Original Article

Journal of Food Safety and Hygiene

Journal homepage: http://jfsh.tums.ac.ir

Influence of consumers' health risk perception of unwholesome foods on the purchase of pre-packaged foods

Akanji Ife Ayomide[1], Olaniyi Felix Sanni*[2], Olugbamila Michael Dada[3], Oluseyi Abimbola Ariyo[4], Daniel Olakunle Olaniran[5], Okwose Innocent[6], Stephen Oluwasola Ayosanmi[7], Chuks Anthony Aguh[8], Lateef Olaide Afelumo[9]

[1]*Department of Public Health, School of Public Health and Applied Sciences, Catholic University College of Ghana, Sunyani-fiapre, Ghana.*
[2]*Research and Development Department, Fescosof Data Solutions, Ogun State, Nigeria.*
[3]*Department of Medical Lab Science, School of Public and Applied Health, Babcock University, Ogun State, Nigeria.*
[4]*Department of Clinical Services, APIN Public Health Initiatives, Abuja, Nigeria.*
[5]*Department of Public Health, Universidad Central de Nicaragua, Managua, Nicaragua.*
[6]*School of Business (OHS), Loughborough University, Loughborough, England.*
[7]*Department of Pharmacy, College of Pharmacy & Nutrition, University of Saskatchewan, Saskatoon, Canada.*
[8]*Supply Chain Management Systems, Management Sciences for Health, Abuja, Nigeria.*
[9]*Department of Public Health, Texila American University, George Town, Guyana.*

ARTICLE INFO

Article history:
Received 03.07.2023
Received in revised form 19.02.2024
Accepted 23.02.2024

Keywords:
Health risk;
Perception;
Pre-packaged foods;
Wholesome foods

ABSTRACT

Packing food has been around for a long time. Food safety rules become increasingly important in the policy as people's lives and consumption patterns evolve. Everyone is always worried about food safety since it is an essential issue in public health. A systematic questionnaire was utilised to collect information from Sunyani people of Ghana to validate this study's findings. 376 persons were used for this study, and the sample utilised face-to-face distribution procedures for the questionnaire, including open-ended questions. The data was analysed using IBM-SPSS version 25.0. The number of consumers who typically buy pre-packaged food differs considerably by gender between those who purchase pre-packaged foods rarely and those who buy frequently (p-value of 0.049). This is also true for respondents who are married, separated, or never married, as they are also significantly different (p-value of 0.004) regarding whether they occasionally or frequently purchase pre-packaged food. The survey also found that most respondents read food labels as part of a healthy lifestyle, with an odds ratio of 2.21 (95% CI 1.27 – 3.85) times more than other explanations. This study's findings also revealed that most respondents only read food labels to check for nutritional information, with an odds ratio of 2.18 (95% CI 1.07 – 4.41) times compared to other reasons. The public should be more aware of the need to read pre-packaged food labels since this will notify them of any potential problems after ingesting that product.

Citation: Akanji IA, Sanni OF, Dada OM, Ariyo OA, Olaniran DO, Innocent O, et al**. Influence of consumers' health risk p erception of unwholesome foods on the purchase of pre-packaged foods**. J Food Safe & Hyg 2024; 10 (1): 7-21
DOI:10.18502/jfsh.v10i1.16441

1. Introduction

Food packaging has been a long-standing habit; for example, early men wrapped food items in leaves and goat skin to preserve them. Food items are now packaged in various materials, including plastics, metals, tins/cans, bottles, paper, and wooden boxes, demonstrating the continued significance of food

*Corresponding author. Tel.: +2348060085465
E-mail address: fescosofanalysis@gmail.com

packaging. In addition, convenience meals (packaged foods) are more accessible to prepare and store than traditional foods. They also minimise food waste and make food preparation easier for homemakers, employees, and students (1). For example, in metropolitan households, women do not have the time to stand in line at the supermarket or prepare essential morning meals. This is caused by the morning rush of metropolitan families who must report to work, school, and other obligations on time. Because of this, pre-packaged, pre-priced items are readily accessible even at supermarkets, allowing for significant time savings while also giving convenience to family members (2). The usage of packaged food items and goods has increased dramatically in recent years. This may be attributable to an increase in the number of working mothers. Food safety regulations are becoming increasingly relevant from a public policy standpoint as people's lifestyles and consumption habits change (3). Even though pre-packaged meals benefit convenience and time savings, one should not ignore their potential hazards because they might compromise the food product's safety.

Food safety is a critical problem for public health, and it is something that everyone is concerned about regularly. Contaminated food can harm people, raising the demand for healthcare services and insurance and government expenditures on public health and other social expenses. Tainted food may spread illnesses and kill (4). Food safety may be improved by having a positive perception of risk. This is important because it reveals how customers perceive the risk connected with food, which can influence their purchasing decisions and desire to purchase the food (5). When people perceive a risk, they express their point of view about the danger inherent in the circumstance. When people prceive a food safety risk, they express their belief about the level of health risk experienced due to ingsting the food (6). From the standpoint of the consumers, food safety is an essentially non-negotiable characteristic of the product (7).

Customers aware of the possible danger of food contamination might pressure suppliers to give more information, be more honest about their operations, and take a more proactive approach to food contamination prevention. Consumer behaviour prompts businesses to strengthen their operational systems to reduce the likelihood of chain disruptions resulting from contamination incidents (8). Finally, risk perception may be an essential technique for notifying other consumers, suppliers, and policymakers when problems with a particular food supplier or supply chain are suspected despite studies on food safety and food risk perception (9). Due to the scope of food safety research, which includes marketing, supply chains, agriculture, and food-related professions, the lack of integration in these studies may be because food safety research is a multidisciplinary issue encompassing various disciplines.

This study aimed to provide baseline information on consumer health risk perception of pre-packaged food. The findings of this study will give current information on consumer behaviour and add to the health risk perspective of consumers towards pre-packaged food.

2. Materials and Methods

2.1. Background of the study area

Sunyani Municipality was the site of this investigation. Sunyani is the capital of Ghana's Bono region and is located in the Bono region. Sunyani West District,

Dormaa East District, and Asutifi District encircle the Municipality in the north, west, and south. The Ahafo ethnic community dominates the city. Sunyani's economy is dominated by agrarians, covering 48% of the local workforce. According to the 2010 Population and Housing Census, the Municipal population of 123,224 equals 5.3 % of the region's total population. 49.9 % of the population is male, compared to 50.1% female (10). The city's population is also concentrated in the city's urban districts. One hundred percent of the residents in the municipal building are women. It is estimated that there were 147,982 persons in every community and sex in 2018. There are 49.1 % men and 50.9 % women in the United States. A total age dependency ratio of 54.0, with males accounting for more than females (54.0 %), is this outcome (53.6 %). A total of 24% of the population is employed in the service sector, followed by 15% in commerce and 13% in industry (11).

Sunyani is home to a slew of prestigious Ghanaian academic institutions. Sunyani and the surrounding towns have several prominent educational institutions, from primary to post-secondary levels. Sunyani contains seven well-established post-secondary institutions, five universities, two smaller satellite centers, and the catholic university college of Ghana.

Sixty-two percent of the population over the age of 15 is considered economically active, and 93 % of those individuals are in paid employment. The city health system comprises six hospitals, twelve clinics, seven CHIPs complexes, three maternity homes, and three health centers. The Municipality, which houses around 60% of the region's population, is one of the region's most important markets and commercial opportunities. Six supermarkets (typically regarded among the best in the area and the country due to their excellent service), 14 food shops, and ten food product distribution centre, although some are unknown (12).

2.2. Study design and type

Quantitative / Qualitative, or combining the two methodologies, will perform the research (13). On the other hand, this study made use of a quantitative approach. Quantitative analysis analyses data and compiles conclusions using statistical methods and numerical measures (14). Researchers frequently use "closed information" to get data from devices measuring attitudes, behaviours, or performance; researchers frequently use "closed information." Use a security checklist to examine observed behaviors while gathering this data. Using a quantitative approach, researchers investigated how well consumers understood and acted upon the information on pre-packaged food labels.

A study design specifies how data will be gathered, processed, and interpreted to answer the subject under investigation (13). Cross-sectional research was used to determine whether customers know the information on food labels and whether they apply it to purchasing pre-packaged food items (15). A few examples include how well consumers comprehend the information in the title, what the customer wants to know, and the benefits or risks of using that information. This descriptive study comprised adults (adult men and women over 18 years old) who visited many supermarkets, shops, and businesses over two to three months.

2.3. Type of study

A descriptive study described the study population, situation, or phenomenon; this technique was suitable for the study as data collection occurred through a survey with open and close-ended questions (15).

2.4. Study population

Study populations are groups of people or things with characteristics such as age, gender, or health status that interest researchers (16). Anyone over 15 who shops at supermarkets and other retail outlets is eligible for this research.

2.5. Sample size

The Yamane formula for proportion was used in this investigation. A simplified procedure for calculating sample sizes is provided by Yamane (17).

$$n = N / (1 + N (e) 2)$$

Sample size "n," which is the population size "N," and desired accuracy "e" are both used in this equation.

The sample size was calculated with a 95% confidence level and a precision (e) of ±5%, As used by Mhurchu *et al.*(18).

Therefore,

$$n = N / (1 + N (e) 2), = 376.$$

Therefore, the sample size was 376.

2.6. Sampling method

To carry out this study, the first phase was a random selection of survey sites, the second stage was a time-location sample, and the third stage was systematic random sampling for selecting participants. The most cost-effective and successful multistage sampling approach, especially for a significant and different population, combines various probability sampling methods (19). About 30 other retail establishments may be located in the area. Because of the high volume of people who frequent them, five well-known shopping centers were selected to serve as study sites. As a result, these five businesses see a high volume of business and sales of prepared meals.

2.7. Methods and tools for collecting data

2.7.1. Instrument for gathering data

A well-designed questionnaire was employed to collect data in this investigation. Questionnaires are the most popular research tool for collecting participant data and are commonly used in quantitative studies. The study questionnaire's validity and reliability were strengthened through a pilot test with 10% of the total sample size. This process allowed us to refine the questions for better clarity and consistency. Experts reviewed the content to confirm its validity, while reliability was checked using Cronbach's alpha, ensuring the questionnaire accurately captures the intended data. When distributing these questions, they can be done in various methods (e.g., by mail, cell phone, one-on-one interviews, handouts or electronically via email or web-based questionnaires) (20). A questionnaire was utilised to gather the data needed to answer the questions posed by the research. This form has only a few open-ended questions. A questionnaire asked about demographic information, the usage of labels on pre-packaged food/products, and what customers wanted to know about brands. Questionnaires were translated into English.

2.7.2. Data collection method

There were five places and periods where the data-gathering procedure was carried out. A representative sample of customers from each site could be obtained using this method. At least 70 people were polled in each specified location, and the results were tallied. The poll was conducted in person. Students and their study aids distributed the surveys. Four research assistants received specific training to assist with data collecting.

DOI:10.18502/jfsh.v10i1.16441

People who agreed to participate were approached by the study's lead investigator and trained assistants, who gave them the questionnaire to complete. Individuals with questions about the questionnaire can ask for clarification from the principal investigator and an assistant trained to assist them in filling it out. The participant was allowed to select from a list of probable answers to a series of pertinent questions by the researcher. The questionnaire was translated for those who did not understand English during data collection.

2.8. Data analysis

The most recent version of SPSS 25 was used to analyse the data. Descriptive as well as inferential statistical approaches were required for the data analysis. A cross-tabulation analysis of the socio-demographic characteristics of participants on nutrition labels, including label use, perceptions of label information, and the substance of label data, was performed using frequency distribution, percentages, and cross-tabulation. We employed Pearson correlation and logistic regression analysis (inferential statistics). The Pearson correlation tests and logistic regression analysis showed that label information differed significantly among socioeconomic categories. According to the p-value, statistical significance had to be determined as less than five per cent.

2.9. Ethical approval

Informed consent was obtained from respondents who had been educated on the importance of providing their responses, and their cooperation was solicited. No email addresses or other contact information was collected through the online form to maintain responders' anonymity.

The survey's participation was optional, and respondents were only permitted to complete it once. Additionally, responses were not shared with any outside parties, and This study proposal was reviewed and approved by the Ethics Review Committee of Ghana Health Service.

3. Results

The frequency of the number of individuals who generally buy pre-packaged food was examined based on the respondents' socio-demographic status. Table 1 shows that 62% of males and 52% of females occasionally bought pre-packaged food products. In the age category, 28-37 years had the higher rate (63.1%) of occasionally buying pre-packaged foods, while 58-67 years had the higher percentage (66.7%) of frequently purchasing pre-packaged foods. Respondents with tertiary education had a 60.9% rate, and most occasionally buy pre-packaged food products. Unemployed respondents reported the highest rate (64.5%) of occasionally buying pre-packaged food, and respondents never married (63.3%). In contrast, the self-employed had the highest rate (49.3%) of respondents who frequently buy pre-packaged food, and married people had the highest rate (55.5%).

Table 1. Frequency of buying pre-packaged food products

Characteristics	Frequency of Purchase of pre-packaged food products			
	Total (n=376) n (%)	**Occasionally n (%)**	**Frequently n (%)**	**p-value**
Gender				
Male	182 (48.4)	114 (62.6)	68 (37.4)	0.049*
Female	194 (51.6)	102 (52.6)	92 (47.4)	
Age category				
18-27	177 (47.1)	104 (58.8)	73 (41.2)	
28-37	103 (27.4)	65 (63.1)	38 (36.9)	
38-47	65 (17.3)	36 (55.4)	29 (44.6)	0.102
48-57	19 (5.1)	7 (36.8)	12 (63.2)	
58-67	12 (3.2)	4 (33.3)	8 (66.7)	
Highest Education Attained				
Primary education and below	27 (7.2)	15 (55.6)	12 (44.4)	
Secondary education	111 (29.5)	56 (50.5)	55 (49.5)	0.179
Tertiary	238 (63.3)	145 (60.9)	93 (39.1)	
Occupation				
Self-employed	71 (18.9)	36 (50.7)	35 (49.3)	
Unemployed	121 (32.2)	78 (64.5)	43 (35.5)	0.131
Professional/Technician/Managerial	184 (48.9)	102 (55.4)	82 (44.6)	
Marital Status				
Never married	245 (65.2)	155 (63.3)	90 (36.7)	
Married	110 (29.3)	49 (44.5)	61 (55.5)	0.004*
Separated/Divorced	21 (5.6)	12 (57.1)	9 (42.9)	

* Statistical significance between variable
Source: Field survey, 2022

Factors associated with respondents' risk perception due to failure to read the pre-packaged food labels before purchase.

As shown in Table 2, factors associated with respondents' risk perception of failure to read the pre-packaged food labels before purchase were examined. The odds of how often respondents read pre-packaged food label information is 4.80 (95% CI 2.41 – 9.58) times higher among respondents that read food labels very often, 2.00 (95% CI 1.03 – 3.86) times higher among respondents that read it always than those that read it sometimes. The odds of what respondents check on food labels was 2.18 (95% CI 1.07 – 4.41) times higher among respondents who check for nutritional information, 1.54 (95% CI 0.74 – 3.20) times higher among respondents who check for the list of ingredients, 0.98 (95% CI 0.47 – 2.06) and 0.51 (95% CI 0.32 – 0.81) time higher among those that look out for expiry date than those that check for batch/lot identification on food labels.

Table 2. Factors associated with respondents' risk perception due to failure to read the pre-packaged food labels before purchase

		No risk perception	Perceived possible risks	Odds ratio (95% CI)	p-value
Overall					
How often do you read the label information	Sometimes	59 (41.0)	85 (59.0)	1.00	
	Very often	12 (12.6)	83 (87.4)	4.80 (2.41 – 9.58)	<0.001*
	Always	16 (25.8)	46 (74.2)	2.00 (1.03 – 3.86)	0.040*
What do respondents check on food labels?					
Expiry date	No	34 (26.2)	96 (73.8)	1.00	
	Yes	101 (41.1)	145 (58.9)	0.51 (0.32 – 0.81)	0.005*
Manufacture date	No	123 (35.9)	220 (64.1)	1.00	
	Yes	12 (36.4)	21 (63.6)	0.98 (0.47 – 2.06)	0.954
List of ingredients	No	124 (36.9)	212 (63.1)	1.00	
	Yes	11 (27.5)	29 (72.5)	1.54 (0.74 – 3.20)	0.244
Nutritional information	No	124 (38.0)	202 (62.0)	1.00	
	Yes	11 (22.0)	39 (78.0)	2.18 (1.07 – 4.41)	0.030*
Batch/lot identification	No	135 (36.6)	234 (63.4)	1.00	
	Yes	0 (0.0)	7 (100.0)	-	-
When respondents read food labels	After purchase	71 (41)	102 (59.0)	1.00	
	During purchase	45 (31.9)	96 (68.1)	1.49 (0.93-2.37)	0.100
	Before purchasing pre-packaged food	19 (30.6)	43 (69.4)	1.58 (0.85-2.93)	0.150
Are you aware of any government agency to report to if a pre-packaged food item is unwholesome?					
No		46 (46.5)	53 (53.5)	1.00	
Yes		89 (32.1)	188 (67.9)	1.83 (1.15 – 2.93)	0.011*
Reasons Why Consumers Read Food Labels					
As part of a healthy lifestyle	No	115 (39.8)	174 (60.2)	1.00	
	Yes	20 (23.0)	67 (77.0)	2.21 (1.27 – 3.85)	0.005*
To see what nutrients are in the food	No	118 (35.1)	218 (64.9)	1.00	
	Yes	17 (42.5)	23 (57.5)	0.73 (0.37 – 1.43)	0.359
To reduce weight	No	122 (34.7)	230 (65.3)	1.00	
	Yes	13 (54.2)	11 (45.8)	0.45 (0.120 – 1.03)	0.059
Concern about their health	No	113 (36.7)	195 (63.3)	1.00	
	Yes	22 (32.4)	46 (67.6)	1.21 (0.69 – 2.12)	0.500
On special diet	No	122 (35.8)	219 (64.2)	1.00	
	Yes	13 (37.1)	22 (62.9)	0.94 (0.46 – 1.94)	0.873
Check for expiry date	No	92 (33.2)	185 (66.8)	1.00	
	Yes	43 (43.4)	56 (56.6)	0.65 (0.41 – 1.04)	0.070
To identify fake products	No	128 (36.3)	225 (63.7)	1.00	
	Yes	7 (30.4)	16 (69.6)	1.30 (0.52 – 3.24)	0.573

Source: Field survey, 2022

Table 3. Association between respondents' risk perception and purchase of pre-packaged foods

	Overall (n = 376)	Perceived not at any risk	Perceived possible risks	Odds ratio (95% CI)	p-value
How well does label information reflect on the food you purchase					
Not at all	42 (11.20	21 (50.0)	21 (50.0)	1.00	
Very well	334 (88.8)	114 (34.1)	220 (65.9)	1.93 (1.01 – 3.68)	0.046*
How well-labeled pre-packaged foods have been useful to you upon purchase.					
Not at all	69 (18.4)	44 (63.8)	25 (36.2)	1.00	
Very well	307 (81.6)	91 (29.6)	216 (70.4)	4.18 (2.41 – 7.23)	<0.001*
How often does the label you read determine your purchase of pre-packaged food products?					
Never	40 (10.6)	29 (72.5)	11 (27.5)	1.00	
Sometimes	140 (37.2)	38 (27.1)	102 (72.9)	7.08 (3.22 – 15.56)	<0.001*
Always/very often	196 (52.1)	68 (34.7)	128 (65.3)	4.96 (2.33 – 10.55)	<0.001*
Is there an association between reading and understanding food labels and positive health?					
No	143 (38.0)	70 (49.0)	73 (51.0)	1.00	
Yes	233 (62.0)	65 (27.9)	168 (72.1)	2.48 (1.60 – 3.83)	<0.001*
Have you ever refused to buy pre-packaged food after reading the label?					
No	108 (28.7)	53 (49.1)	55 (50.9)	1.00	
Yes	268 (71.3)	82 (30.6)	186 (69.4)	2.19 (1.38 – 3.46)	0.001*

Source: Field survey, 2022

However, odd when respondents read food labels, 1.58 (0.85-2.93) higher among those who read food labels before purchasing, 1.49 (95% CI 0.93-2.37) times higher among the respondents who read food labels during purchase than those who read food label after purchase. Respondent's odds of awareness of any government agency to report if a pre-packaged food item is unwholesome was 1.83 (95% CI 1.15 – 2.93) times higher among those who agreed to be aware than those who said no. The odds of why consumers read food labels were 2.21 (95% CI 1.27 – 3.85) times higher among respondents who read food labels as part of a healthy lifestyle, 1.30 (95% CI 0.52 – 3.24) times higher among respondents who read food labels to identify fake products, 1.21 (95% CI 0.69 – 2.12) times higher among respondents that read pre-packaged food label as a result of concern about their health, 0.94 (95% CI 0.46 – 1.94) times higher among those who read it based on a special diet, 0.73 (95% CI 0.37 – 1.43) times higher among those who read the information on a food label to see what nutrients are in the food. 0.65 (95% CI 0.41 – 1.04) times higher among those who check for the expiry date and 0.45 (95% CI 0.120 – 1.03) times higher among those who read it to reduce their weight.

and purchase of pre-packaged foods was also analysed. The respondents' odds of how well label information

Association between respondents' risk perception and purchase of pre-packaged foods

As shown in Table 3, the association between respondent risk perception reflects on the food they purchase was 1.93 (95% CI 1.01 – 3.68) times higher among the respondents who said it reflects very well than those who said it doesn't reflect. The odds of how well the label on packaged foods has been useful to the respondents upon purchase was 4.18 (95% CI 2.41 – 7.23) times higher among those who said it has been useful very well than those who said it hasn't. The respondents' odds of how often the label they read determined their purchase of pre-packaged food products was 7.08 (95% CI 3.22 – 15.56) times higher among those that said it sometimes determined their purchase, 4.96 (95% CI 2.33 – 10.55) times higher among those that said it always determine their purchase than those who said it never determines their purchase of pre-packaged food products. The respondents' odds of knowing if there is an association between reading and understanding food labels and positive was 2.48 (95% CI 1.60 – 3.83) times higher among those who agreed that there is an association between them than those who said no. The odds of whether the respondents have ever refused to buy pre-packaged food after reading the label was 2.19 (95% CI 1.38 – 3.46) times higher among those who said yes than those who said no.

4. Discussion

Frequency of buying pre-packaged food products

This study examined the Influence of Consumers' Health Risk Perception of Unwholesome Foods on the Purchase of Pre-Packaged Foods while making the residents of Sunyani a case study. According to the results obtained from this study, 47.4% of the respondents buy pre-packaged food products more frequently, while 62.6% buy pre-packaged foods more occasionally. This corroborates with the findings of Vemula *et al.* (21) who also said that more than half of the respondents only buy pre-packaged foods occasionally. In contrast, Pal Kaur et al. (22) reported that consumers buy pre-packaged foods more frequently than occasionally. The increased purchasing rate could be attributed to growing consumer confidence and desire to buy pre-packaged foods. Respondents in the age category of 28-37 years buy pre-packaged foods more occasionally (63.1%) than other age groups, while this changes as the older age category of respondents (58-66 years) agreed to buy pre-packaged foods more frequently (66.7%). This concurs with Gartstein et al. (23) said that it could be due to saving energy and time, considering they would be less strong than the younger age groups. Respondents who have attained the tertiary level of education tend to buy pre-packaged foods more occasionally (60.9%) than other age groups. The respondents who have attained secondary school education buy pre-packaged foods more frequently (49.5%). This agrees with the findings of Vemula et al. (21), as they reported that the higher the level of education, the higher the possibility of consumers buying pre-packaged foods. According to this study, the married respondents purchase pre-packaged foods more frequently than the never-married and divorced respondents. This could be due to the convenience that pre-packaged foods offer and how it helps to save time. The findings agree with Gartstein et al. (2016), who also discovered in their study why parents purchase pre-packaged foods.

According to the findings in this study, it is more likely that respondents who read the pre-packaged food

labels very often would frequently/often read food labels than those who read them always or sometimes. This finding agrees with what Darkwa (24) said in his study on consumers' knowledge of pre-packaged food labels while using Koforidua as a case study. This indicates that the proportion of use of labels for purchase purposes differs among consumers probably due to several reasons, such as exorbitant price, as seen in the study of Aryee et al. (25); Mandle et al. (26); Osei et al. (27) and Song et al. (28). The frequent checking/reading of pre-packaged food labels while purchasing pre-packaged food products is essential. It should be practiced to help reduce the risk of eating food products harmful to human health. According to the findings in this study, consumers possess a high level of awareness regarding the contents provided on the pre-packaged food products. Whereby, above the average, consumers claimed to understand the information on a pre-packaged food product. This study found that the respondents are more likely to check for nutritional information first (odds ratio of 2.18) than all other attributes of the pre-packaged food label. At the same time, it is less likely that they would check for the batch/lot identification on food labels. Sarkodie & Boakye-Kessie (29) also reported similar findings in their study, assessing consumers' awareness of food labelling in Sunyani municipality, like Mahgoub et al. (30) . They also revealed that nutrition information on food labels was reported to be consumers' primary food purchasing motivator. This could be because the respondent claims the food label could be reliable enough to provide the nutrition information. The study revealed that consumers prioritize knowing the expiry date when purchasing pre-packaged food. This shows an intentional choice to prioritise product freshness and safety, safeguarding themselves from dangerous or nutritionally compromised foods (31).

Though consumers know information on food labels, some still cannot comprehend the items stated on the label. This could indicate that consumers of this study require more enlightenment about label information, improving consumers' nutritional knowledge of pre-packaged food products. These findings are consistent with the results of Aryee (25), Mandle et al. (26), and Themba and Tanjo (32). This study also shows that a minor read item on a pre-packaged food product is the Batch/Lot identification. This implies consumers understand less batch/lot identification following a pre-packaged product.

Similarly, Grunert et al. (33) discovered that respondents could ascertain the healthiest product. However, the basic understanding of this identified information seems to vary among this study's participants. Similar findings were observed in the study of Aryee et al. (25) and Darkwa (24).

This study also examined when respondents/consumers read food labels, whether before, during or after purchasing pre-packaged foods. The highest percentage of the respondents said they checked for food labels before purchasing. Consumers are more likely to read pre-packaged food labels before purchasing. Contrary to studies such as Kasapila and Shawa (34), a low proportion (29.1%) of consumers use label information before purchasing pre-packaged food. However, the outcome of this study indicates a high proportion (69%) of consumers use label information. Even though some consumers do not use

DOI:10.18502/jfsh.v10i1.16441

label information, a significant number of consumers use label information upon purchase of pre-packaged food products. This implies that consumers use label information provided on a pre-packaged food product; label information could have been made accessible. This could be attributed to the evidence that most study participants were highly educated (63%). That is, they have attained a tertiary level of education. However, this is similar to the studies conducted by Affram & Darkwa (35), Osei et al. (27) and Kasapila & Shawa (34) where 57%, 79.6% and 89.5% of study respondents, respectively, reportedly made use of label information before purchasing of pre-packaged food.

According to this study, it is more likely for respondents who agree to be aware of a government agency to report to if a pre-packaged food item is unwholesome to know some government agency to report to than those who said they do not know. This awareness could be due to their level of education and exposure to information such as this (36). In this study, it was also examined that it is more likely for respondents to read a food label for the sake of maintaining their healthy lifestyle than other reasons like identifying fake products, due to concerns about their health, special diet, to see what nutrients are in the food, check the expiry date and to reduce their weight. It was also noticed that few respondents only read food labels to reduce their weight. The finding is consistent with the results of a study carried out by Mahgoub *et al* (37) and Sunelle et al. (38), where consumers were motivated by health concerns and nutrition information as the primary factor that encouraged consumers to read food labels of specific types of foods to be purchased. In addition, Consumers of pre-packaged foods should make informed eating choices based on their health state and demands. Food labelling information is critical for those on special diets or who have dietary/nutrition-related health issues and diseases such as obesity, diabetes, cardiovascular disease, and many forms of cancer because it allows them to make informed food choices (39).

Association between respondents' risk perception and purchase of pre-packaged foods

According to this study, it is more likely that information on the label reflects very well than for it not to reflect. This could result from what the pre-packaged food is made of if it reflects the food label. This result corroborates Washi's (39) findings in their analysis of consumers' use and understanding of food label information and its effect on purchasing decisions.

Furthermore, to assess the association between respondent's risk perception and purchase of pre-packaged foods, the tendency of how useful pre-packaged food labels are to consumers was examined. The study suggests that food labels are more likely to be more useful to consumers in purchasing decisions than they are not. This indication might be because respondents are well-educated, which would prompt them to sometimes check for important information on the food label before purchasing. The clear reflection of label information could be due to governments' strict monitoring of how well food products are labelled. Perceived risk and benefits use of label information assists them greatly, especially in choosing their pre-packaged food product, precisely a healthier food choice. A similar finding was observed in several other studies, such as Bazhan et al. (40), Finkelstein et al. (41), Sulong et al. (42) and Washi (39). However, Darkwa (24) found that having a fair idea of nutrition does not

necessarily influence consumers' choices of pre-packaged foods.

In addition, the respondents' risk perception and purchase of pre-packaged food products were further analysed based on how often the label they read determined their purchase of them. The findings in this study suggest that it is more likely that consumers reading food labels would sometimes determine their purchase of pre-packaged foods rather than always determining it or not at all. This might be due to the level of trust that the respondents have in the food products they purchase. These findings correlate with Mensah et al. (27) who researched consumers' use and understanding of food labels in the Kumasi metropolis. According to the findings in this study, it is more likely that respondents are aware that there is an association between reading and understanding food labels and positive health than that they are not. This could result from the respondents' level of education, which allows them to read and understand the food label's information and avoid food products that don't help improve their health. This is consistent with Chopera et al. (43), who conducted a study on food label reading and understanding in parts of Zimbabwe. An analysis was also undertaken to examine if the respondents have ever refused to buy pre-packaged food after reading the food label.

According to this study, respondents were more likely to have once refused to buy a food product after reading a pre-packaged food label. This could be attributed to the fact that they might not find the food product very suitable for purchase at the time, which could be due to reasons related to choice or health (43). Health-conscious consumers often read food labels to determine nutritional composition and components. A pre-packaged food item may not be bought if it is unhealthy or doesn't match consumer health standards (44).

5. Conclusion

This study shows that consumers are very familiar with pre-packaged foods, and more than half of the respondents agree to buy them occasionally. Consumers likely read the food labels on the pre-packaged products with this attitude towards pre-packaged food. In this study, consumers mostly look for information such as the list of ingredients and the nutritional content on the pre-packaged food label. Consumers with a higher level of education read label information. The use of label information for a purchase decision is widespread among consumers. This could go a long way in improving their choice-making when selecting which type of pre-packaged food product to consume based on which is suitable for their health. Nevertheless, educating consumers on the importance of label information and appropriate application can increase consumers' selection of healthier food choices. In addition, it is advisable for consumers always to perceive possible risks in a pre-packaged food product regardless of the manufacturer, as no one can be exempted from making mistakes; this would equally help improve the safety of the consumers when it comes to consuming pre-packaged foods.

Funding

The authors declare that no financial support or funding was received for the conduct of this study.

Authorship contribution

Conceptualization - Akanji Ife Ayomide, Olaniyi Felix Sanni

Data curation - Oluseyi Abimbola Ariyo, Akanji Ife Ayomide, Olaniyi Felix Sanni

Formal analysis - Olaniyi Felix Sanni, Chuks Anthony Aguh, Lateef Olaide Afelumo

Investigation – Olugbamila Michael Dada, Daniel Olakunle Olaniran

Methodology – Olugbamila Michael Dada, Stephen Oluwasola Ayosanmi and Olaniyi Felix Sanni

Project administration – Akanji Ife Ayomide, Daniel Olakunle Olaniran

Supervision – Olaniyi Felix Sanni

Validation – Daniel Olakunle Olaniran

Visualization – Akanji Ife Ayomide, Olaniyi Felix Sanni

Writing – original draft – Olaniyi Felix Sanni, Akanji Ife Ayomide

Writing – review and editing - Okwose Innocent, Lateef Olaide Afelumo

Declaration of competing interest

The authors declare that they have no competing interests or conflicts of interest related to this study.

Data availability

Data will be made available upon reasonable request.

Acknowledgments

We would like to express our gratitude to all those who contributed to the completion of this manuscript.

References

1. Wikström F, Verghese K, Auras R, Olsson A, Williams H, Wever R, et al. Packaging Strategies That Save Food: A Research Agenda for 2030. J Ind Ecol. 2019; 23(3):532–40.
2. d'Angelo C, Gloinson E, Draper A, Guthrie S. Food consumption in the UK: Trends, attitudes and drivers. Food Consum UK Trends, attitudes drivers. 2020.
3. Sarkodie NA, Boakye-kessie VA. Assessing Consumer's Awareness of Food Labeling in Sunyani Municipality. 2017; 3(10):1–10.
4. Machado Nardi VA, Teixeira R, Ladeira WJ, de Oliveira Santini F. A meta-analytic review of food safety risk perception. Food Control. 2020; 112(1):107089.
5. FAO. Thinking about the future of food safety. Thinking about the future of food safety. 2022.
6. van der Vossen-Wijmenga WP, Zwietering MH, Boer EPJ, Velema E, den Besten HMW. Perception of food-related risks: Difference between consumers and experts and changes over time. Food Control. 2022; 141:109142.
7. Petrescu DC, Vermeir I, Petrescu-Mag RM. Consumer understanding of food quality, healthiness, and environmental impact: A cross-national perspective. Int J Environ Res Pub Health. 2020; 25;17(1):169. doi: 10.3390/ijerph17010169..
8. Aday S, Aday MS. Impact of COVID-19 on the food supply chain. Food Qual Saf. 2020; 4(4):167–80.
9. Machado Nardi VA, Teixeira R, Ladeira WJ, de Oliveira Santini F. A meta-analytic review of food safety risk perception. Food Control. 2020; 112:107089.
10. GSS. Ghana Demographic and Health Survey, 2010.
11. Ghana Statistical Service. 2010 Population & Housing Census Report. 2014.
12. Assembly SM. Composite Budget for 2019-2022 Programme-based budget estimates for 2019.
13. Ismail IA. Understanding quantitative and qualitative research methods : A theoretical perspective for young researchers Understanding Quantitative and Qualitative Research Methods: A Theoretical Perspective for Young Researchers. 2021; 70–87.
14. England A. Quantitative and Qualitative Research Methods. Res Med Imaging Radiat Sci. 2021; 71–96.
15. Zangirolami-Raimundo J, Echeimberg J de O, Leone C. Research methodology topics: Cross-sectional studies. J

Hum Growth Dev. 2018; 28(3):356–60.

16. Shukla S. Concept of population and sample. How to Write a Res Pap. 2020; 1–6.
17. Yamane T. Stastics; An introductory analysis. 869. 1967; Available from: https://doi.org/10.2307/2282703
18. Ni Mhurchu, C., Eyles, H., Jiang, Y., & Blakely T. Do nutrition labels influence healthier food choices? Analysis of label viewing behaviour and subsequent food purchases in a labelling intervention trial. Appetite,. Appetite (Internet). 2018; 121:360–5. Available from: https://doi.org/10.1016/j.appet.2017.11.105
19. Bhardwaj P. Types of sampling in research. J Pract Cardiovasc Sci. 2019; 5(3):157-63.
20. Bhandari Pritha. Questionnaire Design _ Methods, Question Types & Examples. Scribbr. 2021. p. 1–15.
21. Vemula SR, Gavaravarapu SRM, Mendu VVR, Mathur P, Avula L. Use of food label information by urban consumers in India - A study among supermarket shoppers. Pub Health Nutr. 2014; 17(9):2104–14.
22. Pal Kaur V, Kaur N, Qumar N. Assessment of consumer awareness about usage of food labels and its impact on food buying behavior. Int J Res -Granthaalayah (Internet). 2016;4(7):10–9. Available from: http://dx.doi.org/10.29121/granthaalayah.v4.i7.2016.2591
23. Gartstein, M. A., Bridgett, D. J., Young, B. N., Panksepp, J., & Power T. Origins of Effortful Control: Infant and Parent Contributions. Infancy. 2013; 18:149–83.
24. Darkwa S. Knowledge of nutrition facts on food labels and their impact on food choices on consumers in Koforidua, Ghana: A case study. South Afric J Clin Nutr. 2014; 27(1):13–7.
25. Aryee PA, Helegbe GK, Agordoh PD, Mohammed AJ, Muntala J, sKoblaji FA, et al. Exploring consumer knowledge, understanding and use of food and nutrition label information in the tamale metropolis of Ghana. Afric J Food Agric Nutr Dev. 2019; 19(2):14415–31.
26. Mandle J, Tugendhaft A, Michalow J, Hofman K. Nutrition labelling: A review of research on consumer and industry response in the global South. Glob Health Act. 2015; 22:8:25912. doi: 10.3402/gha.v8.25912.
27. Mensah Lecturer OJ, Lecturer R, R LD, Lecturer AR. Consumers' Use and understanding of food label information and effect on their purchasing decision in Ghana; a case study of Kumasi Metropolis. Asian J Agric Rural Dev. 2012; 2(23):2304–55.
28. Song J, Huang J, Chen Y, Zhu Y, Li H, Wen Y, et al. El conocimiento, la actitud y el uso de la etiqueta nutricional entre los consumidores (China). Nutr Hosp. 2015; 31(6):2703–10.
29. Amoako NS, Polytechnic S. Assessing consumer's awareness of food labeling in Sunyani municipality assessing consumer's awareness of food labeling in Sunyani Municipality. 2020; 3:1–10.
30. Mahgoub SE, Lesoli PP, Gobotswang K. Awareness and use of nutrition information on food packages among consumers in Maseu (Lesotho). Afric J Food Agric Nutr Dev. 2007; 7(6):23–5.
31. Kyei P. Students' Level of Awareness of Expiry Dates of Caned Products. Int J Educ Soc Sci. 2018; 5(2): 38-47.
32. Themba G, Tanjo J. Consumer awareness and usage of nutrition information in Botswana. Bus Manag Horizons. 2013; 1(1):44-58.
33. Grunert KG, Wills JM. A review of European research on consumer response to nutrition information on food labels. J Pub Health (Bangkok). 2007; 15(5):385–99.
34. Kasapila, W., Shawa P. Use and understanding of nutition labels among consumers in Lilongwe, Malawi. Afric J Food Agric Nutr Dev. 2011; 11(5):5171–86.
35. Affram, P., & Darkwa S. Consumers' knowledge, understanding and use of food label information, and how it affects purchasing decision in Ho, Ghana. Asian J Empir Res. 2015; 5(3):24–39.
36. Food and Drugs Authority Ghana. Food and drugs

authority guidelines for the labelling of prepackaged foods.2013;(February):1–18. Available from: https://fdaghana.gov.gh/images/stories/pdfs/downloads/food guidelines/guidelines for the labeling of prepackaged foods.pdf

37. Mahgoub S, Lesoli P, Gobotswang K. Awareness and use of nutrition information on food packages among consumers in Maseru (Lesotho). Afric J Food Agric Nutr Dev. 2007; 07(06):001–16.
38. Sunelle J. A., Hanli de Beer, F. Ment L. Adult consumers understanding and use of information on food labels. A study among Consum living Potchefstroom Klerksdrorp Reg South Africa. 2010.
39. Washi S. Awareness of Food Labeling among Consumers in Groceries in Al-Ain, United Arab Emirates. Int J Mark Stud. 2012; 4(1), doi:10.5539/ijms.v4n1p38.
40. Bazhan M, Mirghotbi M, Amiri Z. Food labels: An analysis of the consumers' reasons for non-use. J Paramed Sci (Internet). 2015; 6(1):2–10. Available from: www.journals.sbmu.ac.ir/jps/article/view/8034/ 6453
41. Finkelstein EA, Li W, Melo G, Strombotne K, Zhen C. Identifying the effect of shelf nutrition labels on consumer purchases: Results of a natural experiment and consumer survey. Am J Clin Nutr. 2018; 107(4):647–51.
42. Sulong F, Salleh R, Ali ZM. Consumer awareness and understanding of front-of-pack (FOP) energy icon labeling in Negeri Sembilan, Malaysia. Malays J Nutr. 2019; 25(2):287–96.
43. Chopera P, Chagwena DT, Mushonga NGT, Chagwena DT. Food label reading and understanding in parts of rural and urban Zimbabwe. Afric Health Sci. 2014; 14(3):576–84.
44. Chan EYY, Lam HCY, Lo ESK, Tsang SNS, Yung TKC, Wong CKP. Food-related health emergency-disaster risk reduction in rural ethnic minority communities: A pilot study of knowledge, awareness and practice of food labelling and salt-intake reduction in a kunge community in China. Int J Environ Res Public Health. 2019; 16(9): 1478. doi: 10.3390/ijerph16091478.