

# **The Effect of Income Level on Nutrition and Health in San Ignacio Town**

A Thesis Submitted to the University of Belize in Fulfilment of  
BIOL 4992 - Independent Research

As Part of Bachelors of Science in Biology

Submitted by

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## **Abstract:**

Epidemiologic data has demonstrated that diet quality and corresponding nutritional status follow a socioeconomic slope. Higher-quality diets have been associated with greater socioeconomic status while energy-dense diets that are nutrient-poor are preferentially consumed by persons with more limited economic means. Because nutrition plays a measurable and significant role in the development of many chronic degenerative diseases their association is important from a public health point of view. This Qualitative study was performed to investigate how low household income as a variable of socioeconomic status is associated with quality of diet as well as overall health through the presence or absence of disease in households within the town of San Ignacio, in the Cayo District. A questionnaire was distributed amongst individual households throughout the town of San Ignacio, and lower income families were assessed based on their response to low income ranges. Nutritional consumption of the families were evaluated via food types to reflect diet quality such as grains, lean meats, fish, fresh vegetables and fruits as a higher quality nutrition whereas refined grains and added fat as energy dense and poorer quality nutrition. The health status of these family members were assessed via presence or absence of major diseases known to be affected by nutrition such as obesity, hypertension, heart disease, diabetes, and osteoporosis. Results revealed the presence of multiple degenerative diseases in these low income families. Many family members had averaged Body Mass Indices (BMIs) above normal value of 24.9 with an association to nutrient poor food choices.

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## **Introduction:**

The importance of proper nutrition is nothing close to a new fact, and more so than ever, nutrition is being linked to one's health, the presence or absence of disease, as well as longevity. According to the World Health Organization (WHO), despite the remarkable technological progress in health care and treatment, there has been a worldwide increase in lifestyle-related chronic diseases (e.g., type-2 diabetes, cardiovascular disease and obesity) during the last decades <sup>[1]</sup>. According to the 2010 CAMDI survey of Diabetes, Hypertension and Chronic Disease Risk Factors in Six Central American Countries, Belizean women ranked highest in number for prevalence of diabetes. Overall, Belizean participants ranked highest in number for prevalence of hypertension as well as increased risk waist circumference <sup>[2]</sup>.

On June 19, 2013 the Ministry of Health held a Nutrition seminar for Food providers and vendors. According to Robyn Daly, Ministry of Health Nutritionist, Belize has a whopping 60% obesity rate, a 14% prominence of diabetes and 28% hypertension. No details were given as to demographic distribution and other factors influencing those statistics. However, The Statistics Institute of Belize (SIB) reports that since 2006 the leading cause of death in Belize is Diabetes mellitus with a high of 9.6 % in 2011 and Hypertensive diseases at 7.7 % . <sup>[3]</sup> While the aetiology of obesity and chronic diseases is complicated, inappropriate dietary choices resulting in poor diet quality is emerging as a major modifiable risk factor. <sup>[4, 5]</sup>

Although the determinants of healthy nutrition are poorly understood, food choice and diet quality is likely influenced by economic factors. According to similar studies on this topic, cost of food has been shown to be negatively associated with diet quality. Economic status including monthly incomes and number of individuals per house hold has been seen to affect nutrition of individuals. Low cost diets have a tendency to be filled with high calorie density and poor nutrient adequacy while higher-quality diets have been associated with higher costs and thus of greater availability to those of higher socioeconomic status. <sup>[6]</sup>

SIB figures for September 2014 report a population of 360,868 persons, a poverty rate of 43 % and an unemployment rate of 12.1 % . No details are given as to indigent poverty. However, FAO reported an alarming 16 percent extremely poor for the year 2010. In September of 2012 Belize reported that the Cayo District had the highest unemployment rate at 18.4 % while the FAO reported in 2010 a rate of 26.6 % . <sup>[7]</sup>

These statistics prompted the interest to investigate whether the various income levels in households within the low to low middle income community in the town of San Ignacio was associated with quality of diet, nutritional status and health through the presence or absence of disease of persons within these households. This Qualitative study was performed via questionnaires. Nutritional consumption of the families were evaluated via food types to reflect diet quality such as grains, lean meats, fish, fresh vegetables and fruits as a higher quality nutrition whereas refined grains and added fat as energy dense and poorer quality nutrition. The health status of these family members were assessed via calculation of their BMI as well as the presence of major diseases known to be affected by nutrition such as obesity, hypertension, heart disease, diabetes, and osteoporosis.

It was hypothesized that the lower level income families may have a poorer diet quality and nutritional status reflected by their BMI as compared to those with higher levels of income in the same community. However, given the small sample size collected and generally lower income geographical area all together it was also hoped that a conclusive outcome on diet quality, nutrition and association of presence of disease would be found overall.

Reasons for food choices and inadvertently diet quality may not only be made based on income level but other factors of socioeconomic status such as education and the lack of nutritional knowledge.<sup>[8]</sup> This study however was limited to the comparison of household income to food choices, nutritional status via BMI and presence of disease.

### **Literature Review**

Health and nutrition has been seen as a great importance throughout the world. Several factors have a great effect on the health and nutrition of individuals including income level, availability of food, education and lifestyle. Studies have been made to demonstrate how income affects nutrition by comparing food choices to the SES (socio economic status) of individuals. In the American Journal of Clinical Nutrition, Darmon and Drewnowski state in their review, Diet quality is affected by not only age and sex but also occupation, education and income levels.<sup>[8]</sup> The SES gradient in diet quality may be mediated by food price and diet costs. A healthier life style with fresher produce may be more costly than that of a more canned food and fattier choice diet. Darmon and Drewnowski's review revealed that low-SES individuals consume less fruits

and vegetables, refined grains, fatty meats and added fats, while the high SES individuals had the availability of whole grains, lean meats, and low fat dairy products which lead to better nutritional status. <sup>[8]</sup>

The study of rural and urban inequalities in food use by Howard Newby (1977) also brought out that the class position of farm laborers, ironically the ones who worked for large food protection companies lived and worked at a great distance from high quality and lower costs shops and thus paid more than their urban counter parts. <sup>[9]</sup> The reason for this was that they paid for the accessibility of the food as well as the product itself. Therefore, accessibility to more nutrient rich foods is an important factor to consider. In 2009, Larson et al made mention of an important statement; that low-income communities frequently lack full service grocery stores and markets for fresh produce whereas families with higher income can afford to drive to super markets and markets for their produce. <sup>[10]</sup>

This setting can be seen in small town areas in Belize such as in San Ignacio whereby families have access to small shops with canned type foods and typically can only afford such types of foods that fit in their budget. Small shops in San Ignacio for instance do not carry fresh produce and low fat dairy products, fresh fish and lean meats because they may not have the infrastructure for chilling of these products. It is customary in the area for fruits and vegetables to be sold at a grand scale on the weekends at a designated market place which requires time and transportation.

Studies in the USA have demonstrated a relationship between food accessibility and food consumption and body mass index. Surprisingly in low-income areas the presence of healthy grocery options was associated with lower BMI while the availability of convenience stores in moderate to high income areas was associated with higher BMI. It was also noted that low-income neighborhoods have less accessibility and a smaller variety. <sup>[11]</sup> Low accessibilities means these families must either settle for what is available or travel longer distances for healthier options.

With poorer food choices come poorer nutritional status and the association of chronic diseases such as obesity, hypertension, high cholesterol, low bone density, diabetes, stroke and cardiovascular disease. Many studies indicate that the majority of individuals coming from a low income family have a poorer nutritional status based on income and price of food. Many are not

educated on what proper nutrition actually is and this has been leading them to make poor choices in food products as well as steering away from the pricier healthy foods. <sup>[12]</sup> The importance of nutritional education has not been given enough credit and there appears to be large room on local, regional and national levels in educating and promoting healthier lifestyles via what is good and what is bad to eat, recommended exercise and health screening. <sup>[7]</sup>

In the CARDI survey in Central America in 2010 the prevalence of diabetes mellitus and hypertension found in the combined Central America sample was higher than the prevalence reported in most countries of Latin America. It is particularly important that, despite having a younger population, Central America had a prevalence of diabetes similar to the prevalence in the United States. <sup>[2]</sup> The data presented indicate that diabetes affects people with a lower educational level, which suggests that the poorest people bear the greatest burden. This means that in the future there will be an important increase in the prevalence of diabetes as the population ages, unless preventive strategies are introduced. Diabetes leads to numerous microvascular complications, making it a major cause of blindness, non-traumatic amputation, and end-stage 2010 renal disease. Diabetes also more than doubles the risk of coronary heart disease, stroke, and peripheral vascular disease. The collective impact of these complications erodes quality of life and imposes a substantial direct and indirect economic burden. <sup>[2]</sup>

Nutrition knowledge has a profound influence on food choice and, concomitantly, nutrient intake. <sup>[7]</sup> Knowledge varies widely across geographical settings, which may explain apparent variability in food choices within populations represented by varying cultural backgrounds. <sup>[7]</sup> The mechanism by which nutrition knowledge transforms into dietary behaviors is intricate. In Britain they have devised a strategy known as the “Eat-well plate” which shows how a healthy well balanced diet, rich in fruit and vegetables can be achieved for a certain amount per week for each individual. <sup>[13]</sup> Strategies such as this would make a large difference in countries for individuals in all the socio-economic statuses by making people aware of what a proper healthy diet should be hopefully to curb the devastating morbidity and mortality associated with chronic diseases related to poor nutrition.

## **Materials and methods**

This Qualitative study was performed using questionnaires distributed to a randomized sample group within the town of San Ignacio in the Cayo district over a period of 4 weeks. This was done to assess whether or not their monthly incomes were associated with diet quality as well as overall health and the presence or absence of diseases in the household.

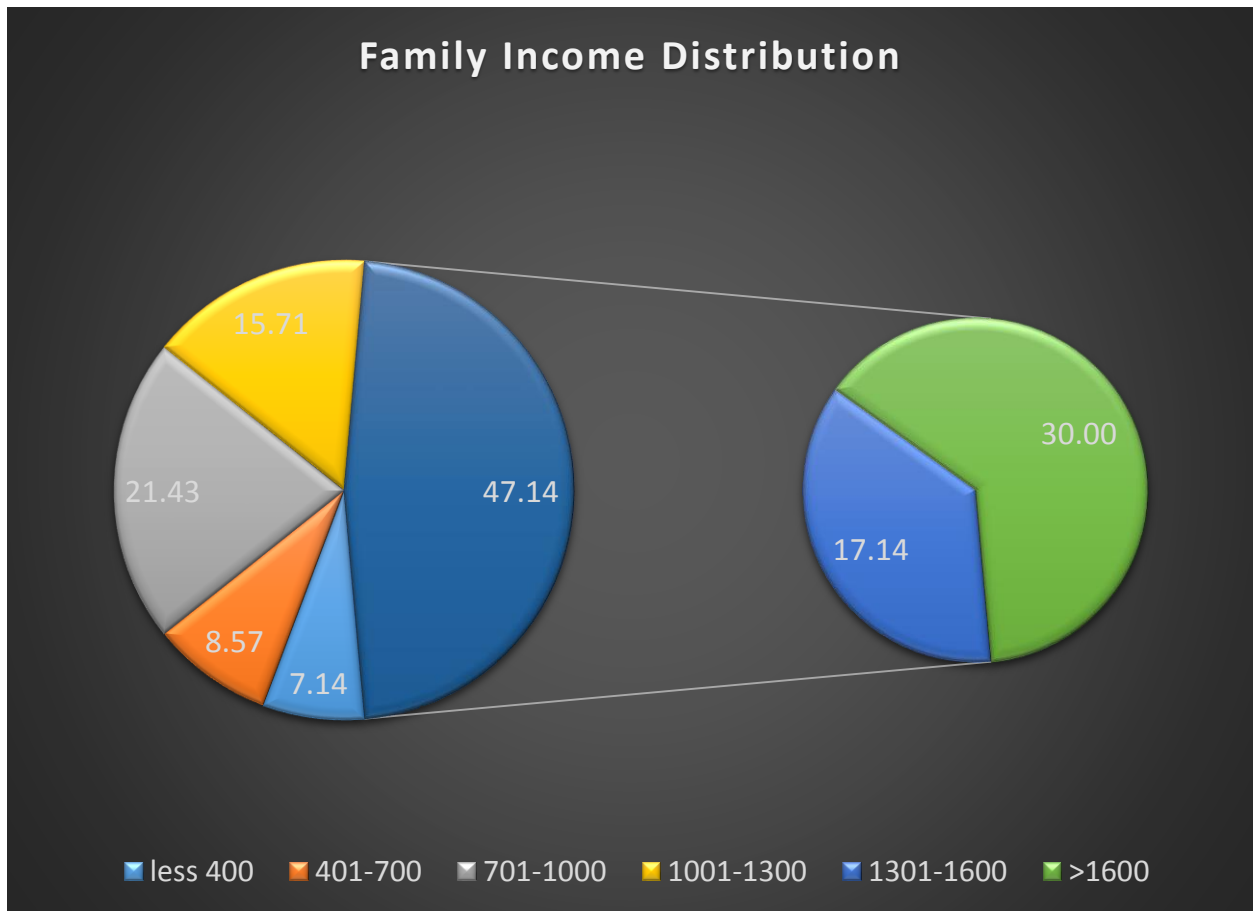
Health status was assessed by calculating the BMI of each individual by using the formula  $\text{Weight}(\text{lb})/\text{Height}(\text{in})^2 \times 703$  using Microsoft Excel© and subsequently, determining the average BMI per household. Statistical analyses of income versus BMI as well as BMI versus amount of Diseases per income were done by simple linear regression and one-way ANOVA using GraphPad, InStat software (La Jolla, CA). A One-Way ANOVA was used to determine whether there were any significant differences between the means of an independent (Income level) group and a dependent (BMI and/or number of diseases) group. Results are interpreted using scatterplots, histograms, plots and calculated statistical data.

## **Results:**

Some seventy heads of household were interviewed in the low to low middle income community. Based on the results of the survey (Figure 1), it can be observed that 47.17 percent have an income of 1300 Belize dollars per month or more, being those on the higher income side of the survey. 15.7 % had an income of 700 dollars or less being those on the lowest income range of the survey and 37.14 % had an income of 701-1300 dollars per month being those on the middle income range of the survey. One particular observation from the survey was that the entry for family size was not considered in averaging an income per individual in each household or average individual household income. Therefore, the higher income levels could represent higher income when compared to the other groups but could also be low average income if family sizes are large and could be even lower than some of the low income ranges if the latter are small family sizes.



Figure 1

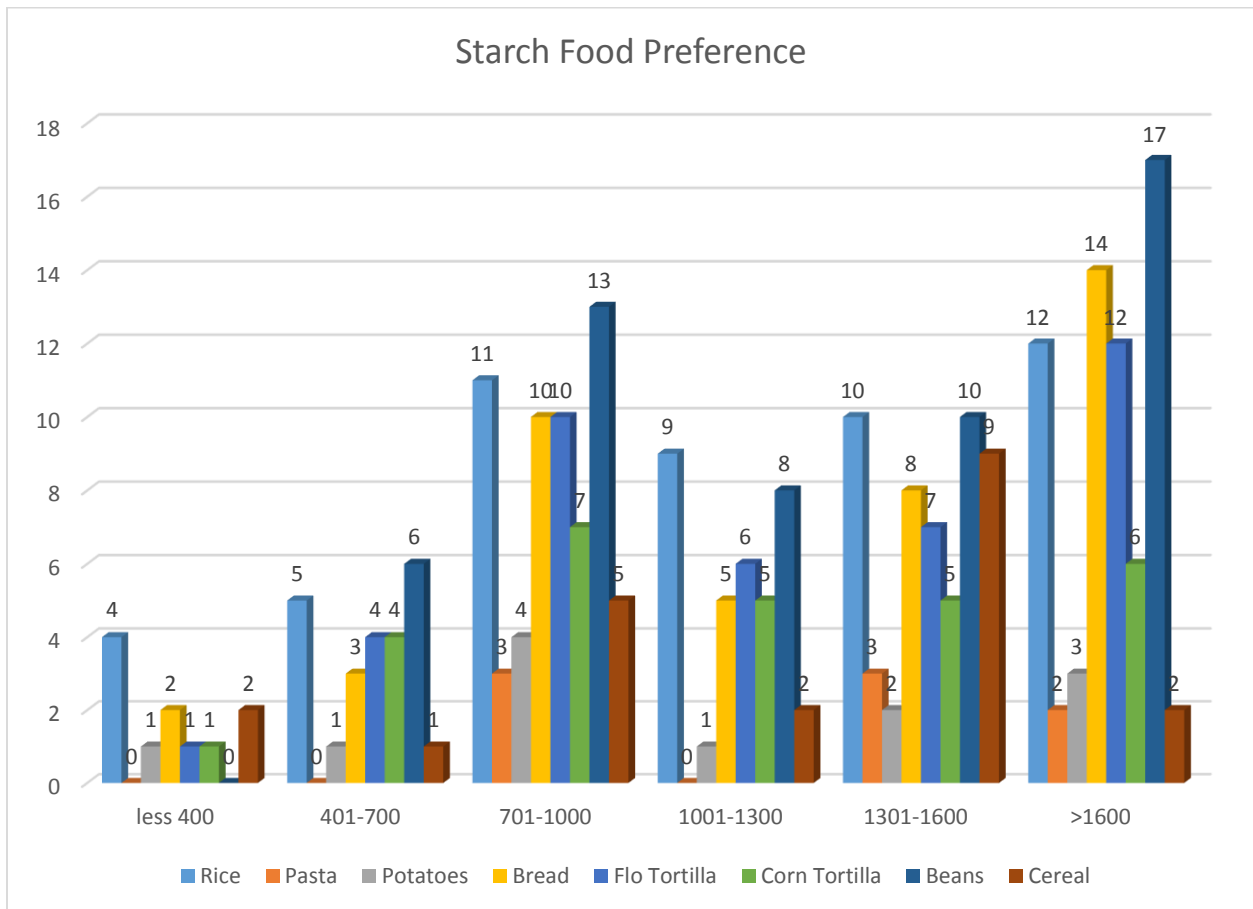


The Food preference charts are depicted below. The charts show graphs of food preferences as indicated by the respondents on a scale from 1-5 with 1 being most preferred and 5 being least preferred. The charts show the food preference for choices 1 and 2 combined for each food group in each income range.

**Figure 2 shows the preference for starches.** Across all income ranges rice was one of the most popular foods as well as beans. Bread is popular among the higher income ranges of the sample size. Upon observation it might appear at first that the higher income ranges had higher consumption of the foods, however, one must recall that the higher income ranges were 47% of the respondents. 81.8 % of the two lower income ranges had a preference for Rice while 71% of the two higher income ranges had a preference for rice. Interestingly, there was no preference for

beans in the lowest income range and only 11% of the two lower income ranges had a preference for beans while income ranges of 700 and above had a high preference for beans which in the survey was categorized as a starch but is also high in protein for which there was no category and could not have been categorized as a meat. Beans was however, the food with the highest preference across income ranges followed closely by rice. Bread which is flour based had high acceptance through all income ranges. Flour tortilla was preferred over corn tortilla in the income groups of 700 dollars or more. These results are consistent with high caloric diets and diets of simple sugars.

Figure 2



In Figure 3 we observe the responses for meats. Chicken was the preferred meat of all respondents across all income ranges. The consumption of beef was only observed in higher numbers for the higher income ranges and so was the consumption of fish. Pork is only observed

at higher consumption in the highest income range of the group. Lamb is only consumed in small amounts in the highest income ranges. Shrimp and conch are preferred meats in incomes above \$1000.00 but only at low levels. Lamb is generally not available even in large supermarkets and higher consumption is possibly associated with particular ethnic groups.

Figure 3

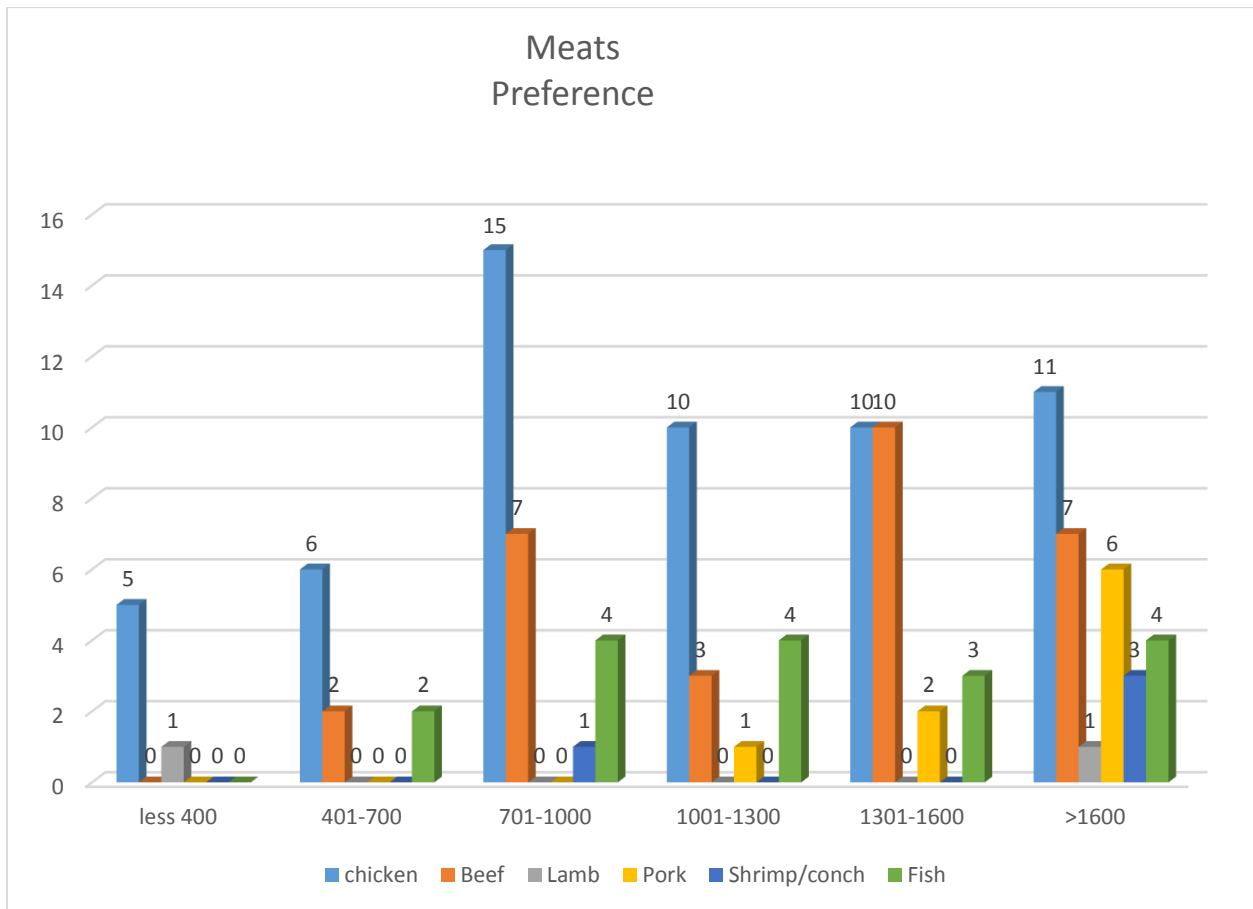
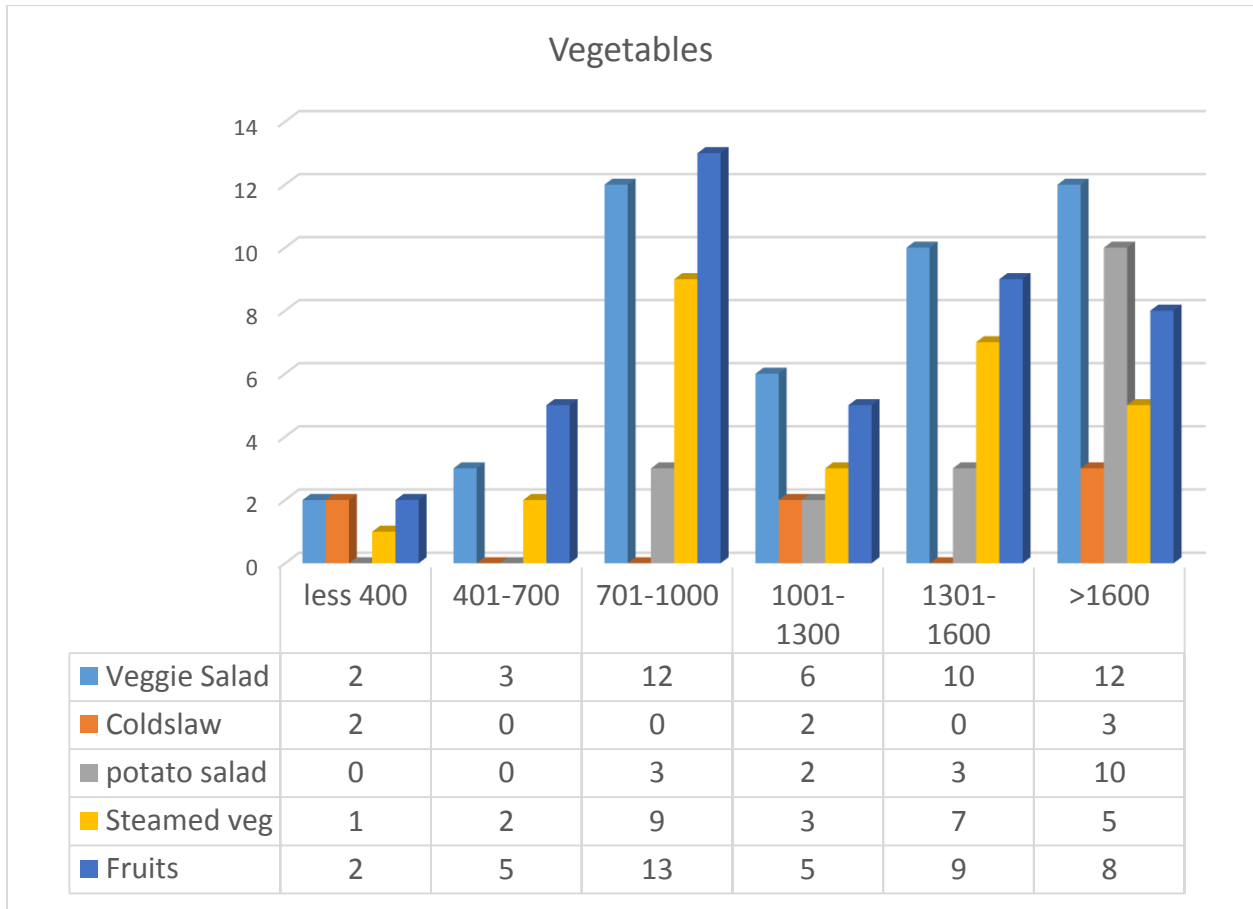


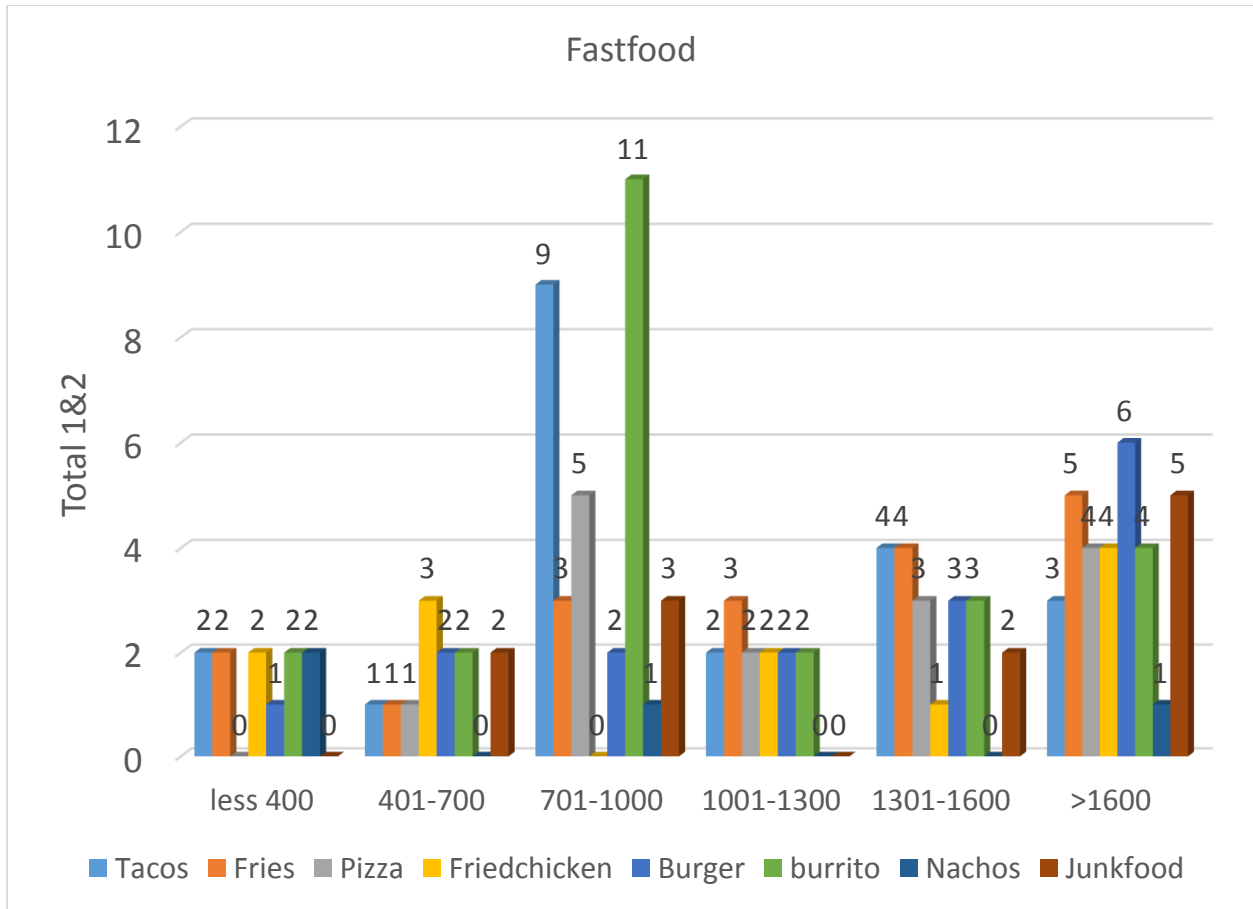
Figure 4 shows the consumption of Vegetables across income ranges. Vegetable salad had the highest preference within the category with fruits following close behind. Potato salad only had some preference in the highest income range while steamed vegetable had some consumption across income ranges. Cole Slaw had the least preference.

Figure 4



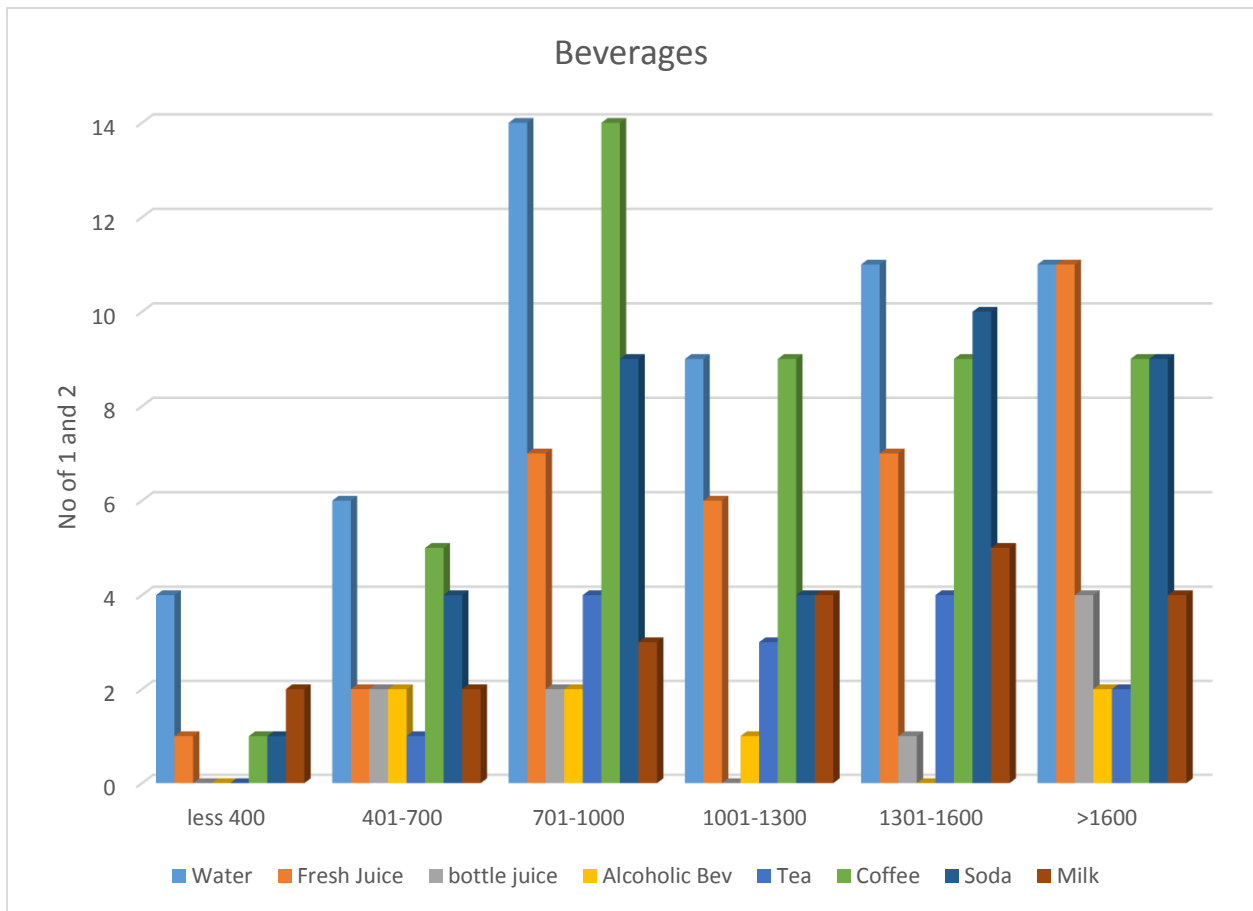
**Figure 5 shows the consumption of Fast-foods.** The graph indicates that Burritos were the choice of preference across all ranges followed closely by Tacos. These foods with the exception of Nachos were widely distributed. The highest income group had a more uniform (close) consumption of all foods except for lower consumption of nachos. This could possibly be an effect of out-of-home consumption (fast-food) for which only the higher income groups can afford. The income group of 701-1000 had a very high preference for Tacos and Burritos.

Figure 5



**Figure 6 depicts the trends in consumption of beverages.** Water was the preferred beverage followed by coffee across all income ranges. These were followed by Sodas and Fresh juice. The income group of 701-1000 had the highest consumption of water and coffee. The lowest income group had zero consumption of alcoholic beverages, bottled juices and tea possibly as a result of affordability. Fresh juices were consumed across all income ranges with higher consumption as income increased.

Figure 6



**Figure 7 depicts the Total consumption** pattern for the most preferred in all food groups in all income ranges. Taking the highest values for all groups would give a diet that is typical for the respondents, composed of Rice and Beans, Chicken, Vegetable salad and Water.

Figure 7

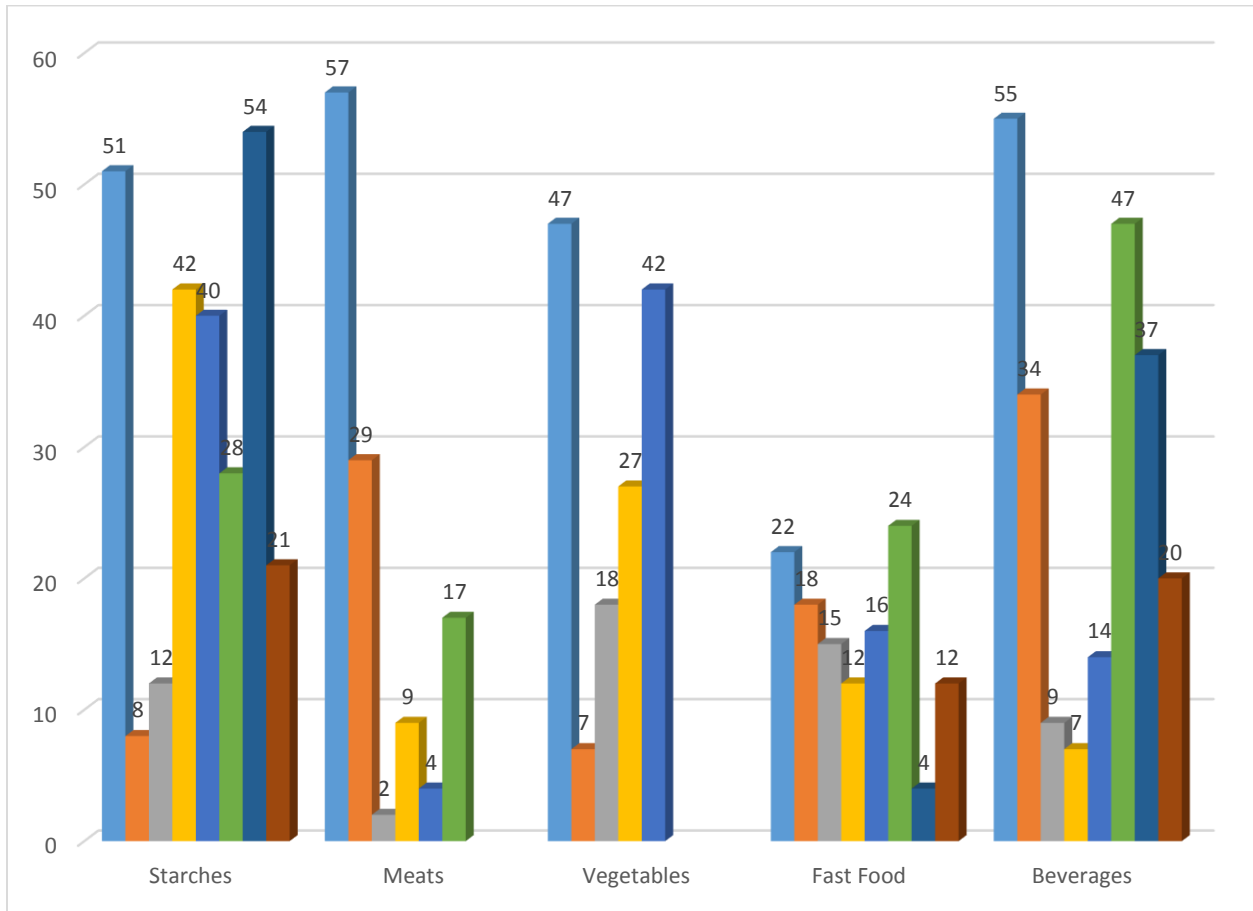


Table 1	Rice	Pasta	Potatoes	Bread	Flo Tortilla	Corn Tortilla	Beans	Cereal
Starches	51	8	12	42	40	28	54	21
Meats	chicken	Beef	Lamb	Pork	Shrimp/conch	Fish		
Vegetables	57	29	2	9	4	17		
	Veggie Salad	Coldslaw	potato salad	Steamed veg	Fruits			
Fast Food	22	18	15	12	16	24	4	12
	Tacos	Fries	Pizza	Friedchicken	Burger	Burrito	Nachos	Junkfood
Beverages	Water	Fresh Juice	bottle juice	Alcoholic Bev	Tea	Coffee	Soda	Milk
	55	34	9	7	14	47	37	20

Figure 8 shows the average number of diseases per family in each categorized income level. Linear regression and one-way ANOVA analyses were conducted using GraphPad, Instat software (La Jolla, CA). Variation among the category means was not greater than expected by chance with the exception of the income level of less than \$400 per month. As a whole, the sample group had an average of 2.7 diseases per household.

*Figure 8*

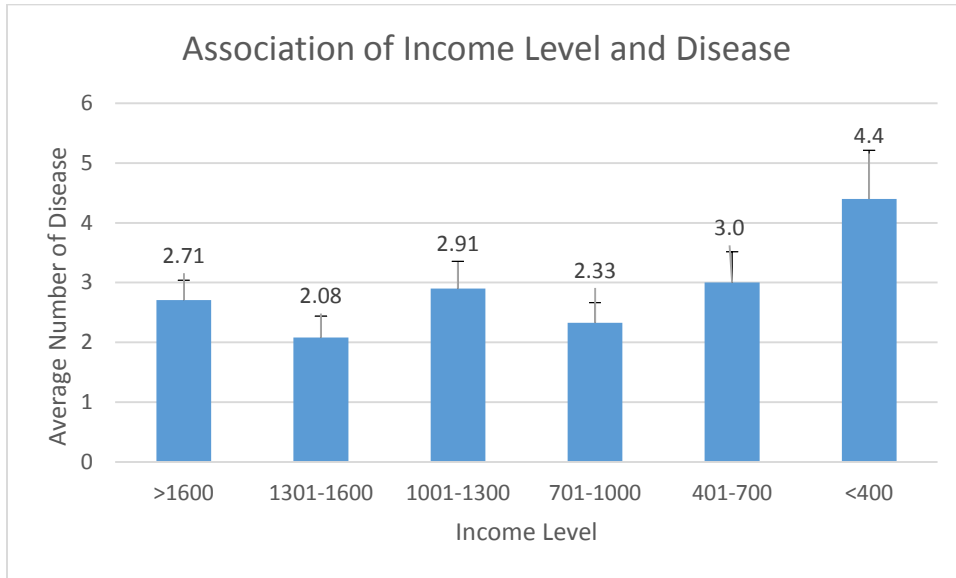


Table 2 shows the ANOVA between Income levels and food choices. This table shows no significant correlation between its variables. Table 3 also shows an ANOVA between Income levels versus BMI. The table shows the variables with no correlation.



Table 2  
Regression Analysis

r <sup>2</sup>	0.033	n	70
r	-0.182	k	1
Std. Error	6.838	Dep. Var.	<b>Total</b>

ANOVA  
table

Source	SS	df	MS	F	p-value
Regression	108.5798	1	108.5798	2.32	.1322
Residual	3,179.4202	68	46.7562		
Total	3,288.0000	69			

Regression output

variables	coefficients	std. error	t (df=68)	p-value	confidence interval	
					95% lower	95% upper
Intercept	13.2095	1.6644	7.937	2.86E-11	9.8883	16.5308
Income	-0.7811	0.5126	-1.524	.1322	-1.8040	0.2417

Table 3  
Regression Analysis

r <sup>2</sup>	0.017	n	70
r	-0.129	k	1
Std. Error	4.144	Dep. Var.	<b>BMI</b>

ANOVA table

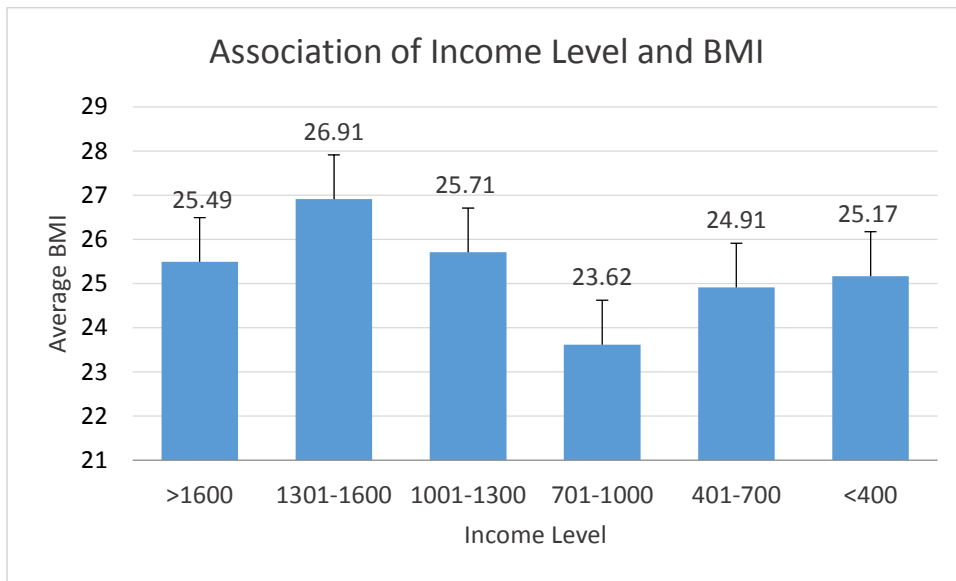
Source	SS	df	MS	F	p-value
Regression	19.6313	1	19.6313	1.14	.2887
Residual	1,167.6262	68	17.1710		
Total	1,187.2575	69			

Regression output

variables	coefficients	std. error	t (df=68)	p- value	confidence interval	
					95% lower	95% upper
Intercept	26.2334	1.0086	26.009	4.65E-37	24.2207	28.2461
Income	-0.3321	0.3106	-1.069	.2887	-0.9520	0.2877

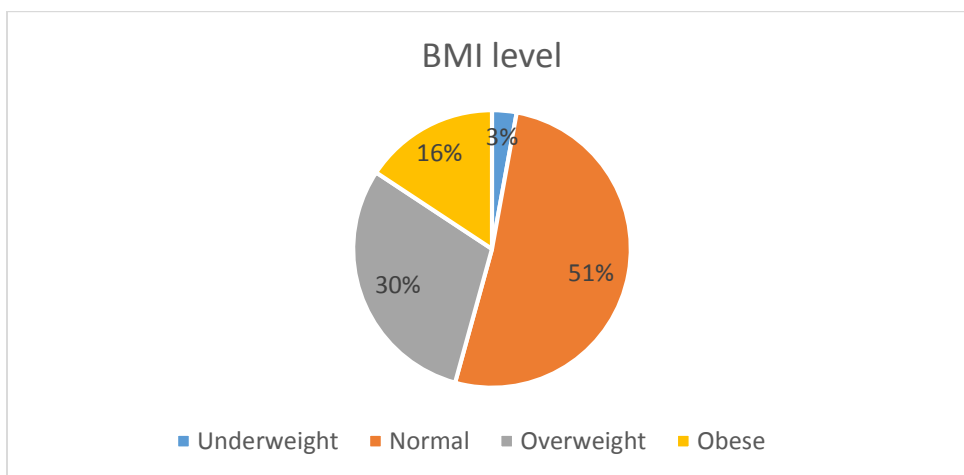
Figure 9 shows the average BMI per family in each categorized income level; linear regression and one-way ANOVA analyses (Table 3) were also conducted for this comparison with the result showing no significant difference among the different income levels and an overall average BMI of 25.3 for the study group which is considered to be overweight.

Figure 9



The diagram in Figure 10 shows a breakdown of the sample population into the different health categories with respect to BMI. Forty six percent were considered overweight or obese with an additional 3% considered underweight.

Figure 10



## **Discussion:**

Although there is no linear correlation between the income level categories in this study and BMI, it is noteworthy that the average BMI of the sample population was 25.3—overweight and generally assessed as unhealthy. This fact is compounded by Figure 10 which shows that 46% of the population is considered either overweight or obese and a total of 49% are considered unhealthy when considering the underweight population—a significant statistic by any means of assessment. Recall, the sample size as a whole with income ranges recorded, is considered to be low income.

Looking at Figure 8 and the overall average of 2.7 diseases per household, it is important to acknowledge the seriousness of the effects of poor nutrition on the health of the demographic surveyed. Considering the chronic and degenerative diseases listed in the survey (obesity, hypertension, cardiovascular disease, etc.), there is an obvious need for adjustment by individuals and families to their diet via education and assistance from the public health/governmental authorities.

Though this study does have an “omitted variables bias” (there are many cultural aspects to the results obtained), it is obvious that the lower income of this demographic does have a negative effect on food choices and overall health

Table 3 shows a p value of 0.288 which is much larger than the level of significance of  $< 0.05$ . This means that there is no real significant correlation between the income levels and the BMI per household, thus accepting the null hypothesis that there is no association between these income levels and BMI.

Statistically, there was also no significance  $p < .132$  between these income levels and foods consumed (Table 2) therefore accepting the null hypothesis that there is no association between food consumption and income levels chosen and that any association is simply by chance.

Perhaps in this case, the sample size of 70 was too small for the population of San Ignacio and Santa Elena which is close to 24,000 or 6000 families of 4 members per family. Additionally, the highest income range in the study of 1600 barely approximates the average per capita GDP of 5034.34 USD or some 10,000 Belize dollars<sup>15</sup>. Therefore this study did not incorporate above average and high income families and thus it can be assumed that the results are not comparative

because in effect the study included only low income families. Therefore, the results of this study have to be taken on the particular context and cannot be taken to inference the prediction of a wider population.

### **Conclusion:**

The study, while not showing significant association between income level and BMI, income level and food preference and income level and disease, served the purpose of looking at the data qualitatively. Several factors being omitted in the study serves the purpose of relooking at the data on a larger scale and to be able to make adjustments especially in the inclusion of wider income ranges to include middle and higher income households. Additionally, averaging number of members per household would give an indication of average income per person within each household therefore solving the problem of spending power within each household. Additionally, while not being able to inference the results of this study to a wider population after not observing the correlations and associations perceived, it is clearly obvious that the lower income of this demographic sample does have a negative effect on food choices and overall health.

The questionnaire could also be reformatted to ascertain that the answers to food choices are not necessarily preferences but actual food choices. Preference may not be what the study is investigating but rather the actual food choices which would hopefully have a stronger association to income.

The survey analysis revealed a 46% obesity rate across all income levels. Diet may be a causative effect but no indication of exercise or physical work was indicated in the survey to show an amelioration of BMI status. Therefore, while not being significantly associated in the study, there is a clear indication of food choice and obesity when the BMI scores are not averaged. It is important to note that all starch food had high consumption responses with rice being followed closely by bread and flour tortillas and in the fast-food group, burritos and tacos were the preferred food choices.

The study did reveal that the Belizean main dish as reflected in the San Ignacio respondents is Rice, Beans, Chicken, Vegetable Salad and Water. If the Income ranges can be perceived as all

low to barely approaching middle income, then the food choices that showed high preferences for almost all starches is a reflection of affordability, ignorance in nutritional knowledge as well as a cultural and institutionalized choice.

## **Bibliography:**

1. Ness, A. (2003). Diet, Nutrition And The Prevention Of Chronic Diseases. WHO Technical Report Series 916. Report Of A Joint WHO/FSA Expert Consultation. *International Journal of Epidemiology*, 914-915.
  
2. Pan American Health Organization PAHO, ©  
The Central America Diabetes Initiative (CAMDI)( 2011): Survey of Diabetes, Hypertension and Chronic Disease Risk Factors. Belize, San José, San Salvador, Guatemala City, Managua and Tegucigalpa Washington, D.C.: ISBN: 978-92-75-13098-8
  
3. Statistics Institute of Belize, Poverty Rate Statistics. (2012). Retrieved May 15, 2015, from <http://www.sib.org.bz/statistics/other-statistics>
  
4. Lin, J., O'connor, E., Whitlock, E., & Beil, T. (2010). Behavioral Counseling to Promote Physical Activity and a Healthful Diet to Prevent Cardiovascular Disease in Adults: A Systematic Review for the U.S. Preventive Services Task Force. *Annals of Internal Medicine*, 736-736, 153, 736–750.
  
5. Gaskins, N., Sloane, P., Mitchell, C., Ammerman, A., Ickes, S., & Williams, C. (2007). Poor Nutritional Habits: A Modifiable Predecessor of Chronic Illness? A North Carolina Family Medicine Research Network (NC-FM-RN) Study. *The Journal of the American Board of Family Medicine*, 124-134.
  
6. Beydoun, M., & Wang, Y. (2008). How Do Socio-economic Status, Perceived Economic Barriers and Nutritional Benefits Affect Quality of Dietary Intake among US Adults? *European Journal of Clinical Nutrition*, 303-313.
  
7. Alkerwi, A., Sauvageot, N., Malan, L., Shivappa, N., & Hébert, J. (2015). Association between Nutritional Awareness and Diet Quality: Evidence from the Observation of Cardiovascular Risk Factors in Luxembourg (ORISCAV-LUX) Study. *Nutrients*, 2823-2838.
  
8. Am J Clin Nutr. May;87(2008):1107-17. Does social class predict diet quality? Darmon N<sup>1</sup>, Drewnowski A.

9. Newby H. (1983) *Living from hand to mouth: the farmworker, food and agribusiness. The sociology of food and eating.* Aldershot: Gower.
10. Drewnowski, A., & Larson. (2009). The Cost Of US Foods As Related To Their Nutritive Value. *American Journal of Clinical Nutrition*, 1181-1188.
11. Hillier, A., Cannuscio, C., Karpyn, A., Mclaughlin, J., Chilton, M., & Glanz, K. (2011). How Far Do Low-Income Parents Travel to Shop for Food? Empirical Evidence from Two Urban Neighborhoods. *Urban Geography*, 712-729.
12. Murcott, A. (2002). Nutrition and inequalities: A note on sociological approaches. *The European Journal of Public Health*, 203-207.
13. Jack I. (2015). Strat-EU. Retrieved May 10, 2015, from <https://www.linkedin.com/grp/post/4628242-194443121>
14. Daly R. (2013) Belize Obesity Rate At 60%, Health Ministry Educates Food Providers On Nutrition. *News7Belize*. Retrieved May 10, 2015, from <http://www.7newsbelize.com/sstory.php?nid=25833>
15. Belize GDP per capita Forecast. *Trading Economics* (2014). Retrieved May 17, 2015, from <http://www.tradingecono>

## APPENDIX

### Appendix I

## SOCIAL NUTRITION SURVEY

1. Ethnicity

- Creole
- Maya
- Mestizo
- Garifuna
- East Indian
- Other

2. Kindly fill in the following table for each individual in your house hold

	Weight	Age	Height (in)	Work (yes or no)	Type of job
Person 1					
Person 2					
Person 3					
Person 4					
Person 5					
Person 6					
Person 7					
Person 8					
Person 9					
Person 10					

3. How many times per day does your family eat home cooked food?

- 0
- Once
- Twice
- Three times
- More than three times

4. How many times per day is food bought outside the home

- 0
- Once
- Twice



- Three times
- More than three times

5. Income per house hold per month.

- < \$400
- \$401-700
- \$701-1000
- \$1001- 1300
- \$1301-1600
- >\$1600

6. How much money per month is spent on groceries? \_\_\_\_\_

7. How much money is spent on bought food? \_\_\_\_\_

8. How many glasses or bottles of water is consumed per day? \_\_\_\_\_

9. On a typical day rate which foods from 1 to 5 on most consumption. 1 being the most preferred choice and 5 being the least.

A	B	C	D	E
Rice	Chicken	Vegetable salad	Tacos	Water
Pasta	Beef	Cold Slaw	Fries	Fresh Juice
Potato	Lamb	Potato Salad	Pizza	Bottle Juice
Bread	Pork	Steamed vegetables	Fried Chicken	Alcoholic beverages
Flour Tortilla	Shrimp/Conch	Fruits	Burger	Tea
Corn Tortilla	Fish		Burrito	Coffee
Beans			Nachos	Soft Drinks
Cereal			Junk food (sweets,chips,chocolate)	Milk

10. Check the appropriate box for each disease that your family has a history of:

- Obesity
- Hypertension (high blood pressure)
- Diabetes
- High cholesterol/triglycerides
- Osteoporosis
- Cardio vascular disease