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“Gimme SAMOA That!”: The Changing Diet in Samoa

Dana Melby
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“ Gimme SAMOA That!”:
The Changing Diet in Samoa

By: Dana Melby

Advisor: Vaasiliega Rupeni Tamanikaiyaroi

Academic Director: Jackie Fa'asisila

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Abstract

With globalization and Samoa's entrance into the global economy imported and processed foods, which are high in fat, sugar, and sodium, are increasingly available for consumption. Diet transition, the change in diet from one high in local and traditional foods to one high in imported processed foods, began in Samoa post-World War II, however, the rate of diet change has increased rapidly in the past three decades. The change in diet has led to increased prevalence of obesity, other risk factors, and non-communicable diseases. Non-communicable diseases (NCDs) include cardiovascular disease (CVD), diabetes, and cancer. This study looks at what factors have influenced diet transition; the ramifications of diet change on health; how trade policy is impacting health; and what is being done by various organizations and ministries to increase nutrition and health awareness. Eight interviews were conducted with experts in the fields of nutrition, medicine, trade policy, and development. Three surveys were conducted in the Apia area and in Lotofaga, Samoa pertaining to what food people were regularly purchasing; how often fruits and vegetables were eaten; and perspectives on diet and health. Secondary sources were used in complement with interview and survey information. While, there is increasing public awareness of the impacts of poor diet on health, rates of obesity and NCDs continue to increase in Samoa. This study suggests that the public is aware of the impacts of food on health. However, in a survey conducted in Apia, consumption of fruits, 30% replying every day, and vegetables, 40%, are not consumed at the rates recommended by nutritionist and health care providers.

Contacts

Dirk Schulz
Food and Nutrition Officer, FAO
Phone: (685)22127
Email: Dirk.Schulz@fao.org

Christine Quested
Principal of the Nutrition Center, MOH
Phone: (685)68137
Email: christineq@health.gov.ws

Anne Marie Thow
Associate Lecturer, The University of Sydney
Phone: +61 422 568 334
Email: annemarie.thow@sydney.edu.au

Dedication

In loving memory of my demonstration garden.

Acknowledgements

Thank you to all the girls for keeping me sane. Thank you, again, to the girls for going out with me, even though it was one o'clock in the afternoon on Monday and hardly appropriate. Thank you to all the people in Apia and Lotofaga who did my surveys... I know they were horribly tedious. Thank you to Acacia for talking me through the moments I had my dress pulled over my head. Thank you to Rupeni for being my advisor and making me laugh every time I talked to you. Thank you to Vanimal for staying alive throughout this. Thank you to my families, at home and in the Pacific. Finally, thank you to Jackie for listening to me ramble on about health, nutrition, and agriculture for entire semester and not complaining. Fa'afetai tele lava.

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Introduction

When asked to conjure up images of the Pacific many people think of white sand beaches and palm trees, not a place where the health and well being of the people is in imminent danger. Sadly, in the Pacific well over half the population is obese, non-communicable diseases account for the majority of the death toll, and imported refined foods are available in even the most remote villages (Pacific islanders 2011). The increase in non-communicable disease (NCD) rates in Samoa is primarily caused by the dramatic diet transition that has taken place over the past decades. This study seeks to outline the factors influencing diet change; the impact diet change is having on health; and how the public is being educated.

Methods

The following paper is the culmination of a one month research project conducted in Apia, Samoa. This study is made up of three parts. First, the various factors influencing diet change in Samoa. Second, how the change in diet is impacting health. Third, what is being done to combat the effects of diet change. Eight interviews were conducted with experts in the fields of health, nutrition, agriculture, and trade policy. The most pertinent of these were with Christine Quested, Principal of the Nutrition Center at the Ministry of Health, Dirk Schulz, Food and Nutrition Officer at the Sub-Regional Office for the Pacific Islands, Food and Agriculture Organization of the United Nations, Anne Marie Thow, Associate Lecturer at Menzies Centre for Health Policy, The University of Sydney and Komal Garewal at the World Health Organization. All interviews were approximately eight to ten questions long and asked questions relevant to each organization. In addition to the interviews three surveys were conducted. One survey was conducted in Lotofaga, Samoa and two others

were conducted in the Apia area. The first survey conducted in Lotofaga was administered to ten people. The purpose of the first survey was to determine the role of imported goods in diet and whether imported goods were replacing local crops in diet. The second survey was administered to ten vendors at the Maketi Fou in Apia, Samoa. It followed the same basic format as the Lotofaga survey. However, changes were made to the Maketi Fou survey prior to handing it out in response to problems that arose during the Lotofaga survey. The final survey, given to 40 people in the greater Apia area, looked at eating habits and healthy living knowledge. Secondary sources, many provided by interviewees, were used to round out the information gathered from the surveys and interviews. Secondary sources were helpful in gathering of NCD statistics.

Background

Into the early 1900s, over a century after Western missionary contact, the diet in the Pacific and Samoa had changed very little. The people still relied on traditional staples foods and subsistence agriculture to maintain their lifestyles. Traditional staples of the Pacific diet included large amounts of starchy food. Root crops such as taro, yams, sweet potato, and cassava as well as breadfruit, bananas, and coconuts are among the most popular starches. These starches, a corner stone of the Pacific meal, are supplemented with meat, fish or seafood (Secretariat of the Pacific Community 1999:3). All of these foods are energy and nutrient dense. While the traditional diet was not diverse it was relatively healthy and provided the necessary nutrients and vitamins. Food insecurity was rare and, “malnutrition only occurred when societies were disrupted by war, drought, hurricanes and/or disease” (Hawkes 2010:148). The only health concern associated with the traditional diet was that the high fiber load was difficult for immature digestive systems to

handle, this resulted in young children taking in lower than recommended amount of protein and energy (Hawkes 2010:148).

Shifts in the traditional Samoan diet began in mid-twentieth century. Much of this change can be associated with World War II. “By the mid-twentieth century, widespread colonization and the World War II had triggered dramatic changes in sovereignty and opened transportation routes, in turn leading to rising availability of a whole new source of food for the islanders” (Hawkes 2010:148). With globalization and the Pacific’s integration into the world economy an influx of imported staple foods flooded the store shelves. These imported goods include sugar, rice, cabin biscuits, bread, potatoes, breakfast cereal, and noodles (Secretariat of the Pacific Community 1999:7). Many of these foods are highly processed, contain little nutritional value and are highly caloric. “Imported staple foods...contain a lot more energy, variable amounts of water, some protein, and little dietary fiber” (Secretariat of the Pacific Community 1999:21). In comparison with their imported counterparts traditional staples have negligible amounts of fat and higher amounts of dietary fiber. Along with this reliance on imported food comes an increase in the levels of food insecurity in urban areas. People in these areas often do not have the space to maintain food gardens and thus rely more heavily on products available in stores and at market.

The decline in health in Samoa is the result of a combination of factors, the main one being diet transition. Changing life style habits have also impacted health. In traditional lifestyles once Samoan women have raised their children it becomes the responsibility of their children and younger members of the village to care for them (Ōtsuka 2007:151). Traditionally, young men carry out the majority of the labor in subsistence lifestyles, so as

men age they take on a less physical role of overseer (Ōtsuka 2007:151). The majority of a person's life was active. Not until they were older did they, men and women, assume a more sedentary role. With a more urbanized lifestyle people of all ages are increasingly sedentary. Urban dwellers consume fewer calories in a week than their rural counterparts but they have higher levels of body fat due to their more sedentary lifestyles (Ōtsuka 2007:151). The transition of Samoan diet from traditional to modern has led to increased rates of obesity and NCDs in all age groups. These rates are among the highest in the world and are continuing to rise.

Impact of Diet Change on Health

From 1961 until 2005 food imports to Samoa increased 5 fold (DiBello 2009:1933). The increase in food imports is demonstrative of the increasing rate of modernization in Samoa and rising demand for these products. Obesity rates in the Pacific correlate directly to the rate of modernization (DiBello 2009:1933) Obesity is a major risk factor for NCDs. NCDs currently account for 43% of the burden of disease in the world and this is expected to rise to 60% by the year 2020 (Hawley 2010:11). In low-income and middle-income countries, NCDs occur at increasingly high rates, “with 80% of worldwide deaths from NCDs occurring in these countries” (Hawley 2010:11).

The rise in NCDs in the Pacific can be attributed to the change in diet from the traditional to the urbanized. With increased urbanization in Samoa, natural disasters, and increases in imported foods, changes are being made to the traditional Samoan, as well as Pacific, diet. In Samoa, “imports accounts for 48% of total dietary energy requirements and 60% of protein requirements” (Adams 1997:43). The urbanization of the population has also changed attitudes about food. This shift to urban living, as well as western influence,

has created a demand for quick, easy, and inexpensive food sources and has decreased the role of subsistence agriculture in the accrual of food.

“The diet of Samoans is rich in oils, fats, carbohydrates, and energy rich foods. This has led to an incredibly high prevalence of overweight and obese people, a high level of NCDs and their associated complications. Samoa has its own dialysis center but still struggles with measles, filariasis, and Chlamydia. The lifestyle here cultivates a physical [idleness] that allows NCDs to become so prevalent” (Garewal 18/11/2011).

Even in the most remote areas of Samoa, people have access to imported foods (Adams 1997:44).

Another major nutrition concern is increased fat content. Originally, the main source of fat was coconut cream and the minimal amounts found in fish and other seafood. The methods for preparing traditional foods did not involve oils or fat. Frying has become a popular method of food preparation and the meat products available, such as leg quarters and corned beef are from the fattiest areas on the animal. Leg quarters, which are considered “dark meat”, have 25% more calories and more than double the amount of fat when prepared without the skin, compared to skinless chicken breast (Dark or White Poultry Meat 2011). Leg quarters are commonly prepared and served with the skin on in Samoa which further increases calories and fat. These types of meat, turkey wings and leg quarters as opposed to chicken breasts, are what the high-income countries do not want. Therefore the traditional sources of protein, such as, fish, seafood, and occasionally local pork or chicken, in the diet have been degraded as well.

“With the import of more nutritious foods (i.e. not canned goods rich in preservatives), people have still stuck to their traditional diet consisting of things such as breadfruit and taro but supplemented... with imported.

Which are high in preservatives, which are good for business, but bad for health. One could argue that the diet has not changed enough to evolve a health consciousness to eat primarily fresh fruits and veggies” (Garewal 18/11/2011).

Hypertension, diabetes and other NCDs are increasing mainly because of diet and lifestyle (Asaua 28/9/2011). Since her teens Dr. Asaua has noted a large increase in obesity. She thinks that this is because when she was younger people had very little money and ate what was available. One factor influencing diet transition has been a rapid monetization of the Samoan economy. For example, currently the starting salary for a doctor is over \$30,000; when she graduated from school in the early 1990’s Dr. Asaua’s starting salary was \$11,000. When people had less disposable income bread and butter was a big treat and the only junk food she could remember having was lolepopo, a ball of coconut and caramelized sugar. People now want a convenient lifestyle and everyone is on the go. Preparing and cooking food outside was very active and involved the whole family. This allowed for family interaction and physical activity. Meal preparation is becoming more about ease and convenience. This desire for convenience results in more calories being consumed than are expended.

“Over nutrition”, excess energy and nutrient intake over time leading to obesity, is the major dietary factor affecting NCDs in the Pacific. Increased energy consumption and decreased activity puts obesity as one of the highest risk factors for diabetes, hypertension, gout, and heart disease. “Traditional staples can be eaten in large quantities without fear of gaining weight. If similar quantities of imported staples are eaten weight gain will occur” (Secretariat of the Pacific Community 1999:26). This is because the nutritional components of traditional staples are much more nutritious as compared to imported staples because

they contain more complex carbohydrates, fiber, and naturally occurring vitamins. Also, the bulky weight and volume of the traditional staples is much lower in calories as compared to similar amounts of the imported staples (Secretariat of the Pacific Community 1999:26).

In more than ten Pacific¹ countries 50-90% of the population is overweight. In American Samoa 80% of women are obese. Obese and severely overweight people are at higher risk for NCDs and people who already have one NCD are at higher risk of developing subsequent NCDs (Adams 1997:32). For example, a person with diabetes is four times as likely to be at risk for coronary heart disease, myocardial infarction, and sudden death (Adams 1997:32). NCDs are the leading health concern in Samoa and elsewhere in the Pacific, where “60% of the leading causes of death were diet related” (Adams 1997:32). Diabetes prevalence in the Pacific is among the highest in the world. In American Samoa the rate of diabetes is 47% of the adult population as compared with the mainland United States where the percentage is much lower at 13% (Pacific islanders 2011). Over nutrition is not the only effect of changes to the Pacific diet. Micronutrient deficiencies of iron, iodine, and Vitamin A lead to anemia and goiters and more seriously death. At least 40% of the entire Pacific population has been diagnosed with a NCD (Pacific islanders 2011). The NCDs in the region account for 75% of all deaths. “In Fiji only 16% of the population is over 55 years of age due to premature deaths primarily caused by NCDs” (Pacific islanders 2011).

High levels of blood lipid, lipoprotein and glucose are risk factors for NCDs. A 2010 study showed that 617 of the 800 subjects had levels of LDL-cholesterol that put them at significant risk for cardiovascular disease (CVD) (Hawley 2010:14). In the same study, high

¹ Nauru, Federated States of Micronesia, Cook Islands, Tonga, Niue, Samoa, American Samoa, Palau, Kiribati, Vanuatu, Tuvalu, Fiji

blood glucose, rates which are an indicator of type II diabetes, were lower at 10.6% of the study population (Hawley 2010:14). A 2009 study of metabolic syndrome in Samoans, an important precursor to CVD, found that, “those with metabolic syndrome were significantly older; had a higher...BMI and abdominal circumferences; and had lower levels of physical activity than those without metabolic syndrome” (DiBello 2009:1938). Those who ate a traditional diet, high in coconut products and seafood while low in processed foods, were less likely to have metabolic syndrome. Metabolic syndrome was found to be positively correlated with a modern, high in processed foods diet (DiBello 2009:1941).

Poor diet is to blame for the majority of health issues in the Pacific, “promotion of traditional foods has fallen by the wayside. They are unable to compete with the glamour and flashiness of imported food” (Pacific islanders 2011). The introduction of imported goods into the Samoan diet has resulted from Samoa’s entrance into the global economy. Trade and trade policy have played a major role in influencing, both positively and negatively, health and diet in Samoa.

Impacts of Trade Policy on Health

Post World War II (WWII) trade related shifts in diet happened rapidly because of a transition from subsistence to commercial agriculture, the creation of administrative centers to stimulate trade and commerce in the Pacific, and finally the influence of the development of agriculture and fisheries for production and export (Hawkes 2010:151). With these changes, the food people ate began to correlate with the current economic situation. In times of high income and following cyclones or other natural disasters the reliance on imported goods, such as rice, canned meat, and white bread, increased. Whereas during times of recession peoples relied on the traditional crops. During these

times of recession, when the diet returned to a more traditional, health was noted to greatly improve as compared to times when imported goods were being favored (Hawkes 2010:152).

With the transition to more commercial cash driven economy came increased urbanization. People living in urban areas have less access to traditional food and the land necessary to grow them (Hawkes 2010:153). Traditional crops are difficult to transport and preserve. “ They are bulky, perishable and have significant waste from peeling, in contrast to staples such as wheat and rice, which can be processed into less bulky forms and then easily stored for long periods of time” (Hawkes 2010:153). Soon after WWII preference for imported goods began to increase and was only limited by availability and affordability (Hawkes 2010:156).

With increased globalization, food coming into low-income countries is higher in fat, sugar, and salt.

“Trade policy in Samoa has become increasingly liberalized, opening the economy in response to global trends (and sometimes pressures) to reduce barriers to imported goods. One influence on health is via its influence on diets. With liberalization the importation of cheap, low quality foods, particularly fatty meats, has increased, and availability of traditional staple foods has declined. This has supported the nutrition transition in Samoa, which is associated with increasing rates of chronic diseases” (Thow 13/11/2011).

Trade policy is now changing to improve healthfulness of food supply in low-income to mid-income countries. Recommendations include decreasing import taxes on healthy foods, and generally decreasing the import of unhealthy foods (Trade and food policy 2010:1). Lowering trade barriers, after Samoa’s independence in 1962, led to an influx of

inferior foods available, such as chicken backs and turkey tails. The concept of bans and taxes has been pivotal in trade agreements in Samoa since the 1990 ban of chicken backs. Chicken backs were banned for reasons very similar to the later ban of turkey tails. They contained little protein and high levels of fat and bone which renders them nutritionally insufficient.

The increased availability of these low quality foods has affected public health. One example of how trade policy is responding to the negative impacts of fatty meats and the importation of low quality food is the Samoan ban on turkey tails. Turkey tails were banned in August 2007 after which three months notice were given for the ban to take hold (Trade and food policy 2010:3). However, turkey tails could still be found in stores up until Christmas time 2007 (Trade and food policy 2010:3).

The turkey tail ban did not result in revenue loss for Samoa. Responses to the ban were mixed; but, the ban did not seem to have major impacts on diet or shop proprietors. Under half of people surveyed in the study just switched to another comparably inexpensive cut of meat (Trade and food policy 2010:3). One quarter of the people reported eating lower fat meat or seafood as a result of the ban (Trade and food policy 2010:3). The bans were successful in decreasing the amount of fatty meat imported into Samoa and raising public awareness about the impacts of diet on health.

Samoa is currently in the process of joining the World Trade Organization (WTO). Upon joining the WTO the ban on turkey tails will have to be removed because they form a barrier to trade. The turkey tail ban can remain in place if it can be scientifically proven that they negatively impact health. Samoa has three years after joining WTO to conduct studies and gather information showing that the ban is necessary (Quested 08/11/2011).

“Interim measures will replace the ban – these are likely to increase the price and limit the supply of turkey tails so may mitigate the immediate impact. Plus, the fact that the ban existed did raise awareness regarding the unhealthfulness of turkey tails, so consumption may stay low because of this educational dimension” (Thow 13/11/2011).

Samoa has also placed two taxes on soft drinks. One is an excise tax, dating from 1984, “the tax was set at 20% in 1984, and set at a fixed rate of 0.030 tala per liter (T/L)...in 1998 increased to 0.40 T/L... in 2008, in order to raise revenue” (Taxing soft drinks 2010:6). The other implemented tax was an import excise duty of a similar nature. The first excise tax was applied to all soft drinks produced or imported to Samoa. The second was only applied to imported soft drinks. Local manufacturers have passed the tax onto consumers thus increasing soft drink prices (Taxing soft drinks 2010:6). Due to these taxes bottled water is now a cheaper alternative because it is not subject to excise taxes (Taxing soft drinks 2010:6). It is the hope that water will be favored over bottled sodas because of its affordability. All excise taxes in Samoa were increased by the Ministry of Finance in 2008 to make up for budget deficit (Taxing soft drinks 2010:6). This tax increase was also attributed to increased awareness of the importance of eating healthy eating.

Upon Samoa’s entrance to WTO soft drink taxes will also have to be changed. “The relatively large proportion of soft drinks imported in the Pacific means that special taxes on imported products were a component of the soft drink taxes,” these taxes are being reduced because they also form a barrier to trade and do not treat domestically manufactured and imported drinks the same(Taxing soft drinks 2010:12).

Trade policy has made efforts to regulate unhealthful products being imported and produced in Samoa. Consumption of these goods is rising along with disease. In order to decrease this, the education of the public is a priority.

Health and Diet Education

Obesity rates in Samoa will likely continue to increase before plateauing (Ōtsuka 2007:185). As rates of obesity increase in youth, the burden of NCDs will also shift to younger age groups (Ōtsuka 2007:185). The Nutrition Center at the Ministry of Health (MOH) has been proactive in promoting and implementing nutrition education in public and in schools.

One of the main nutrition programs is based in the preschools. This program was started by a women's group, with funding and support from Canada Fund and the MOH (Quested 08/11/2011). Canada Fund provided training, kitchen equipment, and a small nutritional booklet given to the preschools for the parents and teachers (Quested 08/11/2011). The MOH participated by conducting consultations and audits.

Preschools currently have the strictest nutrition guidelines. In order to meet standards, which are set by the MOH dictating the use of fruits and vegetables in school foods, the school must have a garden on school grounds. The garden must have six vegetables and two fruit trees (Quested 23/09/2011). The foods from the garden should be used to make healthy foods such as soup for lunches. While overall successful, the preschool gardens have faced some problems. Some gardens exist on school grounds but do not contain the required amounts of fruits and vegetables (Quested 23/09/2011). Many preschools do not have enough land for a garden and have therefore opted to plant one at a parent's house. Finally, the teachers at the preschools are not being properly trained and

trainings have only been done once since implementation. The initial training was funded by Canada Fund and the MOH. This has led to the number of certified cooks and teachers decreasing. The first two problems resulted to schools being excluded from advancing in the program. The schools all met the standard of having a healthy soup available, so progress in nutrition education is being made but the statistics don't always represent it (Quested 08/11/2011). If schools did not meet the standards at the first audit they did not receive the refrigerator and fence for the garden, which was given by Canada Fund upon satisfactorily meeting requirements at the first audit (Quested 08/11/2011). In order to conduct audits the MOH visited the schools to make sure the standards were being met. However, when standards are not met there is no disciplinary action such as repossession of equipment.

Primary and secondary schools are not required to maintain gardens as the preschools are. New food standards in schools, set out by the MOH, require that fruits and vegetables be served in meals and sandwiches from the canteen. This new set of standards is currently being piloted in primary school. The goal is for 50% participation by the end of the 2011 financial year. Currently ten out of 139 primary schools are participating (Quested 23/09/2011).

The Nutrition Center has a demonstration garden which can supply free cuttings and seeds to the interested public. The purpose of the garden is to promote healthy eating. Since the MOH's move to its new location the number of people utilizing the garden has decreased. Only two or three people per month come for cuttings where as prior to the move it was more than 100 people a year (Quested 08/11/2011). The garden is currently in the process of being reestablished. This has caused a decrease in the variety and quantity

of available plants. The Nutrition Center hopes to increase public knowledge about the relocation of the garden through brochures.

Komal Garewal with the World Health Organization (WHO) suggests,

“The primary problem is lack of physical activity and mentality about food, body image, and what is appropriate. The culture here is not as focused on health and beauty in the same manner as Western ideals are. The culture of a Sunday is two big meals, sitting around a fale, talking and lounging, and enjoying the community. This is not a community that is wary about its weight. I think if there was a solution it would be involving the church and MOH. Maybe encouraging intra-village sporting events? Or having church dialogue involve health and risks to health” (Garewal 18/11/2011).

Three of the people interviewed in this study have noted that often times those teaching and promoting health are not actually practicing what they teach. “[The government] has a zumba class two times a week for all employees, but half hide in their offices and the other half that participate do so without really pushing themselves. Even the people who have the education and power to promote health, are unhealthy” (Garewal 18/11/2011). People look up to doctors and nurses and when they see that the doctors are overweight and eating unhealthily they think it is okay (Asaua 28/09/2011). Nurses, pastors, doctors, and nutritionists need to act as role models for a healthy lifestyle (Asaua 28/09/2011). Callum Jones, a personal trainer and health coach, suggests the need for a shift from the top levels of ministries and the medical field if diet is really going to change. This shift needs to come in the form of preventing disease not just treating it and how the public is educated about nutrition (Jones 18/11/2011).

Nutrition education is not only coming from the government, local people are also trying to help educate the public. Callum Jones has a concept called Reformation Samoa.

Reformation Samoa seeks to educate their clientele about healthy lifestyles and nutrition so that when they lose weight their whole lifestyle is healthier (Jones 18/11/2011). Part of his program is focused on eating local. Jones believes that local foods are better attuned to the environment and are therefore better for you. "Food has to have life to give life," says Jones, fresh foods have enzymes in them which help you to digest them (Jones 18/11/2011). Processed foods no longer have enzymes and are essentially dead, so when eating them the body has to use its own enzymes for digest, thus depleting the body's supply. Jones suggests that diet in Samoa has likely changed because of the ease of imported goods. Also, people are overworking, or working outside the home and have less time for traditional food preparation. Local foods are sometimes viewed as lower class. More status is associated with being able to afford imported goods. The prices of imported foods are often more competitive than local, whole chicken is currently around \$1.72 a pound, poor quality, and requires less work. Whereas, local pork and chicken are much better quality, healthier, in large steady supply but require labor and time to raise them. A number of surveys were conducted to better grasp what foods are eaten daily; how often fruits, vegetables, and snacks are eaten; and perceptions of health and food.

Survey Results

Three surveys were conducted between the months of September and November 2011 in Samoa. Two were conducted in the Apia area and one was conducted in the village of Lotofaga. The overarching purpose of these surveys was to look at diet in Samoa. Each survey, while different, shared similar questions and objectives.

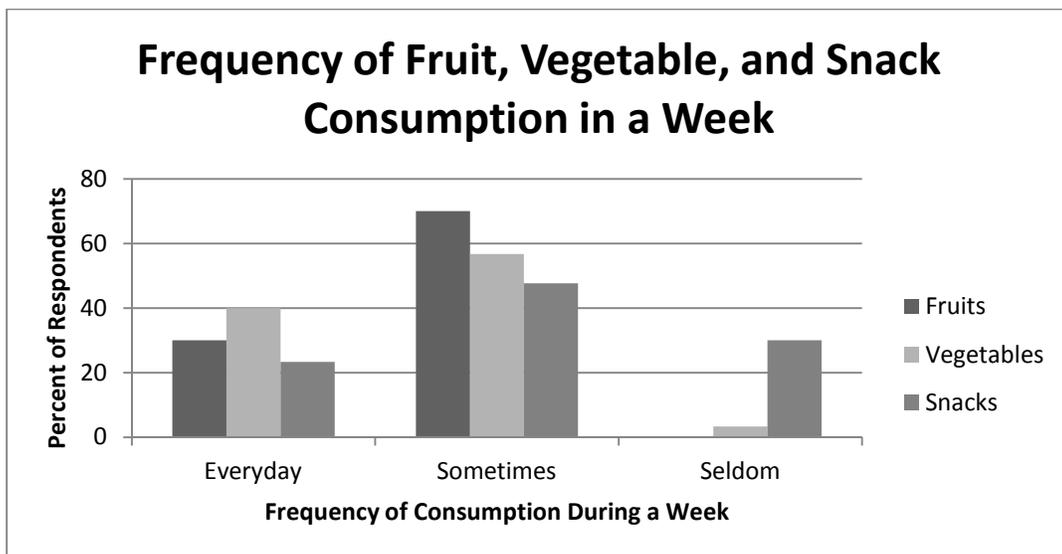
The first survey was conducted in Lotofaga, Samoa during the week of September 11, 2011. The purpose of this survey was to determine what imported foods were

incorporated into the current daily diet and whether imported goods were replacing those grown locally in diet. One hundred percent of people surveyed said they ate taro on a daily basis. The next most popular starch was bananas at 70%. Of the 50% who brought goods to sell at market all of them brought taro. This suggests that taro is still the most important staple food in the Samoan diet. In the category of meat and protein, chicken was the most frequently consumed by 80% of respondents. One flaw of this survey is that it did not ask whether chicken eaten was imported or local. However, observation showed that the majority of chicken consumed was imported. The local chickens were only prepared for important occasions such as fiafia. The most consumed imported good was tinned fish. Fifty percent of survey takers said they consumed it on a daily basis. Rice was consumed by 40% of survey takers daily suggesting that imported starches are becoming fixtures in the daily diet. Other local goods reported to be eaten included fish, breadfruit, pork, yams, and ta'amu. Other popular imported goods were breads and crackers. Every respondent reported having a garden or plantation in which they grew crops for personal use; some also used these crops as a means to generate cash whether at the market or roadside stands. Taro was the most grown crop followed by banana, lau pele, and tomatoes. Other crops included beans, yams, ta'amu, pumpkin, papaya, cabbage, eggplant, cucumbers, and cassava. As mentioned above, half of the people sold goods at the market and all sold taro but other goods sold included cabbage, cucumber, pumpkin, papaya, luau, and ta'amu. The final question of the survey asked how much money was spent on food weekly. The distribution of answers was relatively even with some tendency toward the lower amounts. Three people spent less than \$20 in a week while only one person spent more than \$80.

The second survey was very similar to the first with minor edits to the survey format. This survey was conducted with ten vendors at the Maketi Fou in Apia, Samoa on September 27, 2011. It sought to compile data on food preference, food economics, and agriculture. Sixty percent of merchants ate taro everyday and 50% also ate chicken every day. Of the foods that were eaten everyday by the participants, 32.36% were imported or made from imported goods. A variety of crops were grown by the vendors including taro, bananas, ta'amu, cucumber, cabbage, and breadfruit. Eighty percent sold goods at the market every day. It is likely that those working in the market might eat and purchase more local foods because of ease of access. When asked what foods they bought in the store, 70% said chicken, 40% said sugar, and 30% said rice, bread, or tinned fish. One responded to this question, "Everything!" The amount of money spent on food weekly ranged from less than the \$20 tala to upwards of \$200 tala. All goods bought in the store were imported.

A final survey was conducted in the greater Apia area on the 16 and 17 of November 2011. The purpose of this survey of 40 people was to gather information on diet and health attitudes in the Apia area. In this survey 100% of participants responded that food is important to health. Of those surveyed, 57% of foods consumed daily were imported or made from imported goods such as flour. Only 38.7% of the food consumed daily was a fruit or vegetable. The most popular local food was taro with 50% of survey takers saying they consumed it daily. The most popular imported good with participants was chicken, which 60% consumed daily. The regularity with which people bought snacks varied, 23.3% said daily, 47.7% said sometimes, and 30% said seldom. The most popular snack purchased was Twisties at 32% of responses; the second most popular was potato chips at 25%. When asked how often during the week they ate fruit 30% said everyday while 70% said

sometimes. None of those surveyed responded that they seldom ate fruit during the week. The most popular fruit, at 32.8% of responses were bananas and papayas were the second most popular at 29.5% of responses. The most popular imported fruit was oranges at 8.2% of responses. Forty percent of respondents ate vegetables everyday, 56.7% said sometimes, and 3.3% said seldom. The most popular vegetable was Chinese cabbage with 19.8% of responses, the second most popular was pumpkin with 18.8%, onions were the third overall and the most popular imported vegetable with 16.7%. This survey showed that a large quantity of the diet in the Apia area is made up of imported goods. Local fruits and vegetables are maintained within the diet but eaten less frequently and in smaller amounts than recommended.



The Role of Agriculture in Diet Change

The changing diet and agriculture in Samoa are so closely linked it is important to acknowledge the connection. The taro blight of 1993, which nearly eliminated taro in Samoa, impacted the tastes of an entire generation. Children growing up in this time period grew to prefer potatoes and rice. Even when resistant varieties of taro were introduced a

couple years later the preference held (Tamanikaiyaroi 27/09/2011). Nutritional food security problems are more about quality than quantity in Samoa. Urbanization has caused a change in the quality of foods available. People in urban areas do not have room to grow crops nor is there room to store these crops which are bulky and do not store well for extended periods of time (Schulz 16/11/2011).

Price, in terms of time and money, is also playing a major role in the shift away from subsistence agriculture. The current price of taro per bundle is around \$20 tala, half a sack of rice can be purchased for the same amount of money (Schulz 16/11/2011). The rice is easier to store and has a much longer shelf life. The quantity of food produced, as compared to taro, is much greater. The ease of being able to go to the store is starting to outweigh the quality of food produced by subsistence agriculture. It is much easier and less expensive in terms of time to go buy chicken from the store than to raise it yourself (Tamanikaiyaroi 27/09/2011).

Agriculture is changing in Samoa because of what people want to eat, the increase in population, and the interests of the producers. The older generation has different tastes than the young, the young may prefer a pear to a mango (Tamanikaiyaroi 27/09/2011). Agriculture production is becoming more about commercial cash crops than subsistence. Only a few crops are being grown in intensive production. There has been very little change in what is being grown in Samoa, the majority of new crops that have been introduced are fruits such as, rambutans, papaya hybrids, and citrus varieties (Tamanikaiyaroi 27/09/2011). However large scale agriculture production in Samoa is very difficult because of the small amount of farmable land area.

“Trade policy has also contributed to food insecurity in two ways through its influence on agricultural policy: first, trade liberalization has limited subsidies and protection for domestic agriculture and supported export-oriented agriculture, leaving farmers vulnerable to global price shocks and dependent on a few key crops for income; second, the influx of cheap imports has reduced incentives for agricultural investment, leading to poorly developed agricultural technology, which has limited the capacity of Samoan farmers to increase production in response to the recent food crisis” (Thow 13/11/2011).

Food prices spiked in 2008 causing repercussions throughout the region (Schulz 16/11/2011). In response the Food and Agriculture Organization of the United Nations (FAO) provided seedlings to small scale farmers for subsistence agriculture and so that they could sell the surplus thus generating monetary income (Schulz 16/11/2011).

However one problem is that people are selling the fresh food and then turning and buying the canned. This is likely due to the social value placed on imported goods.

Local foods are underappreciated and devalued (Schulz 16/11/2011). Local products are associated with a poorer lifestyle while imported goods are associated with economic success. Part of FAO’s plan is to educate people on the value of local foods and hopefully change the perceptions and increase knowledge about their value. Schulz says that the use of imported goods will likely continue to rise for now. However, the high-income nations are starting to use more local goods, the mirroring of which may slow down the transition for Samoa. He also says that it is important to show chefs in Samoa how to properly prepare and use the local products which will increase the demand for them.

However, the increase in food quantity over quality has not been all bad, in the 1960s and 70s the rates of malnutrition among children began to lessen because of the increased supply of food (Schulz 16/11/2011). The problems with diet in Samoa must be

looked at from a comprehensive approach. Therefore it is important for all the Ministries and NGOs to join together in a closer collaboration (Schulz 16/11/2011) (Stegemann 17/11/2011).

Conclusion

The findings of this study show that the diet in Samoa is anything but static. A variety of factors have influenced diet change in Samoa. The modernization and urbanization of Samoa have been the overriding factors influencing diet change. The opening of Samoa's markets after independence allowed for the increase in imported goods in Samoa. Upon Samoa's entrance into the WTO the volume of imported goods will increase again and the quality will decrease. The decrease in the quality of imported goods will increase because bans and taxes that previously slowed or stopped the purchase of these goods, i.e. turkey tails and soft drinks must be lifted. These bans and taxes are viewed as barriers to trade because they do not treat imported goods equally. Samoa, already a dumping ground for cheap meats and products from countries such as New Zealand, will face more of these goods coming in.

The increased availability and competitive prices of imported goods have lead to them being incorporated into the local diet. As the surveys suggest one third to one half of the diet of Samoans is made up of imported goods. While people understand the role which diet plays in health, the consumption of fruits and vegetables remains low. Agriculture has played a role in the changing food preference in Samoa. An entire generation started life without taro and have thus come to prefer potatoes and rice. The health of the Samoan people reflects this.

There is not just one cause and not just one result of the diet change. This study has outlined the role in which trade policy, modernization, urbanization, and agriculture have played in shaping the tastes of a nation. While it is likely the traditional diet will continue to succumb to western influences and continue to transform, health education is making strides toward combating this. For real changes to be made, Ministries and other NGOs need to work together towards a common goal. Many of the organizations interviewed have the same concerns and express a need to increase interdepartmental communication, allowing them to work more as a cohesive unit. It is also very important for those who are promoting healthy diets and lifestyles to live them as well. It is only when the figureheads change that the general public will begin to change as well.

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Glossary of Acronyms

CVD- Cardiovascular Disease

FAO- Food and Agriculture Organization of the United Nations

MOH- Ministry of Health

NCD- Non-communicable disease

UNDP- United Nations Development Program

WTO- World Trade Organization

WWII- World War II

Glossary

Diet transition- the change in diet from one high in local and traditional foods to one high in imported processed foods

Excise tax- a tax placed on the production and importation of certain products, taxes are passed on to the consumer in the form of higher prices

Fiafia- a traditional Samoan meal followed by various dances and songs, often used as a way to say goodbye to guests

Globalization- being integrated into the global economy and being connected to other countries on a global scale

Lau pele- edible hibiscus

Lolepopo- traditional Samoan candy, a ball of coconut and caramelized sugar

Micronutrient deficiency- a shortage of a vitamin or mineral that is essential for development or growth

Modernization- transformation of a society from traditional to modern, modernization often impacts diet, family structure, and economy

Non-communicable disease- diseases which are not contagious

Over Nutrition- excess energy and nutrient intake over time leading to obesity

Subsistence agriculture- agriculture that is focused on growing enough food to feed the family

Ta'amu- a yam that is very similar to taro, increased in popularity in Samoa after the 1993 taro blight

Urbanization- movement of the majority of a population into urban areas

Appendix A: Lotofaga Survey

What foods do you eat daily? 'O ā ni mea'ai e masani ona tou 'a'ai ai i aso uma?

What do you grow in your plantation or garden? 'O ā mea'ai e maua i tou maumaga po'o togāla'au?

Has what you grow changed in recent years? 'Ua sui mea e tōtō ai i tou maumaga?

How many times a week do you bring goods to sell at market? 'E fa'afia i le vaiaso 'e te fa'aatu ni mea i le māketi?

What do you bring? 'O ā mea?

How much money do you make in a day? E fia le tupe 'e te maua ai i le aso e tasi?

What foods do you usually buy from the store? 'O ā mea'ai e masani ona 'e fa'atau mai faleoloa.

How much do you spend on food weekly? 'E fia tupe e fa'aaogaina ai e fa'atau mea'ai i vaiaso ta'itasi?

\$0-\$20
\$20-\$40
\$40-\$60
\$60-\$80
\$80 +
'Ou te lē iola

Appendix B : Maketi Fou Survey

What foods do you eat daily? 'O ā ni mea'ai e masani ona tou 'a'ai ai i aso uma?

What do you grow in your plantation or garden? 'O ā mea'ai e maua i tou maumaga po'o togāla'au?

Has what you grow changed in recent years? 'Ua sui mea e tōtō ai i tou maumaga?

How many times a week do you bring goods to sell at market? 'E fa'afia i le vaiaso 'e te fa'aatu ni mea i le māketi?

What do you bring? 'O ā mea?

How much money do you make in a day? E fia le tupe 'e te maua ai i le aso e tasi?

What foods do you usually buy from the store? 'O ā mea'ai e masani ona 'e fa'atau mai faleoloa.

How much do you spend on food weekly? 'E fia tupe e fa'aaogaina ai e fa'atau mea'ai i vaiaso ta'itasi?

\$0-\$20
\$20-\$40
\$40-\$60
\$60-\$80
\$80 +
'Ou te lē iola

Appendix C: Apia Survey

What foods do you eat daily? 'O ā ni mea'ai e masani ona 'e taumafa ai i aso uma?

taro/talo rice/araisa bread/falaoa eggs/fuamoa chicken/moa
vegetables/faalā'aufaisupo fruits/fualā'au aina sweets/mea suamalie

How often do you buy snacks during the week? E fa'afia i le vaiaso 'e te fa'ataua snacks po'o mea'ai suamalie?

everyday/aso uma sometimes/isi aso seldom/seāseā

Which snacks do you eat? O le fea mea ia 'e te taumata ai?

Twisties donuts cakes potato chips candy soda

How often do you eat fruit during the week? E fa'afia i le vaiaso 'e te taumafa ai fualā'au aina?

everyday/aso uma sometimes/isi aso seldom/seāseā

What fruits do you usually eat? Oā fualā'au aina 'e masani ona 'e taumafa ai?

Orange/moli papaya/esi mango/mago apple/aple bananas/fa'I pule

How often in a week do you eat vegetables? E fa'afia i le vaiaso 'e te taumafa ai fualā'au fai supo?

everyday/aso uma sometimes/isi aso seldom/seāseā

Which vegetables do you eat? O ā fualā'au fai supo 'e te taumafa ai?

Lau pele taro/talo pumpkin/maukeni beans/pi chinese cabbage/kapisi saina
lettuce potato/pateta onion/aniani

Is food important to health? E tana mea'ai mo le soifua maloloina o tagata?

IOE

LEAI

How could you change the foods you eat to improve your health? E fa'apefea ona sui mea'ai e te taumafa ai in ia lelei lou soifua maloloina?