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Knowledge of Food Chemistry among Students: A Survey Study

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Abstract: *Health of college students has become an important concern in present era. Irregular and unhealthy eating habits are the reason for ill health of students. Food chemistry provides a basic knowledge to the students which help them to understand the composition and nutritional value of food. This survey was conducted through a structured questionnaire to assess the level of knowledge of food chemistry among college students. One hundred and twenty students of under graduate and post graduate classes of arts, commerce and science stream participated in this survey. The survey questionnaire designed to assess their knowledge about awareness of food chemistry concepts, cooking and nutritional knowledge, food additives & preservatives awareness and food packet label reading behaviour. The survey data were analysed using frequency distribution, percentage analysis, and graphical representation. Chi-Square test was performed to determine the association between stream and knowledge of food chemistry. The findings indicate that science students had a higher level of awareness then compare to non-science students and the difference is statistically significant.*

Keywords: Food Chemistry, Unhealthy Eating, Survey, Nutritional knowledge

I. INTRODUCTION

The youth of today is facing health challenges due to unhealthy eating habits and abrupt life style. The ultra-processed fast food and junk foods are the favourite choice of college students. In order to keep these food items safe to use over a long period of time, preservatives are added to them (Shaker et al., 2022; Harshitha et al., 2024). Food additives are become an integral part of ultra-processed food items to enhance their flavour, colour and texture. Antioxdidant, food colour, artificial sweetener, emulsifier, and acids are different types of food additives used in food for different purpose (Lalani et al., 2024; Urrutia-Pereira et al., 2025). Colour of food is very important to attract consumers. To full fill this requirement, manufacturers add artificial colours to the food (Trasande et al., 2018; Bahna and Burkhardt, 2018). Long term consumption of some food additives can cause adverse health effects in terms of digestive and nervous disorders, respiratory and skin issues (Tuormaa, 1994; Rather et al., 2017). Many times nutritional quotient of food was compromised in order to make it tastier. Materials used for packing food items also have impact on health of consumers (Gupta et al., 2024; Kim, 2025). The above mentioned issues are the obstacle in the path of food safety and good health.

College students are the major contributors of consumption of ultra-processed food like instant noodles, packed food items, ready to eat meals, soft drinks, baked items, dairy products and therefore they are at high health risk like obesity and metabolic disorder (Pagliai et al., 2021; Crimarco et al., 2022; Zhang and Giovannucci, 2023). Knowledge of food chemistry is important for the students because it give them an insight about the nutritional components present in food, function of preservatives and food additives in food items, impact of time of cooking on the nutritional composition of the food, impact of the material used for packing of food items on quality of food. Knowledge of all these facts can help them to improve their health (Guine et al., 2023; Nieto Flores, 2025). Food chemistry is not only a field concern to science students, but knowledge of it is must for student of every stream. A person with good knowledge of food chemistry can make proper choice of food for him and can remain safe from the diseases which developed due to unhealthy eating practices. In order to assess the understanding of food chemistry among students, this survey was conducted among one hundred and twenty students of under graduate and post graduate classes of science, commerce

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and arts stream. In past few years awareness about the healthy eating habits has increased among the youth, still the scientific choice of food items on the basis of their nutritional value differ from person to person based on their background and educational stream. Students of science stream study chemistry of food as an integral part of their science syllabus. The students belongs to arts, commerce or other stream are also aware about good dietary habits, but this awareness generates through their house culture, personal experience or by the knowledge gained through public awareness campaigns on public platforms or social media.

A question series of nineteen questions was prepared to conduct the survey. The survey questions were designed to assess their knowledge about awareness of food chemistry concepts, cooking and nutritional knowledge, food additives & preservatives awareness and food packet label reading behaviour. The study was conducted to understand the level of knowledge of food chemistry among students, to compare food chemistry awareness of the students of science stream and the students of other stream and to analyse the knowledge of students about the role of food chemistry in healthy eating.

II. METHODS

This study used a descriptive research design to evaluate knowledge of college students about the chemistry of food. In order to full fill the objectives of the survey, a series of questions were prepared. The questions have multiple choice answers and the respondent has to choose one of them as per his knowledge and desire. The questions were related to knowledge of food chemistry, taste and aroma of food, cooking time, nutritional value of food, food additives and preservatives, balanced diet and label reading habits of packaged food. These food and nutrition concepts are important for good human health (Table 1). The data were collected from one hundred and twenty college students of science and other streams. Convenience sampling technique was used for data collection. The data collected through questionnaire was statistically analysed. The analysis was done in terms of count of frequency of correct answers, percentage of the response, and graphical representation of the data. In order to measure the difference in awareness about food chemistry in students of different stream, comparison of stream wise data was also done through chi-square test of independence.

Table 1: Food concepts and their role in human health

Food Concepts	**Role in Human Health**
Taste and smell	Create more attraction
Effects of cooking on digestion and nutrients	Improves food palatability and digestibility
Food additives and preservatives	Provide attractive appearance and increases shelf life of the food
Importance of basic macronutrients (carbohydrates, proteins, and fats) of food	Provide energy, support growth and tissue repair, regulate metabolic processes
Balanced diet	Make sure the presence of suitable quantity of all essential nutrients in food
Food labels	Aware the consumers about the composition and date of expiry
Concept of food chemistry	Aware the people about good eating habits

III. RESULT AND DISCUSSION

The data was collected under seven sections - demographic profile, overall knowledge of food chemistry, understanding of taste and aroma of food, effect of cooking on food and nutrients, knowledge of food additives and preservatives, knowledge of nutrients and balanced diet and stream-wise comparison. Descriptive statistics methods were employed on the data obtained. The statistical tools such as frequency count, percentage distribution and graphs were used for analysis of data obtained from survey. Chi-square test of independence was applied to examine the association between academic stream and knowledge of food chemistry.

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Out of one twenty respondents, fifty six students are from science stream, 52 from arts stream and twelve from commerce stream. Stream wise distribution of students is shown in Figure 1. In demographic profile of respondent, the under graduate and post graduate students are classified into three age groups of 17 to 19, 20 to 22 and 23 to 25. Majority of respondent (53.33%) belongs to age groups of 17 to 19. Participation of different age group is shown in Figure 2. More over eighty percent respondents are female and Participation ratio of male and female in survey is shown in Figure 3.

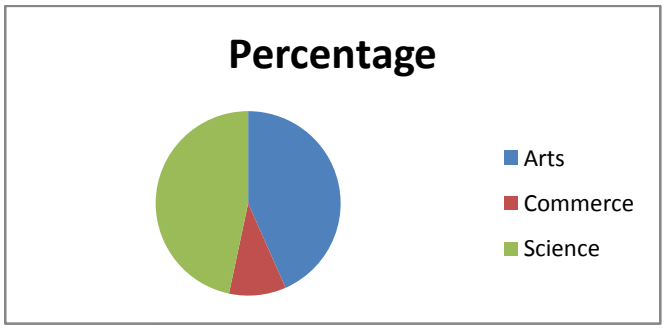

Figure 1: Stream wise student's participation in survey

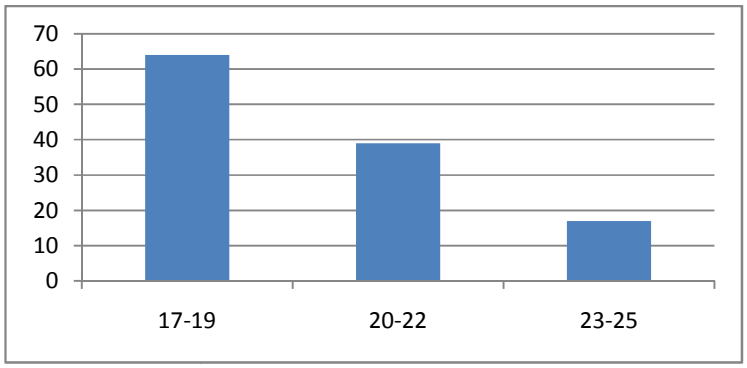

Figure 2: Participation of different age group

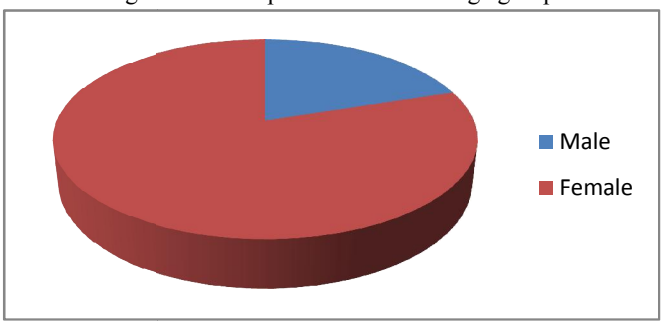

Figure 3: Participation ratio of male and female in survey

In this survey nineteen questions were designed to test the knowledge of students about (1) taste of food, (2) aroma of food, (3) effect of cooking on aroma of food, (4) digestion of cooked food, (5) effect of excess boiling of vegetables, (6) turning of bread brown on baking, (7) preservation of nutrients on cooking in pressure cooker, (8) use of food additives, (9) use of preservatives, (10) example of food additive, (11) effect of excess of food additive on human health, (12) label reading habit of packaged food, (13) function of Carbohydrates, (14) function of proteins, (15) functions of fat, (16) effect of heat on vitamin, (17) meaning of balanced diet, (18) chemistry is part of their syllabus

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and (19) importance of knowledge of food chemistry for healthy eating. The percentage graph of correct answers of these questions is shown in Figure 4.

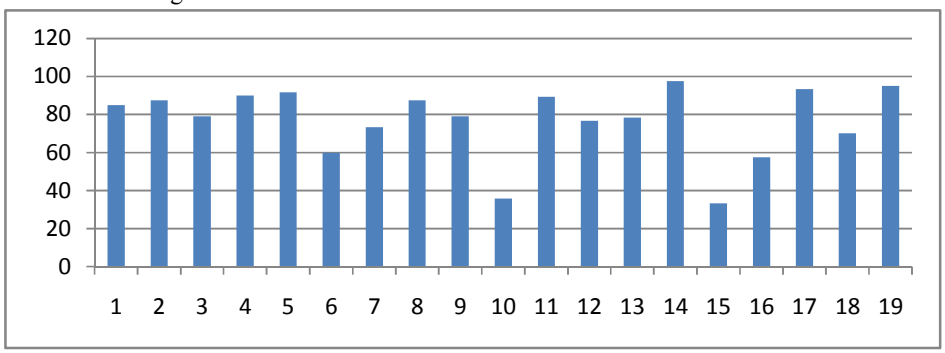

Figure 4: percentage graph of correct answers of respondents

On the basis of responses received during the survey, thirteen out of nineteen questions were considered under high knowledge level (≥75%)**.** The maximum appropriate responses (≥90%) were obtained for the questions related to digestion of cooked food, effect of excess boiling of vegetables, function of proteins, meaning of balanced diet and the role of food chemistry in healthy eating. The maximum percentage of correct answer was observed for the question related to protein requirement (97.50%), followed by the knowledge of balanced diet and the usefulness of food chemistry (90% correctness). This indicates that respondents are well aware about nutrition and good health.

Analysis of survey data indicates that 95% students agreed that the knowledge of food chemistry is important for healthy eating style (Figure 5). Majority of students have better insight about the facts that taste and aroma of food are due to chemical and volatile compounds present in food, cooking affects nutrients, leading to partial nutrient loss and the purpose of food additives and preservatives in processed food. The survey data also indicates that the most students correctly understood the role of carbohydrates and fats for health, as well as they have concept of importance of balanced diet for good health. A high percentage of students reported about their reading habits of food labels on packaged food products, which shows their awareness about health. There are only two question related to food additives and role of fats which receives less percentage of correct answers (<50%).

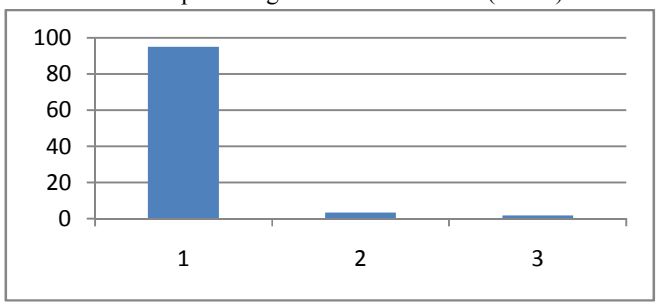

Figure 5: Overall knowledge of respondants of knowledge of food chemistry

The data obtained was analysed according to the subject stream (arts, science and commerce) of the student and it was found that the students of science stream has better understanding (76.4%) than compare to the students of other streams (52.3%) (Figure 6). This difference was significant which shows that students of other streams are little less aware of knowledge of food chemistry.

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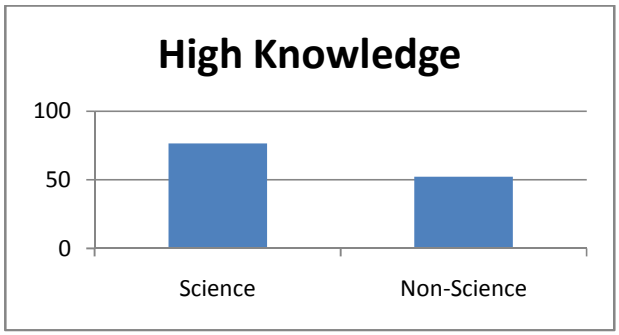

Figure 6: Stream wise analysis of data

Chi square test was performed on survey data to determine the association between academic stream and knowledge of food chemistry. Results of chi square test shows significant difference between subject stream of student and knowledge of food chemistry ($\chi^2 = 6.42$, df = 1, p = 0.011). Thus it is clear that there is a significant difference in the knowledge about chemistry of food between the students from science stream and the students from other stream. This result shows that the awareness about the knowledge of food chemistry is enhanced by science education. High level of awareness about food and balanced diet among the students of science stream indicates that the study of food chemistry as a part of their curriculum helps them to understand the importance of healthy eating habits. Non-science stream students can get this knowledge from their family and through the general awareness campaigns.

Limitation

The major limitation of the study is the small sample size. The limited number of respondents of small size sample may not be the proper representation of entire population. Adaptation of technique of convenience sampling restricts the generalization of results obtained from the data. The survey data was based on self-reported responses therefore there might be a chance that the responses are not genuine and may be influenced or biased. In order to present himself aware, the respondent can give socially acceptable answers instead of his own views which can contaminate the data.

IV. FUTURE SCOPE

In order to generalize the results in future, sample size can be increased. It will increases precision, reliability, and statistical power of the data, which further lead to reduce the possibility of error and increases the confidence in results. Inferential statistical analysis can be applied to data which can provide much better understanding of data. Longitudinal studies can determine the changes in awareness of targeted groups over time which can help to understand the change of perception of students with time.

V. CONCLUSION

The survey based study to assess knowledge of students about concepts of food chemistry shows that respondents have good insight of food they are eaten. Subject stream wise analysis indicates higher awareness of science students than the students of other streams. The chi-square test was performed on the survey data and it was found that academic stream (science and other stream) is very well related with overall knowledge of food chemistry ($\chi^2 = 6.42$, p = 0.011), which further indicates that science students are more aware about the concepts of food chemistry than compared to non-science students. By using social media campaigns, by organizing cooking workshops and interactive sessions about nutritional value of food can support to enhance the knowledge of food chemistry of students of non-science stream.

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