Food Safety in Horticultural Markets in Harare

Report No.2

A Survey of the Awareness and Attitudes of Low-Middle Income Consumers in Harare

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Executive Summary

This report presents the findings of a survey of 400 consumers from five low-middle income suburbs of Harare, conducted in June 2001, to investigate purchasing and consumption practices related to tomatoes and leafy vegetables and to gauge awareness of possible food safety problems related to such produce. A total of 305 women and 95 men were interviewed, ranging in age from 13 to 72. 243 respondents claimed that the main source of income in their household was some form of formal employment; the remaining 157 reported informal sources as the main source of household income. Where responses were given regarding the occupation of the head of household, the main reported occupations were vendor, driver and security guard / watchman.

Nearly all respondents reported that their household had purchased leafy vegetables (386/400) or tomatoes (380/400) during the week prior to the survey. The majority of surveyed households purchase and consume both leafy vegetables and tomatoes either daily or every second day. The vast majority of respondents indicated that the main type of outlet from which they purchase tomatoes is a street stall. The price of tomatoes was the main determinant of the type of outlet frequented, followed by the location (convenience) of the outlet. Quality, which possibly incorporates safety of the produce, was the primary consideration for only a minority of respondents when choosing the type of retail outlet. Similarly, street stalls are the main type of outlet from which respondents purchase leafy vegetables. Here, location was ranked as the most important determinant of choice of outlet type, although price of price was not far behind.

The majority of respondents indicated that they check both price (281/399) and quality (340/398) of products at alternative outlets before making a purchase at any particular outlet. This notwithstanding, 263/399 indicated that they regularly buy from the same outlet. 204 respondents reported regularly patronizing the same street stall, 25 doing regular business with the same hawker and 21 doing regular business with the same vendor at a permanent market. The fact that the known retailer gave them consistent or good quality produce emerged as the single most important reason for such repeat dealing. In addition, familiarity with the retailer was important for a number of respondents, which presumably indicates a degree of trust that s/he would not try to palm poor quality produce onto them.

392 respondents indicated that their household consumes tomatoes either every day or every other day. The equivalent figure for leafy vegetables was 372. The importance of these items lies in their contribution to the standard relish consumed by such households with their staple food, sadza (maize meal). Only a minority of households eat uncooked tomatoes (e.g. in salad) on a regular basis; the majority never eat uncooked tomatoes at home at all. Whilst frequent purchase of tomatoes and leafy vegetables raises the chances that a household will purchase contaminated produce, if it is being widely sold (or sold through the type of outlets that they frequent), the fact that they routinely cook the produce before eating means that they should not be vulnerable to most forms of microbial contamination conveyed by it. They could, however, still be vulnerable to more "durable" sources of contamination such as excessive pesticide residues or traces of heavy metals, such as cadmium and zinc.

Household vulnerability to microbial contamination from fresh produce could be exacerbated by inappropriate storage behaviour (keeping produce for too long or in inappropriate conditions). Without refrigeration, tomatoes should ideally be stored for a maximum of two days and some leafy vegetables for just one, although this will depend partly on the weather (with slightly longer storage possible in winter than in summer). The vast majority of respondents (325/399) claimed that they did not store leafy vegetables for more than one day. Fewer (146/399) claimed that they did not store tomatoes for more than two days. Amongst those storing produce for longer than these limits, refrigeration is the most commonly reported method of storing both tomatoes and leafy vegetables. Nevertheless, over a quarter of respondents admitted to keeping tomatoes outside of a refrigerator for more than two days.

Asked whether they were aware of any health problems that could arise from consuming fresh horticultural produce, 284 respondents gave some affirmative answer, the majority citing problems that would tend to be caused by microbial contamination. The most commonly cited causes of such problems were unhygienic practices by retailers (111) and consumer failure to observe sensible safety precautions (65). The number of respondents citing problems at the production stage (14% of the entire sample) was higher than expected by the research team. Leafy vegetables (88 responses) and tomatoes (48 responses) came out as the types of produce seen as most dangerous by respondents, with fruits (17 responses) and onions (5 responses) some way behind. Street stalls were seen by 167 respondents as being the most dangerous, with hawkers (51 respondents) and Mbare Musika (46 respondents) also quite widely cited.

One of the most striking findings of the research was that 120 respondents (30%) claimed that a member of their household had experienced some form of health problem within the previous twelve months *that they attributed to the consumption of fresh produce*. Whilst there can be no proof that the illnesses were indeed caused by consumption of fresh produce, the association between health problems and fresh produce in the minds of consumers is clear. By far the main type of produce associated with these problems was leafy vegetables (81 respondents).

The majority of respondents claimed that they regularly take precautions to protect themselves against health problems from the consumption of fresh produce. Whilst most of these (e.g. washing produce) are recommended and eminently sensible, some (e.g. washing with Jik) could make the produce less, rather than more, safe! The quality of water used for washing is obviously also important, although not critical if the produce is then going to be well cooked.

Finally, it is worth noting that only three respondents felt they could protect themselves by buying fresh produce from reliable sources. This could relate back to the earlier findings that low-middle income respondents feel themselves constrained in their choice of outlets by price and location / convenience considerations. Thus, if "reliable sources" are more expensive (e.g. supermarkets) and/or located in other areas, they may feel that they have to live with the risks presented by the cheaper or more convenient outlets. What we can deduce from this is that consumers either do not believe there to be "reliable sources" amongst the cheaper outlets (especially street stalls, hawkers and permanent markets) or do not possess sufficient information to be able to identify them, if they do exist.

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Scientists have expressed concern about a number of environmental problems in and around Harare, all of which could be possible sources of contamination of food products sold and consumed in the city. These include: inappropriate use of chemicals in food production (Chikuni et.al. 1997), microbial contamination from polluted water (Gopo and Chingobe 1995) and even the presence of certain heavy metals in certain food products, from either atmospheric sources (Sithole et.al. 1993) or application of sewage sludge to gardens during production (Mangwayana 1995, Manjonjo 1999, Nyamangara and Mzezewa 1999). Whilst these various sources of contamination all merit further scientific investigation, a survey was conducted to ascertain consumer awareness of, and attitudes towards, the various health threats posed by unregulated sale of fresh produce. This report presents the findings of this survey.

The survey was carried out in June 2001. A team of seven enumerators[1] from University of Zimbabwe and Agritex administered questionnaires to 400 consumers at retail outlets in five low-middle income suburbs of Harare over a period of five days. The interviews were conducted in Shona, but based on an English-medium questionnaire.

1. Survey Design

1.1 Choice of Areas

The suburbs selected for the survey were Chitungwiza, Epworth, Glen View, Mabvuku/Tafara and Mufakose. These were selected in collaboration with Consumer Council of Zimbabwe as being representative of low-middle income areas of Harare.

A total of 80 questionnaires were administered in each suburb. Within each suburb, questionnaires were administered at a number of shopping centers or markets. A full list of these sites is given in Table 1. Typically, a formal retail outlet(s) coexists with street vendors (fixed) and hawkers selling various fresh produce. Questionnaires were administered between 15.00 and 18.00 on weekdays. This is one of the busiest times of the day for the sale of fresh produce, as many people buy produce on their way home from work or go out to buy produce to be used as an ingredient in the evening meal. Conducting interviews earlier in the day would have taken much longer and would also have excluded a large subset of consumers (those out at work at this time). Enumerators approached consumers at the shopping centers or markets on a random basis.

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[1] The enumerators were C.Kanjere, C.Musharo, K.Musiiwa, H.Ngorima and S.Taruvinga from University of Zimbabwe and S.Chikobvu and J.Mukajami from Agritex.

Table 1: Survey Sites

Suburb	Survey Sites
Mufakose	Samuriwo Shopping Centre, Mutamba Drive Magandanga Market, Mupani Avenue OK Supermarket, Musasa Avenue
Glen View	OK / FCG, Tichagarika Shopping Centre, Willowvale Road Glen View 3 Shopping Centre, 11th Avenue Makomva Shopping Centre, Patrenda / Glen View Way Glen View 1 Shopping Centre, 5th Avenue / Glen View Way
Mabvuku / Tafara	Zimunhu Shopping Centre, Tafara / Mabvuku Old Tafara Shopping Centre, Nhedzi Road
Epworth	Solani Shopping Centre Domboramwari Shopping Centre Munyuki Shopping Centre
Chitungwiza	Huruyadzo Shopping Centre, St.Mary's Zengeza 2 Shopping Centre Zengeza 3 Shopping Centre Chikwanha Shopping Centre

1.2 Questionnaire Design

The questionnaire aimed to gather information on respondent and household characteristics, household fresh produce purchasing and consumption patterns, and awareness of and attitudes towards the safety of the fresh produce that they bought. Given that questionnaires were administered on the street, a key consideration was that they be short (maximum: 15 minutes). Pre-testing of questionnaires was used to keep the number of questions down to what could be administered in that time. Partly for this reason, too, the focus of the questionnaires was limited to tomatoes and leafy vegetables (rape, kales etc).

A copy of the questionnaire is provided in the Appendix to this report. Once collected, the data was entered into, and analysed using, SPSS.

2. Findings

2.1 Respondent and Household Characteristics

A total of 305 women and 95 men were interviewed. They ranged in age from 13 to 72 (mean = 27).

Respondents reported a mean household size of 5.4 people (range: 1 to 22), of whom 3.3 were adults over 16 and the remainder children. 243 respondents claimed that the main source of income in their household was some form of formal employment; the remaining 157 reported informal sources as the main source of household income. Only 171 responses were given

regarding the occupation of the head of household. These are summarized in Table 2. These are consistent with the characterization of the survey areas as low-middle income.

Table 2: Occupation of Head of Surveyed Households

Occupation of Household Head	Number of Respondents
Vendor	31
Driver	26
Security Guard/Officer	23
Manager/Supervisor	13
Mechanic	13
Clerk	13
Teacher	12
Nurse	5
Other	35
Total	171

2.2 Purchasing of Horticultural Produce

Nearly all respondents reported that their household had purchased leafy vegetables (386/400) or tomatoes (380/400) during the week prior to the survey. In addition, 285 reported that their household had purchased onions, 61 potatoes, 25 green beans, 21 carrots and 9 peas. Ranking of the most important horticultural products for the household produced similar results, which are shown in Table 3. Leafy vegetables, tomatoes and onions are far and away the most important horticultural products consumed by low-middle income households. As will be seen below, the majority of surveyed households purchase and consume both leafy vegetables and tomatoes either daily or every second day.

Table 3: Importance of Different Horticultural Products

Product	Number Ranking 1st	Number Ranking 2nd	Number Ranking 3rd	Total
Leafy Vegetables	268	84	40	392
Tomatoes	121	256	15	392
Onions	5	43	239	287
Potatoes	3	1	26	30
Green Beans	0	3	2	5
Peas	0	1	3	4
Carrots	0	0	2	2
Total	397	388	327	

2.3   Choice of Retail Outlets

2.3.1. Tomatoes

The vast majority of respondents indicated that the main type of outlet from which they purchase tomatoes is a street stall (Table 4). 250 respondents indicated that they buy tomatoes from their main type of outlet on a daily basis and a further 62 every two days. Only 45 indicated that they frequent their main type of outlet for the purchase of tomatoes once every week or less.

Table 4: Most Commonly Used Outlets for Purchase of Tomatoes

Type of Outlet	Number Ranking 1st	Number Ranking 2nd	Total
Street Stall	320	15	335
Permanent Market	46	5	51
Supermarket	11	6	17
Mbare Musika	10	10	20
Hawker	9	35	44
Tuckshop	0	1	1
Household Plot	0	1	1
Total	396	73	

The price of tomatoes was the main determinant of the type of outlet frequented, followed by the location (convenience) of the outlet (Table 5). Quality, which possibly incorporates safety of the produce[2], was the primary consideration for only a minority of respondents when choosing the type of retail outlet. As will be seen below, however, this does not mean that quality or safety are unimportant to these consumers. Rather, they pay attention to quality issues within the constraints imposed by their (tight) budgets and limited time / mobility.

Table 5: Most Important Factor Influencing the Choice of Retail Outlet for Tomatoes

Factor	Number of Respondents
Price of Produce	161
Location of Outlet	130
Quality of Produce	60
Familiarity with Retailer	19
Quantity Required	15
No Other Alternative	8
Wide Variety of Produce	2
Total	395

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[2] Unfortunately, the questionnaire did not explore consumers' understanding of quality: what were the most important quality attributes? etc.

2.3.2. Leafy Vegetables

Similarly, street stalls are the main type of outlet from which respondents purchase leafy vegetables. 298 respondents indicated that they buy leafy vegetables from their main type of outlet on a daily basis and a further 35 every two days. Only 17 indicated that they frequent their main type of outlet for the purchase of leafy vegetables once every week or less.

Table 6: Most Commonly Used Outlets for Purchase of Leafy Vegetables

Type of Outlet	Number Ranking 1st	Number Ranking 2nd	Total
Street Stall	299	31	330
Hawker	35	16	51
Permanent Market	30	2	32
Household Plot	9	1	10
Supermarket	7	2	9
Mbare Musika	6	2	8
Tuckshop	1	0	1
Total	387	54	

In the case of leafy vegetables, location was ranked as the most important determinant of choice of outlet type, although price of price was not far behind (Table 7). Again, quality of produce was the primary consideration for only a minority of respondents when choosing the type of retail outlet.

Table 7: Most Important Factor Influencing the Choice of Retail Outlet for Leafy Vegetables

Factor	Number of Respondents
Price of Produce	134
Location of Outlet	120
Quality of Produce	69
Familiarity with Retailer	20
Quantity Required	16
No Other Alternative	10
Wide Variety of Produce	3
Total	372

2.3.3. Choice of Individual Retailers

The majority of respondents indicated that they check both price (281/399) and quality (340/398) of products at alternative outlets before making a purchase at any particular outlet. That notwithstanding, 263/399 indicated that they regularly buy from the same outlet. 204 respondents reported regularly patronizing the same street stall, 25 doing regular business with the same hawker and 21 doing regular business with the same vendor at a permanent market. The fact that

the known retailer gave them consistent or good quality produce emerged as the single most important reason for such repeat dealing (Table 8). In addition, familiarity with the retailer was important for a number of respondents, which presumably indicates a degree of trust that s/he would not try to palm poor quality produce onto them.

Table 8: Reasons for Repeat Dealing with the Same Retailer of Horticultural Produce

Reason	Number of Respondents
Quality of Produce	94
Price of Produce	70
Familiarity with Retailer	47
Location of Outlet	29
Can Buy on Credit or Discount	10
Quantity Required	4
Wide Variety of Produce	4
No Alternative	4
Total	262

2.4   Consumption Patterns

Table 9 highlights the fact that both tomatoes and leafy vegetables are fundamental to the diet of low-middle income households in Harare. Their importance lies in their contribution to the standard relish consumed by such households with their staple food, *sadza* (maize meal). Only a minority of households eat uncooked tomatoes (e.g. in salad) on a regular basis; the majority never eat uncooked tomatoes at home at all.

Table 9: Frequency of Consumption of Tomatoes and Leafy Vegetables

Frequency of Consumption	Tomatoes	Leafy Vegetables	Raw Tomatoes
Every Day	369	324	11
Every Two Days	23	53	14
Once per Week	1	2	70
Less than Once Per Week	0	0	54
Never	0	1	245
Other	5	19	2
Total	398	399	396

The results presented so far give an indication of the extent to which households are at risk from contaminated tomatoes or leafy vegetables being sold in Harare. On the one hand, most low-middle income households are purchasing and consuming these products either on a daily basis or every other day. This raises their chances of purchasing contaminated produce, if it is being widely sold (or sold through the type of outlets that they frequent). On the other hand, the fact that they routinely cook the produce before eating means that they should not be vulnerable to most forms of microbial contamination conveyed by it. They could, however, still be vulnerable

to more "durable" sources of contamination such as excessive pesticide residues or traces of heavy metals, such as cadmium and zinc.

2.5   Produce Storage

To the extent that households are vulnerable to microbial contamination from fresh produce, this could be exacerbated by inappropriate storage behaviour (keeping produce for too long or in inappropriate conditions). Without refrigeration, tomatoes should ideally be stored for a maximum of two days and some leafy vegetables for just one, although this will depend partly on the weather (with slightly longer storage possible in winter than in summer[3]).

The vast majority of respondents (325/399) claimed that they did not store leafy vegetables for more than one day. Fewer (146/399) claimed that they did not store tomatoes for more than two days.

Amongst those storing produce for longer than these limits, refrigeration is the most commonly reported method of storing both tomatoes and leafy vegetables. Over half of respondents reported that they store their produce in a refrigerator (Table 10). Nevertheless, over a quarter of respondents (including "other" answers) admitted to keeping tomatoes outside of a refrigerator for more than two days.

Table 10: Method of Storage for Fresh Produce

Method of Storage	Tomatoes	Leafy Vegetables
Refrigeration	132	55
Basket or Vegetable Rack	55	14
Dish or Basin	31	0
Other	34	5
Total	252	74

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[3] The survey was conducted during the winter.

2.6   Awareness of Food Safety Issues

Asked whether they were aware of any health problems that could arise from consuming fresh horticultural produce, 284 respondents gave some affirmative answer (Table 11). The majority of the problems cited would tend to be caused by microbial contamination. However, stomach or abdominal pains could be caused by other factors (e.g. excessive pesticide residues?).

Table 11: Possible Health Problems that Respondents were Aware of

Problem	Number of Respondents
Diarrhoea	121
Cholera	87
Stomach / Abdominal Pains	55
Dysentry	8
Vomiting	6
Gastric Ulcer	4
Other	3
Total	284

When asked what might cause such problems, respondents listed practices by retailers, consumers and producers (Table 12). Given the public education efforts to combat cholera, the awareness of retail practices is not surprising. However, the number of respondents citing problems at the production stage (14% of the entire sample) is higher than expected by the researchers.

Table 12: Sources of Fresh Produce-Related Health Problems

Source of Problem	Responsible Agent	Number of Respondents
Unhygienic Practices by Retailers	Retailer	111
Consumer Failure to Observe Safety Precautions	Consumer	65
Stale Horticultural Produce	Any	40
Abuse of Pesticides	Producer	32
Dirty Water Used for Irrigation	Producer	14
High Fertiliser and Manure Input Levels	Producer	11
Poor Quality of Produce	Producer / Retailer	3
Suspected Stolen Horticultural Produce	Retailer?	2
Other	-	1
Total		279

Questioned further, 166 respondents said that they associated certain types of produce with above-average risks of contracting these health problems. Leafy vegetables (88 responses) and tomatoes (48 responses) came out as the types of produce seen as most dangerous by respondents, with fruits (17 responses) and onions (5 responses) some way behind.

A much higher number of respondents (286) associated particular types of retail outlets with above-average risks of contracting these health problems (Table 13). Street stalls were seen by 167 respondents as being the most dangerous, with hawkers (51 respondents) and Mbare Musika (46 respondents) also quite widely cited[4].

Table 13: Why Particular Types of Retail Outlet Represent a Health Hazard

Reason	Number of Respondents
Unhygienic Practices by Retailers	97
Market Places are Dirty	57
Close to Roads, Public Toilets and Dumping Sites	33
Lack of Proper Sanitation Facilities	31
Markets are Over-congested	17
Stale Horticultural Produce	16
Potential Buyers Constantly Fiddling with Produce	9
Suspected Stolen Horticultural Produce	7
Lack of Proper Storage Facilities	5
Dusty Gravel and Muddy Surfaces	5
Lack of Proper Packaging	4
Mbare Market Too Close to Big Bus Terminus	2
Other	9
Total	292

Supermarkets are apparently viewed as a safe place from which to buy fresh produce. No one cited them as carrying a particularly high risk.

It is notable that around half of the responses in Table 13 above would require direct action by public / municipal authorities if they were to be addressed.

One of the most striking findings of the research was that 120 respondents (30%) claimed that a member of their household had experienced some form of health problem within the previous twelve months *that they attributed to the consumption of fresh produce*. The specific problems cited are shown in Table 14. Whilst some of these may be questioned (e.g. cholera) and there can be no proof that the illnesses were indeed caused by consumption of fresh produce, the association between health problems and fresh produce in the minds of consumers is clear. The main type of produce associated with these problems was leafy vegetables (81 respondents), followed by tomatoes (16 respondents) and fruits (12 respondents).

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[4] In addition to Mbare, Chikwanha was cited as a dangerous source by 15 respondents and "permanent markets" in general by 7 respondents.

Table 14: Health Problems Experienced by Household Members within the previous 12 Months that were Attributed to Consumption of Fresh Produce

Problem Experienced	Number of Respondents
Diarrhoea	89
Stomach / Abdominal Pains	22
Cholera	5
Dysentry	2
Vomiting	1
Gastric Ulcer	1
Total	120

The majority of respondents claimed that they regularly take precautions to protect themselves against health problems from the consumption of fresh produce. These are shown in Table 15. Many of these are recommended and eminently sensible. However, some (e.g. washing with Jik) could make the produce less, rather than more, safe! The quality of water used for washing is obviously also important, although not critical if the produce is then going to be well cooked. Indeed, one wonders how some of the illnesses cited in Table 14 could have been caused by horticultural produce if it was thoroughly cooked.

Table 15: Precautions Taken to Ensure that Fresh Produce is Safe to Eat

Precaution	Number of Respondents
Washing	261
Washing with Hot Water or Bleach (Jik)	44
Boiling	35
Store in Refrigerator or Cupboard	20
Peeling and Boiling Tomatoes	6
Steaming	5
Washing and Drying Using a Cloth	5
Buying from Reliable Sources	3
Other	4
Total	383

A last point to note from Table 15 is that only three respondents felt they could protect themselves by buying fresh produce from reliable sources. This could relate back to the earlier findings that low-middle income respondents feel themselves constrained in their choice of outlets by price and location / convenience considerations. Thus, if "reliable sources" are more expensive (e.g. supermarkets) and/or located in other areas, they may feel that they have to live with the risks presented by the cheaper or more convenient outlets. What we can deduce from this is that consumers either do not believe there to be "reliable sources" amongst the cheaper outlets (especially street stalls, hawkers and permanent markets) or do not possess sufficient information to be able to identify them, if they do exist.

Finally, respondents were asked what measures could be taken to make horticultural produce safer to eat. Their responses reflect a similar perception of responsibilities to that seen in Table 12. Food safety problems may occur at production, marketing or consumption stages and all actors bear some responsibility for making fresh produce safer. At the same time, respondents clearly see an important role for public authorities both in training and educating the various players in their responsibilities and in monitoring to ensure that they carry them out.

Table 16: Measures that Could be Taken to Make Horticultural Produce Safer

Measure	Agent Responsible	Number of Respondents
Setting Quality Standards and Monitoring at Market Places	Public Authorities	87
Washing of Produce	Consumers	77
Improving Hygienic Behaviour of Consumers	Consumers / Public Authorities	55
Improving Hygienic Behaviour of Retailers / Vendors	Retailers / Public Authorities	45
Boiling of Produce	Consumers	17
Training of Farmers on Proper Pesticide and Fertiliser Use	Public Authorities	16
Buying from Reliable Sources	Consumers / Retailers	11
Proper Location of Markets and Improved Sanitary Facilities	Public Authorities	3
Proper Storage of Produce	Consumers / Retailers	2
Total		313

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Appendix: Consumer Survey Questionnaire

Enumerator_____   Location_____   Date_____

SECTION 1: Respondent and household characteristics

1.1: Sex of respondent: M / F   1.2: Age of respondent:_____

1.3: Suburb where household is located:_____

1.4: Number of household members: 1.41: Adults (over 16):_____
                                         1.42: Children (under 16)_____

1.5: Major source of household income:_____

1.5 Occupation of head of household:_____

SECTION 2: Purchasing patterns

2.1 What fresh horticultural produce has been purchased by household members for household consumption during the past week?

Produce	Amount purchased (numbers/bunches)
Eg. tomatoes	6

2.2: Which types of horticultural produce are the most important for your household? (rank 1 to 3)

1._____   2._____   3._____

2.3: Where, who from and how often do you purchase tomatoes and leafy vegetables for domestic consumption?

Type of produce	Type of retail outlet: 1 = Permanent market 2 = Street stall 3 = Hawker 4 = Tuck shop 5 = Supermarket 6 = Household plots 7 = other	Most important factor influencing the choice of retail outlet. 1 = price of produce 2 = quality of produce 3 = location of outlet 4 = quantity required 5 = familiarity with retailer 6 = other	Frequency of purchases from this source.
Tomatoes	3	3	everyday
Leafy veg			

2.4: Do you check the prices at other retailers before selecting a retail outlet? Yes / No

2.5: Do you check the quality of produce at other retailers before selecting a retail outlet? Yes/No

2.6: Do you often return to the same retail outlet? Yes / No

2.7: If yes, which type of retail outlet?

2.8: If yes, Why do you return to this retail outlet?

SECTION 3: From purchase to consumption.

3.1: Do you often keep tomatoes for more than 2 days? Yes / No

3.2: Do you often keep leafy vegetables for more than 1day? Yes / No

3.3: If yes, where do you store fresh produce and for how long do you normally store fresh produce?

Produce	How stored?	How long do you normally store?
Tomatoes		
Leafy vegetables		

3.4: How often do you eat tomatoes and leafy vegetables?

	Frequency of consumption 1 = everyday 2 = every 2 days 3 = once a week 4 = less than once a week 5 = never
Tomatoes	
Leafy vegetables	

3.5: How often do you consume uncooked tomatoes?
(1 = everyday; 2 = every 2 days; 3 = once a week; 4 = less than once a week; 5 = never)

SECTION 4: Food Safety

4.1: What health problems, if any, are you aware of from consuming fresh horticultural produce?

4.2: What do you think are the sources of these health problems?

4.3: Are there any types of produce for which health risks are greater? Yes / No
If Yes, which produce and why?

4.4: Are there any types of retail outlet where you think there are higher risks of contamination? Yes / No.

4.5: If yes, why

4.6: What health problems (if any) have members in your household experienced from consuming food in the last year?

Type of health problem	Food causing health problem
Eg diarrhoea	Leafy vegetables

4.7: How do you ensure that the fresh horticultural produce you consume is safe to eat?

4.8: Do you have any ideas of how horticultural produce could be made safer to eat?