ASSESSMENT OF SOCIO-ECONOMIC FACTORS OF HAWKERS ON BACTERIOLOGICAL QUALITIES OF LOCALLY PRODUCED BREWED DRINKS SOLD IN CALABAR SOUTH LOCAL GOVERNMENT AREA OF CROSS RIVER STATE, NIGERIA

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Abstract

The purpose of this study was to assess socio-economic factors of hawkers on bacteriological qualities of locally produced brewed drinks sold in Calabar South Local Government Area of Cross River State, Nigeria. In pursuance of this objective, two null hypotheses was raised. Experimental study design was adopted for the study. The population of the study consisted of hawkers selling locally produced brewed drinks in Calabar South Local Government Area. The sample consisted of 29 hawkers drawn from 5 markets using multi-purpose sampling techniques. Socio-economic factors of hawkers and bacteriological qualities of locally produced brewed drinks sold questionnaire (SFHBQLPBDSQ) was the instrument used to collect data. Data analysis was conducted using simple percentages analysis and laboratory test observation results. Findings revealed that there existed a positive influence of income of hawkers' empowerment and level of training obtained in processing on staphylococcus aureus

bacterial effect in soya milk, tiger nut milk, zobo milk and kunu milk drinks. It was discovered that staphylococcus aureus effect growth in locally produced milk drinks is significantly low because high growth rate of microbial and bacterial effect in milk drinks affect the health of consumers. It was recommended among others that those producing and hawking locally produced brewed drinks should receive adequate training so that they would know all what is needed to produce the drinks that maintain healthy living to the consumers.
Keywords: Socio-economic factors, bacteriological qualities, locally produced brewed drinks.

Introduction

Conceptually and technically speaking locally produced brewed drinks are milk drinks in the categories of soya beans milk scientifically called soya milk, tiger nut milk and zobo milk and kunu milk drinks. These flavored drinks is usually prepared by people in sub-Sahara Africa and other part of the world as locally produced brewed drinks to complement the nutritious and porteinous intake in the body system. The need to take locally produced brewed drinks cannot be over emphasized. This is because the body needs nutrients and protein, anybody who lacks nutrients and proteins in the body could be regarded as not uptimally healthy. Locally produced brewed drinks has become an integral part of our society (Chiemeka, 2020).

According to Sithers and Robinson (2021) locally produced brewed milk drinks like soya milk produced from soya beans is locally produced made out of legume with protein content of 38% from the beans and contains Oligosaccharide (raffinose) which are probiotic and boost immunity. The scientific name for soya bean milk drink is soymilk and every locally produced brewed milk drink like soymilk, tiger nut milk, zobo milk and kunu milk drinks are commonly consumed by people in the globe.

Selwym (2020) stated that locally produced brewed milk drinks ‘douging’ as they are called in China originated in the early 16th century in China, at this time, they were not widely used during the time of Rotory dynasty era but their weeds, grains and legume were widely used in the eighteen century when they were introduced to the market by vitasoy in 1879. The first domestic manufacturer of soymilk, tiger nut milk, and zobo milk drink was sun rich food company in 1879.

Locally produced brewed milk drinks first came to Nigeria in the pre-colonial era. Studies have indicated that a scientific and modern concept of locally produced brewed milk drinks was done by Onochie in 1965 as protein supplement and local Nigerian diet drinks to quench taste and promote good health. For soya beans grain it was equally used as melon seeds to thicken soup. The seeds and grains used in producing locally produced brewed milk drinks can be granted to powder form to produced food supplements.

According to Tineke (2021) the nuts, leaves, seeds, grains and legumes from locally brewed milk drinks are grown in the middle belt of Nigeria especially in today’s Benue state and this

accounted for 65-75% of the total production in Nigeria. Studies have shown that Nigeria is the largest producer of nuts, seeds and grains of soya beans, tigernut, zobo leave and kunu seeds in West Africa. Other major areas of these legumes production is in Niger, Nassarawa, Taraba, Bornu, Bauchi and Sokoto States of Nigeria.

In some parts of Nigeria, soya beans powder and tiger nut granded to powder is mixed with cowpeas to produced Akara and allele used as wheat flour and in the production of bread. Locally produced brewed milk drinks seed, legumes and leaves are perennial crops of the same genus as the papyrus plant. Due to their tuberous rhizomes, they can be eaten raw, roasted, dried baked or made into a refreshing beverage of milk (Whiteman, 2019).

Studies have indicated that the locally brewed milk drinks upon extraction is nutritious, they contain protein, they lower fat in the body and lessen anti nutritional factors especially polyphenols. Locally brewed milks drinks extracted are fermented, they are non-alcoholic beverage drinks and are widely consumed for its thirst quenching and nutritive properties. Even though locally produced brewed milk drinks are being consumed throughout sub-Sahara Africa their extreme period of consumption is during the dry season (Sithers, 2021). The legume, nuts, leaves, seeds and grains from locally brewed milk drinks are prepared by washing the seeds, grains, leaves and legumes in order to removed dirt, dust and soil in them. When washed, they are usually soaked, grinded to powder and cooked with other processes that follow to produced milk drinks.

Studies have shown that factors like the income of those producing these milk drinks, level of their training, dirty environment among others contributed to bacteriological qualities in the brewed milk drinks. Locally produced brewed milk drinks usually sold in the study area as drink supplement are nutritious and proteinous. Their processing procedures has been known to attract microbial and bacteriological infection in the milks. When the leaves, nuts, seeds, grains and legume are not properly washed when harvested for processing into finished milk drinks, it attract micro flora from the field and when processed into milk can caused health challenge through microbial and bacterial present in the milks. Poorly processed locally produced brewed milk drinks are usually prone to staphylococcus aureus microbes and bacterial presence in the milk drinks.

There has been less involvement of modern manufacturing industries in the processing and manufacturing of locally produced brewed milk drinks especially in sub-Shara Africa so it is the locals that produced these milk drinks in some cases using crude ways except those with much income and those that received training and education. Those without these qualities produce the drinks in unhygienic manner for public consumptions. It is also observed that most producers of locally produced brewed milk drinks has less income to put into processing and production. They lack finance to buy modern utensils and, in most cases, do not have patient to allow the milk drinks adequate processing, thus attracting bacteria in the processes.

Ignorance plays a part for sustainable processes to arrive at the production quality. Microbes and bacterial infection occurs in the processing procedure through contamination of the apparatus used in preparing the raw materials to final production that end users consumed. Inadequate training on the part of the producers producing milk drinks is a contributory factor to bacteriological infection presence in the drinks.

Some local manufacturers may not have the requisite skills acquisition to produce the milk drinks, but they carried out these activities due to hunger and economic challenged facing them, and these have posed a problem leading to microbial and bacteria invasion of the finished drinks.

The income of hawkers that produces locally brewed drinks is a vital indices to microbial contents and bacterial present in soymilk, tiger nut milk, zobo milk and kunu milk drinks. (Hong, 2020). According to Mckinney (2021) bacterial present in locally brewed drinks can be contacted through dust, use of dirty utensils, dirty hands and dirty environment, pests and rodents infestation in preparation processes among others which the reason can be lack of money to buy those utensils needed and even purchase of potable water for the production processes.

Shin (2020) stated that for one to get a nutritious zobo milk drink in the southern part of Nigeria, he has to provide native seeds of fruit inscence, otherwise called zobo leave, added with flavor of spices, ginger and galick which they are granded with pineapple flavour thoroughly washed and then cooked to produced a good zobo milk drink flavor. The microbial and bacterial contents can occur when the zobo leave, native zobo seed, ginger, gallick, pineapple are not properly washed before preparation and where the zobo milk drinks are not hygienically produced.Peter (2019) observed that income of hawkers empowerment significantly influenced the bacteriological qualities present in locally produced brewed drinks in that when a hawker who has no extra income from other sources in purchasing utensils for preparing the brewed drinks, the end product is bound to attract bacteria. Studies have indicated that some of the local populace who produced and sell these drinks are engaged in other jobs but produced these drinks for sale as a secondary and part time career.

Chiemaka (2020) is of the view that sales of locally produced brewed drinks does not attract large profit except it is produced in large scale. It has been observed that large scale production requires more income in order to buy ingredients, utensils and the enabling environment needed for the production of locally produced brewed milk drinks. Studies have indicated that hawkers that are engaged in other career activities that earn them income but sells locally produced brewed milk drinks as a secondary source of income tends to invest more money in its production and thus usually lead to minimization of staphylococcus aureau microbial and bacteria found in soymilk, tiger nut milk, zobo milk and kunu milk drinks.

Research by Glasser (2020) indicated that studies carried out in four cities in Nigeria in 2015 showed that hawkers who take up the production of locally brewed milk drinks as main business without any supportive income from other career uses less finances in the production processes. Using less income in the production processes tend to lead to poor production processes thus accommodating greater percentages of microbial and bacteriological qualities in the milk drinks. Studies have proven that about 0.1% civil and public servants in Nigeria's corporations sells locally produced brewed milk drinks to support the income earned in public works.Dust, flies, cockroaches, rodents and dirt from dirty utensils and the environment has been found to contribute to microbial and bacterial present in locally brewed milk drinks. Chiemaka (2020) stated that income of hawkers producing locally brewed milk drinks is to a great extent a determinant to microbial and bacterial present in locally brewed milk drinks in that income is what is used in buying the ingredients, utensils and commodities like water in the production processes.

The benefits of tiger nut and other seeds, legumes of soya beans, zobo among others cannot be over emphasized. These nuts, seeds, leaves and legumes have become popular in the world as a result of their health benefits. For tiger nut, even though it is called a "nut", the tiger nut is a "tuber". A tuber is a piece of a plant's stem that is usually buried in the ground. The tiger nut is the tuber of the cyperusesculentus plant also known as the yellow nutsedge. It taste sweet like almonds. In ancient Egypt, tiger nuts were a primary source of food. Most people eat them today in part of Africa, Europe and the Mediterranean. It is called chufa nuts in spain, "aya" in Hausa, "akiawusa" in Igbo and "Ofio" or "ayemunmi" in Yoruba. It is the ingredient in a drink called horchata de chufa made from tiger nut milk. In china and other places, tiger nut milk and other locally brewed milk drinks is used to help the liver (World Health Organization WHO, 2021).

WHO (2021) assert that tiger nuts can be eaten raw or cooked, but in most western markets, they are usually only sold dried or grand and not raw. Tiger nut flour can be used in baking and dried raw tiger nuts can be eaten as a crunchy snacks. They are a great choice for a snack because they taste nutty and creamy and give you all the fiber you need for the day. Its fibers helps the body to digest and get rid of waste, better and lowers the risk of high cholesterol like heart disease. About 10 grams of fiber are in a serving of most locally brewed nuts, seeds, leaves and legumes. Fiber can also help you lose weight. It promotes digestions, lowers blood sugar level, improve the health of the heart, boosts immunity and it fight against breast cancer among others.

Studies have shown that one do not produced locally brewed milk drinks when he did not received a level of formal or informal training to produce either the soymilk, tiger nut milk, zobo milk and kunu milk drinks. For hawkers or producers to produced zobo milk drinks for instance, he should have the basic training of what ingredients constitutes the production processes. Hawkers has to receive training that zobo leaves and seeds, native seed, fruit incense,

spices of ginger and gallick, pineapple flavor is the necessary ingredients needed to produced zobo milk drinks (Sithers and Robinson, 2021).

William (2021) stated that tigernut known as "Aya" in Hausa, "Ofio" in Yoruba and "Akiausa" in igbo with varieties of black, brown and yellow species has to be prepared having and acquiring expertise training to know the processes and ingredients needed for the production of tiger nut milk drink. Tiger nut contain myristic acid and unoleic acid that needs proper training to be obtained by hawkers to manage these acidic contain properly. It has been observed that if tiger nut are not well cooked, the acidic nature in the nut can transform to microbial and bacteriological qualities in the finished products.
Locally produced brewed milk drinks contain fats and protein in them but possess less anti-nutritional factors especially polyphenols. These milk drinks are consumed for its thirst quenching and nutritive properties. The seeds, nuts, grains, leaves and legumes are usually washed thoroughly with potable water before they are processed to protect and prevent microbial and bacterial contamination. The locally produced milk drinks are to be consumed within 24 hours when not refrigerated and should be stored in a temperature of 40^0 to 100^0c due to its poor shelf life. These milk drinks are cheap to produce because the additives used in its production are easily and locally sourced (Shin, 2020).

According to William (2021) in almost all the locally produced milk drinks, salt and sugar are added but depending on the producer's discretion. The production processes are cheap and simple but clean utensils and expertise training, and knowledge is required. More people in developing countries have developed the skills of producing and packaging the locally brewed milk drinks in an environment that are tidy and sanitarily conducive devoid of flies, cockroaches, rats, flies and dust among others. The crude method of production processes has leads to contamination of the milk drinks which affect the promotion of healthy standard of consumers.

Studies have proved that locally produced brewed milk drinks are nutritious and proteinous with a high contents of soluble glucose, fats, starch, oil and energy with up to about 25.5%. These milk drinks contains carbohydrate and minerals such as iron, potassium, zinc, phosphorus and calcium which are essential for body development and growth. They contain copper, vitamin E and C. Locally produced brewed milk drinks has been trace to prevent heart attacks, thrombosis and cancer. When sugar are not added to them it tends to be beneficial to diabetic patients, obesity, and gastrointestinal disorder patients, and those seeking to reduced cholesterol or lose weight (World Health Organization WHO, 2020).

Methodology

Research design is a plan or blueprint which specifies how data relating to a given problem should be collected and analyzed. The design adopted in the conduct of this study is experimental study design to examined the extent of bacteriological qualities effect of

staphylococcus aureus in soymilk, tiger nut milk, zobo milk and kunu milk drinks.A questionnaire titled Socio-economic Factors of Hawkers and Bacteriological Qualities of Locally Produced Brewed Drinks Sold Questionnaire (SFHBQLPBDSQ) was used in this study to collect data for socio-economic factors of hawkers variables. The locally produced brewed drinks bought from the hawkers were also tested in the laboratory to determine the level of microbial and bacterial present in them using observatory test.The researcher make used of simple percentages analysis and laboratory tests observation results.

Preparation of Macconkey agar:

i. Using a triple beam balance, place a paper on a triple beam balance plate and measure the milk drink liquid ager on it. (Macconkey agar).
ii. Transfer the measured drinks agar into a conical flask containing distilled water and shake it to dissolve the substance particles.
iii. Ensure there is sufficient water in the autoclave before putting the conical flask which contains the agar into the autoclave.
iv. Allow the water to boil at 121^0C for 1-20 minutes.
v. After it might have attained sterilization for the required time.
vi. Allow the autoclave to get cooled then remove agar and pure it into the petris dishes.
vii. Put the plate hot air oven to solidify and it is ready for use.

Culture

In studying and identifying micro-organisms, the organism have to be cultivated and isolated in pure culture. Most bacteria can be cultured in artificial media if the media meet the nutritional and physical growth requirements of the bacteria. They contain water and sources of nitrogen, carbon, mineral salts, and essential vitamins.

Incubation

The sample drinks were incubated at 37^0C to create an ambience similar to that of natural condition to human hence, allowed for growth of micro-organism as they would have done in human body.

Gram stain

Gram staining is the ability of an organism to resist decolourization with acetone, alcohol or alkaline after the initial staining with rosaaniline dyes. This can be done in four major steps.

i. Crystal violet (primary stain) which stains all the bacteria.
ii. Modant (Lugo’s iodine) which helps the primary stain to stick to the slide.
iii. Acetone (Decolorizer) the gram-positive resists decolourization while the gram negative are being decolrize.
iv. Carbolfuchin or sefranin (counter stain) stain gram negative bacteria.

Procedure for gram staining

1. Place a drop of water on the slide.

2. Pick a colony of the organism with wire loop and make a smear on the slide.
3. Allow to dry and fix the smear by passing through the flame.
4. Allow it to cool.
5. Flood the slide crystal violet for 30 seconds.
6. Rinse with tap water
7. Apply lugo's iodine for 30 – 60 seconds.
8. Decolorize with acetone and rinse immediately.
9. Counter stain with carbolfuchin or safranin for 1 minute
10. Clean the back of slide and allow air to dry.
11. Examine under the microscope with x100 objective.

Identification methods and techniques

Bacterial identification methods are tested to speciate, differentiate or identify bacteria, most of these test are based on the biochemical reactions and enzymatic activity of bacteria. They are often referred to as "biochemical test". The biochemical test includes catalase test and coagulase test.

Catalase test

This test helps to differentiate staphylococcus from streptococci. It is useful in differentiating mycobacterium species.

Principle**:** The enzymes catalase, acts as a catalyst in the breakdown of hydrogen peroxide to oxygen and water.

$2H_2{}^{0}2 \longrightarrow 2H_2{}^{0}2 + 0_2.$

When the organism containing catalase encounters hydrogen peroxide, bubbles of oxygen are given off.

Reagent**:** Hydrogen peroxide, 3 (10 volume solution).

Method 1:

1. Emulsify a few colonies of the organism in distilled water on a clean slide place in a petrisish.
2. Add 1-2 drops of H_20_2 and cover the dish.
3. Gas bubbles indicate a positive reaction.

Method 2

1. Place 2-3ml of hydrogen peroxide (H_20_2) in a test tube
2. With a sterile wooden applicator or plastic rod or glass stirrer, pick some colonies of the organism and immerse it in the hydrogen peroxide solution.
3. Immediate gas bubbling indicates positive test.

Coagulase test

This test is used to differentiate staph aureus from other staphylococci.

Principles**:** The enzymes, coagulase, cause lasma to clot by converting fibrinogen to fibrin. Coagulase is produced by staphylococcus aureus. It is considered a pathogenicity test for staphylococcus Aureus.

Method 1

1. Place two separate drops of saline on a slide.
2. Emulsify one or two colonies of the organism in each of the drops to make thick suspension.
3. Dip the tip of a straight wire into the undiluted plasma and mix the adhering traces of into one of the bacteria suspensions.
4. Look for immediate coarse champing of the mixture (within 5-10 seconds). The chumping indicates positive coagulae test.

Free coagulase test:this converts fibrinogen to fibrin by first activating the coagulase detected by the information of a clot in the tube in which broth culture is mixed with plasma.

Method 2

1. Dilute the neat plasma 1 in 10 in saline. (0. 2ml of plasma with 1.8ml of saline)
2. Into each of three small test tubes labelled, and 0.5 ml of the diluted plasma. I.e (T) (P) and (N).
3. Add five drops (about 0.1ml) of an 18–24-hour broth culture of the test organism to the tube i.e. the first tube.
4. Add five drops a (18-24) hour broth culture of staphylococcus aureus to the (P) tube.
5. Add five drops of sterile broth to the tube (N)
6. Mix gently and incubate all three tubes at 37^0c preferably in water bath.
7. Examine for clot after 1 hour, two hours, and if still there is no clot, examine at 30 minutes internal for up to six hours

Gently tilt the tube to observed clot. The positive control should produce clot within one hour. The negative control should produce no fibrin clot.

Materials use

The materials and methodology used in this research study in relation to bacteriological qualities of laboratory test observation were samples containers labelled appropriately according to the brand of locally produced brewed drinks and locations of collection, they were placed into a polythene bag and conveyed in an ice packed cooler to the University of Calabar laboratory. The analysis was done within two hours of collections at different days whenever the brewed drinks were brought from the hawkers.

The materials used in this research study to analyze the locally produced brewed drinks as they were collected from the source of purchase each day were:

Reagent: The reagents used by the researcher were pepton water, crystal violet, (primary stain), modant (Lugo's iodine), aceton (decolorizer), and carbon fushin (counter stain).

Apparatus: the researcher used the following apparatus in carrying out the study and testing: Sterilize sample containers, wine loop petris dishes, pasture pipette, cover slips, test tubes, sterile boxes, glass slide, gloves, cotton wool distilled water, macconkey agar, nutrient agar and locally produced brewed milk drinks of soymilk, kunu milk, tiger nut milk and zobo milk.

Equipment: the researcher make use of the following equipment. They were Autoclave, hot air oven, Bunsen burner, microscope and incubator.

Sampling technique and sample size

To ensure representativeness of the population in the sample selection, multi-purpose sampling approaches were adopted. The hawkers of the locally produced brewed drinks were monitored at Watt market, Atakpa market, Mbukpa market, Anantigha Slaughter market and Nsidung beach market over a period of one month on daily basis. Ten hawkers met at Watt market, four hawkers at Atakpa street market, five hawkers at Mbukpa market, five hawkers at Anantigha Slaughter market and five hawkers at Nsidung beach market. In Watt market, three of them sells soymilk drinks, two sells kunu milk drinks, two sells tiger nuts milk drinks and three hawkers sells zobo milk drinks. At Atakpa street market, one hawker each sells soymilk drink, kunu milk drink, tiger nut milk and zobo milk drink. At Mbukpa market one hawker sells soymilk, kunu milk, zobo milks respectively and two hawkers sells tiger nut milk drink. At Anantigha Slaughter market, two hawkers sells soy milk drink while one hawkers each sells kunu milk, tiger nut milk and zobo milk drinks respectively and at Nsidung beach market one hawker each sells soy milk, kunu milk, tiger nut milk and two hawkers sells zobo milk drink.

The total sampling of those selling locally produced brewed drinks were Twenty-nine (29) randomly selected from five daily markets in Calabar South Local Government Area of Cross River State and their products were equally bought by the researcher for laboratory testing.

See Table 1 for distribution of hawkers in the sampled markets.

Table 1: Distribution of hawkers in the sampled markets

S/N	Name of markets	Names of locally produced brewed drinks	No. of hawkers sample used
1.	Watt market	Soymilk	3
		Kunu milk	2
		Tiger nut milk	2
		Zobo milk	3
		Total	10
2.	Atakpa market	Soy milk	1
		Kunu milk	1
		Tiger nut milk	1
		Zobo milk	1
		Total	4
3.	Mbukpa market	Soy milk	1
		Kunu milk	1
		Tiger nut milk	1
		Zobo milk	2
		Total	5
4.	Anantigha slaughter market	Soy milk	2

		Kunu milk	1
		Tiger nut milk	1
		Zobo milk	1
		Total	5
5.	Nsidung beach market	Soy milk	1
		Kunu milk	1
		Tiger nut milk	1
		Zobo milk	2
		Total	5
		Grand total	29

Source: Field work, (2023).

Results

Research Hypotheses

The following research hypotheses were posed to give directions to the study:

I. Income of hawkers' empowerment do not significantly lead to staphylococcus aureus bacterial effect in soymilk, tigernut milk, zobo milk and kunu milk locally produced brewed drinks.
II. Level of training obtained in processing do not significantly lead to staphylococcus aureus bacterial effect in soymilk, tiger nut milk, zobo milk and kunu milk locally produced brewed drinks.

Hypotheses were posited to be tested to provide solution on the problem of this study. Each hypothesis was tested using observation test in the laboratory and simple percentage analysis. Hypotheses testing for socio- economic factors of hawkers are presented in table 2 and table 3 using simple percentage analyses.

Ho1:

Incomes of hawkers' empowerment do not significantly lead to staphylococcus aureus bacterial effect in soymilk, tiger nut milk, zobo milk and kunu milk locally produced brewed drinks.

The independent variable is income of hawkers' empowerment, while the dependent variable is staphylococcus aureus bacterial effect in soymilk, tiger nut milk, zobo milk and kunu milk locally produced brewed drinks. To test the income of hawkers' empowerment, the result is presented in Table 2.

Table 2: Income of Hawkers Empowerment and Staphylococcus Aureus Effect

Variables	Yes		No		Total
	SA	A	D	SD	
Extra income from other sources for production lead to staphylococcus aureus control	20	7	1	1	
Total	27		2		29

Analysis in table 2 indicated that 27 respondents' hawkers in the five markets that sells locally produced brewed drinks affirmed and upheld that extra income from other sources put into production lead to staphylococcus aureus control while 2 hawkers rejected the variables. This prove that 27 of the hawkers out of 29 used as sampled is of the majority and it then means that using extra income from other sources to support production lead to staphylococcus aureus control.

Ho2:

Level of training obtained in processing do not significantly lead to staphylococcus aureus bacterial effect in soymilk, tiger nut milk, zobo milk and kunu milk locally produced brewed drinks.

The independent variable is level of training obtained in processing, while dependent variable is staphylococcus aureus bacterial effect in soymilk, tiger nut milk, zobo milk and kunu milk locally produced brewed drinks. To test the level of training obtained in processing, the result is presented in Table 3.

Table 3: Level of Training Obtained and Staphylococcus Aureus Effect

Variable	Yes		No		Total
	SA	A	D	SD	
Level of training obtained on production lead to staphylococcus aureus control	19	6	2	2	
Total	25		4		29

Analysis in table 3 indicted that 25 respondents' hawkers in five markets that sells locally produced brewed drinks affirmed and upheld that training in the aspect of production obtained lead to staphylococcus aureus control while 4 hawkers rejected the variable. This prove that 25 of the hawkers out of 29 used as sampled is of the majority and it then means that receiving expertise training in production lead to staphylococcus aureus control.

Analysis of Microbial and Bacteriological Effect

Analysis of microbial and bacteriological effect of locally produced brewed drinks is presented in this section using observation test in the laboratory and a simple percentages summary form.

Table 4: Results of staphylococcus isolated from locally prepared brewed drinks sold in Watt market

Locally prepared brewed drinks	No. of positive effect	No. of negative effect
Soymilk	+ 4%	-96%
Kunu milk	+31%	-69%
Tiger nut milk	+20%	-80%
Zobo milk	+15%	-85%

Analysis in table 4 indicated that soymilk drinks had +4% positive staphylococcus aureus effect and -96% negative effect, kunu milk drinks had +31% positive effect and -69% negative effect, tiger nut milk drinks had +20% positive effect and -80% negative effect and zobo milk drinks had +15 positive effect and -85% negative effect over 100% test rate respectively. The summary of the analysis shows that staphylococcus aureus effect growth in each of the milk drinks is not significantly high but low. High growth rate of microbial and bacterial effect in milk drinks affect the health of consumers.

Table 5: Results of staphylococcus aureus isolated from locally prepared brewed drinks sold in Atakpa market

Locally prepared brewed drinks	No. of positive effect	No. of negative effect
Soymilk	+3%	-97%
Kunu milk	+8%	-92%
Tiger nut milk	+4%	-96%
Zobo milk	+8%	-92%

Analysis in table 5 indicated that soymilk drinks had +3% positive staphylococcus aureus effect and -92% negative effect, kunu milk drinks had +8% positive effect and -96% negative effect, tiger nut milk drinks had +4% positive effect and -96% negative effect and zobo milk drinks had +8% positive effect and -92% negative effect over 100% test rate respectively. The summary of the analysis shows that staphylococcus aureus effect growth in each of the milk drinks is not significantly high but low. High growth rate of microbial and bacterial effect in milk drinks affect the health of consumers.

Table 6: Results of staphylococcus isolated from locally prepared brewed drinks sold in Mbukpa Market

Locally prepared brewed drinks	No. of positive effect	No. of negative effect
Soymilk	+10%	-90%
Kunu milk	+20%	-80%
Tiger nut milk	+8%	-92%
Zobo milk	+12%	-88%

Analysis in table 6 indicated that soymilk drinks had +10% positive staphylococcus aureus effect and -90% negative effect, kunu milk drinks had +20% positive effect and -80% negative effect, tiger nut milk drinks had +8% positive effect and -92% negative effect and zobo milk drinks had +12% positive effect and -88% negative effect over 100% test rate respectively. The summary of the analysis shows that staphylococcus aureus effect growth in each of the milk drinks is not significantly high low. High growth of microbial and bacterial effect in milk drinks affect the health of consumers.

Table 7: Result of staphylococcus isolated from locally prepared brewed drinks sold at Anantigha slaughter Market.

Locally prepared brewed drinks	No. of positive effect	No. of negative effect
Soymilk	+14%	-86%
kunu milk	+12%	-88%
Tiger nut mlik	+4%	-96%
Zobomilk	+2%	-98%

Analysis in table 7 indicated that soymilk drinks had +14% positive staphylococcus aureus effect and -86% negative effect, kunu milk drinks had +12% positive effect and -88% negative effect, tiger nut milk drinks had +4% positive effect and -96% negative effect and zobo milk drinks had +2% positive effect and -98% negative effect over 100% test rate respectively. The summary of the analysis shows that staphylococcus aureus effect growth in each of the milk drinks is not significantly high but low. High growth rate of microbial and bacterial effect in milk drinks affect the health of consumers.

Table 8: Results of staphylococcus isolated from locally prepared brewed drinks sold at Nsidung beach Market.

Locally prepared brewed drinks	No. of positive effect	No. of negative effect
Soymilk	+6%	-94%
Kunu milk	+14%	-86%
Tiger nut milk	+2%	-98%
Zobo milk	+10%	-90%

Analysis in table 8 indicated that soymilk drinks had +6% positive staphylococcus aureus effect and -94% negative effect, kunu milk drinks had +14% positive effect and -86% negative effect, tiger nut milk drinks had +2% positive effect and -98% negative effect and zobo milk drinks had +10% positive effect and -90% negative effect over 100% test rate respectively. The summary of the analysis shows that staphylococcus aureus effect growth in each of the milk drinks is not significantly high but low. High growth rate of microbial and bacterial effect in milk drinks affect the health of consumers.

Discussions

The findings of hypothesis 1 showed that there existed a positive influence of income of hawker's empowerment and staphylococcus aureus effect in locally produced brewed milk drinks sold to consumers. The findings in this research study proves that 27 of the respondents hawkers out of 29 used as sampled affirmed and upheld that extra income from other sources put into production lead to staphylococcus aureus control in that more finances has been a contributory factor for the purchase of utensils and other materials.

The findings corroborate the assertion of McKinney (2021) that bacterial present in locally brewed drinks is contacted through poorly washed nuts, leaves, seeds, legumes and dust, use of dirty utensils, dirty hands and dirty environment, pests and rodents. Failure to acquire and purchase utensils to cover the brewed drinks while the production is in process can lead to microbes and bacteria from flies, rodents, cockroaches dust infection among others that attack the drinks. Literature reviewed and findings done about socio-economic factor of hawkers and bacteriological effect on locally produced brewed drinks sold at the market has not produced contrary reports in relation to the fact that observatory test done in the laboratory has shown that staphylococcus aureus effect growth in the brewed drinks is not significantly high because high growth rate of microbial and bacterial effect in milk drinks affect the health of consumers. The results of hypothesis 2 showed that there existed a positive influence of level of training obtained in processing and staphylococcus aureus bacterial effect in soya milk, tiger nut milk, zobo milk and kunu milk drinks. This assertions are results of the findings in this study, in that 25 hawkers out of 29 hawkers used as respondents sampled affirmed and upheld that receiving training on how to produced locally brewed drinks enable the producer and seller to know the necessary materials of nuts, grains, legumes, leaves and seeds, material, and utensils to be used

and how and when to use them including maintaining an hygienic environment in production processes.

These findings have support from other researchers such as William (2021) who noted that anybody that want to produced locally brewed drinks should obtain training on how to prepared them so that they know the processes, utensils and all that is involved in the production of locally produced brewed drinks. Training on the production processes enables producers and sellers to maintain hygienic situation.It has been discovered in this study that staphylococcus aureus effect growth in locally produced milk drinks is significantly low. High growth rate of microbial and bacterial effect in milk drinks affect the health of consumers.

Conclusions

The findings of this study showed that staphylococcus aureus effect growth in soymilk, tiger nut milk, zobo milk and kunu milk locally produced brewed drinks is not significantly high but low. The positive effect of microbial and bacterial effect in each of the drinks tested in the laboratory was not significantly high. The low negative effect of bacterial infection in the drinks has leads to healthy nutritious and portentous gain by the consumers.

Due to the findings discovered in this study, it is paramount for those producing locally produced brewed drinks for sells and consumption to involve the use of extra income to put into the business because the little profit gain from the production to consumption is minimal. Having extra source of income to put into the business will help in buying utensils and all what is needed to make a sustainably production. The hawkers and producers should also received training on how to produced the drinks and all that is involved and in maintaining a healthy and hygienic environment.

Recommendations

Based on the findings of the study, the following recommendations are made;

i. More and extra income should be employed into production of locally produced brewed drinks in order to buy adequate materials and utensils that aids in sustainably productions.
ii. Those producing and hawking locally produced brewed drinks should received adequate training so that they would know all what is needed to produce the drinks that maintain healthy living to the consumers. Knowledge gained in training will aid in practicing habits by producers, hawkers that controlled bacterial infection in the drinks.
iii. Agencies responsible for regulating the production and hawking of locally produced brewed drinks should carry out effective monitory and sanction those who refused to practice hygienic and healthy standard.
iv. Government agencies should make the levy or rate paid by hawkers and producers of locally produced brewed drinks to be minimal so that they can produce drinks that meet up hygienic and health standard. Those exorbitant levies collected from them can be added to the production.

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