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Assessment of nutritional adequacy of food items sold in University Cafeteria

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Abstract
The present study was conducted to investigate the nutritional adequacy of food items sold in the cafeteria of NIMS University. The objective of this study was to analyse the different food items sold out in the cafeterias, the impact of customers on cafeteria foods, assess the nutrient compositions of food items available, cafeteria food consumption pattern of the customers, hygiene and sanitation practices and associated factors among the chefs and food handlers. A cross-sectional survey was conducted in two cafeterias namely Express food and La Papoté situated at NIMS University, Jaipur, Rajasthan, where a large number of individuals visit and have snacks, deserts, and beverages. The primary data was collected in two steps: firstly, a self-administered, closed-ended questionnaire that has been pre-designed and structured questions was developed which was distributed among a total of 70 samples including students, hospital interns and staffs between the age group of 18-30 years; secondly, an interview was conducted among the chefs and food handlers of the cafeterias using another close-ended, pre-designed structured questionnaire. The findings demonstrate that, in general, consumers place more value on a food's taste, flavour, look, and odour than on its quality, nutritional content, or price. Consumption of healthy foods like Coconut Water, Lemon Water, Boiled Eggs, Salads, Sautéed Vegetables, Chicken Bowls and Steamed Chicken, and Masala Oats were found to be quite low and erratic when compared to those of other foods, such as Tea and Coffee, Burgers, and Cheese Maggie. It was also been discovered that consumption of breakfast cereals including Muesli, Corn Flakes, and Chocolate Flakes was substantially lower. The seven chefs and food handlers working in the cafeterias were all interviewed, and it was discovered that they all have minimal fundamental knowledge and general habits regarding the nutritious content of meals, foodborne illnesses, food safety, and the storage of foods.

Keywords: Nutritional adequacy, fast food, cafeteria, consumption pattern, intake

Introduction
The two factors that most significantly contribute to human growth are health and nutrition. Treatment of nutrition-related issues presents new obstacles for nations going through an economic transformation, such as those that are arising in the global marketing race (Vecchio *et al*., 2014) [14]. Education is essential to the growth and socioeconomic well-being of society. People learn good information, habits, values, and attitudes throughout the extensive educational process. In any developing nation, the younger generation is one of the most significant age groups because they are seen as the nation's future (Mekonnen & Ayele, 2020) [11]. Fast food consumption, overeating, and binge eating are all associated with irregular work schedules, prolonged screen use, and home isolation. Such a way of living led to unhealthful eating and weight increase (Alamri, 2021) [2]. The general people have anxiety about contracting an infection, frustration, sadness, boredom, loneliness, and financial loss as a result of the global epidemic and home confinement. Reduced social contact and children and adults' inconsistent daily schedules may lead to psychological anguish and a decline in physical and mental health. (Brooks *et al*., 2020) [4]. The incidence of chronic diseases like diabetes, cardiovascular diseases, and psychiatric illnesses increased as a result of these various circumstances, which also had an impact on healthy eating. To concentrate on nutrition and address mass societal weight rise, it was crucial to develop strategies and design interventions (AL Mughanis *et al*., 2020).

Nutritional adequacy is the result of the consumption of an adequate amount of all the essential nutrients and energy to meet an individual's requirements according to recent RDA values (ICMR-NIN, 2020). It is mandatory for growth and development and good health status. It refers to enough consumption of essential nutrients (like carbohydrates, protein, fat, vitamins, minerals, and dietary fibres) needed to provide a balanced diet as per the requirement of the subject to maintain good health.

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According to the study of Castro-Quezada *et al*., (2014) [6] "nutritional adequacy is the comparison between the nutritional requirements and intake of certain individual or population. In population groups, the prevalence of nutrient adequacy can be assessed by the probability approach or using the Estimated Average Requirement (EAR) cut-point method."

In 1951, the "Fast food" term was first found in a dictionary by Merriam–Webster. According to Merriam–Webster, fast food can be defined as food which can be prepared and served very rapidly. In general, fast food can be considered as any meal with low preparation time (Islam *et al*., 2010) [9]. It is easy to prepare, processed food rich in calories, fat, salt, and sugar content but lacking in nutrition content, usually sold in the cafeterias, or restaurants.

In accordance with the study of Desbouys *et al*., (2020) [7], more than one-third of deaths globally in 2013 were revealed to be caused by dietary risk. In order to combat the present rise in non-communicable diseases, the WHO has focused on nutritional habits. A healthy, varied diet is required at every stage of life. Early adulthood and adolescence are crucial transitional years for acquiring healthy habits (such as using cigarettes and alcohol, eating habits, exercising, and getting enough sleep, for example) that, if not developed, could lead to the development of non-communicable diseases in the future.

Nowadays, cafeterias are an important place which has an impact on regular food choice. Most of the students spend their maximum time in college, university, or hostel. Easy availability, attractive appearance, less cost, colourful menu, easy marketing strategy, bored from a monotonous menu of hostel mess and peer pressure attract them towards the cafeteria. Usually, cafeterias sell cold drinks, milkshakes, burgers, Maggi, nuggets, fries, shakes, smoothies, muesli, salads, sandwich, and many others.

Keeping this in mind the purpose of this research paper is to assess the nutritional adequacy of food items which are sold in the two cafeterias (Express food and La Papoté) of NIMS University campus and which are mostly consumed by students, interns, and staff of the institution between the age group of 18-30 years. With the increasing awareness about healthy eating habits, it is crucial to evaluate the nutritional content of the food being sold in educational institutions. The aim of this study is to determine whether the food items sold in cafeterias provide the necessary nutrients required for a healthy diet.

Objectives of the study

- To assess the current scenario of the cafeteria.
- Based on the assessment, the development of a research tool.
- To collect the data about the nutritional composition and adequacy/ inadequacy of food items sold in the cafeterias at the university.
- To analyze and evaluate the collected data.

Methodology
Research Design: The research design for the present study was a cross-sectional survey design.

Location of Study: The study was conducted in the two cafeterias of NIMS University namely Express food and La Papoté in Jaipur, Rajasthan. . The cafeterias were chosen

based on the respected cafeteria managers' approval as well as the university's willingness and acceptance of the researcher's request to gather information from the chefs and food handlers who work there as well as from the patrons who eat at those cafeterias.

Fig 1: Location of Study (NIMS University, Jaipur, Rajasthan)

Fig 2: Cafeteria no.1: Express Food

Fig 3: Cafeteria no.2: La papoté

Sample Selection and Sampling Technique: Seventy (n=70) respondents including students, interns, and staffs of the age group of 18-30 years (adolescence/early adulthood) were selected via a simple random sampling technique. Samples involved were regular customers of the cafeterias or who have consumed food from these cafeterias for not less than 6 months prior to the commencement of the study.

Fig 4: Collection of Data from Respondents in the Cafeteria

Development of Research Tool: Two structured questionnaires were made for the collection of the information from the customers of the cafeteria and the chef and food handlers of the cafeteria separately. These questionnaires are made up of a number of self-administered, closed-ended questions that have been pre-designed and structured. Before the respondents were given the questionnaires, they were informed of the objectives of the information collection pertaining to the subject.

An interview was done using pre-structured close-ended questionnaire among the cafeteria's chefs and food handlers. The menu of the cafeterias; name and amount of raw ingredients was collected by a short interview with the chefs of the cafeteria. The menus included the following food items:

- Milkshakes and smoothies
- Tea and Coffee
- Cold drinks
- Brownie and ice-cream
- Coconut water and lemon water
- Boiled egg and omelette
- Burger
- Sandwich
- Fried food (French fries, nuggets, and potato cheese shots)
- Cheese Maggie
- Salads
- Sautéed vegetables
- Chicken bowl
- Muesli, oats
- Choco flakes and Corn flakes

Validation of Research Tool: Prior to gathering data from the study population, a pilot study was carried out on a sample size of 15 cafeteria customers (aged 18 to 30 years) to assess the feasibility of the created tool and to spot any gaps. Based on the pretesting of the questionnaire on the sample group, minor adjustments were made.

Inclusion Criteria
- The study included all the customers of the cafeterias or who have consumed food from the cafeteria for not less than 6 months prior to the commencement of the study, between the age of 18-30 years.
- All types of food items, including snacks, main meals and beverages that are available for purchase during hours of operation.

Exclusion Criteria
- The customers who are not willing to participate in the survey were excluded.
- People who are less than 18 years old and more than 30 years old were also excluded.
- Food items that are not available regularly or are seasonal were excluded.

Data Collection: In the present study, a survey technique was used to gather significant and important primary data in order towards achieving the objectives mentioned earlier. To collect data for the current study, specifically self-administered, closed-ended pre-designed questionnaires (annexed) were created. Customers, from a few selected cafeterias (two cafeterias from NIMS University Express Food and La Papoté), were given questionnaires in exchange for their important comments. A brief interview with the cafeteria's chefs and food handlers using pre-designed, close-ended questionnaires yielded information on the cafeteria's menu as well as the names and quantities, of its raw ingredients; general knowledge and practices about nutrition, hygiene, and sanitation of them.

To extract the relevant information from the earlier research for the current investigation, a thorough review of the body of literature was conducted. To find the appropriate information that was valuable for the study, numerous academic documents that focused on cafeteria and other food outlet-related research conducted among adolescents and young adults (18-30 years old) were searched in Google Scholar, PubMed, Shodhganga.

Data Analysis: Depending on the objectives and concerns of the research, analysis was required after the data had been gathered. Two different excel sheets were used to insert the information gathered from the two questions. With the use of MS Excel's "Sort and Filter" feature, the data analysis was carried out. The data was sorted and then entered into tabular representations in MS Word for the evaluation.

The nutritive value of food items sold in cafeterias was calculated with the help of the following books "Nutritive value of Indian foods" by the C. Gopalan and "Indian Food Composition Tables" by Longvah *et al*., 2017. The nutritive value of packed and processed food items was evaluated using the "nutrition information" provided in the packet.

Results and Discussions
Background of Study
The two cafeterias at NIMS University—Express Food and La Papoté—were the locations of the cross-sectional survey. From the customers who were eating there, 70 samples (n=70) in total were taken. 34 (49.57%) of them were women, while 36 (51.43%) of them were men.

Age is a key factor in determining how much the younger generation consumes excessively and is unhealthy. The bulk of the respondents (57.14%) were between the ages of 21 and 25, followed by 38.57% between the ages of 15-20, and the remaining 4.29% between the age groups of 26 and 30.

An effort was made to get a representative sample of responders from each occupational group. However, students provided the best responses, with responders from other groups failing to return the duly completed questionnaires. As a result, a high response (80%) rate from students was obtained, the remaining respondents are interns from NIMS

Hospital (17.14%) and University employees (2.86%).

Knowledge about Eating Habits and Nutrition

It is crucial to remember that the nutritional adequacy of any eating behaviour depends on a number of variables, including the person's overall dietary choices, food diversity, and attentiveness to meet nutritional demands. It is necessary to follow a well-balanced diet that includes important nutrients including proteins, vitamins, minerals, and healthy fats to support general health and wellbeing in all food habits. Vegetarians made up 38.42% of the population in the current study, non-vegetarians made up 51.42%, and ovo-vegetarians made up 10%.

The term "nutritive value" describes the quantity and quality of nutrients found in food that support human health and wellbeing. It refers to the nutritional content and composition of a food or beverage and its ability to provide essential nutrients to the human body. Three categories were used to assess how the knowledge of respondents about nutritional value using three parameters: "Not at all," "Somewhat," and "Good." According to the current survey, 44.28% of the sample had "Good" knowledge of the nutritional value of food. 45.72% of respondents said they were "Somewhat" or "Not at all" aware of the nutritional value of food, while 10% said they were "Not at all" aware of it.

In a study by Yahia et al., (2016) [15] conducted among college students which indicated that female students know more about nutrition than male students do (the mean nutrition score for female students was 5 points higher than that of male students). Their knowledge of nutrition was inversely associated with intake of fat and cholesterol.

In a very short period of time, the fast food business has emerged as one of the sectors with the fastest growth rates worldwide. Described by the Oxford Dictionary as "easily cooked, processed, and served in snack bars and restaurants as a quick meal or to be taken away," fast food is typically consumed quickly (Khan et al., 2023) [10]. Among the 70 respondents, only 10% of respondents do not eat fast food, compared to 90% who do.

But according to a recent survey by Abraham et al. (2018) [1], 85.1% of interviewees said they do not typically eat fast food. They also heavily concurred (61.2%) that unhealthy ingredients are used in fast food. This demonstrates that young people are aware of how unhealthy fast food is and make efforts to stay as far away from it as they can. They assert that their meal choices are mostly influenced by flavour, convenience, and processed foods, all of which are symptoms of unhealthy eating behaviours even though they do not frequently eat at fast food places.

However, "junk food" refers to the type of food that is typically found in fast food restaurants. According to some claims, fast food is high in fat, particularly trans fats, and saturated fats, as well as sodium and cholesterol, and is the primary factor in a number of modern diseases. Fast food eating on a regular basis can result in a number of ailments and health issues, including dietary deficiencies, cholesterol issues, diabetes, muscle loss, heart diseases, cardiac disorders, sexual dysfunction, hypertension, skin allergies, depression, overweight issues, and obesity issues (Singh & Mishra, 2014) [12]. The data of the current study exhibits that 8.57% of respondents do not consume fast meals on a weekly basis; 67.14% consume fast foods 1-3 times per week; 18.57% consume fast foods 4-6 times per week; and 5.71% consume fast foods 7 or more times per week.

A set pattern is a daily meal routine that is predictable and dependable. It entails eating meals in fixed amounts and at set intervals. While dietary requirements and personal tastes can differ, sticking to a set meal schedule has several health benefits. Around 27.14% of respondents, have a regular meal schedule. 30% of respondents do not adhere to any set meals, while 42.86% occasionally follow a fixed meal pattern.

Corresponding with Stockton & Baker's (2013) research, college students have to adjust to college life, it is inevitable that they will encounter a new setting for meal preparation, planning, and eating. Even though many college-aged students are aware of how important it is to fulfil dietary guidelines, their knowledge and attitudes may make it difficult for them to alter their behaviour. However, the college students' understanding of nutrition does not necessarily result in them making good food choices because there are many other factors at play. Interestingly, they also discovered that college students believed dangerous chemicals and additives, not calories, were the cause of the harm from fast food. The pupils were more worried about the additives in their food than the number of calories they were consuming. Additionally, compared to female college students, male students consumed more fast food.

Analysis of the Health Condition of the Respondents

Chronic diseases or non-communicable diseases (NCDs), as well as health diseases, are terms used to describe long-term problems that usually advance slowly and are frequently influenced by lifestyle choices, including diet and nutrition. Food consumption and health conditions are significantly correlated. In order to avoid, manage, and lower the risks of chronic diseases, making informed food decisions and adopting a balanced, nutrient-rich diet can be extremely important. The majority of respondents to the study (77.14%) reported they were in good health. 15.71% of those surveyed are obese or overweight. One per cent of respondents (1.43%) have polycystic ovarian disease (PCOD). Hypertension affects 4.28% of survey respondents. 1.43% of the sample consists of diabetics.

Impact of Respondents on Cafeteria Foods

To evaluate the nutritional adequacy of food items sold in the cafeterias of NIMS University, it is essential to consider the perspectives and experiences of the individuals who consume meals from these cafeterias regularly. The food choices made on a daily basis play a crucial role in maintaining health and well-being. In wide educational institutions like NIMS University where students and staffs often rely on cafeteria meals, it becomes essential to ensure that the food provided meets the nutritional needs of the individuals consuming it.

The participants responded to four main questions on the impact of cafeteria food are demonstrated in the Table 1.

Table 1: Assessment of Impact of Respondents on Cafeteria Foods

Variables	Parameters			
	Poor	Fair	Average	Excellent
Overall Nutrition Value of Current Menu	14.28%	47.14%	35.71%	2.86%
Quality of Foods	8.57%	34.28%	54.28%	2.86%
Overall Taste of Current Menu	4.28%	44.28%	45.71%	5.71%
Hygiene of the Cafeteria	2.00%	34.28%	47.14%	18.57%

The above attributes were evaluated using the "Poor," "Fair," "Average," and "Excellent" four parameters. Table 1 displays the findings. More than half of respondents (Poor 14.28% and Fair 47.17%) claimed that they disapproved of the present menu's overall nutritional content; 35.71% said they thought it was about average. Only 2.86 percent of respondents rated the current menu's food quality and overall nutritional value as good, compared to 54.2 percent who gave an average rating and the remaining 34.2 percent and 8.5 percent who gave poor ratings for the quality of food. 44.28% of respondents thought the dish tasted fair, 4.28% thought it tasted awful overall. 45.71% thought it was average, and the remaining 5.71% thought it was fantastic. Only 2% of respondents rated the cafeteria's cleanliness as poor, compared to 18.57% who gave it an excellent rating, the remaining 34.28%, and 47.14% who gave it a fair and medium rating respectively. Results are illustrated in Figure 5.
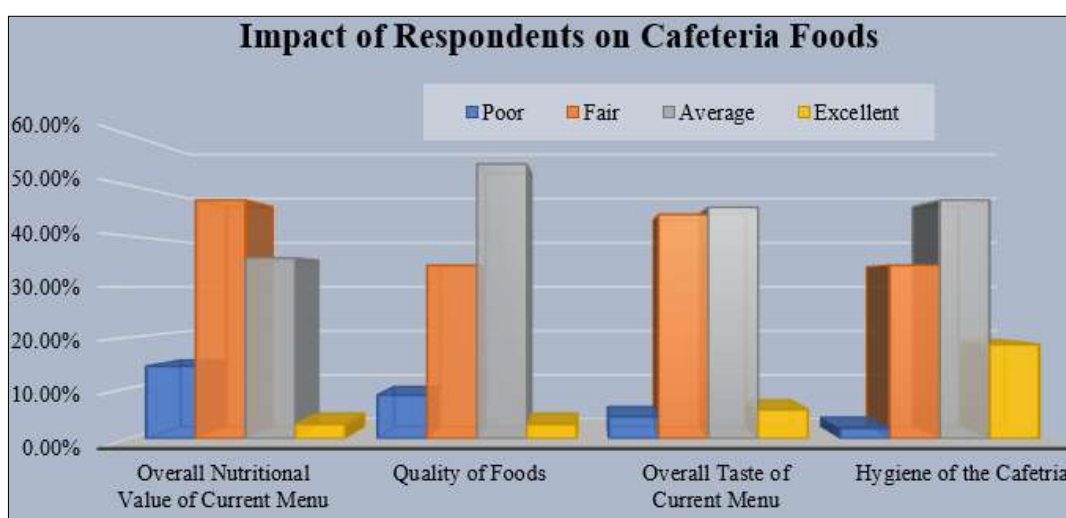
Fig 5: Diagrammatic Representation of Impact of Respondents on Cafeteria Foods

The study showed that a variety of factors, including food quality, nutritional content, cost, and flavour, contributed to customers' perceptions of cafeteria food as acceptable. In general, 12.86% of respondents prefer the quality of the cafeteria's cuisine, 20% of respondents buy food from the cafeteria because of its nutritional value, and 15.71% of respondents buy food from the cafeteria because of its cost. The taste of the food is liked by 51.43% of respondents.

In the present study, the results showed that generally, the consumers give more importance to attributes like taste, flavour, appearance, and odour rather than the quality, nutritional value, or cost of a food. In comparison to 11.43% of respondents, 50% of respondents are willing to pay more for food that is of a higher and healthier quality. For occasionally better and healthier meals, 38.57% of respondents said that they were willing to spend more.

Similarly, in accordance with research by Brown *et al*., (2014) college students frequently choose their meals from vending machines based on convenience, taste, price, and time rather than nutritional content.

There is a possibility of getting food poisoning or other health problems after consuming foods that are provided by the food establishments. According to the current survey, in response to the question "whether they associate any illness they had with the cafeteria food consumed" 60% of respondents reported that they had never experienced such problems. Only 10% of respondents said they experienced food poisoning more than once, compared to 18.57% who had it once, 11.43% twice, and 10% who had it multiple times.

On a scale of 0 to 10, where 0 represents not at all liked and 10, represents greatly cherished, a study of respondents' opinions on the cafeteria was requested. Responses had a mean rating score of 6.43, a maximum rating score of 8, and a minimum rating score of 2.

Nutritional Composition of Food Items Sold in the Cafeterias
In this study, the nutritional content of food products served in the cafeterias at NIMS University is examined. With the aid of the books, "Nutritive Value of Indian Foods" by C. Gopalan and "Indian Food Composition Tables" by Longvah *et al*., 2017 analysed the micronutrient profile of food items, including carbohydrates, proteins, fats, and some essential micronutrients, is evaluated. The "nutrition information" included in the packet was used to assess the nutritive content of the packaged food item.

The following Table 2 summarizes the typical nutrient (Protein, Fat, Carbohydrate, Energy, Fibre, Sodium, Iron, Calcium) composition of the food (Milkshake and Smoothies, Brownie with ice-cream, Coconut Water, Lemon Water, Boiled egg, Omelette, Veg and Chicken Burger, Veg and Chicken Sandwich, French Fries, Potato Cheese Shots,

Nuggets, Maggie, Green Garden Sprout Salad and Chicken Sprout Salad, Sautéed Vegetables, Chicken Bowl, Muesli, Masala Oats, Choco Flakes, Corn Flakes) served (as per single Serving size) in NIMS University's two cafeterias.

Table 2: Nutritive Values of Food Items Sold in Cafeteria

Food Items	Nutrients							
	Protein (g)	Fat (g)	Carbohydrate (g)	Energy (kcal)	Fibre (g)	Sodium (mg)	Iron (mg)	Calcium (mg)
Milkshake & Smoothies	10.33	11.18	27.37	304.66	—	98	—	146
Brownie with Ice-cream	5.55	21.91	48.03	397.96	—	172	2	57
Coconut water	0.4	—	8.2	36	—	210	0.6	48
Lemon water	0.23	0.18	2.22	43.3	1.6	—	—	—
Boiled Egg	13.43	10.54	—	147.8	—	124	1.2	50
Omelette	15.56	25.14	7.53	314.24	—	214	2.3	86
Veg Burger	11.34	8.08	52.5	352.48	4.6	402	1.7	95
Chicken Burger	15.48	10.93	34.52	354.1	2.2	378	2.5	152
Veg Sandwich	5.53	6.73	32.23	222.28	4.3	435	3.2	114
Chicken Sandwich	19.91	14.2	25.9	349.99	1.82	512	2.1	132
French fries	7.18	29.28	44.3	469.44	—	—	—	—
Potato Cheese Shots	16.18	42.6	42.52	642.2	—	—	—	—
Nuggets	20.2	41.2	43.4	625.2	—	—	—	—
Cheese Maggie	10.39	21.55	43.9	374.2	2	719.8	4.83	—
Green Garden Sprout Salad	22.5	19.38	65.8	497.91	14.91	436	5.3	78.5
Chicken Sprout Salad	32.31	25.74	54.11	577.07	8.5	740	3.6	—
Sautéed Vegetables	3.6	10.5	12.42	145	5	118.56	2	36.72
Chicken Bowl and Steamed Chicken	63	32	0.1	561.23	—	182	4.1	35
Muesli	9.63	10.6	41.5	303	2	120	5.9	—
Masala Oats	15.46	3.82	51.13	264.85	8.13	255	4.38	—
Choco Flakes	10.9	9.65	50.6	327.5	3.5	—	2.5	506.5
Corn Flakes	6.43	8.5	42.82	279.3	0.75	207	3.7	312.1

Cafeteria Food Consumption Pattern Among the Respondents

Food frequency questionnaire (FFQ) is simple for the researcher to use, the food is the best dietary evaluation tool. In reality, the technique is an advanced representation of food history. It consists of two parts: a qualitative analysis that looks at the frequency of food consumption and a quantitative analysis that uses a culinary measures or other methods to estimate how much food is consumed. The subjects answer on how often and how much food they have consumed in a given period of time. FFQ can focus on the intake of specific nutrients, dietary exposure to a particular group of foods only (which may be linked to a particular disease) or on assessing the inter-correlations between nutrients and between foods (i.e., the dietary pattern) with their effects on health status/risk of diseases (Gherasim *et al*., 2020) [8].

Table 3: Pattern of Cafeteria Food Consumption among the Respondents

Food Items	Intake						
	Never	Less than once in a month	1-3 times per month	Once per week	2-4 times per week	Once daily	More than once a day
Milkshakes and Smoothies	28.57%	21.43%	24.28%	10.00%	8.57%	2.86%	4.28%
Tea and Coffee	15.71%	8.57%	18.57%	15.71%	22.86%	11.43%	7.14%
Cold Drinks	38.57%	10.00%	21.43%	11.43%	14.48%	2.86%	1.43%
Brownie and Ice-cream	44.28%	22.86%	15.71%	11.43%	2.86%	2.86%	0
Coconut water and Lemon water	52.86%	10.00%	18.57%	5.71%	8.57%	4.28%	0
Boiled Egg and Omelette	52.86%	5.71%	10.00%	14.28%	5.71%	10.00%	1.43%
Burger	15.71%	18.57%	37.14%	15.71%	8.57%	2.86%	1.43%
Sandwich	21.43%	14.28%	37.14%	17.14%	7.15%	2.86%	0
Fried Foods (French fries, nuggets, potato cheese shots)	35.71%	12.85%	22.86%	15.71%	10.00%	2.86%	0
Cheese Maggie	27.14%	12.86%	28.57%	12.86%	12.86%	5.71%	0
Salad	48.57%	11.43%	15.71%	10%	8.57%	4.28%	1.43%
Sautéed vegetables	62.86%	14.28%	10%	8.57%	4.28%	0	0
Chicken bowl and Steamed chicken	71.43%	8.57%	7.14%	7.14%	5.71%	0	0
Muesli and Masala Oats	61.43%	14.28%	11.43%	7.14%	2.86%	2.86%	0
Choco Flakes and Corn flakes	55.71%	14.28%	12.86%	7.14%	8.57%	1.43%	0

Hygiene and Sanitation Practices and Associated Factors among Chefs and Food Handlers

For numerous reasons, the necessity of cleanliness and sanitation practises in determining the nutritional adequacy of food items accessible in NIMS University cafeterias is critical. These practices ensure food safety, nutrient preservation, allergen management, food spoilage prevention, food quality maintenance, and consumer confidence. Incorporating these practices into nutritional adequacy assessments aids in identifying potential areas for improvement and ensuring that the food items sold in these cafeterias fulfil the required criteria for university community

health and well-being. Among chefs and food handlers, there are various related variables to consider. An interview employing a pre-structured close-ended questionnaire was used to acquire brief information on those factors.

Socio Demographic Profile of the Chefs and Food Handlers

According to conducted interview in the two cafeterias at NIMS University (Express Food and La Papoté), there are now seven cooks and food handlers employed. Out of the 5, one works at Express Food and the other two at La Papoté. Six employees of them are between the age group of 21 and 30, and one is just 19 years old. Two are female and five are male. The cafeterias have a total of 7 employees, including 2 chefs, 3 food handlers, and 2 servers.

Basic Knowledge and General Practices of the Chefs and Food Handlers

The basic knowledge and general practices of chefs and food handlers are crucial for ensuring the adequacy and safety of food items sold in these cafeterias. They ensure not only the nutritional profile of meals but also the safety and enjoyment level of consumers thanks to their grasp of nutrition, allergies, food safety, and quality control.

Table 4: Basic Knowledge and General Practices of Chefs and Food Handlers

Knowledge-based Questions	Percentage (%) of Correct Answers
Knowledge about the nutritional content of the food served in the cafeteria	100%
Awareness of food-borne illnesses	85.71%
Preferences to buy food that provides nutrition label	100%
Read the food labels that are provided with food products	85.71%
Awareness about FSSAI mark and other safety marks	71.42%

The water used for cooking is regular tap water. Refined oil is mostly used for food preparation, sometimes groundnut oil is also used. They frequently serve or use raw (unpasteurized) milk. Meat that is just partially cooked (the interior is still pink) is never used or served. At the conclusion of closing hours, cafeteria leftovers are tossed out.

Keeping Time of Food in the Cafeteria

For food to illnesses and keep the best flavour and nutritional content, time must be managed properly at each stage, from purchase to consumption. The storage and time restrictions for certain foods vary. Food waste can be minimised, food safety may be maintained, and cafeteria patrons will be able to have the greatest possible eating experience by being mindful of the amount of time food spends in each step. The following table (Table 5) indicates the keeping times of various foods in the cafeterias of NIMS University:

Table 5: Keeping Time of the Food Items in the Cafeteria

Food item	Keeping time
Cooked food	4-6 hours
Perishable foods (fruits, vegetables, milk, meat)	1 day
Semi-perishable foods (potato, onion, ginger) and ready-to-eat foods	5-7 days
Non-perishable foods (cereals, pulses, sugar, oil)	More than 20 days

Hygiene and Sanitation Practices of Cafeteria Workers

Hygiene and sanitation in the two cafeterias (Express Food and La papoté) of NIMS University involve the practices and measures taken to ensure clean and safe conditions in the food preparations and dining areas of the cafeteria, it encompasses various aspects, including food handling, personnel hygiene, cleaning and sanitization, pest control, waste management etc. It is important for university cafeterias to comply with local health and safety regulations, as well as any specific guidelines or standards set by the university or relevant authorities.

Table 6: Hygiene and Sanitation Practices of Chefs and Food Handlers

Hygiene and Sanitation Practices based Questions	Percentage (%) of Answers
Washing hands with soap and water before and after preparing food, after touching any body part and after using the lavatory	100%
Washing food items before handling them	100%
Keeping raw and cooked foods separately	85.71%
Wearing head masks, hand gloves	100%
Keeping foods covered	100%
Checking the temperature of the refrigerator	100%
Cleaning the food preparation area	100%
Going to the cafeteria kitchen when they are ill	42.85%

A favourable perspective among chefs and food handlers because the majority of them produced outcomes that went above and beyond what was regarded as the minimum.

Conclusion

Based on the findings of this study, it is observed that the nutritional adequacy of the food items available in these cafeterias are suboptimal. The analysis revealed that the cafeterias provide different types of food items among them some are healthy like Lemon Water, Coconut Water, Boiled Egg, Salads, Sandwich, Masala Oats, Sautéed Vegetables, Chicken Bowl, and Steamed Chicken (Lemon and Coconut

water are a good source of fluid; Boiled egg, Chicken Bowl, and Steamed Chicken are a prior example of first class protein; Sandwich, Salads, Masala Oats, Sautéed Vegetables, are rich in fibre content) but the consumption rate of these food items are quite irregular and unfortunately many participants of the study never had these foods. Different fast foods are also available in the cafeteria among which some are high in sugar content like Tea, Coffee, Cold drinks, Brownie with Ice-Cream, Omelette, Fried Food items like French fries, Nuggets and Potato Cheese Shots, Cheese Maggi, Burger are the typically processed food and most of these are rich in sugar, fat, sodium, and calorie content. Regular intakes of these foods exhibit an imbalanced macronutrient ratio and indicate potential risk promoting unhealthy eating behaviours among the university population, which can contribute to the development of chronic health diseases like obesity, diabetes, cardiovascular diseases hypertension etc. These shortcomings highlight the need for improvements in the quality and variety of food options provided within the cafeterias. Moreover, the study revealed a good aspect of these cafeterias' chefs and food handlers. They have a very satisfactory degree of fundamental knowledge and experience handling food safely and hygienically.

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