



## Awareness, barriers and facilitators on the use of food labels among adult consumers in Morogoro Municipality, Tanzania

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### Abstract

**Background:** Food labeling is a fundamental educational tool for advocating for public awareness. When properly used, food labels serve as an essential public health tool that help consumers understand the nutrition value of food, storage conditions, compare products and make informed food choices. This study aimed to assess the awareness, use, barriers and motivators regarding prepackage food label among adults' consumers in Morogoro Municipality.

**Methods:** A cross-sectional study was conducted between February and May 2025, among 310 adults aged 18+ years. Data were collected using a structured and pretested questionnaire that covered awareness, attitude, barriers and facilitators that influence the use of label on prepackaged foods. Data analysis was performed using SPSS version 27, employing descriptive statistics and multivariate logistic analysis.

**Results:** Out of 310 respondents, about 76% were female; 37% were of age between 31-50 years. Awareness of food labels was high (73.5%) of which 50% read the labels consistently. Increased age was negatively associated with reading food labels [AOR 0.96, 95% CI [0.94, 0.98]], while having secondary (AOR 3.09, 95% CI [1.1, 8.71]) or university education (AOR 4.5, 95% CI [1.42, 14.3]) significantly increased the likelihood of reading food labels. Barriers were language used (60%), time constraints (51%), information overload (46%), complexity (47%) and distrust on labels (37%). Health and dietary goals (23.5%) were the main facilitators for food label use.

**Conclusion:** Despite high awareness, consistent food label use was moderate. Barriers such as language, complexity, time constraints, information overload and lack of trust on food labels hinder usage, while health goals encourage engagement. The ministry of Trade and Industry should ensure compliance of label requirements in respect of the language. Target public education is essential to improve consumer understanding and use of food labels.

**Key words:** Awareness, facilitators, barriers, food labels, Tanzania

### Introduction

Food labels serve as an essential public health tool that help consumers understand the nutrition value of food, storage conditions, compare products and make informed food choices (Samit Dutta & Deval Patel, 2017). Food product labeling has become a popular policy tool in the food industry, and it is legal requirement for food safety standards which has to be fulfilled by food manufactures (Ababio et al., 2012a, Amoako, et al., 2017, Riaz et al., 2022).

According to Food Safety and Standards Packaging and Labelling Regulations, 2011 (FSSAI, 2011) and the Codex General Standard for the Labelling of Pre-Packaged Foods (Codex Stan 1 - 1985), labels on pre-packaged foods should clearly state the product name, list of ingredients, net content, manufacturer's name and address, and country of origin. Food label must also provide batch identification, date markings, and recommended storage conditions. Furthermore, nutrition information and instructions for proper use are essential to guide consumers in making informed

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and safe food choices. Although ingredient list on the labels is available, many customers purchase and consume processed and prepackaged foods without paying attention to the information provided, often overlooking details necessary for the informed food choices (Jáuregui et al., 2020). Hence awareness about the use of food labels is important because various health related conditions are prevailing due to consumption of unhealthy food products (Huang et al., 2021).

A study by Kwabena Osei et al., (2024) in African countries found that consumer awareness and use of nutrition labels were relatively higher than their knowledge and understanding of the labels. Customers use food labels primarily to check the expiration date, brand name, and the product's appearance and shape when making purchasing decisions. Nutritional information is often not considered as a major factor that influence purchasing decisions (Kwabena Osei et al., 2024 and Tadesse et al., 2019).

The study by Sauer et al., (2021) revealed that nutrition transition affected food consumption pattern in Tanzania, with 47% of all foods consumed in rural areas and 78% in urban areas are processed. Food label use is limited by language barriers, low understanding, and lack of trust. Most labels are in English, a language not conversant for many people to understand. The absence of front-of-pack labelling and low public awareness further reduce usage (Kwabena Osei et al., 2024). Despite high intake of processed foods, awareness and use of food labels remain low. Samson (2012) found that only 25% of Tanzanians were aware of food labelling thus affecting the use of food labels during purchasing. Increased consumption of processed foods, limited awareness of food labels usage and sedentary lifestyle have contributed to the rise in overweight and obesity among the general adult population in Tanzania, with high prevalence in urban areas of 30-37% in 2021 (Pallangyo et al., 2020 and Zubery et al., 2021). Additionally, the prevalence of hypertension and diabetes among adults has increased by 3.2% and 1.2% respectively (MOH, 2024). The government of Tanzania is dedicated to improving her citizens' health by developing and providing quality services, strengthening policies and proposing strategies which are informed by local research on Non-Communicable Diseases (NCDs) (MOH, 2024).

The government has signed, agreed, and is committed to adhering to internationally set targets such as Sustainable Development Target 3.4 and the Global Action Plan to Prevent and control NCDs, (2013-2030) which requires all countries to ensure that, the NCDs premature deaths are reduced by one third in 2030 (Bennett et al., 2018). Among the proposed strategies to address the rise in diet-related non-communicable diseases, was the enforcement of food labels as a cost-effective approach to mitigate the impact of unhealthy diets (Madsen et al., 2020). In support of this, Tanzanian food laws emphasize consumer safety by strictly prohibiting the sales of unlabeled food products. According to Tanzania Food Labelling Regulations, (1989) revised version in 2002, it is stated that “no person shall sell a manufactured, processed, prepacked or repacked food unless a label has been affixed or applied to that food”. Furthermore, to ensure information accessibility, food labelling law mandates that “any statement, information, or declaration that is required by any regulation made under these Regulations to appear on the label of any food shall be in Swahili or English” (TBS, 2022).

Despite the World Health Organization recommendations on food labels and the recognized health and economic importance, research on consumer awareness, barriers and facilitators for reading labels on prepackaged foods in Tanzania remains limited. This study, therefore aims to fill this gap by examining the awareness and use of food labels among adult consumers in Morogoro Municipality, Tanzania.

## Materials and methods

### Description of study area

The study was done in Morogoro region. Morogoro municipality was selected purposively due to rapid urban growth and its strategic location as a transit hub connecting the Southern Highlands, Central, and lake zones. Morogoro region is one of the 31 administrative regions in Tanzania and

ranks the second largest in size. It is also the third leading region for non-communicable diseases (NCDs) in the country (Kitole et al., 2023). According to the National Bureau of Statistics (MFOP, 2022 ) the region has a population of approximately 3.2million, making it the fourth most populous region in Tanzanian mainland. The study focused on Morogoro Municipal council which has population projections totaling approximately 471,409 people, with 226,817 males and 244,592 females. The region comprises nine (9) district councils; however, the study was conducted in Morogoro municipal council, which had a total of 29 wards out of which six (6) wards (Kichangani, Kilakala, Kingo, Mwembesongo, Sabasaba and Sultani) were included in this study (Figure 1). The region is predominantly engaged in agriculture, official work, and business activities, with pre-packaged foods being exchanged between Morogoro and other regions (MFOP, 2022).

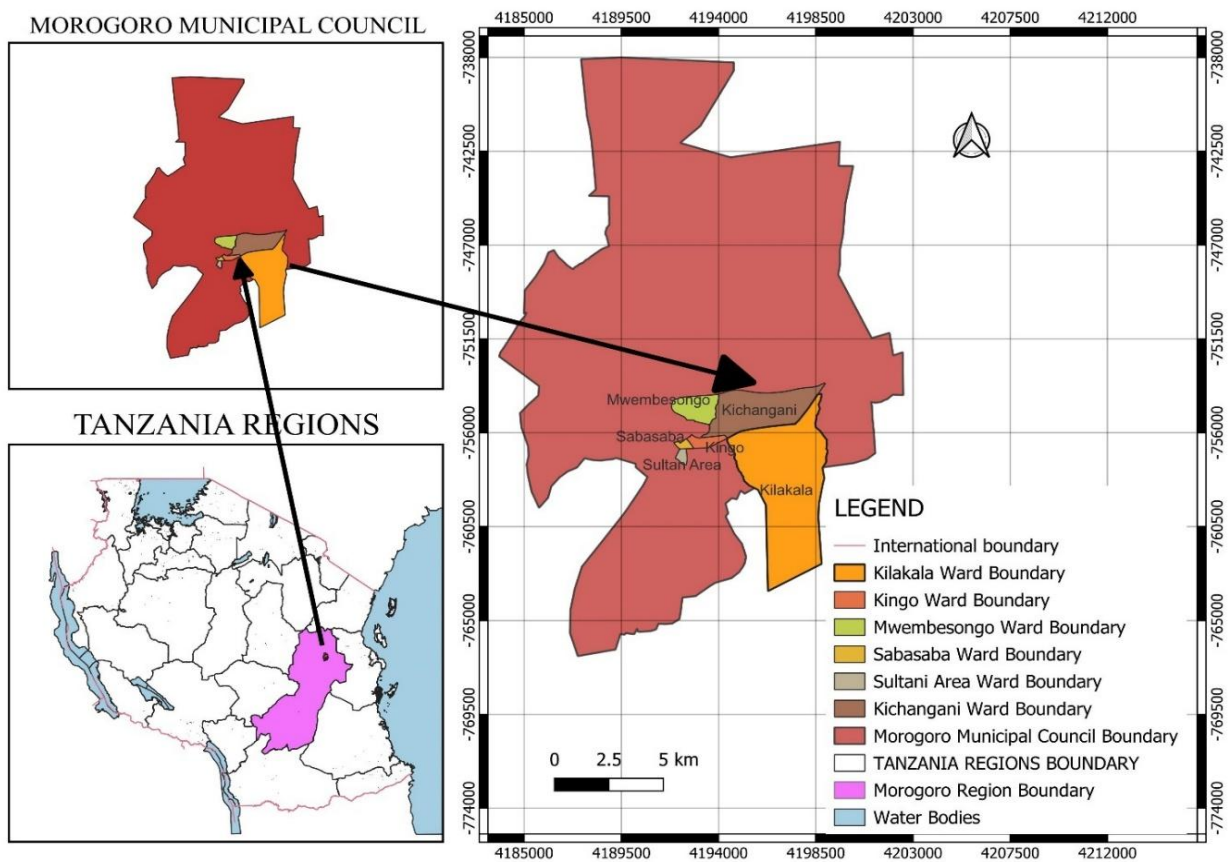


Figure 1: Location of Morogoro municipal council - study area

### Study Design

A cross-sectional study design was used as data collected once. This design enabled data collection at a single point in time, allowing estimation of prevalence and providing a quick, cost-effective snapshot of current trends (Setia, 2016).

### Study Population

#### Inclusion and exclusion criteria

The study targeted adult respondent of 18 and above, as Tanzanian law recognizes individuals from this age as adults. Respondents were also required to be the primary food purchaser in the households. Individuals unable to communicate verbally were excluded from the study.

#### Sample size and sampling procedure

The sample size drawn from this population, based on the prevalence of awareness on food labels in Tanzania estimated at 25% (Samson, 2012). Formula by Kothari (2004) was used to calculate sample size ;  $N = \frac{z^2 p (1-p)}{d^2}$

Whereby.

N = desired sample size

z = standard normal deviation, set at 1.96 corresponding to 95 % confidence interval

p = 25% (Samson, 2012)

q = (1-p) proportion of the population who are estimated to have the particular characteristics (1-0.091)

d = degree of accuracy desired 5% or (0.05)

Therefore.

$$N = \frac{1.96 \times 1.96 \times 0.25 (1-0.25)}{0.05 \times 0.05} = 288.12 \sim 288.$$

In order to cater for non-response rate, the sample size was increased by 10%, assuming a response rate of 90%.

$$\text{Sample size} = (N + 10\% \text{ of non-response}) \\ 288 + 28.8 = 316.8 \sim 317.$$

Therefore, the sample size was 317 respondents.

A multistage sampling method was applied to ensure representativeness. At first stage, six wards were selected from Morogoro Municipality using simple random sampling. In the second stage, two streets within each selected ward were chosen randomly. In the third stage simple random sampling was used to select households from the chosen streets. The sample of 317 adult consumers were evenly distributed across the selected six wards. In each household purposive sampling was applied to select the primary food purchaser aged 18 years and above.

A total of four Focus Group Discussions (FGDs) were conducted with 28 respondents, distinct from those who participated in the quantitative survey. Respondents were purposively selected based on their age, sex, and their role as primary household food purchasers. Each group consisted of seven respondents, including four females and three males. The FGDs were designed to gather qualitative data on barriers and facilitators related to the use of food labels, as quantitative methods alone could not adequately capture the depth and context of respondent's experiences. The discussions were conducted across different wards to obtain diverse community perspectives. Data saturation was reached after the fourth FGD.

### Data collection

Primary data were obtained through questionnaire and FGDs in the field. A structured questionnaire was used to collect data at the household level. Before data collection, a pilot survey was conducted to pretest the questionnaire and assess its validity. Then questionnaire was modified so as to answer research question based on what was observed in the field after pretesting. Data were collected using face to face interviews which took an average of 45 minutes per respondents. The information collected included; socio demographic characteristics of respondents, awareness and use of food labels prior to purchasing of prepackaged foods. The last section covered questions to assess barriers such as language, time, information, and label complexity and facilitators like health goals, personal interest, motivation, and label design when purchasing prepackaged foods. FGD guide was used to collect information during Focus Group Discussions (FGD's) on barriers and facilitators so as to support result from quantitative results.

The interview was audio recorded and supplemented by hand note taking to ensure comprehensive capturing of the data.

### Statistical analysis

Quantitative data entry, coding, and analysis were performed using IBM SPSS Statistics version 27. Descriptive statistics were used to describe results on socio-demographic, awareness, barriers and facilitators to food labels use. Categorical variables (residence, sex, marital status, occupation and education) were presented using frequencies and percentages, while age was presented as a continuous variable using mean  $\pm$  Standard Deviation. The outcome variable (use of food labels) was categorized into two responses as “YES” or “NO”. Binary logistic regression was performed to assess the relationship between dependent variables (use of food labels) and independent variable (socio-demographic characteristics). Significant variable in the univariate analysis was declared eligible for multivariate regression.

Thematic analysis was conducted to identify recurring themes in the text, and the findings from the focus group discussions (FGDs) were reported in a textual narrations and quotations.

### Ethical considerations

Ethical clearance to conduct the study was granted by Sokoine University of Agriculture and approved by the National Institute for Medical Research (NIMR) with reference number NMR/HQ/R.8a/Vol.IX/4860. Informed consent was obtained from all respondents after being briefed on the study objectives. Confidentiality was maintained by assigning identification numbers in place of participant names.

## RESULTS

### Socio-demographic characteristics

Table 1 presents social demographic characteristics of the study population. The age category of 31-50 years represented large portion of the group (37%). Female respondents were 75.5% and 70% of the entire population were married. In terms of education level (38%) of the respondents had a primary school education while a small proportion (16%) had university education. Respondents who were employed were 41% and 40% were peasants (Table 1).

**Table 1: Socio-demographic characteristics of the sample studied (N=310)**

Variables	Frequency (n)	Percent (%)
<b>Age</b>		
18-30	112	36.1
31-50	115	37.1
51-60	50	16.1
61+	33	10.6
<b>Sex</b>		
Female	234	75.5
Male	76	24.5
<b>Marital status</b>		
Married	192	61.9
Not married	118	38.1
<b>Education level</b>		
No formal education	52	16.8
Primary school	118	38.1
Secondary school	90	29

College/university	50	16.1
<b>Occupation</b>		
Peasant	125	40.3
Business	32	10.3
Formal employment	127	41
Unemployed	26	8.4

### Awareness and use of food labels among consumers

The results in Table 2 show that 73.5% of respondents were aware of food labels. About half (50%) of the respondents always read labels during purchase, while 21.5% never read them. Most familiar terms that consumers focused on during purchase were expiry date (75%), storage condition (52%) and name of manufacture (46%). About 93% used food labels to determine shelf-life and safety of products as a primary reason (Table 2)

**Table 2: Awareness and use of food labels (N=310)**

	Frequency (n)	Percent (%)
<b>Awareness on labels</b>		
No	82	26.5
Yes	228	73.5
<b>Reading of food labels</b>		
Always	115	50.4
Rarely	64	28.1
Never	49	21.5
<b>*Familiar terms observed on labels n=179</b>		
Ingredients	60	33.5
Net content	72	40.2
Manufacture name	82	45.8
Country of origin	50	27.9
Batch /lot identification	15	8.4
Nutrition information	77	43
Storage condition	93	52
Instructions for use	68	38
Manufacture date	120	67
Expiry date	135	75.4
<b>*Primary reason of using food labels n=179</b>		
Brand name of the product	24	13.4
Nutrition information	77	43
Quantity of the product.	11	6.1
Advertising verification.	9	2.9
shelf-life and safety of products	167	93.3
Cost	36	20.1

**\*Multiple response**

### Factors associated with reading food labels

Table 3 presents result on association between reading food labels and socio-demographic characteristics. Age and education level were significantly associated with reading food labels. Increase in age was negatively associated with reading food labels (AOR 0.96, 95% CI [0.94, 0.98]). Respondents with secondary education were nearly three times more likely to read food labels (AOR 3.09, 95% CI [1.1, 8.71]) than respondents with no formal education while respondents with university/college education were about four times more likely to read labels (AOR 4.5, 95% CI [1.42, 14.3]) compared to those without formal education. No significance association was found between food label reading and other demographic variables such as sex, marital status and occupation of respondents (Table 3).

**Table 3: Association between reading of food label and socio-demographic characteristics: Binary logistic regression**

Variables	COR ,95% [CI]	AOR ,95% [CI]	P-value
<b>Age</b>	0.96 [0.94, 0.98]	0.96 [0.94, 0.98]	<b>0.001**</b>
<b>Sex</b>			
Female	1		
Male	0.93 [0.51, 1.68]	1.04 [0.52, 2.08]	0.91
<b>Marital status</b>			
Not married	1		
Married	0.94 [0.54,1.62]	0.64 [0.34,1.21]	0.17
<b>Occupation</b>			
Unemployed	1		
Peasant	0.84 [0.34, 2.44]	1.60 [0.52, 4.98]	0.41
Business	0.29 [0.08, 1.03]	0.98 [0.23, 4.10]	0.9
Employed	0.47 [0.18, 1.26]	0.73 [0.25, 2.13]	0.65
<b>Education</b>			
No formal education	1		
Primary	1.13 [0.45, 2.79]	0.89 [0.33, 2.37]	0.86
Secondary	3.9 [1.51, 10.1]	3.09 [1.1, 8.71]	<b>0.03**</b>
College/University	4.9 [1.72, 13.9]	4.5 [1.42, 14.3]	<b>0.01**</b>

**Note:** The abbreviation: Confidence interval (CI), (Adjusted Odds Ratio (AOR), (Crude Odds Ratio (COR), \*\* significant association.

### Barriers and facilitators in reading food labels

#### Barriers in reading labels

Table 4 presents result on barriers and facilitators influencing respondents on reading food labels. Common identified barriers in this study were language used (58%), Time constraints (51%), information overload (46%), complexity of labels, less information and lack of trust. (Table 4).

**Table 4: Barriers on food label reading**

	Frequency (n)	Percent (%)
<b>*Barriers</b>		
Lack of understanding labels	115	37.1
Complexity of food labels	144	46.5
Language barriers	179	57.7
Time constraints	159	51.3



Information overload	142	45.8
Less information	120	38.7
Mistrust in labels	115	37.1
Unclear labels	64	20.6
Lack of awareness campaigns	51	16.5
Label accuracy and reliability	46	14.8

**\*Multiple response**

These results were supported by focus group discussion where by the following barriers such as: use of unfamiliar language, time constraints and mistrust of accuracy of the information. Some prepackaged food used different languages such as English, Spanish, chines and Arabic languages. Some respondents struggled with language issues as noted:

*“English is a problem, at least I can understand Kiswahili”* (FGD1 - Female April, 2025)

*“I rarely read labels and sometimes I don’t understand them because of complicated English, Spanish or Arabic languages”* (FGD 3 - Female April, 2025).

Many consumers face time pressures when shopping, which limits their ability to carefully read and interpret food labels. Busy schedules, crowded stores, and the need to make quick decisions often lead shoppers to skip label reading or rely on familiar products rather than evaluating nutritional information. Time constraints thus act as a significant barrier to making informed food choices. This was reported by respondents as follows;

*“I usually don’t have much time while shopping, so I just grab what I know without checking the label”* (FGD 4, Female, April, 2025),

*“Reading all the information on the package takes too long, especially when I’m in a hurry”* (FGD 3, Male, 24 years)

Consumers highlighted that they distrust the accuracy and reliability of information provided on food labels. Some believed that manufactures prioritize marketing over the truth and transparency, making it difficult to make informed choices.

*“I think some companies lie. I have seen cases where the ingredients don’t match what the food tastes like”* (FGD 1 - Male April, 2025).

*“If expired food products have TBS mark and they are still on shelves, who is ensuring our safety and why should I keep on trusting labels?”* (FGD 2 - Female April, 2025).

**Facilitators for reading labels**

About 24% of respondents agreed health and dietary goals as the main purchasing personal motivation and interest (19%). Furthermore, Consumers suggested the use of Swahili language to facilitate better understanding of food labels (73.5%), followed by increasing font size (62%) and strengthening government monitoring of labeling standards (56%) (Table 5)

**Table 5: Facilitators on food label reading**

	Frequency (n)	Percent (%)
<b>*Facilitators</b>		
Health and dietary goals	74	23.9
Label visibility and prominence	30	9.7
Peer and family influence	25	8.1



Personal motivation and interest	59	19
Label design preferences	22	7.1
Nutrition and diet knowledge	17	5.5
<b>*Consumers' opinions on food labels</b>		
Labelled in Swahili	228	73.5
Bigger font size	193	62.3
Campaigns on using labels	213	68.7
Labelling process monitoring	174	56.1

**\*Multiple response**

These results were also supported by focus group discussion where the respondents reported healthy and dietary goals and nutrition awareness and education as some of the facilitators in reading labels.

While barriers exist, respondents actively engage with reading food labels for specific health and dietary goals. For instance, one of the respondents stated that

*“My health comes first, so I always read food labels to know the ingredients and nutritional content before consuming anything”*. (FGD 4- Female April, 2025). Another added

*“I trust the information only after seeing the TBS mark because they assure safety of my health”* (FGD 3- Male April, 2025).

Knowledge about nutrients, calories, or food additives encourages label use. Consumers who understand the health implications of certain nutrients, such as high sugar, salt, or saturated fat, are more likely to read and interpret food labels to make healthier choices. This was reported by FGD 4, Female, April 2025 *“I learned about nutrients in high school, so I always check on amount of protein, sugar, available minerals and vitamin content before buying”*, also FGD 3, Male, April 2025 said *“I know which additives can be harmful, so I make sure to avoid products that contain them.”*

This means education on food label use can make a significant contribution to their use during purchasing.

## Discussion

This assessed awareness and use of food labels among adult consumers in Morogoro Municipality, as well as the barriers and facilitators influencing their use.

### Awareness and use of food labels

Approximately three-quarters of respondents were aware of food labels, which may be linked to a high level of education, since the study found that consumers with a high level of education were more likely to read food labels compared to consumers with low education. Another reason could be due to increased access to prepackaged foods and exposure to media advertisements. These findings contrast with earlier results from Tanzania, where only 27.4% of respondents reported awareness (Samson, 2012). This was due to the supermarket environment, where consumers are more likely to encounter food labels as they select products directly from the shelves. Our results align with what was reported in studies conducted in Botswana, Nigeria and Ethiopia, which found that about 78%, 83.6%, and 90%, respectively, were aware of food labels (Iheme et al., 2020, Adesina et al., 2022, Themba & Tanjo, 2013). Similarity of these trends has been linked to socio-demographic factors such as education, occupation, and income. Likewise, a study in Libya by Alshukri & Elramli, (2020) reported 96.3% of consumer awareness on food labels, which was largely driven by having university degrees. The study further revealed that both occupation and education level were significantly associated with food label awareness and use.

However, this extent of awareness did not reflect reading of food labels before purchasing. In our study, only about half of the respondents always read food labels, while some reported never reading them. Reported reasons for not reading labels included reliance on prior personal experience with the products, language barriers and the perception that government authorities had already ensured product quality and safety. Similar patterns have been reported in Uganda, where 61% of respondents reported reading food labels before purchasing, while 20.3% never read them (Mukisa & Mugabi, 2024), and in Ethiopia, where only 48% of consumers reported reading labels consistently (Tadesse et al., 2019). Failure to use food labels may lead to some consumers to prioritize brand familiarity over nutrition information, assume that all products are safe and ultimately increase the consumption of unhealthy ingredients, therefore rising the risk of diet related diseases.

In this study the most commonly recognized and frequently checked food label terms were expiry date manufacture date, storage condition and nutrition information. This is because of significant role manufacture dates and expiration dates play in shaping consumers food-related decisions. Being aware of these dates and nutrition information on food labels enable consumers to avoid expired products and make safer food choices. Similar findings have been reported in Ghana, where expiry date ranked first and nutritional information ranked second among factors that was considered by consumers before purchasing products (Ababio et al., 2012b).

#### **Barriers and facilitators on use of food labels**

In the study barriers to effectively food label reading was language barriers, unclear and complex labels, insufficient details and information overload. These challenges were further linked to lack of interest, often caused by faint or small-fonts labels and lack of trust caused by unfamiliar terminologies. However, according to Tanzania Bureau of Standards (TBS, 2022), it is mandatory for food label to be written in the language understood by the target consumers, and where another language is used, a proper translation must be provided in English and Swahili. Similar challenges related to the use of food labels have been reported in Ghana by (Amoako, 2017) who identified lack of knowledge, unfamiliar language, time constraints, and product familiarity as key barriers to food label use. Likewise, (Affram & Darkwa 2015) also reported time limitations and small font size as significant obstacles among Ghanaian consumers. In South Africa, (Koen et al., 2018) highlighted complexity of food label which makes difficulty in understanding contents as major barrier. Such challenges may lead to unintentional selection of unhealthy foods, increasing the risk of diet-related diseases.

The most important factors influencing respondents' food label reading were health and dietary goals, personal motivation or interest, label visibility, and label design, all of which supported healthier choices of prepackaged foods. In contrast, peer or family influence and nutrition knowledge were considered less important, suggesting that individual and household health concerns are the primary drivers of label use. Similar facilitators were reported in Libya, where 15.3% of respondents indicated that health concerns motivated them to read food labels (Buzgeia et al., 2023). However, only a small proportion of respondents in the present study reported using food labels to verify advertisements. Instead, advertisements themselves were identified as major factors influencing purchasing decisions, a finding consistent with (Mensah, 2012) who reported that marketing and pricing strategies play a significant role in shaping consumer choices in Ghana.

Consumers in our study highlighted the need for improved food labels, specifically recommending the use of Swahili language, larger fonts, and clear terminologies. Similar recommendations have been reported in studies from Dar es Salaam, Tanzania (Rusobya et al., 2024), Nigeria (Ajibade et al., 2025) and China (Schiro et al., 2020) all of which emphasized that well-designed, localized, and easy-to-read labels enhance comprehension, build consumer trust, and support informed purchasing decisions.



One key limitation of the study was that some participants reported using food labels even though their actual behavior during interview may not have reflected this. To address this limitation in the field, we incorporated practical tasks in which participants were shown a food label and asked to interpret the information presented. This approach helped validate their real level of understanding and ensured that self-reported label use was supported by demonstrated comprehension.

### Conclusion and recommendations

The study revealed that while awareness of food labels was high, their use was moderate. Key challenges included technical terminology, small fonts, unfamiliar languages, and complex information. With the increasing consumption of pre-packaged processed foods (Abioye et al., 2020), there is a need for the Ministry of Health, the Ministry of Education, in collaboration with the Tanzania Bureau of Standards (TBS), to promote nutrition education programs in schools, community centers, and health clinics to ensure that the consumers understand the importance of reading food labels. The regulatory authorities should develop standards and guidelines on front-of-pack labelling to make nutrition information more accessible and easier for consumers to use. It is also important to monitor compliance with the use of the Kiswahili language for the locally manufactured and imported foods.

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### Conflicts of interest

The authors declare that they have no conflicts of interest.

### Availability of data and material

All data generated or analysed during this study are included in this manuscript

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