

EatSafe: Evidence and Action Towards Safe, Nutritious Food

EatSafe in Ethiopia Baseline Assessment

August 2023

This EatSafe report presents evidence that will help engage and empower consumers and market actors to better obtain safe nutritious food. It will be used to design and test consumer-centered food safety interventions in informal markets through the EatSafe program.

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ACRONYMS AND ABBREVIATIONS

Below is a list of all acronyms and abbreviations used in this document.

C	Consumer
EatSafe	Evidence and Action Towards Safe, Nutritious Food
FS	Food safety
FTF	Feed the Future
GAIN	Global Alliance for Improved Nutrition
HH	Household
HHR	Household resident
IRB	Institutional Review Board
KAP	Knowledge, Attitudes, and Practices
LMIC	Low- and Middle-income country
MD	Median
SD	Standard deviation
SE	Standard error
TOC	Theory of Change
USAID	United States Agency for International Development
V	Vendor

EXECUTIVE SUMMARY

Feed the Future's EatSafe: Evidence and Action Towards Safe, Nutritious Food (EatSafe) aims to improve the safety of nutritious food sold in traditional markets by empowering consumers to demand safer food and empowering vendors and other market actors to meet that demand. In Ethiopia, EatSafe operates in the Sidama region. The study presented here is part of EatSafe's effort to evaluate the impacts of food safety behavior change interventions on consumers and vendors in traditional markets.

EatSafe's market-based interventions seek to empower consumers and vendors by increasing their ability to implement improved food safety practices through behavior change. This assessment summarized food safety behaviors and behavior drivers across **four food safety macro-indices**, assessed via structured surveys:

- **Salience:** the extent to which food safety is "top-of-mind" for respondents;
- **Self-efficacy:** the extent to which respondents believe they can make optimal decisions to ensure the food they purchase and eat is safe, and the extent to which they feel their actions would have an impact on food safety (i.e., locus of control);
- **Knowledge:** including awareness of food safety concepts and practices;
- **Behaviors:** including food safety practices, use of food safety cues when purchasing food in the market, and communications about food safety.

In Ethiopia, EatSafe's intervention assessment framework utilizes baseline and endline surveys. EatSafe developed two cohorts, one in the study market (n=230 consumers and n=236 vendors) and the other in a nearby and comparable control market (n=230 consumers and n=230 vendors). Results in this report are aggregated to include findings from both the intervention and control markets.

Findings from the baseline assessment, representing the starting point before interventions were implemented, are presented according to the four food safety behavior change macro-indices as well as their sub-indices across vendors and consumers. Results are also compared across men and women.

Overall, consumers and vendors think food safety is important, compared to other food choice drivers, and have a high level of general food safety knowledge. However, they have less self-efficacy, that is perceived ability to conduct food safety practices. Additionally, consumers reported that they do not conduct food safety practices often. From the perspective of behaviors, consumers infrequently used food safety-related cues to decide which shops to purchase food from. Similarly, vendors infrequently implemented food safety practices in the market. Neither consumers nor vendors communicate about food safety regularly.

Differences in self-efficacy and behaviors of men and women were found, although minor. Men had a greater level of confidence in their ability to accomplish food safety behaviors. Men also reported a higher level of practice of food safety behaviors than women. Men and women both consider food safety as important when compared to other food and vendor attributes and had similar levels of knowledge about food safety.

The findings included in this report allow for EatSafe to identify specific areas to focus on during intervention implementation, and guide course correction in its early phases. Following implementation, EatSafe will conduct an endline survey with the same cohort of consumers and vendors. Once the endline is complete, EatSafe will conduct a full analysis to determine if and how food safety behavior change indices have changed over time. Additionally, targeted qualitative and quantitative assessments carried out during intervention implementation will complement findings from the cohort study and provide insights into individual food safety interventions in traditional markets.

I. INTRODUCTION

Traditional food markets support livelihoods and nutrition security for billions of people worldwide (1,2). However, traditional markets in low- and middle-income countries (LMICs) experience unique challenges to providing safe food, including inadequate physical infrastructure and little to no regulatory oversight – all of which can increase food safety risks (2).

Feed the Future's EatSafe: Evidence and Action Towards Safe, Nutritious Food (EatSafe) seeks to enable lasting improvements in the safety of nutritious foods bought and sold in traditional markets by leveraging consumer demand. In Ethiopia, EatSafe operates in the southwestern region of Sidama. The program's focus commodities are kale, tomatoes, and lettuce – fresh, nutritious vegetables that are commonly sold and eaten in the community (3). However, these commodities can carry a risk of foodborne disease. EatSafe identified foodborne hazards, including *Salmonella* spp., in samples of fresh vegetables purchased from traditional markets in the region (4), filling a data gap (5) and highlighting the need for food safety improvements.

EatSafe also assessed conditions and factors that could be leveraged to improve food safety in the program context (6,7). For example, it found that consumers' purchase choices in traditional markets are driven by several factors such as price, perceived food quality, and relationships with the vendors (3), illustrating the importance of vendor-consumer demand dynamics in improving food safety. Food safety is often embedded in other factors, that individually or combined could be leveraged to motivate and enable consumers and vendors to adopt improved practices.

To address these challenges and leverage local conditions, EatSafe developed [three interventions](#) to increase consumer demand for safer food and help vendors meet that need by supplying safer food. EatSafe is testing the impact of these interventions on food safety behaviors and behavior change drivers – knowledge, attitudes, and practices (KAPs) – in consumers and vendors in traditional food markets. To this end, EatSafe developed novel assessment tools, first used in two markets in Nigeria (8). This report documents the approach and results from the baseline survey of this tool, deployed in a study and control market in Sidama region, Ethiopia.

I. METHODS

1.1. STUDY LOCATION

The study was conducted in two markets in southwestern Ethiopia: one in Oromia region (control market) and one in Sidama region (study market). The markets were chosen based on operational parameters, including when the market operates (at least weekly), who they sell to (direct to consumer) as well as what commodities they sell (all

EatSafe's key commodities in Ethiopia: kale, lettuce, and tomatoes). Both markets are in a fixed location with no known plans to move or alter the markets' boundaries. Both markets have vendors that sell their food in similar ways including on the ground on tarps as well as elevated off the ground. In both markets, both men and women vend and purchase food items.

1.2. MEASUREMENT APPROACH

The EatSafe assessment framework and survey tools, previously developed and deployed for in the Nigeria baseline study (8), were piloted and slightly modified for the local Ethiopian context. For example, a question about beef consumption was modified to include an option covering individuals who did not consume beef due to fasting. The measurement approach is described in-depth in the cited report and briefly below.

The baseline/endline study seeks to measure changes in knowledge, key behaviors, and behavior drivers relevant to food safety in traditional markets. The overarching research questions of this study are:

- What is the degree of change in consumers' and vendors' KAPs associated with the overall set of interventions?
- What are the specific interventions or attributes of interventions that are associated with changes in KAPs?

This study uses four food safety macro-indices (**Table 1**): salience, knowledge, self-efficacy, and behaviors. Some indices are composed of sub-indices that evaluate different aspects of the index. All indices were expressed on a 0-100% scale. A higher score indicates a higher level of the associated index (e.g., a higher degree of knowledge of food safety). Low index scores at baseline indicate factors with ample room for improvement.

Table 1. Description of indices and sub-indices included in the assessment

INDICES	SUB-INDICES	DESCRIPTION	GROUP*
SALIENCE	Ranking	A ranking of the importance of “food safety” among food, shop, and vendor attributes (e.g., price, familiarity with vendor)	C, V
	Choice	How often respondents chose “food safety assurance” as one of the factors that influence their decisions about the food they purchase, over 8 rounds of factors.	
	Composite	Combination of Ranking and Choice indices into one Salience index	
SELF-EFFICACY	Perceived Self-efficacy	Series of questions capturing respondents’ subjective understanding of their capability to make optimal decisions to ensure FS (e.g., confidence in ability to access information about food safety, identify if vendors use food safety best practices that prevent contamination)	C, V
	Locus of Control	Series of questions capturing the extent to which respondents believe they have power over FS outcomes	
	Composite	Combination of Likert scale data of Perceived self-efficacy and Locus of Control into one Self-efficacy index	
KNOWLEDGE	Knowledge	A module of true/false questions on FS concepts (e.g., handwashing, cleanliness of stalls, cross-contamination)	C, V
BEHAVIORS	Communication	Frequency of respondents’ communication about FS (e.g., on vendor hygiene, food handling practices, food safety resources; in the last month from never to always)	C, V
	Consumer Practices	Frequency of self-reported FS actions while shopping (e.g., assessing vendor hygiene, assessing food storage conditions, checking for damage of food or packaging; in the last month from never to always)	C
	Vendor Practices	Frequency that respondents self-reported performing FS actions (e.g., waste disposal, wearing personal protective equipment like gloves, elevation of food products off the ground)	V
	Use of FS Cues	Number of food safety-related cues identified by respondents from images of traditional markets (e.g., stall cleanliness, food storage, elevation of food from the ground)	C
	Composite	Combination of Likert scale and self-reported frequency data into one Behavior index	C, V

* “C” refers to consumer respondents, and “V” to vendor respondents. FS refers to “food safety.”

1.3. DATA COLLECTION

Ethical approval (Approval Number EPHA/06/374/23) was obtained through the Ethiopia Public Health Association (EPHA). Data collectors were men and women from the Oromia or Sidama regions of Ethiopia. Data collectors participated in a multi-day, in-person training that included an introduction to the overall study, a review of the survey tools by question, and role-playing scenarios. Data quality checks were conducted throughout the data collection process to ensure the proper collection of data.

Inclusion criteria required survey participants to be at least 18 years old, able to communicate in Amharic, Sidama or Afan Oromo, and be a consumer or vendor of kale, lettuce, or tomatoes on an average week at the market. Exclusion criteria included participating in EatSafe's Focused Ethnographic study (7), being unwilling to be recontacted for follow-up activities, another member of the household or shop already being enrolled, or planning to move in the next two years. All consumers that were recruited and met inclusion criteria decided to enroll, while 4% of vendors (21 vendors) that were recruited decided not to enroll.

Data were collected in April – May 2023. Oral informed consent, as well as consent for follow-up contact, was received before starting the interview. For vendors, interviews were conducted primarily in the market. For consumers, interviews were conducted at a local youth center, the market, or a local cafe. Interviews were conducted in either Amharic, Sidama, or Afan Oromo. Data was collected orally and entered into tablets using the SurveyCTO software (version 2.80.4; Cambridge, Massachusetts). The vendor observation survey also had a paper data collection form for ease of counting. All data was entered into an electronic copy and merged.

A total of 466 vendors of kale, lettuce, and tomatoes were enrolled from two markets using convenience sampling, based on commodity and gender quotas representative of the market composition. A total of 460 consumers were enrolled using simple random sampling: one of every 10 individuals that passed the enumerator were approached to be enrolled, up to the gender quota. The final sample size included 230 consumers and 230 vendors in the control market, and 230 consumers and 236 vendors in the study market where interventions will be implemented.

1.4. DATA ANALYSIS

The socioeconomic status of respondents was assessed using the Poverty Probability Index (PPI). A set of questions related to household assets were asked of respondents to determine their likelihood of having an income below international poverty lines or below the Ethiopian National Poverty Line. The methodology to calculate the PPI has been further described in a previous report by EatSafe (6).

Sub-index scores were calculated by summing the scores of individual answers. Sub-indices were combined to create an index score. Index and sub-index scores were normalized to a 100-point scale (with 0 and 100 respectively being the lowest and highest possible score). Descriptive statistics were used to describe central tendencies and distributions. T-tests were used to compare differences between index scores of consumers and vendors as well as genders. Linear regression models were used to determine the role of groups (consumers or vendors) and gender as factors impacting index scores. Statistical significance was defined as $p < 0.05$. Data analysis and figure creation were completed using R Statistical Software (v4.2.2; R Core Team 2022).

2. DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

Table 2 summarizes the demographic characteristics of respondents enrolled in the intervention and control markets (see [Appendix 1](#) for the demographic characteristics disaggregated by market). Women constituted the majority of both vendors (92%) and consumers (73%). Both groups were relatively young on average, with a median age of 27 and 28 years for consumers and vendors, respectively. For most respondents the chosen interview language, a indication of the preferred spoken language, was Amharic (selected by 73% and 69% of vendors and consumers, respectively).

Table 2. Consumer and Vendor Demographics

CHARACTERISTIC		CONSUMERS (N=460) Percent (n)*	VENDORS (N=466) Percent (n)*
INDIVIDUAL LEVEL			
Gender	Male	27% (126)	8% (37)
	Female	73% (334)	92% (429)
Median age (range)		27 (18 – 72 years)	28 (18 – 70 years)
Marital Status	Married	66% (305)	69% (321)
	Not Married	28% (130)	22% (102)
	Divorced	4% (18)	5% (21)
	Widowed	2% (7)	5% (22)
Completed Education	None	1% (6)	15% (71)
	Pre-Primary	1% (4)	3% (13)
	Primary	7% (33)	24% (111)
	Secondary	45% (205)	55% (257)
	Post-Secondary	46% (211)	3% (14)
Survey Language	Amharic	69% (316)	73% (341)
	Afan Oromo	28% (127)	26% (119)
	Sidama	4% (17)	1% (6)
HOUSEHOLD-LEVEL			
Respondent is head of HH	Yes	56% (259)	54% (251)
	No	44% (201)	46% (215)
# of HHR (range)		4 (1 – 15 people)	5 (1 – 12 people)
# of HHR <5 years (range)		1 (0 – 6 people)	1 (0 – 4 people)
FOODS PURCHASED OR SOLD^a			
Kale		63% (289)	21% (98)
Lettuce		26% (118)	9% (40)
Tomato		93% (428)	74% (347)
POVERTY RATE (mean (SD))			
Poverty Rate ^b		19% (10%)	20% (12%)
Ethiopian National Poverty Rate ^c		7% (5%)	8% (7%)

Note: HH refers to “household,” while HHR refers to “household residents.”

* Unless otherwise specified, N refers to the total number of participants, and n to the number of participants associated with the %.

^a Consumers and vendors could purchase and sell more than one vegetable.

^b Based on the international poverty line threshold of USD \$3.20/day.

^c The Ethiopian national poverty line is 7,184 ETB/year, USD ~\$130/year, in 2015 prices (9).

Vendors were slightly more likely on average to have an income below the international poverty line of \$3.20/day, compared to consumers, although this difference was not significant. This trend was similar when considering the likelihood of participants having an income below the Ethiopian national poverty line; this difference was statistically significant ($p < 0.05$).

3. RESULTS

3.1. FOOD SAFETY INDICES

A wide range of index scores were observed among surveyed consumers and vendors, indicating that the indices effectively capture the existing variability in food safety knowledge, attitudes, and practices in the target populations. Results for all indices are summarized in **Table 3** and the following sections.

The salience index received the overall highest scores, with an overall mean score of 69%. The knowledge index had similar results with an overall mean score of 67%. By comparison, the behavior index received the lowest scores, with both consumers and vendors achieving less than a 40% score on average. Self-efficacy received moderate scores, with a mean of 53% achievement for both consumers and vendors.

Table 3. Index results, by respondent group and indices

INDICES	SUB-INDICES	CONSUMERS (N =460)		VENDORS (N=466)		TOTAL (N=926)	
		MD	MEAN (SD)	MD	MEAN (SD)	MD	MEAN (SD)
SALIENCE	Composite Salience	75%	70% (27%)	63%	68% (20%)	70%	69% (24%)
	Ranking*	80%	69% (34%)	70%	73% (20%)	80%	71% (28%)
	Choice*	75%	71 % (20%)	63%	63% (19%)	63%	67% (20%)
SELF-EFFICACY	Composite Self-efficacy*	57%	56% (19%)	50%	50% (22%)	54%	53% (21%)
	Perceived Self-efficacy	57%	57% (20%)	55%	56% (22%)	56%	57% (21%)
	Locus of Control*	56%	54% (19%)	41%	45% (20%)	50%	50% (20%)
KNOWLEDGE	Knowledge*	75%	73% (13%)	61%	61% (12%)	69%	67% (14%)
BEHAVIORS	Composite Behaviors*	40%	42% (13%)	38%	38% (8%)	38%	40% (12%)
	FS Communication*	38%	42% (10%)	39%	41% (9%)	39%	41% (10%)
	Consumer Practices	43%	44% (14%)	NA	NA	NA	NA
	Use of FS Cues	36%	40% (15%)	NA	NA	NA	NA
	Vendor Practices	NA	NA	35%	35% (5%)	NA	NA

Note: MD refers to median; SD refers to standard deviation; and FS refers to food safety.

* Statistically significant group differences between consumers and vendors at $p < 0.05$ significance level, t-test.

3.1.1. SALIENCE

EatSafe defines salience as how important or “top-of-mind” food safety is in purchasing decisions (for consumers) and for their business (for vendors). A high score in this index is related to a higher placement of food safety compared to other factors including food price, shop characteristics, and vendor characteristics such as food freshness, shop cleanliness, and vendor personality. This index was composed of two sub-indices: ranking (where safety was ranked among other factors) and choice (where a choice was offered between two products with different characteristics, where food safety was one of the characteristics).

Consumers and vendors had high mean salience scores when asked to compare products with different attributes (i.e., choice sub-index) or factors of influence food purchasing (i.e., rank sub-index). Differences between the mean scores of consumers and vendors on the choice and rank sub-indices were statistically significant ($p < 0.05$ for both). Vendors and consumers had mean scores of over 60% on the salience index, with a large spread (mean of 68% for vendors, mean of 70% for consumers, respectively; **Figure 1**).

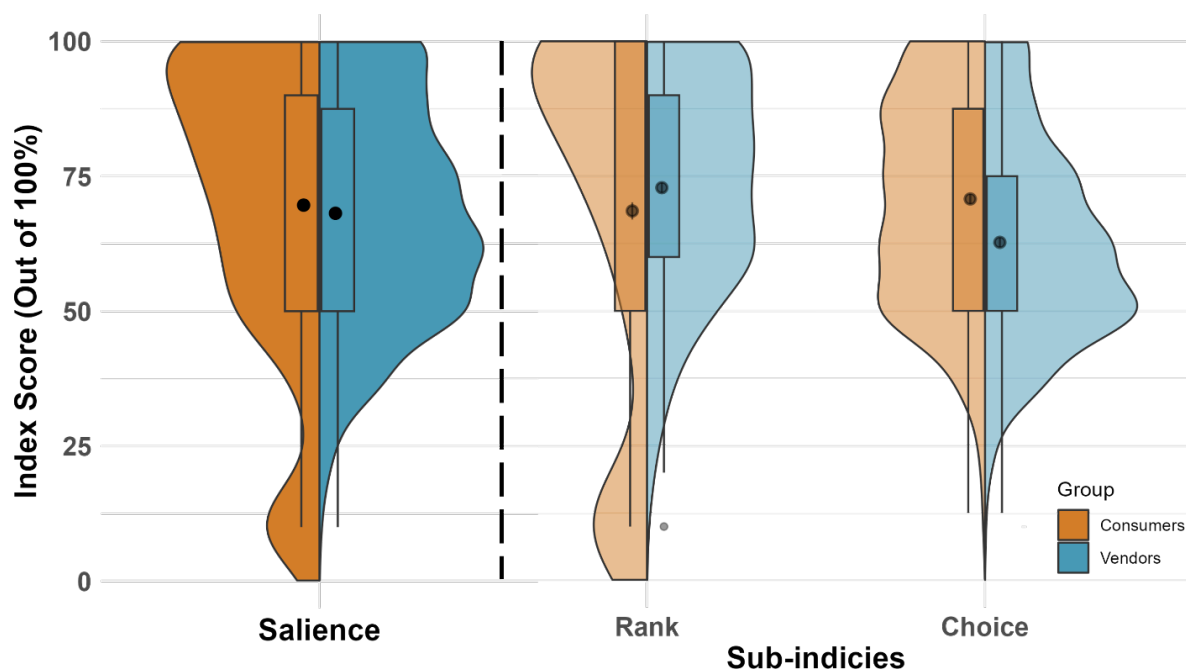


Figure 1. Distribution of food safety salience index and its sub-indices, by group

3.1.2. SELF-EFFICACY

Self-efficacy is vendors’ and consumers’ level of confidence that they can make choices to buy (or sell) safer food and keep it safe. Higher scores correspond to greater confidence in one’s ability to enact food safety-related behavior or practices.

Consumers and vendors had higher average perceived self-efficacy than locus of control. They had similar levels of confidence in their perceived ability to enact food safety practices to select safer food (for consumers) or to maintain its safety while selling it, for vendors (perceived self-efficacy; mean consumers: 57%, mean vendors: 56%). In comparison to vendors, consumers had a greater level of belief that their actions can change food safety outcomes (locus of control; mean consumers: 54%, mean vendors: 45%) and this difference was statistically significant ($p < 0.05$, **Figure 2**).

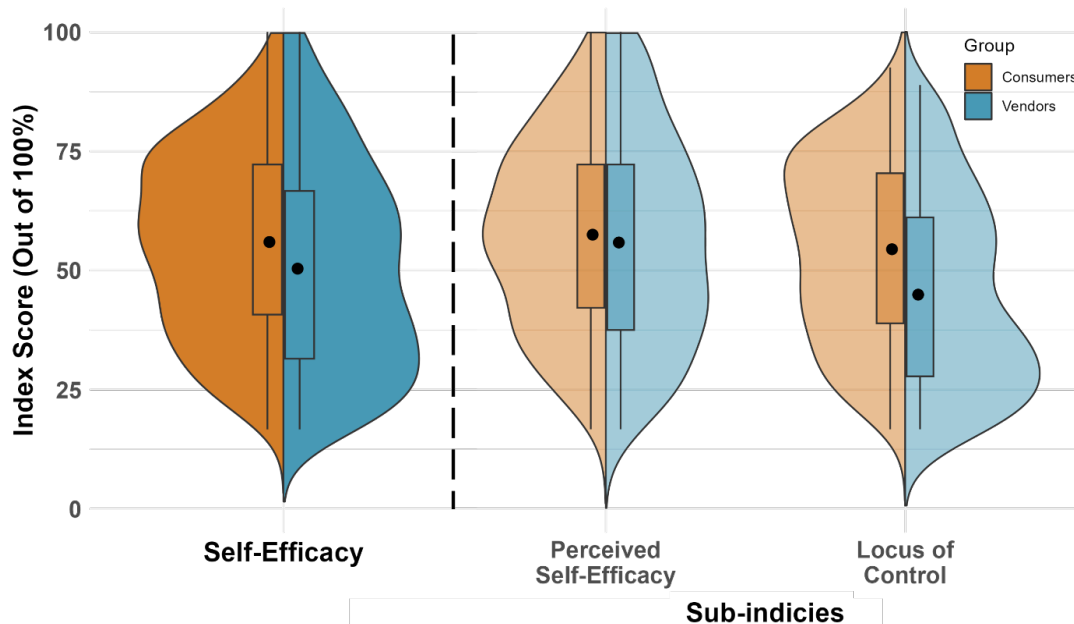


Figure 2. Distribution of food safety self-efficacy index and its sub-indices

3.1.3. KNOWLEDGE

The knowledge index evaluates the participant's ability to respond correctly to a set of true or false food safety questions. Consumers had a higher mean percentage of correct answers than vendors (mean: 73% and mean: 61% respectively, **Figure 3**). This difference was statistically significant ($p < 0.01$).

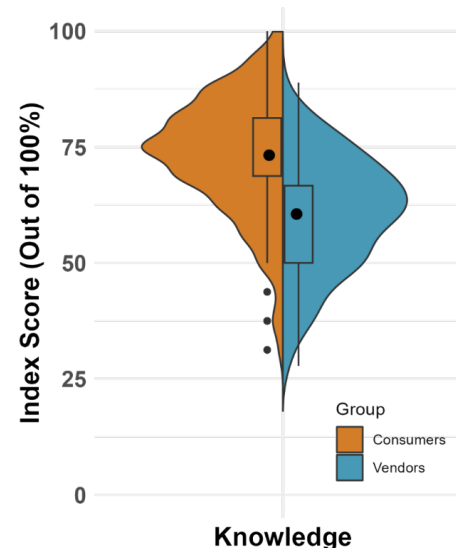


Figure 3. Distribution of food safety knowledge index and sub-index scores

3.1.4. BEHAVIOR

The behavior index was comprised of two sub-indices for vendors and three for consumers (Table 1, Figure 4). Both consumers and vendors answered a questionnaire section on food safety practices and one on communications about food safety, customized to the practices relevant to each group. In addition, consumers were also evaluated on their intent to use relevant food safety cues (such as vendors selling food off the ground, a stall appearing clean) when shown a picture of a food stall, as reasons for shopping at that stall or not.

Overall, consumers and vendors demonstrated the lowest scores for the behavior index as compared to other food safety macro-indices. Vendors and consumers did not talk about food safety often, either amongst themselves or with the other group, averaging a 40% score (Figure 4). Consumers identified 40% of food safety cues on average. Vendors and consumers reported conducting low levels of food safety practices (mean: 35% of practices for vendors; mean: 44% of practices for consumers respectively, Figure 4).

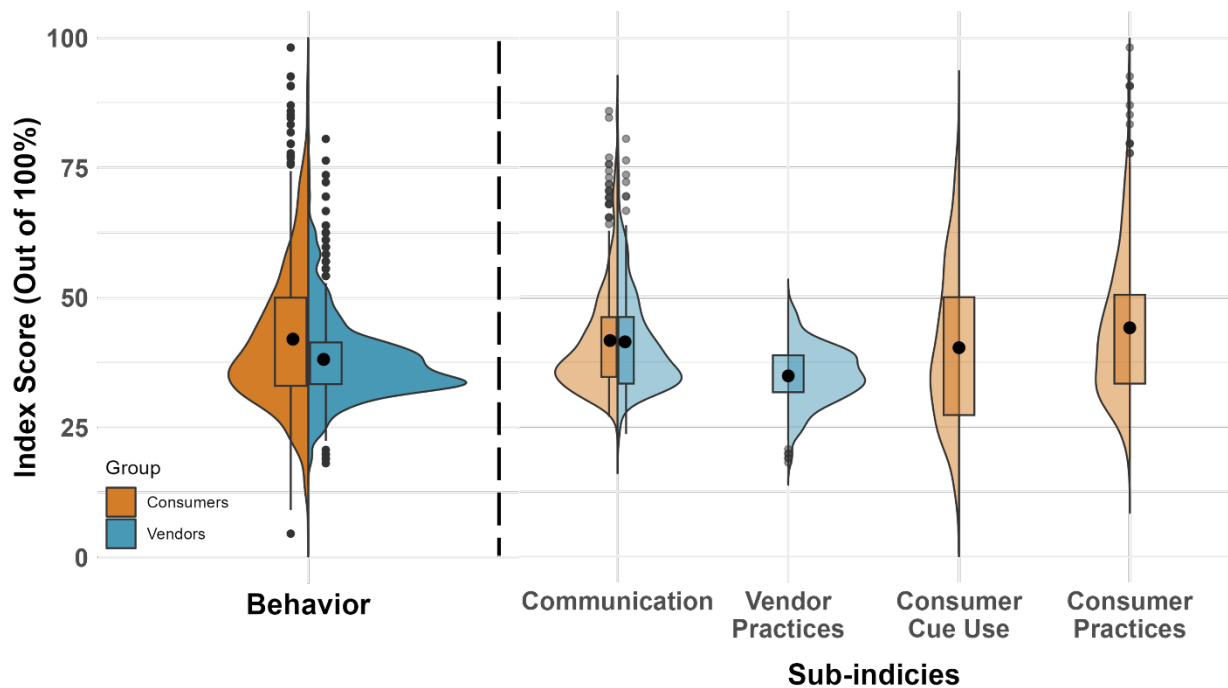


Figure 4. Distribution of food safety behaviors index and sub-index scores

3.2. GENDER DIFFERENCES IN FOOD SAFETY KAPs

The effect of gender on index scores was assessed in combination with their vendor/consumer status, using a linear model (Figure 5). While men constituted a small

proportion of consumers (27%) and vendors (8%), it was possible to compare indices by gender.

Small, yet significant ($p < 0.05$) differences between the mean scores of men and women were observed for the behavior and self-efficacy indices, when the group (vendor or consumer) was also included in the model (behavior: 3% higher for men, SE: 0.5%; self-efficacy: 4% higher for men, SE: 2%). Using this model, male consumers have a 3% higher behavior score, and 4% higher self-efficacy score than female consumers, on average. No significant difference was found between genders for the other two indices. Descriptive statistics for indices among vendors and consumers can be found in [Appendix 2](#).

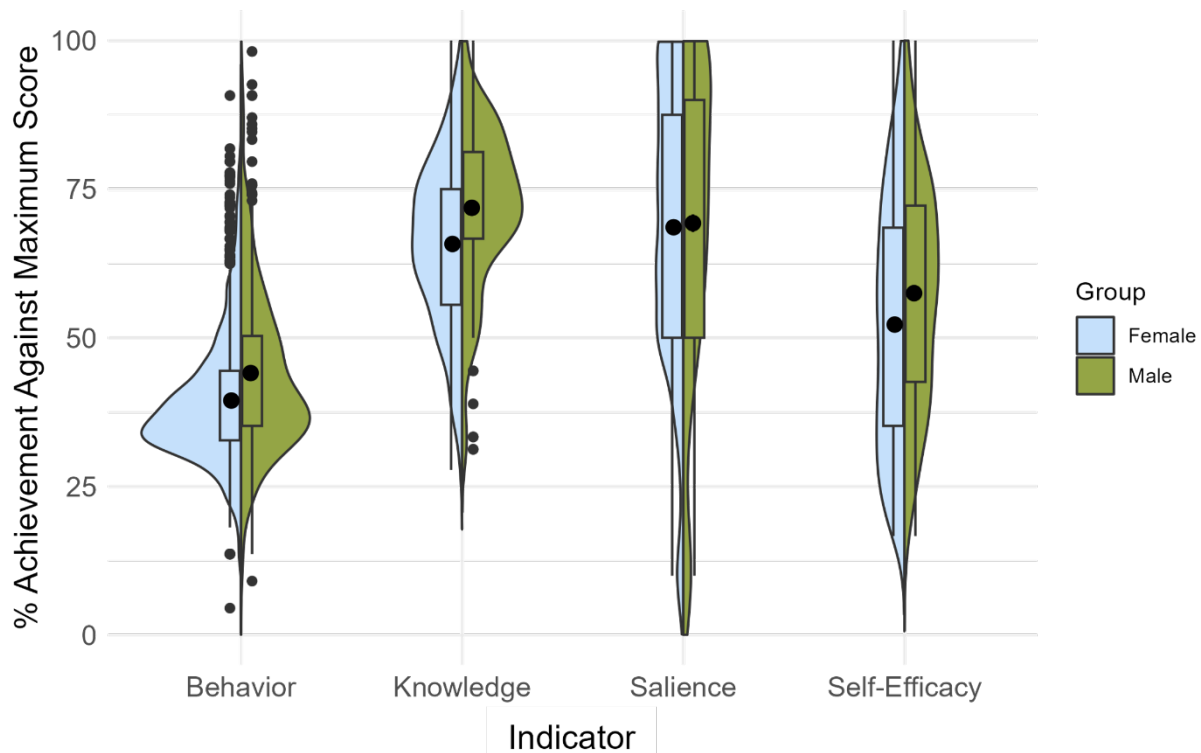


Figure 5. Composite food safety indices by gender, for consumers and vendors together¹

3.3. COMPARISON ACROSS STUDY AND CONTROL MARKETS

Comparisons between both demographic characteristics and index scores were conducted and can be found in [Appendix 1](#) and [Appendix 3](#).

Differences between the study and control market demographic characteristics were found. On average, the control market had more female participants, younger

¹These results represent consumers and vendors combined. Black dots represent group mean index scores and boxplots depict group medians and quartiles of the index scores.

participants, more married individuals, lower educational levels, different survey languages, more people in their household as well as a higher poverty rate when compared to the study market.

Only minor differences were observed between the index scores of both the study and control markets. Modest but statistically significant differences in food safety salience and behaviors were observed between the two markets, with slightly higher scores in the control market for salience, and in the study market for behaviors. Self-efficacy was slightly higher but not significantly so in the control market ([Appendix 3](#)).

This study hypothesizes that the interventions will increase index scores. Having a control market with lower index scores at baseline, lower educational levels, and a higher poverty rate will account for changes that are due to other factors, making it a good comparison for this study. Due to the similarities in KAPs in the two markets, the findings, presented earlier in this report, were combined across both markets, to illustrate the overall starting KAP levels in the study region before interventions were implemented.

4. DISCUSSION AND IMPLICATIONS

4.1. BASELINE FOOD SAFETY KAPs

Of the four indices, vendors and consumers had the highest levels of salience and knowledge, although differences were seen between the knowledge levels of vendors and consumers. Vendors and consumers had moderate levels of self-efficacy. In contrast, vendors and consumers reported low levels of food safety-related behaviors. This suggests that there is potentially a gap between what vendors and consumers think they can do versus the food safety practices they conduct. These findings indicate that interventions should build upon relatively high levels of salience and knowledge and focus on increasing self-efficacy (i.e., the motivation, confidence, and ability to carry out food safety practices in their daily lives). Practically, interventions could apply these findings by focusing on motivating consumers through social accountability mechanisms and vendors through capacity development and by making a business case for food safety. More broadly, it also points to the possible benefits of interventions that improve infrastructure, services, and tools for vendors to carry out food safety practices.

Consumers had higher scores than vendors across all indices. This could potentially be due to differences in the socioeconomic status of vendors and consumers. For example, consumers had higher levels of post-secondary education than vendors.

When comparing the study and control markets, only modest differences were observed. Namely, individuals in the control market had higher salience and self-efficacy scores overall, while individuals from the study market had higher behavior

scores. Individuals in both markets had similar levels of knowledge about food safety. This information demonstrates that the study and control markets have populations with similar food safety KAPs at baseline. This suggests that any differences in KAPs between the two markets at endline would be most likely associated with actual changes due to the interventions.

4.2. GENDER

While vendors and consumers in the market were mostly female, it was statistically feasible to assess gender differences. Overall, men and women had similar levels of salience and knowledge. This demonstrates that food safety is important to both men and women, and they have knowledge of food safety practices like handwashing.

Men and women had different levels of behavior and self-efficacy: men had a higher level of confidence and self-reporting of conducting food safety-related behaviors than women. In practice, while some differences by gender were statistically significant for both consumers and vendors, differences in mean scores were only a few percent, and hence not large enough to require different approaches directed to men or women. However, attention to adequately reinforcing self-efficacy in women is warranted. In its interventions, EatSafe strives for participation from both genders and employs a range of characters, role models, and messages that can speak to both genders and different life stages, in addition to considering other factors such as ethnicity and language, where relevant. Baseline findings confirm that intervention messages and activities should target the same behavior drivers for men and women, using approaches that are effective and culturally appropriate for each gender.

4.3. TOOL PILOTING AND IMPLEMENTATION

The survey tools were piloted before being used for clarity, respondent effort required, and cultural acceptability. For example, one of the questions on the poverty probability index asked if participants consumed beef in the last week. It is common in Ethiopia to be fasting during the time of this survey, i.e., refraining from consuming animal products, even if they eat beef at other times. Therefore, the potential answers to this question were edited to include an option of “No, I am fasting at this time.”

The survey team experienced slight resistance from individuals to enroll in the survey as the last survey conducted in this area was during the COVID-19 pandemic. It was found that many consumers and vendors negatively associated the COVID-19 pandemic with surveys. To better explain the goals of the study, the survey team developed a summary of the study purpose that was played over a loudspeaker in the market at the start of enrollment activities. In addition, a local government representative (from the kebele, the smallest administrative sub-division in Ethiopia) accompanied the survey team around the market, vouching for the initiative.

4.4. STUDY LIMITATIONS

This study was conducted in two markets in Ethiopia; therefore, results might not be generalizable to other settings. Second, there was a limited number of male vendors in the market, which limited their representation in the study. Third, data collected in this study were self-reported. This could have led to response bias, particularly “social desirability bias” (i.e., reporting what one knows to be the expected or desired answer, even if it is not accurate). Additionally, this study used indices to describe certain dimensions of behavior and behavior drivers. These were selected as most relevant to food safety and demand behaviors, and as feasible to assess within a structured survey framework. They are not meant to cover all possible drivers.

4.5. CONCLUSIONS

Measuring changes in KAPs can provide important insights for programs seeking to leverage consumer demand to improve food safety. Findings of the EatSafe-in-Ethiopia baseline assessment characterize pre-intervention KAPs in the two primary beneficiary groups, market consumers and vendors, and confirm the appropriateness of the selected interventions. All indices, while not starting at extremely low levels, show ample room for improvement, justifying interventions that promote a range of behavioral dimensions. Self-efficacy and food safety behaviors achieved the lowest scores, highlighting their importance as intervention targets. This is aligned with EatSafe’s practical and context-based intervention approach focused on empowering and enabling individuals to make food safety practices part of their daily routine. As index scores were comparable between consumers and vendors, a similar level of content complexity and approaches can be included in intervention activities reaching each. However, slightly lower education levels in vendors could have implications for the design of training activities. Similarly, gender differences were modest, justifying a common intervention approach and focus on women and men.

Following this baseline assessment, interventions have been implemented in one market, while a separate market in the same southwest region of Ethiopia serves as a control. After interventions have been implemented, an endline assessment will be conducted using the same tools. Analyzed together, endline and baseline data from study and control markets will provide estimates of change in KAPs during the time frame when interventions were in place. The changes in KAPs across two cohorts of consumers and vendors will serve as the primary metrics of intervention impact. An exposure assessment as well as qualitative interviews will provide insights into participants’ extent and mode of engagement with interventions, thus elucidating obstacles and mechanisms for behavior change. The evidence generated will provide insights to support intervention selection and program design to foster food safety and consumer demand in traditional markets.

5. REFERENCES

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6. APPENDICES

6.1. APPENDIX 1: DEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS IN THE INTERVENTION AND CONTROL MARKETS

Table A1. Demographic characteristics of participants in the intervention and control markets

CHARACTERISTIC		CONTROL MARKET (N = 430)		INTERVENTION MARKET (N = 436)		P-VALUE ^a
		Percent (N)*		Percent (N)*		
		CONSUMERS (N = 230)	VENDORS (N = 230)	CONSUMERS (N = 230)	VENDORS (N = 236)	
INDIVIDUAL LEVEL						
Gender	Male	25% (57)	4% (10)	30% (69)	11% (27)	0.020
	Female	75% (173)	96% (220)	70% (161)	89% (209)	
Median age, in years (range)		27 years (18–61)	26 years (18–60)	27 years (18–72)	28 years (18 – 70)	0.024
Marital Status	Married	78% (179)	71% (164)	55% (126)	67% (157)	<0.001
	Not Married	17% (38)	19% (43)	40% (92)	25% (59)	
	Divorced	3% (8)	5% (11)	4% (10)	4% (10)	
	Widowed	2% (5)	5% (12)	1% (2)	4% (10)	
Completed Education	None	2% (4)	19% (44)	1% (2)	10% (23)	<0.001
	Pre-Primary	1% (2)	5% (12)	1% (2)	0% (1)	
	Primary	10% (24)	28% (64)	4% (9)	20% (47)	
	Secondary	50% (110)	45% (104)	39% (90)	64% (152)	
	Post-Secondary	36% (85)	0% (0)	55% (127)	5% (13)	
Survey Language	Amharic	45% (103)	48% (110)	93% (213)	98% (231)	<0.001
	Afan Oromo	55% (127)	52% (119)	0% (0)	0% (0)	
	Sidama	0% (0)	0% (1)	7% (17)	2% (5)	

HOUSEHOLD-LEVEL						
Respondent is HH head	Yes	54% (125)	41% (94)	58% (134)	67% (157)	<0.001
	No	46% (105)	59% (136)	42% (96)	33% (79)	
# of HHR (range)		5 people (1 – 15)	6 people (1 – 12)	4 people (1 – 9)	5 people (1 – 10)	<0.001
# of HHR <5 years (range)		1 person (0 – 6)	1 person (0 – 4)	0 person (0 – 3)	1 person (0 – 2)	<0.001
FOODS SOLD OR PURCHASED ^b						
Kale		61% (140)	27% (61)	65% (149)	16% (37)	N/A
Lettuce		13% (29)	6% (13)	39% (89)	11% (27)	
Tomatoes		94% (216)	69% (159)	92% (212)	80% (188)	
POVERTY RATE (mean (SD))						
Poverty Rate ^c		20% (10%)	23% (12%)	19% (10%)	18% (12%)	<0.001
Ethiopian National Poverty Rate ^d		8% (5%)	9% (7%)	7% (5%)	7% (7%)	<0.001

Note: HH refers to “household,” while HHR refers to “household residents.”

*Unless otherwise specified.

^a Chi-squared tests were conducted between study and control markets for categorical variables and t-tests were conducted between intervention and control markets for continuous variables.

^b Consumers and vendors could purchase and sell more than one vegetable.

^c Based on the international poverty line threshold of \$3.20 USD/day.

^d The Ethiopian national poverty line is 7,184 ETB/year, ~\$130 USD/year, in 2015 prices (9).

6.2. APPENDIX 2: INDEX SCORES DISAGGREGATED BY GENDER

Table A2. Gender differences in index and sub-index scores among consumers

INDEX	SUB-INDICES	MALE (N=126)		FEMALE (N=334)	
		MD	MEAN (SD)	MD	MEAN (SD)
SALIENCE	Composite	72%	70% (21%)	75%	70% (22%)
	Ranking	80%	69% (35%)	80%	69% (34%)
	Choice	75%	71% (20%)	75%	71% (20%)
SELF-EFFICACY	Composite *	60%	59% (16%)	56%	55% (17%)
	Perceived Self-Efficacy	57%	58% (19%)	57%	57% (20%)
	Locus of Control *	62%	60% (18%)	52%	52% (19%)
KNOWLEDGE	Composite *	75%	75% (12%)	75%	73% (13%)
BEHAVIORS	Composite *	32%	34% (8%)	30%	31% (6%)
	FS Communication *	42%	47% (13%)	37%	40% (8%)
	Consumer Practices*	45%	49% (16%)	41%	42% (13%)
	Consumer Cues	41%	40% (13%)	36%	40% (16%)

Note: MD: median; SD: standard deviation; and FS: food safety.

Significance level: * $p < 0.05$, t-test

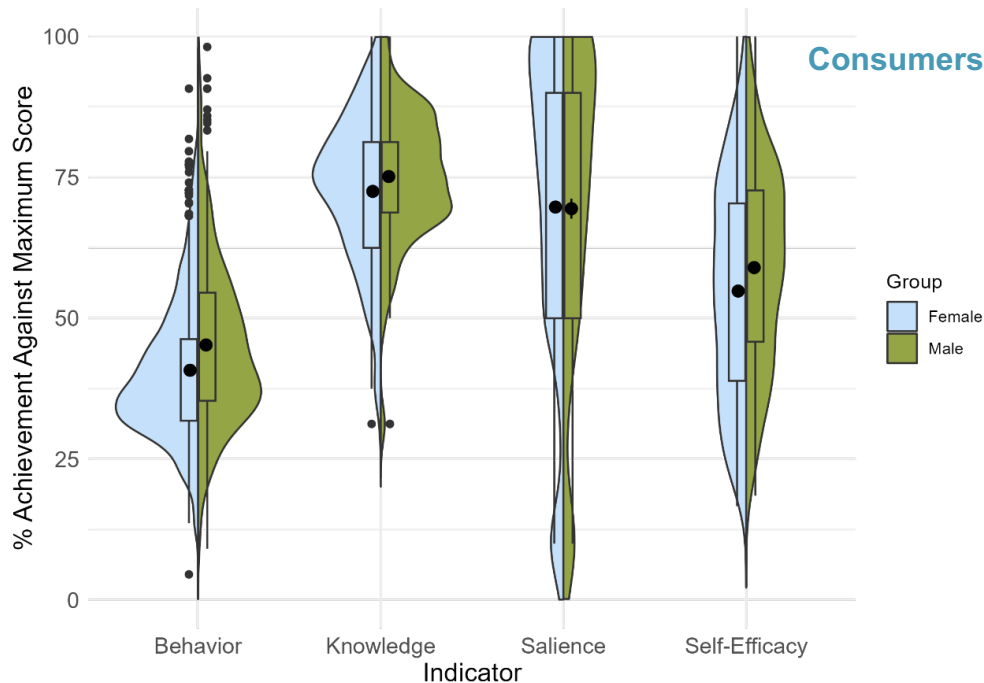


Figure A1. Composite food safety indices by gender for consumers.

Table A3. Gender differences in index and sub-indices scores among vendors

INDEX	SUB-INDICES	MALE (N=37)		FEMALE (N=429)	
		MD	MEAN (SD)	MD	MEAN (SD)
SALIENCE	Composite	70%	69% (13%)	68%	68% (14%)
	Ranking	70%	76% (19%)	70%	73% (20%)
	Choice	63%	62% (21%)	63%	63% (18%)
SELF-EFFICACY	Composite *	54%	53% (16%)	48%	50% (19%)
	Perceived Self-Efficacy	54%	56% (23%)	56%	56% (22%)
	Locus of Control *	50%	49% (18%)	41%	44% (20%)
KNOWLEDGE	Composite *	61%	61% (14%)	61%	61% (12%)
BEHAVIORS	Composite *	18%	19% (2%)	18%	19% (3%)
	FS Communication *	40%	42% (8%)	39%	41% (9%)
	Vendor Practices	35%	35% (4%)	34%	35% (6%)

Note: MD: median; SD: standard deviation; and FS: food safety.

Significance level: * $p < 0.05$, t-test

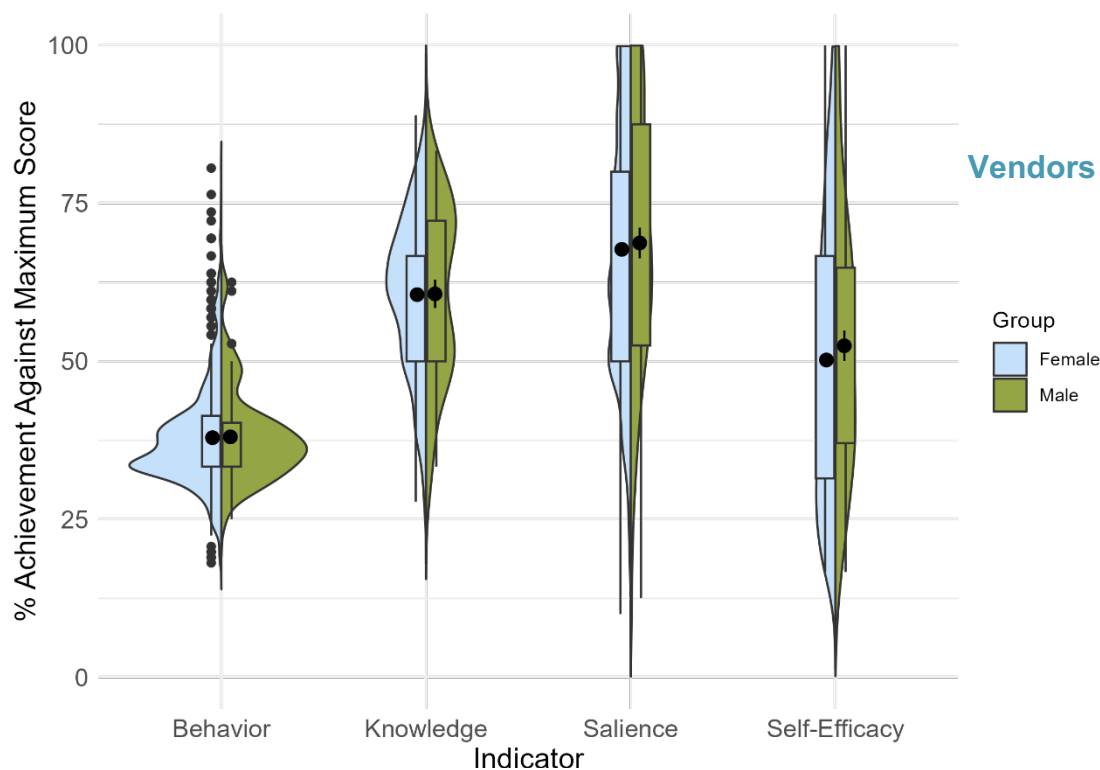


Figure A2. Composite food safety indices by gender for vendors

6.3. APPENDIX 3: INDEX SCORES DISAGGREGATED BY MARKET

Table A4. Index score comparison between study and control markets, for consumer and vendor groups combined

INDEX	SUB-INDICES	CONTROL MARKET (N = 460) ¹		STUDY MARKET (N = 466) ¹	
		MD	MEAN (SD)	MD	MEAN (SD)
SALIENCE	Composite *	73%	72% (17%)	69%	66% (19%)
	Ranking*	80%	73% (26%)	80%	68% (30%)
	Choice *	75%	70% (20%)	63%	63% (19%)
SELF-EFFICACY	Composite*	57%	55% (19%)	52%	52% (17%)
	Perceived Self-Efficacy	59%	58% (21%)	54%	56% (21%)
	Locus of Control*	54%	52% (21%)	44%	48% (19%)
KNOWLEDGE	Composite	69%	67% (12%)	69%	67% (16%)
BEHAVIORS	Composite*	22%	24% (7%)	25%	27% (9%)
	FS Communication*	37%	40% (9%)	41%	43% (10%)
	Consumer Practices*	39%	42% (14%)	43%	46% (14%)
	Consumer Cues*	32%	36% (13%)	46%	45% (15%)
	Vendor Practices*	33%	33% (6%)	36%	36% (5%)

Note: MD: median; SD: standard deviation; and FS: food safety.

¹ The sample size for salience, self-efficacy, and knowledge is n=466 in the study market and n=460 in the control market, while the sample size for the behavior indicators varies (n=236 in the study market and n=230 in the control market, for vendor practices; and n=230 in the study market and n=230 in the control market for consumer practices and cue use).

Significance level: * p<0.05, t-test