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Research

Feasibility-testing of recommendations in Ghana's food-based dietary guidelines

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Background

Ghana published her first national Food-Based Dietary Guidelines (FBDG) in 2023. The process of developing the guidelines required field-testing of the draft recommendations in both text and graphic formats. The testing focused on assessing user comprehension, acceptability and feasibility of the draft recommendations.

Objective

In this paper, we describe the process and findings of this testing.

Methods

Seventy-four focus group discussions (FGDs) comprising 579 participants from the Coastal Savannah, Forest Transition and Northern Savannah zones were conducted. Adult and adolescent males and females were selected, purposively through a multi-stage process to participate in the discussions. The audio-recorded interviews from the FGDs were transcribed and thematically analyzed using a combination of pre-determined and emerging coding approaches.

Results

Across locations, sex and age groups, all 12 draft recommendations tested were generally considered understandable; however, there was a need to revise the wording of some recommendations to enhance clarity. FGD participants were able to correctly recognize and interpret the images designed to complement the communication of the recommendations. Participants particularly acknowledged the colourful nature of the food guide graphics and their inclusion of familiar foods. There was a general expressed willingness to adopt the recommendations, which was attributable to the perception that the messages aligned with the local food culture. Eating fruit daily and reading food labels and nutrition information on pre-packaged food, however, were considered counter-cultural. Food prices, seasonality, distance to markets, preferences and tastes, as well as traditional dietary practices, were also identified as potential barriers to adoption of the recommendations. Strategies suggested by participants to enable adoption of the recommendations included paying food production subsidies to farmers (especially for nutrient-rich foods), accompanying graphics with texts, prioritizing consumption of local foods and translating the recommendations into local languages.

Conclusions

Generally, the technical recommendations for Ghana's draft were considered to be comprehensible, culturally sensitive and feasible to adopt. These findings have been taken into consideration in finalizing the FBDG and should help guide its implementation.

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INTRODUCTION

Consuming optimal diets is important for health and improving human capital development across the life course (Aryeetey & Ramos, 2022; Frempong & Annim, 2017; Gebru et al., 2018). Consuming sub-optimal diets underpins a multiple burden of malnutrition (Gebru et al., 2018; Haddad et al., 2016). With the rising prevalence of overweight and obesity globally, it is projected that by the close of 2025, about 167 million people will experience compromised health outcomes as a result of being either overweight or obese (Viana et al. 2025).

In Ghana, malnutrition persists in all its forms. Overweight and obesity among women of reproductive age (>20 years) have increased rapidly and are currently estimated at 50% (GSS et al. 2023; Ofori-Asenso et al., 2016). Overweight is a risk factor for the rapidly rising prevalence of chronic diet-related diseases, including diabetes, hypertension and cardiovascular diseases (FAO, 2016; Ofori-Asenso et al., 2016). At the same time, the burden of undernutrition, especially among young children, women of reproductive age and adolescents, remains high (GSS et al. 2023).

One key strategy to address sub-optimal diets is adopting the recommendations from food-based dietary guidelines (FBDG) (FAO, 2016). FBDG is a policy tool that is useful for guiding population-level decisions on what constitutes a healthy diet. It also provides a useful guide for individuals and families to make daily dietary decisions on what to purchase and consume. Thus, FBDG is typically designed using simple, brief and easily understandable messages that are realistic and feasible for the ordinary person to use (Faber & Villiers, 2021). FBDG are also helpful in formulating population-level food and agriculture policies, including those on food production, processing, distribution and on the promotion of healthier diets (Aryeetey & Ramos, 2022; Bekele et al., 2023; Faber & Villiers, 2021; FAO, 2016).

The process of FBDG development should be evidence-informed, requiring an understanding of public health priorities, dietary behaviors, food availability and food access. The process of developing Ghana's FBDG was informed by a framework developed by FAO and WHO (WHO, 1998), as described elsewhere (Aryeetey & Ramos, 2022; Bekele et al., 2023; FAO, 2016). A critical component of this process is the field-testing of the technical recommendations by the National FBDG Task Team. This paper presents the findings of the field-testing of the recommendations among a cross-section of community members.

METHODS

STUDY DESIGN

Field-testing of the developed guidelines used a qualitative data collection approach involving focus group discussions (FGDs). In addition to structured FGD guides, photographic images and accompanying messages were utilized to obtain a comprehensive assessment of the recommendations across participant groups and regions.

STUDY LOCATION

Data gathering was carried out in a total of 16 districts in three selected regions of Ghana (Greater Accra, Ashanti and Northern Regions); each representing one of the three ecological zones in the country - Coastal Savannah, Forest Transition and Savannah, respectively. The regions were purposively selected due to their cosmopolitan nature - a melting pot of multiple cultures, which made them convenient for gathering rich and diverse data to inform the refinement and adoption of the recommendations in the dietary guidelines.

Regions, districts and communities were selected through a multi-stage process to represent urban, peri-urban and rural settings to take into account socio-cultural, education, occupation, marital status, religion and economic differences (Aryeetey & Ramos, 2022; Bekele et al., 2023; Faber & Villiers, 2021; FAO, 2016).

TARGET POPULATION AND PARTICIPANT SELECTION

The target population groups were adult males and females (20 years and above), as well as adolescent males and females (12-19 years). Within communities, participants were purposively selected to include diverse socio-demographic backgrounds. Consented and assented participants were initially contacted with the assistance of local community, district and metropolitan government officers, schoolteachers and public health personnel, who were the contact persons for the study.

DATA COLLECTION

The 12 recommendations that were tested were written in the English language and presented in both text and image formats (see Boxes 1 and 2). The images were intended to be easily understood by participants who were unable to comprehend English adequately.

Each technical recommendation was accompanied by a set of tips/strategies for practising it (see Appendix A). Six questions were asked about each of the 12 recommendations, followed by a set of probing questions to assess participants' understanding of the recommendations, their acceptability, cultural appropriateness, practicality and barriers to their adoption. Similarly, for each image, a set of questions was asked to assess participants' recognition of the image, the clarity of the message it conveyed and their likes and dislikes about the image. Suggestions for improving the clarity of images and aligning them with corresponding messages were explored with the participants. Additionally, the images in Figure 1, "Asanka" (earthenware) and Figure 2, "Tapoli" (a wooden grinder), which were intended to convey all the key messages of the FBDG, were included for participants' appraisal.

Two FGD guides, informed by pre-determined themes, were developed and used as data collection tools – one each for the text recommendations and the images. In addition to participants' assessment of the recommendations, data on participants' sex, age, education, employment and marital status were collected. Each FGD was moderated by qualitative interview experts with assistance by note-takers. Discussions were held within the communities and at times convenient to participants. FGDs had an average duration of 90 minutes and were conducted in either a local language or English according to participants' preferences. In all, 74 FGDs, including 579 participants, were carried out. Half of the FGDs (37) were on the text recommendations and the

other half on the images. There were separate FGDs for the four categories of participants – adult men (n=18), adult women (31), adolescent boys (n=5) and adolescent girls (n=20). Table 1 presents the distribution of FGDs and participants among the four categories.

Box 1. Original text and image formats of recommendations, as presented to participants

Box 2. Text and image formats of recommendations

Figure 1: Asanka

Figure 2: Tapoli

Table 1. Participant categories and FGDs

Participant Category	Number of Focus Group Discussions	Number of Participants	Proportion of participants (%)
Adolescent Males	5	46	7.9
Adolescent Females	20	171	29.6
Adult Males	18	138	23.8
Adult Females	31	224	38.7
Total	**74**	**579**	**100**

DATA MANAGEMENT AND ANALYSIS

All FGDs were audio recorded and transcribed into English. Data saturation for each of the issues/questions raised was reached when no new information was gathered across the 4 participant groups. Transcription of the recorded FGDs was done by trained research assistants and reviewed by a supervisor for accuracy. Participants' identities were concealed; name references were masked using numeral codes.

Thematic analysis of the 11 predetermined themes, as recommended by Bingham (2023), was applied using both deductive and inductive coding approaches. The deductive process involved creating codes guided by the interview guide and applying the codes/labels to the data. The codes that were created were categorized and placed under the appropriate themes. Subsequently, the categorized codes and their respective themes informed the development of a codebook that facilitated the coding of transcripts by two independent coders, ensuring uniformity in the coding process, both within and across transcripts.

The following steps involved reading through the transcripts and applying the codes to participants' statements. Codes that conveyed similar meanings were grouped together and placed under their respective themes. Similarly, emerging codes that were not previously identified were placed under appropriate themes. Analysis focused on dominant responses, while noting those peculiar to specific participants' locations as well as points of disagreement and consensus. In reporting the findings, verbatim quotations relevant to each theme were used to illustrate them.

Table 2. Pre-determined (a priori) themes explored

Themes	
Text messages	**Image messages**
1. Understanding the text recommendations	6. Recognition of image
2. Willingness to adopt recommendations	7. Understanding of messages carried by images
3. Perceived ease and enablers of adoption	8. Clarity of messages carried by images
4. Barriers to adoption of recommendations	9. Identifying with messages carried by images
5. Consequences of adopting recommendations	10. Preferences about images
	11. Suggestions for improving quality/presentation of images

RESULTS

SOCIO-DEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS

A total of 579 men, women and adolescent girls and boys across the three ecological zones in Ghana participated in the study. There was an almost equal regional distribution of participants: Ashanti Region – 207 (36%), Greater Accra Region- 197 (34%) and Northern Region - 174 (30%). Participants' socio-demographic characteristics are presented in Table 3.

Table 3. Participants' socio-demographic characteristics (N=579)

Variable	Frequency	Percent
Age (years)		
12-19	217	38
20-59	338	58
60+	24	4
Sex		
Female	395	68
Male	184	32
Marital status		
Single	323	55.8

Table 3. Continue

Variable	Frequency	Percent
Married	218	37.8
Co-habiting	16	2.8
Divorced	7	1.2
Widowed	15	2.6
Education		
No Education	37	6
Basic (Primary and junior high)	363	63
Senior High School	132	23
Tertiary	47	8
Occupations		
Unemployed	58	10
Artisanal and petty traders	258	44.6
Professional/ technical/managerial	31	5.5
Retired	4	0.7
Student	228	39.4
Household Size		
1-5	157	27
6-10	330	57
11-20	64	11
20+	28	5

POSITIVE IMPRESSIONS OF THE RECOMMENDATIONS (PERCEIVED STRENGTHS)

Positive impressions of the recommendations are presented in detail in Appendix B. Most participants expressed an understanding of both the text recommendations and the messages conveyed by the images, indicating the pro-well-being purposes of the messages. The reported willingness to adopt the recommendations was common, owing to their alignment with participants' usual dietary practices, their perceived health benefits and the lessons learned from the discussions. The intention to adopt most recommendations was perceived as easy because participants were accustomed to practicing them. Low purchasing power may also have facilitated the adoption of certain recommendations, such as limiting sugar intake. Another driver for the high reported willingness to adopt recommendations was the perceived positive health-related benefits.

Participants' indications of needed enablers of adoption were effective public educational activities at both community and household levels using the vernaculars, financial support and reduction in food prices to offer all households access to a variety of foods for their households and payment of government subsidies to farmers. Other enablers were infrastructural (access to food market) and technical (developing a food menu) in nature.

Recognition and description of images were correctly identified and described. Similarity/identity between contents of Figure 1 ("*Asanka*") and Figure 2 ("*Tapoli*") was duly specified. Participants indicated that images matched the messages they carried. They also indicated that most messages and their corresponding images were visually clear, the images were perceived by all to be appealing and they expressly liked the arrangements of the food items into the various food groups. The colourful nature and display of variety of locally-produced foods were also commended. Participants demonstrated ability to identify all images and their intended messages. Likes about image in Figure 1 – '*Asanka*' - included its graphic and communication strengths, but the graphic/physical attributes of image in Figure 2 – "*Tapoli*" - were considered superior among participants across the regions.

CHALLENGES TO MESSAGE COMPREHENSION AND ADOPTION

The challenges to understanding and adopting the recommendations are presented in Appendix C. In summary, the challenges related to text recommendations were misunderstood/misinterpreted. These challenges occurred in 7 out of the 12 recommendations. The issues there included the diversity of food groups required in a meal to make a consumer healthy, as well as foods considered healthy for specific consumers. Consumption of fruits, vegetables, fatty and cold foods was another set of misunderstood/misinterpreted issues. The healthiness of fatty meat, buying colored tubers instead of the usual white ones, the purported adverse effects of consuming too much salt and the health implications of excessive sugar-sweetened food consumption for women were additional concerns. Participants across the regions attributed the misunderstanding/misinterpretation of some recommendations to the use of technical terminology and the writing of the recommendations in the English language.

Barriers to the adoption of the recommendations were perceived to be diverse and multi-dimensional, including physical, educational/technical/cognitive, economic/financial, psychological and socio-cultural. Seasonality, resulting in low accessibility and unaffordability of recommended foods, especially vegetables, was perceived as a potential barrier across the regions. Other specific barriers included non-alignment of recommendations with usual dietary practices, addiction to unhealthy dietary practices, inorganic farming practices including the use of agro-chemicals such as pesticides, ignorance of nutritional/health benefits of various foods and a perceived association of consumption of some legumes, nuts and pulses with ill-health, including diarrhea and acne. Barriers to adoption of recommendation 9 ("*being physically active every day*") comprised poor knowledge, attitude and practices related to physical activities. All participants perceived illiteracy, stemming from low levels of literacy in English, as a potential barrier to adopting recommendation 10 ("*read food labels and nutrition information*").

The leading complaint about the images was the absence of labels to identify the names of the depicted foods (most participants across the regions). Participants in the Northern Region disliked the inclusion of crabs and snails for reasons of cultural sensitivity. Adult males in the same region disliked the display of perceived foreign vegetables in contrast with the inadequate display of local vegetables in the image representing Recommendation 3 (Eat a variety of vegetables every day).

SUGGESTIONS FOR IMPROVING QUALITY/PRESENTATION OF IMAGES

Participants made suggestions for improving the quality and presentation of all the images. Suggestions that were common to all the images were labelling the contents of each image for easy identification and enlarging the images for visual clarity. For the image representing Recommendation 5 (Eat a variety of animal-source foods every day), exclusion of snails and crabs was suggested by participants in the

Northern Region. The other suggestions related to specific images are presented in Table 4.

Table 4. Participant suggestions for improving quality/presentation of images

Graphics/Image	Suggestion
1: Figure 1- ***"Asanka"***	○ Image should be enlarged for better clarity with proportions of the six food groups.
2: Figure 2 – ***"Tapoli"***	○ Bottom (background) to be designed like the top for ease of recognition as a "tapoli". ○ Water should be placed within the "tapoli" and not outside it.
Recommendation 1: ***Eat a diverse and varied diet from the six food groups every day.***	○ Inclusion of more items such as pork, kobi and momone.
Recommendation 2: ***Eat a variety of fruits every day.***	Inclusion of nutrient contents of all fruits. ○ Inclusion of other fruits such as strawberry, apple, grape, local fruits (local mango and passion fruit).
Recommendation 3: ***Eat a variety of vegetables every day.***	○ Inclusion of more local vegetables such as: cassava and "Kwahu nsusua"/ "kantose"(African turkey berry) leaves, dandelion, lettuce, bitter leaf and cauliflower. ○ Inclusion of other vegetables such as green bean, spring onion and lettuce.
Recommendation 4: ***Eat a variety of legumes, pulses and nuts every day.***	○ Inclusion of more food items such as soyabean.
Recommendation 5: ***Eat a variety of animal-source foods every day***.	○ Inclusion of other food items such as mushroom, tilapia, goat, pork and foods people in Northern Ghana are familiar with.
Recommendation 6: ***Use healthy fats, oils and oily seeds in moderation***	○ Inclusion of palm-kernel oil and recommended daily intake of oil
Recommendation 7***: Eat a variety of whole/unpolished grains, cereals and tubers every day.***	No suggestion
Recommendation 8: ***Eat less frequently foods and ingredients that are high in sugar, fats and salt.***	○ Separation of all uncancelled from cancelled foods. ○ Add labels to indicate dangerous foods. ○ Inclusion of alternatives such as healthy local snacks.
Recommendation 9: ***Be physically active.***	○ Descriptions of the various games displayed ○ Inclusion of cycling ○ Should take the aged into consideration and define what is appropriate for them.
Recommendation 10: ***Read food labels and nutrition information***	No suggestion
Recommendation 11: ***Keep food safely and eat safe food.***	○ Inclusion of a refrigerator and proper labelling of actions in image ○ Additional vegetables to the image ○ Labelling of actions
Recommendation 12: ***Drink water regularly.***	○ Write in words number of glasses of water to drink ○ Add the sources of drinking water ○ Add images of someone drinking water ○ Inclusion of bottled water

DISCUSSION

The study assessed the feasibility of Ghana's food-based dietary guidelines among a cross-section of Ghanaians at the community level in three regions representing the three ecological zones. Findings are discussed under three broad themes.

POSITIVE IMPRESSIONS OF RECOMMENDATIONS

Most participants understood both the texts and images and their willingness to adopt recommendations was high. Correct interpretation of guidelines among users is critical for effective communication (Faber & Villiers, 2021). In this study, most adolescent participants correctly identified the six food/nutrient groups displayed in the guidelines owing to their exposure to nutrition education through school curricula (Silva et al., 2023). Their willingness and ease of adoption assessed the acceptability of the recommendations among participants. Ghana's FBDG is targeted at healthy members of the Ghanaian population aged 5 years and above (Aryeetey & Ramos, 2022). Therefore, identification by participants with the recommendations is a sign of their feasibility. This positive impression may be explained by their perception that most messages aligned with their usual dietary practices, which enhanced their ability to identify and relate with them (messages). This finding aligns with the recommendations for developing FBDG which emphasize cultural acceptability of guidelines as a driver for adoption (Aryeetey & Ramos, 2022; Bekele et al., 2023; Faber & Villiers, 2021; FAO, 2016; Plessis et al., 2022; WHO, 1998).

All participants were knowledgeable about the benefits of consuming a diverse and varied diet, including fruits and vegetables. The benefits mentioned were mostly improved well-being, including health and reduced disease burden. This finding reflects the purpose for which WHO and FAO are encouraging all nations to develop and adopt FBDG (FAO, 2016). The implications of consuming diverse and varied diets, including fruits, vegetables, legumes and cereals while limiting consumption of other foods such as unhealthy fats and oils, sugar and salt have been emphasized (Gebru et al., 2018; Haddad et al., 2016). The positive features of the images, identified by participants, are not different from those of other FBDG, especially the inclusion of locally available foods for ease of identification and adoption, while also addressing issues of cultural appropriateness (Bekele et al., 2023; FAO, 2016; Plessis et al., 2022).

CHALLENGES TO MESSAGE COMPREHENSION AND ADOPTION

Participants identified economic/financial, socio-cultural, educational/technical/cognitive and physical/environmental challenges to the comprehension and adoption of the

message. They also identified psychological challenges. Economic/financial challenges included low purchasing power, limited access to markets, high transportation costs, and concerns about the perceived increased budgetary allocations and the diets that would result from adopting the recommendations. Poor access to markets retards the availability of perishable crops such as fruits and vegetables. Although improving health while preventing illnesses is the desire of all, meeting the requirement to eat consistently diverse and varied foods from at least four of the six food groups would necessitate households to increase their budgetary allocations for food, with potential implications for resource allocations for other needs.

Socio-cultural challenges included cultural mindset and dietary tastes, preferences and choices. Culture plays a significant role in developing a people's thought patterns and perceptions and shapes their mindset about the environment, including dietary choices (Faber & Villiers, 2021). Directly adopting recommendations that are averse to their culture is unlikely to be acceptable. In Ghana, as in most other African countries, portion sizes of food comprise more carbohydrates at the expense of fruits and vegetables (FAO, 2009). Shifting to larger portion sizes of fruits and vegetables may be challenging to achieve overnight. Consumption of animal-source foods in most households is restricted to adults, leaving children, the most vulnerable household members, deprived (Colecraft et al., 2012). Drivers of food choices, including tastes and preferences, have been identifed in earlier studies (Liem & Russell, 2019; Osei-Kwasi et al., 2017). In this study, crab and snail were recommended by participants in Northern Regions for removal from the list of images to enhance their cultural accessibility.

Cognitive challenges included the use of nutrition concepts, presenting recommendations in English, inability to read food labels, the absence of labels on each food item displayed, unawareness of the meaning of red cross marks on some foods and misperception of some locally produced foods as foreign. The need to use simple, comprehensible phrases (including avoiding nutrition jargon) in developing dietary guidelines has been emphasized in facilitating communication to all categories of participants (FAO, 2016; WHO, 1998). Non–labeling of images may cause misconceptions or lead to failure to recognize them. Some participants misconstrued "alansa", an uncommon fruit in their food environment, as rotten tomato. Similarly, shea nut and shea butter were not recognised by a few participants. Similar observations were made by consumers in Tanzania when their FBDG was field-tested for feasibility (Plessis et al., 2022). Red cross marks on some foods, intended to mean "consume in moderation," were misperceived among adolescents as indicating "stop eating these foods because they are dangerous". Adolescents may have found the inferred message difficult to accept, owing to their preference for tasty foods most often prepared with plenty of sugar and salt (Bawajeeh et al., 2022).

Adolescents may also have been averse to the message carried in the image: "eat less frequently".

Some locally produced foods may have been misperceived as foreign because they are not produced in the participants' specific local environments. The physical/environmental challenges to message comprehension and adoption included seasonality of foods and non-cultivation of food crops linked with scarcity of agricultural land and health-related issues. Similar findings have been made in other feasibility studies on FBDG, including those of Tanzania and Ethiopia (Bekele et al., 2023; Plessis et al., 2022). Seasonality hinders year-round availability and affordability of foods, particularly fruits and vegetables, during the dry season (Jager et al., 2023). Most participants identified physical activities such as running and jogging as a big challenge. Engaging in minimal physical activities (including household chores) as opposed to leading a sedentary lifestyle has been found to contribute positively to health (Park et al., 2020).

SUGGESTIONS FOR IMPROVING IMAGE QUALITY/PRESENTATION AND MESSAGE ADOPTION

To improve image quality/presentation, participants suggested labelling of all images and their contents, as well as the removal of red cross marks. Forms of support suggested to improve message adoption included reducing the high prices of some healthy foods through government subsidies and reforms to enhance access to farming resources; improving access to markets for such foods; nutrition education at household and community levels; and developing a menu. Using a menu to suggest daily food options may help improve dietary choices and adoption of recommendations. Other countries have recommended and encouraged improved food availability and affordability through backyard gardening and small animal rearing (Bekele et al., 2023). Nutrition education could address issues of suboptimal knowledge, poor attitudes/misperceptions and unsatisfactory dietary choices/practices. An example is the popular myth associating groundnut consumption with acne. Relevant issues of knowledge may include health benefits of locally produced foods. Using a menu to suggest daily food options may help improve dietary choices and practices, facilitating the adoption of the FBDG recommendations.

LIMITATIONS OF THE STUDY

The study was carried out in three out of Ghana's 16 administrative regions, which has implications for generalizability; however, these regions included all three ecological zones of Ghana to enhance the representativeness of the sample. Language may have been a barrier since all messages were presented in English and some participants were not fluent.

CONCLUSION

Potential facilitators of the adoption of Ghana's FBDG may include the quality of texts and images, their high levels of cultural acceptability/sensitivity, alignment of most recommendations with local dietary practices and perceived benefits of their adoption. The main potential challenges to adoption may be economic/financial issues that invariably hinder food accessibility, availability and affordability. Socio-cultural, cognitive, physical and psychological challenges may need to be addressed through diverse means, including sustained and mass educational/awareness creation activities, as well as the production of food labels in the main vernaculars identified in the country.

AUTHOR CONTRIBUTIONS

Conceptualisation, Funding acquisition: RA and PA; Methodology: SZ-A, RA and PA. Project administration: SZ-A, RA and MAN. Investigation: SZ-A, RA, MAN and RAA. Formal analysis: SZ-A, RA and MTA. Writing - original draft: SZ-A, RA and MTA. Writing - review & editing: RA, PA, SZ-A, RA, MAN and MTA. All authors have read and approved the final version of the paper and its submission.

CONFLICT OF INTEREST

Authors declare no competing interest.

DECLARATION OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN SCIENTIFIC WRITING

Nothing to disclose.

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APPENDICES

Appendix A: Tips for practicing the recommendations

Technical Recommendations	Tips for practicing the recommendations
1. Eat a diverse and varied diet from the six food groups every day.	-The six food groups are: 1. Fruits, 2. Vegetables, 3. Legumes, pulses and nuts, 4. Animal-source foods, 5. Healthy fats, oils and oily seeds and 6. Whole/unpolished grains/cereals and tubers. -Include foods from at least four of the six food groups in every meal/snack. -Ensure variety in the foods you eat across all meals and snacks. Aim for variety in the type of meals and snacks each day.
2. Eat a variety of fruits every day.	-Eat at least two servings of a variety of fruits every day. -Eat a variety of fruits that come in different colours. -Eat fruits regularly either as part of a meal or separately as a snack whether eating at home or out of home.
3. Eat a variety of vegetables every day.	-Increase eating of a variety of vegetables as part of a healthy diet. -Eat at least three servings of a variety of vegetables daily. -Eat a variety of leafy vegetables and brightly-coloured vegetables.
4. Eat a variety of legumes, pulses and nuts every day.	-Eat at least two and a half servings of a variety of beans, nuts and legumes each day. -Use only beans and nuts that are free of mould and colouration. -Soak, hull, or germinate beans and roast nuts to improve their nutritional benefits.
5. Eat a variety of animal-source-foods every day.	-Eat one and a half serving of a variety of animal-source foods each day. -Choose lean meat cuts; limit eating of fatty meat. -Limit eating of animal-source foods that have been preserved with additives.
6. Use healthy fats, oils and oily seeds in moderation.	-Use one servings of healthy oils each day. -Prioritize oils that are liquid when heat has not been applied, over those that are solid or semi-solid at room temperature. -Reduce total fat consumption as a proportion of total calories in a healthy diet.
7. Eat a variety of whole/unpolished grains, cereals and tubers every day.	-Increase eating of a variety of coloured roots and tubers such as orange-fleshed sweet potato, yellow cassava, purple yam and cocoyam over white roots and tubers. -Prioritize whole grain flour products (e.g. brown bread) over refined flour products (e.g. white bread). -Eat four servings of a variety of whole grain and/or colored tubers and plantain each day.
8. Eat less frequently foods and ingredients that are high in sugar, fats and salt.	-limit intake of foods that contain a lot of added sugar. -limit intake of sweetened drinks, sweets and table sugar. -limit intake of salt and salted foods.
9. Be physically active.	-Adults should engage in moderate intensity aerobic physical activity for at least one hour each day on most days (at least five days of the week). -Healthy children should engage in moderate-to-vigorous intensity aerobic physical activity for at least one hour every day on all days of the week. -Reduce time spent by children watching television, using phone, tablets and computers.
10. Read food labels and nutrition information.	-Select packaged foods that have low calories (i.e. not more than 40 Calories) in each serving. -Select packaged foods that have low fats (i.e. not more than 3 grams), saturated fats and trans fats (not more than 1% of Calories) in each serving. -Select packaged foods that are wholesome and not beyond the expiry date in each serving.
11. Keep food safely and eat safe food.	-Wash hands using soap and running water after using the toilet or cleaning a child's toilet. -Separate raw and cooked foods; use different knives and cutting boards for handling raw food. -Store foods in separate and covered containers to avoid contamination.
12. Drink water regularly.	-Drink at least eight cups of water in a day. -Limit drinking of alcoholic beverages. -Limit drinking of sugar-sweetened beverages to cool thirst.

Appendix B: Positive impressions of recommendations

Theme1-Understanding text recommendations	Sources	Quotations
Most recommendations encouraged daily consumption of foods from diverse food groups.	Most participants	*"One should have a bit of the foods mentioned in each of the six food groups in a meal" – (Adol. Males, Oforikrom, AR).*
Other recommendations encouraged moderate consumption of other food.	Most participants	*"We shouldn't take plenty salt and sugar" (Adult Females, Mbanaayili, NR).*
Understood recommendations as important for enhancing health.	Most participants	*"This recommendation alerts us about the health benefits of eating a balanced diet." – (Adult Females, Oforikrom, AR).*
Eating a balanced diet and eating from the six food groups were commonly associated with recommendation 1- *"Eat a diverse and varied diet from the six food groups every day".*	Most participants	*"One should have a bit of the foods mentioned in each of the six food groups in each meal" – (Adolescent Males, Oforikrom, AR)*

Theme1-Understanding text recommendations	**Sources**	**Quotations**
C onsumption of a variety of fruits and vegetables in recommendations 2- *"eat a variety of fruits every day*" and 3- *"eat a variety of vegetables everyday"* - was understood.	Most participants	*"It means eating a variety of fruits daily to boost your immune system" (Adult Males, Oyarifa, GAR).* *"It's telling us to eat different vegetables daily" (Adol. Females, Zangbalun, NR).*
Recommendations 6 – "*use healthy fats, oils and oily seeds in moderation"* and 8 – "*eat less frequently foods and ingredients that are high in sugar, fats and salt*" were understood as limiting consumption of "fats and oils, oily seeds" as well as foods high in sugar, salt and fat.	Most participants	*"This recommendation advises us to reduce the amount of sugar and salt we add to our meals" (Adult Males, Tikrom, Ejisu, ARi).*
Participants understood recommendations 9 – *"be physically active*", 10 - *"Read food labels and nutrition information"* and 11- *"keep food safely and eat safe food"* to be related to actions that they needed to take to complement their dietary intake and enhance their health.	Most participants	*"To engage in physical activities like walking and jogging frequently is healthy" (Adult Males, Oyoko, AR).* *"Check expiry dates and the nutritional contents of the item before buying it" (Adult Males, Oyarifa, GAR).* *"We should cover our foods and wash our hands with soap under running water" (Adult Females, Mbanaayili, NR).*
Theme 2 – Willingness to adopt recommendations		
There was high reported willingness to adopt the recommendations.	All participants	*"Yes, we'll all start eating foods from the six groups daily" (Adol. Females, Adjen Kotoku, GAR).*
Willingness to adopt recommendations was high partly because they aligned with participants' usual dietary practices.	All participants	*"The foods we eat daily are the same as what you're saying" (Adult Males, Oyarifa, GAR).* *"The foods I eat in the house daily are the same as the foods that you mentioned" (Adol. Females, Iddi Fong, NR).*
Enlightenment gained from the focus group discussions during the data collection was a motivation for adoption.	All participants	"*I'm willing to practise what I learnt from this discussion" (Adult Males, Tikrom, AR).*
Willingness was high partly because of healthiness and protection against diseases were associated with vegetables.	All participants	*"Yes, we'll follow it because eating vegetables can make me healthy" (Adol. Females, Wiowso, AR).* *"Yes, because they (vegetables) can protect our bodies" (Adol. Females, Zangbalun, NR).*
Theme 3: Ease and enablers of adoption of recommendations		
Eight of the recommendations - Recommendations 1, 2, 3, 5, 6, 7, 9 and 11 were considered easy to adopt albeit less frequently than they are indicated in the recommendations.	Most participants	*"I eat from at least four of the six food groups daily." (Adult Males, Suame, AR).* *"I usually eat varieties of vegetables daily" (Adol. Males, Suame, AR).* *"I mostly include animal-source foods in my meals" (Adol. Females, Wiowso, AR).* *"With the nature of our work, we even drink more than what you're saying" (Adult Males, Tema Newtown GAR).*
Intake of sugar was limited, as recommended because of financial constraints.	Most adult females in Northern Region	*It's (recommendation related to less sugar consumption) similar to what we do because in the case of sugar we can't even afford the money to buy and put a lot in our food" – (Adult Females, Mbanaayili, NR).*
Theme 4: Consequences of change to adopt recommendations		
Consensus among participants that varying their daily meals would boost their immune system and make them healthier.	All participants	*"For me, it means eating a variety of fruits makes me eat balanced diets which will improve my immune system." (Adult Males, Oyarifa, GAR).* *"Following this recommendation has the potential to prevent diseases" (Adol. Females, Wiowso, , AR).*
Theme 5: Recognition of images		
Most of the contents of all the 14 images were recognised and correctly described.	All participants	
Contents were either individually mentioned as food items or described in items of food groups.	All participants	*"I can see neri, Bambara beans, groundnut, beans of all kinds, then eerh cashew nuts" (Adult males, Iddi Fong NR).* *"I see the five food groups including energy-giving and body-building foods" (Adol. females, Oduman, GAR).* *"I see some foods that've been put into five groups. Some foods give us energy, others are body-building foods and still others give us protection" (Adol. females, Oyoko, AR).*
Similarity between contents of images in Figures	All participants	*"Figure 2 is the same thing we saw on page 1 (Figure 1)"*

Theme1-Understanding text recommendations	**Sources**	**Quotations**
1 ("asanka") and 2 ("tapoli") were identified.		*(Adult males, Tema Newtown, GAR).* *"Figure 2 has the same information as the previous one (Figure 1)" (Adult women, Suame, AR).*
Theme 6: Understanding of messages carried by images		
Appreciable level of understanding messages carried by the images. Messages were perceived as encouraging consumption of diets from different food groups, engaging in physical activities for health and well-being and importance of drinking a lot of water.	All participants	*"The message tells us to eat balanced diets, drink water and have exercises too (Adult females, Malshegu, NR).* *"It tells us that when we eat all these foods, we'll be active and strong; It tells us that when you eat all these foods, you need to exercise (Adolescent females, Oyoko, AR).*
Theme 7: Clarity of messages carried by images		
Participants perceived that there was generally no mismatch between the images and their perceptions of the messages they carried.	All participants	*"Well communicated, it did well to have presented different varieties of legumes indicating that we have in our communities and we should eat them" (Adult males, Malshegu, NR).* *"The image communicates well to me in that I've to include animal-source foods in all my meals" (Adol. females GAR).* *"It communicates well to us because most of the foods are very common in our societies and are easy to identify" (Adult females, Malshegu, NR).*
Most images were considered highly visible.	All participants	*"I think the pictures are okay. I can see clearly what everything is and how they have been grouped" (Adult males, Tema Newtown GAR).*
The red marks (crosses) on some food items in image 10 (Recommendation 10 in Box 4) were rightly perceived to indicate need to limit their consumption.	All 3 regions	*"It's telling us to reduce the intake of these items, candy, cake, biscuit because of the sugar content. That's why there's a red cross on it" (Adult females, Malshegu NR).* *"You should eat such foods in moderation, thus once a while.; They have been cancelled, hence aren't good for our health (Adult females, Tema New Town, GAR),*
Theme 8: Identifying with messages carried by images		
All participants identified with all 14 images and the messages they carried. Identification was communicated using words and phrases such as *"for everybody", "for all of us", "for everyone" and "for the youth".*	All participants	"*The messages are for everybody" (Adult females Women, Asigbrkope, GAR).* *"The picture here indicates that the food menu is meant for the youth. If you look at the exercises, old men can't do them. They're meant for us so that we'll have energy for our daily activities" (Adolescent males, Nbanaayili, NR).* *"They are meant for all of us, for me and everyon"e (Adult males, GAR)*
Theme 9: Likes about images		
Participants easily recognised the image in Figure 1 – *"Asaka"* as a traditional utensil used for cooking and eating in many households in Ghana.	All participants	*"It's an earthenware bowl or asanka. We use it in our homes to cook. We also eat from it" (Adult females, GAR).*
Likes about the image included it being used as an eating utensil at home, grouping/classification of food items, the demonstration of the concept of a balanced diet, display of healthy foods and the message the image carried- "eat diverse and varied diets.	Participants in GAR and AR	*"I like the asanka image because I usually eat from the asanka" (GAR)* *"Asanka tells us to have all the food groups in a meal at a time"(AR….)*
Participants preferred *"tapoli" (*presented in image in Figure 2) to *"asanka"* (presented in Figure 1) mainly on grounds of the better and orderly arrangement of all six food groups and the largeness of the individual food items. Other likes about Figure 2 - *"tapoli"* – were its colorfulness, attractiveness and clarity of picture.	All participants	*I'll prefer Figure 2 because of the arrangements of the foods -the foods are grouped more orderly" (NR*

Appendix C: Challenges to message comprehension and adoption

Theme 1: Understanding text recommendations	**Sources**	**Quotations**
There was some misunderstanding/misinterpretation of certain aspects of the recommendations as	All 3 regions	

Theme 1: Understanding text recommendations	**Sources**	**Quotations**
indicated below:		
Recommendation 1- "e*at a diverse and varied diet from the six food groups everyday"*- A participant indicated that including two or three food groups in a meal was adequate to make one healthy.	Few participants in Northern Region	*"If I'm able to eat foods from at least two or three of the six groups, it's healthy" (Adult Males, Sagnarigu, NR).*
Recommendation 1- "e*at a diverse and varied diet from the six food groups everyday"*- Not all foods were considered healthy for all consumers, so the choice of an appropriate food had to be determined by a medical expert.	Few participants in AR	*"Not all foods are good for our health. We should go for check-ups at the hospital from time to time to know which foods are good for our health and those which aren't" (Adolescent Males, Oforikrom, Ashanti)*
Recommendation 3- "*Eat a variety of vegetables everyday"* one could eat vegetables in lieu of fruits where necessary.	Few adult females in GAR	*".. if there're no fruits, eating vegetables can make you healthy" (Adult Females, Usshertown, GAR).*
Recommendation 5 – *"Eat a variety of animal-source foods every day"*- one needed to stop eating fatty foods.	Few participants in GAR and NR	*"It means we should avoid fatty meat" (Adult Males, Sagnarigu, NR).*
Recommendation 7- *"Eat a variety of whole/unpolished grains, cereals and tubers every day*"- participants were encouraged to buy coloured tubers instead of the usual white ones.	Few participants in Ashanti Region	*"This recommendation means that we should buy and eat coloured tubers and not the white ones" (Adolescent Females, Wiowso, AR).*
Recommendation 8 – "*eat less frequently foods and ingredients that are high in sugar, fats and salt"* – eating too much salt was poisonous.	Greater Accra Region	*"Eating or adding plenty salt to food is literally food poisoning" (Adult Males, Oyarifa, GAR).*
Recommendation 8 – "*eat less frequently foods and ingredients that are high in sugar, fats and salt"* – excessive consumption of sugar-sweetened foods had health implications for women.	Greater Accra Region	*"Women get candidiasis when they eat excessive sweets" (Adult Females, Atrobinya, GAR).*
Written/text recommendations (in English) not comprehensible to a few participants	All 3 regions	*"I don't understand the English" (Adult Females, Ussher Town, GAR).*
Theme 2: Willingness to adopt recommendations		
Willingness to adopt recommendations should be a gradual process	Some participants in Greater Accra Region	*"At the beginning, we weren't doing that so if we decide to do that now, it may be difficult. We may have to do it little by little" (Adult Females, Oduman, GAR).*
Theme 3: Barriers to adoption of recommendations		
Adopting the recommendations may be hindered by low accessibility - non-availability and unaffordability of the recommended foods, especially vegetables and fruits.	All 3 regions	*"We'll all be willing if there's money." (Adult Males, Oyarifa, GAR).*
Complete adoption of the four recommendations relating to the consumption of a variety of fruits daily (Recommendation 2), legumes and nuts (Recommendation 4), moderation in the intake of salt and sugar (Recommendation 8) and reading food labels (recommendation 8) and reading food labels, (Recommendation 10) would be hindered by their non-alignment with everyday dietary-related practices.	Across sexes, age-groups and regions	*" It's difficult because it isn't every day that one gets money to buy fruits" (Adol. Females, Zangbalun, NR).* *"I hardly consume fruits" (Adol. Females, Wiowso, AR).* *"Madam, we don't like eating fruits" (Adol. Females, Adjen Kotoku, GAR).* *"It's difficult because I don't include beans and other nuts in my meals" (Adolescent Females, Wiowso, AR).* *"I take a lot of soft drinks as snacks" (Adult Males, Oyarifa, GAR).* *"I've been consuming a lot of sugary drinks" (Adult Females, Oforikrom, AR).*
Lack of purchasing power was another strong barrier to adoption of most of the recommendations.	All 3 regions	*"Owing to poverty, it's difficult to adopt some of them on a daily basis" (Adult Males, Zangbalun, NR).* *"My grandmother won't get the money for us to buy animal-source foods every day" (Adolescent Females, Wiowso, AR).*
Differences in preferences and tastes, health – related issues, scarcity linked to seasonality of foods, cultural mindset linked to upbringing, inaccessible markets, ignorance of nutritional benefits of various foods, illiteracy, inorganic	All 3 regions	*"I don't like fruits so I hardly include them in my foods." (Adolescent Females, Wiowso, Ahafo Ano South, Ashanti).* *"My husband for instance, doesn't take pineapple else we'll rush him to the hospital" (Adult Females,*

Theme 1: Understanding text recommendations	**Sources**	**Quotations**
production and laziness were other barriers common across all participant groups.		*Oduman, Ga West, GAR).* *"The fruits are seasonal so we eat a lot when they're in season. But when out of season, we may eat when we fancy and can afford them" (Adult Females, Mbanaayili, NR).*
Time constraints, peer pressure and non-cultivation of fruit crops linked to inadequacy of agricultural land were additional barriers.	Greater Accra Region	*"We don't have land for farming them" - (Adult Males, Tema Newtown, TMA, GAR).*
A barrier to the adoption of Recommendation 4 *("eat a variety of legumes, pulses and nuts every day")* was their perceived association with ill-health including diarrhoea and acne.	Adolescent females and adult females in all 3 regions	*"Those foods cause running stomach. Eating groundnut gives pimples." (Adol. Females, Adjen Kotoku, GAR).* *"I might get pimples on my face." (Adult Females, Oforikrom, AR).*
Addiction would be a barrier to the adoption of some aspects of Recommendation 5 – *"Eat a variety of animal-source foods every day"* - choosing healthy lean meat over fatty meat.	A few participants especially, adolescents in ashanti region	*"Choosing lean and healthy animal-source foods over fatty meat will be challenging because I enjoy the fatty animal-source foods better" (Adol. Males, Suame, AR).*
Barriers to adoption of Recommendation 9 – *"being physically active every day"* included the following: time-constraints, health-related issues, ignorance about the health-related benefits and laziness	Some participants in all 3 regions	*"I go to school from Mondays to Fridays and on weekends I work as a shop attendant so I won't get the time to exercise." – (Adolescent Females, Wiowso, Ahafo Ano South, Ashanti).* *"I'm lazy. I can't be doing exercise 5 times in a week." – (Adolescent Females, Iddi Fong, Kumbungu District, NR).* *"I've never ever exercised because I've waist pains" – (Adult Females, Asigbekope, Ada East. GAR).* *"My grandmother will tell me to perform the house chores when I decide to engage in any physical activity." – (Adolescent Females, Wiowso, Ahafo Ano South, Ashanti).*
Illiteracy was the barrier to the adoption of Recommendation 10 – *"read food labels and nutrition information".* low levels of literacy in English were identified as the root of this barrier.	All Participants	*"Reading would be very difficult for some of us because we aren't educated" – (Adult Males, Sagnarigu. Sagnarigu District, NR).*
Theme 4: Consequences of change to adopt recommendations		
Adopting the recommendations would raise budgetary allocations for feeding.	GAR and NR	*"This'll bring a lot of cost on me." – (Adult Males, Oyarifa, GAR)*
Theme 5: Wrong initial recognition/identification of some images		
Shea fruit (in image representing Recommendation 4) as mango	GAR	*I can see so many varieties of fruits in the picture such as mango; one is hanging and one is on a branch" (Adult males, Malshegu, NR)*
Some legumes (in image representing Recommendation 4) as cocoa beans, rotten beans and red maize.	AR and NR	*"I can see cocoa beans" (AR)* "I see *rotten beans and red maize" (Adolescent males, NR).*
Shea nuts (in image representing Recommendation 8) as cocoa.	AR	*"I can see cocoa (referring to shea nut)"* (Adult male, AR)
Shea butter oil (in image representing Recommendation 8) as pieces of bread.	NR	*"I see pieces of bread (referring to shea butter)"* (Adol males, NR).
Image representing Recommendation 10 *("reading food labels and nutrition information*……) as a "lady holding pomade" and as "people holding sugar"	AR and NR	*"A lady holding pomade" (Adult Female, Ashanti).* "P*eople holding sugar" (Adult Female, NR).*
Theme 6: Understanding of messages carried by images		
Image representing Recommendation 1 ("e*at a diverse and varied diet from the six food groups everyday"*) was misunderstood as advertising food.	GAR	*"It shows foods are sold here. It means that they sell these kinds of foods there" (Adult males, Teiman, GAR).*
There was some misunderstanding about the arrangement of the food items in Figure 2 – e.g. foods placed in the upper part of the image were considered more important and so worth according more attention to than those below.	NR	*"I think the foods have been ranked according to how much energy they give so the higher a food is placed in the image, the more energy it gives. As human beings, we all need energy, so the top part is very important. We should eat them at all costs but for those down if one is unable to get much, small portions will suffice. But the top food items are a must to get" (Adol. Males, Nbanaayili NR).*

Theme 1: Understanding text recommendations	**Sources**	**Quotations**
The foods shown in Figure 2 were misunderstood as being marched with the respective potential categories of consumers.	Some participants in NR	"*Looking at the picture, they've grouped the foods and matched them with the human images there. The down one contains the vegetables and fruits and some protein-giving foods. So, the down ones are good for both adults and children. The top ones indicates it's good for adults and grown-ups because the picture here is matched with the images of adult" (Adult males, NR).*
Foods in Figure 2 were misunderstood to have been grouped for consumption on different days.	Some participants in Northern Region	*"The top food items consist of grains meant to be eaten on the first day. The second day, the next set of foods can then be eaten. The third one is repeated, meaning that 3 days later you can come back to the first one" (Adult Males, NR).*
Arrangement of foods in Figure 2 was misconstrued as fruits must be consumed after grains.	✓	*"After the meal, maybe in the evening or early in the morning, the fruits can be eaten after the grains" (Adolescent Males, NR).*
The message carried in the image representing Recommendation 1 ("e*at a diverse and varied diet from the six food groups everyday"*) was misconstrued to mean that some of the foods could be used for medicinal purposes.	Some Adult Males in Ashanti Region	*"The image communicates its message well because it shows us some foods and fruits that can be used for medicinal purposes" (Adult Males, Abuontem, AR).*
Image representing Recommendation 7 – "*Eat a variety of whole/unpolished grains, cereals and tubers every day"*- was interpreted to mean that the cereals and tubers were the good foods of health so their consumption was being encouraged.	Some Adult Females in Ashanti Region	*"The image shows us the cereals and tubers that are good for our health. These are the healthy foods we've to be eating" (Adult Females, Abuotem, AR).*
Among the misconceptions about image 12 ("*drinking water regularly"*) were: pour sachet water into a glass before drinking it, drink water every 8 hours, drink water 4 to 8 times daily and do not drink cold water.	AR and NR	*"Sachet water should be poured into a glass before drinking it" (Adult males, Abuontem AR).* *"It means we should drink water every 8 hours" (Adult Females, Suame, AR).* *"It's telling us that every individual has to drink water at least 4 times up to 8 times a day" (Adult Females, NR).* *"It tells us not to drink chilled water" (Adult Females, GAR).*
Theme 7: Clarity of messages carried by images		
Concerns about the perceived ambiguity of some aspects of messages carried by images included: Arrangement of fruits in image representing Recommendation 2 – *"eat a variety of fruits every day".*	Adolescents in Northern Region	*"To me, it doesn't communicate well. I've seen that it's been arranged in rows, but I don't know whether it's telling us that those in the same row give the same nutrients. At least, they should've indicated that fruits in the same row contain the same nutrients so that we'll know that if I don't get pawpaw and I get pear, I'll still meet the same target. But as it is, there's nothing to give such information" (Adol males, Mbanaayili, NR).*
Non-explanation of red marks (crosses) on some foods in image 8 (show image 10).	Few participants in NR	*"I can see that in every picture, they put a red cross on it and I don't know why" (Adult males, Garishegu NR).*
Lack of reasons for discouraging the consumption of foods with red marks (crosses) on them in Image 8.	Few participants in NR	*"It doesn't communicate well to me because it doesn't tell me why I shouldn't eat them. You can't just tell me not to eat them. Tell me why I shouldn't eat them" (Adol. Females, Mbanaayili, NR).*
Theme 8: Identifying with messages carried by images		
Concern about the relevance of Image 12 - *Read food labels and nutrition information* - to persons who may not be able to read in English.	Few participants in AR and GAR	*"But it will be of no use to those who are illiterates" (Adult females, GAR).* *"Do not understand what the picture means, picture confusing (Adult females, AR).*
Theme 9: Dislikes about images		
Absence of labels on all images to show names of foods	Across all 3 regions	*"I think the labelling is important because we were just arguing about what kind of oil this is. So, I think labelling is important so that we can be clear as to what we're eating and what's good for us" (Adol males, NR).*
Inclusion of crabs and snails	Participants in NR	*"I don't like the picture that much because, I don't take snail and crab that's why I don't like the picture" (Adult males, NR)*
Inadequate display of local vegetables in image 3	Adult males in NR	*"Lack of display of sufficient local vegetables" (Adult males, NR).*

Theme 1: Understanding text recommendations	**Sources**	**Quotations**
The cancelling and red markings on all foods in image representing Recommendation 8 - *Eat less frequently foods and ingredients that are high in sugar, fats and salt.*	Adolescents in NR	*"I don't like the image because it has been cancelled" (Adol. Males, NR)* *"I don't like the picture because of the red markings" (Adol. Females, NR).*