

**Sustainable Development of Peri-urban Agriculture in South-east Asia (Susper)
Kingdom of Cambodia, Lao PDR, Vietnam RS**

**VEGETABLE CONSUMPTION BEHAVIOUR
IN VIETNAM**

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Project N°00005600 funded by Ministry of Foreign Affairs of France, and implemented by:

- Asian Vegetable Research and Development
- Centre de coopération Internationale de Recherche Agronomique pour le Développement (CIRAD)
- Department of Agriculture, Ministry of Agriculture & Forestry, Lao PDR
- Department of Agronomy and Agricultural Land Improvement, Ministry of Agriculture, Forestry & Fisheries, Kingdom of Cambodia
- Research Institute of Fruit and Vegetable, Vietnam

April 30, 2003

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ABSTRACT

Within the scope of the SUSPER project, an analysis of vegetable consumption was carried out in 2002. It dealt with both the quantitative (evolution of consumed quantities) and qualitative aspects (medical risks associated with vegetable consumption) of vegetable consumption.

With nearly 6 million tons consumed per year, vegetables represent in volume the second foodstuff in Vietnam after rice. The total increase in consumption results both from population growth (2% per year) and individual consumption increase (54 kg/capita/year).

However, the value of consumed vegetables represents less than 5% of the total food consumption value.

The consumption of vegetables is higher for urban consumers than for rural consumers (+17%), and increases in proportion to household income.

Vegetables constitute a major component of Vietnamese cooking. Cooking techniques seem to be changing, however, especially in urban areas. This is because vegetables are increasingly served with meat (the consumption of which is also increasing) or in meals prepared by street restaurants.

Another important point is that 88.5% of all Hanoi residents interviewed considered vegetables to be a health hazard due to the increasing use of agrochemical input. This fact does not seem to affect vegetable consumption because vegetables are thought of as having high nutritional qualities. Consumers also put their faith in their own practices when it comes to choosing and preparing vegetables in order to avoid health risks.

INTRODUCTION

Within the scope of the SUSPER project, an analysis of vegetable consumption was carried out in 2002. It dealt with both the quantitative aspects (evolution of consumed quantities) and qualitative aspects (medical risks associated with vegetable consumption) of vegetable consumption.

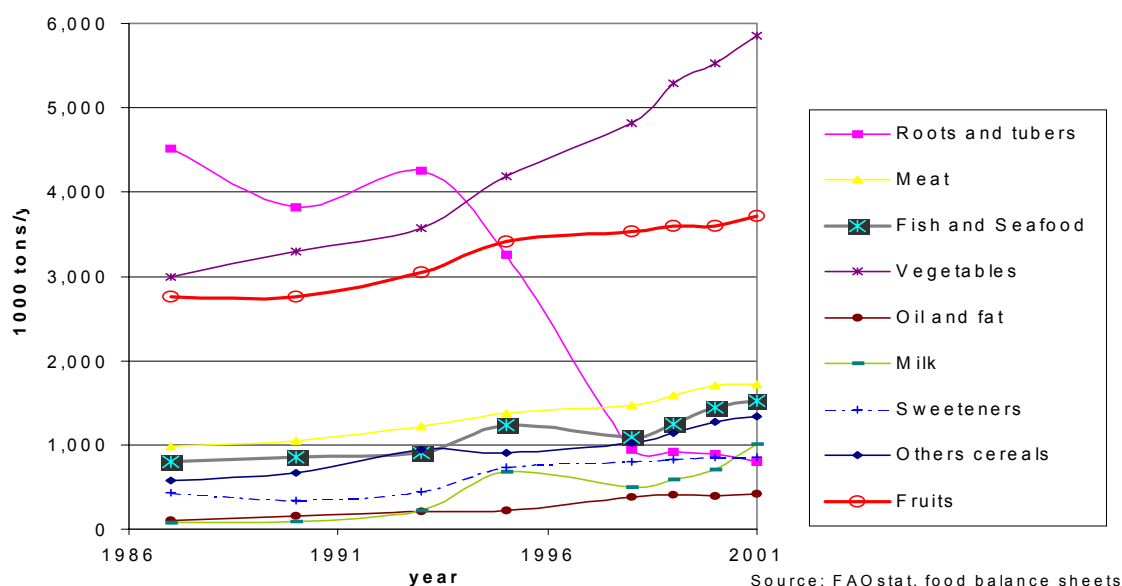
I – VEGETABLE CONSUMPTION IN VIETNAM

A – CONSUMPTION ON A NATIONAL SCALE

With nearly 6 million tons consumed per year, vegetables (excluding potatoes and sweet potatoes) represent the second most consumed foodstuff in Vietnam after rice (more than 13 million tons consumed per year¹). During the last fifteen years, vegetable consumption has increased together with general foodstuff consumption, with the exception of roots and tubers (Figure 1). This total consumption increase is the result of population growth (approximately 2% per year) and an increase in individual consumption.

Figure 1 –Food Consumption Trends in Vietnam

(Quantities consumed in 1,000 tons per year throughout the country between 1987- 2000)



¹ Food balance sheets, Vietnam. FAO and MADR

B – PER CAPITA CONSUMPTION

Several sources, such as the consumption surveys carried out by the National Institute of Nutrition (NIN) and those carried out by the General Statistics Office (GSO) allow for evaluation of individual consumption in Vietnam. The comparison of different data sources is not always easy due to different methodologies and food categorization. However, the data reveals clear trends (Table 1).

Table 1 – Individual consumption of various foodstuffs

Sources: National Institute of Nutrition (NIN), Vietnamese Living Standard Survey (VLSS-GSO), and Food balance sheet (Food and Agriculture Organization/Ministry of Agriculture and Rural Development)

Source	NIN 1987	NIN 2000	VLSS 92-93	VLSS 97-98	FAO 1987	FAO 1993	FAO 1998	FAO 2000
Kg/capita/year								
Rice	164.83	145.01	153.26	150.36	105.5	161.3	170.4	174.3
Other staple food in rice equivalent			14.5	9.72				
Other cereals	22.7	5.84			9.4	13.4	13.6	16.4
Roots and tubers	30.71	14.78			73	60.5	12.5	11.4
Tubers and roots	13.72	3.25			35.7	28.4	1.8	1.8
Vegetable tubers	16.98	11.53			37.3	321	10.7	9.6
Leafy vegetables	45.5	53.66			48.4	50.8	63.9	71.2
Vegetables and beans			28.63	37.44				
Beans and pulses	1.02	2.91			2.1	2.4	2.8	3
Fruits	1.49	22.76	22.55	17.76	44.6	43.4	46.8	46.3
Meat	8.91	18.63	9.61	14.04	16	17.3	19.5	21.9
Fish and seafood	18.23	19.20	13.41	13.56	13	129	14.4	18.5
Oil and fat	1.10	2.47	1.36	3.96	1.6	29	5.1	5
Eggs and milk	1.07	3.75			2.7	4.6	8.4	11.2
Milk			0.41	0.6	1.3	3.2	6.7	9.1
Eggs					1.4	1.4	1.7	2.1
Eggs (number)			14.8	28.2				
Tofu	2.48	4.48	3.02	4.8				
Sugar and sweeteners			2.66	4.2	7	6.3	10.6	11
Sugar			0.29	2.9				

The individual consumption of leafy vegetables (water spinach, mustard, lettuce, amaranth, ceylon spinach, etc.) has increased steadily to reach about 54 kg/capita/year in 2000, according to the data supplied by NIN. In comparison, vegetable consumption in France was 51.5 kg/adult/year in 1999.

According to a study conducted by IFPRI (2002) this increase is accompanied by an increase in the diversity of consumed varieties. Despite large quantities, the value of consumed vegetables does not exceed 71,000 VietnamDong (VND)/capita/year (GSO, VLSS 97-98)², which is around 5 dollars/ capita/year.

² In 1998, 1 dollar = 14,000 Vietnam Dong (VND)

And even if this value has increased (from 48,000 VND in 1993), there is no increase in the relative share of overall consumption. The contrary is true: vegetables represented only 4.7% of the food consumption value in 1998 (evaluated at 1,520,000 VND/capita/year, around 108 dollars, in 1998) and 6.4% in 1993.

Table 2 – Evolution and share of vegetables in food consumption (according to the data of GSO, VLSS 92-93 and 1997-98, thousands of Vietnamese Dong, in current prices.³)

	Urban'93	Urban'98	Rural '93	Rural '98	Total '93	Total '98
Vegetable and bean, kg/capita/year	32,51	43,32	27,66	35,56	28,63	37,44
Vegetable and bean, VND/capita/yr	74	106	42	61	48	71
Total value of food consumption	1,110	2,321	657	1,305	747	1,520
% value of vegetable /total value	6.7	4.6	6.4	4.7	6.4	4.7

About 43% of the fruits and vegetables consumed by Vietnamese households are produced at home (IFPRI 2002).

C – DIFFERENCES IN HOUSEHOLD CONSUMPTION

However, these average figures of consumption hide certain differences. A more detailed examination of the data - be it in urban or rural areas, in different regions or in households of different social economic levels - tells a different story.

1. RURAL/ URBAN AREAS

The comparison of the food consumption structure between rural and urban populations shows that urban vegetable consumption was noticeably higher than in rural households in 1998: 43 kg and 37 kg /capita/year, respectively (GSO, Table 2).

However, in the case of Hanoi, Quang (Quang 1999) shows that based on data supplied by NIN, vegetable consumption in the Capital is higher than the urban average and that it is on the decrease: 73 kg/capita/year in 1984 as against 66.5 kg/capita/year in 1995.

³ In 2002, 1 dollar= 14,300 VND

2. REGIONAL DIFFERENCES

The value of consumed vegetables also varies between areas: from 47,220 VND/capita/year in the Northern Mountains to 126,500 VND/capita/year in the Southeast (GSO, table 3). But, vegetables still represent a small share of total food consumption in monetary value (from 3.9 to 5.7%).

Table 3 – Vegetable consumption in different areas, from survey data VLSS 1997/98, GSO

Regions	Southeast	Red River Delta	Mekong River Delta	Central Coast	Northern Uplands	North Central	Central Highlands	
Value of consumed vegetables VND/cap/an	71,000	126,500	65,000	73,170	80,520	47,220	46,850	56,130
Share of vegetables in food consumption %	5.00%	5.0%	4.1%	5.0%	5.7%	3.8%	3.9%	4.7%

A study conducted by IFPRI (from GSO data) indicates that fruit and vegetable consumption patterns are influenced by local production patterns. Examples are beans and kohlrabi, which are more widely consumed in the North than in the South.

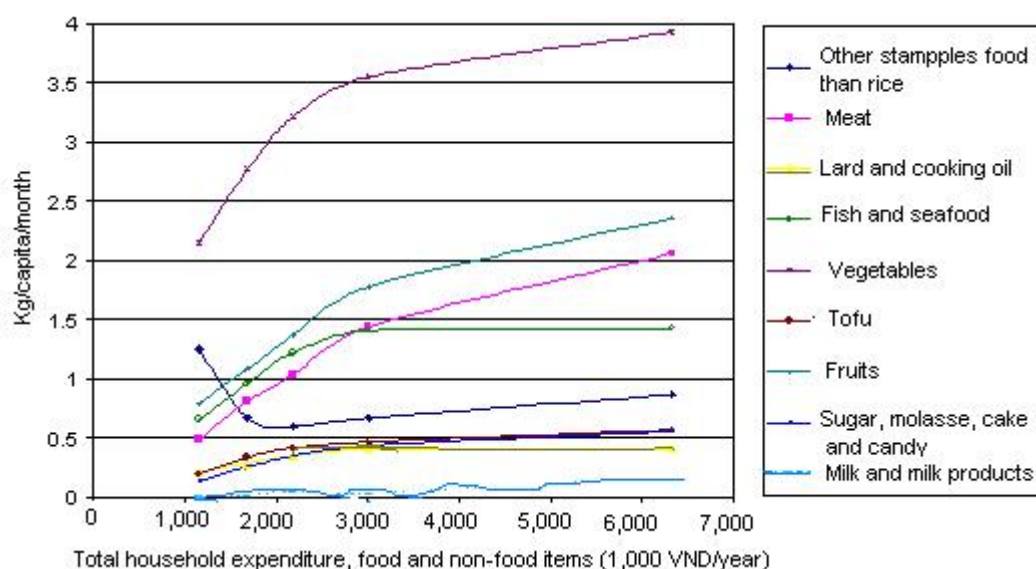
The same study shows that from a comparison between 1993 and 1998 VLSS, fruit consumption had increased in the North at the expense of vegetable consumption. At the same time, vegetable consumption had increased at the expense of fruits in the Mekong Delta.

3. DIFFERENCES ACCORDING TO INCOME LEVELS

A calculation of the level of consumption of various products compared to total household expenditure gives an approximation of consumption elasticity compared to income⁴ (Figure 2).

⁴ The VLSS divided the households into five equal groups corresponding to five total expenditure brackets. The first group corresponds to the 20 % of households having the lowest income (1,148,000 of VND/capita/year). The fifth group corresponds to the 20 % of households having the highest income (6,325,000 of VND/capita/year). We have used the average consumption of each household group.

Figure 2 – Food consumption and total expenditure of Vietnamese households (according to the survey's data VLSS 97-98, GSO)



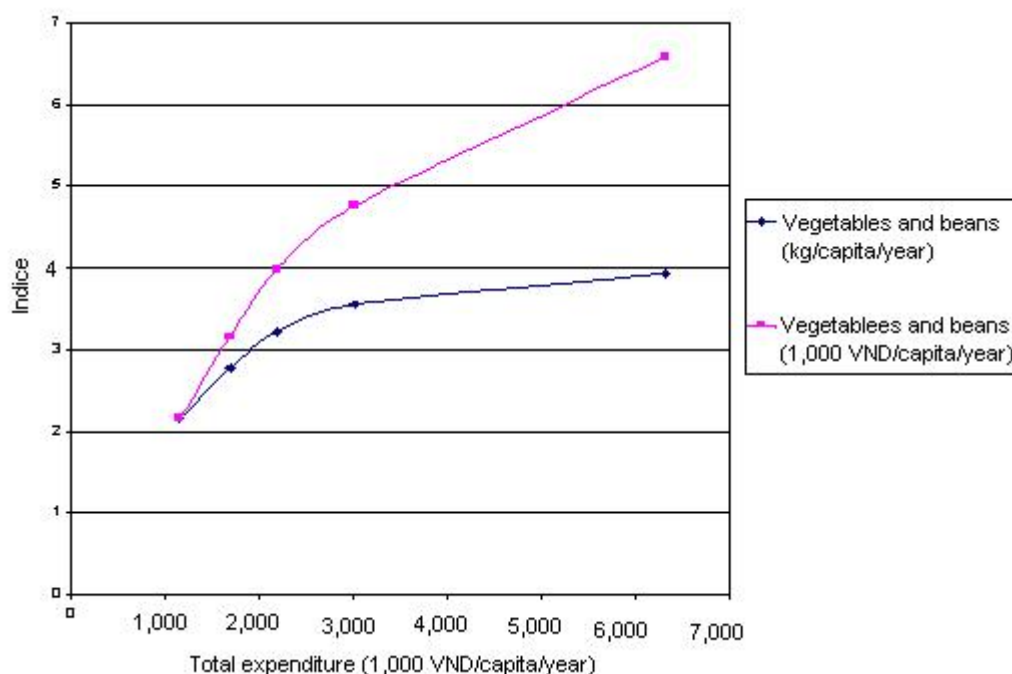
The quantity of vegetables consumed increases with household incomes. The situation is similar for other products, except the “cereal group (rice and starches not included)”.

More precisely, we note that up to the fourth group of total expenditures, which represents 80% of the population, a significant increase takes place in vegetable consumption and on a smaller scale, an increase in fruits, fish, shrimps, sea food products and meat (which we can describe as "superior products").

The consumption differences between the fourth and the fifth groups reveal a deceleration of the consumption growth curve for the majority of products (with a clear "saturation" of fish, shrimps and sea food products), rice (not on the graph), tubers and other cereals constituting exceptional cases. Indeed, Krowolski (1993) shows that when incomes increase, root and tuber consumption decreases, as rice consumption increases, followed by a reduction in rice as consumption of other cereals such as wheat, increases. The sensitive relationship between vegetable consumption and income varies according to species: an IFPRI study points out that for some products like kohlrabi and water spinach, the demand is less sensitive to income growth.

If we analyze the differences between these groups, not in consumed quantities but in monetary value, we see that consumption value increases more sharply than quantity when incomes go up. Figure 3 presents a comparison of the quantities and the value of vegetable consumption per capita while bringing the curves to an index to highlight the data.

**Figure 3 – Household expenditures on Vegetable consumption in terms of food and non-food
(sources: Our calculations, based on VLSS 97-98, GSO data)**



We note that consumption value definitely rises more quickly than the quantity starting with the second quintile. These differences in consumption mean that wealthier households buy products that are more expensive because they substitute, within the same product range, inexpensive food for more expensive alternatives⁵

II - SUPPLY AND USE OF VEGETABLES BY THE CONSUMERS

A - THE IMPORTANCE OF VEGETABLES IN VIETNAMESE CULINARY HABITS

Vegetables constitute a major component of Vietnamese food. In periods of shortage, they constitute, with rice or tubers, the food base. During the wars, wild vegetables gathered in paddy fields often replaced cultivated vegetables. In addition, although these vegetables have disappeared today from delta areas with the disappearance of fallow fields, this practice allowed the Vietnamese people to survive many periods of food shortage.

⁵ These differences cannot be explained by merely noting that the rich are likely to go shopping where products are more expensive. There are proportionally more wealthy people in urban areas than in rural ones because household expenditures have been adjusted to consider regional price fluctuations as shown in the survey VLSS.

In Vietnamese cooking, vegetables are generally consumed boiled, salted, fermented, sautéed or raw. When vegetables are served either sautéed or raw they often accompany with richer dishes, which indicate a relative abundance of food (Box 1, Krowolski and Simon-Barouh 1993).

Box 1 – Use of vegetables in Vietnam (Krowolski and Simon-Barouh, 1993).

Vegetables are boiled, drained to be consumed with brine, fish or soy sauce, or are used in their cooking water as soup. Some vegetables (carrots, turnips, cucumber, etc) are prepared salted (*muôi*), often desiccated first. Others (cabbages, eggplants, beans, mustard leaves, etc) are fermented to make tangy products (*dua*) like a kind of sauerkraut, etc.

Raw vegetables (*rau song*) are presented alone, like water spinach, or very often in bunches of mixed aromatic combinations such as; green salad leaves, mustard leaves, mung bean germs, cucumber slices, are served with all kinds of "fragrant herbs" (*rau thom*): mint, coriander, knot-grass, basil, perilla as well as garlic leaves and finally Welsh onion. These plants accompany boiled or roasted meat, fried fish or fish simmered with brine; their presence on the table thus always reflects a relative abundance of food. The shortage of meat or fish is very often accompanied by the disappearance of raw vegetables and instead people often eat boiled or salted vegetables. When vegetables are sautéed they are often associated with meat, fish or shellfish.

Herbs have the role of condiment: Welsh onion, coriander, pepper, garlic, ginger, turmeric. Meat is often associated with one specific spice, with the aim of respecting the Ying/Yang balance (Manh, in Poulain 1997). Thus, brooded duck eggs are associated with odorous knotgrass, buffalo meat with garlic, dog meat with galangal.

B – STREET MARKETS: THE MAIN RETAIL POINT

Consumers buy mainly fresh vegetables, and on a smaller scale salted or fermented vegetables, at street markets. The vegetables constituting a salad base (green salad, mustard sheets, mung bean, etc.) are sold in mixtures and in handfuls. Buyers are generally faithful to one or two retailers in the market from whom they buy their vegetables daily. It is estimated that in Hanoi, stores and supermarkets sell less than 2% of all fresh vegetables (Tan Loc 2002). The supermarkets mostly sell tomatoes, cabbages, salads, cucumbers, "choysum", Yard-long bean, Chinese cabbages and water spinach at double or triple the price found in the markets. They are generally known as "clean" vegetables coming from cooperatives which have been certified by the Hanoi People's Committee and mandated to produce high quality vegetables based on controlled use of agrochemical input and better irrigation water. These supermarkets are especially busy over the weekend and their clientele is often local.

A range of canned vegetables are available in supermarkets but do not seem to be a popular item. Most are domestic, except for canned tomato products, which are often from Thailand or elsewhere. Frozen vegetables are available in a few supermarkets, but they are not widely consumed in Vietnam (IFPRI, 2002).

III – QUALITY EXPECTATIONS OF CONSUMERS

A – VEGETABLE QUALITY EXPECTATIONS

In 2000, a study was carried out by Emma Bridier, (Bridier 2000), concerning consumers' perception of vegetable quality in Hanoi. The study showed that the quality standards of "a good vegetable" for the consumers in Hanoi are:

Beautiful appearance, freshness, taste, tenderness, size. On the other hand, some consumers look for vegetables with imperfections, even with insects, giving them the impression that these vegetables were not overly sprayed.

Clean, healthy, good nutritional quality. Locally grown, during the main season, in a healthy environment, with only a reasonable use of agrochemical input.
Well-preserved, well-packed, good price.

We took Bridier's research one step further with a survey carried out in Hanoi, in July and August 2002 at the Institute of Sociology of the Vietnam National Center for Social Sciences and Humanities. This survey studied consumers' perception of food health risks. It was conducted in 200 sample households in the urban area of Hanoi, between July and September 2002. People interviewed were mainly female (83% of the sample group), persons responsible for food purchase (89.5%) and for domestic meal preparation (83.5%). The families were made up on the average of 4 to 5 people and had an average monthly income of a little higher than 445,000 VND per person, less than 30 dollars per person per month.

We note that this figure was probably under-estimated by the interviewees, when we compare it to the national urban average of 832,500 VND per person and per month, GSO 2002. In addition, ten in-depth interviews completed this survey.

This survey did not focus especially on vegetables or peri-urban agricultural products, but rather on food risks in general. In this way, we were able to avoid the 'halo effect' of over-exaggeration by the interviewee on subjects, which are perceived to be of concern to the interviewer.

B – CONSUMER PERCEPTION OF VEGETABLE QUALITY: AN UNSAFE PRODUCT

1 – UNSAFE FOODSTUFFS

Answering the question "Mention three foodstuffs which are, according to you, the most dangerous for consumer's health", consumers topped the list with "vegetables" (88.5% of the interviewees), followed by meat (69.5%), fruits (46%) and fish (37%). Concerning species, they mentioned primarily:

A. Water spinach (*Ipomea aquatica*, 46.5% of the interviewees)

B. Rau cai (40%). "Rau cai" represents a rather vast family of vegetables, belonging to the genus *Brassica* *Raphanis* and *Nasturtium*.

C. Following at a distance are the Yard-long bean (*Vigna sesquipedalis*, 9.5%) and cucumber (*Cucumis sativum*, 6%).

TABLE 4 – RAU CAI

Vietnamese name	Latin name	English name	French name	Preparation	Importance of consumed quantities
Cai xanh	<i>Brassica juncea</i>	Leaf mustard, Indian mustard, Chinese mustard	Moutarde indienne, moutarde de Chine	Sautéed, boiled or served in soup	++
Cai ngot	<i>B.rapa, groupe Choysum</i>	Choysum	Choysum	Sautéed, boiled	++
Cai bap	<i>B. oleracea, groupe Headed Cabbage</i>	Headed cabbage	Chou pommé, chou cabus	Sautéed, boiled or fermented	++
Cai cu	<i>Raphanus, Sativus L.</i>	Radish	Radis	Fermented sheets Tubers:fermented/served in soup	+
Cai xoong	<i>Nasturtium officinale</i>	Water cress	Cresson d'eau	Boiled or sautéed	+
Cai be/ cai dua			Chou champêtre	Fermented	+
Cai bao	<i>B.rapa, groupe Chinese cabbage</i>	Chinese cabbage, Peking cabbage, petsai	Chou chinois		-
Cai lan	<i>B. oleracea, groupe Kale</i>	Chinese kale, chinese broccoli	Brocoli de Chine, chou vert de Chine	Boiled	-

2 – FEAR OF AGROCHEMICAL INPUT

The risks associated with vegetable consumption by consumers reveal that the main concerns of consumers are the use of chemical products in agriculture. Indeed, in 172 answers concerning vegetable, the use of pesticides was mentioned as the main concern in 143 cases (81% of the cases). In addition, other less accurate references have shown concern over the presence of chemical products and "growth stimulants" (24 answers). Followed by "too much fertilizer" or the use of "human fertilizer" (12 answers).

The presence of chemical residue is clearly a major consumer concern. Bacteriological contamination was rarely and indirectly mentioned, as we can see from the reference to the use of human fertilizer (4 interviewees). These results confirm Bridier's research (Bridier, 2000) on the perception of vegetable quality by Hanoi consumers. The same fear of agrochemicals appeared in the answers relating to other "dangerous" products (meat, fruits and fish). Consequently, 91% of the interviewees referred to the use of chemical products in both production and preservation as a food health risk.

C – PERCEIVED FOOD HEALTH RISKS

This section will present the risks associated with total food consumption.

1 – MEAL AND FOOD QUALITY

If a majority of consumers estimate that quality of their meals has improved (91% of the interviewees, Table 5), they don't have the same opinion about the quality of the products currently available at the market (Table 6).

Table 5: “Do you think that over the last ten years, your meal quality?”

	Has improved	Has decreased	Has not changed.	No idea.	Total
Number of people giving this answer	187	2	10	1	200
% of people giving this answer	93.5	1	5	0.5	100

Table 6: “Do you think that in the last 10 years, the quality of marketed foodstuffs in general ?”

	Has improved	Has decreased	Has not changed	No ideas	Total
Number of people giving this answer	71	112	12	5	200
% of people giving this answer	35.5	56	6	2.5	100

This perceived improvement in meal quality is a result of product abundance and greater diversity. We must also not forget the fact that until 1986 ration tickets were in use.

2 – POTENTIAL HEALTH RISKS

Perhaps because of this perceived decrease in quality, 65% of the interviewees estimate that foodstuffs are no longer safe (Table 7). Nearly 90% of interviewees believe food may do serious negative effects on health (Table 8).

Table 7 – “In your opinion, in general, do foodstuffs present health risks today?”

	Not at all	Not really	Rather more dangerous	Completely dangerous	No ideas	Total
Number of people giving this answer	2	65	117	7	9	200
% of people giving this answer	1	32.5	58.5	3.5	4.5	100

Table 8 – “Concerning possible risks of illness caused by consumption of these products, do you think that ?”

	They do not have serious effects on health	They can have serious effects on health	No ideas	Total
Number of people giving this answer	21	179	0	200
% of people giving this answer	10.5	89.5	0	100

3 – INDIVIDUAL PROTECTION

Nevertheless, this apparent concern is mitigated by the fact that 47.5% of the interviewees thought they could more or less protect themselves (Table 9).

Table 9 – “Concerning the possible risks of illness caused by the consumption of these products, do you think that...”

	Number of people giving this answer	% of people giving this answer
Consumers can completely protect themselves from these risks	7	3.5
Consumers can somewhat protect themselves from these risks	88	44
Consumers can protect themselves from these risks only in part	92	46
Consumers have no means to protect themselves	6	3
No ideas, no answer	7	3.5
Total	200	100

Consequently, the majority of the interviewees (89%) estimated that consuming food they have prepared “does not present” or “hardly presents” a health risk (Table 10). Choosing, cleaning and cooking food seem to be essential links of the quality chain.

Table 10 – “Do you estimate that people eating meals prepared by you face health risks ?”

	Not at all	Not really	Quite dangerous	Completely dangerous	No ideas	Total
Number of people giving this answer	110	68	18	0	4	200
% of people giving this answer	55	34	9	0	2	100

D – AVOIDING RISKS

1 – PLACE OF PURCHASE

The purchasing location constitutes a way to guarantee product quality. In general, interviewees have greater confidence in supermarkets (table 11). However, it is mainly in street markets (see above) that consumers buy their vegetables due to the higher prices in supermarkets. Moreover, E. Bridier (2000) showed that consumers give little credibility to the "clean vegetables" label marketed by supermarkets.

Consumers generally rely on their usual retailers. The interviewees pointed out that they have known their retailers for a long time and that they have never had any problems. From the point of view of the consumers, the sanitary quality of vegetables is judged by their own experience.

Table 11 – “Do you think that you face health risks from food bought in following places ?”

	Not at all		Rather not		Rather dangerous		Completely dangerous		No ideas		Total
	n	%	n	%	n	%	n	%	n	%	
In supermarkets	111	55.5	48	24	20	10	0	0	21	10.5	200
From your usual street market seller	76	38	86	43	34	17	0	0	4	2	200
With veterinary seal	99	49.5	66	33	18	9	0	0	17	8.5	200
With a well-known brand	84	42	75	37.5	31	15.5	0	0	10	5	200

2 – GOOD HOUSEKEEPING

It is in large part due to the good practices of housekeepers that consumers judge the safety of their food. In the case of vegetables, washing and soaking of produce in salty water (94.5% of interviewees say they do this). Sometimes the water used to wash rice is also used to do the dishes, because it is reputed to have “cleansing” properties. Consumers recognize that they wash vegetables more than before. The peeling of vegetables is also mentioned.

One way to guarantee the sanitary quality of prepared food is to not keep it more than one day. Throwing away suspicious products, even just after buying them, also seems to be a way of maintaining the family's health.

3 – CHOOSING FOOD PRODUCTS

Even if vegetables are perceived to be health risks, consumers continue buying them thanks to the trust that they place in their own behavior. To the question “*According to you, what are the foods or food products you should eat less of to be in good health?*” (chosen from a list), vegetables were never mentioned. The most frequently mentioned were fat, meat, and glutamate, followed by tea and coffee. However, it seems substitutes exist within the group: fruity vegetables such as gourds sometimes replace water spinach and cabbage.

The fact that the perceived poor sanitary quality of vegetables does not affect vegetable consumption is due to the confidence that consumers have in their own practices of avoidance and in the nutritional qualities attributed to vegetables. Vegetables are associated with a good meal and good nutrition. None of the diets mentioned by the people interviewed implied a limit to vegetable consumption. A rule is often mentioned: to remain in good health, it is necessary to eat more vegetables than meat. With a respective consumption of 54 kg and 19 kg, this rule seems non-restrictive for the majority of consumers!

4 – ORIGIN OF VEGETABLES: THE CASE OF PERI-URBAN VEGETABLES

In her research, E. Bridier shows that the majority (30 out of 36) of interviewed persons knows the origin of products that they consume (general knowledge of production zones of different vegetables). Our qualitative interviews showed that buyers seldom ask the seller for the food product origin at the time of the transaction. In general, they consider that it is the seller's responsibility.

Consumers never spontaneously evoked the peri-urban origin of vegetables as a potential indication of quality. But according to Bridier's work, peri-urban vegetables are considered by consumers to have the advantage of freshness. Freshness is an essential characteristic of food quality in Asia (Simoons 1991) as mentioned by 96% of our sample group. However, according to consumers, these vegetables also have the inconvenience of coming from intensive production systems that affect their sanitary quality.

Peri-urban production is not judged in a uniform way: for example, interviewees say they avoid vegetables from Van Dien, in where one of the biggest cemeteries of Hanoi, as well as a television station, locate. Tham (Tham 2002) notes that water spinach from Ngoc Ha is particularly appreciated (and has sometimes been sold at double the price of other water spinach) because it is cultivated in a pond recently used for agriculture.

E – VICTIMS OF POISONING, CLIENTS OF “CLEAN VEGETABLES”

1 – VICTIMS OF FOOD POISONING

According to a quarter of those asked, anyone can be a victim of food poisoning. Responsibility is assigned to ignorant people who don't pay attention to hygiene. The poor or those who look for the lowest prices are also victims (Table 12).

In our qualitative interviews, those asked never knew anyone personally who had been a victim of food poisoning. If poisonings seem frequent to them, it is because newspapers, television or radio has abundantly informed them of food borne diseases.

Table 12 – “According to you, who are the main food poisoning victims?”

(Spontaneous answers, several answers are possible)

Answers	Number of investigated having given this answer	% of investigated having given this answer
Ignorant people	62	31
People lacking hygiene	47	23.5
People looking for low prices	31	15.5
Everybody is affected	72	36
Poor people	34	17
Children, old people	13	6.5
People who don't pay attention	16	8
People who eat in restaurants	11	5.5
Others	16	8
Don't know	2	1

2 – CONSUMERS OF ‘CLEAN VEGETABLES’

Asked the question “According to you who is the principal client of clean vegetables?” interviewees evoked the obstacles to buying *these* vegetables (Table 13). The first obstacle is financial: ‘clean’ vegetable consumers are well off, who many people perceived to be civil servants. There is also a practical obstacle: it is necessary to live close to, or have time to get to, a supermarket, which is the main sales outlet for clean vegetables.

Whereas in other studies (Bridier, op.cit.), credibility was often mentioned as a weak point of fresh vegetable merchandising, just one person said “People who believe in *clean* vegetables” (‘Others’ in Table 13).

Table 13 – “According to you, who are the main consumers of ‘clean’ vegetables?”

(Spontaneous answers, several answers are possible)

	Number of investigated having given this answer	% of investigated having given this answer
Well-off people	106	53
Worried people	51	25.5
Educated people	26	13
Civil servants	9	4.5
People living close to supermarkets	28	14
People having spare time	3	1.5
People who had suffered food borne diseases	10	5
Others	4	5.1

CONCLUSION

Vegetables are widely consumed in Vietnam. If the standard of living keeps increasing, so too should the value of individual vegetable consumption – through an increase in quantities or through the purchasing of vegetables that are more expensive. It is also likely that the way of preparing these vegetables will move toward raw or sautéed vegetables and therefore toward species which are more suitable for this use. Parallel to this is the development of consumption outside the home in urban areas, oriented toward single-dish meals (Bun Cha, Pho, My Xao). This could also have an influence on the choice of vegetables consumed. It therefore seems necessary to study, considering the effect of these factors, changes in vegetable type consumption in greater depth. Vegetables are perceived as the food product, which presents the highest risks for consumer health.

This perception can be split into three components: perceived gravity, perceived frequency and declared fear (according to the linear log model of Peretti-Watel 2000). Sanitary problems caused by vegetable consumption are considered as serious; they are linked to the existence of chemical residues. Poisoning is perceived to be frequent. This perception does not relate to any individual experience, but to information received from the media. The fear of food poisoning is weak thanks to the faith housekeepers have in their own practices.

Several studies have confirmed the existence of hazards to consumer health related to the use of plant-care products (at least 63 deaths in 2001). It remains to be verified if consumers are right to trust their own practices in order to reduce these risks. According to the World Health Organization (WHO), 60% of food borne illnesses in Vietnam occur frequently in meals of families. An analysis of market produce sanitary quality should be followed up by an investigation into domestic sanitation in order to test these household practices.

It is also necessary to consider the microbiological quality of vegetables, to which consumers are quite unresponsive. What is the bacteriological quality of sold and consumed vegetables? Are there any risks? Is it necessary to inform the consumer about them?. According to WHO, microbiological contamination has caused at least 30% of food borne illnesses in Vietnam.

These results show that an information campaign, aimed at consumer awareness of food health risks, should not only focus on the quality of the food itself since the consumers seem to be informed of the potential dangers, but rather on the efficiency of consumer practices.

This explains why consumption of vegetables is not affected by the risk associated with it. Consumption is high for reasons of taste, because vegetables are not expensive and consumers attach an important nutritional role to them. As an interviewee stated: "In my family, we eat a lot of vegetables, not because we are poor, but because we pay attention to our health".

Consumers associate peri-urban agriculture with intensive agricultural practices resulting in the chemical contamination of vegetables. However, this does not seem to harm the image of the products. Firstly, because consumers consider their practices of avoidance as efficient, secondly because peri-urban vegetables have one great advantage: they are fresh. Freshness in this case is perceived as the distance from field to chopstick. This claim of freshness is crucial in Asia, as we can see in the purchase of live animals such as fish and poultry. The use of refrigerators, in any case, is not convincing enough to make up for freshness. This resistance is very strong in the case of meat: buyers explain that they touch the meat before buying it. If the meat is cold, it means that it was taken out of a refrigerator, and thus that it cannot be fresh any more. The importance of freshness is an indisputable asset to peri-urban products.

Previous studies explain the obvious contradiction between the perception of vegetables as high risk products, and the failure of marketing 'clean vegetables' by factors such as: the low credibility of quality signs and the high price of vegetables. Other problems must be taken into account, such as the distance from farms to shops and the confidence of consumers in their own practices of avoidance confirmed by their personal experience, expressed as: "*We never had any problems*".

The survey shows that although consumers, as buyers, do not reject the products of intensive agriculture, as citizens they disapprove of the increasing utilization of chemicals in both plant and animal production systems. This suggests that the coordination between consumers and producers cannot be achieved through market exchange only, and calls for the implementation of a

framework of dialogue permitting the establishment of a *social contract* (in the sense of Landais, 1998). This *contract* should aim at establishing co-ordinative relationships between consumers and producers, as well as urban and peri-urban dwellers, in order to define the place and the role of peri-urban agriculture whose multi-functionality can then be recognized and encouraged.

Appendix 1: Sampling used in this investigation (CIRAD/IOS 2002)

Two hundred families were selected from the urban area of Hanoi. The method of sampling used a two-stage cluster sampling procedure.

Thus, three districts with diversified situations were chosen:

1. Hai Ba Trung: this district includes civil servants and well-off families near the center of the city, and poor migrant households in the South.
2. Hoan Kiem: mainly considered as a traditional district, largely inhabited by shop owners (in two quarters of the thirty-six streets). Many employees stay here only during the day. Well-off families also live here, as well as poorer families in areas of the district, which are liable to flooding.
3. Cau Giay: this new district is populated by officials (soldiers and their families live in Nghia Do quarter), and students (Nghia Tam quarter). Numerous well-off families have left the city center to settle in houses recently built in this district (in Dich Vong in particular).

In each district, sub-district units (quarter and groups), and households were randomly selected. Within each district, the number of households selected is proportional to the number of inhabitants of the district, in relation to the total population of Hanoi. In each district, quarters then groups, then households were randomly selected: 8 to 12 households from each group, 1 to 3 groups from each quarter.

	Total population *	Percentage of population	Nb of selected households selected	Nb of Group selected	Nb of quarters selected
Hai Ba Trung	358,800	24.6	83	8	4
Hoan Kiem	172,100	11.8	40	4	2
Cau Giay	246,600	16.9	57	6	3
Hanoi citadel	1,460,400	100			

* (Hanoi statistical year book, 2000)

One exception is Quynh Mai quarter, which was not randomly selected but deliberately chosen because of previous work done there by a group of 20 households.

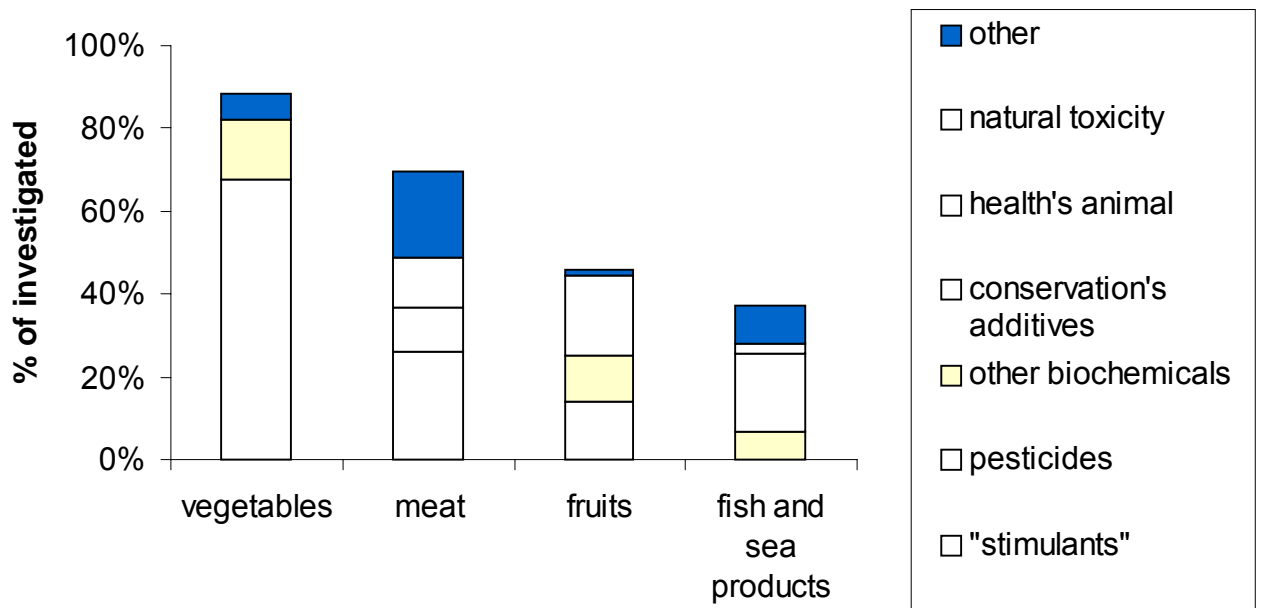
In each family, the person in charge of purchasing and preparing the food was questioned.

Our sample is thus the following:

1. Hai Ba Trung district : 103 families living in Bach Ma, Truong Dinh, Dong Tam, Tan Mai and Quynh Mai quarters.
2. Hoan Kiem district: 40 families, living in Hang Bac and Dong Xuan quarters.
3. Cau Giay district: 57 families living in Trung Hoa, Nghia Tan and Dich Vong quarters.

Data was collected by a questionnaire (approved by the municipal authorities), containing a large number of open questions. The two-hour interview was completed in the selected home. Additionally, about ten interviews in detail have completed this phase of investigation.

Appendix 2: Unsafe foodstuffs and the nature of contamination or danger according to consumers of Hanoi, 2002.



Answers to question (CIRAD/IOS investigation, 2002, Hanoi, 200 interviewees'): According to you, which are the three types of food that present the more of dangers for the health of consumers nowadays? Why? (Spontaneous answers)

Appendix 3: Consumption of individual major vegetables in urban and peri-urban Hanoi (2002)

(g/pers/day).	All Hanoi	Urban	Peri-urban
Cabbage	56.8	59.5	54.2
Kangkong	46.9	46.6	47.2
Pakcchoi	30.5	25.9	35.1
Kolrabi	23.9	26.1	21.7
Tomato	18.8	21.2	16.5
Mustard	15.3	14.5	16.2
Garland	7.5	8.0	7.0
Chrysanthemum			
Alliums	8.6	10.2	7.0
French bean	9.7	14.8	4.6
Pumpkin	0.5	0.6	0.4
Other vegetables	39.3	41.3	37.3

Households consumption survey conducted by RIFAV in 2002, 800 households

source: Mai Thi Phuong Anh, Hoang Lan Anh, To Thi Thu Ha, Mubarik Ali, 2003. Urban and Peri-urban agriculture in Hanoi: resources and opportunities for food production. Project Report, SUSPER project, Hanoi.

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