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Knowledge Attitude and Practices of Food Labelling Among Students of University of Calabar Cross River State Nigeria

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KNOWLEDGE ATTITUDE AND PRACTICES OF FOOD LABELLING AMONG STUDENTS OF UNIVERSITY OF CALABAR CROSS RIVER STATE NIGERIA

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Abstract

Background: Food labels provide important nutritional and safety information that can support informed food choices. However, awareness of food-label information does not necessarily translate into appropriate interpretation and use.

Objectives: This study assessed the knowledge, attitude and practices of food labelling among undergraduate students of the University of Calabar, Nigeria.

Methods: A cross-sectional descriptive study was conducted among 396 undergraduate students of the University of Calabar. Respondents were selected using a multistage sampling technique. Data were collected using a structured, self-administered questionnaire covering sociodemographic characteristics, knowledge, attitude and practices related to food labelling. Data were analysed using the Statistical Package for the Social Sciences (SPSS) version 24. Descriptive statistics were presented as frequencies, percentages, means and standard deviations, while chi-square and t-test were used to assess associations. Statistical significance was set at $p<0.05$.

Results: The respondents were predominantly female (56.6%) and aged 20–24 years (45.2%). Although high proportions correctly recognized individual food-label components, including ingredients (94.6%), manufactured and expiry dates (93.4%), and nutrition information (93.2%), overall knowledge of food labelling was poor among 67.9% of respondents, while 21.7% had fair and 10.4% had good knowledge. Overall, 58.3% demonstrated a negative attitude towards food labelling. Although 61.1% reported reading food labels, overall food-

labelling practice was poor among 86.6% of respondents. Among respondents who did not read labels, lack of understanding was the most frequently reported reason (71.7%). Knowledge was significantly associated with food-label use (χ^2=10.520, p=0.005), whereas attitude was not significantly associated with food-label use (χ^2=0.105, p=0.746).

Conclusion: Despite recognition of several individual food-label components, undergraduate students demonstrated substantial gaps in overall food-labelling knowledge, attitude and practice. The significant association between knowledge and food-label use, together with lack of understanding as the major barrier to label reading, highlights the need for practical food-labelling education that emphasizes interpretation and application of label information in everyday food-purchasing decisions.

Keywords: food labelling; nutrition knowledge; attitude; food-label practices; university students; nutrition information; Nigeria.

Introduction

The increasing availability and diversity of pre-packaged foods have made food labelling an important component of the modern food environment. Changes in food production, urbanization and lifestyles have contributed to greater consumption of processed and packaged foods, while diets high in free sugars, unhealthy fats and sodium remain important contributors to diet-related non-communicable diseases (NCDs) (World Health Organization [WHO], 2025). In this context, nutrition labelling provides consumers with information that can support informed food purchasing and consumption decisions. The WHO identifies nutrition labelling, including nutrient declarations and interpretive front-of-pack labelling (FOPL), as an important policy measure for improving consumer understanding and supporting healthier food choices (WHO, 2022, 2025).

Food labels provide information about the composition, nutritional characteristics, ingredients, quantity, durability, storage conditions, allergens and other characteristics of packaged foods. Access to such information can help consumers compare products and select foods according to their nutritional needs, preferences and dietary restrictions. However, the availability of information on a package does not necessarily mean that consumers understand or use it effectively. The usefulness of food labelling therefore depends not only on the completeness and clarity of the information provided but also on consumers' knowledge, attitudes and ability to interpret and apply the information during purchasing decisions. Recent evidence among university students demonstrated substantial knowledge of food labels, but also showed differences between knowledge, label-checking behaviour and actual use of label information when selecting foods (AlBlooshi et al., 2025).

Food labelling has consequently become an important component of public health strategies aimed at improving food environments and reducing diet-related disease. The WHO and Food and Agriculture Organization emphasize the importance of healthy dietary patterns in preventing malnutrition in all its forms and reducing the risk of NCDs (WHO & FAO, 2024). Nutrition labelling can complement broader dietary interventions by making information about the nutritional properties of packaged foods more accessible at the point of purchase. In particular, interpretive FOPL systems are intended to simplify complex nutritional information and assist consumers in identifying products with less favourable nutritional profiles (WHO,

2023). Thus, effective food labelling may contribute to healthier food choices when consumers possess the knowledge and motivation required to interpret the information provided.

In Nigeria, the importance of food labelling is particularly relevant because of changes in the food environment and the increasing availability of packaged and processed foods. Evidence indicates that the Nigerian diet has undergone a gradual transition involving greater inclusion of processed foods, fats and sugars, alongside increasing concerns about overweight, obesity and diet-related NCDs (Petrikova et al., 2023). The nutritional quality of products available in the Nigerian food environment also raises concerns. A recent assessment of 883 pre-packaged foods found that important nutrient information was not consistently disclosed, while many products exceeded nutrient-profile thresholds for one or more nutrients of public-health concern (Iheme et al., 2025a). These findings underscore the importance of enabling consumers to critically evaluate information presented on packaged foods.

Nigeria has established regulatory requirements governing the labelling of pre-packaged foods. The National Agency for Food and Drug Administration and Control (NAFDAC) Pre-Packaged Food, Water and Ice Labelling Regulations, 2019 specify requirements for food labelling and prohibit the manufacture, importation, distribution, advertisement or sale of pre-packaged foods that do not comply with the prescribed labelling requirements (NAFDAC, 2019). However, regulatory provision alone may not ensure that consumers receive or understand all relevant nutritional information. A recent Nigerian study assessing 883 pre-packaged food products found generally high compliance with several basic labelling requirements, but identified substantial gaps in quantitative ingredient declaration and the disclosure of priority and non-priority nutrients (Iheme et al., 2025b). Earlier national evidence similarly showed that most packaged foods provided only partial nutrition information, with very few products displaying complete nutrient declarations required under the 2019 regulations (Iheme et al., 2023).

The effectiveness of food labelling therefore depends substantially on consumer knowledge and engagement with the information provided. Consumers need to understand terms, nutrient quantities, serving sizes, ingredient lists, expiry or durability dates and nutrition claims in order to use labels appropriately. Evidence from university populations suggests that although students may demonstrate considerable familiarity with food labels, factors such as cost, perceived usefulness, time and individual characteristics can influence whether label information is actually consulted during food selection (AlBlooshi et al., 2025). This distinction between knowing about food labels and consistently using them makes the assessment of knowledge, attitude and practices particularly relevant among young adults.

University students constitute an important population for studying food labelling because the university period is often associated with increased independence in food purchasing and consumption. Students may frequently make individual decisions about packaged foods based on considerations such as convenience, affordability, availability and personal preference. Consequently, their knowledge and attitudes toward food labels may influence the extent to which they incorporate label information into everyday purchasing practices. Recent research among university students has demonstrated that knowledge of food labelling can be relatively high while label use remains influenced by practical considerations such as cost and individual circumstances (AlBlooshi et al., 2025). Assessing these dimensions together is therefore more informative than examining label knowledge alone.

Evidence from Nigeria also indicates that gaps in food-label knowledge are not restricted to the general adult population. Research among students has identified differences in understanding and perception of food labels, with educational and environmental factors influencing knowledge of food labelling and safe nutrition (Olaoye, 2024). However, available Nigerian research has focused on relatively few university populations and geographical settings. For example, previous research among undergraduate students at the University of Ibadan examined knowledge, perception, attitude and use of food-labelling information, demonstrating the relevance of these constructs within Nigerian university settings. Nevertheless, evidence specific to students of the University of Calabar remains limited.

Understanding the knowledge, attitudes and practices of students of the University of Calabar is therefore important for identifying how effectively young consumers engage with food-label information. Such evidence can help determine whether students possess adequate knowledge to interpret food labels, whether they perceive labelling positively, and whether they routinely apply label information when selecting packaged foods. It can also provide context-specific evidence for nutrition education, consumer-awareness programmes and interventions aimed at improving the use of food labels among university students. Accordingly, this study assessed the knowledge, attitude and practices of food labelling among students of the University of Calabar**.**

Methods

Study design
The study employed a cross-sectional descriptive survey aimed at determining the knowledge, attitudes, and practices of food labelling among students of the University of Calabar

Population of the study
The population of the study comprised undergraduate students enrolled at the University of Calabar. The University of Calabar has a diverse student body, representing various disciplines, socio-economic backgrounds, and cultural identities. The total student population at the University of Calabar was estimated to be 42,000, with both male and female students from different age groups and academic levels.

Inclusion criteria
All males and female students' age 17-30 years across the faculties who are full time undergraduate students and sign the consent form were included excepts those that are pregnant.

Exclusion criteria
All Postgraduates students (male and female) and female undergraduate students who are pregnant or in any form of medication, acutely ill or with known chronic diseases

Sample size determination
The sample size of this study was determined using Yamane method (1967)

$$n = \frac{N}{(1+N(e)^2)}$$

The 396 respondents will come from different faculties and departments in the school campus.

Sampling technique

Table 1 shows the faculties, departments and number of participants from each of the selected departments. Multi stage random sampling technique was adopted in selection of the respondents for the study. In the first stage, five (5) out of fifteen (15) faculties in the university was selected by simple random sampling without replacement. In the second stage, three (3) departments were selected from the Faculty of Arts and Allied Medical Sciences, 1 from Law, 4 from Management Sciences and 2 from Basic Medical Sciences using simple random sampling without replacement. In third stage, proportionate sampling was used to select the number of respondents from each department and the respondents in each department were selected using simple random sampling without replacement.

Faculties	**Departments**
Law	Law (35)
Arts	Mass Communication (30)
	History and International Studies (30)
	Philosophy (25)
Management Sciences	Business Management (30)
	Banking and Finance (30)
	Marketing (26)
	Accounting (30)
Basic Medical Sciences	Human Nutrition and Dietetics (40)
	Biochemistry (25)
Allied Medical Sciences	Nursing Science (40)
	Public Health (25)
	Radiography (30)
Total	**396**

Data collection

Data were collected through a self-administered questionnaire distributed to respondents. The questionnaire was adapted from relevant similar studies and consisted of five sections.

Socio-Demographic Information: This section included questions about the respondents' age, sex, religion, marital status, residence, level of study, department/course of study, ethnic group, and income. Respondents were asked to tick (√) any of the options that apply to them or to complete the blank spaces provided as applicable.

Knowledge of Students on Food Labels: This section assessed the students' understanding of food labels. It included questions that asked respondents to define what a food label is and to identify its components. Respondents were asked about the understanding of terms such as "expiry date" and "best before," as well as their perceptions of the information provided on food labels. The section will also evaluate whether respondents believe that food labels affect their nutritional awareness and whether they find the information sufficient for making informed choices.

Attitude of Students Regarding Food Labels: This section assessed the attitudes of respondents toward food labeling. It contained statements about their perceptions of food labels and their influence on purchasing decisions. Respondents were asked to indicate their level of agreement or disagreement with each statement, helping to categorize their attitudes as positive or negative.

Respondents' Practice of Food Labels: This section assessed the frequency with which respondents read food labels, their motivations for doing so, and any difficulties they encounter. Questions were included to explore the relationship between reading food labels and the respondents' health conditions. Respondents were also asked about their reasons for not reading food labels if applicable, as well as their intentions to start using food labels more effectively with increased awareness.

Food Label and Health Condition: This final section examined the relationship between food labeling and health conditions. Respondents were asked whether they believe food labels can guide against certain diseases and if they have ever been diagnosed with any food-related illnesses. The collected data provided valuable information about the knowledge, attitudes, and practices of University of Calabar students regarding food labeling, contributing to a better understanding of their eating behaviors and the effectiveness of food labeling as a tool for promoting healthy dietary choices.

Informed Consent
Consent to participate

Ethical approval was obtained from the Ethical Committee, Cross River State Ministry of Health, Nigeria after submitting the project proposal with the necessary documents required by the Ethical Committee with Protocol Number: CRS/MH/HREC/2024/VOL.2/059 Dated: 25th September, 2024. Prior to participation, informed consent to participate was orally obtained from participants. They were provided with a comprehensive oral explanation of the study's objectives, methodologies, their expected roles, and the potential benefits of their involvement and were assured of the confidentiality of their responses and informed of their right to withdraw from the study at any time without facing any consequences. This was done in accordance with Declaration of Helsinki principles.

Data Analysis
Data collected from the study was analyzed using the Statistical Package for the Social Sciences (SPSS) version 24. Descriptive statistics such as frequencies and percentages were used to summarize the data. Inferential statistics, specifically the T-test, was employed to determine any significant differences between groups. The level of significance was set at $p < 0.05$

Statistical Analysis
Data analyzed was coded and entered into the system, after which data cleaning was carried out by running frequencies of all entered data to ensure that values were not missing and duplicated. The research questions and the research hypotheses were tested using the descriptive statistics which included frequencies, percentages, standard deviation/the mean rating statistics and the chi-square statistical tool (which was used to determine the association of variables with nutritional status). Statistical significance was accepted when the $p<0.05$

RESULTS

Table 2 shows the socio-demographic background of the respondents The majority of the respondents were female (56.6%), while males made up 43.4%. Age-wise, most students were between 20 and 24 years (45.2%), with 41.4% aged 24 to 28 years, and a smaller group (13.4%)

aged 16 to 20. In terms of religion, Christianity (98.0%), was the predominant while, 2.0% of respondents identified as Muslim. More students lived on campus (53.5%) compared to those living off campus (46.5%). The majority of respondents were single (95.7%), with only 4.3% married. As for academic levels, most respondents were in 400 level (37.1%) and 300 level (32.1%), while smaller groups were in 200 level (19.4%), 100 level (7.3%), and 500 level (4.0%). Looking at course distribution, the largest groups were from Nursing Science and Human Nutrition and Dietetics (each 10.1%), followed by Law (8.8%) and Mass Communication, Radiography, Business Management, Banking and Finance, and Accounting (all 7.6%). Other notable courses included Marketing (6.5%), Public Health, Biochemistry, and Philosophy (6.3% each). The Faculty of Management Sciences had the highest number of respondents (31.4%), followed by Allied Medical Sciences (24.0%) and Basic Medical Sciences (16.4%). The Faculty of Arts and Faculty of Law also had notable representation, with 19.4% and 8.8%, respectively. Ethnic representation showed that the majority were Igbo (42.9%), followed by Yoruba (11.1%) and Hausa (7.1%). More respondents (94%) reported earning between N10 and N20, while smaller portions reported higher earnings, with only 4.2% earning between N30 and N40, and less than 2% earning above N50.

Table 2 Socio-demographic background of respondents

Variable	Frequency	Percentage (%)
Sex		
Female	224	56.6
Male	172	43.4
Total	396	100.0
Age		
16 – 20	53	13.4
20 – 24	179	45.2
24 – 28	164	41.4
Total	**396**	**100.0**
Religion		
Christianity	388	98.0
Islam	8	2.0
Total	**396**	**100.0**
Residence		
Off campus	184	46.5
On campus	212	53.5
Total	**396**	**100.0**
Marital status		
Married	17	4.3
Single	379	95.7
Total	**396**	**100.0**
Level of Study		
100 level	29	7.3
200 level	77	19.4
300 level	127	32.1
400 level	147	37.1

500 level	16	4.0
Total	**396**	**100.0**
Departmental/course of study		
Human Nutrition and Dietetics	40	10.1
Biochemistry	25	6.3
Nursing Science	40	10.1
Public Health	25	6.3
Radiography	30	7.6
Business Management	30	7.6
Banking and Finance	30	7.6
Marketing	26	6.5
Accounting	30	7.6
Law	35	8.8
Mass Communication	30	7.6
History and International Studies	30	7.6
Philosophy	25	6.3
Total	**396**	**100.0**
Faculty		
Basic Medical Sciences	65	16.4
Allied Medical Sciences	95	24.0
Management Sciences	116	31.4
Faculty of Law	35	8.8
Faculty of Arts	85	19.4
Total	**396**	**100.0**
Ethnic group		
Agbo	1	3
Annang	27	6.9
Asa (Rivers State)	6	2.6
Bekwara	9	2.3
Boki	26	6.6
Edo	14	3.5
Efik	26	6.6
EKOI	1	3
Hausa	28	7.1
Ibibio	9	2.4
Igala	1	.3
Igbo	170	42.9
Ijaw	5	1.3
Kanuri	3	8
Oron	4	1.0
Tiv	2	5
Urhobo	6	1.5
Yala	14	3.5
Yoruba	44	11.1
Income from all sources		
10-20	376	94
30-40	14	4.2
50-100	2	0.6

100 and above	4	1.2
Total	**396**	**100.0**

This aspect of the result examined the respondents' knowledge of food labels and the term 'best before,' as presented in Table 3. When asked to define a food label, 89% of respondents recognized it as the nutrition information on the packaged food product, while a few (9%) understood it to include all written components on the packaging. Only 2% believed it referred to the manufacturer's name and address. For those that understood the meaning of 'best before,' 80% of the respondents stated that they knew what the term meant, while 20% indicated they did not. Regarding the definition of 'best before,' 69% wrongly identified it as the expiry date, or the date after which the product should not be consumed. However, 25.75% believed that the product could still be used after this date, and 5.25% mistakenly thought it referred to the manufacturing date.

Table 3 Respondents' definition of food label and 'best before'

Variable	**N**	**%**
Explanation of food label (N=396)		
All written components on the packaged food product*	36	9
The Nutrition information on the packaged food product	356	89
The manufacturer name and address on the packaged food product	4	2
The nutrition information on the packaged food product	23	5.8
Total	**396**	**100**
Whether know what best before means (N=396)		
Yes	320	80.0
No	76	20
What best before means (N=396)		
Expiry date/ It means a date after which the product cannot be consumed	276	69
Product can still be managed after the date*	99	25.75
Same as manufacture date	21	5.25

***Correct response**

Results from Table 4 shows the respondents' awareness of the components of food labels. The results indicate that a significant majority (94.6%) recognized the list of ingredients as a component of food labels, while only a small percentage (4.8%) did not and just 0.3% were unsure. Awareness of the name of the manufacturer was reported by 70.5% of respondents, although a notable portion (26.0%) did not recognize it as a component, and 3.5% were

uncertain. Concerning the NAFDAC number, 72.0% of respondents acknowledged it as important, while 26.0% did not, and 2.0% were unsure. Both the manufactured date and expiry date were correctly identified by 93.4% of respondents. Instruction for use was recognized by 90.2% of the participants, with 9.1% not aware of it, and 0.8% unsure. The nutrition information was correctly identified by 93.2% of respondents, and 90.4% recognized the net contents and drained weight, with 9.1% indicating they did not know. Awareness of the country of origin was high, with 87.1% correctly identifying it as a component, while 12.6% did not and 0.3% were unsure.

Table 4 Components of food labels

Components	**Yes (%)**	**No (%)**	**Don't Know (%)**	**Total (%)**
List of ingredients	376 (94.6) *	19(4.8)	1(0.3)	396(100.0)
Name of manufacturer	276 (70.5)	103 (26.0)	14 (3.5)	396(100.0)
NAFDAC number	285 (72.0)*	103 (26.0)	8 (2.0)	356 (100.0)
Manufactured date	370 (93.4)*	25 (6.3)	1 (0.3)	396 (100.0)
Expiry date	370 (93.4)*	25 (6.3)	1 (0.3)	396 (100.0)
Instruction for use	357 (90.2)*	36 (9.1)	3 (8)	396 (100.0)
Nutrition information	369 (93.2)*	27(6.8)		396(100.0)
Net contents and drained weight (Liquid foods–volume, solid foods – weight)	358 (90.4)*	36(9.1)	2 (0.5)	396 (100.0)
Country of origin	345 (87.1)*	50 (12.6)	1 (0.3)	396 (100.0)
Name of packaged food	328 (82.8)*	64 (16.2)	4 (1.0)	396 (100.0)

Table **5** presents the respondents' awareness of various aspects of food product information, as detailed in the table 4. The results show that a significant majority of respondents (89.1%) were aware of the standard of the product, while 10.4% were not and 0.5% were unsure. Regarding nutritional labels, 90.0% of respondents recognized this information as important, with only 8.8% not aware and 0.3% unsure. 90.3% of participants knew how to use the food product, with 9.8% indicating they did not have this knowledge. The awareness of the product's lifespan was also high, with 88.9% of respondents acknowledging this information, while 10.6% were unaware and 0.5% were unsure. Lastly, 81.6% of respondents were aware of the product's price, but 18.2% did not know it, and 0.3% were uncertain (Table 4).

Table 5 Information from the food label

Information	Yes (%)	No (%)	Don't Know (%)	Total (%)
Standard of the product	353 (89.1)*	41 (10.4)	2 (0.5)	396 (100.0)
Nutritional label/details	360 (90.0) *	35 (8.8)	1 (0.3)	396 (100.0)
How to use food product	357 (90.3) *	39 (9.8)		396 (100.0)
Life span of the product	352 (88.9) *	42 (10.6)	2 (0.5)	396 (100.0)
Price of the product	323 (81.6)	72 (18.2) *	1 (0.3)	396 (100.0)

The result in Table 6 shows respondents' perceptions of the availability and usefulness of nutritional information on food packaging. When asked whether food packaging conveys sufficient information about nutritional value, serving size, calories, nutrients, and grams of fat, 49.0% of respondents said they always found this information sufficient, while 40.4% reported that it was sufficient sometimes. A smaller portion (10.6%) said they never found the information sufficient. Regarding whether the nutrient information helps to restrict the intake of certain nutrients due to allergies, 54.5% of respondents felt that it sometimes helps, while 34.8% believed it always does. However, 10.6% indicated they never found it helpful. In terms of promoting the consumption of certain nutrients that may be required in sufficient quantities, again, 54.5% of participants said this information was helpful sometimes, while 32.6% believed it was always helpful, and 12.9% stated it never is. Lastly when asked if the food package and label provide meaningful information about the company name, address, and expiry date, 54.3% responded that it helps sometimes, 49.0% said it always helps, and 15.5% indicated that they never find this information meaningful.

Table 6 Availability of nutritional information

Variables	Yes Always (%)	Yes Sometimes (%)	Never (%)	Never (%)
Whether food package convey sufficient information on the nutritional value, serving size, calories, nutrients and grams of fat contents to you	194 (49.0)*	160 (40.4)	42 (10.6)	396 (100.0)
Whether the Information contained on the list of nutrients help you to restrict intake of certain nutrients that you may be allergic to	216 (54.5)*	138 (34.8)	42 (10.6)	396(100.0)
Whether the information contained on the list of nutrients help to promote the consumption of certain nutrients that you or some individual may require in sufficient quantity.	216 (54.5)*	129 (32.6)	51 (12.9)	396 (100)
Whether the food package and label convey meaningful information on the company name, address and the expiry date	215 (54.3) *	120 (30.3)	61(15.5)	396 (100)

Table 7 shows the items commonly found in the nutritional details on food labels and whether respondents identified them correctly. For serving size, 82.8% correctly identified it, while 17.1% did not. Calories were recognized by 87.9% of respondents, and grams of fat by 86.6%. Similarly, 87.6% correctly identified nutrients, while ingredients and storage instructions were recognized by 87.9% of respondents. Additionally, 90.4% correctly identified the manufacture date.

Table 7 Items contained in the nutritional details found in the food label

Items	True (%)	False (%)	Total (%)

Serving size	328 (82.8)*	68 (17.1)	396 (100.0)
Number of calories	348 (87.9)*	48(12.1)	396 (100.0)
Grams of fat	343(86.6)*	53 (13.4)	396 (100.0)
Nutrients	347 (87.6)*	49 (12.4)	396 (100.0)
Ingredients	348 (87.9)*	48(12.1)	396 (100.0)
Manufacture date	341 (90.4)*	55 (13.9)	396 (100.0)
Instruction on storage	348 (87.9)*	48(12.1)	396 (100.0)

The perceived benefits of food labels among respondents are presented in table 8. A significant majority (77.0) of respondents believed that the nutritional information on food labels helps in managing certain diseases, while 9.8% disagree, and 13.2% are unsure. When asked how nutritional details can be helpful, 55.0% of respondents said the information helps individuals limit their intake of unfavorable nutrients. Additionally, 13.6% noted that it assists those trying to increase their nutrient intake, and 31.3% stated that the information is beneficial for disease management. However, 20.2% of respondents felt the information was not helpful at all.

Table 8 Benefit of food labels

Variables	**N**	**%**
Whether nutritional information on food labels lead to better management of some diseases (N=396)		
Yes	305*	77.0
No	39	9.8
Don't Know	52	13.2
How information relating to nutrition details can be helpful (N=396)		
Information could help individuals restrict intake of certain unfavorable nutrients	218*	55
Those trying to get enough nutrients could make use of the information gotten from the nutritional details	54*	13.6
The information could be helpful in managing some diseases	124*	31.3
The information cannot be helpful at all	80	20.2

Table 9 categorizes respondents based on their knowledge of food labels. The majority, 67.9%, fall into the "poor" knowledge category, indicating a limited understanding of food label information. However, 21.7% of respondents have "fair" knowledge, while only 10.4% demonstrated "good" knowledge.

Table 9 Categorization of knowledge among respondents

Knowledge Categories*	N	%
Poor	**269**	67.9
Fair	86	21.7
Good	41	10.4
Total	396	100.0

Table 10 presents the attitude of respondents regarding food labels. A notable percentage of about 42.2% respondents agreed that they could recommend the use of food labels to their friends, while 54.5% disagreed with this statement. Most respondents (61.5%) do not consider food labels important, which affects their decision-making, as 60.1% indicated they could purchase packaged food without reading the label. In terms of the influence of friends on their food label usage, 51.5% felt that friends could sway their decisions, while 47.0% disagreed. Additionally, 53.8% expressed skepticism about the accuracy of information on food labels, suggesting it may deter them from using them. However, a significant 77.3% stated that they prefer using food labels because they help them stay conscious of their health, and 78.3% trust the information on food labels enough to make health decisions.

Table 10 Attitude of respondents regarding food labels

Attitudinal Statements	Agree (%)	Disagree (%)	Undecided (%)	Total (%)
I can recommend the use of food labels to my friends	167 (42.2) *	216 (54.5)	13 (3.3)	396 (100 0)
I do not regard food labels as important Therefore, I cannot use it to make any decision	242 (61.5)	144 (36.4)	10 (2.5)	396 (100.0)
I can purchase packaged food product without reading the food label	238 (60.1)	151 (38.1) *	7 (1.8)	396 (100.0)
Even if am advised on the importance of food labels, I cannot use it	197 (49.7)	195 (49.2)*	4 (1.0)	396 (100 0)
I can only make use of the food labels	121	188	39 (11.2)	348 (100.0)

because of the NAFDAC number as it is the only important item on it	(34.8)	(54.0)*		
My friends can influence my decision to use food labels	204 (51.5)*	186 (47.0)	6 (1.5)	350 (100.0)
Information presented on food labels are sometime not correct so I cannot use food labels	213 (53.8)	173 (43.7)	10 (2.5)	396 (100.0)
I prefer the use of food labels as it makes me conscious of my health	306 (77.3) *	83(21.0)	7 (1.8)	396 (100.0)
I trust the information on food labels enough to make a health decision	310 (78.3)*	74 (18.7)	12 (3.0)	396 (100 0)

Table 11 shows categorization of attitude among respondents More than half of the respondents (58.3%) showed a negative attitude, indicating indifference towards the importance of food labels. However, 41.7% of respondents showed a good attitude, reflecting a more positive perception of the role that food labels play in their purchasing decisions and health awareness.

Table 11 Categorization of attitude among respondents

Attitudinal* Categories	**N**	**%**
Negative	231	58.3
Good	165	41.7
TOTAL	**396**	**100**

Table 12 shows the practices of respondents regarding food labels. Majority of respondents, (61.1%), reported that they read food labels, while 38.6% indicated they do not. Among those who do not read the information, the primary reason (71.7%) is a lack of understanding, followed by 16.2% stating lack of time, 5.1% showing no interest, 4.5% noting small percentage, and 2.0% expressing no opinion. Only 0.5% mentioned disbelief in the information provided. When asked if enlightenment would encourage better use of food labels, 30.6% agreed, while a substantial 68.4% were unsure. Regarding the consideration of expiration dates when purchasing products, a significant 83.3% said they do consider them, showing a general awareness of product safety. In terms of when respondents read food labels, 67.7% do so before

buying a product, while 7.1% read them after purchasing at the store, 9.1% read them after returning home, and 15.9% felt they did not need to read them at all.

Table 12 Respondents' practice of food labels

Variables	N	%
Whether read food labels (N=396)		
Yes	242	61.1*
No	154	38.6
Reasons for not reading information on food labels (N=396)		
Small print	18	4.5
No Opinion	8	2.0
Not interested	20	5.1
Do not believe it	2	.5
No time	64	16.2
Do not understand	271	71.7
Whether enlightenment will encourage the use of food labels effectively (N=396)		
Yes	121	30.6
No	4	1.0
Don't know	271	68.4
Whether consider the expiring dates of the products bought (N=396)		
Yes	330	83.3
No	66	16.7
When the food label of purchased food product is read (N=396)		
Before buying the food product	268	67.7
After buying the food product at the food store	28	7.1
When you get home from the food store	36	9.1
Don't need it	63	15.9

Table 13 presents the frequency with which respondents read different components of food labels. Majority of respondents (81.6%), consistently check the expiry date, and 47.3% always

read the manufactured date. Similarly, 45.2% of respondents regularly check the NAFDAC number, while 49.5% always read nutrition information. For other components, such as the list of ingredients and instructions on the label, 72.2% and 37.9% of respondents read them consistently, respectively. However, a notable percentage, around 38.4%, admitted to never checking the storage condition.

Table 13 Frequency in reading the components of the food label

Components	Never (%)	Sometimes (%)	Always (%)	Total (%)
Nutrition information	68 (17.2)	132 (33.3)	196 (49.5)	396 (100.0)
NAFDAC number	72 (18.2)	11 (37.1)	179 (45.2)	296 (100.0)
Manufactured date	11 (4.3)	46 (18.0)	121 (47.3)	396 (100)
Expiry date	66 (16.7)	7 (1.8)	323 (81.6)	396 (100.0)
List of ingredients	66 (16.7)	44 (16.7)	286 (72.2)	396 (100.0)
Instructions on food label	78 (19.7)	168 (42.4)	150 (37.9)	396 (100.0)
Storage condition	219 (38.4)	78 (19.7)	99 (25.0)	396 (100.0)

Table 14 presents the nutrients that respondents look for when checking food labels and the influence of food labels on their purchasing decisions. Among the nutrients, vitamins were the most commonly checked, with 35.1% of respondents saying they look for this information. Protein follows with 21.5%, while a smaller percentage check for minerals (14.1%), fat (2.3%), and total energy (2.5%). Notably, only 0.3% check for carbohydrates. In terms of the influence of food labels on purchasing decisions, 63.4% of respondents indicated that food labels sometimes influence their choices, while 14.1% stated that they are always influenced. However, 12.9% reported that food labels never affect their purchasing decisions. When asked about the use of food labels by friends or peers, 50.8% confirmed that their friends do use them, while 31.1% said they do not, and 18.1% were unsure. The majority of respondents (41.2%) emphasized that the information should be clear. Other factors included being readily legible (10.8%), well-positioned on the package (18.5%), and not obscured by any printed matter (29.5%).

Table 14 Nutrients checked while making use of food label and influence to use food labels

Variables	N	%
Nutrients looked out for when nutrition		

information under the food label is checked (N=396)		
Total Energy	10	2.5
Protein	85	21.5
Vitamins	139	35.1
Carbohydrate	1	.3
Fat	9	2.3
Minerals	56	14.1
All of the above	81	20.4
Whether food label on a product influence decision to purchase it (N=396)		
Yes Always	56	14.1
Yes Sometimes	251	63.4
Never	51	12.9
Whether friends or peers make use of food labels (N=396)		
Yes	201	50.8
No	123	31.1
Don't know	72	18.1
Factors that could encourage the use of food labels (N=396)*		
Information should clear	163	41.2
Readily legible	43	10.80
Position on the packaged food	73	18.5
Not obscured by any written printed matter	117	29.5

Categorization of the respondents' use of food labels is presented in table 15. The results reveal that a substantial majority, 86.6%, reported a poor practice of using food labels, while only 13.4% demonstrated a good practice.

Table 15 Categorization of use of food label among respondents

Practice Categories	N	%
Poor	343	86.6

Good	**53**	13.4
TOTAL	**396**	**100**

Table 16 presents the relationship between knowledge categories and the use of food labels among respondents. The data reveals that among those with poor knowledge, only 7.3% reported using food labels effectively, while a significant 60.0% did not use them at all. For respondents categorized as having fair knowledge, 3.0% indicated they use food labels, with 18.7% not using them. Similarly, among those with good knowledge, 3.0% used food labels effectively, while 7.3% did not. Overall, only 13.4% of respondents reported good use of food labels, while majority, 86.6%, demonstrated poor or no use (Table 15).

Table 16 Categorization of food label use by knowledge

Knowledge Categories	Use of food labels		Total (%)	**X^2	df	P-value
	Yes (%)	No (%)				
Poor	29 (7.3)	240 (60.0)	67.9 (2.0)	10.520	2	0.005
Fair	12 (3.0)	74 (18.7)	86 (21.7)			
Good	12 (3.0)	29 (7.3)	41(10.4)			
Total	53 (13.4)	343 (86.6)	350 (100.0)			

Table 17 shows the relationship between respondents' attitudes and their use of food labels. The data shows that among those with a negative attitude, only 8.1% reported effectively using food labels, while a significant 50.3% indicated they do not use them. However, among respondents with a positive attitude, 5.3% utilized food labels, and 17.2% did not. Majority (86.6%) of respondents reported using food labels, while 13.4% stated they did not.

Table 17 Categorization of food label use by attitude

Attitude Categories	Use of food labels		Total (%)	X^2	df	P-value
	Yes (%)	No (%)				
Negative	32(8.1)	199 (50.3)	231(58.3)	0.105	1	0.746
Positive	21 (5.3)	34(17.2)	144 (36.4)			

Total	343 (86.6)	53(13.4)	396 (100.0)

Significant at P<0.0

Discussion

Understanding food labels supports informed dietary choices by providing information on nutrient composition, ingredients and allergens (Roberto et al., 2017). The predominantly young and unmarried profile of respondents is consistent with previous university-based studies, including research among students at the University of Ibadan and young people in the Obafemi Awolowo University community. The relatively balanced sex distribution is also relevant, although Adesina et al. (2022) and Md Zaini et al. (2022) found no significant gender differences in food-label use, knowledge, attitude or practice. Age, however, may influence food-labelling behaviour, as Adesina et al. (2022) and Babalola et al. reported associations between age and the use of food-product information.

The predominance of unmarried respondents is expected among undergraduates and may limit direct comparison with household-based populations, where marital status and household responsibilities can influence food purchasing. Oke et al. identified marital status, sex, education, occupation and income as factors associated with nutritional-label use among urban Nigerian homemakers. The diversity of academic levels and faculties in the present study is important because nutrition education, knowledge and attitudes may influence label-reading behaviour, with previous nutrition education particularly associated with label use.

The ethnic diversity of respondents reflects the multicultural nature of Nigerian universities; however, ethnic composition should not be considered a determinant of food-labelling behaviour without statistical evidence. Differences between university populations may largely reflect their geographical and sociocultural settings. Socioeconomic circumstances are also relevant because students with limited income may have to balance nutritional considerations with affordability and purchasing priorities. Falola (2014) reported positive associations between willingness to read food labels, household income and educational status, while Oke et al. identified income, occupation, education, marital status and sex as predictors of nutritional-label use.

Finally, students' residence may influence their food-purchasing environment and exposure to packaged foods, particularly where students living independently have greater responsibility for food selection. Nevertheless, this relationship requires direct statistical assessment. Overall, the demographic, educational, ethnic, socioeconomic and residential characteristics provide important context for interpreting food-labelling knowledge and practices among university students (Roberto et al., 2017; Adesina et al., 2022; Md Zaini et al., 2022; Babalola et al.; Falola, 2014; Oke et al.).

The predominance of poor knowledge of food labelling observed in this study suggests that exposure to packaged-food information does not necessarily translate into the ability to understand or interpret it. This finding is important because food labels are intended to provide consumers with information that can support informed purchasing and dietary decisions. Evidence from sub-Saharan Africa indicates that although food-label use is relatively widespread, consistent use and comprehension remain substantially lower, with educational attainment and other socioeconomic circumstances influencing consumers' ability to benefit from label information (Nkhoma et al., 2024). Thus, the knowledge pattern observed among University of Calabar students may reflect a broader challenge of translating the technical information presented on food packages into practically useful nutrition knowledge.

The finding also contrasts with results reported among university students in other settings. AlBlooshi et al. (2025), in a large study among 1,153 students at Zayed University in the United Arab Emirates, reported a generally positive level of food-labelling knowledge, with substantial proportions also reporting label checking and use of nutritional information. Similarly, Malaysian university students demonstrated relatively high knowledge of food labels, although good knowledge did not necessarily translate uniformly into good label-use practices (Md Zaini et al., 2022). Differences between these studies and the present findings may be related to variations in nutrition education, food environments, socioeconomic circumstances, institutional exposure to health information, and the instruments used to classify knowledge.

Within Nigeria, the present finding differs markedly from the earlier University of Ibadan study in which most undergraduate respondents were classified as having good knowledge of food-labelling information. That study nevertheless identified gaps in understanding specific components of labels, demonstrating that an apparently satisfactory overall knowledge score can coexist with weaknesses in particular aspects of label interpretation. More recently, Olaoye et al. (2024) reported that parental education, school curriculum and access to basic amenities were important factors associated with knowledge of food labels and safe nutrition among secondary-school students in Kwara State. These findings reinforce the importance of the educational and social context in developing food-labelling literacy.

The relatively limited knowledge observed in the present study may also have implications for how students interpret nutrition information. A systematic review by Kelly et al. (2024) found that nutrient declarations can improve consumers' understanding of the nutritional content of foods, but also noted that interpretive elements may be required to reduce misunderstanding. Likewise, evidence from reviews of front-of-package labelling indicates that simplified and interpretive formats are generally easier for consumers to understand than conventional nutrition information panels. This suggests that improving food-labelling knowledge among university students may require more than simply increasing exposure to labels; education should also address how to interpret nutrients, ingredients, serving information, health claims and regulatory information.

The attitudinal findings indicate a complex rather than uniformly negative perception of food labels. Although the overall categorization indicated a predominantly negative attitude, several individual responses suggest that respondents recognize the potential health value and credibility of food labels. This apparent inconsistency is noteworthy because attitudes towards food labelling are multidimensional: consumers may recognize the usefulness of labels while simultaneously perceiving them as difficult to understand, unnecessary, inconvenient or insufficiently reliable.

This pattern is consistent with the broader literature showing that consumers' attitudes do not always translate directly into food-labelling behaviour. Priya and Alur (2023), in a comprehensive review of consumer behaviour towards food and nutrition labelling, identified attitudes, personal beliefs and previous experiences as important influences on label-related behaviour. Similarly, evidence from sub-Saharan Africa indicates that food-label use is determined by multiple factors, including education, income, employment and household characteristics, rather than by knowledge or attitude alone (Nkhoma et al., 2024).

The finding is also relevant to the Nigerian food environment. A study of consumers in Lagos reported that although many respondents paid attention to nutritional information, understanding of the information was lower than the proportion reporting that they read labels. The study also found that food labels influenced purchasing decisions among a substantial proportion of consumers. This distinction between noticing a label and being able or willing to use the information meaningfully may help explain why favourable responses to some individual statements in the present study coexist with an overall unfavourable attitude classification.

Another consideration is trust in the information presented on food packages. The respondents' mixed perceptions of label accuracy are particularly relevant because trust can influence whether consumers consider label information sufficiently credible to guide purchasing decisions. Recent evidence indicates that nutrition and health claims can influence consumers' perceptions of the healthfulness of products, sometimes independently of their actual nutritional quality (Kelly et al., 2024). Consequently, improving students' attitudes towards food labels should involve not only promoting their benefits but also developing the ability to critically evaluate the different types of information presented on packages.

The finding that peers may influence food-label use is also consistent with the broader understanding of food choice as a socially and environmentally influenced behaviour. Among young adults, purchasing decisions are shaped not only by individual knowledge but also by perceptions, preferences and the characteristics of the food environment. Evidence from a recent systematic review found that different front-of-package labelling systems can influence young consumers' purchasing intentions and behaviour, although the magnitude and direction of effects vary according to the type of label used (Guo et al., 2024). Therefore, university-based food-labelling interventions may benefit from approaches that incorporate peer communication and social learning rather than relying exclusively on individual information provision.

The practice findings demonstrate an important gap between exposure to food labels and their effective utilization. This distinction is consistent with the sub-Saharan African evidence, where approximately four-fifths of adults reported some degree of food-label use, but regular use was considerably lower (Nkhoma et al., 2024). The present findings similarly suggest that reading a label should not automatically be interpreted as effective use, since respondents may examine selected information without integrating the information into broader purchasing decisions.

The predominance of lack of understanding among respondents who did not read food labels is particularly important. It suggests that the barrier is not necessarily lack of availability of information but difficulty converting the information into meaningful knowledge. This agrees with evidence from nutrition-labelling research showing persistent challenges in consumers' understanding and appropriate use of label information. A recent study among university

students in the UAE likewise found that although many students reported checking food labels, education concerning food labels remained important for improving their dietary practices (AlBlooshi et al., 2025).

The relatively high attention given to expiry dates and other basic safety information is understandable because these components provide relatively straightforward information with an immediate practical implication. In contrast, nutrition information, ingredient lists and other technical components require greater interpretive ability. This distinction is supported by evidence from sub-Saharan Africa showing that expiry dates, price and taste are among the product attributes that commonly influence food-purchasing decisions (Nkhoma et al., 2024). Therefore, food-label education should extend beyond recognition of expiry dates to include interpretation of nutritional composition and the relative importance of different label components.

The pattern of nutrient information consulted by respondents also suggests selective rather than comprehensive engagement with nutrition information. The emphasis on vitamins and protein, compared with comparatively little attention to energy, carbohydrate and fat, may reflect differences in perceived health value or familiarity with particular nutrients. This is important because focusing on selected nutrients can provide an incomplete picture of the nutritional quality of a product. Kelly et al. (2024) reported that nutrient declarations can improve understanding and may improve the healthfulness of food choices, while also emphasizing the importance of appropriate presentation and interpretation of nutrition information.

The respondents' preference for clear, visible and legible information is consistent with the evidence supporting simplified food-labelling formats. Systematic reviews have found that interpretive front-of-package systems can improve consumers' understanding and assist healthier food choices compared with conventional information formats. Among young adults specifically, recent evidence indicates that graded and colour-coded interpretive labels can influence food-selection behaviour, although the effectiveness of warning labels varies across studies (Guo et al., 2024). The present finding therefore supports the importance of improving not only the availability of label information but also its clarity, visibility and accessibility.

The very low proportion classified as having good food-label practice, despite some evidence of label reading, highlights the difference between isolated label-reading behaviours and comprehensive food-label utilization. This pattern is broadly compatible with the sub-Saharan African systematic review, which found that regular food-label use was much lower than any reported use (Nkhoma et al., 2024). It also corresponds with findings from public universities in Akwa Ibom State, Nigeria, where the prevalence and intensity of food-label use among students were reported to be limited despite recognition of the importance of food labels.

The significant association between knowledge category and food-label use indicates that knowledge is relevant to behavioural engagement with food labels in this population. This is consistent with the Nigerian literature, including the University of Ibadan study, where food-label use was significantly associated with knowledge. However, evidence is not entirely consistent. A 2024 study among undergraduate students at UiTM Puncak Alam found no significant association between nutrition knowledge and use of nutrition labels during food purchases. This difference indicates that knowledge alone may not be sufficient to produce consistent label use. Accessibility, motivation, product characteristics, time, purchasing context and the comprehensibility of label information may act alongside knowledge.

The significant knowledge-use relationship observed in the present study should therefore be interpreted as an association rather than evidence that increasing knowledge alone will necessarily produce improved purchasing behaviour. This interpretation is supported by the broader literature, which identifies food-label use as a multidimensional behaviour influenced by individual, social and environmental factors (Nkhoma et al., 2024; Priya and Alur, 2023).

In contrast to knowledge, attitude was not significantly associated with food-label use in the present study. This suggests that a favourable attitude towards food labelling may not necessarily translate into consistent use of label information. The finding contrasts with Egbekunle (2017)**,** who reported significant associations between food-label use and knowledge, perception and attitude among undergraduate students of the University of Ibadan. It also differs from findings among consumers in Enugu State, where Monye et al. (2020) reported relationships between knowledge and attitude towards food labels and respondents' educational level, geographical location and socioeconomic status.

However, the differences may reflect variations in study populations, measurement instruments, classification criteria and food environments. Egbekunle's study focused specifically on undergraduates at the University of Ibadan, whereas Monye et al. (2020) examined consumers across Enugu State. The present study similarly focused on university students but was conducted in a different geographical and sociocultural setting. These differences suggest that the relationship between attitude and actual food-label use may vary according to the characteristics and circumstances of the population studied. Thus, a positive attitude towards food labelling alone may be insufficient to ensure consistent label use, particularly where other practical or socioeconomic factors influence food-purchasing decisions.

The lack of a statistically significant attitude-use relationship may therefore indicate that interventions directed solely at changing perceptions may have limited effects unless they also address the practical barriers identified in the study. The finding that lack of understanding was a major reason for not reading labels is particularly relevant in this regard. Educational approaches that combine nutrition knowledge with practical demonstrations of how to interpret labels may be more appropriate than attitude-focused messaging alone. Evidence from food-labelling research supports the value of simplified and interpretive formats in facilitating understanding and purchasing decisions (Kelly et al., 2024; Guo et al., 2024).

Overall, the findings indicate a substantial gap between food-label availability, knowledge, attitudes and actual use among students of the University of Calabar. The pattern is consistent with evidence that food-labelling behaviour is shaped by the interaction of knowledge, perceptions, product characteristics, social influences and the usability of the information itself. The findings therefore support the need for university-based nutrition education that emphasizes practical interpretation of food labels, particularly nutrition information, ingredients and regulatory information, while encouraging students to incorporate this information into routine purchasing decisions. Such approaches are consistent with current evidence that clearer and more interpretable labelling can improve consumer understanding and support healthier food choices.

Conclusion

The study concludes that students of the University of Calabar had considerable awareness of several basic components of food labels, particularly ingredients, expiry dates, nutrition

information and product details; however, this awareness did not translate into adequate overall food-labelling knowledge. Most respondents were categorized as having poor knowledge, while a greater proportion also demonstrated a negative attitude towards food labels. Although many students reported reading food labels and checking expiry dates, comprehensive and consistent use of label information was limited, with the majority classified as having poor food-label practices. Lack of understanding was the major barrier to reading food labels. Knowledge was significantly associated with food-label use, whereas attitude was not significantly associated with food-label use. These findings indicate a substantial gap between awareness of food labels and their effective application in food-purchasing decisions. Strengthening practical food-labelling literacy among university students is therefore important to enable them to interpret and apply nutritional and safety information when selecting packaged foods.

Recommendations

Based on the compelling evidence of this study, the following recommendations are proposed:

1. The University of Calabar should incorporate practical food-labelling education into student health and nutrition programmes, with emphasis on interpreting serving sizes, calories, nutrients, ingredients, nutrition claims, expiry dates and NAFDAC information.
2. Nutrition education should move beyond providing information to include demonstrations using commonly consumed packaged foods, enabling students to compare products and apply label information during purchasing.
3. Food manufacturers and regulatory authorities should promote clear, legible and easily accessible food-label information, particularly nutritional information and other details that students identified as difficult to interpret.
4. NAFDAC, universities and other relevant public-health organizations should strengthen consumer-awareness campaigns that improve understanding of food labels and encourage their routine use.
5. Since peers may influence food choices and label use, university nutrition programmes should consider peer-education and student-led awareness activities to reinforce appropriate food-labelling practices.
6. Future studies should examine the practical and socioeconomic factors that influence food-label use among Nigerian university students and evaluate the effectiveness of targeted food-labelling education and simplified labelling interventions in improving actual purchasing behaviour.

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Author Contributions

C.V.E: Conception, methodology, investigation, writing original draft, manuscript preparation and revision.
E.E.O: Conception, methodology, data analysis, investigation, data curation, writing original draft and resources
E.M.O: Investigation, validation, resources.
U.B.I: Investigation, resources, supervision
All authors reviewed the manuscript.

Declaration of Generative AI and AI-Assisted Technologies in Scientific Writing

AI was used to comprise and correct grammatical. CHATGPT and quillbot was used.

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References

Adesina E, Ajayi B, Amoo EO, Adeyeye B, Ajayi MP, Olawande T, Olawole-Isaac A, Udume ME. Consumers' knowledge and use of nutritional labelling information in Lagos, Nigeria. *Sustainability*. 2022;14(1):578. doi:10.3390/su14010578.

AlBlooshi S, Smail L, Aldayyani A, Zeb F, Ibrahim A. University Students' Understanding and Utilization of Food Labels: A Cross-Sectional Study. *International Journal of Food Science*. 2025;2025:7391826. doi:10.1155/ijfo/7391826.

Egbekunle KO. *Knowledge, perception, attitude and use of food labelling information among undergraduate students of the University of Ibadan, Oyo State, Nigeria* [master's thesis]. Ibadan: University of Ibadan; 2017.

Guo Z, Ning Y, Mustafa M. Impact of five types of front-of-package nutrition labels on consumer behavior among young adults: a systematic review. *Nutrients*. 2024;16(17):2819. doi:10.3390/nu16172819.

Iheme GO, Egechizuorom IM, Edafioghor LO, Okonkwo EM, Olah LE, Onyeonu BA, Kupoluyi OE, Enuka HC, Adile AD, Hajara I, Ogbonna OC, Asouzu NC, Ikejiofor C. Compliance of pre-packaged food products with Nigerian food labelling guidelines: the NigeFE study. *Frontiers in Nutrition*. 2025;12:1644344. doi:10.3389/fnut.2025.1644344.

Kavanaugh M, Quinlan JJ. Impact of Messaging Strategy on Consumer Understanding of Food Date Labels. *Journal of Nutrition Education and Behavior*. 2021;53(5):389–400. doi:10.1016/j.jneb.2021.03.007.

Kelly B, Ng SH, Carrad A, Pettigrew S. The potential effectiveness of nutrient declarations and nutrition and health claims for improving population diets. *Annual Review of Nutrition*. 2024. doi:10.1146/annurev-nutr-011224-054913.

Md Zaini S, Ibrahim MA, Saad N, Mohd Nazori MN, Shamsuddin AS. Knowledge, attitude, and practice on food label use among university students. *International Journal of Allied Health Sciences*. 2022;6(3):2642–2653. doi:10.31436/ijahs.v6i3.781.

Monye FN, Ezumah NN, Ani J, Umezuruike H, Ukwueze FO, Okiche EL. Examining knowledge, attitude and practice towards food labels among consumers in Enugu State, Nigeria – a baseline survey. *International Journal of Law and Society*. 2020;3(4):221–231. doi:10.11648/j.ijls.20200304.20.

National Agency for Food and Drug Administration and Control (NAFDAC). *Pre-Packaged Food, Water and Ice Labelling Regulations 2019*. Abuja: NAFDAC; 2019. (NAFDAC)

Nisa L, Nuryanto N, Purwanti R, Dieny FF. Hubungan pengetahuan dan sikap terkait label pangan dengan kepatuhan membaca label pangan pada mahasiswa Universitas Diponegoro. *Journal of Nutrition College*. 2024;13(1):81–88. doi:10.14710/jnc.v13i1.40154.

Nkhoma DE, Mumba WK, Banda KJ, Sakala M, Panyani D, Muwalo B, Masingi Mbeye N. Prevalence and determinants of adult consumer use and comprehension of food labels in sub-Saharan Africa: a systematic review and meta-analysis. *Nutrition Reviews*. 2024;82(3):318–331. doi:10.1093/nutrit/nuad064.

Olaoye IJ, Olaoye DD, Adegbite AO, Ayandele JK, Olaoye ST. Knowledge and perception of secondary students on food labels and safe nutrition in Kwara State, Nigeria. *Journal of Agriculture, Food and Environment*. 2024;5(1):22–29. doi:10.47440/JAFE.2024.5105.

Olaoye IJ. Knowledge and perception of secondary students on food labels and safe nutrition in Kwara State, Nigeria. *Journal of Agriculture, Food and Environment*. 2024;5(1). doi:10.47440/JAFE.2024.5105.

Osei PK, Domfe CA, Anderson AK. Consumer awareness, knowledge, understanding, and use of nutrition labels in Africa: a systematic narrative review. *SAGE Open*. 2024;14:1–14. doi:10.1177/21582440241241982.

Osei PK, Domfe CA, Anderson AK. Consumer Awareness, Knowledge, Understanding, and Use of Nutrition Labels in Africa: A Systematic Narrative Review. *SAGE Open*. 2024;14:1–14. doi:10.1177/21582440241241982.

Petrikova I, Bhattacharjee R, Fraser PD. The 'Nigerian Diet' and its evolution: review of the existing literature and household survey data. *Foods*. 2023;12(3):443. doi:10.3390/foods12030443

Priya KM, Alur S. Analyzing consumer behaviour towards food and nutrition labeling: a comprehensive review. *Heliyon*. 2023;9(9):e19401. doi:10.1016/j.heliyon.2023.e19401.

Roberto, C. A., Wong, D., Musicus, A., Hammond, D., & Kawachi, I. (2017). The Influence of Sugar-Sweetened Beverage Health Warning Labels on Parents' Choices. *Pediatrics,* 139(5), e20162193

Shamim K, Ahmad S, Alam MA. Consumer understanding of food date labels: preventing food wastage. *British Food Journal*. 2022;124(10):3116–3132. doi:10.1108/BFJ-06-2021-0672.

Turvey C, Moran M, Sacheck J, Arashiro A, Huang Q, Heley K, Johnston E, Neff R. Impact of messaging strategy on consumer understanding of food date labels. *Journal of Nutrition Education and Behavior*. 2021;53(5):389–400. doi:10.1016/j.jneb.2021.03.007.

Udoh ES, Antia-Obong EA, Udo AA. Use of food labels by students in public universities in Akwa Ibom State, Nigeria. *AKSU Journal of Agriculture and Food Sciences*. 2022;6(2):35–51.

World Health Organization & Food and Agriculture Organization. *What are healthy diets? Joint statement by the Food and Agriculture Organization of the United Nations and the World Health Organization*. Geneva: WHO; 2024. (World Health Organization)

World Health Organization. *Healthy diet*. Geneva: World Health Organization; 2025. (World Health Organization)

World Health Organization. *Manual to develop and implement front-of-pack nutrition labelling: appendix*. Copenhagen: WHO Regional Office for Europe; 2023. (World Health Organization)

World Health Organization. *Nutrition labelling: policy brief*. Geneva: World Health Organization; 2022. (World Health Organization)