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DEPARTMENT OF FOOD AND NUTRITION

Details of students of Food and Nutrition (Honours) who completed projects on the following topics in 2022-2023
Total number of students = 04 (Four)
Semester: V

SL NO.	NAME OF THE STUDENTS	PAPER	UNIVERSITY ROLL NO.	UNIVERSITY REGISTRATION NO.	TOPIC OF PROJECT WORK
1	SRIPARNA CHOWDHURY	DSE B1	203056-11-0024	056-1211-0121-20	A SURVEY ON THE DOMINANCE OF FOOD ADDITIVES AMONG COLLEGE STUDENTS
2	SOHINI HALDER	DSE B1	203056-11-0026	056-1211-0123-20	SURVEY OF KNOWLEDGE ABOUT HAZARD ANALYSIS CRITICAL CONTROL POINT (HACCP) AMONG COLLEGE STUDENTS
3	ANKANA BERA	DSE B1	203056-11-0072	056-1214-0129-20	A SURVEY ON THE KNOWLEDGE OF FOOD SAFETY AMONG SCHOOL STUDENTS
4	SHOEMAIY A KHATUN	DSE B1	203056-11-0076	056-1215-0096-20	DETECTION OF METANIL YELLOW IN SOME COMMONLY AVAILABLE FOODS LIKE TURMERIC POWDER, LADDU, AMRITI

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A SURVEY ON THE DOMINANCE OF FOOD ADDITIVES AMONG COLLEGE STUDENTS

UNIVERSITY ROLL NUMBER: 203056-11-0024
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FOOD SAFETY & QUALITY CONTROL

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SEMESTER: V
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ACKNOWLEDGEMENT

This is a survey **'On the Dominance of Food Additives among the College students'**, which was a compulsory requirement for the partial fulfillment of my graduation course.

I would like to acknowledge and give my warmest thanks to our respected teacher **Dr. Bidisha Maity**, who gave me the opportunity to work on this wonderful topic. Her guidance and advice carried me through all stages of writing my project.

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INTRODUCTION

An expert committee on Food Additives, made up of representatives of FAO and WHO, has defined food additives as non-nutritive substances added intentionally to food, generally in small quantities, to improve its appearance, flavour, texture, or storage properties. [1] This definition excludes substances primarily added for enhancement of their nutritive value, such as vitamins and minerals. [1]

DEFINITION

Food Additive is defined as ***a substance or mixture of substances, other than a base foodstuff, which is present in a food as a result of any aspect of production, processing, storage, or packing***. This definition includes both intentional and unintentional additives. [1]

NEED OF FOOD ADDITIVES

The use of food additives is imperative in the complex and integrated society in which we live. Here the areas of food production are separated from the areas of consumption. [1]

- Additives have provided protection against food spoilage during storage, transportation, distribution, or processing. [1]
- With the present degree of urbanization, it would be impossible to maintain food distribution without the processing and packing with which many additives are involved. [1]
- There is a great demand nowadays for "instant", "heat and serve", and "ready-to-cook" convenient foods and additives have the major importance in this type of food industry. [1]
- It gives the food a smooth and consistent texture. [2]
- It maintains wholesomeness of foods. [2]
- These are used to control acid-base balance of foods and provide leavening. [2]
- It can also be used to improve or preserve nutritional value of the food. [2]

The major categories of food additives are discussed hereby –

Preservatives [3]

Name of Preservatives & their Properties		USES
Sodium chloride (common salt)	Stops the growth of micro organisms and interferes with the action of proteolytic enzymes.	Butter, Bread, Cheese, Cabbage, Meat, Fish
Acetic acid (Vinegar)	Bactericidal (At 5 percent mainly antibactericidal)	Pickles, Chutney, Sauces
Sodium Benzoate	Antibacterial and antifungal action in acid foods	Fruit juices, Soft drinks, Desserts
Nisin	Antibacterial	Cheese

Figure 1: Acetic acid

Figure 2: Common salt

Figure 3: Sodium benzoate

Figure 4: Nisin

Colours [3]

General function: Make food attractive [3]

NATURAL COLOURANTS AND THEIR SOURCES	
Sources	Colourants
Annotto	Bixin, Norbixin
Saffron	Crocetin, Beta-Carotene, Zeaxanthin
Algae	Red phycoerythrins, Blue Phycocyanins
Paprika extracts	Capsanthin and capsorubin
Carrot	Beta & Alpha Carotene

Some Permitted & Non-Permitted Colours under the Food Safety and Standard Act

Permitted Colours		Non-permitted Colours
Colour	Common name	
Red	Ponceau 4 R, Carmosine, Erythrosine	Rhodamine, Orange G, Amaranth, Fast red, Metanil yellow
Yellow	Tartrazine, sunset yellow F.C.F	
Blue	Indigo carmine, Brilliant Blue F.C.F	
Green	Fast Green F.C.F	

Figure 5: Paprika extracts

Figure 6: Annotto

Flavouring Agents [3]

General function: Impart or help impart a taste or aroma in food [3]

NATURAL FLAVOUR SUBSTANCES	
Spices	Herbs
Bay leave, Cumin seed, Coriander seed, Caraway seed, Chilies, Cinnamon, Cardamom, Clove, Fenugreek seeds, Garlic, Ginger, Mustard, Nutmeg & Mace, Poppy seeds, Pepper, Turmeric, Saffron	Celery, Coriander leaves, Mint leaves, Curry leaves, Parsley, Basil, Aloe Vera, Alfalfa

SOME TYPICAL SYNTHETIC FLAVOUR ADDITIVES	
Synthetic Flavours	Foods
Monosodium glutamate	Chinese foods
Amyl acetate	Banana
Methyl anthranilate	Grapes
Ethyl butyrate	Pineapple

Sweeteners [3]

RELATIVE SWEETNESS OF VARIOUS SWEETNERS		
Type		Relative sweetness (RS)
CALORIE SWEETNERS	Sucrose	1.0
	Fructose	1.2
	Glucose	0.7
	Invert sugar	0.8
	Caramel	0.9
LOW-CALORIE SWEETNERS	Sorbitol	0.5
	Mannitol	0.6
	Maltitol	0.8
	Lactitol	0.5

NON-CALORIE SWEETNERS & THEIR USES			
	Type		Uses
SYNTHETIC	Cyclamate		Tabletop sweetners
	Acesulfame K		Baked goods, Chewing gum, Soft drinks, Gelatin desserts
	Aspartame		Gelatin desserts, Low-calorie frozen desserts
	Sucralose		Beverages, Frozen dairy desserts
	Neotame		Fruit and Vegetable juices
	Saccharin		Used to sweeten Aracanut (Supari and Pan masala)
NATURAL	Non-protein	Neohesperidine DC	Isolated from citrus peels
		Steviocides	Bio-sweetner (50g stevia powder = 1000g cane sugar)
	Protein	Talin	Relative sweetness: 200000
		Thaumatin	West African fruit plant
		Brazzein	Found in fruit of native West African Oubli plant (sweetness is 1500 times greater than sucrose)

Emulsifiers & Stabilizers [3]

Guargum	Used as a Stabilizer in Ice-cream, Cake mixes, Cheese, Beverages
Papain	Stabilizer in Beer and Meat tenderizer
Lecithin	Used as an emulsifier or lubricant in infant formulas, breads, margarine etc.
Gelatin	Used for stabilizing, thickening and gel formation in jellies, gravies, cake toppings etc.

Antioxidants [3]

General function: Prevent flavor and colour changes, retard rancidity and deterioration from exposure to oxygen. [3]

Type	Name	Uses
Natural	Vitamin C(Ascorbic acid)	Fruits, Jams, Vegetables
	Vitamin E(Tocopherols)	Oils, Meat pies, Soya beans
Synthetic	BHA(Butylated hydroxyanisole)	Margarine, Cheese, Chips

Flour Improvers [3]

General function	Uses	Chemical substance
Convert protein -SH grouping into disulphide bonds	• For bleaching purposes • For dough toughening purposes	Benzoyl peroxide, Chlorine gas, ClO_2, NO_2, $KBrO_3$, KIO_3, CaO_2 &$Ca(IO_3)$

The above mentioned categories are not enough. [3] There is a large variety of compounds such as - Anticaking agents, Antimicrobial agents, Curing and pickling agents, Firming agents, Enzymes, Neutralizing agents, Chelating agents, Propellants, Aerating agents and gases, Clouding agents, Clarifying agents and some Processing aids (Acids, Acidity regulators, Humectants or Moisturizing agents, Gelling agents, Antifoaming agents) are also included under the term 'Food Additives'. [3]

UNINTENTIONAL ADDITIVES

The unintentional incorporation of any physical or chemical substances into food is as widespread as intentional addition and may present health hazards. [1] These types of source can be -

- Radio-active Fallout (^{90}Strontium causes cancer) [1]
- Agricultural Contaminants (Insecticides, Fungicides) [1]
- Animal Food Additives (Antibiotics of animal foods) [1]

World Health Organization (WHO) RESPONSE

Evaluating the health risk of food additives

WHO, in cooperation with the Food and Agriculture Organization of the United Nations (FAO), is responsible for assessing the risks to human health from food additives. [4] Risk assessment of food additives are conducted by an independent, international expert scientific group – the Joint FAO/WHO Expert Committee on Food Additives (JECFA). [4]

The starting point for determining whether a food additive can be used without having harmful effects is to establish the acceptable daily intake (ADI). [4] The ADI is an estimate of the amount of an additive in food or drinking water that can be safely consumed daily over a lifetime without adverse health effects. [4]

International standards for the safe use of food additives

The safety assessments completed by JECFA are used by the joint intergovernmental food standard-setting body of FAO and WHO, the Codex Alimentarius Commission, to establish levels for maximum use of additives in food and drinks. [4] Codex standards are the reference for national standards for consumer protection, and for the international trade in food, so that consumers everywhere can be confident that the food they eat meets the agreed standards for safety and quality, no matter where it was produced. [4]

How do I know which additives are in my food?

The Codex Alimentary Commission also establishes standards and guidelines on food labeling. [4] These standards are implemented in most countries, and food manufacturers are obliged to indicate which additives are in their products. [4] People who have allergies or sensitivities to certain food additives should check labels carefully. [4]

WHO encourages national authorities to monitor and ensure that food additives in food and drinks produced in their countries comply with permitted uses, conditions and legislation. [4] National authorities should oversee the food business, which carries the primary responsibility for ensuring that the use of a food additive is safe and complies with legislation. [4]

AIMS & OBJECTIVES

This is a survey on '**THE DOMINANCE OF FOOD ADDITIVES AMONG COLLEGE STUDENTS**', which have done for the purpose to –

- Know about the choice of students about some street foods based on the taste and appearance.
- Reveal if, the students have the proper knowledge about the usage food additives that are commonly used.
- Disclose the students' practice towards food additives.

REVIEW OF LITERATURE

SCUZS et al. (2014) conducted a cross-sectional choice based conjoint analysis of 'Food Additives and Consumer Preferences' (received at 8th April) & revealed that "preservatives" had an outstanding importance in both products' choice decisions in the analyzed countries, mainly in Hungary and Romania. [5] The presence of packaging gases had higher utility value for the Hungarian and Spanish participants in case of pre-packed cheese, and in case of cheese for Spanish and Romanian respondents. [5]

Badroonesha Aumjaud et al. (February 2014) have carried out a survey among selected consumers and manufacturers about 'Food Additive Control' on the University of Maritius campus indicated that the majority of respondents never checked food labels for additive information when making purchases. [6] A group of working consumers from the university had a poor knowledge also. [6] The in-depth interviews with food industry representatives provided evidence of manufacturers' commitment to use and control of food additives to ensure product safety and quality. [6]

Corina Aureliz Zugravu et al. (2017) conducted a pilot study on 'Attitudes towards Food Additives', which concluded that food improvement agents can be a peculiar item, since modern food relies on them. [7]

Prerna Gupta et al. (January 2021) published an article on 'Utilization of Additives with regard to Street Food' which discussed the adverse health effects of different street foods. [8]

Mona S. Hamed et al. (2020) have surveyed on the 'The Pattern of Food Additives Consumption among Preschool Children and Knowledge and Attitude of their mothers in AI Sharkia Governorate, Egypt', which concluded that a relatively large proportion of preschool children consumes plenty of foods containing food additives on a daily base, the majority of the marketed foods products contains 2-5 different food additives, there is unsatisfied public awareness regarding food additives. [9] Level of education and knowledge about food additives has a great effect on attitude towards it and the frequency of its consumption. [9]

MATERIALS & METHODS

This survey was conducted based on a questionnaire that was circulated to assess the real status of general idea about 'food additives' and acquire the knowledge of its consumption frequency in regular basis.

TYPE OF QUESTIONNAIRE:
Pre-formulated 'Self-structured Questionnaire'.

PARTICIPANTS:
Randomly selected college students and the Aims & Objectives of the study were explained thoroughly before the commencement of the survey.

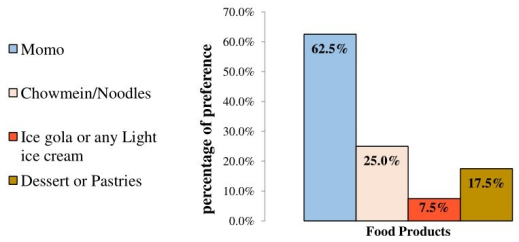
RESULT

From responses of the students, I got the following results-

1. What type of street food do you prefer most among the following?

N= 40

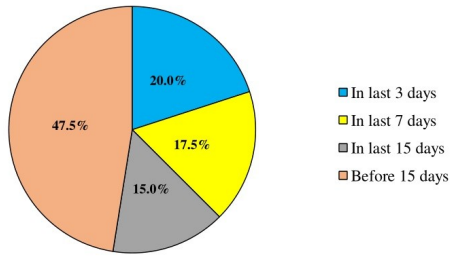
Momo **n (%)**	Chowmein / Noodles **n (%)**	Ice gola or any Light ice cream **n (%)**	Dessert or Pastries **n (%)**
25 (62.5)	10 (25.0)	3 (7.5)	7 (17.5)

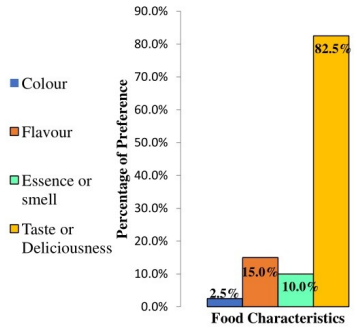


2. When have you consumed it last time?

N=40

In last 3 days **n (%)**	8 (20.0)
In last 7 days **n (%)**	7 (17.5)
In last 15 days **n (%)**	9 (15.0)
Before 15 days **n (%)**	16(47.5)





3. What character of the food attracts you more?

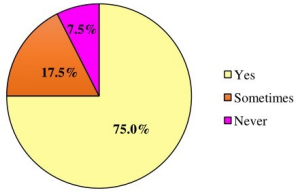
N=40

Colour **n (%)**	1 (2.5)
Flavour **n (%)**	6 (15.0)
Essence or Smell **n (%)**	4 (10.0)
Taste or Deliciousness **n (%)**	33 (82.5)

4. Do you ever hear about the term 'Food Additives'?

N=40

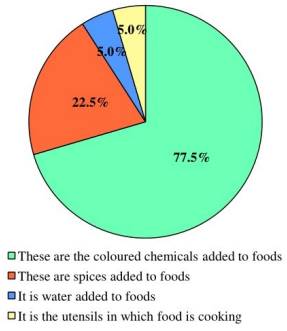
Yes **n (%)**	Sometimes **n (%)**	Never **n (%)**
30 (75.0)	7 (17.5)	3 (7.5)



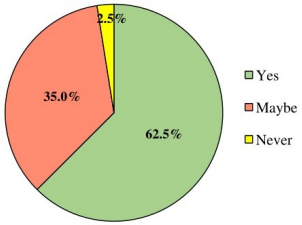
5. What 'Food Additives' may be as per your knowledge?

N=40

These are the coloured chemicals added to foods **n (%)**	31 (77.5)
These are spices added to foods **n (%)**	9 (22.5)
It is water added to foods **n (%)**	2 (5.0)
It is utensils in which it is cooking **n (%)**	2 (5.0)



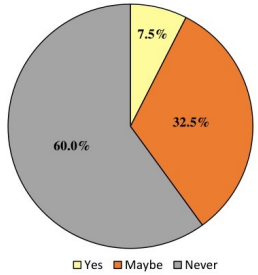
6. **Do you think is it possible that the food, which you have mentioned as your preference, may contain any kind of non-nutritional additive?**



N=40

Yes **n (%)**	25 (62.5)
Maybe **n (%)**	14 (35.0)
Never **n (%)**	1 (2.5)

7. **Do you think the colour or flavour or essence or taste that makes you grab the food immediately is health friendly?**



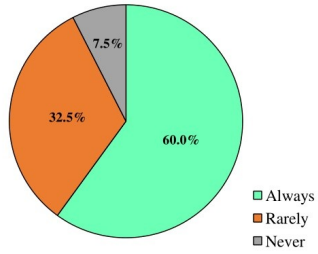
N=40

Yes **n(%)**	3 (7.5)
Maybe **n(%)**	13 (32.5)
Never **n (%)**	24(60.0)

8. **Will you approve the food if it is prepared in home without the additives and in general absence of that too much exciting taste, flavour or essence?**

N=40

Always **n (%)**	24 (60.0)
Rarely **n (%)**	13 (32.5)
Never **n (%)**	3 (7.5)



DISCUSSION

The above outcomes were found after the survey among college students and according to it -

- ⇒ They prefer momo more than the other food item mentioned (Chowmein / Noodles, Ice gola or any Light ice cream, Desserts / Pastries) and this is because it was delicious for them.
- ⇒ Major proportion of students had a rough but correct idea about food additives, its uses & any harmful effects it can cause.
- ⇒ Though the students like street foods the the consumption frequency was not so high.
- ⇒ Maximum students were ready to consume the food item if it is prepared at home.

CONCLUSION

The survey has ultimately revealed a high willingness of college students to engulf street foods mainly due to their deliciousness which makes them delighted. They had enough knowledge about the existence of unnatural food additives among the dishes they generally consume in street at their busy schedule to fulfill instant hunger. Most students were mentioned additive as coloured compound though they were unknown about the existence of other forms of additives. As they have not much idea about permitted and non-permitted additives, they have to be more aware about it.

A portion of the responded students were much infrequent about street food consumption which I will like to mark as an effect of the current post-pandemic awareness. Major group of students were ready to consume the same food in homemade recipe in absence of the additives. These can be a step of progressive mentality towards physical well-being of the whole young generation.

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APPENDIX I

A SURVEY ON THE DOMINANCE OF FOOD ADDITIVES AMONG COLLEGE STUDENTS

QUESTIONNAIRE

1. Full Name

_____

2. Your Age

_____

3. Educational Qualification

_____

4. What type of street food do you prefer most among the following?

☐ Momo
☐ Chowmein / Noodles
☐ Ice gola or any Light Ice cream
☐ Dessert or Pastries

5. When have you consumed it last time?

○ In last 3 days
○ In last 7 days
○ In last 15 days
○ Before 15 days

6. What character of the food attracts you more?

☐ Colour
☐ Flavour
☐ Essence or Smell
☐ Taste or Deliciousness

7. Do you ever hear about the term 'Food Additives'?

○ Yes
○ Sometimes
○ Never

8. What 'Food Additives' may be as per your knowledge?

☐ These are the coloured chemicals added to foods
☐ These are spices added to foods
☐ It is water added to foods
☐ It is the utensils in which food is cooking

9. Do you think is it possible that the food, which you have mentioned as your preference, may contain any kind of non-nutritional additive?

◯ Yes
◯ Maybe
◯ Never

10. Do you think the colour or flavour or essence or taste that makes you grab the food immediately is health friendly?

◯ Yes
◯ Maybe
◯ Never

11. Will you approve the food if it is prepared in home without the additives and in general absence of that too much exciting taste, flavour or essence?

◯ Always
◯ Rarely
◯ Never

Survey of Knowledge about Hazard Analysis Critical Control Point (HACCP) among College Students

University Roll Number:203056-11-0026

University Registration Number:056-1211-0123-20

Paper Code : DSE B 1
FOOD SAFETY & QUALITY CONTROL
FOOD & NUTRITION (HONOURS)
Semester : V
YEAR : 2022-2023

Introduction

Hazard Analysis Critical Control Point (HACCP) is a scientific and systematic approach to identify, assess and control of hazards in the food production process. HACCP works on critical point (CCPs), which if controlled can eliminate health risks. [1]

Origin : HACCP system on food safety was developed jointly by the Pillsbury Company, the United States Natick Laboratories and the National Aeronautics and Space Administration in 1974.[2]

Needs for HACCP :

- **New challenges e.g. the most important challenge is the increasing number of new food pathogens.**[2]
- **There also in increasing public health concern about chemical contamination of food.**[2]
- **Another important factor is that the size of the food industry and the diversity of products and processes have a grown tremendously.**[2]
- **The need of HACCP in the United States (U.S.) particularly in the seafood and juice industries.** [2]

Principles of Hazard Analysis and Critical Control Point (HACCP) System :

In order to enhance food safety, every stage of the food production (from purchasing , receiving, transportation , storage , preparation , handling, cooking to serving)should be carried out and monitored thoroughly.[1]

There are 7 principles in HACCP System.[1]

7 PRINCIPLES OF HACCP

1.Analysis Hazards.

2.Determine critical control points.

3.Establish limits for critical control points.

4.Establish monitoring procedures for critical control points.

5.Establish corrective actions.

6.Establish verification procedures.

7.Establish a record system.

Advantages of HACCP

- HACCP aims to evaluate and monitor the whole food processing.
- HACCP conduct hazard identification.
- Addresses challenges with food safety.
- HACCP system is used to prevent unsafe food items from reaching consumers.
- Improve control to production process.
- Business liability protection.[3]

Objectives of this Survey

This is a “Survey of knowledge about Hazard Analysis Critical Control Point (HACCP) among college students ; which have done for the purposes to –

❖Know about their knowledge about HACCP.

Review of Litteratures

Italo F Angelillo et. al. (2001) conducted a survey on "HACCP and food hygiene in hospitals knowledge, attitudes, and practices of food-service staff" at Calabria in Italy. This survey concludes that full implementation of the HACCP system and infection control policies in hospital food services is needed.[4]

Mehrdad Askarian et. al. (2004) conducted a survey on "Knowledge, attitudes, and practices of food-service staff regarding food hygiene" at Shiraz in Iran. This survey concluded that there is a dire need for education and increased awarness among food service staff regarding safe food handling practices.[5]

Wen-Hwa ko et. al. (2013) conducted a survey on “The relationship among food safety knowledge, attitudes, and self-reported HACCP practices” in restuarent employees in Taiwan. This study found correlation among knowledge,attitude and HACCP practices, with attitude mediating the relationship between knowledge and HACCP practices. [6]

Md Jahid Hasan et. al. (2022) conducted a survey on “Structural modeling to understand the relationship among food safety knowledge, attitude, and self-reported HACCP practices” in restuarent employees in Bangladesh. This study demonstrated that restuarent employees in Bangladesh ofteb lack knowledge regarding food safety and HACCP. So, in order to improve knowledge and attitude on safe HACCP practice among the restuarent employees, proper education and interactive training sessions can be conducted. [7]

Materials & Methods

(this survey was conducted based on a questionnaire.)

- **Types of questionnaire : Pre-formed "Self-structured Questionnaire"**

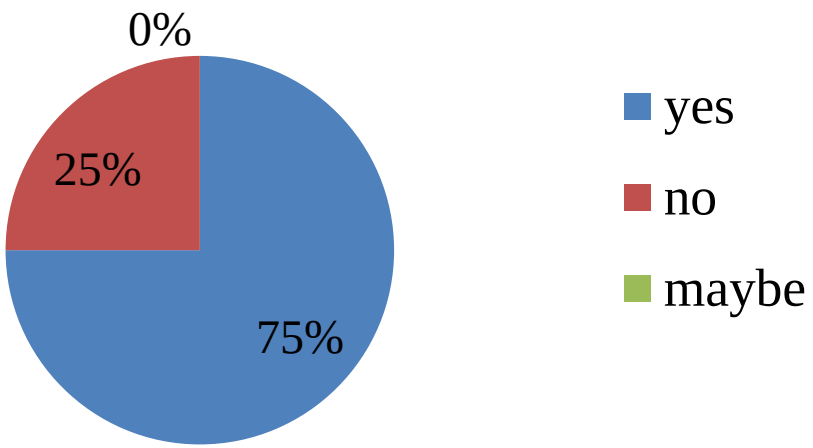
- **Participants : Randomly selected college students.**

Result

1.Did you hear the term “HACCP” ?

N =40.

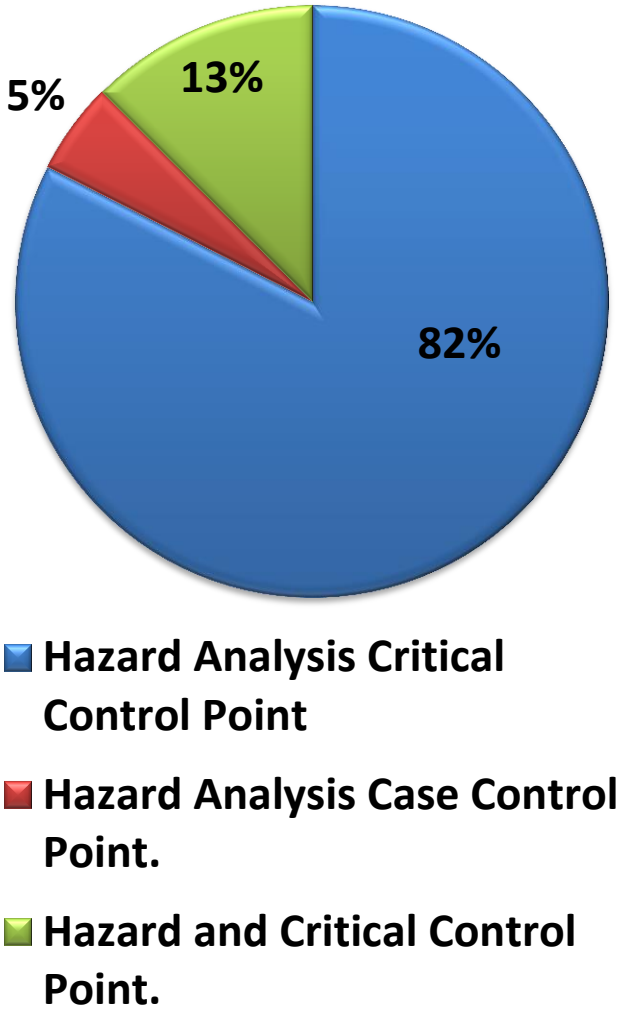
Yes N(%)	No N(%)	Maybe N(%)
30(75%)	10(25%)	0



2.What is the full form of HACCP?

N =40

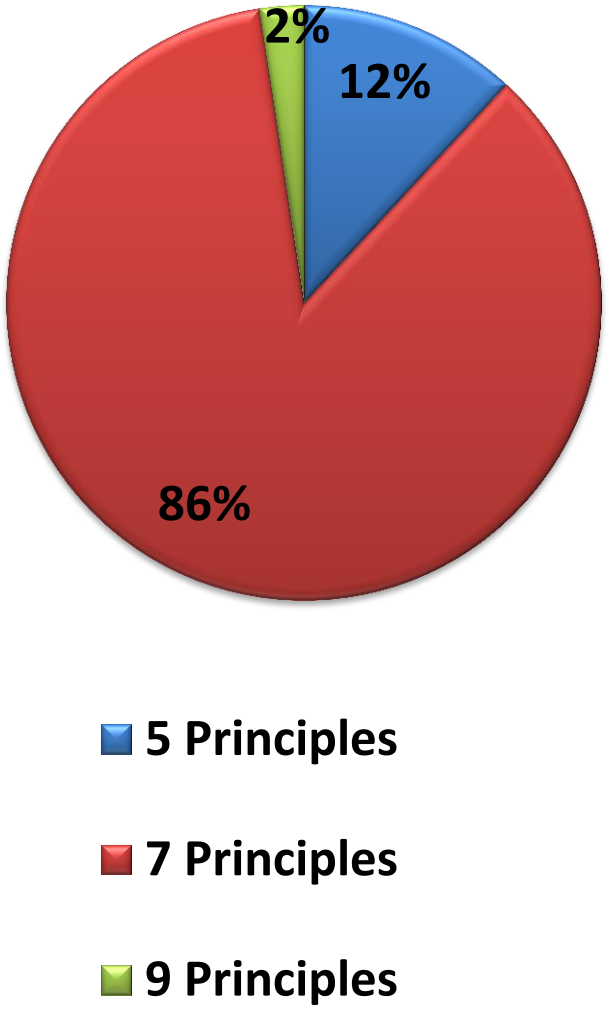
Hazard Analysis Critical Control Point N (%)	Hazard Analysis Case Control Point. N (%)	Hazard and Critical Control Point .N (%)
33(82.5%)	2(5%)	5. (12.5%)



3.How many principles are there in HACCP ?

N =40

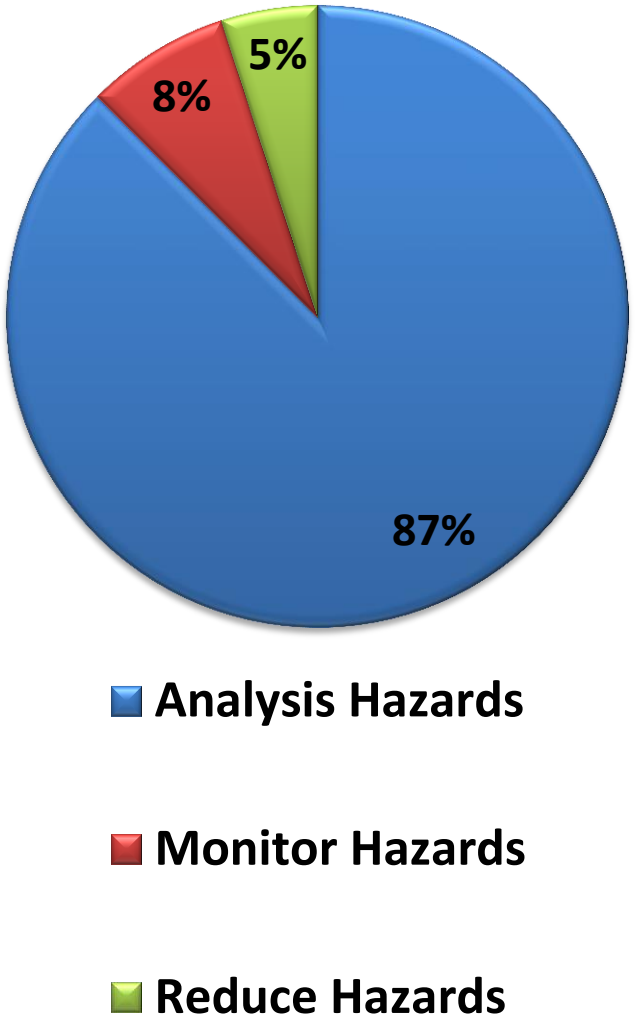
5 Principles N(%)	7 Principles N(%)	9 Principles N(%)
5 (12.5%)	36 (90%)	1 (2.5%)



4.Is the following statement is a principle of HACCP ?

N =40

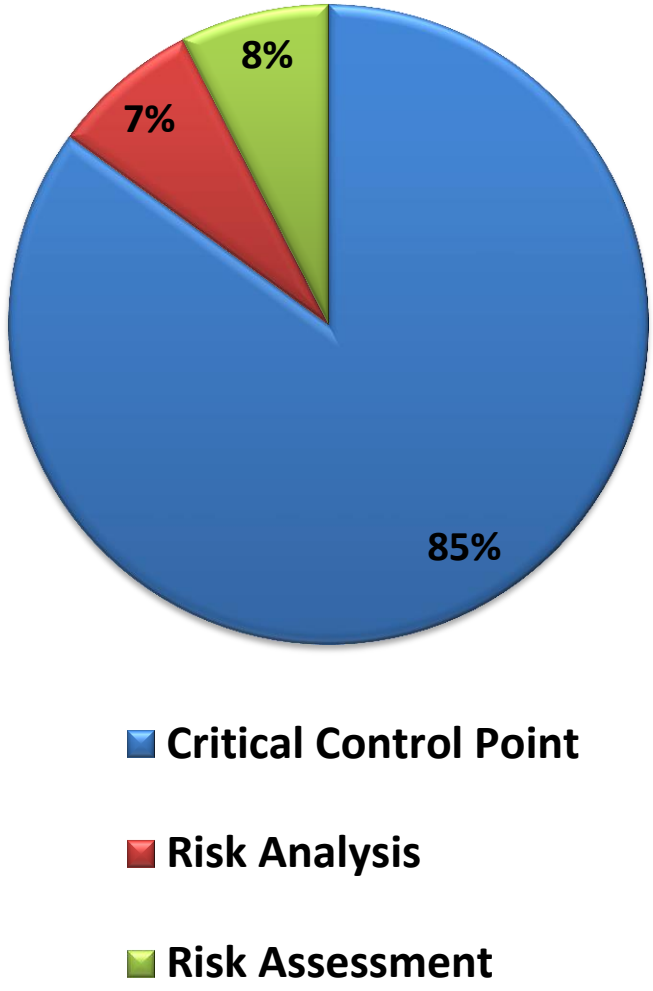
Analysis Hazards N (%)	Monitor Hazards N (%)	Reduce Hazards N (%)
35 (87.5%)	3 (7.5%)	2 (5%)



5.HACCP works on –

N =40

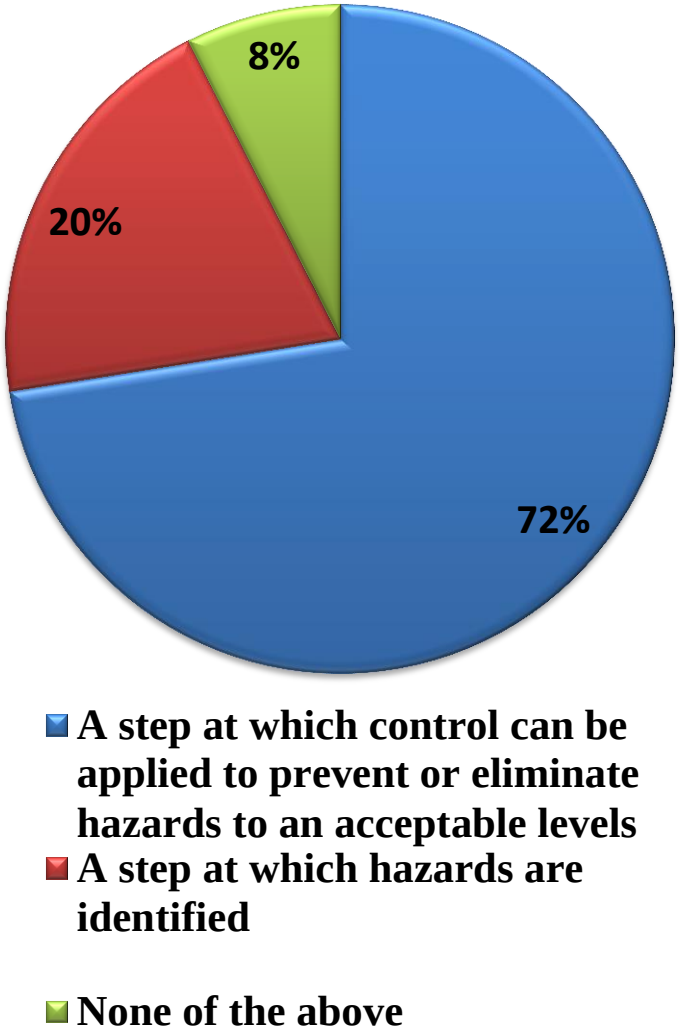
Critical Control Point N (%)	Risk Analysis N(%)	Risk Asssessment N(%)	
34 (85%)	3 (7.5%)	3 (7.5%)	



6.What is Critical Control Point ?

N =40

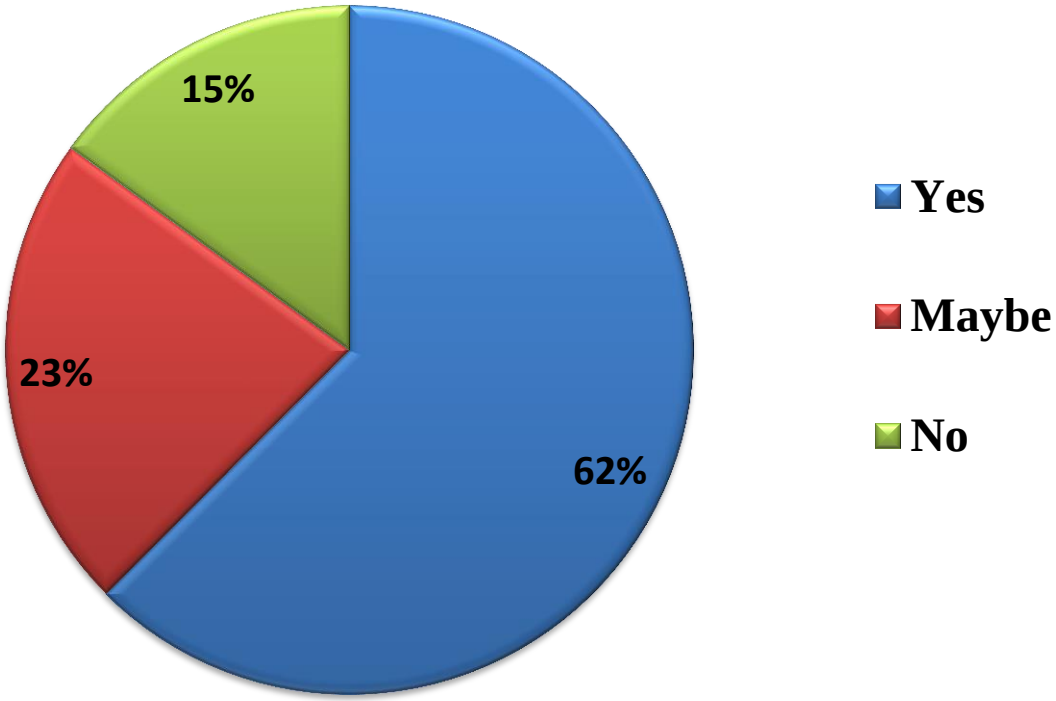
A step at which control can be applied to prevent or eliminate hazards to an acceptable levels N (%)	A step at which hazards are identified N(%)	None of the above N(%)
29 (72.5%)	8 (20%)	3 (7.5%)



7.Is cooking a Critical Control Point ?

N =40

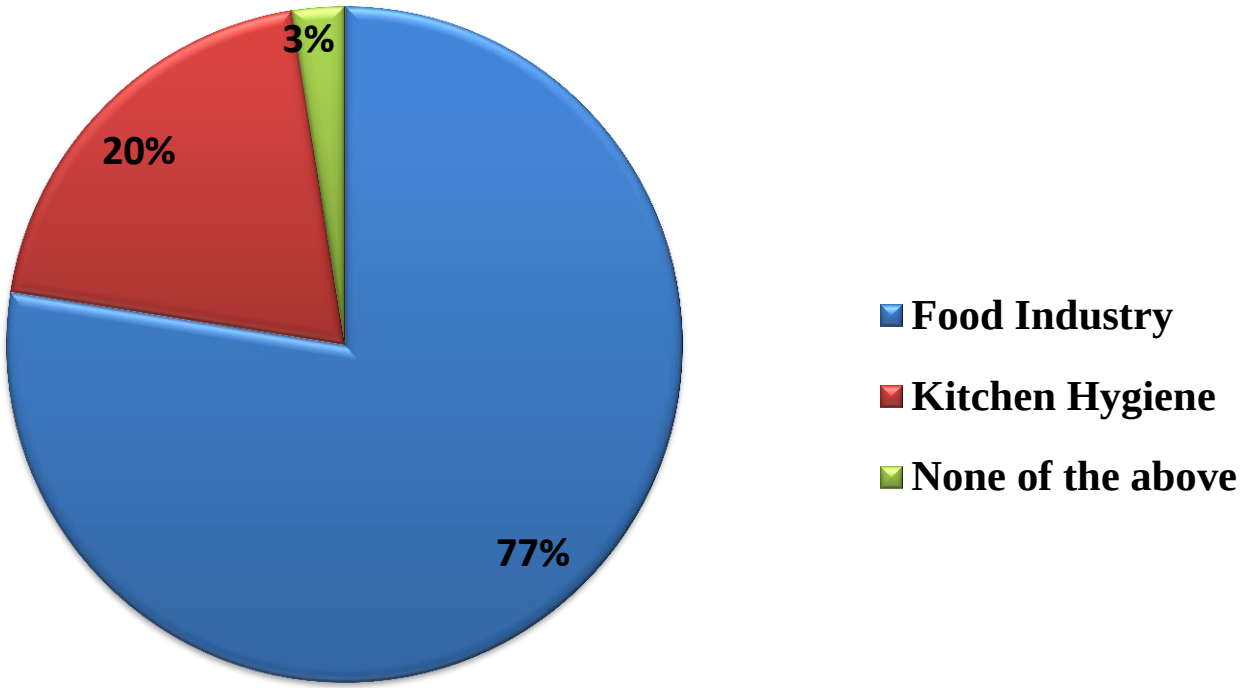
Yes N (%)	Maybe N (%)	No N(%)
25 (62.5%)	9 (22.5%)	6 (15%)



8.HACCP is beneficial to-

N =40

Food Industry N(%)	KitchenHygieneN (%)	None of the above
31(77.5%)	8(20%)	1(2.5%)



Discussion

The above outcomes were found after the survey among college students and according to it :

•Only 75% of total 40 responses hear the term “HACCP” ..

•82.5% of total 40 responses know the correct full-form of the term “HACCP” . This is a quite good indicator which reflects their basic knowledge about HACCP.

•90% of total 40 responses know the total number of principles of HACCP. A positive knowledge towards this question was reported by the great majority.

• 87.5% of total 40 responses can recognize the correct principle among 3 statements.

•85% of total 40 responses know the correct area on which HACCP works.

• 72.5% of total 40 responses can correctly define the critical point.

•Only 62.5% of total 40 responses can consider cooking as a critical control point where as 15% of 40 responses deny it totally and the rest of participants (22.5%) were no sure about it.

•Only 77.5% of total 40 responses know the correct area for which HACCP is beneficial .

Conclusion

This survey was conducted to determine the knowledge about Hazard Analysis Critical Control Point (HACCP) among college students. The knowledge level of College students on HACCP was quite good. This survey report reflects their positive knowledge towards HACCP.

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Thank You

DETECTION OF METANIL YELLOW IN SOME COMMONLY AVAILABLE FOOD LIKE TURMARIC POWDER, LADDU, AMRITI

UNIVERSITY ROLL NUMBER : 203056-11-0076

REGISTRATION NUMBER : 056-1215-0096-20

Paper Code : DSE B 1

FOOD SAFETY & QUALITY CONTROL

FOOD & NUTRITION HONOURS

SEMESTER : V

YEAR : 2022-2023

ACKNOWLEDGEMENT

This is a experiment '**On the detection of metanil yellow in some commonly available food like turmeric powder , laddu , amriti'**, which was a compulsory requirement for the partial fulfillment of my graduation course.

I am grateful to Almighty for giving me the strength to successfully conduct my experiment and for sustaining my efforts which many a times did oscillate.

I am deeply indebted to our respected teacher ***Dr. Bidisha Maity*** ,without whose constructive feedback this project would not have been a success. The valuable advice and suggestions for the corrections, modification and improvement did enhance the perfection in My project .

Words cannot express my gratitude to the other teachers of our department for their valuable comments and suggestions.

TABLE OF CONTENTS

INTRODUCTION

Food adulteration refers to the act of intentionally debasing the quality of food by either adding or replacing the food substances with undeclared alternative components, or by the removal of some valuable components. This is usually done to lower the cost or increase the bulk of a given food product.

Adulteration or contamination of natural food products is one of the major challenges in today's society. Despite various actions and penalties, the practice of adding adulterant is quite common in developing countries. There are various methods used for adulterating natural products.

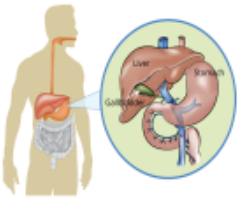
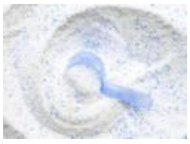
- **TYPE OF ADULTERANTS :** Adulteration may be intentional or unintentional .The former is a willful act on the part of the adulterator intended contamination is usually due to ignorance, negligence or lack of proper facilities

- **Intentional adulteration** :-The adulterants are added as a deliberate act with intention to increase profit .
  E.X-Sand, marble chips, stones ,chalk powder etc.

- **Incidental Adulteration:-**Adulterants are found in food due to negligence, ignorance or lack of proper facilities.
  E.X-Packaging hazards like larva of insects, droppings, pesticide residues etc.

- **Metallic Adulterantion:-** When the metallic substances are added intentionally or accidentally.
  E.X-arsenic , pesticides, lead from water , mercy from effluents, tins from ,cans, etc .

- **Health Hazards :-** Health hazards are chemical , physical or biological factors in our environment that can have negative impacts on our short -or-long term health.

ADULTERATION OF FOOD		
FOOD ARTICAL	**ADULTERANT**	**HARMFUL EFFECT**
Turmeric Powder & Sweets 	Metanil yellow 	Highly Carcinogenic
Honey 	Molasses and sugar 	stomach disorders 
Oil seeds 	Argemone seeds 	epidemic dropsy severe glaucoma 
Ghee 	vegetable oil animal body fats 	anemia enlargement of heart 
Black papper 	papaya seeds 	liver disorder stomach disorder 
Milk 	sope powder  chalk powder 	cancer vomiting nausea 

AIMS AND OBJECTIVES

This is the experiment on, 'Detection of metanil yellow in some commonly available food like turmeric powder, laddu, amriti,'on our health which have done for the purpose of-

- **know the importance of uses of the branded food products.**
- **Estimate the frequency of food adulteration among the most common foods**
- **Estimate how pure food the common people are getting from the brands.**

REVIEW OF LITERATURE

Kalivas, John H. Et. Al. published on a research paper on Food analysis without laboratory prepared or determined reference food adulterant values. at 2014 and he conducted that food analysis example, synchronous fluorescence spectra of extra virgin olive oil samples adulterated with sunflower oil is used. Results are shown to be better than those obtained using ridge regression with reference calibration samples. The flexibility of PCTR allows including reference samples and is generic for use with other instrumental methods and food products.

Nasreen Tahmed Et. Al. have done a review on Food Adulteration and consumer awareness 1. at September 2014 and She conducted that the Consumers considered expiry date and quality or freshness as the best criteria while buying packaged and open food items respectively; only 11 (12%) respondents considered approval of regulatory authority for buying packaged food items. More than half of the food consumed which warrants actions by the Government, the industry, and the consumers.

Ameeta Sharma A. et. Al. Published on research paper on Food Adulteration at march 2017 and The concluded that the consumer should avoid buying food from places which do not maintain proper hygiene conditions. Both local and branded food stores should be inspected by government bodies.

MATERIALS & METHODS

- Sample – Turmeric powder
  Laddu
  Amriti

- Reagent – Alcohol
  Hydrochloric Acid (HCl)

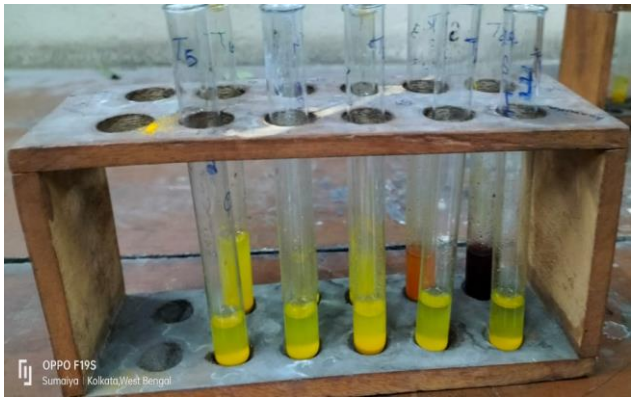
Experiment	Inference
2 Gm Of Sample (Turmeric Powder , Laddu , Amriti) Was Taken In A Test Tube . 3 Ml Of Alcohol Was Poured Into It & It Was Shaken Well . Then Few Drops Of Hydrochloric Acid Was Added To It .	The colour change(violet / pink) depicts positive result and otherwise that will be negative.

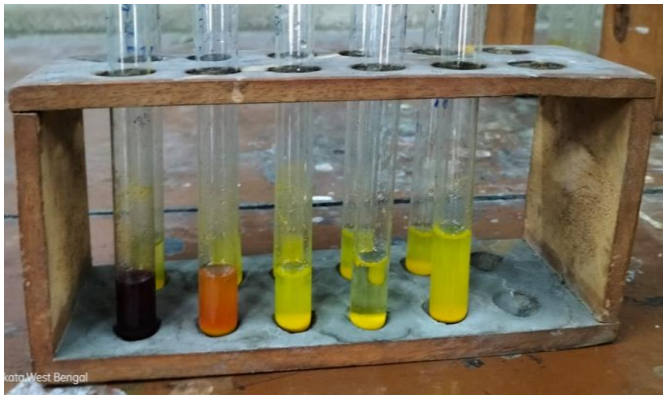
RESULT

From responses of the experiments,I got the following results :

❖ Turmeric Powder

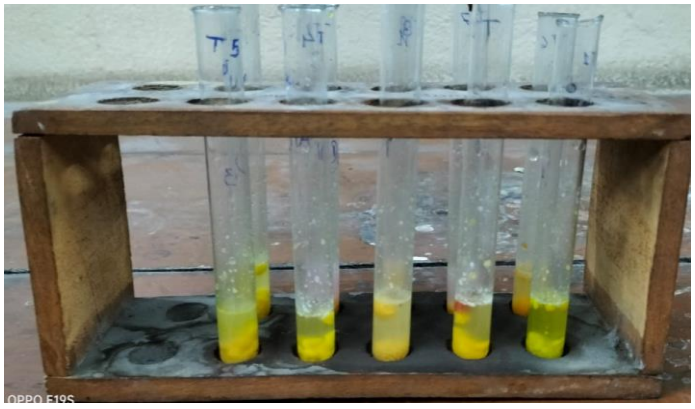
Sample	Observation	Inference
B1 (Emami healthy and tasty) 	The Pink Colour Was Not Formed	Metanil Yellow In The Sample Was Not Present
B2 (Cookme) 	The Pink Colour Was Not Formed	Metanil Yellow In The Sample Was Not Present
B3 (Sunrise) 	The Pink Colour Was Not Formed	Metanil Yellow In The Sample Was Not Present
B4 (Everest) 	The Pink Colour Was Not Formed	Metanil Yellow In The Sample Was Not Present
B5 (ASHOK) 	The Pink Colour Was Not Formed	Metanil Yellow In The Sample Was Not Present
L1 (Kiran store) 	The Pink Colour Was Not Formed	Metanil Yellow In The Sample Was Not Present
L2 (Sandhya store) 	The Pink Colour Was Not Formed	Metanil Yellow In The Sample Was Not Present
L3 (Rajlaxmi store) 	The Pink Colour Was Not Formed	Metanil Yellow In The Sample Was Not Present
L4 (Usha enterprise) 	The Pink Colour Was Not Formed	Metanil Yellow In The Sample Was Not Present
L5 (Raju enterprise) 	The Pink Colour Was Not Formed	Metanil Yellow In The Sample Was Not Present

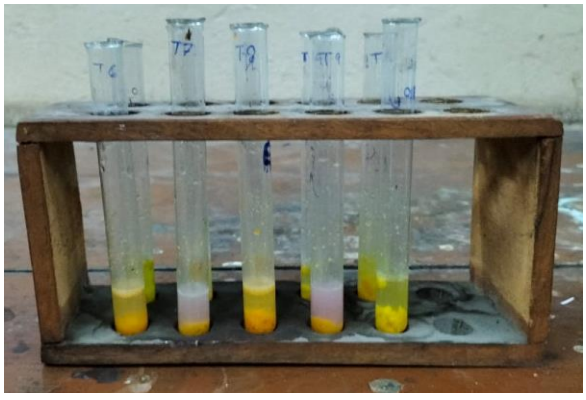




❖ Laddu :

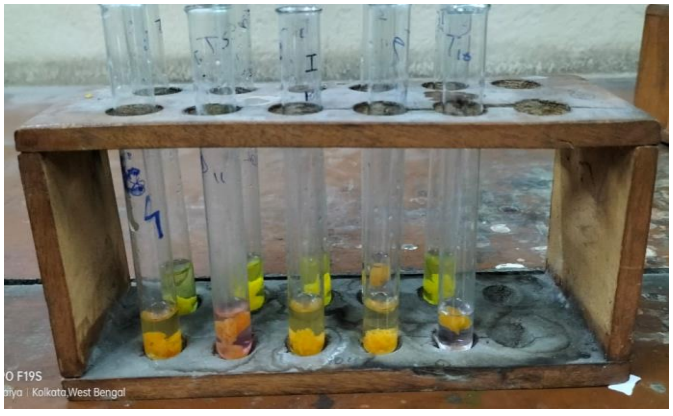
Sample	Observation	Inference
B1 (Haldiram'S) 	The Pink Colour Was Not Formed	Metanil Yellow In The Sample Was Not Present
B2 (SUGAR & SPICE LADDU) 	The Pink Colour Was Not Formed	Metanil Yellow In The Sample Was Not Present
B3 (HINDUSTAN SWEET) 	The Pink Colour Was Not Formed	Metanil Yellow In The Sample Was Not Present
B4 (Mio Amore) 	The Pink Colour Was Not Formed	Metanil Yellow In The Sample Was Not Present
B5 (Kamdhenu) 	The Pink Colour Was Not Formed	Metanil Yellow In The Sample Was Not Present
L1 (Sandhya Store) 	The Pink Colour Was Not Formed	Metanil Yellow In The Sample Was Not Present
L2 (Joynagar Moa Shop) 	The Pink Colour Was Formed	Metanil Yellow In The Sample Was Present
L3 (Appayan) 	The Pink Colour Was Not Formed	Metanil Yellow In The Sample Was Not Present
L4 (Narendra Mistanna Bhandar) 	The Pink Colour Was Formed	Metanil Yellow In The Sample Was Present
L5 (Laxmi Sweets) 	The Pink Colour Was Not Formed	Metanil Yellow In The Sample Was Not Present

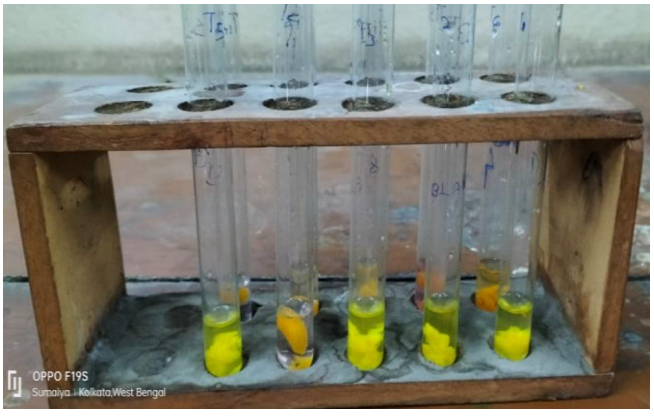




❖ Amrita

Sample	Observation	Inference
B1 (Hindustan Sweet) 	The Pink Colour Was Not Formed	Metanil Yellow In The Sample Was Not Present
B2 (Kamdhenu) 	The Pink Colour Was Not Formed	Metanil Yellow In The Sample Was Not Present
B3 (Kathlen) 	The Pink Colour Was Not Formed	Metanil Yellow In The Sample Was Not Present
B4 (Balaram Sweet) 	The Pink Colour Was Not Formed	Metanil Yellow In The Sample Was Not Present
B5 (Kamala) 	The Pink Colour Was Not Formed	Metanil Yellow In The Sample Was Not Present
L1 (Sandhya Store) 	The Pink Colour Was Not Formed	Metanil Yellow In The Sample Was Not Present
L2 (Joynagar Moa Shop) 	The Pink Colour Was Formed	Metanil Yellow In The Sample Was Present
L3 (Appayan) 	The Pink Colour Was Not Formed	Metanil Yellow In The Sample Was Not Present
L4 (Narendra Mistanna Bhandar) 	The Pink Colour Was Formed	Metanil Yellow In The Sample Was Present
L5 (Laxmi Sweets) 	The Pink Colour Was Not Formed	Metanil Yellow In The Sample Was Not Present





• Food standards act in India :

They are formulated along the lines of codex alimentations –

- **Compulsory standards**
- **Voluntary standards**

▪ Compulsory standards :-

- **Food Safety and Standards Authority of India (FSSAI) has been created for laying down science based standards for articles of food and to regulate their manufacture, storage, distribution, sale and import to ensure availability of safe and wholesome food for human consumption.**

Aims to establish a single reference point for all matters relating to food safety and standards, by moving from multi- level, multi- departmental control to a single line of command.

It consolidates various acts & orders that have hitherto handled food related issues in various Ministries and Departments.

- **The prevention of Food Adulteration act(PFA) 1955.The main objectives of the PFA Act and Rules are to project the consumer against ill-health caused by Adulteration to restrict and control the use of food additives and to confirm the nutritional standards of the food.**

- **Voluntary standards:-**

• **Argmark :** Agriculture product grading and marketing act 1937.

"The Director of Marketing and Inspection grades commodities as 1 2 3 4 meaning special, good, fair, and ordinary. The "ARGMARK" label is an assurance of quality. It also helps settle disputes between buyers and sellers.

• Indian Standards, Institute (ISI): It is responsible for laying. ISI, These are standers evolved after chemical, biological and physical assessment of the product to be market.

DISCUSSION

We use all the food products in our daily life . Among them, we can trust branded food products without fear and we should avoid local food products as much as possible

Among the Food products we use in our daily life, we can trust the branded food products with out fear and we should avoid local food products as far as possible.

CONCLUSION

Selection of wholesome and non-adulterated food is essential for daily life to make sure that such foods do not cause any health hazard. It is not possible to ensure wholesome food only on visual examination when the toxic contaminates are present in ppm level. So, I which have been Seen in my experiment that's some food that not looks like not much adulterated but when I Chemically diagnosis of the food item. I get presence of metanil yellows on it and this proves that though, the food is not looks harmful visually but it is harmful chemically for our health.

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A SURVEY ON THE KNOWLEDGE OF FOOD SAFETY AMONG SCHOOL STUDENTS

UNIVERSITY ROLL NUMBER- 203056-11-0072
UNIVERSITY REGISTRATION NUMBER- 056-1214-0129-20
PAPER CODE: DSE-B-1
FOOD SAFETY & QUALITY CONTROL
FOOD & NUTRITION HONOURS
SEMESTER: V
YEAR: 2022-2023

INTRODUCTION OF FOOD SAFETY

Food safety refers to routines in the preparation, handling and storage of food meant to prevent foodborne illness and injury.[1]] From farm to factory to fork, food products may encounter any number of health hazards during their journey through the supply chain.[1]

Definition:

Food Safety is a scientific discipline describing :

1. Handling
2. Preparation
3. Storage
4. Serving

Of food in ways that prevent food borne illness.[1]

AIMS & OBJECTIVES

This is a survey on

'THE KNOWLEDGE OF FOOD SAFETY AMONG SCHOOL STUDENTS'

which have done for the purpose to –

1. Know about food safety among the school students based on their knowledge.

2. Reveal if, the students have the proper knowledge about the usage the safety of food

3. Disclose the students' knowledge towards food safety

REVIEW OF LITERATURE

Zemichael Gizaw (2019), Public health risks related to food safety issues in the food market: a systematic literature review; Food safety in the food market is one of the key areas of focus in public health, because it affects people of every age, race, gender, and income level around the world.[4] The local and international food marketing continues to have significant impacts on food safety and health of the public.[4]

Kyung-Eun LEE, Kyung Ryu (2004); Influences of school food service employees' food safety training on food safety knowledge and practices; Korean Journal of Community Nutrition, 597-605, 2004; The purpose of the study was to investigate relationships among food safety training, knowledge, and practices of school food service employees.[5] A questionnaire that identified employees' food safety training experience, knowledge, and practices was developed based on a review of literature.[5]

Patricia Foriwaa Ababio, Pauline Lovatt (2015); A review on food safety and food hygiene studies in Ghana Food safety and hygiene in Ghana was studied using desk top literature review.[6]Food research was highly concentrated in the capital city of the country and most research focus were on commercial food operations specifically street foods and microbiological safety with limited information from institutional catering and other forms of food hazards.[6]Recommendations on regulating the General Hygiene Principles, implementation of HACCP to strengthen the food sector, regular food safety and hygiene workshops and training for food handlers that commensurate with their roles were made.[6]

MATERIALS & METHODS

This survey was conducted based on a questionnaire that was circulated to assess the real status of general idea about ‘Food Safety’ and acquire the knowledge among school students.

TYPE OF QUESTIONNAIRE:

Pre-formulated ‘Self-structured Questionnaire.

PARTICIPANTS:

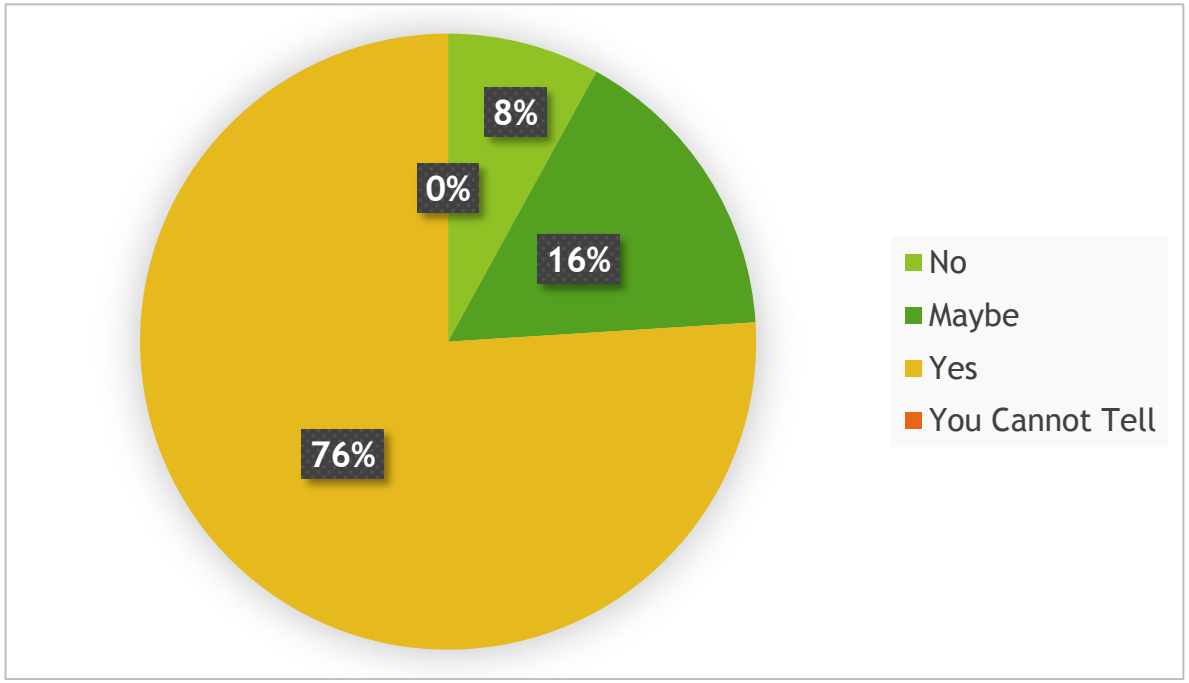
Randomly selected school students and the Aims &Objectives of the study were explained thoroughly before the commencement of the survey

RESULTS

From responses of the students, I got the following results-

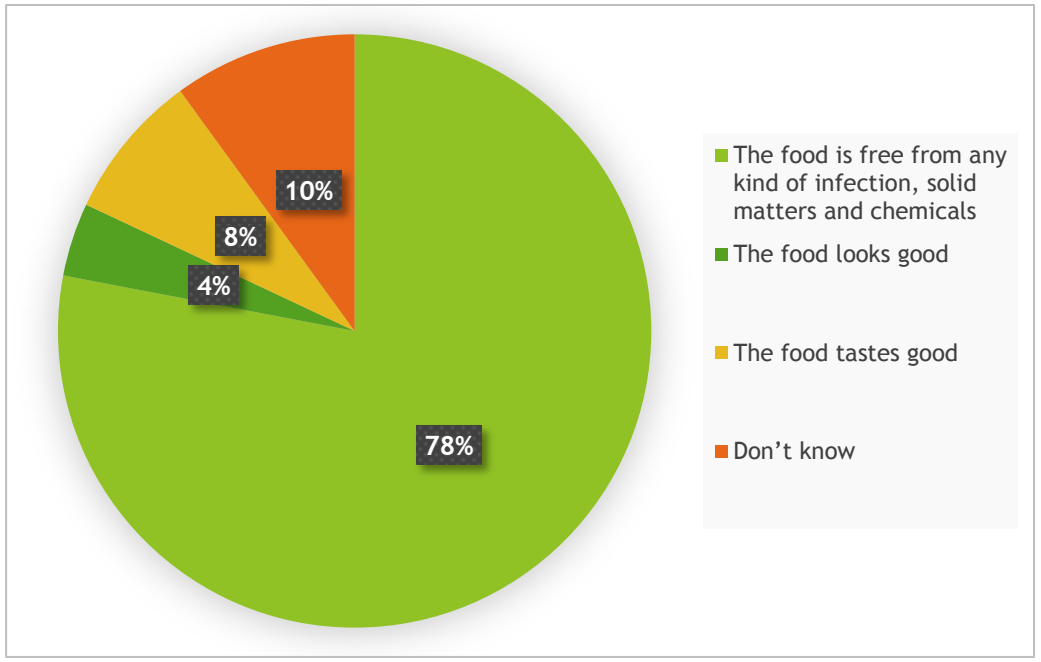
1.Do you heard about the term 'Food Safety'?
N=50

Yes n (%)	No n (%)	Maybe n (%)	You Cannot Tell n (%)
38 (76%)	4 (8%)	8 (16%)	- (0%)



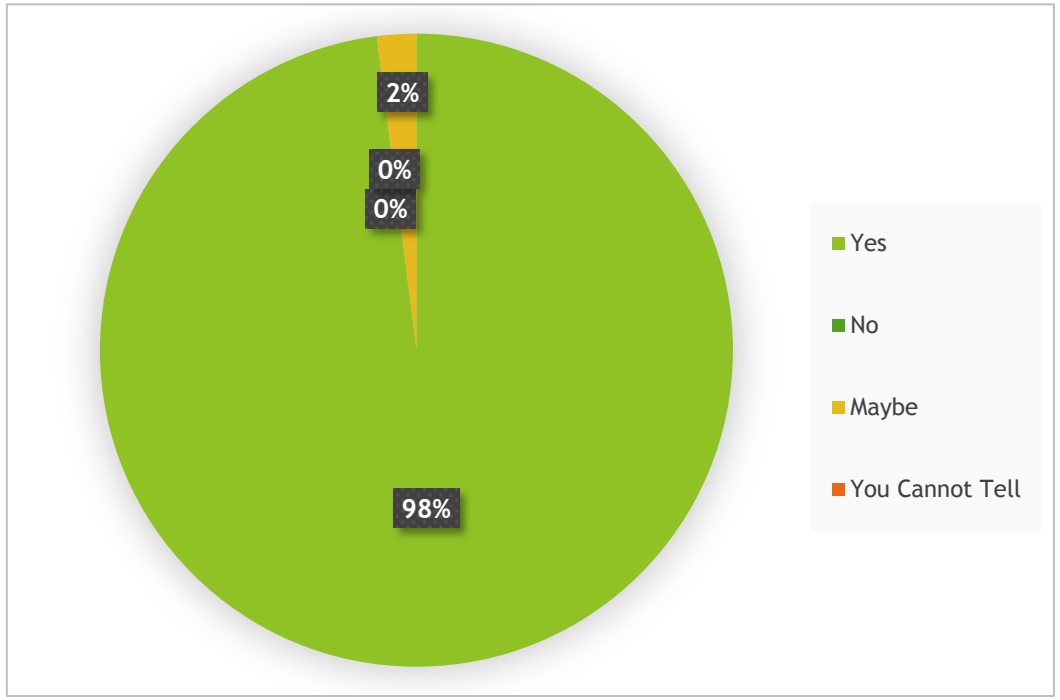
2. What do you think about safe food?
N=50

The food is free from any kind of infection, solid matters and chemicals n (%)	The food looks good n (%)	The food tastes good n (%)	Don't know n (%)
39 (78%)	2 (4%)	4 (8%)	5 (10%)



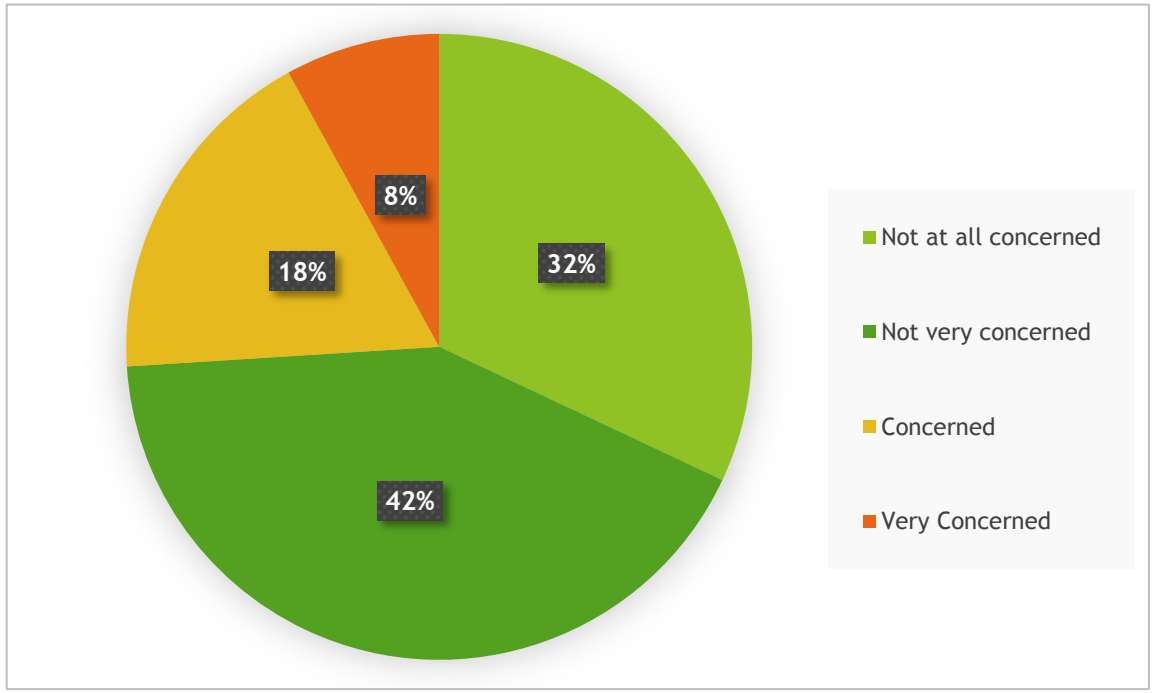
3. Do you think food safety is important for us?
N=50

Yes n (%)	No n (%)	Maybe n (%)	You cannot tell n (%)
49. (98%)	- (0%)	1. (2%)	- (0%)



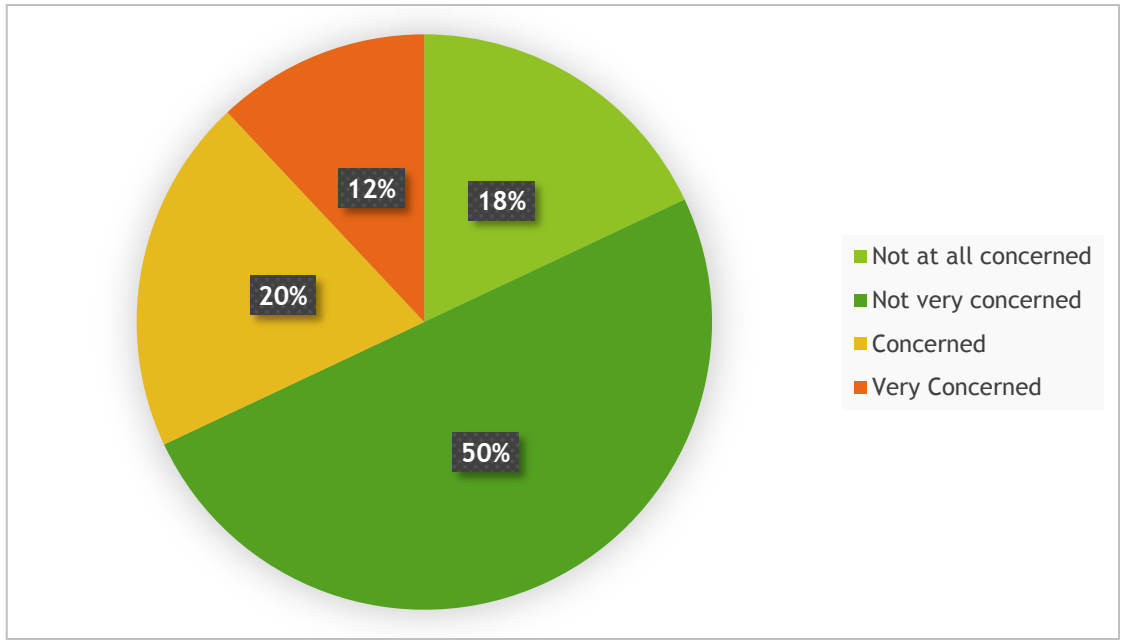
4. Do you think all people are concerned about safety of food prepared away from home?
N=50

Not at all concerned n (%)	Not very concerned n (%)	Concerned n (%)	Very Concerned n (%)
16 (32%)	21 (42%)	9 (18%)	4 (8%)



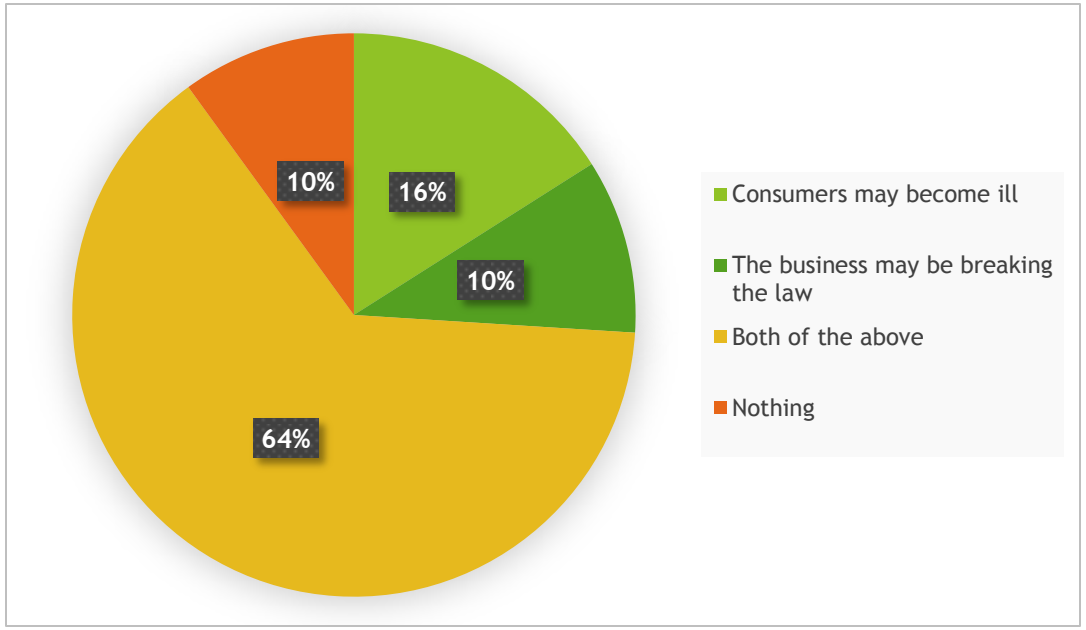
5. Do you think all people are concerned about safety of food purchased to prepare at home?
N=50

Not at all concerned n (%)	Not very concerned n (%)	Concerned n (%)	Very Concerned n (%)
9 (18%)	25 (50%)	10 (20%)	6 (12%)



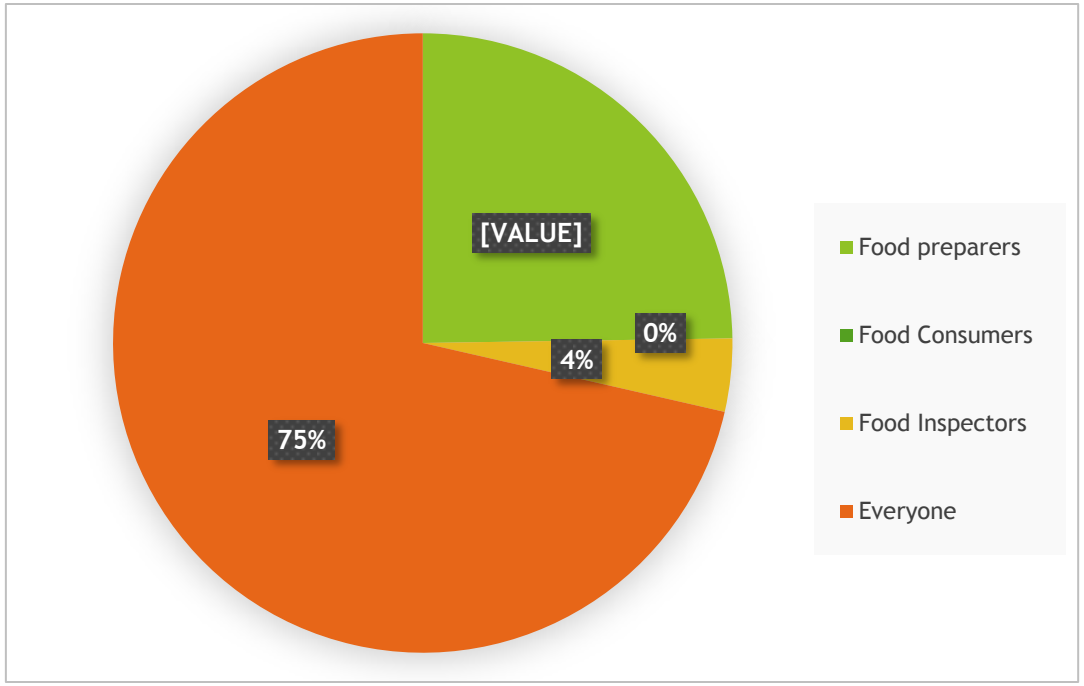
6. What happens if a food business sells unsafe food?
N=50

Consumers may become ill n (%)	The business may be breaking the law n (%)	Both of the above n (%)	Nothing n (%)
8 (16%)	5 (10%)	32 (64%)	5 (10%)



7. Who is responsible for food safety?
N=50

Food preparers n (%)	Food Consumers n (%)	Food Inspectors n (%)	Everyone n (%)
13 (26%)	- (0%)	2 (4%)	35 (75%)



DISCUSSION

The above outcomes were found after the survey among school students and according to it –

1. Major proportion of students heard about the term 'Food Safety'.

2. All students know that what food safety is actually means and how we can know the food is safe or not.

3. Major number of students are not very concerned about the safety of food prepared away from home & also concerned about the safety of food purchased to prepare at home.

4. Almost all students think that if a food business sells unsafe food, then consumer can become ill and the business also breaks the law.

CONCLUSION

The most important goal of food safety is to protect consumers. Through the survey I came across a conclusion that a major portion of students were having the knowledge of food safety which is a good mark of this survey. Major group of students were also not very concerned about the food purchased to prepare at home and prepared away from home. All over this survey can be a step of progressive towards a healthy lifestyle of the whole young generation.

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THANK YOU