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Title: A comparison of Milk and Milk Beverage intake among St. Augustine Girls' High School Students; Forms 1, 3 and 5

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A COMPARISON OF MILK AND MILK BEVERAGE INTAKE AMONG ST. AUGUSTINE GIRLS' HIGH SCHOOL STUDENTS; FORMS 1,3 AND 5.

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CHERISSE RAMAI

SUPERVISED BY Dr. PATRICIA DYETT

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ABSTRACT

Objective: To investigate whether lower form St. Augustine Girls' High School students use milk and milk beverages more frequently than higher form St. Augustine Girls' High School students.

Research Methods and Procedures: This pilot study was conducted at the St. Augustine Girls' High School among students of forms 1, 3 and 5. A total of 115 students were randomly selected. One hundred and five students completed and returned the questionnaire: form 1(n= 34), form 3(n= 41) and form 5(n=30). Inclusion criteria were a student of form 1, 3 or 5, and between the ages of 11 to 18. The study was conducted by the collection of information on the questionnaire on milk intake. Data was analysed using SPSS version 17.0 for windows. Statistical tests included descriptive analyses to determine frequency of milk intake among the class forms. Attitude and knowledge were analysed using chi squared tests; and (ANOVA) compared the means of intake among the forms.

Results: The frequency of intake of unflavoured milk and milk beverages were highest among the form 3 students (51.63%). The intake of flavoured milk and milk beverages were highest among form 1 students (55.9%). There was a significant difference in the means of intake among the forms for milk and milk beverages, p= 0.002 and soy milk p= 0.000.The knowledge level of the three forms was on average the same with no p value less than 0.05 for any of the knowledge questions. The attitude to milk and milk beverages resulted in 91.4 % of the students drinking the milk but 65.7% not liking it and 95.2% of them was aware that milk was good for them.

Conclusion: Among the students of St. Augustine Girls' High School milk intake was highest among form 3 students for unflavoured milks and highest among form 1 students for flavoured milk. This may have resulted from the knowledge of the students on the importance of milk and calcium in the diet at such a crucial age and on perception of milk and milk beverages by the students. Some perceived it as too high in calories hence the high in intake of skimmed, reduced fat and low fat milk types at the form 3 level and others just did not like the taste.

CHAPTER 1: INTRODUCTION

1.INTRODUCTION

1.1 Background

St Augustine Girls High School (SAGHS) is located at Evans Street, Curepe on the beautiful twin island of Trinidad and Tobago.

Founded on the 19th September 1950, SAGHS is one of five Presbyterian Secondary Schools in Trinidad & Tobago. SAGHS offers a seven year program of study to girls aged eleven to nineteen .Their students come from diverse social, cultural and religious backgrounds and have been chosen from the top 3% of girls writing the Secondary Entrance Assessment (SEA) Examination.

SAGHS claims to be a gem among secondary schools having evolved over the many years of its existence into an educational institution renowned for its academic as well as extracurricular excellence (S.A.G.H.S. 2010). From a health standpoint however, a closer look into nutrition patterns of SAGHS students might be warranted, particularly with respect to milk consumption.

Many previous studies claim that the intake of milk among adolescents is on the decline. In particular the intake of adolescent girls is very low (Hendijani 2010). Milk is an important souce of available calcium for teenage girls and has been proven to be the most bioavailable source for growing teenagers (Agoreyo 2002).

The decline in milk intake affects the adolescent population of girls between the ages of 11 - 18 years. This growing problem increases bone fractures and osteoporosis at a later age. Research shows that bone development rapidly proliferates between the ages of 11- 18 for girls and decrease in rate of development beyond this age (Weaver, Peacock and Johntson 1999).

These cases of bone fractures and osteoporosis later in life occur because children are not properly educated on the importance of milk and milk beverage intake in their diets. The implication of this lack of education is that children do not know the importance of calcium in the diet and how it can prevent severe problems of bone fractures and osteoporosis later on in life.

Agoreyo (2002) in The Journal of International Women's Studies, states that adolescence and childhood are the key periods of life in which bone development, density and greatest amounts of calcium are deposited into the bones. For the first three decades of life bone development occurs but as age increases over forty years, bone development gradually declines as calcium is slowly reabsorbed into the body.

This research is important as it seeks to address the possible issue of a decline in the frequency of intake of milk and milk beverages among teenage girls as age increases. Since milk is one of the most bioavailable sources of calcium, it is of utmost importance that this age group increases their intake of milk and milk beverages. By doing this research I hope to make aware the problem of the decline in milk intake among this vulnerable group. Hopefully the problem can be addressed and reduce the risk of bone fractures and osteoporosis at later stages of life.

Problem Statement

In an ideal setting, sufficient milk intake among adolescent girls is crucial for the supply of calcium in their diet. The purpose of this is to attain maximum bone development at this age. Weaver et al (1997) in the article" Adolescent nutrition in the prevention of postmenopausal osteoporosis" states that adolescence is the window of opportunity to influence lifelong health. It is at this time when most bone acquisition and development takes place and is referred to as a

critical point for bone density to progress. This intake of calcium is dependent on the knowledge of the importance of calcium in the diet and the most bioavailable sources to achieve the adequate amounts.

Unfortunately this is not the case, as many teenage girls do not consume milk and milk beverages as they should. Milk is proven as one of the most bioavailable sources of calcium and is an appropriate source for growing teenagers. Eastell et al. investigated the effect of milk supplementation on bone mineral acquisition in adolescent girls. A randomized controlled study was done for a period of 18 months on 82 girls aged 12.2 (SD 0.3) years, from four secondary schools in Sheffield. The bone mineral density was measured using dual X ray absorptiometry. Biochemical markers of bone turnover were also evaluated. It was concluded that milk supplementation significantly enhances bone mineral density acquisition in young girls and could favorably modify attainment of peak bone mass (Cadagon, et al. 1997).

The importance of acquiring mineral density at the age of adolescent is to prevent the occurrence of bone fractures and osteoporosis at a later age. Osteoporosis is a major public health concern that is the major cause for many of the deaths in the elderly. It is the period where there is a rapid decline in bone density from the resulting effects of post menopause. Therefore as much bone density must be acquired in the period where maximum calcium absorption occurs and therefore maximum bone development (Ogochukwui and Obuekw, 2002). A review of literature done on the Latin American and Caribbean region in 2002 resulted in 12-18 % of the women 50 years and older developing osteoporosis and 8-22 % developing proximal femur osteoporosis. The total population was 524 million people in that region.

If the adolescent girls do not consume high amounts of calcium containing foods, especially milk, then there could be a possibility that the intake of calcium for maximum bone development

would be too low; and the possibility of less dense bones increases the risk of bone fractures and osteoporosis at the post-menopausal age.

In order to determine the intake of milk and milk beverages among SAGHS students, questionnaires will be administered to the students. A comparison of forms: 1, 3 and 5 will be done to determine the frequency of intake of milk among the students and their knowledge status of the importance of milk in the diet.

The following research question will be explored by the study: What is the relationship between age and frequency of intake of milk and milk beverages among students of St. Augustine Girls' High School forms: 1, 3 and 5?

1.3 Rationale

This research is important as it can help to open the eyes of the public concerning a possible underlying cause for the development of the disease osteoporosis in society. Current research done in the area of milk and milk beverage intake among secondary school girls in Trinidad or even in the Caribbean was not found. But a review study done in the Latin and Caribbean region found that that the risk of osteoporosis at age 50 and over was a 12-15 % (Ogochukwui and Obuekw, 2002).

This pilot study can help to open a door for new research to emerge, and control the growing problem of osteoporosis in the Caribbean region. If there is a direct link between milk intake at adolescent age and osteoporosis at a later age in the Caribbean region then the problem can be more appropriately addressed.

1.4 Objectives

General Objective:

To investigate whether lower form St. Augustine Girls' High School students use milk and milk beverages more frequently than higher form St. Augustine Girls' High School students.

Specific Objectives:

1) To investigate the perception of the importance of calcium in relation to milk, milk beverages and other food sources among St. Augustine Girls' High School students.

2) To assess and compare the frequency of intake of milk and milk beverages among St. Augustine Girls' High School students: forms: 1, 3 and 5.

3) To investigate possible reasons for observed milk intake patterns among St. Augustine Girls' High School students forms: 1, 3 and 5.

1.5 Hypothesis

The frequency of the intake of milk among St. Augustine Girls forms; 1, 3 and 5 would decrease as the age group increases.

KEY TERMS

Osteoporosis- Osteoporosis is the thinning of bone tissue and loss of bone density over time. (A.D.A.M Encyclopedia)

Bone Density- The measurement of the amount of calcium and other minerals in a segment of bone, a higher mineral content indicating a higher bone density and strength, used to detect osteoporosis or monitor its treatment (Web definitions .com)

Adolescence- The period following the onset of puberty during which a young person develops from a child into an adult (web definitions .com).

CHAPTER 2: LITERATURE REVIEW

2.0 LITERATURE REVIEW

2.1 Calcium intake a growing problem

Inadequate calcium (Ca) intake is a serious public health concern among adolescent girls. This has very serious implications since this mineral is involved with numerous metabolic processes including bone remodeling, vascular function, muscular contraction, and others. Moreover, the literature suggests that adequate calcium intake may reduce the risk of obesity and insulin resistance syndrome and certain chronic diseases of aging such as hypertension, some forms of cancer and osteoporosis.

One risk factor associated with osteoporosis is low bone mineral density. Therefore, maximizing bone mineral density during adolescence and early adulthood is crucial to good bone health later in life. But while peak bone mass (PBM) is fully achieved during early adulthood, fractional calcium absorption is highest during early adolescence. Recently a study showed that Chinese adolescent girls who drank milk had higher bone mineral density than those who did not (Cadagon, et al. 1997). Optimizing calcium intake along with the proper balance with phosphorus, vitamin D, and other key nutrients involved in bone health is particularly critical for pre-adolescent and adolescent girls due to the high incidence of osteoporosis among older women (Storey, Forshee and Anderson 2004). Weaver (1999) stated in Adolescent nutrition for the prevention of osteoporosis, that approximately 40% of peak bone mass in girls is accumulated in this short stage of the life cycle. He referenced to it as the window of opportunity implies that it is the best time for acquiring bone mass.

Milk consumption among girls of this crucial age of adolescence is rapidly on the decline. Studies show that due to the increase in sweetened beverages such as soft drinks on the market ,

the choice of milk is not a priority among teenage girls (Hendijani and Karim 2010). This research agrees with Miller, where he found that soft drinks are taking the place of milk and milk beverages in the diet of young women (Miller, Jarvis and McBean 2001).

In this research project the relationship between age and frequency of intake of milk and milk beverages will be investigated and the factors leading to the pattern will be discussed.

2.2Milk as a great source of calcium

Calcium in milk is generally considered to have a higher bioavailability than that from cereals and vegetables. Milk and milk products have been shown to be superior to vegetables with respect to calcium retention. Calcium in milk is particularly well absorbed relative to that in plant foods, due to the presence of substances like oxalate, phytate and fiber in plant food, which bind calcium thereby rendering it less absorbable. Moreover certain components of milk like lactose and casein have been associated as enhancers of calcium absorption. The nutritional value of milk is such that as a food, it cannot be so easily dismissed (Agoreyo 2002). Miller (2001) agreed with this in his article "The Importance of meeting Calcium needs with foods". It was stated that food is the best source to attain calcium; and dairy products such as milk of all kinds are great sources of calcium in the diet.

2.3 Decline in milk consumption among teenage girls and the social cognitive theory

Consumption of milk and milk beverages is not prevalent among teenage girls. It is important to find an association between personal and environmental factors with the intention to consume milk. For better understanding of consumption, some similar researches have been conducted to find the relationships between physiological needs, food preferences, parental offers, peer force,

media, social norms and personal attitudes. Dairy products are the best biologically utilized source of calcium. Hence, increasing the consumption of milk is the best way to increase dietary calcium intake level among children. Malaysians consume more dairy products compared to other Southeast Asian countries. This is due to growing urbanization coupled with increasing household income (Hendijani and Karim 2010). This shows that the environment greatly impacts the intake and choice that a person makes concerning intake of milk and milk beverages. The theoretical framework used to find out the relationships between the factors and intake is the Social cognitive theory.

Conceptual Model

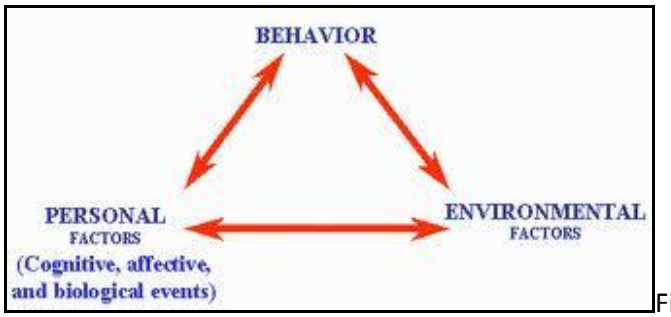

Fig 1.

Social Cognitive Theory is a learning theory based on the ideas that people learn by watching what others do and will not do (Bandura 1989) These processes are essential to understanding personality. Social cognitists agree that there is a fair amount of influence on development which is generated by learned behavior. This learned behavoiur is displayed in the environment in which one grows up and it is believed that cognition and the environment greatly influences how a person behaves.

The chief factors that influence development are observation of others, with the environment, behavior and cognition (way of thinking). These three factors are not independent rather they are all mutual. They all influence each other.

In agreement with this another study stated that Social Cognitive Theory (SCT) addresses the psychosocial dynamics influencing health, behaviour and methods for promoting behavioral change. Within the SCT, human behavior is explained in terms of all three, where behaviour, personal factors (including cognition), and environmental influences all interact. The personal factors involve the individual's capabilities to anticipate the outcomes of behavior and to learn by observing others. The individuals must have confidence in performing certain behaviours and must be able to analyze experience (Baranowski, Perry and Guy 2002).

In application to milk intake among adolescent girls, the SCT is the framework on which the girls make their decisions and hence show the behaviour of milk intake. There are factors that influence the intake of milk among adolescent girls. These factors include personal factors such as cognitive (how they think), affective (how they feel,moods) and biological events such as sensory systems ,neural systems and physical structures. The cognition and the affective factors will both affect the behaviour ie. milk intake of the adolescent girls. Some girls may think that milk is high in calories hence resulting in low intake or none at all.(behaviour). The environment also plays an important role in resulting behaviour of the adolescent girls. If milk is not in the home it could affect intake; also if parents do not encourge the intake of milk among their children then the resulting behaviour will be either low milk intake or none at all. Other personal factors that may affect the behaviour are lactose intolerance, price of milk, preference and choice. Another environmental factor is lack of availability eg. in the schools and homes.

A study done by Cavadini (2000) agreed with Hendijani where the trends in the intake of food among adolescents between the ages of 11 and 18 showed that milk intake declined as age

increased with no compensation from other dairy products. The reason for the decline was a combination of pesonal and environmental factors hence supporting the Social Cognitive Theory.

2.4 Possible Reasons for Milk Intake Decline among adolescent Females

Various reasons can be identified for the decline in milk intake among teenage girls as they grow older; including lactose intolerance; increase in non-dairy beverage consumption; adolescent perception of milk; weight and image issues; adopting a strict vegetarian diet; and knowledge about milk as an important calcium source.

2.4.1 Lactose Intolerance

Lactose intolerance also called lactase deficiency, means it is not possible to fully digest the milk sugar (lactose) in dairy products. The problem behind lactose intolerance is a deficiency of lactase, an enzyme produced by the lining of the small intestine. Many people have low levels of lactase, but most do not experience signs and symptoms. Only people with both low lactase levels who also have associated signs and symptoms have, by definition, lactose intolerance (Mayo clinic 2010)

Since there are some persons who cannot tolerate cow's milk due to the lactose content the intake of milk and milk products will decline or be completely avoided. As such, it might be useful to have both, lactose reduced and calcium fortified milk alternative products for their consumption.

There is a wide assortment of alternative milk products for lactose-reduced diets in many parts of the world including Trinidad. One study done in Finland indicates that changes in eating habits

might be the real reason for reduction of milk product consumption. It has also found that a low milk product consumption was associated with a high consumption of non-milk drinks. These findings provide a challenge for nutrition educators to design effective ways to reverse the trend towards increasing consumption of soft drinks and different kinds of juices. At the same time, it is needed to maintain the favourable changes that have occurred in the content and quality of fat in the diet. According to a cross sectional study done in California and Indiana amongst 10 -13 year old female adolescent girls, it was found that milk maldigesters who restricted cow's mlk from as early as 10 years showed a lower bone mineral content which showed possibility of resulting in oteoporosis later in life. But a study done by Weaver and Plaweki (1994) contradicted this. In the research it was found that if the right amounts of bioavalable sources of calcium are consumed by the lactose intolerant or vegan , then bone density would not be hindered . One cup soy milk can contain as much as 300 milligrams (mg) of calcium and 500mg if it is fortified (Greer and Krebs 2006). Therefore the lactose intolerant individual can attain the recommended daily allowance (RDA) if the right foods are eaten. According to the Caribbean dietary guideline the RDA of calcium for teenage girls is 900mg and for milk consumption it is approximately 3 cups (Recomended Dietary Allowances for the Caribbean 1993).

2.5 How milk and milk products are perceived by adolescent girls

Another factor that contributes to the decline in milk intake among teenage girls is that some girls perceive milk to be a negative in their diet. By doing this there are many health implications that can occur if the RDA for calcium is not compensated for in the diet.

A study examined the health implications on the declining calcium intake in female adolescents from the University of Benin, Benin City, Nigeria. Well-structured, in depth questionnaires were

distributed to 500 adolescent female students to access their calcium intake from the foods they eat. The results showed that many adolescent females avoid dairy products, the best source of calcium, because of the perception that all dairy products are fat - laden foods. Others replace milk with regular or diet soda, unconcerned about the "empty calories" or limited nutritional value of soda. Some are not aware of the serious, long lasting health implications of inadequate calcium consumption. Most do not think they will ever become one of the 26 million women worldwide that suffer from osteoporosis today. Though the threat of osteoporosis may be in the far off into future for many female teens, this study recognizes the immediate need to reverse their inadequate calcium intake (Agoreyo 2002). Promoting the consumption of fat-free milk products and vegetable fats will keep the fatty acid content in balance. There are skimmed milk and low fat milks that can replace the full cream milk in the diet of the weight conscious.

One researcher found that teenagers dislike the taste of plain milk hence the decrease in the consumption. They investigated the preference of flavoured milk among teenage girls and found that flavoured milks were more accepted than the taste of plain milk (Hendijani and Karim 2010)

2.6 Contradicting that milk is the best source of calcium

Some studies state that mammalian milk is unnecessary in the diet. To an extent this contradicts other studies done that proved that milk is the most bioavailable source of calcium.

The researcher in the article "Should Dairy be recommended as part of a healthy vegetarian diet?" stated that mammalian infants need mother's milk for nourishment and growth (Lanou 2009) However, milk is not necessary for humans after the age of weaning, as evidenced in part by the physiologic decrease in and often loss of the ability to digest lactose (milk sugar) for

roughly three quarters of the world's population. Nutrients found in cow and other animal milks are readily available in other whole and fortified foods. Beans, grains, and many vegetables are excellent sources of protein. The researcher stated that calcium is more highly absorbed from beans and most greens (40–64%) than from milk (32%). Fortified cereals, juices, soy milk, rice milk, and others have higher concentrations of calcium that is absorbed nearly as well as dairy calcium (28–36%). Some of the richest sources of calcium include orange juice, bananas, potatoes and honeydew melon. The researcher also raises the argument that cow's milk contributes to many of the rising health concerns such as cardiovascular disease and cancer and therefore should be eliminated from the diet (Lanou 2009).

2.7Aims of current study

This research will add to the body of research because it aims to investigate the intake of milk and milk products among teenage girls of SAGHS between the ages of 11-17. The study will compare the different groups of students based on their frequency of milk intake in an average week. This research also aims to investigate the perception of the importance of calcium in the diet and other calcium containing foods. Lastly it will investigate some of the possible reasons why milk and milk beverage intake is low and declining as the age group increases.

CHAPTER 3:

METHODOLOGY

3.0 METHODOLOGY

This pilot study was conducted at the St. Augustine Girls' High School among adolescent girls between the ages of 11 and 17. Such students were classified into groups better known as forms and the targeted groups for the study were forms 1, 3 and 5. These groups were suitable to determine the comparison of milk intake among the girls as the form increases.

Selection of students was based on random sampling, but participation was based on parent's and child's consent. After a brief description of the project, and assurance of confidentiality, consent was obtained and each participant completed the questionnaire.

The study was done by questionnaire only and each selected student was given a questionnaire to take home, obtain parent's consent, complete the questionnaire and return the completed questionnaire to the respective form teacher. The collection was done within two weeks of the distribution.

3.1 Subjects

The required sample size was calculated n= 115, Form 1= 36, form 3= 43, form 5 =36 participants. The total number of respondents who completed the questionnaire was 105. The remaining 10 students did not receive consent to participate in the study. The total study population was 323 students and the margin of error used to calculate the sample size was d=0.05. The percentage of the population used was 35.6%, therefore increasing the accuracy of the study.

For the selection of students, a randomized selection was done using the program Minitab. The numbers of all the students in the form were entered and the selection of the required numbers for each respective form was attained.

3.2 Questionnaire

The questionnaire was a three part 8 item questionnaire comprising of demographics, food frequency questions, and questions on use of cow's milk and milk beverages.

Demographics included form, location, and ethnicity. The food frequency questionnaire (ffq) included food item intake over the average week. The food items listed included cow's milk beverages, soy milk beverages, almond and rice milk and other calcium containing foods. The question on use of cow's milk and milk beverages investigated if cow's milk was used by the student and how it is perceived by the individual. The use of calcium supplementation and the perception of a calcium rich food investigated how important calcium was to the individual.

3.3 Statistical Analyses

Data from the questionnaires were entered into SPSS version 17.0 (for windows). Demographics were analysed using frequency and percentages for form, location and ethnicity. Descriptive statistics were used to present these demographical data. Chi squared tests was done to test the significant differences in the knowledge and attitude of intake to milk and milk beverages among the three class forms.

Analysis of variance (ANOVA) was used to test the significant differences between the mean intakes of the three groups for milk intake and other calcium containing food intake.

CHAPTER 4: PRESENTATION OF FINDINGS

4.0 Presentation of findings

4.1 Demographics

Table 1 shows the demographics of the one hundred and five students who participated in the milk intake questionnaire. On average the number of participants per group remained the same. The majority of the students were from the central region (44.8 %) with the least from South and West 2.9% and 1% respectively. They were from all ethnicities with the most being of East Indian descent (67%). Of mixed descent there was (24.8%) of students while there was no one in the category of Chinese or Spanish descent.

TABLE 1: DEMOGRAPHICS OF PARTICIPANTS ACCORDING TO FORM, REGION AND ETHNICITY.

Variable	Frequency (n)	Percentage (%)
Form		
1	34	32.4
3	41	39.0
5	30	28.6
Region		
North	26	24.8
South	3	2.9
Central	47	44.8
East	28	26.7
West	1	1.0
Ethnicity		
East Indian	71	67.6
African	8	7.6
Mixed	26	24.8

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4.2 Knowledge of the students

Tables 2 and 3 shows the knowledge of the students in forms 1, 3 and 5 on the function of calcium in the body and on which food supply the most calcium to the body. Descriptive tests show that the majority of the students only knew one function of calcium as being for the building of bones. They failed to realize or lacked the knowledge of the various other roles that calcium plays in the body.

TABLE 2: CALCIUM RELATED KNOWLEDGE OF THE STUDENTS ACCORDING TO FORMS

Question	Form 1 n (%)	Form 3 n (%)	Form 5 n (%)	Total n (%)
Building bones is the function	29 (85.3)	37 (90.2)	92(87.6)	92 (87.6)
Blood clotting is the function	1 (2.9)	0 (0.00)	0 (0.0)	1 (1.00)
Transmission of nerve impulses	1 (2.9)	0 (0.00)	0 (0.0)	1 (1.00)
Which food supplies the most calcium?				
Dark Green vegetables	0 (0.00)	0 (0.00)	2 (6.7)	2 (1.9)
Orange juice	0 (0.00)	4 (9.8)	3 (10.0)	7 (6.7)
Nuts	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
Meat	1 (2.9)	0 (0.00)	0 (0.0)	1 (1.00)
Milk and milk beverages	28(82.4)	29(70.7)	20(66.7)	77(73.3)
Cheese and butter	3 (8.8)	5 (12.2)	3 (10.0)	11(10.5)
Peas and beans	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
Eggs	1 (2.9)	0 (0.00)	0 (0.0)	1 (1.00)

With the use of chi squared tests table 3 shows that there was equal knowledge on the function of calcium among the three forms. They all knew the bone building function of calcium p (0.797) Therefore there was no difference among class form knowledge for that question. The majority of the students also did not know that blood clotting and transmission of nerve impulses were functions. The majority of the students knew that the milk and milk beverages supplied the most calcium p (0.348) which was not significant and showed that knowledge was equal for the girls of all forms.

TABLE 3: KNOWLEDGE OF STUDENTS ON FUNCTION OF CALCIUM AND CALCIUM RICH FOODS REPRESENTED BY CHI SQUARED VALUES

Variable	**X^2**	**P value(sig)**
Building bones is the function of calcium	0.455	0.797
Blood clotting is the function of calcium	2.108	0.348
Transmission of nerve impulses is the function of calcium.	2.108	0.348
I think dark green leafy vegetables supply most calcium	5.097	0.078
I think orange juice supply the most calcium	3.593	0.166
I think nuts supply the most calcium	-	-
I think fruits supply the most calcium	1.487	0.476
I think meat supply the most calcium	2.108	0.348
I think milk and milk beverages supply the most calcium	2.238	0.327
I think cheese and butter supply the most calcium	0.235	0.899
I think peas and beans sully the most calcium	-	-
I think eggs supply the most calcium	2.108	0.348

4.2.1

Fig 1 shows the knowledge level of the three forms on the perception of the most calcium containing food. Most respondents knew that milk and milk beverages supply the most calcium. But form 5 showed that the least percentage (66.7%) knew that it was true. The highest percentage of form 1 students knew that milk and milk beverages supplies the most calcium with 82.4% of the respondents selecting yes for their answer.

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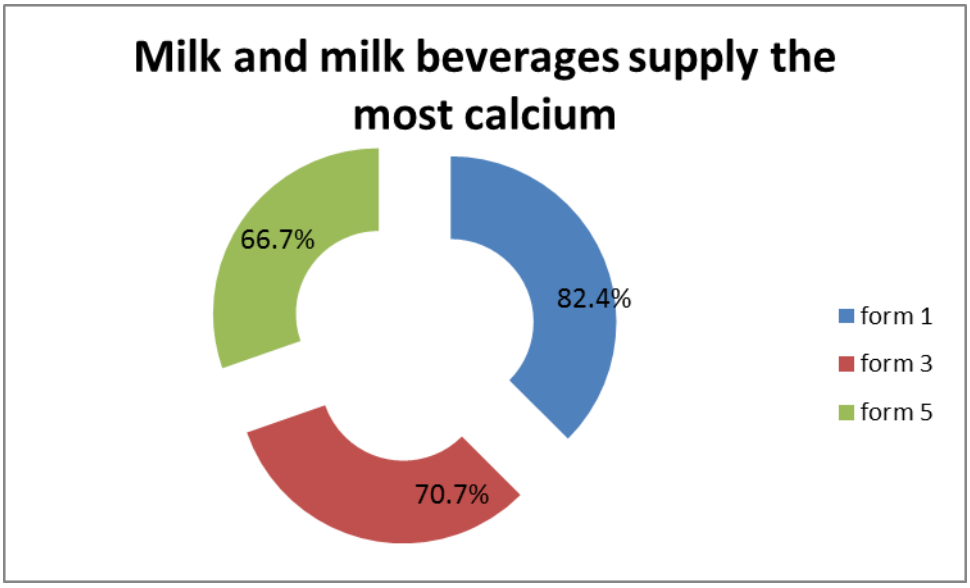

FIG 1: KNOWLEDGE LEVEL ON CALCIUM CONTAINING FOOD AMONG THE THREE FORMS.

4.3 Attitude to milk and milk beverages

Table 4 shows that 91.4% of the students drank cow's milk which leaves 9.2% who did not drink cow's milk. The form 1 and form 5 students preferred the taste of the cow's milk more than the students of form 3.The majority (95.2 %) of the students knew that milk is good for them. According to this table student in form 3 and 5 preferred flavoured milk beverages more than those of form 1. A very small percentage (2.9%) of the students all belonging to form 1 reported as being lactose intolerant. Only one respondent reported of religious prohibition of use. A small percentage of all students (6.7%) thought it was a beverage for babies. The highest percentage of students (9.8%) of form 3 thought it was too high in calories but overall only (6.7%) thought so. Among all forms, 2.9 % of the respondents thought that drinking milk was not important.

TABLE 4: ATTITUDES TOWARD MILK INTAKE AMONG THE THREE FORMS

Question	Form 1 n (%)	Form 3 n (%)	Form 5 n (%)	Total n (%)
I drink cow's milk	31(91.2)	38 (92.7)	27 (90.0)	96 (91.4)
I like the taste	24 (70.6)	25 (61.0)	20 (66.7)	69 (65.7)
I know it is good for me	33 (97.1)	37 (90.2)	30 (100)	100(95.2)
My parents make me drink it	10 (29.4)	13 (31.7)	6 (20.0)	29 (27.6)
I prefer flavoured milk beverages	20 (58.8)	26 (63.4)	19 (63.3)	65 (61.9)
I am lactose intolerant	3 (8.8)	0 (0.00)	0 (0.00)	3 (2.9)
Religious reasons prohibit is use	0 (0.00)	1 (2.4)	0 (0.00)	1 (1.0)
I think it is a beverage for babies	2 (5.9)	4 (9.8)	1 (3.3)	7 (6.7)
It is too high in calories	2 (5.9)	4 (9.8)	1 (3.3)	7 (6.7)
I do not think it is important	1 (2.9)	2 (4.9)	0 (0.00)	3 (2.9)

4.3.1

Fig 3; a bar chart shows a comparison of attitude to cow's milk intake and taste preference among the three different forms. Based on descriptive frequencies all class forms drank cow's milk with percentages above 90%. Among all class forms comparisons to taste preference, intake of cow's milk showed percentages that were higher than the preference of the taste of the milk. Form I students liked the taste of milk more than the students in forms 3 and 5.

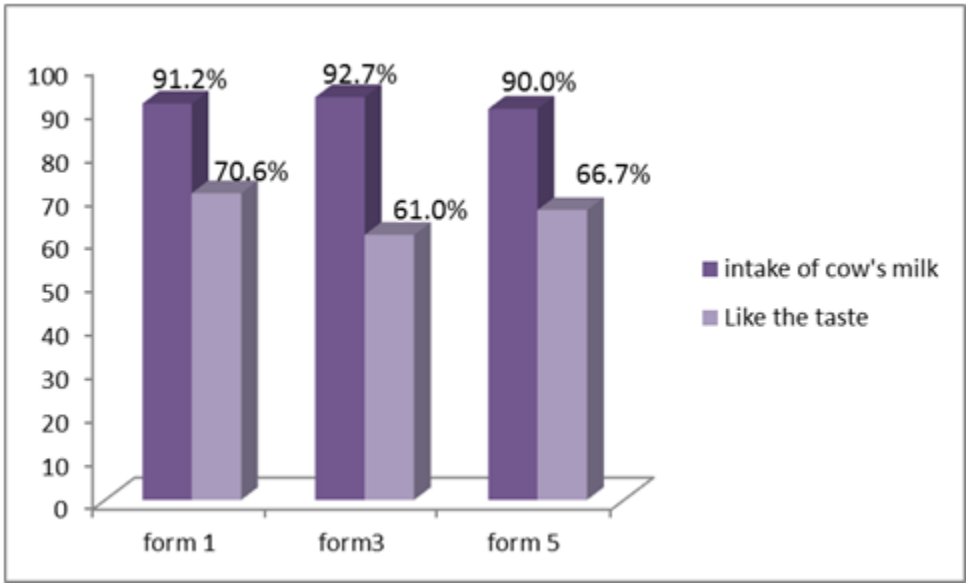

FIG3: A BAR CHART SHOWING A COMPARISON OF COW'S MILK INTAKE AND TASTE PREFERENCE AMONG FORMS

4.4 Milk and milk beverage intake

Table 5 shows the type of milk consumed and the frequency of intake among the different class forms.

Overall frequency of cow's milk intake ranged from15% - 50 %. Only Whole milk, Low fat and Milo showed that an average of half of the population consumed it. The least consumed types of milk were Rice and Almond milk, 9.5% and16.2% respectively.

The frequency of milk intake was highest among form 3 students for most milk types except for whole milk and flavoured milks.

Of the soy milk choices whole soy milk was the most preferred by the girls (39.0%). Reduced fat soy milk (20%) and flavoured soy milk was slightly less preferred with intake being (31.5%). Form three students consumed a significantly higher amount of soy milk of all types than those of form 1 and 5.

TABLE 5: MILK AND MILK BEVERAGE INTAKE AMONG FORMS 1, 3 AND 5

Type of Milk	Form 1 n (%)	Form 3 n (%)	Form 5 n (%)	Total n (%)
Whole Milk	23 (67.6)	21(51.2)	12 (53.4)	56 (53.4)
Reduced fat	12 (35.3)	18(43.9)	8 (26.7)	38 (36.2)
Low fat	14 (41.1)	28(68.3)	9 (30.0)	51 (48.6)
Skimmed	13 (38.3)	18(43.9)	12 (40.0)	43 (49.9)
Choc nut	17 (50.0)	18(43.9)	11 (36.7)	46 (43.8)
Suppligen	19 (55.9)	21(51.3)	12 (40.0)	52 (49.5)
Eggnog	7 (20.6)	5 (12.2)	3 (10.0)	15 (14.3)
Milo	20 (58.8)	22(53.7)	13 (43.7)	55 (52.2)
Whole soy milk	14 (41.2)	22(53.7)	5 (16.7)	41 (39.0)
Reduced fat soy milk	10 (29.4)	20(48.8)	3 (10.0)	33 (31.5)
Flavoured soy	6 (17.7)	13(31.7)	2 (6.7)	21 (20.0)
Almond milk	6 (17.7)	7 (17.1)	4 (13.3)	17 (16.2)
Rice milk	5 (14.7)	3 (7.3)	2 (6.7)	10 (9.5)

4.4.1

Fig 4 shows that the average intake of unflavored soy and cow's milk was 43.1%. Whole cow's milk intake was the highest among the three forms (53.4%). Reduced fat soy milk intake showed the lowest frequency of intake (31.5%).

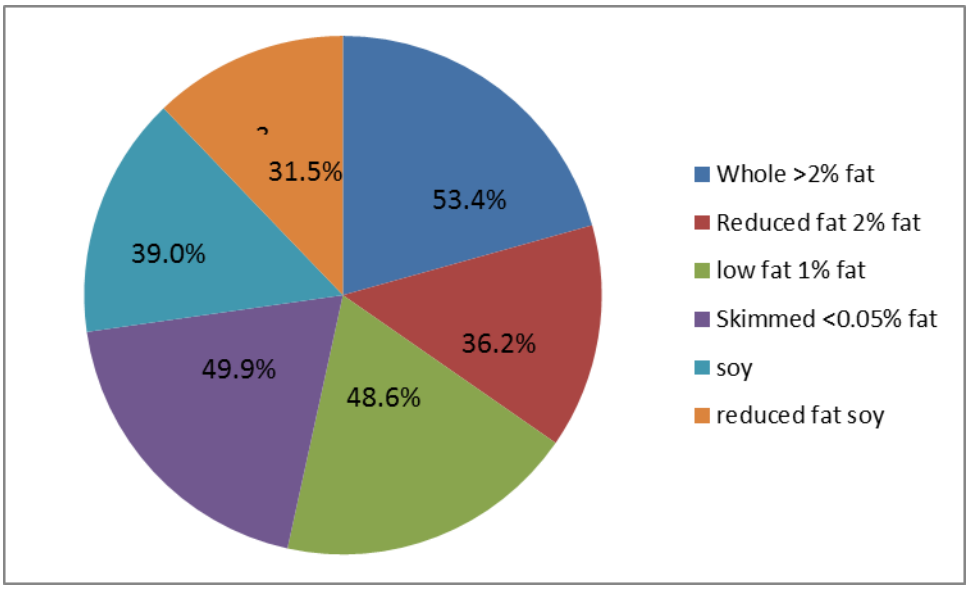

FIG 4: THE PERCENTAGE OF INTAKE OF UNFLAVOURED MILKS

4.4.2 Intake of Calcium containing foods

With regards to other calcium containing foods, table 6 shows that all intakes were well over 50 %, except tofu which was 48.6%.

Canned fish intake among forms 1and 5 students were roughly the same 76.5% and 73.3% respectively. Form 3 had the highest intake (87%). Green leafy vegetable were most frequently used by the students of form 5(93.3%). Peas and bean intakes were highest among the form 5 students (98.3%) and lowest among form 1 students (91.2%). Cheese dishes intake was highest among form 3 students (97.6%) and lowest among form 5 (90%). Egg intake among the three forms ranged from 85% -86%. Tofu intake was highest among form 1 and form 3 students. Nuts intake for forms 1 and 5 showed to be roughly the same and form 3 intakes was highest. Ice cream intake for all 3 groups was high with all percentages being over (90 %). Bread intake for all three groups showed full intake (100%).

TABLE 6: INTAKE OF OTHE CALCIUM CONTAINING FOODS BY THE PARTICIPANTS ACCORDING TO FORM.

Type of Food	Form 1 n (%)	Form 3 n (%)	Form 5 n (%)	Total n (%)
Canned Fish	26 (76.5)	36 (87.0)	22(73.3)	84(80.0
Green leafy vegetables	29 (85.3)	37 (90.2)	28(93.3)	94(89.5)
Peas and beans	31 (91.2)	38 (92.7)	28 (98.3)	97 (92.3)
Ochroes	29 (85.3)	29 (70.7)	21 (70.0)	69 (65.7)
Cheese dishes	32 (94.1)	40 (97.6)	27 (90.0)	99 (94.3)
Eggs	29 (85.3)	35 (85.4)	26 (86.7)	90 (85.7)
Tofu	18 (52.9)	22 (53.7)	11 (36.7)	51 (48.6)
Nuts	28 (82.4)	38 (92.7)	25 (83.3)	91 (86.7)
Ice cream	34 (100)	38 (92.7)	29 (96.7)	101(96.0)
bread	34 (100)	41 (100)	30 (100.0)	105(100.0)

4.4.3

Table 7 shows the results of the Analysis of variance (ANOVA) test. The association between the form the student was in and frequency of intake of milk and milk products was tested. It resulted in $F=6.092^{**}$ ($p=0.002$) showing that there was an association between milk intake and class form. There was a significant difference among class forms, for the intake of plain cow's milk beverages $F=4.094^{**}$, $p=0.019$. This test was also done to see the association of forms and frequency of intake of other calcium containing foods. This resulted in no association between form and frequency of intake for other calcium rich foods. Analysis of frequency of soy milk resulted in a significant difference in the mean intake of soy milks both flavoured and unflavoured with an $F=8.672^{***}$ and $p < (0.01)$.

TABLE 7: ANOVA SHOWING ASSOCIATION BETWEEN THE FORMS AND FREQUENCY OF INTAKE.

Independent Variables	Mean frequency of intake	F	P(significance)
Milk beverage intake		6.902**	0.002
Form 1	6.765		
Form 3	6.976		
Form 5	4.100		
Plain cow's milk		4.094**	0.019
Form 1	2.706		
Form 3	2.951		
Form 5	1.733		
Flavoured Milk		6.996	0.116
Form 1	2.735		
Form 3	2.341		
Form 5	1.800		
Other foods		1.260	0.288
Form 1	14.324		
Form 3	14.366		
Form 5	13.300		
Soy milk		8.627***	0.000
Form 1	1.118		
Form 3	1.707		
Form 5	0.400		

*** Significant at 1%, ** significant at 5%,

4.5 Intake of calcium supplement

Fig 5 shows that calcium supplements was taken by all forms. Form 3 demonstrated the highest calcium supplement intake (39.0%); while form 5 students demonstrated the least frequent use of supplements (16.7%). When tested with the chi squared test the p value was 0.113, indicating that there was no difference in the mean frequency of intake of supplements among the three groups.

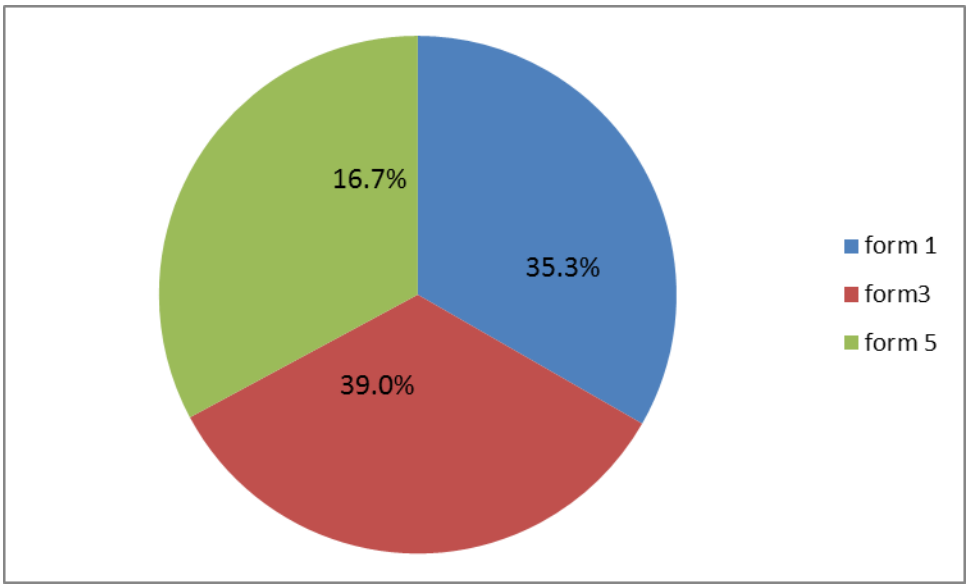

FIG 5: INTAKE OF CALCIUM SUPPLEMENTS AMONG THE FORMS

CHAPTER 5: DISCUSSION OF FINDINGS

5.0 Discussion of findings

This study investigated the knowledge among St. Augustine Girls High School students of calcium rich foods in particular milk and milk beverages and its importance in the diet; the attitude to milk and milk beverages and the intake behaviour toward these beverages.

5.1.1 Demographics

One hundred and five students participated in the study. The average number of participants per form was 35. Most of the respondents resided in the central region (44.8%) with the least from Southern part of Trinidad. Most of the students were of East Indian descent; this is typical of many school populations in Trinidad. The lack of Chinese or Spanish participants would have been as a result of the random sampling done. Also the study population was limited to one school as the study maintained itself as a pilot study. If a larger population was done with multiple schools there is a chance that demographic data would be different.

5.1.2Knowledge of students on Calcium

The majority of the students (87.6%) only knew one function of calcium and they failed to realize that calcium has multiple functions in the body. Building bones was the obvious function but other important functions such as blood clotting and transmission of nervous impulses were not selected. On average most girls (73.3%) knew the food that supplies the most calcium in the diet was milk and milk beverages. Even though these students attend one of the most prestige schools, their knowledge on calcium's importance was limited. Hareel and Riggs (1998) found similar results about the knowledge level of adolescent girls on the subject of calcium's importance in the diet and calcium containing foods.

The Chi squared test however, resulted in the students having equal knowledge on the function of calcium and calcium rich foods. There was no significant difference in the knowledge at the 5 % level as most students chose similar answers resulting in p values >0.05.

5.1.3Attitude toward milk intake

The number of students who drank cow's milk was very high with slight differences in the percentage of frequency of intake. When the percentage of students who drank cow's milk was compared to the percentage of those who liked it; there was a noticeable decrease in the preference of taste for milk. This shows that there was a positive attitude to drinking milk and milk beverages but a negative one to the taste of milk. Ninety five percent (95%) of the respondents knew that milk was good for them. This may have resulted in such the positive attitude in milk drinking even though taste was not preferred. Twenty seven percent (27%) of the students said that their parents made them drink the milk and that is why they consumed it. This was not expected as it is assumed that milk intake is not one of choice by most students and parents would enforce the importance of milk by their children. The preference of flavoured milk was 61.9%. This was a high percentage which may have resulted from just the fact that plain milk was not their preference. Hendijani et al in their study of the preference of flavoured milk among adolescent girls agreed with the results where they too found that flavoured milk was more preferred by the adolescent population

Lactose intolerance was not very common among the students. This is a possible reason why the attitude toward milk intake was very positive among the students. A small percentage of the students did not think milk was important and that it was a beverage for babies. This showed that they were not familiar with the importance of milk in the diet for young girls and they think that

only babies are the ones who need it. This is supported by Agoreyo et al (2002) where the participants consumed more juices and soft drinks compared to milk and milk beverages. And their lack of knowledge in the area of osteoporosis and bone health leads them to think they would never fall into the group of 26 million women who suffer from osteoporosis today. High calorie content of milk was not a major concern among the students. A total of 6.7% of the students thought it was too high in calories. The majority of the students were of form 3 who thought that milk was too high calorie. Since these girls now entered mid teen age, they start looking at their physical appearance a little more. This may be a possible reason for the highest number of girls considering milk as high calorie in form 3 as compared to form 5. Agoreyo et al (2002) in the study done in Nigeria confirmed that adolescents believe that milk is too high in calories. This is inconsistent with this research study since overall, only a small percentage of the students at St. Augustine Girls' High School found milk to be high in calories. In the study done by Agoreyo et al (2002) it was found that the milk intake drastically declined because adolescent girls were becoming more weight conscious.

5.1.4 Milk and Milk beverage intake

The majority of students consumed at least one type of milk. Only 6.7 % of the students drank no type of milk. The possible reason for this is due to dislike of taste, religious reasons prohibit its use or being lactose intolerant.

Overall the intake of cow's milk; whole, reduced, low fat and skimmed milk was 53.4%, 36.2%, 48.6% and 49.9% respectively. On average half of the population consumed these types of milk. For whole milk intake for form 3 was (51.2%), form 5 (53.4%) and for form 1 (67.6%). This was not expected as it contradicts the assumption that milk intake would be less as form increases.

Form 1 consumed the most whole milk, form 5 was second and form 3 consumed the least. This result matches well with the previous results on attitude to milk, which shows that form 3 girls were most conscious of their weight. So their alternative milk of choice would have been either low fat or skimmed milk. Form 3 consumed reduced fat milk most frequently. This again agrees with the assumption that milk is high calorie and the issue of weight gain. Among form 3 intakes for reduced fat milk was (43.9%), low fat milk (68.3%) and skimmed milk (43.9%).Frequency of intake was highest among form 3 for all the reduced fat type of milks again agreeing with the study done by Agoreo (2002) where the adolescents were weight conscious.

The intake of flavored cow's milk such as choc nut, supligen, and milo was consumed fairly well by the population. Only Eggnog had a very low percentage intake of 14.3%. The other flavours were well liked by the population hence the higher frequency of intake. Eggnog however is not a well-liked flavour among the girls. Reasons for this may have been due to preference of taste and familiarity with the flavour. The frequency of intake of all flavoured milks was lower as form increased. This is consistent with the study done by Cavadini (2000) where milk intake declined as age increased.

A higher than expected portion of the students consumed soy milks both plain, whole soy milk and reduced fat soy milk and flavoured soy milks. Thirty nine percent (39%) consumed whole soy milk and 31.5 % consumed reduced fat soy milk. Twenty percent (20%) consumed the flavoured soy. It is understood that the lactose intolerant students would consume soy milk as an alternative and a good calcium rich food. Weaver et al (1994) in the article calcium adequacy of the vegan diet shows that vegans and lactose intolerant persons who consume the right amounts of bioavailable sources of calcium rich foods including soy milk will not have a lower bone mineral density and could possibly reduce the risk of developing osteoporosis later in life.

Flavoured soy milk (20%) was the least frequently consumed of the soy milk options. This result contradicted the results from the study done by Hendijani and Karim (2004), where they found that flavoured milks were more accepted by adolescent girls. A possible reason for the low frequency of intake of the flavoured soy milk is possibly preference, taste or availability. As most students may consume what is in the house hold or what is available at school. The least consumed milks were almond milk (16.2%) and rice milk (9.5%). The intakes did decrease as form increased but overall the frequency of intake was lowest of all the milk options. This decrease in milk intake remains consistent with the assumption that milk intake among adolescent girls decrease as form increase. The study done by Cadivini supports these results. Personal factors, environmental factors all play a part in the behavior which is milk intake among the students.

Figure 4 shows that plain milk both cows and soy milk was consumed in more or less the same frequency. While whole milk still holds the leading position, the other unflavoured milks such as soy, almond were consumed in frequencies that were close to that of whole milk.

5.1.5 Possible reasons for the milk intake pattern among St.Augustine High School students

The possible reasons for such pattern in milk intake would stem from many factors. Some of these would be the environment of the child. If parents do not encourage their children to drink milk and milk beverages, or do not set the example then there is a high possibility that the child would not do so. Parental advice and education would help children to make the right choice in their eating habits. Some children do not like the taste of plain milk or unflavoured milk, so by introducing flavoured milks which is seen to be accepted by some will encourage the student not only to consume the milk product but to enjoy the taste as well. As age increases at mid teenage,

girls tend to be bombarded by the models on the television, the magazines. The outer beauty and "physical thinness" is being portayed as beautiful and hence these young girls tend to want to adopt such a figure. By cutting calories they feel that they can achieve this. Not only they will be cutting calories but they will be starving their bones of the calcium they need for proper development at this crucial age. This is where the problem begins and osteoporosis develops later in life. Another reason that the children would decrease their milk intake is that they do not feel it is very important at this age. They find it easier to drink the sweetened beverages such as soft drinks and juices which they prefer the taste of as well. Overall the lack of education and the awareness of the importance of milk in the diet is the biggest problem. If children are not educated on the importance of milk they are going to make a choice of what is tasty to them. And in most cases soft drinks, juices that are sugar laden drinks gets first preference over nutrient filled drinks. This is consistent with the research done by Babolian Hendijani 2010 in the article "Factors affecting milk intake among adolescent girls".

5.1.6 Intake of Other calcium containing foods

There is a wide variety of calcium containing food available for use. These may not be the most bioavailable source but they are sources that are rich in Calcium. Generally it was seen that the frequency of intake for the 3 forms for other calcium containing foods was not significantly different among the groups. Analysis of variance showed that $P > 0.05$. This means that the consumption among the three groups showed no difference between the means of intake and that the students of the three forms consumed on average the same frequency of other calcium consuming foods as seen in table 7.

All foods were consumed in percentages above 80% except that of ochroes (65.7%) and tofu (48.6%). This was expected as ochroes and tofu are two foods that are generally not well accepted by the population. These are two foods that its taste is not universal hence the results obtained. Since the consumption of these other calcium containing foods were on average equal it showed that the students ate these calcium containing foods quite frequently. This was expected as these foods are foods that are generally consumed every day by both vegetarians and non-vegetarians. When compared with intake of milk and milk beverages this group of other foods were consumed in higher frequencies. This is a favorable result if Lanou (2009) is correct in his research. He believed that milk is not the best form of calcium and that that the other foods that contain calcium are very rich sources. In his research he found that the calcium from green beans and vegetables are better absorbed than that of milk and dairy products. Form the trends in the table 6 it shows that the diet of the girls would then be rich in calcium which lessens the risk of them developing bone fractures and osteoporosis later on in life.

Calcium supplements intake was not very prevalent among the girls. Over 30% of students consumed a calcium supplement. This shows that only a small percentage of the children are aware that supplementation is important if the diet does not meet the Recommended Daily Amounts for the specified nutrients, in this case calcium being the star mineral. When tested by the chi squared test, the result showed that there was no difference in the intake of calcium supplement among the three groups.

5.2 Limitations of the study

5.2.1 Sample size

As previously highlighted, this study was a pilot study done on a small sample size. This therefore is not typical of the entire female adolescent population between the ages 11- 18 years. Due to the study population being convenient it was used and the results when compared among the different forms seemed very close with slight variations. This made it difficult to infer if there was any real significance between the different groups as most tests showed no significant differences between the groups but the frequency and percentages showed slight differences.

5.2.2 Selection Bias

Selection bias on the account of the researcher may have occurred because even though random sampling was done, the questionnaires were given to other students in the class if the selected student was absent from school that day.

5.2.3 Response Bias

Although the questionnaire was pretested on 5 students, there were still some responses that were left blank. These occurred in the section of the food frequency recall. Some students may have misinterpreted the instruction and only selected one response in each section of the foods. Therefore leaving it up to the researcher to assume that intake was 0 times per week for the ones that had no indication. Also for section concerning attitude to milk intake where responses were either yes or no, some respondents left some blank, therefore leaving it up to the researcher to assume that blank answer indicated no as the answer. Recall for the week may have been

difficult for some to measure and this may have led to a guess when answering the question and may have caused inaccurate responses by the students.

5.3 Recommendations

5.3.1 Use more schools in the specific area

To increase sample size and increase respondent rate, a number of schools in the St. Augustine area could have been tested to make the results more representative of the adolescent female population. Even though the study focused on just the St. Augustine Girls, to make it representative and valid for the benefit of a larger female adolescent population more schools should have been included.

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5.3.2 Restructure Questionnaire and pretest again

The questions that were not answered properly should be restructured and presented more clearly and specific. If instruction was made to ensure that each question was answered then maybe the respondents would have known that an answer was required for every single part of the questionnaire.

5.4 Conclusion

The knowledge of the students on the importance of milk and milk beverages in the diet showed no significant difference among the forms when tested. This shows that all students were equally knowledgeable on the subject even as the age group increased. The attitude to milk intake was one that was convincingly positive but the attitude to whether they liked it was less positive for all forms. This shows that although the students consumed milk and milk beverages the possible reason for doing so was of the knowledge that it was good for them.

The intake of milk and milk products among the students did show a significant difference as the mean frequency of intake among the class forms differed. The intake frequency of other calcium containing foods however did not show a significant difference among the forms indicating that on average they all consumed other calcium containing foods such as cheese, meats, and vegetables in same frequency. Future research should aim to investigate how much calcium is actually consumed by the students form milk and milk beverages and other food in their diet. This can then help to determine if they meet the Recommended Daily Values of calcium for their age group.

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APPENDIX

Questionnaire #_____

UNIVERSITY OF THE WEST INDIES

DEPARTMENT OF AGRICULTURAL ECONOMICS AND EXTENSION

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Dear Parent /Guardian,

I am Cherisse Ramai, a final year student of the University of the West Indies, St Augustine. Part of my graduation requirements is that I conduct a study of nutrition among residents of Trinidad and Tobago. I have chosen to examine milk intake among high school students. Since I am a past student of St. Augustine Girls' High School I have been given the permission to conduct my study among students of Form 1, 3 and 5. Your daughter has been selected to participate in the study and I hereby seek your permission to have her answer the questions attached and return the completed questionnaire to her Form teacher

Please indicate your willingness to have your daughter participate by placing a tick in the relevant box below.

Thanking you for your kind assistance.

Sincerely

_____

Cherisse Ramai

[ ] I hereby give my consent for my daughter's participation.

[ ] I do not wish my daughter to take part in the survey.

Milk intake patterns of High School Students

Questionnaire

Please select the response that best describes you by placing a tick [√ **]** in the space provided.

1) What form are you in? [ ] Form I [ ] Form III [ ] Form V

2) Which region of Trinidad do you live?
   North [ ] □ South [ ] □ Central [ ] □ East [ ] □ West [ ] □

3) Ethnicity
   East Indian [ ] □ African [ ] □ □ Chinese [ ] Spanish [ ]
   Mixed [ ]
   Other (Please Specify) _____

   □

4) Please tick the response that best describes your intake on an average weekly basis.

Food Item	Weekly Intake		
	Never 0 times	Rarely 1-2 times	Sometimes 3-5 times
Milk and milk beverages			
(Regular cow's milk, liquid and powdered)			
a) Whole > 2% fat	[ ]	[ ]	[ ]
b) Reduced Fat 2% fat	[ ]	[ ]	[ ]
c) Low fat 1% fat	[ ]	[ ]	[ ]
d) Skimmed 0.0-0.5 %fat	[ ]	[ ]	[ ]
Flavoured milk beverages (liquid and powdered)			
e) Choc nut	[ ]	[ ]	[ ]
f) Suppligen	[ ]	[ ]	[ ]
g) Eggnog	[ ]	[ ]	[ ]
h) Milo	[ ]	[ ]	[ ]

Food Item	Weekly Intake Never 0 times	Rarely 1-2 times	Sometimes 3-5 times
Soy milk and milk beverages (liquid and powdered)			
i) Whole > 2 % fat	[ ]	[ ]	[ ]
j) Reduced fat< 2% fat	[ ]	[ ]	[ ]
k) Flavoured soy drinks	[ ]	[ ]	[ ]
Almond Milk	[ ]	[ ]	[ ]
Rice milk	[ ]	[ ]	[ ]
Other foods			
l) Canned fish (tuna,sardine,salmon)	[ ]	[ ]	[ ]
m) Green leafy vegetables(patchchoi, spinach, broccoli)	[ ]	[ ]	[ ]
n) Peas and beans(red beans, baked beans)	[ ]	[ ]	[ ]
o) Ochro	[ ]	[ ]	[ ]
p) Cheese dishes (macaroni pie, lasagna, pizza)	[ ]	[ ]	[ ]
q) Eggs	[ ]	[ ]	[ ]
r) Tofu		[ ]	[ ]
s) Fruits(orange, pineapple, watermelon)	[ ]	[ ]	[ ]
t) Nuts (Almonds)	[ ]	[ ]	[ ]
u) Ice cream, yogurt, cheese cake	[ ]	[ ]	[ ]
v) Bread	[ ]	[ ]	[ ]

5) Which of the following applies to your use of cow's milk and milk beverages?

	Yes	No
I drink cow's milk	[ ]	[ ]
I like the taste	[ ]	[ ]
I know it is good for me	[ ]	[ ]
My parents make me drink it	[ ]	[ ]
I prefer flavoured milk beverages	[ ]	[ ]
I am lactose intolerant	[ ]	[ ]
I am vegan	[ ]	[ ]
Religious reasons prohibit its use	[ ]	[ ]
I think it is a beverage for babies	[ ]	[ ]
It is too high in calories	[ ]	[ ]
I do not think it is important	[ ]	[ ]
It is too expensive	[ ]	[ ]

6) What do you think is the function of calcium in the diet?

[ ] Building and maintaining strong bones and teeth. □

[ ] Blood clotting

[ ] Transmission of nerve impulses. □

[ ] All of the above

[ ] not sure.

7) Do you take calcium supplements? Yes [ ]□ No [ ]□

8) From which source do you think you get the most calcium? (select only one)

□ [ ] Dark green leafy vegetables □ [ ] Milk and milk beverages. □

[ ] Orange juice [ ] Cheese and butter

[ ] Nuts [ ] Peas and beans

[ ] Fruit [ ] Eggs

[ ] Meat

THANK YOU!!