storing it in the freezer
- Store in an airtight container or plastic freezer bag

Storage duration for different types of squash:

Butternut	4-6 months
Spaghetti	1-3 months
Acorn	1-3 months
Delicata	2-3 months
Kabocha	3-4 months
Pumpkins	3-4 months

Figure C2. Recipe and nutrition education highlighting common RAH pantry produce. These were handed out to HDS employees within the RAH food pantry during designated employee hours.

Caldo De Pollo

Ingredients

- 2 tablespoons olive oil
- ¾ medium white or yellow onion chopped
- 2 celery sticks chopped
- 4 large carrots
- 2 garlic cloves whole or minced
- 9 cups water
- 1 8 ounce can tomato sauce
- 2 large skinless boneless chicken breast
- 2 chicken legs bone in (skin is optional)
- 2 chicken flavor bouillon cubes
- 1 tablespoon kosher or sea salt (if using fine salt, use half the amount)
- ½ teaspoon black pepper or more to taste
- 1 teaspoon dried Mexican oregano
- ¼ cup chopped cilantro
- 1 corn on the cob cut into 5 pieces (or 1 can of corn)
- 1 chayote cut into 2-inch cubes
- 2 large russet potatoes cut into 2-inch cubes
- 2 medium zucchinis cut into 2-inch cubes
- lime juice and hot sauce for serving.

Instructions

1. Heat the oil in a large heavy-bottomed pot (5-quart) over medium heat. Add the onion, celery and carrots. Sauté until onions start to soften, about 3 minutes. Add the garlic and cook a minute more.
2. Add the water, tomato sauce, chicken, and spices. Bring it to a boil and reduce the heat to a simmer. Cover and cook for about 30 minutes until the chicken starts to soften.
3. Add the cilantro, corn on the cob, chayote and potatoes and cook for 10 minutes. Then add the zucchini.
4. Cover and simmer for 10 more minutes. Turn off the heat and let it sit for 5 more minutes before serving.
5. Ladle into bowls and drizzle lime juice and hot sauce.

How to Save Money and Eat Healthy!

Buy Affordable, Nutrient-Dense Food

Grains	Rice, oats, pasta
Legumes	Beans, lentils, chickpeas
Produce	Potatoes, carrots, bell peppers, celery, bananas, apples • Produce that is in-season is cheaper! • Try picking up produce that is frozen and canned
Protein	Eggs, yogurt, peanut butter, tofu, ground turkey, canned tuna

Shop Smart!

- Stick to your grocery list. It will help you avoid unnecessary purchases
- Shop sales, use coupons, and compare prices between grocery stores

Cook at Home

- Eating out can be expensive! Cooking at home is most often cheaper and healthier

Figure C3. Recipe and nutrition education highlighting frozen and canned produce. These were handed out to HDS employees within the RAH food pantry during designated employee hours.

Elote in a Cup

With canned, frozen, or fresh corn!

Ingredients

2 canned corn, 15 oz. each
1 tablespoon butter
2 tablespoons mayonnaise
2 tablespoons sour cream
3/4 cup cotija cheese
1/4 teaspoon chili powder
1 1/2 teaspoons chili lime salt (tajin)
1/4 cup cilantro, minced
1 lime

Instructions

1. Drain canned corn.
2. Melt butter in skillet over medium-high heat. Add a single layer of corn to skillet and grill for 3-4 minutes until corn begins to turn golden brown. Depending on the size of your skillet, you may need to repeat this process. Divide butter if corn is grilled in multiple turns.
3. Allow corn to cool. Meanwhile, stir together mayonnaise and sour cream in a small bowl. Chop cilantro, slice lime into six wedges. Set aside.
4. Once the canned corn has cooled stir the mayonnaise/sour cream sauce into it.
5. Assemble the Mexican Street Corn in a cup by evenly dividing corn into six cups. Top the elote with cotija cheese, chili powder, chili lime salt and cilantro. Garnish each cup with a fresh lime wedge.

Facts About Canned and Frozen Produce

Nutrition:

- Canned and frozen produce both often retain most of their nutritional value
- "Low sodium", "no salt added", and "packed in water" canned products are the best option for nutritional value

Shelf Life:

- Canned and frozen produce have a long shelf life! Canned products can be stored for an average of 1-5 years and frozen for an average of 6-12 months
- Can help reduce food waste since canned and frozen produce lasts longer than fresh produce
- Can be an affordable option for buying out-of-season produce

Usage Tips:

- Rinse canned products to reduce the sodium content
- You don't have to thaw frozen produce if it is used in soup, stir-fry and smoothies!
- Combine canned, frozen and fresh vegetables for added nutritional variety

APENDIX D

Figure D1. A formal recommendation given to the CSU community partner.

March 26th, 2025

To: Emma Chavez

Subject: Recommendations for Increasing Usage of the Rams Against Hunger (RAH) Food Pantry by CSU Employees

Authors: Brittney Sly and Jesse Whitcomb

ISSUE:

Although the various food pantries on the CSU main campus serve a wide variety of individuals in the CSU community, the CARE Program and RAH Program initiatives have observed that many CSU employees are not utilizing these resources, in particular the RAH Food Pantry is underutilized. Many of the CSU employees of concern, are considered of a lower socioeconomic status, mostly of individuals within minority groups, and have voiced experiencing increased food insecurity.

BACKGROUND:

Food insecurity can happen to anyone at any time. It has been gathered that the notion that employed individuals are automatically food secure due to personal income is often not the case. Commonly these individuals have more financial responsibility and may not be able to qualify for SNAP benefits due to specific work and income requirements. Additionally, many employees find SNAP benefits eligibility factors to be confusing, inconsistent, and often unfair which deters individuals to apply altogether. With this, employed food insecure individuals often turn to food banks and pantries, but there are multiple barriers that may impact their access to using these resources. The most documented barriers include negative stigma around food bank usage, lack of knowledge and/or resources regarding using the food acquired there, and food bank messaging that is confusing and contributes to negative stigma. Community-based interventions have addressed these barriers in similar populations with some success and ultimately made strides toward reducing food insecurity rates for this population.

In collaboration, a pilot project targeting Housing & Dining Services employees was executed to address barriers to employee use of the RAH Food Pantry including increasing awareness of the food pantry being for employees and decreasing negative stigma. The goal was that the interventions implemented would increase awareness and decrease stigma to ultimately increase usage of the RAH Food Pantry by employees.

RESULTS:

Of the 27 participants that took the post-intervention survey:

- 4 people had not visited the pantry before the fall semester, so these individuals could have come based on some of the intervention efforts.

Information Table Event

- 39% of participants noticed the information table at the pantry during the fall semester.
- Of the participants that did visit the table:
    - 30% of 7 individuals found the information there very helpful.
    - **Notes:** Perhaps the information at the tables could be transferred to emails or there could be increased messaging about the table, if these tables will be continued.

Change Messaging and Information Dissemination

- 28% of participants found out about the pantry through another coworker.
- 25% of participants found out about the pantry through emails from general CSU.
- 46% of participants found out about the designated employee hours through another coworker.
- 27% of participants found out about the designated employee hours through emails.
    - **Notes:** Informational emails being sent to employees should be continued. Some voiced however that they would like to be put on the listserv for emails that come from Emma. Perhaps there is a way to promote this? It would also be helpful to know how often general CSU emails are sent out and what kind of information is on them. Perhaps these emails could promote the pantry for employees and continue the messaging of decreasing food waste by using the food pantry.

Designated Employee-hours

- 57% of participants did not know Tuesdays from 9-11am were designated employee-only hours.
- 52% of participants did not visit the pantry during these hours.
- 30% of participants visited the pantry during these hours.

- Of the people that visited during these hours, 80% said it influenced their decision to visit the pantry.
    - Some positive comments on how it influenced their decision included themes of "convenience" and "helpful information".
    - Others commented that the hours didn't work with their schedule.
    - **Notes:** This intervention tactic has the potential to make a difference in CSU employee food bank utilization, but the data is not there to support it being the most effective strategy.
    - **Notes:** Since many employees reported not knowing about the employee hours, if this was to continue, perhaps further communication could be executed such as more general emails or a sign on the door of the pantry with the normal hours and the designated employee hours.

CONCLUSIONS:

- Emails are important communication tools for employees to receive information about the RAH Food Pantry and CSU employees like receiving them as they act as reminders of the existence of the food pantry and provide encouragement that the food pantry is intended for them.
- Due to many employees voicing the inconvenience of the 'employee-designated' hours, having an information table during these specific times may not be the best intervention for this population. They seem to value the operational characteristics of the RAH food pantry more - It being fast, in-and-out by nature, with produce and other ingredients they can easily utilize. However, employees did voice liking the information provided at the tables, thus the information provided at these tables could be sent via email.
- Employee hours did not appear to be the most effective intervention tactic during this pilot study. However, considering the restricted timeframe during the intervention for such hours, it is recommended that enacting these hours for a longer period of time or over multiple days that work for more employees, could be useful.