



The Centre for Global Food and Resources

The Vietnam urban food consumption and expenditure study

Factsheet 9: Insights into vegetable expenditures and consumption

This factsheet provides unique insight into vegetable expenditure and consumption behaviour in Vietnam. Vegetables are an important part of the Vietnamese diet and consumed everyday by most households. However, they are a relatively inexpensive part of the Vietnamese diet, with expenditures on vegetables making up only about 13% of urban households' monthly food expenditures¹.

Considering expenditures, vegetables are the second most important food group (following meats; see Factsheet 3 for more information on food expenditures). Expenditure shares were calculated using answers to the following questions from the survey: "During the past month, how many times did your household purchase [particular food product ...]". Next, respondents were asked: "For each purchase, what is the normal value (in VND) of [the product] bought for household consumption."

Among the wide variety of vegetables available in Vietnam, the survey collected information specific to the 24 most common and popular vegetables. The list of vegetables was refined following focus groups and extensive survey pretesting.

Urban Vietnamese households purchase and consume a diverse portfolio of vegetables (Figure 1). In terms of relative expenditure, **cabbage** was the most important vegetable in Hanoi (10% of vegetable expenditures) and

Chillies, shallots, onions and garlic were most important in Ho Chi Minh City (8.8% of vegetable expenditures). **Cai meo** (also known as H'mong mustard) was most important in Lao Cai City with 11% of vegetable expenditures and **Susu fruits and leaves** (also known as chayotes or chokos) was most important in Son La City, with 14.4% of vegetable expenditures (Figure 1).

Cai meo also attracted 10% of vegetable expenditures in Son La City. However, cai meo represented less than 1% of vegetable expenditures in Hanoi and Ho Chi Minh City. Interestingly, 21% and 59% of households in these cities, respectively, said they never purchased this vegetable (Figure 2). Cai meo is a leafy vegetable indigenous to the north west of Vietnam, i.e. provinces such as Lao Cai and Son La. Consequently cai meo is well suited to the growing conditions in the mountainous regions of north west Vietnam and readily available to consumers in these locations. The small share of expenditures and large number of households not consuming cai meo in Hanoi and Ho Chi Minh City indicates that the supply chains for this vegetable from the north west to these cities is underdeveloped. Consumers may also not be aware of cai meo. Thus, developing this supply chain, particularly the end market, could represent an opportunity for farmers in the northwest.

A similar result was found for **susu fruits and leaves** (Figure 1 and Figure 2). The leaves or shoots are edible, however, compared to the fruit, they are less commonly seen in the market place. Research for development projects such as the Australian Centre for

¹Household expenditures were weighted by the number of adult male equivalents in the household to calculate a 'per adult male equivalent'. This allowed us to standardise food expenditure across households with more or less people and different ratios of adults to children. The weights were calculated using WHO/FAO energy requirements from the 2004 Human Energy Requirements, Food and Nutrition Technical Report Series.

International Agricultural Research (ACIAR) funded project “Towards more profitable and sustainable vegetable farming systems” are encouraging farmers to recognise the opportunity to harvest the shoots of these plants to create multiple sources of income from the one plant. Like cai meo, susu plants are suited to the temperate growing conditions in the north west of Vietnam, especially

mountainous areas such as Lao Cai and Son La provinces. The tropical climate in Ho Chi Minh City inhibits local production of susu fruits and leaves and as such it is not surprising that they only represent 1.3% of monthly vegetables expenditures (Figure 1) and 59% of Ho Chi Minh City households have never purchased this vegetable (Figure 2).

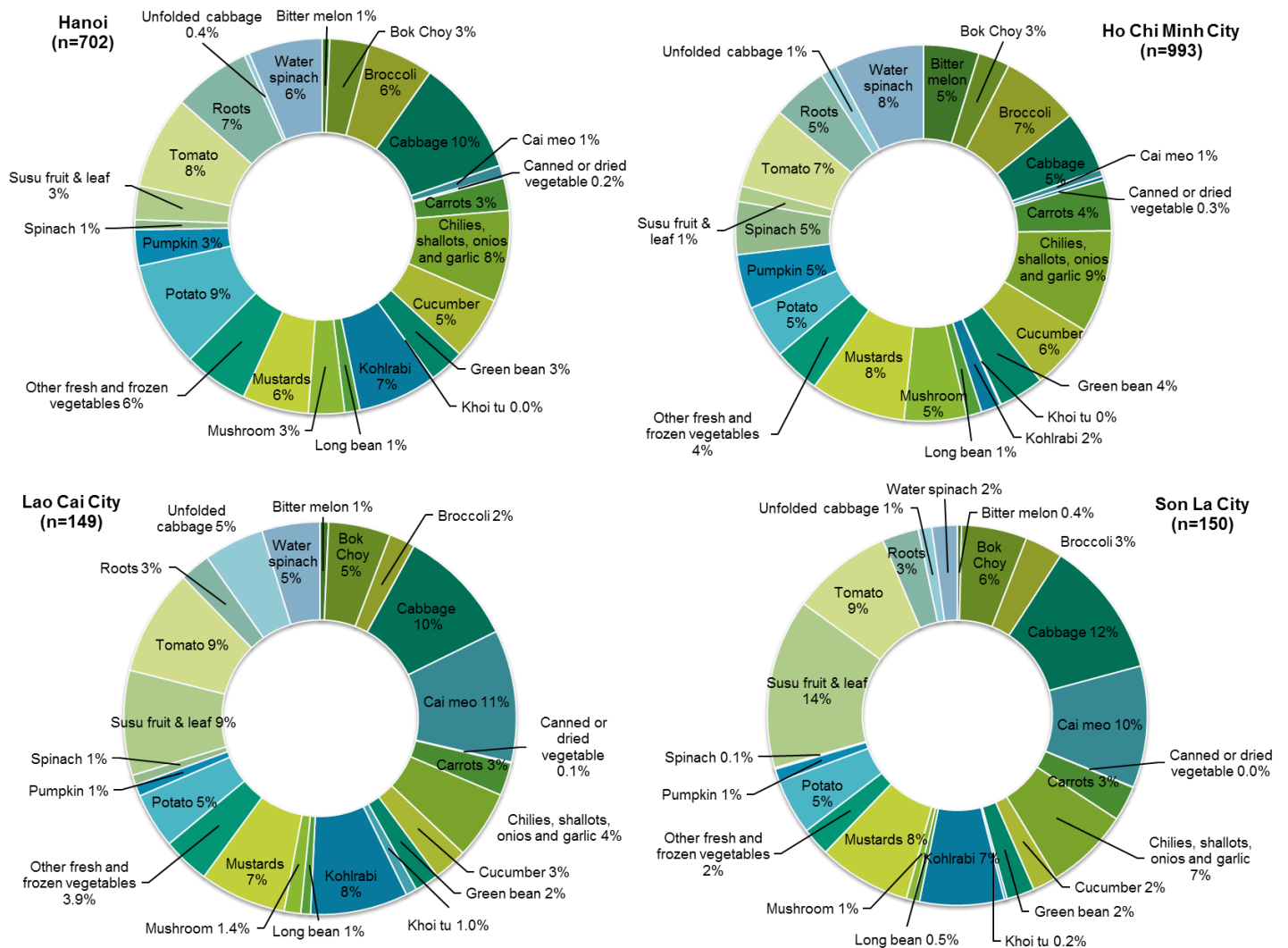


Figure 1. Share (%) of monthly vegetable expenditures (per adult male equivalent) on different types of vegetables in Hanoi (top left), Ho Chi Minh City (top right), Lao Cai City (bottom right) and Son La City (bottom left). See Table A1 in the appendix for further information.

Food safety drives Vietnamese consumers' vegetable purchase decisions

In the survey, households were asked to indicate which (of 22 options) is the most important factor that influences their decision to buy broccoli, cabbage, cai meo, susu leaves,

tomatoes and water spinach. A comparison of relative frequencies of the seven most commonly chosen factors that influence vegetable purchase decisions across cities is presented in Figure 2.

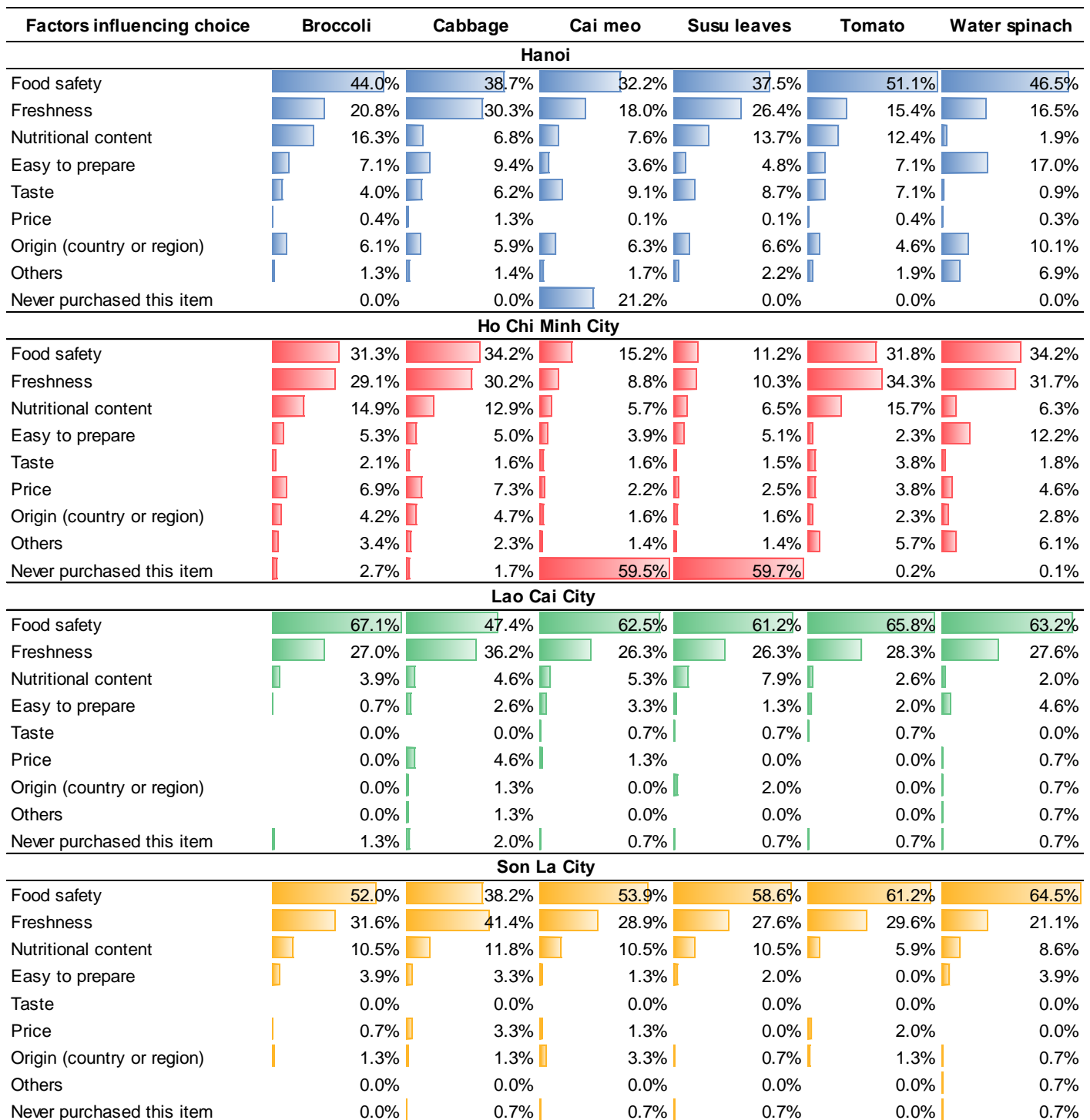


Figure 2. Share (%) of households that nominated the listed factors as important in purchase decisions for broccoli, cabbage, cai meo, susu leaves, tomato and water spinach in Hanoi (n=693), Ho Chi Minh City (n=996), Lao Cai City (n=152) and Son La City (n=152), Vietnam. See Table A3 and A4 in the appendix for the percentages graphed here as well as a breakdown of the factors included in the 'others' category.

The top five most important factors chosen by households did not change significantly between vegetables and cities (Figure 2). Overall, consumers in each of the surveyed cities considered **food safety** as the main factor affecting their decisions to purchase these six vegetables. **Freshness** was the

second most important attribute chosen by our surveyed households. Moreover, freshness was selected more often than food safety as influencing Ho Chi Min City consumers' purchase decisions for tomatoes and Son La City consumers' purchase decisions for cabbages.

In general, **nutritional content** was more important for Hanoi and Ho Chi Minh City consumers relative to Lao Cai City and Son La City consumers. **Nutritional content was also more important for the leafy green vegetables compared to other vegetables** (Figure 2).

Another important consideration here is that households did not independently (unprompted) state 'production method' (e.g. organic, VietGAP) with the same frequency as food safety (See Table A2 in the Appendix). This same issue exists in the survey results for fruits (Factsheet 10).

In light of this finding, it may be interesting to investigate why consumers perceive that the product is safe to eat without an understanding of the production method or use of a certification or labeling information that signals 'safety'. Perhaps consumers feel that retail outlet they shop at provides an appropriate signal of this information and/or that they trust the person they purchase food products from. The reasons consumers shop at different outlets and their perceptions of outlets was discussed in Factsheet 6 and certification issues were analysed in detail in Factsheet 8. The next section provides more detailed insight on where consumers are purchasing their vegetables.

Households shop for vegetables at traditional outlets

The survey collected information regarding the place/retail outlet type where consumers are buying different types vegetables. Definitions of the retail outlets included in the survey are presented in the appendix.

Traditional markets (formal wet markets, informal street markets, traditional family shops, semi-permanent stands and peddlers/mobile vendors) were the dominant channel used by households purchase vegetables, capturing 85%–99% of monthly vegetable expenditures per adult male equivalent. Some reasons for the dominance of traditional outlets may be the convenience, availability of products, price and the perceptions of factors such as the freshness of the products offered at the outlet. More

information and details of other factors influencing consumers' decisions to shop at different outlets are presented in Factsheet 6.

The average share of vegetable expenditures going to traditional outlets was greatest in Lao Cai City and Son La City, compared to Hanoi and Ho Chi Minh City (Figure 3). This is not surprising considering that there has been less development of modern markets in these urban areas.

Formal wet markets were the most important traditional outlet to purchase vegetables in Hanoi, Ho Chi Minh City and Lao Cai City (Figure 3). Informal street markets were the second most important channel, with 14% to 38% of vegetables expenditures going to this outlet (Figure 3). In, Son La City, informal street markets received the greatest share of vegetable expenditures.

Modern outlets (supermarkets/hypermarkets, minimarts and specialty shops) received less than 14% of monthly vegetables expenditures per adult male equivalent (Figure 3). Vegetables expenditures at supermarkets were greatest in Ho Chi Minh City followed by Hanoi (Figure 3). This pattern is not restricted to vegetables, the share of all food expenditures going to modern outlets is greatest in Ho Chi Minh City and second greatest in Hanoi (see Factsheet 4 and Factsheet 5 for more information).

The dominance of traditional outlets was expected as modern food retailing is in relatively early stages of development in Vietnam. Further, the differences in expenditures shares by outlets between Ho Chi Minh City and Hanoi as compared to Lao Cai City and Son La City are not surprising considering variations in the relative development of modern markets in larger urban cities versus the two smaller cities.

As households continue to purchase most of their vegetables from traditional outlets, smallholder farmers selling vegetables into traditional chains may not be negatively affected by the growth of supermarkets, especially in the northern, regional cities, in the short to medium term.

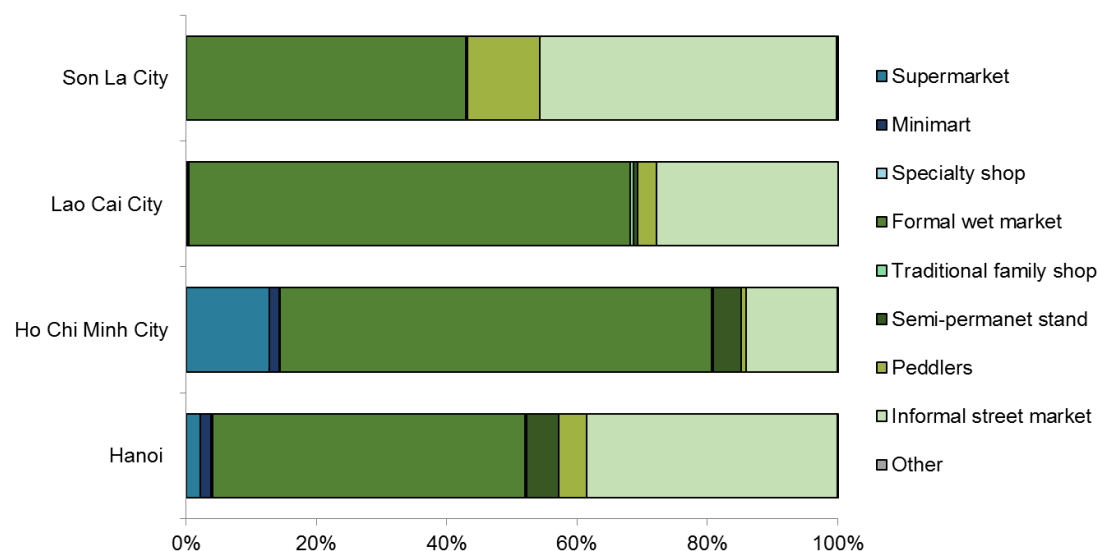


Figure 3. Share (%) of monthly vegetable expenditure (per adult male equivalent) at types of retail outlets in Vietnam. ‘Modern outlets’ are depicted by blue shading and ‘traditional outlets’ are shown using green shading. See Table A2 in the appendix for the percentages of expenditure graphed here. Further analysis of outlets receiving vegetable expenditures was conducted for households in different income groups in each city and is presented in Table A8 in the appendix. Note: ‘Other’ outlets include phone orders, online shopping and restaurants/cafes, etc.

The relationship between household income and vegetable consumption

In the survey, households indicated which of nine different gross monthly income categories was most appropriate for their household. Using this information, we divided the sample into four income groups (see Table A9 in the appendix for information about income groups).

We then use this information to explore household expenditure on vegetables with respect to income. As household incomes increase, we expect their absolute expenditure (per adult male equivalent) on food to increase and with this the expenditures on vegetables also increases (Table1).

Despite an increase in absolute vegetable expenditure across income groups in some cities, **we observe a decrease in the share of food expenditures dedicated to vegetables between the lowest and highest income groups. For example, between the lowest and highest income group, relative expenditures on vegetables decreases by 3.5% in Hanoi and 1% in Ho Chi Minh City.**

From this, it appears that households spending more money on food as incomes increase are increasing their expenditures on food products

other than vegetables, e.g. meat, beverages, etc. See Factsheet 3 for more information about relative expenditure shares on different foods across incomes groups.

Consumers’ expenditures on different vegetables when incomes increased differed across cities (Figure 4). The share of vegetable expenditures on **cabbage** decreased as incomes increased in every city (Figure 4).

Expenditure shares on **cai meo** increased with income in Hanoi and Ho Chi Minh City, but decreased in Lao Cai City and Son La City (Figure 4). This may be related to the high availability and low prices of this product in northwest cities.

The share of expenditures dedicated to **broccoli, carrots, potatoes and roots** experienced the greatest increase across income groups in all cities. The different behaviour in relation to vegetable consumption across cities and income groups can be related to variables such as availability of the products and their substitutes, quality and price. So, further investigation and market analysis may offer a more comprehensive evaluation of the effect of income on consumers’ vegetable preferences.

Table 1. Average monthly vegetable expenditure (VND per month) per adult male equivalent by income group in Hanoi (n=702), Ho Chi Minh City (n=993), Lao Cai City (n=149) and Son La City (n=150), Vietnam.

City	Low	Low-Middle	Middle-High	High
Hanoi	182,888	180,369	176,159	188,321
Ho Chi Minh City	269,457	249,056	253,747	260,166
Lao Cai City	314,514	257,038	230,247	266,741
Son La City	250,731	261,291	346,006	270,774

Note: Income groups are defined in Table A9.

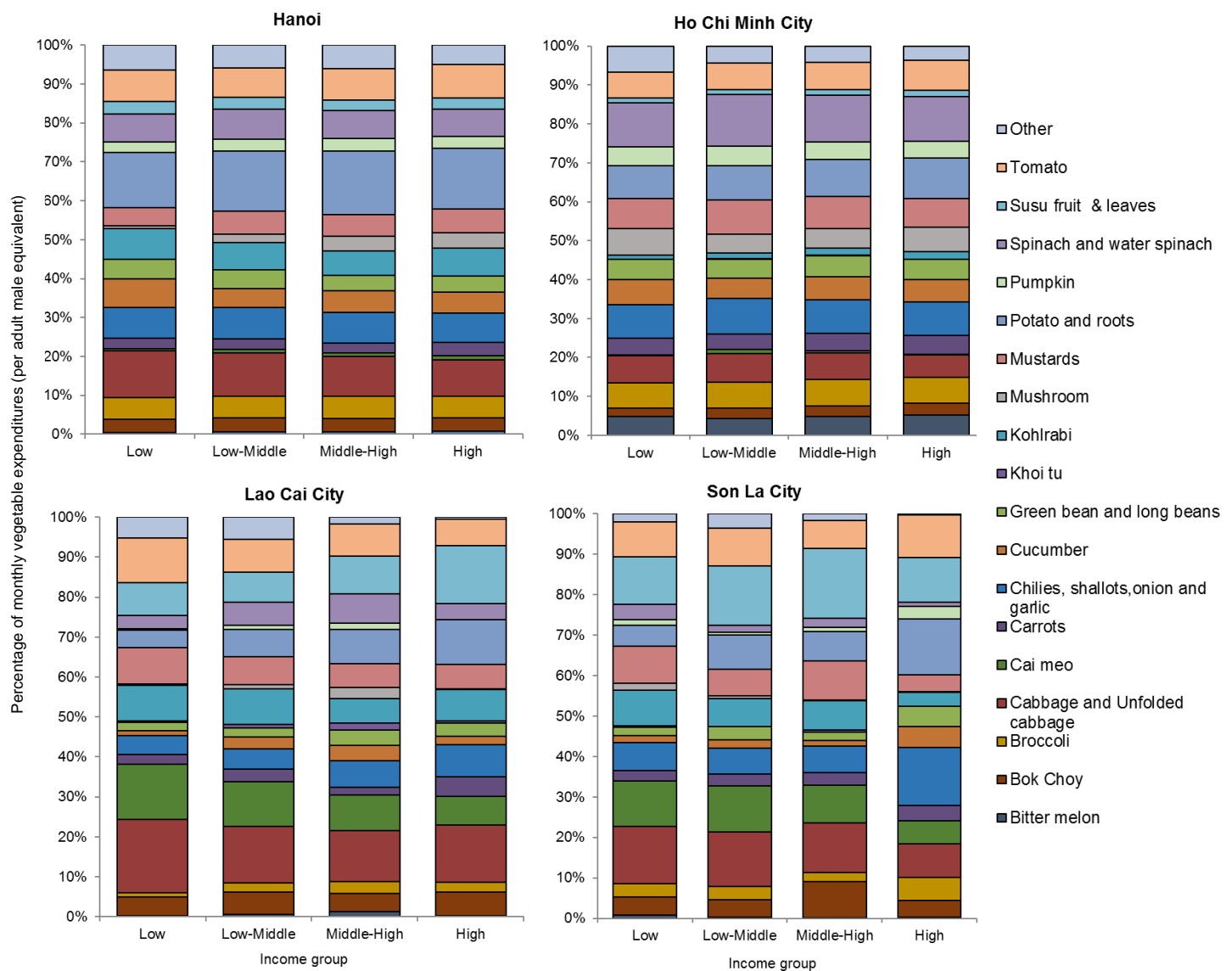


Figure 4. Share (%) of monthly vegetable expenditures (per adult male equivalent) on different vegetable by income group in Hanoi (top left), Ho Chi Minh City (top right), Lao Cai City (bottom left) and Son La City (bottom right), Vietnam. See Table A5 in the appendix for the percentages of expenditure graphed here. Note: The category ‘other’ includes other fresh vegetables as well as canned, dried and frozen vegetables.

Changes to vegetable consumption behaviour compared to five years ago

For households that stated they consumed [vegetable] in the 30 days prior to the survey,

we asked if members of the household were consuming more, less or similar quantities compared to five years ago (i.e. compared to 2011). Although the changes are subjective

and based on households reporting them, considering these reported changes is interesting as they can reflect changes in: (1) availability of different vegetables; (2) perceptions about the quality or health

attributes of different vegetables; (3) household incomes or; (4) tastes/preferences that allow them or cause them to change consumption patterns.

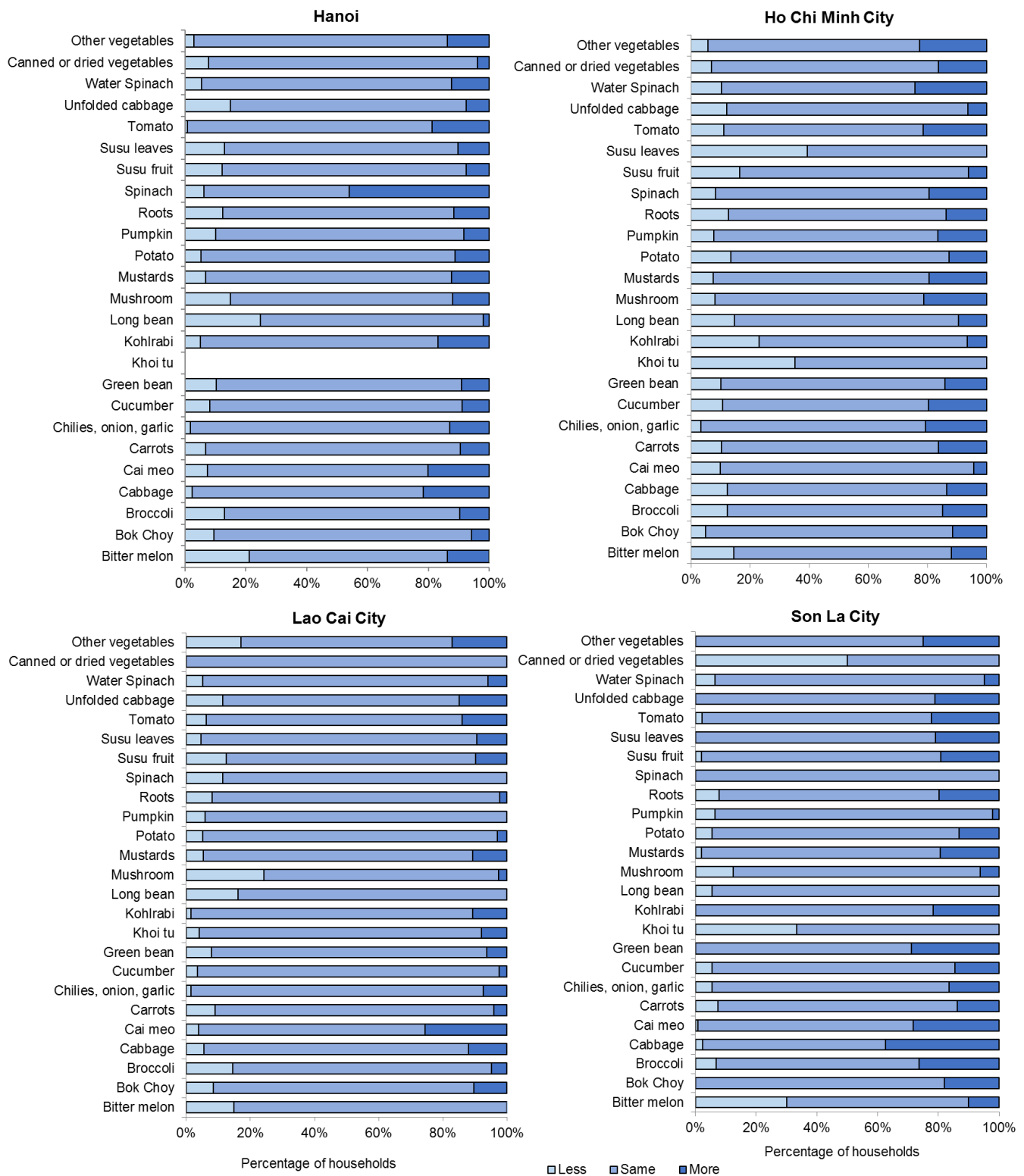


Figure 5. Share (%) of households who purchase [vegetable] who stated they are buying relatively 'less', a similar amount ('same') or 'more' of the [vegetable] compared to five years prior to the survey (i.e. compared to 2011) in Hanoi (top left), Ho Chi Minh City (top right), Lao Cai City (bottom left) and Son La City (bottom right), Vietnam. See Table A6 and A7 in the appendix for percentages graphed here.

Ultimately, a greater understanding of the drivers of consumption changes is important as they may suggest growing demand for certain products.

Most respondents from all cities said that they have continued to purchase and consume similar quantities of vegetables (Figure 5 and Tables A6 and A7 in the appendix). A similar behavior was recorded for fruits (Factsheet 10).

Increased Consumption

With respect to *increasing* vegetable consumption, we discuss only vegetables where at least 15% of households surveyed, indicated that they are consuming a larger per capita amount than they were five years previously (2011 versus 2016/2017).

For Ho Chi Minh City, more than 15% of households indicated they increased (over five years) their consumption of: water spinach (24%), other fresh and frozen vegetables (22%), chilies, shallots, onions and garlic (21%), mushroom (21%), tomato (21%), spinach (19%), mustards (19%), cucumber (19%), pumpkin (16%), carrots (16%), and canned or dried vegetables (16%).

For Hanoi, the largest increases were seen for: spinach (46%), cabbage (22%), cai meo (20%), tomatoes (19%) and kohlrabi (17%).

For Lao Cai City, the only vegetable products where a relatively higher share of households showed evidence of increasing consumption were for cai meo (25%) and other fresh and frozen vegetables (17%). For Son La City, larger shares of households reported increased consumption of cabbage (37%), broccoli (26%), cai meo (28%), green beans (29%), other fresh and frozen vegetables (25%), tomato (22%), kohlrabi (21%), susu leaves (21%), unfolded cabbage (21%), susu fruit (19%), mustards (19%), roots, e.g. sweet potato (19%) bok choy (18%) and chillies, shallots, onions and garlic (16%).

Decreased Consumption

A number of respondents (e.g. 21% in Hanoi and 15% in Lao Cai City and 30% in Son La City) indicated that they are consuming relatively *less bitter melon* compared to five years ago. This reduction in consumption may reflect changes in availability, the relative cost of bitter melon or perceptions about the quality of this product available for purchase.

Appendix to factsheet 9

Definitions and percentages used to generate graphs

Definitions of retail outlets

- *Hypermarkets and Supermarkets* (examples include Metro, Big C, Fivi Mart, Unimart, AC Mart).
- *Minimart* or convenience store (examples include 7-Eleven, Vinmart, Shop & Go, Circle K).
- *Specialty shops*: small sized shops with clear external billboards signalling the offer of certified safe, clean or organic foods (examples include Bac Tom, Big Green and Klever Fruit).
- *Online*: customers order food online and have their order delivered or prepared for collection.
- *Phone order*: customers order food over the phone and have their order delivered or prepared for collection.
- *Formal wet market*: a market formally established by the authorities.
- *Traditional family shop*: a small food shop run by a household that commonly sells processed foods and beverages.
- *A semi-permanent stand*: a retailer selling from a table, stand, cart, or stall that can be moved, but generally stays in one place during the day.
- *Informal street markets*: retailers sell to the public without having a permanent structure for the market.
- *Peddlers/mobile street vendors*: a retailer operating on foot, on a bicycle, or from a pick-up and sells both food and non-food items.

Table A1. Share (%) of monthly vegetable expenditure (per adult male equivalent) on different vegetables in Hanoi (n=702), Ho Chi Minh City (n=993), Lao Cai City (n=149) and Son La City (n=150), Vietnam.

Vegetables	Hanoi	Ho Chi Minh City	Lao Cai City	Son La City
Bitter melon	0.6	4.8	0.7	0.4
Bok Choy	3.4	2.7	5.1	5.6
Broccoli	5.7	6.7	2.1	3.2
Cabbage	10.0	5.3	9.8	11.7
Cai meo	0.9	0.6	10.9	10.3
Canned or dried vegetables	0.2	0.3	0.1	0.0
Carrots	2.8	4.4	2.7	3.0
Chillies, shallots, onions and garlic	7.9	8.8	5.6	7.2
Cucumber	5.4	5.7	2.8	2.1
Green bean	3.1	3.9	2.0	2.4
Khoi tu	0.0	0.1	0.9	0.2
Kohlrabi	6.8	1.7	8.0	7.2
Long bean	1.3	1.3	0.8	0.5
Mushroom	3.1	5.4	1.4	0.7
Mustards	5.7	8.2	7.1	7.9
Potato	9.1	4.6	4.6	4.7
Pumpkin	3.1	4.7	1.0	1.1
Roots	6.7	4.8	2.5	3.1
Spinach	0.9	4.5	0.8	0.1
Susu fruit & leaves ¹	2.9	1.3	8.6	14.4
Tomato	8.0	7.1	8.8	8.6
Unfolded cabbage	0.4	1.4	5.0	1.2
Water spinach	6.4	7.7	4.8	2.1
Other fresh and frozen vegetables	5.6	4.0	3.9	2.4

¹Note: Susu fruits are also known as chayotes and chokos; water spinach is also known as morning glory.

Table A2. Share (%) of monthly vegetable expenditures (per adult male equivalent) at retail outlet type in Vietnamese cities.

Outlets	Hanoi	Ho Chi Minh City	Lao Cai City	Son La City
Supermarket/hypermarket	2.1	12.7	0.3	0.0
Minimart	1.7	1.5	0.1	0.0
Specialty shop	0.2	0.2	0.0	0.0
Formal wet market	48.0	66.2	67.7	42.8
Traditional family shop	0.2	0.3	0.5	0.1
Semi-permanent stand	4.9	4.3	0.7	0.2
Peddlers	4.3	0.8	2.8	11.0
Informal street market	38.4	14.0	27.9	45.6
Other ¹	0.1	0.1	0.0	0.1

¹Note: 'Other' outlets include online shopping, phone orders and restaurants/cafes, etc.

Table A3. Share (%) of households that nominated the listed factors as important in purchase decisions for broccoli, cabbage, cai meo, susu leaves, tomatoes and water spinach in Hanoi (n=693) and Ho Chi Minh City (n=996), Vietnam.

Factors influencing choice	Hanoi						Ho Chi Minh City					
	Broccoli	Cabbage	Cai meo	Susu leaves ¹	Tomato	Water spinach	Broccoli	Cabbage	Cai meo	Susu leaves ¹	Tomato	Water spinach
Food safety	44.0	38.7	32.2	37.5	51.1	46.5	31.3	34.2	15.2	11.2	31.8	34.2
Freshness	20.8	30.3	18.0	26.4	15.4	16.5	29.1	30.2	8.8	10.3	34.3	31.7
Nutritional content	16.3	6.8	7.6	13.7	12.4	1.9	14.9	12.9	5.7	6.5	15.7	6.3
Easy to prepare	7.1	9.4	3.6	4.8	7.1	17.0	5.3	5.0	3.9	5.1	2.3	12.2
Taste	4.0	6.2	9.1	8.7	7.1	0.9	2.1	1.6	1.6	1.5	3.8	1.8
Price	0.4	1.3	0.1	0.1	0.4	0.3	6.9	7.3	2.2	2.5	3.8	4.6
Origin	6.1	5.9	6.3	6.6	4.6	10.1	4.2	4.7	1.6	1.6	2.3	2.8
Diversity	0.7	0.3	0.6	0.4	0.1	0.3	1.4	0.4	0.1	0.2	0.4	1.2
Brand	0.1	0.6	0.6	0.9	0.7	3.2	0.1	0.0	0.0	0.1	0.2	0.0
Production method (e.g. organic)	0.1	0.4	0.4	0.4	0.4	0.3	0.5	0.2	0.5	0.6	0.4	2.4
Grade, Class	0.1	0.0	0.1	0.1	0.3	0.1	0.4	0.5	0.1	0.0	0.2	0.6
Firmness/texture	0.0	0.0	0.0	0.1	0.0	3.0	0.1	0.0	0.0	0.0	0.1	0.1
Expiry date	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0
Appearance	0.0	0.0	0.0	0.0	0.1	0.0	0.3	0.4	0.1	0.1	0.4	0.2
Colour	0.0	0.0	0.0	0.0	0.1	0.0	0.5	0.5	0.3	0.2	3.7	1.4
Smell	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Variety	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1
Package size	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.2	0.0
Other labelling info	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0
Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Never purchased this item	0.0	0.0	21.2	0.0	0.0	0.0	2.7	1.7	59.5	59.7	0.2	0.1

¹Note: Susu leaves are also known as chayote or choko leaves or shoots; water spinach is also known as morning glory.

Table A4. Share (%) of households that chose each of the listed factors as the most important influence in their decision in to buy broccoli, cabbage, cai meo, susu leaves, tomato and water spinach in Lao Cai City (n=152), Son La City (n=152), Vietnam.

Factors influencing choice	Lao Cai City						Son La City					
	Broccoli	Cabbage	Cai meo	Susu leaves ¹	Tomato	Water spinach	Broccoli	Cabbage	Cai meo	Susu leaves ¹	Tomato	Water spinach
Food safety	67.1	47.4	62.5	61.2	65.8	63.2	52.0	38.2	53.9	58.6	61.2	64.5
Freshness	27.0	36.2	26.3	26.3	28.3	27.6	31.6	41.4	28.9	27.6	29.6	21.1
Nutritional content	3.9	4.6	5.3	7.9	2.6	2.0	10.5	11.8	10.5	10.5	5.9	8.6
Easy to prepare	0.7	2.6	3.3	1.3	2.0	4.6	3.9	3.3	1.3	2.0	0.0	3.9
Price	0.0	0.0	0.7	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Origin	0.0	4.6	1.3	0.0	0.0	0.7	0.7	3.3	1.3	0.0	2.0	0.0
Taste	0.0	1.3	0.0	2.0	0.0	0.7	1.3	1.3	3.3	0.7	1.3	0.7
Brand	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Production method (e.g. organic)	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Diversity	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.7
Grade, Class	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Firmness/texture	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Expiry date	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Appearance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Colour	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Smell	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Variety	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Package size	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other labelling info	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Never purchased this item	1.3	2.0	0.7	0.7	0.7	0.7	0.0	0.7	0.7	0.7	0.0	0.7

¹Note: Susu leaves are also known as chayote or choko leaves or shoots; water spinach is also known as morning glory.

Table A5. Share (%) of monthly vegetable expenditure (per adult male equivalent) on different vegetable products by income group in Hanoi (n=702), Ho Chi Minh City (n=993), Lao Cai City (n=149) and Son La City (n=150), Vietnam.

Income groups ¹	Bitter melon	Bok choy	Broccoli	Cabbage	Cai meo	Carrots	Chillies, shallots, onion, garlic	Cucumber	Green & long beans	Khoi tu	Kohl-rabi	Mush-rooms	Must-ards	Potato & Roots	Pum-pkin	Spinach	Susu fruit & leaves ²	Tomato	Other ³
Hanoi																			
Low	0.4	3.4	5.5	12.1	0.5	2.6	7.9	7.4	5.0	0.0	7.8	0.8	4.8	14.2	2.7	7.0	3.3	8.1	6.4
Low-Middle	0.6	3.5	5.7	11.0	1.0	2.7	8.0	4.9	4.9	0.0	7.0	2.1	5.9	15.5	3.0	7.7	3.0	7.6	5.8
Middle-High	0.6	3.4	5.8	10.3	0.8	2.5	7.9	5.5	3.9	0.0	6.3	3.8	5.5	16.4	3.2	7.1	2.8	8.1	6.0
High	0.8	3.4	5.5	9.4	1.1	3.5	7.5	5.3	4.2	0.0	7.2	4.0	6.1	15.6	3.1	7.0	2.8	8.6	5.0
Ho Chi Minh City																			
Low	4.9	2.1	6.4	7.0	0.1	4.3	8.8	6.5	5.1	0.0	1.1	6.8	7.7	8.4	4.8	11.4	1.1	6.7	6.7
Low-Middle	4.4	2.7	6.6	7.3	1.0	4.0	9.2	5.2	4.9	0.1	1.5	4.8	8.8	8.8	5.0	13.3	1.2	6.8	4.4
Middle-High	4.8	2.8	6.9	6.7	0.6	4.5	8.7	5.8	5.5	0.1	1.8	5.0	8.3	9.4	4.6	12.1	1.4	6.9	4.2
High	5.2	3.0	6.8	5.6	0.3	4.8	8.6	5.8	5.1	0.1	1.9	6.4	7.2	10.5	4.3	11.6	1.5	7.7	3.7
Lao Cai City																			
Low	0.2	4.8	1.0	18.4	13.7	2.5	4.6	1.3	2.1	0.3	9.0	0.3	9.1	4.4	0.3	3.4	8.2	11.2	5.2
Low-Middle	0.6	5.7	2.2	14.2	11.3	3.2	5.0	2.9	2.4	0.8	8.9	1.1	7.0	6.8	1.0	5.8	7.5	8.3	5.6
Middle-High	1.3	4.5	2.9	12.8	9.0	1.9	6.6	3.9	3.9	1.6	6.2	2.7	6.0	8.6	1.6	7.4	9.3	8.1	1.7
High	0.2	6.0	2.4	14.4	7.3	4.7	8.1	2.2	3.2	0.6	7.8	0.3	6.0	11.2	0.1	4.0	14.5	6.7	0.5
Son La City																			
Low	0.8	4.6	3.2	14.1	11.2	2.6	6.9	1.8	2.2	0.3	8.8	1.7	9.2	5.3	1.3	3.8	11.6	8.7	2.0
Low-Middle	0.3	4.2	3.4	13.4	11.4	2.9	6.3	2.0	3.3	0.0	7.0	0.5	6.7	8.5	0.6	1.7	14.8	9.2	3.6
Middle-High	0.1	9.0	2.1	12.2	9.4	3.2	6.4	1.4	2.1	0.6	7.2	0.1	9.8	7.1	1.1	2.2	17.4	6.9	1.7
High	0.3	4.1	5.8	8.2	5.7	3.7	14.5	5.1	5.0	0.0	3.4	0.1	4.1	13.9	3.2	0.9	11.0	10.5	0.4

Notes: ¹Information about income groups is available in Table A8. ²Susu leaves are also known as chayote or choko leaves or shoots. ³'Other' includes canned vegetables, dried and processed.

Table A6. Share (%) of households who purchase [vegetable] who stated they are buying relatively 'less', a similar amount ('same') or 'more' of the [vegetable] compared to five years prior to the survey (i.e. compared to 2011) in Hanoi (n=702) and Ho Chi Minh City (n=993), Vietnam.

Vegetables	Less	Same	More	Less	Same	More
	----- Hanoi -----			----- Ho Chi Minh City -----		
Bitter melon	21.1	65.1	13.8	14.5	73.6	11.9
Bok choy	9.5	84.8	5.7	5.0	83.5	11.5
Broccoli	13.0	77.3	9.7	12.3	72.8	14.8
Cabbage	2.4	75.9	21.7	12.2	74.3	13.5
Cai meo	7.4	72.5	20.1	9.9	85.9	4.2
Carrots	6.8	83.8	9.5	10.2	73.5	16.2
Chillies, shallots, onion and, garlic	1.9	85.2	13.0	3.3	76.0	20.7
Cucumber	8.2	82.8	8.9	10.7	69.6	19.7
Green bean	10.3	80.6	9.0	10.2	75.7	14.1
Khoi tu	0.0	0.0	0.0	35.3	64.7	0.0
Kohlrabi	5.0	78.1	16.8	23.0	70.6	6.4
Long bean	24.9	73.1	2.0	14.7	75.8	9.5
Mushroom	15.0	73.0	12.0	8.1	70.5	21.3
Mustards	6.9	80.6	12.5	7.6	73.0	19.5
Potato	5.2	83.5	11.2	13.5	73.7	12.7
Pumpkin	10.2	81.6	8.3	7.8	75.7	16.5
Roots	12.4	76.1	11.5	12.8	73.5	13.7
Spinach	6.3	47.7	45.9	8.3	72.2	19.4
Susu fruit	12.2	80.2	7.6	16.5	77.3	6.1
Susu leaves ¹	12.9	76.7	10.3	39.5	60.5	0.0
Tomato	0.9	80.3	18.8	11.0	67.5	21.4
Unfolded cabbage	14.9	77.6	7.5	12.1	81.6	6.3
Water Spinach ²	5.5	82.2	12.3	10.4	65.5	24.2
Canned or dried vegetables	7.7	88.5	3.8	7.0	76.7	16.3
Other vegetables	2.9	83.5	13.6	5.8	71.5	22.7

Notes: ¹Susu leaves are also known as chayote or choko leaves or shoots; ²Water spinach is also known as morning glory.

Table A7. Share (%) of households who purchase [vegetable] who stated they are buying relatively 'less', a similar amount ('same') or 'more' of the [vegetable] compared to five years prior to the survey (i.e. compared to 2011) in Lao Cai City (n=149) and Son La City (n=150), Vietnam.

Vegetables	Lao Cai City			Son La City		
	Less	Same	More	Less	Same	More
Bitter melon	14.8	85.2	0.0	30.0	60.0	10.0
Bok choy	8.4	81.3	10.3	0.0	81.9	18.1
Broccoli	14.5	80.7	4.8	6.9	66.7	26.4
Cabbage	5.6	82.4	12.0	2.4	60.2	37.4
Cai meo	3.9	70.5	25.6	0.8	71.0	28.2
Carrots	9.1	86.9	4.0	7.4	78.7	13.8
Chillies, shallots, onion and garlic	1.5	91.1	7.4	5.5	78.1	16.4
Cucumber	3.6	94.0	2.4	5.5	80.0	14.5
Green bean	7.9	85.7	6.3	0.0	71.2	28.8
Khoi tu	4.0	88.0	8.0	33.3	66.7	0.0
Kohlrabi	1.4	87.8	10.8	0.0	78.3	21.7
Long bean	16.1	83.9	0.0	5.6	94.4	0.0
Mushroom	24.3	73.0	2.7	12.5	81.3	6.3
Mustards	5.3	84.0	10.7	2.0	78.6	19.4
Potato	5.1	91.8	3.1	5.5	81.3	13.2
Pumpkin	6.0	94.0	0.0	6.5	91.3	2.2
Roots	8.0	89.7	2.3	7.9	72.4	19.7
Spinach	11.4	88.6	0.0	0.0	100.0	0.0
Susu fruit	12.5	77.8	9.7	2.0	78.8	19.2
Susu leaves ¹	4.7	85.9	9.4	0.0	79.1	20.9
Tomato	6.3	79.6	14.1	2.2	75.5	22.3
Unfolded cabbage	11.5	73.6	14.9	0.0	78.9	21.1
Water Spinach ²	5.1	88.9	6.0	6.6	88.5	4.9
Canned or dried vegetables	0.0	100.0	0.0	50.0	50.0	0.0
Other vegetables	17.1	65.7	17.1	0.0	75.0	25.0

Notes: ¹Susu leaves are also known as chayote or choko leaves or shoots; ²Water spinach is also known as morning glory.

Table A8. Share (%) of monthly vegetable expenditure (per adult male equivalent) at type of retail outlet by income group in Hanoi (n=702), Ho Chi Minh City (n=993), Lao Cai City (n=149) and Son La City (n=150), Vietnam.

Income group ¹	Supermarket	Minimart	Specialty shop	Formal wet market	Traditional family shop	Semi-permanent stand	Peddlers	Informal street market	Other ²
Hanoi									
Low	1.0	0.3	0.0	31.8	0.0	13.4	10.4	43.0	0.1
Low-Middle	14.9	2.4	0.6	36.0	3.2	9.4	3.8	29.7	0.1
Middle-High	3.1	2.6	1.3	39.9	4.1	11.6	6.9	30.0	0.5
High	7.5	5.0	0.9	36.8	3.9	10.4	6.1	28.9	0.5
Ho Chi Minh City									
Low	15.9	0.8	0.0	51.8	0.0	10.0	3.3	18.2	0.0
Low-Middle	21.6	7.8	0.3	49.6	4.5	5.5	0.8	9.9	0.0
Middle-High	8.5	2.5	0.4	25.4	3.5	53.4	1.2	5.1	0.0
High	25.7	2.9	0.1	29.4	6.2	24.4	0.7	7.6	2.9
Lao Cai City									
Low	0.0	0.7	0.0	64.1	10.2	0.0	5.1	19.9	0.0
Low-Middle	4.8	0.0	0.0	55.6	5.9	7.2	3.7	22.8	0.0
Middle-High	0.0	0.0	0.0	49.3	1.9	4.0	3.6	41.1	0.0
High	0.0	0.0	0.0	88.6	0.0	0.0	2.7	8.6	0.0
Son La City									
Low	0.0	0.0	0.0	29.2	2.2	5.5	9.1	53.9	0.0
Low-Middle	0.3	0.0	0.0	39.5	5.9	6.1	9.1	33.7	5.5
Middle-High	0.0	0.1	0.1	30.2	3.5	0.5	15.3	50.4	0.0
High	0.0	0.0	0.0	78.2	0.0	6.4	11.9	3.5	0.0

Notes: ¹Information about income groups is available in Table A9; ²'Other' outlets include online shopping, phone orders and restaurants/cafes, etc.

Table A9. Share (%) of households in each gross monthly income group in Hanoi Ho Chi Minh City, Lao Cai City and Son La City, Vietnam.

Income group	Household gross monthly income (VND)	Household gross monthly income (USD) ⁺	Percent of households [#]			
			Hanoi	Ho Chi Minh City	Lao Cai City	Son La City
Low income	1.5 to 4.5 million	67.29 to 201.88	6.7	7.2	18.8	26.0
Low-Middle income	4.5 to 7.5 million	201.89 to 336.46	32.1	30.3	40.3	44.0
Middle-High income	7.5 to 15 million	336.47 to 672.92	40.6	41.4	34.9	21.3
High income	≥ 15 million	≥ 672.93	20.7	21.1	6.0	8.7

⁺Based on exchange rate of 1 USD = 22,291 VND from 1 December 2016; [#]Sample includes only those households that answered all questions about expenditure, Hanoi n=702, Ho Chi Minh City n=993, Lao Cai City n=149 and Son La City n=150.