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Exploring Food Literacy Among S[ā]moans Living in the [San Francisco] Bay Area

By

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THESIS

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Most of all I want to thank my husband for being the rock to my foundation.

Faafetai tele lava

## Abstract

**Issue:** *“If food and lifestyle choices are implicated in the high rate of non-communicable diseases (NCDs) affecting Pasifika peoples, then there is a need to understand their beliefs with regard to food” (p.xvii) Soon (2016).* Samoans face some of the highest rates of diet-related NCDs in the world (Blair 2018), yet there is limited research on Samoans in the U.S. **Goal:** The goal of this thesis is to gain a better understanding of how food literacy, food choice and culture present themselves among the Samoan population in the Bay Area, California. **Methods:** 36 question survey of 147 participants and five follow up interviews, three questions each. **Key results:** Church is a highly underutilized source of health information, high consumption of fast food, culture plays a major role in food selection, high rate of NCDs, and a preference for filling foods. **Conclusion:** Understanding food literacy and behaviors among this population can aid in health community based health interventions.

## **TABLE OF CONTENTS**

Abstract

Table of Contents

Chapter 1: Introduction

Chapter 2: Literature Review

Chapter 3: Methodology

Chapter 4: Results

Chapter 5: Discussion and Conclusion

Appendix A & B

References

# Chapter 1 Introduction

This thesis research was inspired by a 2021 study that explores food literacy among Samoans living in Samoa (Kammholz et al. 2021). The study aimed to explore food knowledge and behaviors of adult Samoans by assessing the four domains of food literacy: plan/manage, select, prepare, and eat. Through a interviewer-administered questionnaire of a convenience sample of 150 participants, they found that participants generally plan to include healthy food (87%), budget money for food (87%), know where to find nutrition labels (68%), of which 43% always use them to inform their food choices. The study also found that over 90% of the participants agreed or strongly agreed that food impacts health, but their understanding of the Pacific Guidelines for Healthy Living was lacking.

This research uses the frame of food literacy as defined by Vidgen (2014), being equipped with the knowledge and skills required to navigate food systems to guide in healthy choices is fundamental to sustainable healthy and dietary behaviors. Food literacy is an emerging construct that seeks to describe practical food related aspects of nutrition (Kammholz 2021). Research on food literacy among Samoans in America is very limited and has only been published very recently. For example, Soon (2016) wrote about what food literacy means to Samoans in 2016. Soon (2021) later looked at the role midwives in New Zealand have on food literacy among Samoan families in 2021. Kammholz's 2021 exploratory descriptive study that explored food literacy among Samoans in Samoa is among one of the first to explore food literacy with an interviewer-administered questionnaire in the Pacific Islands.

The term “food literacy” is a relatively new term, first used in nutrition policies and plans in the 1990s and published in literature starting in 2001 (Begley 2016). It has emerged to describe the everyday practicalities that are associated with navigating the food system and utilizing it to ensure regular food intake that is consistent with nutritional needs (Vidgen 2014). Vidgen reviewed existing research that explores food literacy and found a great variation in the definitions and concepts of food literacy, making it difficult to define which in turn poses a barrier to measure and monitor food literacy. Despite no shared understanding of the term food literacy, Vidgen noted that it is increasingly being used in policy, research, and practice in the public arena today. Thompson (2006) conducted a systematic scoping review of the literature using the term “food literacy” to synthesize a comprehensive understanding of how the term is used, its reach and its application over time. They found the term first used in 41 countries in all levels of income countries, except for low income countries. They also found that the US was the first country to use the term, which was in 1998, and since then its use has increased exponentially over time, internationally and across many disciplines.

The goal of this thesis is to explore food literacy, health issues, and cultural significance of food among Samoans who reside in the Bay Area with the rationale that immigrants in the US experience the food environment and diet-related health through the lens of immigration. Samoans currently have some of the highest rates of non-communicable diseases (NCDs) in the world (Blair 2018). There is limited research on NCD among Samoans living in the US. This research aims to contribute to the research by providing insight on the following questions: how does food literacy present itself among Samoans?; what are some of the contributing factors to food selection?; what role does culture play in food selection?; what do health issues and food literacy look like among the study population? The hope is that this research may provide insight

into ways to improve healthy behaviors, such as food selection, and help reduce health issues Samoans face.

## Positionality Statement

It is important to note that a researcher's positionality influences their interpretation and understanding of the research and shapes their own research. The researcher who conducted this study identifies as a bi-racial Samoan/white female who has been an active member of the Pacific Islander community in the Bay Area in California since 2019. Although she is Samoan, and has lived in American Samoa as a child and has visited Samoa throughout her life, she was born in the US and has spent most of her life in Oregon. She did not grow up immersed in the Samoan community and does not speak the language. The researcher is middle class and college educated. She has married into a Samoan family who is deeply immersed in the Samoan cultural church system within the Bay Area. She has been a vegetarian since the age of twelve and therefore does not eat many of the Samoan food dishes. The researcher acknowledges that these lived experiences have shaped how she views the world and relationships with food, and may have an influence on how this research is viewed.

## Road Map

Chapter one gives the background of Samoa and American Samoa, including a brief history of globalization, the patterns of migration, and the effects those have had on the diet and health of Samoans. This is important because it lays the foundation to understanding the diet and health of Samoans today. Chapter two reviews the literature starting with defining the concepts of food literacy and health literacy. Food systems in Pacific Islands are discussed to provide an



understanding of how it has changed over time and how that has impacted the diet of Samoans. This is followed by a look at Samoans, health issues and the impacts of globalization, and then studies on food literacy and diet among Samoans. Poverty in relation to food selection and food literacy is explored to help understand the impacts access to resources may have on health and food choice. Lastly, the influence of Samoan culture on food selection is explored. This review of literature is important because it provides a foundation for the connection between food literacy, health issues, and cultural significance which is further illustrated from the results of this research. Chapter three details the methodology of this research. Research methods include a survey and interviews that ask questions aimed at gaining a better understanding of food literacy, health issues, and cultural significance of food selection. Chapter four presents the results of the data, including a demographic table and some visual representations of data to help provide a better understanding when interpreting the results. Chapter five discusses the data from this research, drawing out common themes to aid in analysis, while providing some perspective from additional literature. This chapter helps to confirm and further some aspects of the initial research questions and offer different perspectives. It also provides areas where future research is needed.

## Background on Samoa

The archipelago of the Samoan islands consists of 14 small islands in the heart of the Pacific Ocean about halfway between Hawaii and New Zealand. During the late 1800s, Germany, Britain, and the United States all valued the Samoan archipelago for its strategic location for trade, military, and commerce in the Pacific Ocean (Vidgen 2014). In an attempt to alleviate hostility among the three powers, the three countries signed the General Act of Berlin in 1889, preserving an autonomous and independent government in Samoa. War between the ruling

countries was avoided by a typhoon that struck the Samoan islands, sinking all of the warships anchored there except for one. In 1889, it was divided into two countries, American Samoa in the east, a territory of the US, and the independent nation of Samoa in the west, which was occupied by Germany and then New Zealand in 1914. In 1962, Samoa became the first Pacific Island nation to gain independence. It has the world's second largest Pacific island group, after the Maori in New Zealand. In 1997 the country changed its name from Western Samoa to Samoa (Britannica 2020).

The independent country of Samoa (formerly Western Samoa) is a small island country made up of nine volcanic islands, four of which are inhabited. The two largest islands are Savai'i and Upolu. Upolu is home to the capital city Apia and about three-quarters of Samoa's total population (Nationsonline, 2021). The total population of Samoa is about 200,000. The official languages are English and Samoan (World Population Prospects 2022). In the early 19th century, colonial missionaries introduced Christianity to Samoa. Colonization had a profound impact on the Samoan culture resulting in the loss of some indigenous practices such as disrupting the Samoan *matai* (chief) system, prohibiting village cricket, discarding traditional attire, and changing traditional hair styles in accordance to biblical scripture (Background Note: Samoa. 2008; Myform, 2005). However, Samoans never lost their *Fa'a Samoa*, the Samoan way of life, and are communal and maintain strong cultural, familial, language, dress, food, and Christian religious beliefs and practices. In fact, it is something they take great pride in. Similar ways of life are seen throughout the Pacific Island cultures. Samoa is a self-governed society which consists of a blend of government held positions and village chiefs, or *matai's*.

American Samoa, officially known as the Territory of American Samoa, is an unincorporated territory of the United States and has a population of about 41,000. It is made up

of six islands with Tutuila as the largest island and home to the capital Pago Pago (Creevey et al. 2022). The majority of the population are ethnically Samoan. Most people speak both English and Samoa. During World War II, the United States built a Navy Station in Pago Pago and considered American Samoa a valuable military asset. The Pago Pago harbor played an important role during the war as an essential link in communication between allied countries (U.S. Department of the Interior 2019). Citizens of American Samoa are considered nationals of the United States. Unlike the four other unincorporated U.S. territories, people born in American Samoa have never been granted birthright citizenship. This is due in part to the American Samoan government intervening in the case to oppose birthright citizenship out of fear that granting U.S. citizenship would be a detrimental threat to the *fa'asamoa*, the Samoan way of life. *Fa'asamoa* is built on a system that recognizes extended families as social structures and communally held lands are run by chiefs (Brady, 2018). The American Samoa government believes that communal property ownership and the limiting of property ownership to individuals who are at least 50% Samoan would be at risk. A change in the political structure of American Samoa could alter how that works. The American Samoan government believes that both of these practices would be impossible to protect under the U.S. Constitution (Pampuro, 2021). This status is a highly debated topic as some American Samoans want the benefit of citizenship while others fear citizenship will eventually lead to the loss of their land rights and indigenous political system.

They have an elected governor and territorial legislature and a non-voting delegate in the U.S. House of Representatives. They do not have the right to vote in federal elections, they do not pay U.S. income taxes or vote in presidential elections, but they may serve in the U.S. armed services. They have the right to work and travel freely in the U.S. American Samoa is heavily

influenced by Western cultures. For example, with over 30,000 restaurants worldwide, in 2004, the McDonalds in American Samoa, named “The McDonalds by the Bay”, ranked number one in average restaurant sales in the world (News,R.N.Z.2004).

## History of Colonization/Globalization

### Migration

Almost half of the population in American Samoa are foreign born, mostly from Samoa with some from the U.S., Asia, and other Pacific Islands (Foster 2022). Due to a mass migration of American Samoans to the U.S. during the mid-20th century, there are now almost as many American Samoans living abroad than in the islands (Creevey et al, 2022). Remittances make up a significant portion of the economy and are a key source of income for households in American Samoa and Samoa. Remittances, mostly coming from New Zealand and Australia, are the second biggest source of foreign exchange and account for about 20% of Samoa’s GDP (World Trade Organization (2019). Samoans usually migrate to New Zealand while American Samoans usually migrate to the U.S.

Gershon (2007) identified three waves of Samoan migration to the U.S; 1) Prior to WWII, Samoan scholarship students migrated to the U.S. to pursue education at theological universities; 2) After WWII, American Samoans enlisted in the U.S. military (more than any other U.S. territory or state (Leong (2021))); 3) Post-war boom, and the largest migration wave, young Samoans migrated in pursuit of manual labor jobs in the U.S. Most of these young adults who migrated to the U.S. worked two to three jobs, sent money home to their families, and lived in multigenerational households. This can still be seen throughout the Samoan community in the

U.S. today. Today these expatriates make up most of the older generation of Samoan migrants and whose children are natural-born citizens.

Currently there are just over 200,000 Samoans living in the U.S (Bureau 2021), almost equivalent to the amount of Samoans living in both Samoa and American Samoa (U.S. Census Bureau, 2010). Samoans represent the second largest population of Pacific Islanders in the USA, following Native Hawaiians. The highest concentrations of Samoans are in Utah, California, Washington, Hawaii, Nevada, and Alaska. This is due in part, to the pursuit of employment and religious opportunities, and familial ties. Between 2000 and 2017, the Pacific Islander (PI) population grew by 29%, making them among the fastest growing ethnic groups in California (Regional Pacific Islander Task Force 2020). About 0.8% of the California population identify as Pacific Islander, and 53% of them reside in Bay Area counties (Regional Pacific Islander Task Force 2020). Samoans are the second largest Pacific Islander population in California comprising about 19% after Native Hawaiians.

Health disparities among Samoans, specifically on non-communicable diseases (NCD), is well documented globally, however, within the United States it is difficult to distinguish the Samoan population because they are more often lumped under the umbrella term Native Hawaiian Pacific Islander (NHPI). This topic will be explored more in the next chapter. Samoans have high rates of NCDs, for example in 2016 NCDs accounted for about 81% of deaths in Samoa, which is slightly less than the U.S. in which 88% of deaths were due to NCDs (World Health Organization Country Profiles, United States, Samoa, 2018). In 2018, NHPIs were 2.5 more likely to be diagnosed with and die from diabetes compared to non-Hispanic whites, and American Samoans had the highest rate of diabetes among the NHPI sub-population, and were 2.8 times higher than the national white population (Office of Minority Health, Diabetes, 2021).

NHPIs were reported being 80 percent more likely to be obese than non-Hispanic whites, and Samoans were 5.6 times more likely to be obese compared to the overall Asian American population (Office of Minority Health, Obesity, 2020). Compared to non-Hispanic whites in the US. American Samoan women are twice as likely to be diagnosed with, and die from, cervical cancer and men are eight times more likely to develop liver cancer (Office of Minority Health, Cancer, 2021). In Hawai'i, Samoans have the lowest life expectancy of the state's seven major ethnic groups (Park 2009). In a 2017 survey of Samoans in California, it was found that less than 40 percent of adults reported their health as very good or excellent, compared to 60 percent of the U.S. population (University of Michigan News (2017). In a study of over 44,000 insured individuals living in the US of various racial and ethnic backgrounds, including Puerto Ricans, Whites, Hawaiians and several Asian groups, Samoans had the highest percentage of obesity with an odds ratio of obesity of 8.97 ( $p < 0.001$ ) compared to whites. (Taira et al., 2004).

## Chapter 2 Literature Review

This chapter will review some of the relevant literature as it pertains to food literacy, health literacy, and cultural influence on food selection among Samoans. Sections include Defining Food Literacy, Food Literacy and Health Literacy, Pacific Island Food Systems; Samoans, Health Issues and Globalization; Samoans, Food Literacy, and Diet Related Studies; Culture and Fa’asamoa. It is important to understand this background because it helps lay the foundation for the connections between food literacy, health issues, and cultural significance. Understanding those connections could potentially help inform public health initiatives to combat NCDs among the Samoan population. Improving dietary habits of a population is a multifaceted task, which requires an understanding of the social context and food related abilities and skills of individuals.

### Defining Food Literacy

Understanding the definition of food literacy, its components and the larger implications is important in framing this study. In the realm of public policy and public health, Vidgen (2014) defines food literacy as “the scaffolding that empowers individuals, households, communities or

nations to protect diet quality through change and strengthen dietary resilience over time” (p.54). Vidgen (2014) identified the four domains of food literacy as the skills, knowledge and behaviors required to plan, manage, select, prepare and eat food to meet needs and determine intake . Kammholz et al. (2021) recognized that policy and environmental actions have a critical role in improving access to and consumption of healthy foods and that these interventions are heavily dependent on a greater understanding of individuals’ knowledge of food and associated behaviors. Understanding food selection is important for public health since policy is designed to address NCDs needs to consider linkages among food preferences, health impacts, affordability of food choices, and modernization (Evans et al. 2003). In the context of this research, traditional diets are defined by a high intake of local, cultural, and traditional foods, such as taro, fish, breadfruit, and *palusami* (coconut juice wrapped in taro leaves), which consists of minimally processed foods. Modern diets are characterized by a high intake of processed and/or imported foods, such as fast food, rice, dairy, and processed sugar, and a low intake of traditional foods.

An important component of the definition of food literacy is food selection, a focus of this study. Videgen (2014) narrows the definition down to three main components: “a) Access to food through multiple sources and knowing the advantages and disadvantages of these; 2) Determine what is in a food product, where it came from, how to store it and use it; and 3) Judge the quality of food” (p.55). Food selection is explored in this research and will be discussed in detail in the following chapter. Factors that contribute to NCDs and poor dietary practices are complex and require an interdisciplinary approach that acknowledges the social context of health. What is not well documented is food literacy among Samoans living in the US which is why this research is important.



Research shows a correlation between low food literacy rates, food insecurity and health. For example, a study done in Western Australia aimed to describe the prevalence of food insecurity in adults enrolled in a food literacy program and examine the relationship between food insecurity and a range of variables. In a sample size of 1,433 participants, they found a strong association between food literacy behaviors and food insecurity in which inadequate food literacy may contribute to food insecurity, and being food insecure may limit the ability to engage in food literacy behaviors to achieve adequate diet quality (Begley 2019). A study done in Italy surveyed 1,200 adults in an effort to assess food literacy and health. They found that socio-economic status influences food literacy skills, people who suffer from social inequalities are more likely to show limited food literacy, and inadequate food literacy is correlated with worsening individual health (Palumbo et al. 2019).

Nutrition education can have an impact on food security. A study looked at a multiethnic, low-income population in New York over a three year period who participated in the Expanded Food and Nutrition Education Program who either graduated or terminated involvement in the program prior to graduation. They found that both groups had a significant decrease in food insecurity from pre-to post education, but those who graduated showed a decrease in food insecurity significantly more than those who did not graduate (Dollahite 2009).

Truman (2019) conducted a scoping review of the literature on barriers to food literacy to examine the relationship between food-related knowledge, attitudes, and behaviors. Behaviors were defined as external factors such as external limitations, resources, and environmental conditions, and were identified as the largest group (66%) posing barriers to food literacy. Some of the most frequent barriers reported included lack of learning time for individuals, lack of

funding for community programs, the home/living environment, and community food insecurity (Truman 2019).

## Food Literacy and Health Literacy

Food literacy is not well studied in Pacific Islander populations, especially in the United States. The need to understand how Pacific Islanders make food decisions and how it correlates with health issues highlights a gap in literature. Although much of the public health research illustrates the importance of health literacy in regards to addressing NCDs and obesity, little is known about health literacy in the Pacific Islands (Bollars 2019).

Food literacy is a sub-area of health literacy. Nutrition plays a central role in health and chronic disease prevention, and shaping dietary patterns is especially important (Nishida 2004). In order to make pro-health dietary changes, one must first be equipped with the skills and knowledge necessary to navigate modern-day food systems. An improvement in food choice and consumption could help reduce obesity and NCDs, and consequently reduce pressures on health systems who are inundated with patients suffering from preventable diseases (Kammholz 2021).

The term health literacy is a relatively new concept, which evolved out of a long history, starting pre-Civil war era, of defining, redefining, and quantifying the functional literacy needs (Berkman et al. 2010). Berkman states that the concept of health literacy was first introduced in the U.S. through the Department of Education's 2003 National Assessment of Adult Literacy Survey, in which health items were included in the survey. Since then, the relationship between health status, outcomes, and low literacy rates have increasingly been documented, forming a new field of study referred to as *health literacy* (Berkman et al. 2010).

Krause et al. (2018) conducted a systematic review of definitions of nutrition literacy and identified the main components as: competencies that increase the motivation, awareness, and ability of individuals as they engage with family, individuals, community, and society health issues. This definition is further supported by another review of literature by Nutbeam (2015), who summed up the definition of health literacy as “describing a person’s ability to perform knowledge-based literacy tasks (understanding and using information) that are required to make health related decisions in a variety of different situations” (p.16).

Low health literacy rates have been linked to health disparities and health issues. For example, in 2011, Berkman et al (2011) conducted an updated systematic literature review (previously done in 2004) to determine whether low health literacy is related to poorer use of health care, costs, outcomes, and disparities in health outcomes among people of all ages. They reviewed 96 studies and found that low health literacy is consistently associated with poorer ability to understand and follow medical advice, poor health outcomes, and differential use of healthcare services. They also found that poor health literacy partially explains racial disparities in some health outcomes (Berkman et al (2011). Weiss (2001) conducted a review of the international medical and education literature to identify research on health literacy and found a strong association with limited health literacy and poor health status and that literacy skills more accurately predict health status more than any other socio demographic variable. One study aimed to determine if community health literacy has an independent relationship with individual self-reported health beyond health literacy (Sentell et al. 2014). Analyzing data from the 2008 and 2010 Hawai’i Health Survey that included 11,779 individuals within 37 communities, Sentell found that both individual and community low health literacy were strongly associated with self-reported poor health status, lower education attainment, older age, poverty, and non-

White race. Kondo (2011) conducted a meta-analysis of peer-reviewed papers to investigate the health impacts of socioeconomic disparities as well as the underlying pathways to those disparities. They found that a large population have risks of mortality and poor self-rated health due to income inequality, suggesting a modest adverse effect of income inequality on health.

Immigrants and ethnic minorities have been identified as experiencing disproportionately low or inadequate health literacy, contributing to the health inequalities (Local action on health inequalities improving health literacy 2015). Gibney et al.(2020) analyzed data from 1005 Irish survey respondents in the 2011 European Health Literacy estimated and compared associations between health status, health behaviors, and healthcare utilization within different levels of social status in the Irish population. They found that while improving health literacy would be beneficial to all groups, it would have the most impact in the lower social status groups, therefore contributing to reducing social disparities in health outcomes (Gibney 2020). Logan et al (2015) conducted a selected review of the literature on how health literacy, health equity, and health disparities are connected both in practice and in research. They found that health literacy is intrinsically linked to both an individual's and a community's socioeconomic status and that improving health literacy may reduce health inequalities (Logan, 2015).

In order to achieve a goal of healthy eating, it is important for an individual to be food literate, in which health literacy skills are involved. The increase in diet related diseases has been linked to a lack of understanding and skill set around food and its use (Vidgen 2012). Velardo (2015) argues that a comprehensive conceptualization of nutrition literacy needs to include key elements of health literacy and food literacy constructs. Velardo utilizes Nutbeam's tripartite model of health literacy, a useful framework for exploring links between health literacy, nutrition literacy, and food literacy constructs, to examine competencies that are likely to facilitate healthy

food relationships. They found there are overlaps between nutrition literacy and food literacy, especially when it came to food selection.

Health and food literacy rates are not well studied in Samoa, especially when it comes to influence of culture. However, one study in Samoa found that health literacy was influenced by culture and the family circle, where support is provided through the church and local gatherings, was proved to be central to health (Bollars 2019). This same study also found that personal ownership of health was lacking, despite basic knowledge of NCDs, the population in study lacked a deeper understanding of the implications of NCDs. Bollars identified two themes when it came to the family circle and health: 1. Health is a family issue as well is medication and; 2. Health is considered confidential and is only to be shared with family members. Speaking about your own health issues outside of your family is considered rude. Understanding how culture influences health is important because it can inform public health interventions.

## Poverty, Race, and Diet-Related Health

The connections between poverty, race, and diet-related health is well documented. One study in St. Louis, Mo, conducted audits of community supermarkets and fast food locations to assess location and availability of food choices and used the 2000 census data to assess racial distribution and federal poverty levels to look at whether all communities have equal access to foods that enable individuals to make healthy dietary choices (Baker et al. 2006). They found that, regardless of income, mixed-race and white high-poverty areas as well as all African American areas were less likely than white higher-income communities to have access to foods that enable individuals to make healthy choices, posing a barrier to making positive changes to their diets, which in turn exacerbates disparities in health outcomes. However, Brinkley (2017)

conducted a U.S. national county-level multi-variable spatial regression analysis of socioeconomic status, the built environment and food environment factors, and found that health outcomes are strongly associated with race and income and less with supermarket access.

Research shows that there is a correlation between low income earners and increased health issues. Chetty et al (2016) analyzed newly available data on income and mortality for the US population from 1999 through 2014 in an effort to better understand the relationship between income and life expectancy. They found that higher income was associated with greater longevity and the difference in life expectancy across income levels increased. They also found that life expectancy and income varied a lot and were correlated with health behaviors and local area characteristics. Frohlich (2006) documented contemporary evidence on the patterns of health disparities in Canada and found that the lowest income earners were five times more likely to report fair or poor health than the highest income earners. Bor et al. (2017) reviewed studies that reported trends in survival inequalities in the US from 1980 through 2015. They found that low income people reported worse health status than higher income individuals and that poor people increasingly live shorter lives than higher income people.

The relationship between race and health disparities has been well documented and the evidence is overwhelming. The CDC identifies that there is a growing body of research that shows centuries of racism in the US having a profound and negative impact on communities of color who experience higher rates of health issues when compared to Whites (CDC Health Equity 2021). Ten percent of Hispanics reported having fair or poor health compared with 8.3 percent of non-Hispanic whites in the US (CDC Health of Hispanic or Latino Population 2022). American Indian/Alaska Native adults were found to be almost three times more likely to be diagnosed with diabetes, 2.3 times more likely to die from diabetes, and twice as likely to be

diagnosed with end stage renal disease than non-Hispanic whites in the US (CDC Health of Hispanic or Latino Population 2022). Tuberculosis was found to be 35 times more common in Asian Americans than among non-Hispanic whites in the US (US Department of Health 2020). Tuberculosis for NHPI is higher than any other population in the US (US Department of Health (2020).

Fan (2015) conducted an in-depth comparative case studies on why Samoa and American Samoa, who have similar cultural and economic backgrounds, have different health outcomes. They found that in Samoa, higher incomes are positively associated with greater cardiovascular disease risk, but in American Samoa lower incomes are associated with greater cardiovascular disease risk, alluding to the impact Westernized diets have had on Samoans.

## Pacific Islanders and Food Systems

Food systems in the Pacific Islands have gone through significant changes as they have been impacted through Western influences. The historical shifts in food security in the Pacific Islands, including Samoa, have been outlined by Jagjit Kaur Plahe et al. (2013). They break the changing food environments in the Pacific down into three main stages: 1) *Colonial-Settler Food Regime*, European engagement with the Pacific was founded on exploitative and extracted development. Many Pacific Islanders were converted from self-sufficient tribal societies into agriculture commodities exports, with little benefit to the locals; 2) *Post-War Food Regime* was “characterized by a reversal of the net flow of food” (p.314), flowing from north to south, as seen in the first regime. It now began to flow from north (developed) to the south (undeveloped), perpetuating the exploitation of locals. As exports took precedence over local needs, government budgets became more dependent on foreign aid; 3) *The Corporate Food Regime*, while the local

food sovereignty remained mostly protected by local governments, the rise of international corporations and trade agreements weakened local government and community control by opening the Southern agricultural economies to food imports while simultaneously eroding the traditional role of the state. The World Trade Organization's Agreement on Agriculture, along with many other free-trade agreements, further undermined Pacific Island nations' ability to grow local foods. The international trade rules set by the WTO in which national regulations to protect agriculture, society, health, and the environment were considered trade restrictive so the WTO converted these regulations into tariffs. Tariffs and price guarantees for farmers were reduced or abolished and agriculture research support was decimated .

The accessibility, affordability and desirability of foods is powerfully shaped by the surrounding food system. In the Pacific region, a processed foods nutrition transition is actively changing the food environment, especially in lower-middle income countries. Samoa is officially designated a Small Developing State and was included on the United Nations (UN) least developed country list from 1971, however in 2014 the UN reported it had "graduated" from that status (UN 2017). There is some limited research on the role of processed foods in nutrition transition in the Pacific Islands in the context of NCDs, however the patterns, underlying drivers, and trends of processed food systems in the Pacific is not well documented. Sievert et al. (2019) found that between 2004 and 2018 there was a steady increase in sales per capita in Samoa of processed foods. This trend is reflected across the Pacific Island region. For example, aside from Australia, American Samoa had the highest level of soft drink sales in the Pacific region. When broken down by per capita, American Samoa had nearly double the sales of vegetable oil as higher income countries like Australia and New Zealand (Sievert et al 2019). This study demonstrated that processed foods play a significant role in the diets of Pacific Island nations,



especially those undergoing economic and social transitions such as urbanization, trade and globalization, and income growth.

The concept of power dynamics within the Samoan culture can be expressed through food quantity and quality that is served to others, as a sign of respect. Production and distribution of food has long been an inseparable part of the power dynamics within the Samoan culture (Bindon 2006). Traditionally, Samoan chief status within villages is validated and emphasized by food production, preparation, and eating (Bindon 2006). During meals, traditionally elders, religious leaders, and chiefs are served first, followed by women and children, and then the untitled and/or servers are last. Wentworth (2020) identified that eating with dignity in Samoa requires a meal complete with meat, starchy foods (like taro or rice) and a soupy or saucy dish.

Food is a means of building and maintaining social relationships and community cohesion. Lameko (2020) observed that most of the politicians, government officials, and ministers and their wives, are overweight or obese. Because these are positions of power within the Samoan culture, they are well fed by the people as a sign of respect. Lameko also states that there may be a correlation between Samoans who hold positions of power and higher rates of obesity. In cultural exchanges, the fattiest sections and largest portion sizes of a cooked pig are served according to social status. For example, high chiefs receive larger portions of the prestigious foods, with the intention that it will serve their families at home as well (Bindon, 2006).

Samoan ideologies of power associate fat bodies with a high social status and abundance of resources (Shore, 1989). Broadly speaking, in Oceania the body is seen as a community project in which fatness is an indication of community care and wealth (Hardin, 2018). Therefore

community leaders exhibit their power through their large bodies. The abundance of food indicates the ability to mobilize social networks, in which fatness is a material expression of power (Hardin, 2018; Young 1971). Dubois et al. (2012) found that consumers choose larger food and drink portion sizes because it indicates a sign of greater social status. In Samoa, people struggle with reducing food intake in a context where consumption of food is both a way to recognize the generosity and status of others, while also creating ones' own status as a receiver of gifts (Hardin, 2018).

## Samoans, Health Issues, and Globalization

The literature of the impact of globalization on Pacific Islanders and health is well documented. McGarvey (2010) conducted a review of the published literature on the socioeconomic, public health, medical, and demography in relation to the Samoan migrant population living outside of Samoa and found that they may be at risk for poor levels of health due to poverty, sociocultural influences on healthcare knowledge, attitude, access, and low health literacy rates. New Zealand, Australia, and the US have the largest Pacific Island migrant population. National survey data suggests that levels of non-communicable diseases (NCDs) are higher among these migrant populations than in many of the island populations themselves, implying that migration exacerbates the issues of obesity and other NCDs (Hawley 2015). For example, a 2004/2005 National Health survey conducted in Australia found that 63% of migrant adults born in the Oceania region (excluding Australia), were found to be overweight or obese (World Health Organization 2014). One study showed that the Samoan-born population living in Queensland, Australia, was more than seven times as likely to be hospitalized for diabetes-related issues than the general Queensland population (Queensland Government 2011).

In the Pacific region, the increase in household incomes, urbanization, and increase of women in the workforce have positioned processed foods as both a marker of social status and convenience (Friel 2015). The participation of Pacific Island countries in global free trade agreements, in addition to market penetration of transnational beverage and food corporations, has made processed foods widely available, even in remote areas ( Hawley 2015). As a consequence, the Pacific Island region has had an increase in health issues.

Samoans face a health epidemic of rising obesity and diet-related non-communicable diseases (Kessaram 2015). According to the WHO's Noncommunicable Diseases Samoa 2018 country profile, NCDs are estimated to be the cause of 81% of deaths among Samoans living in Samoa, with 34% cardiovascular, 15% cancer, 9% diabetes, and 5% chronic respiratory disease reported as other causes of death. The United States has the twelfth highest obesity rate in the world at 36.2%. On the list of "fattest" countries in the world, eight of the top ten countries are in the Pacific region, Samoa ranked at sixth in the world (World Population Review 2022). The rise of NCDs and obesity and Pacific Islanders is well documented. Pacific Island nations have been disproportionately affected by NCDs, accounting for about 70% of all deaths in the Pacific Islands (Hawley et al 2015). The Samoan-born population in Queensland, Australia was shown to be more than seven times more likely to be hospitalized for diabetes-related complications than the rest of the population (World Health Organization 2014). In a study looking at diabetes rates among adult members of Kaiser Permanente Northern California, Pacific Islanders had more than three times the rate of diabetes than white people (Andrew 2013). A staggering 80% of women in American Samoa were considered obese (U.S. National Library of Medicine 2010.).

There are multiple theories that exist speculating as to why Samoans (and other Pacific Islanders) are so susceptible to obesity, including cultural factors, Western influence, and the recent discovery of the rare “thrifty” gene that could be the cause of a genetic predisposition toward higher Body-Mass-Index (BMI). In 2015, Hawley found that 86% of American Samoan mothers were overweight or obese during early pregnancy, which can raise the risk of obesity in infants. Hawley later stated that chronic disease among the adult population in Samoa has gotten so bad that there needs to be a generational shift, such as public health interventions that target children, in order to be effective (Blair, 2018).

The effect of globalization, specifically the impacts of trade and the penetration of multinational corporations, on the Samoan diet has been well documented as well as the obesity epidemic among Samoans (Bindon 1970). Pacific Island nations are heavily affected by NCDs, with some of the highest rates of diabetes and obesity in the world. Estime et al (2014) states that trade is one of the many systemic causes of NCDs in the Pacific. In their study they found significant correlations in country level expenditure and caloric intake between ‘unhealthy’ and imported foods as well as between imported foods and obesity (Sahal 2014). The influence of Westernized diet on Samoans is further supported by DiBello (2009) in which they note that 71% of women and 61% of men in American Samoa are considered obese, while only 30% of men and about 50% of women in Samoa are obese. DiBello reiterates that this ecological difference in obesity rates between the two islands can be related to the different levels of modernization in both countries. Shifts in diet towards a modernized diet and less variety of dietary patterns are considered a key factor in the rise of NCDs and obesity in Samoa (Snowdon 2013). Reducing the intake of modern processed foods may help to prevent the continued growth in the prevalence of metabolic syndrome in American Samoa and Samoa (DiBello 2009).

Traditionally, Samoan diets consisted of seafood, banana, taro, yam, breadfruit, coconut, and papayas. Foods that were more expensive, less available, or considered more valuable such as pigs, were reserved for cultural occasions. When the missionaries, military, and traders came to Samoa in the 1830s, the traditional diets of Samoans began to change over time to include more processed, imported, and canned foods (Bindon 1982). Bindon (1982) conducted a study that measured the effects of modernization on the dietary patterns of adult Samoans who were categorized as more traditional, intermediate, or modernized on the bases of residence. His study of 330 Samoan adults residing in American Samoa and Hawaii revealed an increasing reliance on purchased foods, a decrease in traditional Samoan foods, and an increase on introduced foods such as rice and bread. This influence of Western foods continues to persist today.

Food systems and dietary behaviors have undergone dramatic transitions from traditional diets to modernized diets over the past few decades, significantly impacting food environments and human health throughout the Pacific Islands. Samoa is no exception, with the influence of globalization on food systems, changing the diets of Samoans in Samoa and abroad (Bindon 1970). Changes in the dietary patterns of Samoans run parallel to increased rates of NCDs and obesity (Kammholz 2021). Understanding food behaviors in a rapidly changing food environment is a critical step in supporting sustainable, healthy food behaviors.

## Samoans, Food Literacy, and Diet Related Studies

The research of food literacy in relation to Samoans and diet is somewhat limited. Soon (2016) stated that *“if food and lifestyle choices are implicated in the high rate of NCDs affecting Pasifika peoples, then there is a need to understand their beliefs with regard to food”* (p.xvii). In a study on measuring health literacy and obesity among Native Hawaiian and Pacific Islanders

(NHPI) in the United States, Lassetter et al. (2014) found that nearly half of NHPIs have difficulty interpreting nutrition facts labels. Fiti-Sinclair (2004) found that among Samoans living in Samoa, there is a lack of knowledge of healthy versus unhealthy foods and how these foods affect one's health. The need for further nutritional information and education was identified.

In Samoa, between 1961 and 2007, total energy (caloric) availability increased substantially, by 47%, per capita per day. Many of these extra calories came from dietary fat, which rose by 73%. Locally grown products such as coconut, fruit, and taro showed little to no increase during this time (Seiden et al. 2012). Seiden et al. (2012) study identified the need for further research on Samoans consumer food prices, diet, food security, and health to better understand the transformation of the local food system. Bell's (1999) research supported earlier research that micronutrient-dense foods, such as green vegetables, are not a major feature of Pacific Island diets. Coconut, taro, rice, onions, and banana were more commonly found in Pacific diets.

Much of the literature on the diaspora of Pacific Islanders has resulted in dietary transitions, shifting from traditional to modern dietary patterns and a decline in the nutritional quality of diets. The diets of Samoans living abroad are high in processed foods. Bell et al. (1999) found that young adult Samoans from Samoan church communities in Auckland, New Zealand, consumed a diet that was more modernized, a diet higher in fat and sugar and lower in a variety of micronutrients, than the diet of older community members. A study on the dietary habits of 207 Samoans in an urban setting in Australia showed that Samoans consume significantly fewer vegetables and more processed foods than other populations (Perkins 2016). The impact on Samoans' dietary habits may be attributed to socio-economic factors, cultural

practices, and length of stay in Australia. Perkins (2016) found that poor vegetable consumption among Samoans living in Australia may be associated with their length of residence. One study that looked at how Australian immigrants' health changes with the number of years since migration found that immigrants from some countries have lower NCD rates upon arrival than the Australian-born population, however that gap tends to narrow with time (Biddle 2007). A study looking at Samoans living in American Samoa and Hawaii showed the effects of modernization on their dietary patterns. Patterns found included an increase in variety of foods and purchased foods, decrease in traditional Samoan foods, especially the staples (taro, banana, breadfruit, etc.), and an increase in introduced foods (Bindon 1982). Similar studies showed that Samoans and Tongans perceive traditional foods (taro, banana, cassava, etc.) as healthier despite the increase of imported food consumption (Jones 2012; Evans 2003).

## Body Mass Index (BMI)

The Body Mass Index, which is based on height and weight of a person, is an inaccurate way of measuring body fat content because it does not take into account bone density, muscle mass, overall body composition, or racial and sex differences (Nordqvist, 2022). Since 1972, body-mass index (BMI) has been the most widely used measure to diagnose obesity. Recently, there has been significant literature that challenges the accuracy (Ortega 2016, Romero-Corral, 2018 to name a few) and questions if the BMI is still the best tool to measure obesity (Sharma, 2013). When it comes to Polynesians specifically, Swinburn (1999), further supports the dispute of BMI being an accurate measure of obesity. Their study found that at higher BMI levels, Polynesians were significantly leaner than Europeans, implicating the need to separate BMI definitions of overweight and obesity for Polynesians specifically. One study questioned the

relevance of applying standards developed primarily for Caucasian populations when screening Polynesian children for obesity and explored more accurate means of measurement (Davison, 2007). Pacific Islanders have been found to have proportionally more muscle tissue and bone mass than some other ethnic groups (Rush et al., 2009). This indicates that BMI is not the most accurate way to measure health.

It is important to note that recently a study found that about half of Samoans have a newly identified genetic variant that may make them genetically predisposed to obesity. The “thrifty” gene was found to promote more efficient storage of more fat and is rare in other populations, but is common among Samoans (Brown University 2016). This should be taken into consideration when assessing body fat composition and possibly genetic predisposition.

## Culture and Fa’asamoa

As with many Pacific Island cultures, Samoa is a collectivist society. It is important to understand the role of culture’s influence on food selection and health. Health literacy was found to be influenced by culture and the family circle proved to be central to health (Kessaram et al. 2015). Personal ownership of health was found to be lacking and the population lacked a deeper understanding of chronic disease implications (Kammholz 2021). Bollars et al. (2019) revealed that health literacy in Samoa is strongly influenced by the culture, personal responsibility for health is lacking, and the family is central to health in a community that is supported through church and local groupings. A study done in Australia looking at the Samoan migrant populations’ perspective on diabetes found that cultural factors, which influence the risk and management of diabetes, can be barriers to changing health behaviors, but may also lead to opportunities for culturally targeted diabetes education and health promotion (Shahab 2019).



Hardin (2013) found that *fa'asamoa* was found to be a main influencer in food preferences, taste, and how resources are used, including people prioritizing social obligations (such as cultural ceremonies and church) over one's individual health. This suggested that socially oriented well being potentially posed a risk to individual health. Hardin's study on the health practitioners perspective on NCDs in Samoa took a different approach to influencing change by avoiding blaming individuals for their metabolic health disorders and instead focusing on culture. This approach puts the responsibility of change into the hands of local leaderships to effect community-wide change. This is important to note when thinking about public health interventions.

The Samoan culture puts a lot of pressure on Samoans during cultural exchanges. A result of that is that many Samoans feel the need to appear as well-off as their neighbors. This can be seen in any cultural or social gathering abroad or in Samoa by the amount of money or food that is presented, often beyond their means (Gershon 2000). Some imported processed foods have obtained a higher cultural value than traditional foods, replacing them in cultural exchanges and social gatherings in an effort to convey wealth (Hosman 2019). For example, a can of soda has replaced a coconut and a case of corned beef has replaced a whole pig during cultural ceremonies. Being able to provide more expensive, imported foods can also denote status, resulting in Samoans eating less-healthy, more processed foods that increase their risk of developing Type 2 diabetes (Thelwell 2020).

Elements of food literacy, health literacy, and cultural influence on food selection have been explored in the literature. Most of these studies have been conducted overseas in New Zealand, Samoa, American Samoa and Australia. Very few studies have been done in the US. This research adds to the existing body of work by providing further insight into food literacy

rates, health literacy, food selection and cultural influences among a sub-population of Samoans in the US. This work informs the larger conversation of public health by contributing the Samoan perspective.

Migration, effects of a globalized food system, and influence of a Westernized diet have had an impact on the Samoan population, both on island and in the diaspora. Samoans have increased consumption of Western foods which has been correlated with an increase in health issues, especially obesity. There is some evidence of a lower rate of health issues in Samoa, where there is less of an influence of Western foods. For example, diabetes, cancer, cerebrovascular and heart disease are leading causes of death and occur both in Independent and American Samoa, however the rates of death from these diseases are higher in American Samoa (Health profiles, Samoa 2014; Health profiles, American Samoa 2014). Neonatal mortality rates were lower in Samoa at 4.2 compared to American Samoa at 7.4 per 1,000 live births (Compare maternal health indicators Polynesia public health 2013). In American Samoa, 93% of the adult population was considered obese (Ichiho 2013), compared to 85% in Samoa (Fan 2015). Overall, there is limited research on food literacy, health literacy, and cultural influence of food selection of Samoans.

Food is central to cultural identities. Its preparation and its consumption play a central role in the preservation of identity, especially in diaspora situations in which the reconstruction of “home” is important (Holtzman 2006; Mannur 2007). One study by Baker, Karrer, and Veeck (2005) explored the different types of nostalgia and webs of association in the context of favorite recipes. They found that food can trigger connections to happy childhood memories in relation to ritual events and intergenerational contact. These memories of food were associated with social groups, ethnicity, and location, including one's homeland.

## Chapter 3 Methodology

Due to the limited amount of literature on Samoans in general, but specifically food literacy, this research explores how food literacy presents itself among Samoans in the Bay Area. This chapter provides an overview of methodology used in this study. Specifically, it includes a description of the study design, qualitative methodology, recruitment processes of participants, instruments used, and approaches taken to analyze data.

### Qualitative Methodology

A phenomenological qualitative design was identified as the most appropriate approach for the nature of this research. Creswell (2007) defined phenomenology as a method that examines and describes the lived experiences of individuals in their encounter with a particular phenomenon. The intention of a phenomenological approach is to understand a phenomenon from the perspective of those who have immediate, direct, or first-hand experience with it. Hays & Singh (2011) further articulate this approach by stating that it also aims to identify similarities in experiences among people pertaining to the phenomenon that is being researched. Since the goal of this research was to explore and gain a better understanding of how food literacy, food selection, and cultural relevance presents itself among Samoans in the Bay Area in California, the use of phenomenological research design was deemed most appropriate.

### Instruments

The approach utilized in this study was a 32-question survey of a sampling of 147 participants. The survey was followed up with a semi-structured three question interview of a randomly selected five participants who volunteered. In a phenomenological study, open-ended

questions are ideal, specifically when the researcher enquired about the participants' experiences, influences, and the effects of the studied phenomenon (Creswell, 2007). The intention of this research design was to allow for genuine responses from the participants to their own experiences of the studied phenomenon without leading on, influencing, or being suggestive (Hays & Singh, 2011).

The researcher had access to a free UC Davis student account with Qualtrics. Qualtrics is a user-friendly data collection instrument that allows one to create surveys, and collect, synthesize and analyze data. The Crosstabs under the Data and Analysis option in Qualtrics allows one to overlap result variables to look for correlations. Single variable results are presented in the Results chapter while correlations of variables are presented and discussed in the Discussion section.

## Participants

The criteria to complete the survey was the participants must be 19 years of age or older, identify as Samaon (full Samoan, *afakasi* (half Samaon), or multi-racial Samoan), and live in the Bay Area of California. The Bay Area was defined as Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma counties.

## Recruitment

Recruitment was primarily done through social media. A flier was made with a survey link and QR code. The survey link was shared through email, text message, and social media. On the researcher's personal Facebook profile page, the survey flier was shared 47 times. Sharing beyond that did occur, but due to the nature of social media (i.e., "stories" only showing for 24 hours) the exact number of times it was shared is unknown. A similar study by Kammholz

(2021) on food literacy among Samoans was recently conducted within the islands of Samoa using 150 participants. The goal of this study was to similarly get 150 survey respondents, although in the end 147 respondents completed the survey. The survey was posted for two weeks and by the time the survey closed, only 147 people responded, just shy of the 150 goal. About one in five Pacific Islanders in California reside in the San Francisco Bay Area, with 53% of the Bay Area PI population living in the Counties of San Francisco, Alameda, and San Mateo (Regional Pacific Islander Task Force, 2020). Currently, Pacific Islanders comprise 0.8% of California's population and Samoans represent the second largest PI ethnic subgroup (19.1%) (Regional Pacific Islander Task Force, 2020). The goal of 150 survey subjects represents a subset of this larger population and is in relative proportion to the similar study conducted in Samoa.

## Survey

A survey consisting of 32 questions about food selection, health, culture and general food literacy was created in Qualtrics through a free UC Davis student account. The list of questions can be found in Appendix A. The questions were adapted after reviewing several surveys and articles on similar topics (Kammholz 2021, Krause 2018, Fingland 2021). Many of the surveys reviewed on food literacy included questions that asked about familiarity with food labels, recommended portion sizes, calorie intake, and defining what healthy food looks like. Some of the questions for this survey were adapted to be culturally specific, for example, some traditional Samoan food dishes were used in questions around defining healthy foods. Questions about health were asked using the most common health issues that Samoans experience. The goal was to make a short answer culturally specific survey that provided data on how certain attributes of food literacy, health, and culture present among Samoans living in the Bay Area.

## Informed Consent and Confidentiality Procedures

The survey and interview questions were approved and classified as exempt through UC Davis's Institutional Review Board (IRB). A consent statement based on IRB form HRP 502 Consent Exempt Research was used for the survey. Before beginning the survey, all participants were provided with an informed consent statement, which entailed the purpose of the study, confidentiality, and the possible benefits and harm of their participation. At the end of the survey, there was an opportunity for participants to enter their email address to volunteer for a follow up interview. For the audio recorded interviews, verbal consent was obtained on record before beginning the interview. The audio recorded interview consent included the purpose of the recording and disclosure of how the recording would be stored and when it would be deleted. No identifying information was collected. Survey data was stored in the researchers secure UC Davis Qualtrics account. Results will be deleted upon completion of the research project.

Once the survey closed, the researcher collected all of the emails from participants who volunteered to be interviewed. There were a total of 54 emails submitted at the end of the survey. One email was sent to all 54 respondents who were all "bcc" in order to preserve confidentiality. A total of 12 people responded and the first five respondents were interviewed. Interviews were done within a week of the email being sent and they were recorded on Zoom. Interviews lasted 15 minutes or less. Audio was recorded and stored in a secure UC Davis Zoom account and will be deleted upon completion.

## Data Analysis

In this study design, the participants are seen as co-researchers due to their contribution through sharing their lived experiences as it relates to the research study (Hays & Singh, 2011).

The predeveloped open-ended questions in the semistructured interview were designed to pull from the participants' experiences as they relate to the Samoan culture and food selection. Utilizing a phenomenological perspective, the interview process should elicit a description of how several individuals experience the same phenomenon, with a specific focus on the meanings associated to the phenomenon by each participant (Hays & Singh, 2011).

The survey results were analyzed using the tools available in Qualtrics. Results that stood out the most, for example the prevalence of obesity, were noted and overlapped with a second variable, such as income, to see if there was a correlation between the two. Single variables were analyzed for general themes, for example, most participants were able to identify healthy meals vs. unhealthy meals. These themes were then discussed in relation to the published literature on the relative topics.

In analyzing the data from the five interviews with each participant, the researcher took a thematic approach in interpreting the data at hand. Following the procedure for analyzing phenomenological research data, the first step is bracketing, which is used to set aside personal experiences, biases and preconceived notions about the research topic (Hays & Singh, 2011). Following bracketing, the researcher extracted themes, which entailed identifying common phenomena expressed by the participants. Direct quotes were pulled from the interviews to further support the dominating themes. Similarities and differences between themes and participant responses were noted and utilized in making analytical interpretations.

# Chapter 4 Results

## Survey Results

This research explores food literacy and identifies some of the contributing factors of food selection among Samoans living in the Bay Area. This section fills the knowledge gap of measuring food literacy among Samoans highlighted in the literature review chapter. The results from the survey respondents are presented in this chapter. Survey questions asked were about demographic information, food selection, food literacy, health, and culture. They will be discussed in further detail in the following chapter.

### Demographic Characteristics of Survey Participants

A total of 148 individuals who identified as Samoan (bi-racial, multi-racial or full Samoan), were 19 years or older, and resided in the Bay Area (Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma counties) responded to this survey. Nine people replied “no” to the screening question and did not complete the survey. Not everyone responded to every question. For example, some questions only had 144 responses. The number of respondents for each question is in parentheses next to each demographic below.



Table 1  
*Demographic Information About Participants*

Demographic characteristics	Number of Participants		%
<b>Racial Identity (147)</b>			
Afakasi (bi-racial)	22		15
Mixed race (more than 2 races)	20		14
Full Samoan	105		71
<b>Gender (148)</b>			
Female	115		78
Male		32	21
Other (trans-female)	1		1
<b>Age (147)</b>			
19-29	35		24
30-39	40		27
40-49	39		27
50-59	22		15
60 +	11		7
<b>Education (148)</b>			
Some high school	5		3
High school or equivalent (e.g. GED)	25		17
Some college, no degree	49		32
Associates degree (e.g. AA, AS)	22		15
Bachelors	32		22
Master's degree (e.g. MA, MS, MEd)	13		9
Doctorate degree	2		1
<b>Individual Income (144)</b>			
Under \$20K	23		16
\$20,0001-\$40K	19		13
\$40,001-\$60K	32		22
\$60,001-\$80K	27		19
\$80,0001-\$100K	18		13
\$100,001 or over	25		17

Employment Status (148)		
Full time (40+ hours per week)	101	68
Part time (up to 39 hours per week)	14	9
Unemployed	14	9
Student	7	5
Retired	7	5
Unable to work	5	3
Marital Status (148)		
Single (never married)	56	38
Married, or in a domestic partnership	76	51
Widowed	7	5
Divorced	5	3
Separated	4	3
Place of Birth (148)		
US	117	79
American Samoa	16	11
Samoa	8	5
Other	6	5
New Zealand	4	
Japan	1	
Papua New Guinea	1	
Age of Migration to US (27)		
10 years of younger	11	
11 to 19	11	
20s	3	
30s	1	
40s	1	
Years Living in U.S. Since Migrating (38)		
Less than 1 year	1	
1-20	13	
21-40	12	
41-70	12	

Samoan Language Proficiency (148)		
Little to none	46	31
Some	52	35
Fluent	50	34
Affiliation with a Samoan Church (148)		
Yes	81	55
No	67	45

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### Racial Identity

Of the 148 participants who responded to the survey, 147 participants responded when asked how they identify racially. Race was broken down into three categories, *Afakasi* (bi-racial), Mixed-race (more than 2 races), and full Samoan. The majority of participants, 105 (71%), identified as full Samoan. There was an almost even split between participants who identified as *afakasi*, 22 participants (15%) and participants who identified as mixed-race, 20 participants (14%).

### Gender

All 148 participants responded when asked about their gender. Of those who responded, 115 participants identified as female (78%), 32 participants identified as male (21%), and one individual described themselves as trans-female.

### Age

The ages of participants in this study were recorded in increments of ten. A total of 147 participants responded. There were 35 participants in the 19-29 year old group, 40 participants in

the 30-39 age group, 39 participants in the 40-49 age range, 22 participants in the 50-59 age group, and 11 participants in the 60 and over age group.

## Education

All 148 participants responded to their level of education. Education was measured by the completion of different levels of education, starting with some high school and ending with a doctorate degree. Five participants completed some high school (3%), while 25 participants completed high school or equivalent (17%). Forty-nine participants completed some college, with no degree (32%), 22 participants completed an Associates degree (15%), and 32 participants completed a Bachelors. The number of participants completing education beyond that decreased, with 13 participants completing Master's degrees (9%), and only two participants completing a Doctorate degree (1%).

## Income

Individual income levels were measured in increments of twenty-thousand, starting at "under \$20K" and ending at "\$100K or over". There were 144 participants who answered this question. Of those who answered, 23 participants reported making under \$20K (16%) and 19 participants make \$20,001-\$40K (13%). The majority of participants, 32 total, reported making in the \$40,001-\$60K range (22%) with the second highest at 27 participants (19%) making in the range of \$60,001- \$80K. In the higher income bracket, 18 participants (13%) make \$80,001-\$100K and 25 participants (17%) make \$100,001 or more. A total of 30% of the participants reported in the two highest income levels.

## Employment Status

All 148 participants responded to the employment status question. The majority, 101 participants (68%), reported working full time (40+ hours per week). There were 14 participants who reported working part time (up to 39 hours per week) and 14 participants who were unemployed (9%). Only seven participants were students (5%) and seven participants were retired (5%). Five participants (3%) reported as “unable to work”.

## Marital Status

All 148 participants responded to the marital status question. The majority of participants, 76 total (51%) are married or in a domestic partnership. The next highest marital status was single, with 56 participants (38%). Seven participants are widowed (5%), five participants are divorced (3%) and four participants are separated (3%).

## Place of Birth

All 148 participants responded to this question. By far the majority, 177 participants (79%), were born in the U.S. The next highest was 16 participants born in American Samoa (11%). Eight participants were born in Samoa (5%). Six participants (5%) reported being born in a country not listed and filled in the blank “other” as follows: four participants were born in New Zealand, one participant in Japan, and one participant in Papua New Guinea.

## Migration

Of the 30 participants who were born overseas, 27 answered a question about how old they were when they moved to the U.S.. The timespan ranged from seven months to 46 years,

with the majority of participants migrating when they were 19 years or younger. In analyzing this data further, 11 participants were aged 10 or younger, 11 participants were between the ages of 11 and 19, three participants were in their twenties, one participant in their thirties and one participant in their forties.

Of those participants who migrated to the U.S., they were asked how many years they have been living in the U.S. since they migrated. It is unclear why 38 participants responded to this question when only 30 participants reported not being born in the U.S. Of those 38 participants, only one reported moving to the US. within the last year. There were 13 participants who have lived in the U.S. for 1-20 years, 12 participants who have lived in the U.S. for 21-40 years, and 12 participants who have lived in the U.S. for 41-70 years.

#### Language Proficiency

All 148 participants responded to the question asking how they would best describe their Samoan language proficiency in reading, writing, and speaking. Language proficiency options were described as “little to none”, “some” or “fluent”. Results were pretty even across the board with 4 participants reported “little to none” proficiency (31%), 52 participants reported “some” (35%), and 50 participants reported being fluent (34%).

#### Affiliation with a Samoan Church

All 147 participants answered a question about if they attended or were affiliated with a Samoan church. Results were pretty close, with 81 participants (55%) reporting yes they were affiliated, and 67 participants (45%) reporting no they were not affiliated with a Samoan church.

This data does not reflect whether those who answered “no” attend or are affiliated with a non-Samoan church.

## Food Selection

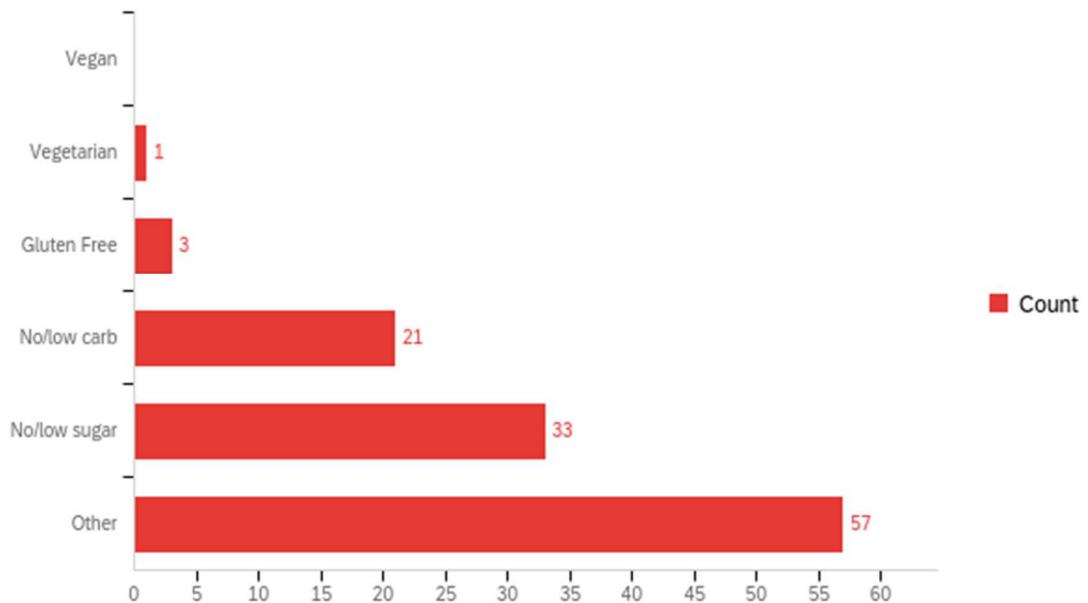
Using a 5-point Likert scale, participants were asked several questions to gain a better understanding of contributing factors of food selection. When asked if any health issues they experience affect what they eat, responses varied with 29% saying never; 50% sometimes; 12% often; and 9% always. When asked how often they plan to include healthy foods in what they eat: 1% said never, 22% rarely; 60% often; and 17% said always.

Participants were given a list and asked to choose the most important factor they consider when preparing meals for their families. In ascending order from the results, options included cultural relevance (3%), nutrition (10%), cost and convenience were both (18%), quantity (20%), and quality (40%). There was a fill-in-the blank “other” option of which two participants responded with “taste”, two participants responded with “all of the above”, and one participant responded with “what I feel like eating”. By far the most important factor was quality while nutrition was the least important factor.

To gain a better understanding of factors that contribute to individual food selection, participants were asked to choose the two most important factors that influence the food they eat. In ascending order from the options given, results were as follows: cultural relevance (7%), nutritional value (10%), cost (26%), convenience (27%), and taste (30%). Cost, convenience, and taste were all pretty close, while cultural relevance was the least important factor.

To gain a better understanding of general dietary behavior, participants were asked if they have any dietary restrictions. Table 2 shows the results expressed in the number of participants who responded to provide an exact count instead of percent.

Table 2 Dietary Restrictions



There are zero vegans, one vegetarian, three participants who are gluten free, 21 who are on a No/low carb diet, and 33 participants who are on No/low sugar diets. Unfortunately the 57 that reported “other” did not fill-in-the-blank, so this remains unknown.

Using a 5-point Likert scale, participants were asked how often they use nutrition facts and serving size guidelines when choosing foods to eat. Participants reported 33% never; 53% sometimes; 13% often; 2% always.

To get an idea of beverage preferences, participants were asked to choose from a list which beverage they are most likely to drink with a meal. In descending order of responses, by a landslide, the main beverage choice was water (73%), followed by soda (18%), diet soda (5%), and fruit juice (3%).



## Measuring Food Literacy

Several questions were asked to gauge the level of food literacy. These questions were based on a general search of previous food literacy research surveys. Using a 3-point Likert scale, participants were asked how familiar they were with the USDA Food Pyramid. Results were as follows: 13% reported not being familiar at all, 68% reported being someone familiar, and 19% were very familiar.

To gain a better understanding of serving size awareness, participants were given a list of daily calorie intake amounts and asked to choose which one they think is the recommended amount for an average adult. The correct answer is 2,000 for women and 2,500 for men. About 48% chose the correct answer, while 27% chose 1,200, less than the recommended amount, and 25% chose 2,800-3,000, higher than the recommended amount. To dig deeper into understanding portion size, participants were asked to select what they believe is the correct portion size of meat in comparison to a three part list of everyday objects, i.e., a deck of cards,  $\frac{1}{3}$  of an average size dinner plate, or a large Iphone. The USDA recommended serving size of meat is 2-3 per day, one serving size being comparable to the size of a deck of cards. About half (53%) chose the correct answer while the other half chose the larger portion sizes (39% chose  $\frac{1}{3}$  size of an average dinner plate and 7% chose the size of a large Iphone).

Using a 4-point Likert scale, participants were asked if they ensure that their everyday food intake is consistent with the nutritional recommendations. Participants reported that 27% never do; 60% sometimes do; 10% do often; 3% always do. To get a better understanding of how Samoans in the Bay Area think of their diet in relation to their health, the following question was asked (taken from Kammahoz, 2021)). Do you agree with this statement: “Eating processed

foods are high in salt and fat and can be harmful to my health”. Using a 4-point Likert scale, participants responded with 80% always; 13% often; 5% sometimes, and 1% never.

The following questions, as shown in Tables 3-6, were asked in an effort to gauge their understanding of food and health literacy by measuring what they understand as healthy and unhealthy foods. Participants were instructed to choose all that apply. The obvious healthy choices, such as oatmeal and smoothie for breakfast; salad or soup and sandwich for lunch; green salad or taro,banana, and fish for dinner; and fruit and veggies and nuts and cheese were all rated as the healthiest options. This indicates a general understanding of what is defined as “healthy”.

Table 3 Which of these meals would you consider a healthy breakfast?

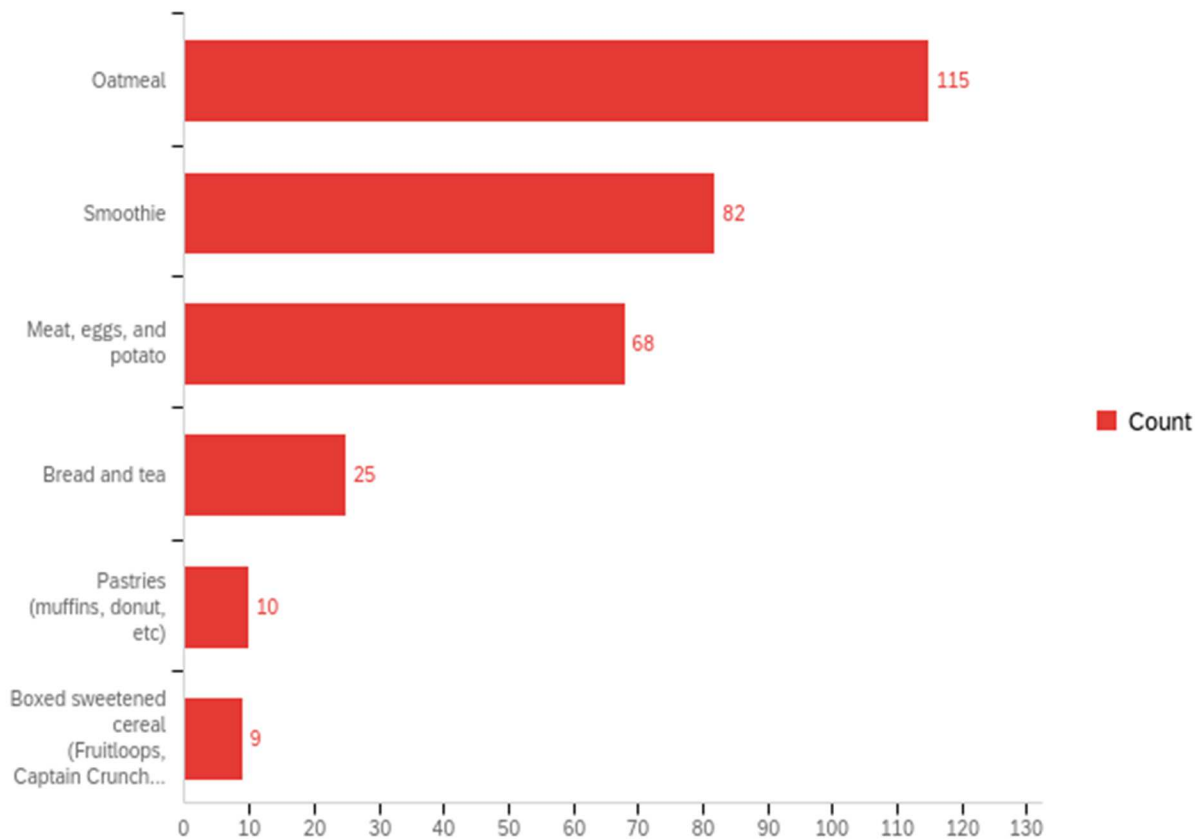


Table 4 Which meals would you consider a healthy lunch?

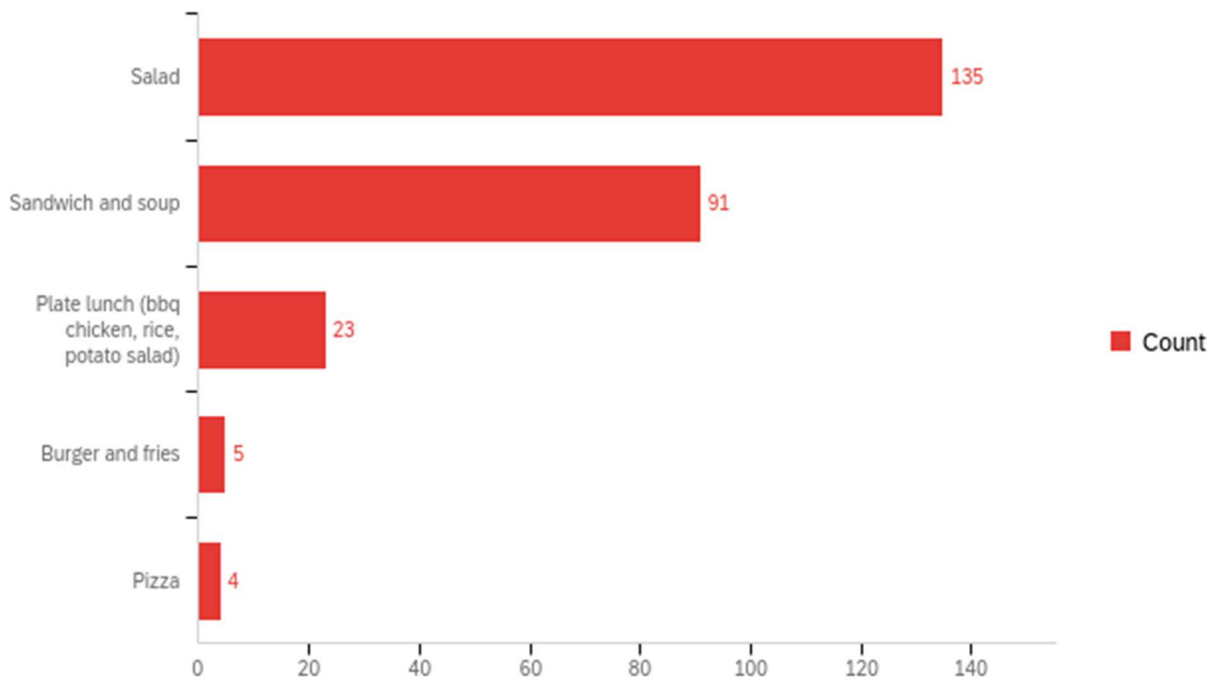


Table 5 Which of these meals do you consider a healthy dinner?

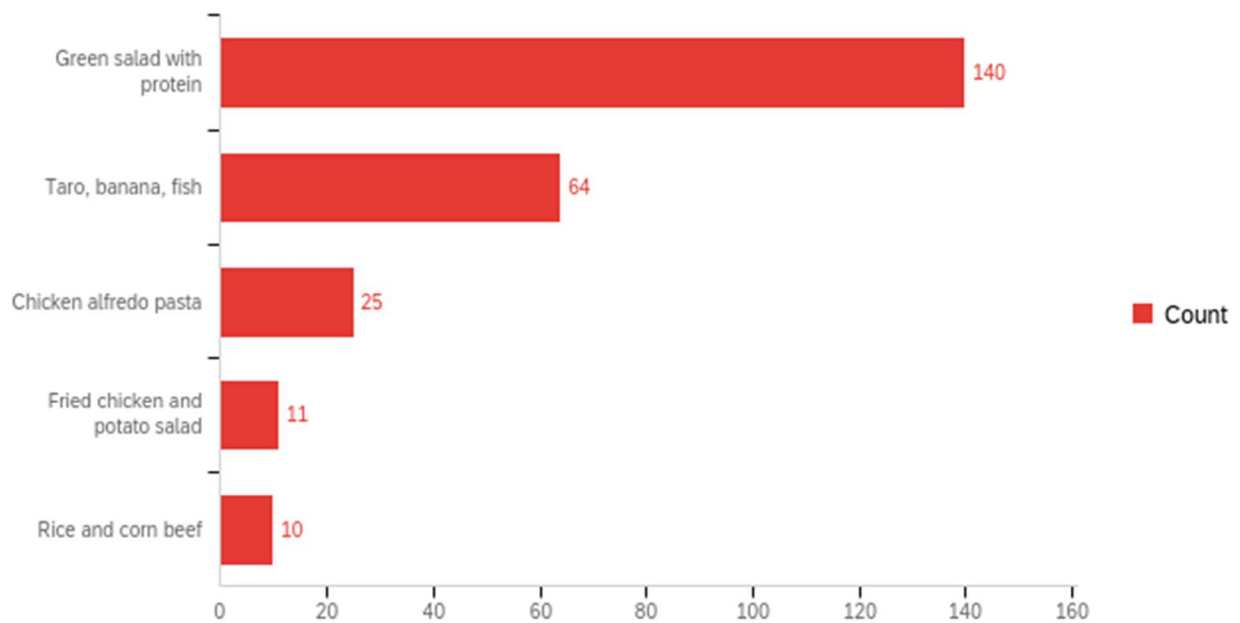
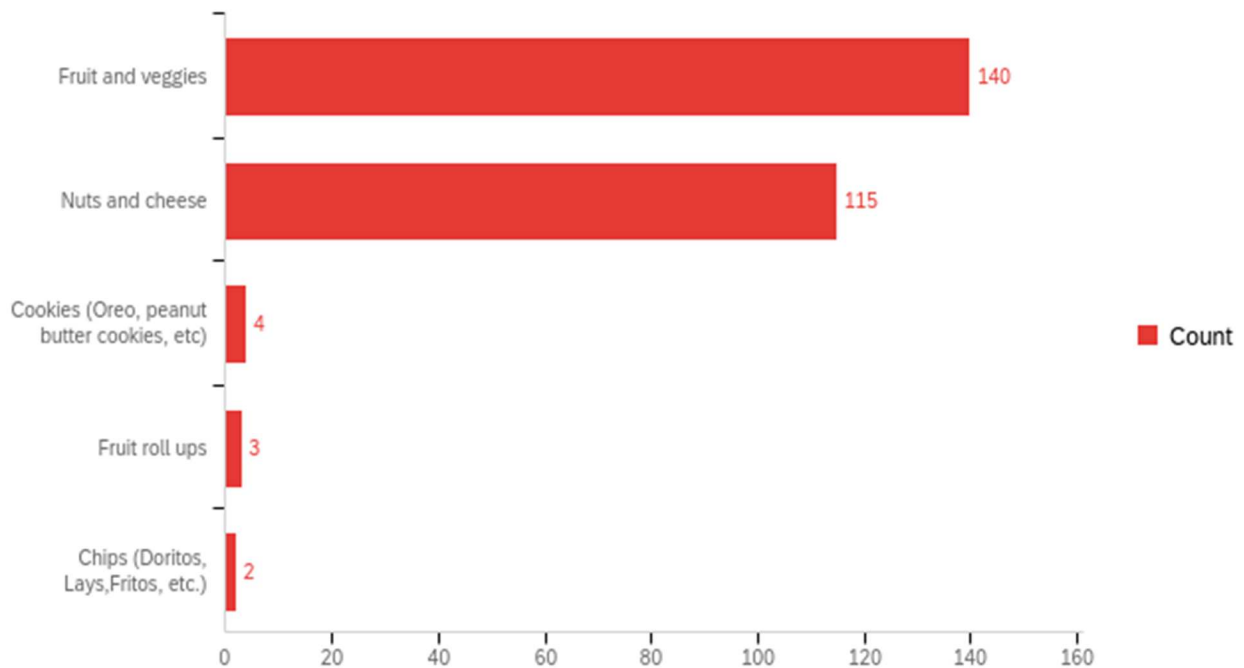


Table 6 Which food would you consider a healthy snack?



Although the numbers were much lower for the obviously unhealthy choices, it is important to take note that they did still receive responses. For example, nineteen people (6%) consider sugary boxed cereal and pastries as a healthy breakfast, nine people (4%) consider burger, fries, or pizza as a healthy lunch, ten people (4%) consider rice and corned beef as a healthy dinner, and nine people (4%) consider chips, cookies, and fruit roll ups as a healthy snack. It could be the same people voting for each of these choices, but it does help gauge a better understanding of how Samoans define what is considered healthy.

### Nutrition Labels

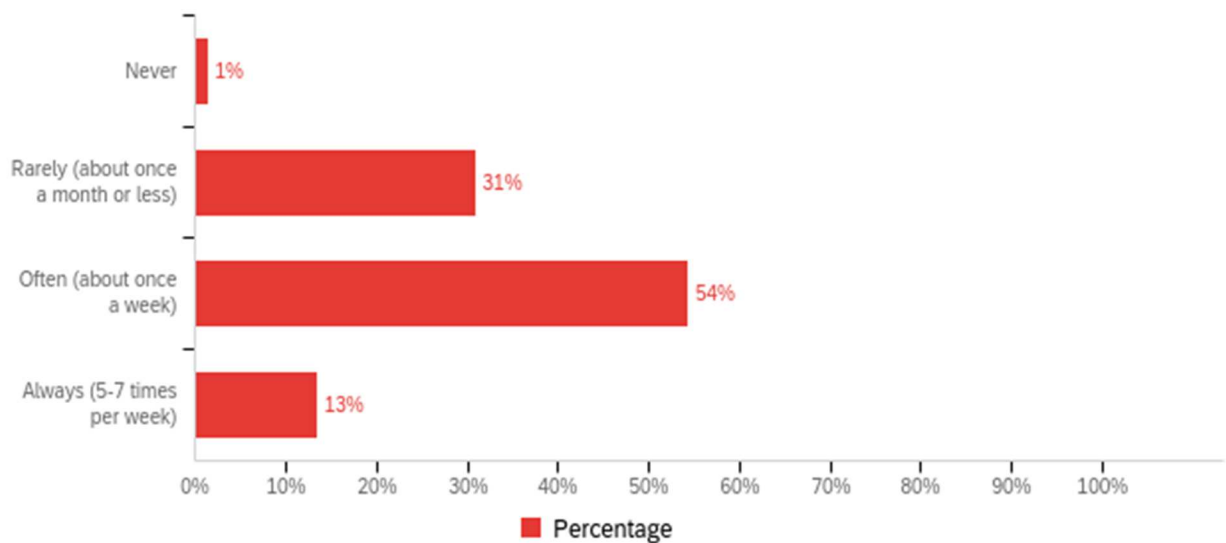
To further measure food literacy, participants were asked if they knew where to locate the nutrition label on food packaging. Almost everyone, 94%, knew where to locate the nutrition label, 6% did not. Being able to locate the food label on packaging is a component of being food

literate. On a 4-point Likert scale, participants were asked how often they use the nutrition label on food packaging when purchasing food. The majority of participants reported “never or rarely” using the food label (57%), while 35% said often, and 8% said always. This indicates that just because someone may be food literate, it does not mean they will necessarily use those skills when selecting food.

## Fast Food

Using a 4-point Likert scale, Table 7 shows how often participants reported eating at fast food restaurants. As is shown, about 55% of participants eat fast food often and 14% eat fast food almost daily. Summed up, 69% of participants reported eating fast food once or more times per week. When asked if they use the nutrition label when ordering food from a fast food restaurant, 18% said yes, 76% said no; 5% did not know that information was available.

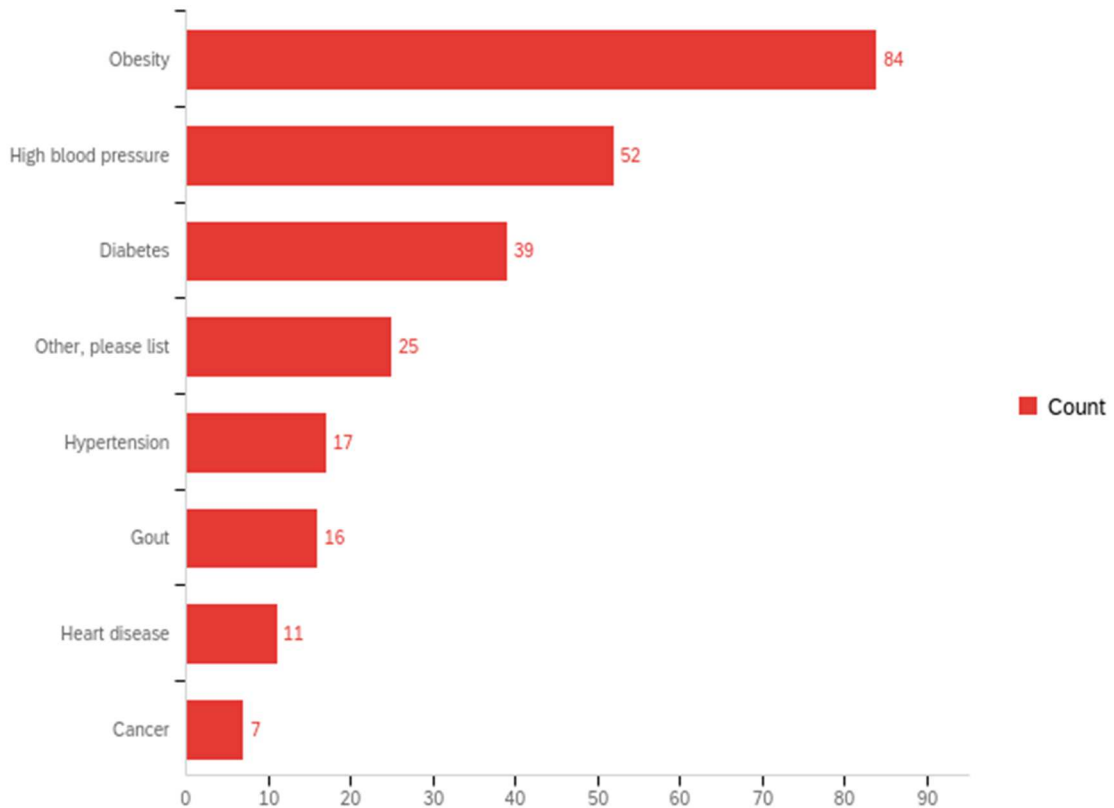
Table 7 About how often do you eat at fast food restaurants (McDonalds, KFC, Wendys, etc)?



## Health

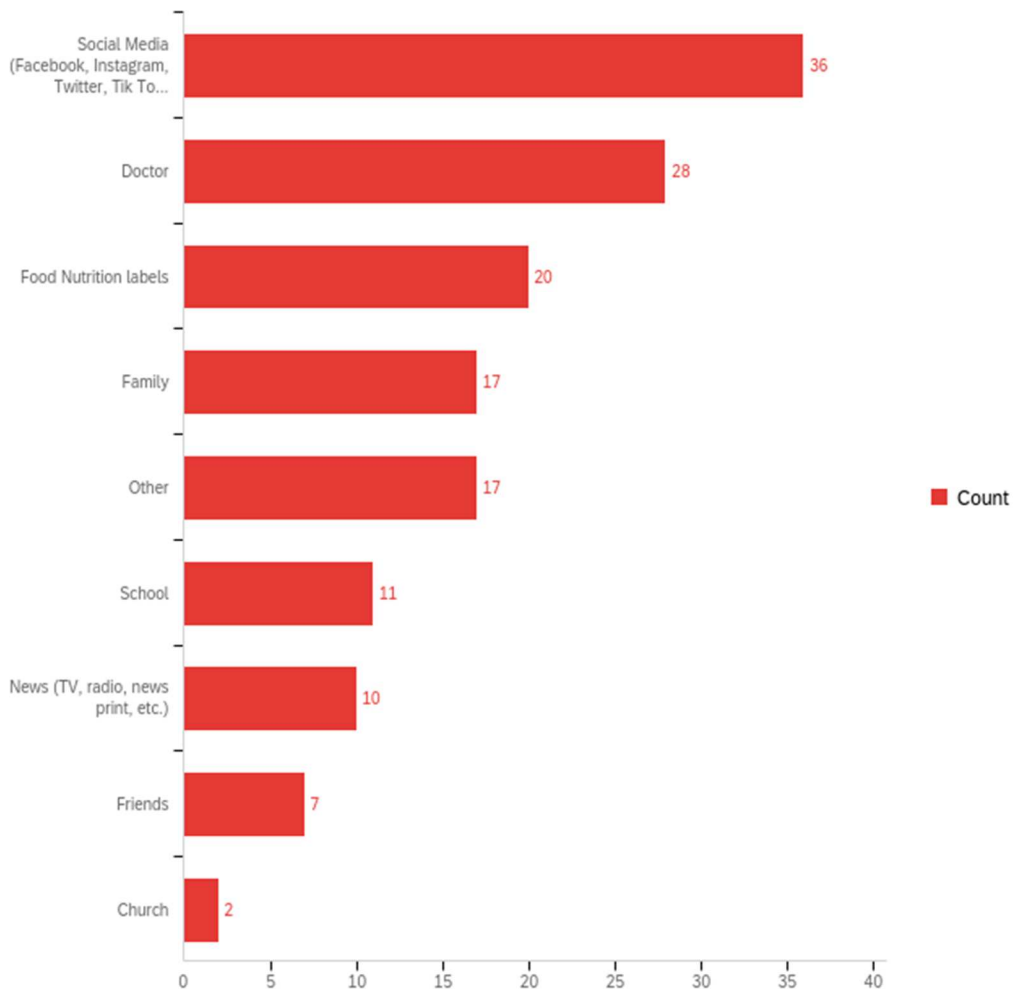
To get a better idea of health experiences among Samoans living in the Bay Area , participants were asked to select all that apply from a list of health issues. Table 8 shows health issues that were experienced by participants for any period of time in their lives. Obesity is by far the most prevalent, with high blood pressure and diabetes as next most common. This is highly supported by the literature. Three or less people reported experiencing the following, as reported in the fill-in-the blank “other” option: anxiety, anemic, and hepatitis B, lupus, kidney failure, gallstones, eye disease, asthma, and high cholesterol. Gout, hypertension, heart disease and cancer were surprisingly low.

Table 8 Have you ever experienced any of the following for any period of time?



Two questions were asked to identify the primary sources that participants go to to learn about diet and health. In Table 9, participants were asked to select their primary source for learning about healthy foods. Results show that social media is the primary source, and doctors are secondary. It is interesting to note that church is the least common source.

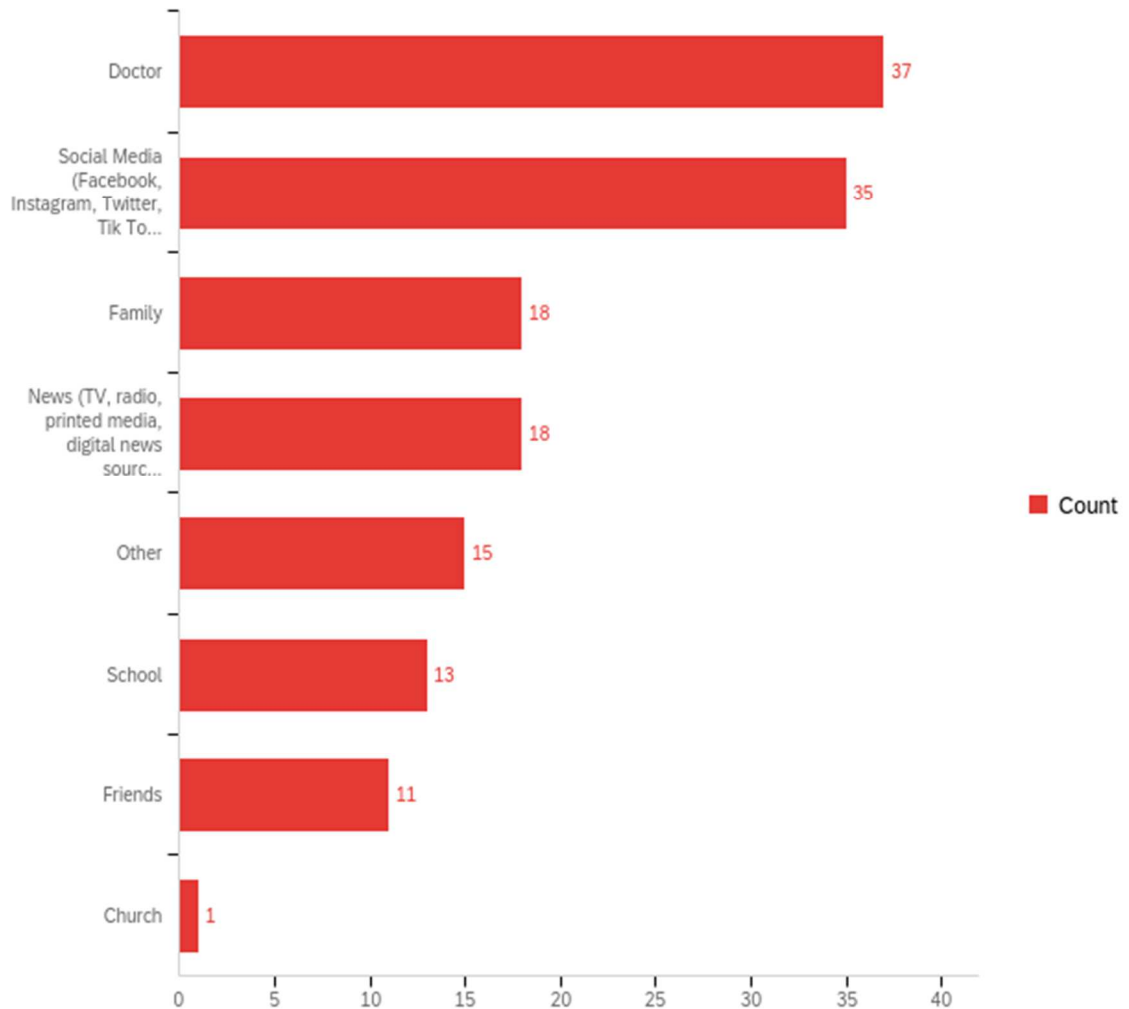
Table 9 Primary Sources for Learning About Healthy Foods



A similar question was asked about what participants' primary source was for learning about health practices such as diet, exercise, water consumption, sleep, etc. They were asked to choose only one answer. Table 10 shows the results as their primary sources being doctors, with

social media as a very close second. Again, church is the least common source for health information. These results are consistent with the previous question.

Table 10 Primary Sources for Learning about Health Practices



## Culture

One question was asked about culture, “When attending a Samoan cultural function (church, faalavelave, funeral, etc.) what are three foods you are likely to take?” Participants filled in three fill-in-the-blank answers. The responses are expressed using the WordCloud feature of







1. Favorite foods were predominantly traditional Samoan dishes
2. Dominating factors that contribute to how Samoans select their foods were:
  - a. Familiarity, grew up eating Samoan food, nostalgia/connection to Samoan culture, Foods that they were exposed or taught to eat from a young age
  - b. Filling foods due to not knowing when their next meal might be
  - c. Affordability
  - d. Taste
3. Cultural reasons why Samoans choose some foods over others:
  - a. Cultural connection
  - b. Familiarity with Samoan food dishes

## Correlations of Findings

### Health Issues and Food Literacy

The two variables were chosen in Qualtrics to identify if there was any correlation: do you experience any of the following health issues, and how often do you use nutrition labels on food packaging when purchasing food. Of the 84 people who reported experiencing obesity, 62% of them reported never or rarely using labels, and 38% reported sometimes or always using labels. With the exception of diabetes which was about a 50/50 split in the use of labels, in general, of those who experienced health issues listed (gout, obesity, high blood pressure, heart disease, cancer, hypertension, or other), the majority of them reported never or rarely consulting nutrition labels. It was a similar trend for those who experience health issues, 77% of them reported that they do not look at food labels when ordering food from fast food restaurants. Of the 84 people who experience obesity, 62 of them reported often or always plan to include

healthy foods in what they eat, while 23 participants said rarely and zero said never. This indicates an effort towards a healthier diet, however further research is needed to investigate barriers to combating obesity. It is interesting that the majority of participants do not consult nutrition labels when purchasing foods, however the majority plan to include healthy foods in their diet. Perhaps participants are already familiar with healthy foods (as identified in the data on choosing healthy meal options), and therefore do not feel the need to consult nutrition labels.

To get a better understanding of how Samoans in the Bay Area think of their diet in relation to their health, the following question from Kammahoz (2021) was asked : Do you agree with this statement: “Eating processed foods are high in salt and fat and can be harmful to my health”: 80% said always; 13% often; 5% sometimes, and 1% never. This may indicate a generally high level of awareness of the impacts of diet and health. Of the 119 participants that answered always in agreement with that statement, 35% reported never or rarely eating at fast food restaurants and 65% answered often or always eating at fast food restaurants. Data from this survey suggests that Samoans are generally aware of their health, and are able to identify healthy meals versus unhealthy meals, yet tend to make unhealthy diet choices. Further research is needed to to identify the reasons behind unhealthy food choices, such as socioeconomic status or if participants live in urban food deserts.

### Income and Health

There does not seem to be a correlation between income level and health issues experienced. For example, looking at obesity, 18% reported experiencing obesity who make \$100,001 or more, 12% of the \$80K-\$100K reported experiencing obesity, 25% for the \$60-80K income level, 24% \$40-60K, 14% \$20-40K, and only 12% under \$20K reported experiencing

obesity. This is interesting to compare to data from a National Health and Nutrition survey (Ogden et al, 2010) in which they found that obesity prevalence is generally similar at all income levels, however among non-Hispanic black and Mexican-American men, those with higher incomes are more likely to be obese than those with low income. In the same study, they found that higher income women are less likely to be obese than low income women, but most obese women are not low income.

### Food Literacy

Generally speaking, the participants were relatively educated with 33 participants having a bachelors or higher, and 22 participants having completed an associates degree. There were only 30 participants who reported having a high school education or less, seven of which are currently students. However, very few students completed the survey, despite being shared specifically with the Strategic Asian and Pacific Islander Retention Initiative and UC Davis, and the Oceania Student Success Program at City College in San Francisco, and a Samoan professor at San Francisco State University. This could possibly indicate disparities in NHPI student enrollment and access to higher education and reflect a low level of Samoan students in higher education programs. NHPI desegregated data on higher education enrollment is limited. One study that examined how educational opportunities differ across California found that Pacific Islander (64%) high school graduates are much less likely to enroll in college within 12 months than their Asian (91%), Filipino (77%), and white (76%) peers (Perez et al. 2021). Another study that looked at NHPI in higher education in the U.S., showed that about 58% of Samoans begin college and leave without a degree, aligning with overall low college attainment rates among NHPIs. The literature has similar results to this research, in which “some college, no degree” was reported by the majority of participants (48).

Participants, in general, have a good amount of knowledge of where to find and how to read nutrition labels, however, they still reported a high level of medical conditions and the majority like to eat at fast food restaurants at least once a week. This may indicate that, although they are relatively educated and food literate, it does not necessarily mean that they will use those skills when selecting food. Many factors could contribute to this, for example, 80 participants reported convenience as the second most significant factor, after taste, that influenced their food selection. The majority of respondents work full time. This is to be expected in an area like the Bay where the cost of living is one of the highest in the county. This study does not distinguish how many jobs participants' hold, but of those who reported convenience as a priority, 61% of them work full-time or more. Seventy percent of those who prioritized convenience reported always eating at fast food restaurants (5 or more times per week). Although Bay Area counties were not distinguished in this study, convenience could also be a result of urban food deserts. For example around 900 neighborhoods across the Bay Area are considered food deserts (Sierra 2021).

Results from the survey indicated some misconceptions about healthy eating. When asked what the recommended daily calorie intake is for an average adult, 73 participants answered correctly, however 36 participants reported higher than the recommended daily calorie intake while 41 participants reported lower than the correct answer. When asked to compare the recommended serving size of meat to an everyday object (deck of cards,  $\frac{1}{3}$  of a dinner plate, or a large I-Phone), 79 participants answered correctly (deck of cards) while 69 participants answered higher than the recommended amount. Of the 79 participants who answered correctly, 63 participants reported using nutrition labels and serving size guidelines when choosing foods, at least sometimes or more. The majority of participants were able to identify the healthy meal

options when listed along non-healthy meal options. Further research would benefit from digging deeper into this by asking, although they could identify healthy meal selections, how often do they actually choose those healthy meals? If they know what is healthy, but don't choose the healthy options, what are some of the reasons?

## Food Selection

When asked if participants use nutrition facts and serving size guidelines when choosing foods to eat, 47 people stated they never use recommended nutrition information, while 80 participants do at least some of the time, and another 23 participants reported often or always. This may indicate an effort to maintain a healthy diet. The main beverage choice during a meal was water (73%); followed by soda (18%), diet soda (5%), fruit juice (3%), and zero reported alcoholic beverages. This data was surprising, given that American Samoa had the second highest sales per capita of carbonate beverages out of 15 Pacific Island nations from 2004-2018 (following Australia) (Sievert, 2019).

## Filling Foods

Another recurring factor of food selection was that Samoans often choose foods that are filling. When asked about if there are any cultural reasons as to why Samoans choose one food over another, one participant struggled to answer, so the researcher further prompted by giving the example of choosing corned beef or an orange or green salad. The participant said, “*I don't even care for an orange or to be healthy, I want something that's going to fill me up, something that's good. And beef is just tastier. We want something that's going to fill us up*”. This participant expressed several times during the interview that she knew a lot of Samoan foods were not healthy, aware that they are high in salt and fat, but she didn't care because they

brought her comfort, they tasted good, and they were what she grew up on so she was familiar with them. Another participant reiterated that a contributing factor as to why Samoans choose the foods they do is related back to socio-economic status, *“Filling food is most important because a lot of Samoans are poor and prioritize filling foods over nutritious foods. Like rice, rice is a must”*. Another interviewee reiterated this point when describing the reason behind why her three favorite foods are Samoan dishes, *“because they taste good and are filling”*.

### Fast food

Fifty seven percent of those who experience obesity reported eating at fast food restaurants often (about once a week); 50% of people who have experienced gout and 61% with diabetes reported eating fast food often. No participant who answered the question on what health issues they have experienced for any period of time (obesity, diabetes, gout, etc) reported “never” eating fast food. The majority of the participants who reported eating fast food often (about once a week) were between the ages of 19-39. The majority of those 50 and older reported rarely eating at fast food restaurants. The majority (60%) of those who were born in the U.S. reported often eating at fast food restaurants, while about 60% of those born overseas reportedly rarely. This may reflect the impact Westernized diets have on Samoans who live in the Bay Area. This is a similar result to Bell et al. (1999) study in New Zealand which found that younger Samoans consumed more food than older Samoans that were typical of a Western diet. Another study on dietary habits of Samoans in Australia reported similar results, more than half of the participants reported eating fast food two to three times per week (Perkins et al., 2016).



## Body-Mass-Index

The survey question asking about health issues participants have experienced at any point in their lives provided a list of common health issues experienced by Samoans, but did not provide a definition. For example, obesity was not defined or given specific measurements, therefore participants self-diagnosed themselves with obesity. Although the majority of participants self-reported having experienced obesity, and obesity is prevalent among the general Samoan population both on island and abroad, there may be more accurate or appropriate tools to measure obesity among Samoans.

## Connection to Culture

*“ Samoans choose the foods they grew up with. Samoa is the mother and that’s the food, the milk, she offered her babies and her babies still like it.” ~ interviewee*

One theme that came up was preference for cultural foods. Four out of five of the interviewees listed at least one Samoan food as their three favorite foods. One participant said, *“I don’t have a favorite food, I just love Samoan food”*. When asked about what they think are the contributing factors to how Samoans select their foods, familiarity and culture were some of the dominant factors. One participant said:

*“Sometimes we choose foods because it takes us back home, especially those of us who lived overseas. It brings back memories and sometimes that feeling of being home.”*

Another participant further supported this connection to culture and food,

*“ When we grew up as young Samoans in Samoa, these are the foods we grew up eating...there is a special way, a Samoan way, of making food and that is to me, the cultural connection that I have established with food like fausi, and I carried it as this type of food belongs to our culture and when we have cultural ceremonies, we see these types of food being presented and it has become the food that is appropriate to provide at cultural events. It has become part of how we present cultural routines.”*

All interviewees reported that the food choices they make are related to what they grew up on, therefore they're familiar with, *“ Whatever was available in the islands, we have made it part of our culture”*. This preference for Samoan foods is further supported by the visual presentation of data in the WordCloud graphic, in which the foods people choose to bring to cultural gatherings are predominantly Samoan food dishes. One interviewee expanded on this concept by saying,

*“Bringing cultural foods to Samoan events such as corn beef, taro, and palusami, is the norm. If you brought a green salad or fruit, people are unlikely to eat it. If vegetables are present at a gathering, they are always smothered in something like salad dressing, or mayonnaise in a potato salad for example. Samoan food is what we know. It's familiar to us.”*

The traditional Samoan diet does not consist of many vegetables. Typically the vegetables consumed consist of onions, bok choy, carrots, yams, potatoes, pumpkin, and cabbage. They are usually eaten as part of a soup or noodle dish. Other vegetables cooked on their own, or a green salad, are often untouched by many Samoans (Fiti-Sinclair 2004). One of the participants in Fiti-Sinclairs study further reiterated how Samoans view vegetables by later quoting a woman from a very low-income family *“ I never buy any vegetables. How can I waste*

*money when I need it for food? ”. The results from this survey are consistent with the literature in that vegetables are not part of the traditional Samoan diet, and are not considered filling, therefore Samoans generally do not consume a lot of them, even if they are aware that they are considered a healthy food.*

In thinking about cultural influences, a very interesting study on health practitioners’ perspectives on obesity and metabolic disorders in Samoa contrasted individually oriented health with socially oriented well-being (Hardin 2014). Their study suggested that food consumption fosters social well-being may also be detrimental to individual health. Instead of blaming individuals for not changing their diet and health behaviors, this study suggested that local leadership is required in order to have a community-wide change. The implications of *Fa’asamoa* were further discussed as the primary barrier to lifestyle change, noting that Samoans prioritize social obligations (such as church) over individual health and as a result, socially oriented well-being was deemed potentially detrimental to individual health. This research is important to note because it identifies the influence of the Samoan culture and makes the very important point that health interventions may be most effective at a cultural level, not necessarily on an individual level. Samoa is a collectivist society where individuality is not valued, so taking a cultural approach to health interventions seems that it would be the most effective approach. This point is further supported when the role of the church is discussed in a later section.

Fiti-Sinclair’s (2004) study further supports the influence culture has on food choice as it pertains to social constraints, or the relationships we share. In this study they explored why Samoans eat so little fruits and vegetables. They asked participants what foods would they contribute to communal meals. All participants listed foods categorized as unhealthy. In fact, the participants laughed at the idea of bringing a plate of fruit or a salad. They expressed that the

quality of food you contribute is a sign of respect and bringing non-filling cheap food (such as fruits and vegetables) is shameful. These sentiments are reiterated in the results of this study, when participants were asked what is the most important consideration when preparing meals for their family, quality was by far the most important factor. This may indicate that the quality of food given to others is symbolic of the respect for their relations. Further research on the cultural aspect of how the quality of food given to others represents respect is needed.

## Church

At the core of the Samoan culture is religion. Culture is often most expressed through church functions and is the epicenter of many social events and community gatherings (Hendrikse, 1995). An estimated 85–90% of American Samoans residing in Hawai‘i belong to a Samoan church (Mishra *et al.* 2000). It is interesting to note that 55% of the participants in this research reported being affiliated with a Samoan church, however church was reported as the least common source of information for health. This information was surprising given that much of the literature cites church as an ideal platform for health intervention and education.

For example, Aitaoto (2007) examined developing church-based cancer programs with Samoans living in the U.S. Investigators who had found spiritually linked beliefs about health and illness in the Samoan population suggested the Samoan church is an ideal venue for health-related interventions. In an effort to increase the low rates of a drug distribution that eliminates the transmission of filariasis in American Samoa, one study found that partnering with churches for drug distribution and using multiple media channels for health promotion led to sustained program improvements (King 2011). Another study that looked at the needs and experiences of Samoan breast cancer survivors in Southern California, underscored the need for culturally-

specific social support services for Samoans. Their findings, based on recommendations from a community report-back, stressed the importance of expanding Samoan cancer social support groups through collaborations with leaders and churches (Tanjasi et al 2011).

Although participants in this study reported high rates of Samoan church affiliation but church was reported as the least used source of information when it comes to health, this does not mean that church should not still be considered a viable option for health education and interventions for Samoans in the Bay Area. There are other factors that could have contributed to these results, for example, perhaps Samoan churches are not currently utilizing health intervention or education programs, therefore participants may not associate churches with being a source of health information. Further research on local Samoan churches, the existence of health programming, and effectiveness should be explored.

## Chapter 5 Discussion and Conclusion

*“ Unless the fa’asamoa changes, the NCDs will never change”* (interview with Samoan physician in Samoa) (Calwell, 2021 p.227)

This research did not indicate a strong correlation between income level and health issues experienced by participants. This is interesting to compare to data from a National Health and Nutrition survey (Ogden et al, 2010) in which they found that obesity prevalence is generally similar at all income levels, however among non-Hispanic black and Mexican-American men, those with higher incomes are more likely to be obese than those with low income. In the same study, they found that higher income women are less likely to be obese than low income women, but most obese women are not low income.

The results from this study indicate that the participants were relatively food literate, however it does not necessarily mean they will use those skills when selecting food. For example, Evans et al. (2003) found that although Tongans were generally health conscious, they still purchased low-cost, imported foods, despite knowing the health implications of consuming them, because it made more sense economically. Fiti-Sinclair (2004) found that Samoans rarely consider the nutritional value of food when preparing meals. This is reflected in the responses to the survey questions about primary factors that influence food selection in which nutrition scored in the bottom three, both for individual food selection and when preparing meals for their families.

The literature on food literacy rates in regards to nutrition label interpreting and utilizing among NHPs have varied results. In a study that measured health literacy and obesity among

NHPIs in the U.S., Lassetter (2015) found that nearly half of the NHPs had difficulty interpreting nutrition labels. However, in this study, 94% of the participants reported knowing where to locate the nutrition label on food packaging. In Vidgen's (2021) study on measuring food literacy rates among adult Samoans in Samoa, 68% reported knowing where to find the nutrition information on foods. Although the majority of the participants in Vidgen's study and this study knew where to locate food labels, the food literacy rate among Samoans in the Bay Area was much higher. However it is interesting to note that 43% of the participants in Vidgen's study reported always using the food label to make purchase decisions while only 9% in this study reported using the label to inform purchase decisions (the majority was 43% reported rarely using the label). Perhaps this could be due to a number of factors such as less packaged foods (therefore less food labels) being consumed in Samoa, inconsistent food packaging labels in Samoa, or food labels being in another language in Samoa. Vidgen's study also showed that 64% of females and 41% of males reported always or most of the time using the label compared to the results of this study which showed that 42% of women and 50% of males reported often or always using the label.

This study showed a strong preference for filling foods, which is consistent with the literature on Samoans and food choice. A study done in Samoa on food choice had similar results noting that the three most common reasons for food selection were that “ they provide a lot of energy for a long time, they taste good, or that they are traditional Samoan food” (Jones et al. 2011 p.457). Although the literature on reasons behind food selection among Samoans is limited, the results from this research do support findings from previous studies.

Vidgen (2014) states that food literacy is an enabler to healthy eating and that focusing on food literacy alone is unlikely to influence health outcomes. This supports the previous point

that in order to make change, it is important to incorporate multiple strategies to address health and well being. It is hoped that the conclusions from this study add to the body of knowledge and form the basis for future planning for health interventions for Samoan populations.

This study shows that the degree of food literacy was fairly high in that most participants knew how to interpret and where to locate nutritional information, and were able to identify healthy meal options. Participants' tendency to make healthy choices, the frequency of eating at fast food restaurants, and the level of reported health issues indicate that there are other factors that contribute to their food selections. Some research suggests a correlation between low income and education levels with lower food literacy rates and more health issues. However, the participants in this study were generally educated and had high levels of income, but had high levels of food literacy and high levels of health issues. Research indicates that culture has a significant role in food choice. The traditional Samoan diet is fairly healthy. The rate of NCDs reported in Samoa in comparison to American Samoa and the Samoan diaspora is significantly lower. This indicates a strong influence of Western culture on the Samoan diet.

In thinking about public health interventions in relation to Samoans, it is important to understand collectivistic societies. Food plays a major role in their cultural identity and Samoans prefer foods that they are familiar with. The church plays a major role in Samoan culture. Possible avenues for impactful health campaigns would be how to adapt the traditional Samoan diet to be healthier, and to expose children to healthy food options at an early age so that they are familiar with them as they grow up. Public health interventions should focus on a community approach instead of an individual approach and should encourage community participation. The church may be an effective avenue for change and further research is needed in that area. For



example, churches could host member weight loss challenges, decrease the social value of more expensive and unhealthy foods, or encourage fruit and vegetable consumption.

## References

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## Appendix A: Survey Questions

1. Do you live in The Bay Area? (Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma counties), identify as Samoan, and are 19 years or older?
  - Yes
  - No (survey ends)
  
2. Have you ever experienced any of the following for any period of time? Click all that apply:
  - Gout
  - Diabetes
  - Obesity
  - High blood pressure
  - Heart disease
  - Cancer
  - Other, please list

3. Where were you born?

- U.S.
- American Samoa
- Samoa
- Other, please specify

4. How many years have you lived in the United States?

5. What is your primary source for learning about healthy foods?

- Church
- Friends& Family
- School
- News (TV, radio, news print, etc.)
- Social Media (Facebook, Instagram, Twitter, Tik Tok etc.)
- Doctor
- Food Nutrition labels
- Other

6. When you go grocery shopping, do you know where to locate nutrition information on food packaging?

- Yes
- No

7. How often do you use the nutrition label on food packaging when buying food?

- Never
- Rarely
- Often
- Always

8. How often do you plan to include healthy foods in what you eat?

- Never
- Rarely
- Often
- Always

9. Do you agree with this statement?

Eating foods that are high in salt and fat can be harmful to my health.

- Yes
- No
- Other, please explain

10. What are the 2 most significant factors that influence the food you eat?

- Cost
- Convenience
- Culture
- Nutritional value
- Taste
- Other, please explain

11. How often do you eat at fast food restaurants (McDonalds, KFC, Wendys, etc)?

- Daily
- 3-5 times a week
- Once a week
- Never

12. Do you look for nutritional information when ordering from a fast food restaurant?

- Yes
- No
- I did not know that info was available

13. Do you have any diet restrictions?

- Vegan
- Vegetarian
- Gluten Free
- Low carb
- Low sugar
- Other

14. Do you use nutrition facts and serving size guidelines when choosing food to eat?

- Never
- Rarely
- Often
- Always

15. Which of these meals would you consider a healthy breakfast? (Click all that apply)

- Meat, eggs, and potato
- Pastries (muffins, donut, etc)
- Boxed sweetened cereal (Fruitloops, Captain Crunch, Apple Jacks, Honey Bunches of Oats, etc)
- Bread and tea
- Oatmeal
- Smoothie

- Other

16. Which meal would you consider a healthy lunch? (click all that apply)

- Pizza
- Burger and fries
- Sandwich and soup
- Salad
- Plate lunch (bbq chicken, rice, potato salad)
- Other

17. Which meals do you consider a healthy dinner? (click all that apply)

- Rice and corn beef
- Taro, banana, fish
- Fried chicken and potato salad
- Green salad with protein
- Chicken alfredo pasta
- Other

18. Which food would you consider a healthy snack?

- Chips (Doritos, Lays, Fritos, etc.)
- Fruit and veggies
- Nuts and cheese
- Cookies (Oreo, peanut butter cookies, etc)
- Fruit roll ups
- Other

19. Which best describes your proficiency with the Samoan language? (ability to read, write, and/or speak)

- Little to none
- Some
- Fluent

20. Do you attend a Samoan church/are you affiliated with a Samoan church?

- Yes
- No

21. When attending a Samoan cultural function (church, faalavelave, funeral, etc) what are three foods you are likely to take?

- 1
- 2
- 3



22. When preparing meals for your family, what is your most important consideration?

- Quality
- Quantity
- Cultural
- Convenience
- Cost
- Nutrition
- I don't prepare meals for a family
- Other

23. What is your age?

- 19-29
- 30-39
- 40-49
- 50-59
- 60 and up

24. Which one best describes how you identify?

- Afakasi (bi-racial Samoan)
- Mixed race (more than 2 races)
- Full Samoan

25. What is your highest level of education?

- Some high school
- High school degree or equivalent (e.g. GED)
- Some college, no degree
- Associate degree (e.g. AA, AS)
- Bachelor's degree (e.g. BA, BS)
- Master's degree (e.g. MA, MS, MEd)
- Doctorate degree
- Other

26. What is your gender?

- Male
- Female
- Other, please specify

27. What is your annual income? (not household income)

- Under \$20,000
- \$20,001-\$40,000
- \$40,001 – \$60,000

- \$60,001 – \$80,000
- \$80,001 – \$100,000
- \$100,001 or over

28. When you go grocery shopping, do you know where to locate nutrition information on food packaging?

- Yes
- No

29. How often do you use nutrition information on food packaging when you go grocery shopping?

- Never
- Rarely
- Often
- Always

30. How many servings of vegetables do you think are recommended per day?

- 0-2
- 3-5
- 6-8

31. What beverage are you most likely to drink with a meal?

- Water
- Soda
- Diet soda
- Fruit juice
- Alcohol

32. The recommended servings of meat per day is 2-3. The size of one meat serving is comparable to the size of:

- Deck of cards
- Baseball
- Size of an iPhone

33. Recommended daily calorie intake for an average adult is:

- 1200
- 2200
- 2800
- 3000

34. How familiar are you with the USDA food pyramid?

- I am familiar
- I am kind of familiar
- I am not familiar

35. I ensure my everyday food intake is consistent with the nutritional recommendations?

- Never
- Sometimes
- Often
- Always

36. Do any health issues you experience affect what you eat?

- Never
- Sometimes
- Often
- Always

### **Appendix B Interview Questions**

1. What are 3 of your favorite foods and why?
2. What are some of the factors that you think contribute to how Samoans select their foods?
3. Do you think there are any cultural reasons as to why Samoans choose one food over another?