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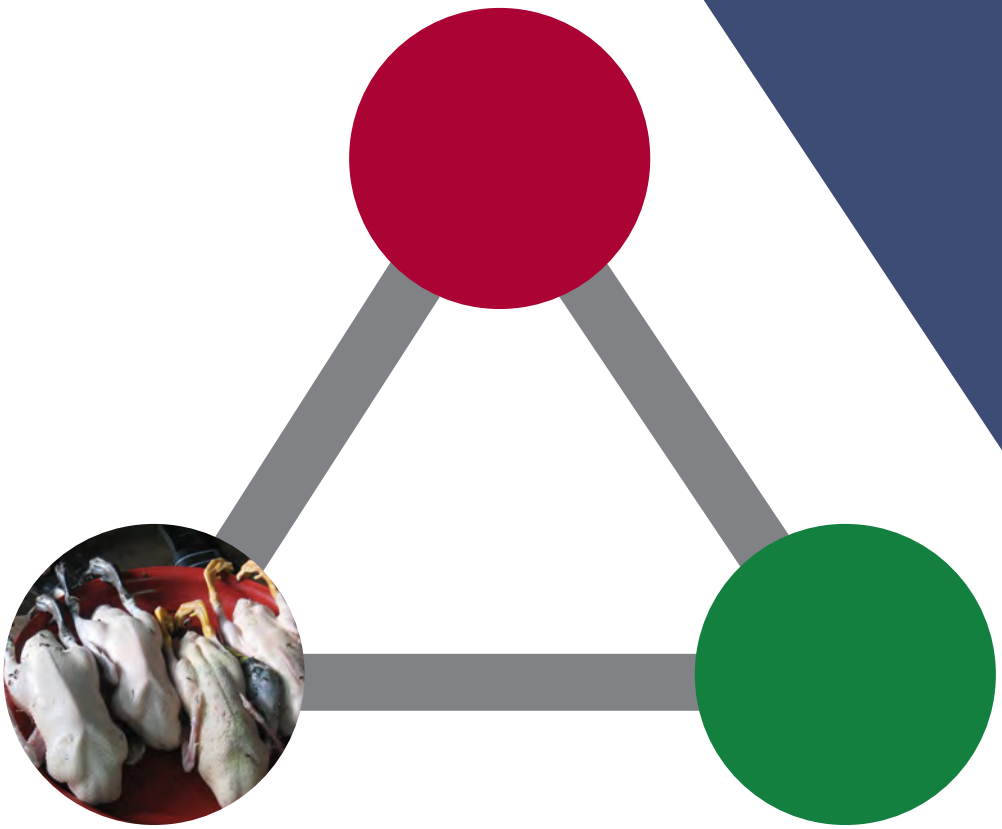

Survey of consumer preferences for poultry products in Phnom Penh and Siem Reap Cambodia

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ABBREVIATIONS AND ACRONYMS

CEDAC	Cambodian Center for Study and Development in Agriculture
CENTDOR	Center for Development-Oriented Research in Agriculture and Livelihood Systems
FAO	Food and Agriculture Organization of the United Nations
HPAI	highly pathogenic avian influenza
MAFF	Ministry of Agriculture, Fisheries and Forestry
NGO	non-governmental organization
US$1	4 100 riel

EXECUTIVE SUMMARY

Poultry raising is primarily regarded as a small-scale production system in Cambodia. During the period 1990 to 2007, poultry production in the country declined, and was at a significantly low level in 2004 to 2005. This could be an impact of highly pathogenic avian influenza (HPAI) outbreaks in neighbouring countries and within Cambodia. Within the country, most marketing of poultry products is of live birds, brought from the countryside to markets, rather than of pre-slaughtered birds. Consumers believe that live birds are healthier. This poses a particular challenge for organizing safe marketing chains and stimulating production.

This survey was funded by a FAO project (GCP/INT/010/GER) and conducted in April and May 2009 by the Center for Development-Oriented Research in Agriculture and Livelihood Systems (CENTDOR), a Cambodian research non-governmental organization (NGO). The survey's objective was to build understanding of consumer preferences concerning poultry products and purchasing criteria. Two cities were selected: Phnom Penh, with 160 household samples; and Siem Reap with 106. In addition, 15 restaurant respondents in Phnom Penh and ten in Siem Reap were also interviewed.

The following are the key findings from the survey:

- Household respondents primarily consume domestic and industrial chickens and domestic ducks (including Muscovy). Consumption of semi-scavenging chickens, semi-scavenging ducks and industrial ducks was not reported.

- Regarding the consumption of domestic chickens, people usually purchase whole or half birds (94 percent) rather than specific parts (13 percent). The average weight of the whole domestic chickens bought is about 1.2 kg each, and that of the specific parts about 0.9 kg.

- Only 15 percent of household respondents purchase industrial chicken meat, as whole, half or specific parts of birds. More households purchase industrial chicken in Phnom Penh (20 percent) than in Siem Reap (about 10 percent). Typically, whole chickens are bought pre-roasted, while specific parts are bought uncooked. The average weight of the whole industrial chickens bought is about 1.2 kg, and that of specific parts about 0.8 kg.

- Consumption of domestic duck meat (including Muscovy ducks) is less common than consumption of chicken meat. Only 26 percent of households purchase whole ducks, and 10 percent purchase duck parts. Higher-income households (34 percent) tend to consume more duck meat than lower-income households (20 percent). The whole ducks or duck parts purchased weigh an average of about 1.4 kg.

- In general, duck eggs are consumed more frequently than chicken eggs. About 40 percent of the respondents purchase chicken eggs on a weekly basis, compared with 94 percent purchasing duck eggs weekly or even daily. Cooking convenience was the main reason for purchasing eggs, ahead of other preference criteria such as price, safety and freshness. Eggs are usually purchased from market stalls and grocery stores near respondents' homes. Consumers buy an average of seven eggs at a time, with low-income households purchasing five and high-income households nine.

- Restaurants use mainly chicken meat. Duck meat is usually sold by food vendors rather than in restaurants. Of the 25 restaurant respondents, 21 buy only domestic chickens and the remaining four sometimes buy industrial poultry or both. However, it was observed that restaurants serving breakfast tend to use only domestic chickens, as customers can recognize the meat easily, while restaurants serving lunch or dinner can mix industrial with domestic chickens, as customers cannot recognize the meat as easily. On average, a restaurant uses approximately 6.6 kg of poultry meat per day.

- There are three common places to buy poultry products: formal markets (for about 90 percent of respondents), supermarkets (about 7 percent), and poultry stores (about 3 percent). The purchase of poultry products declined during and after HPAI events.[1] High-income households changed the places where they purchase during HPAI periods, preferring to purchase at supermarkets, which they believe are safer than normal markets.

- During and after HPAI outbreaks, 68 percent of the respondents reduced their consumption of poultry by about half. The primary reason for doing so was fear of HPAI, for 50 percent of the respondents.

- Among the 266 sample households, 22 eat food at street stalls, 27 in small specialized restaurants, 17 in family-run food houses and 28 at luxury restaurants. 40 percent of the restaurants reported that their clients changed their preferences immediately after they learned about HPAI. However, some clients simply asked that their food be well cooked.

[1] HPAI events covered the period 2004 to 2007, which was a sensitive period for the consumption of poultry products.

- Of the household respondents, 36 (13.5 percent) know or have heard the brand name(s) of poultry products they buy; of these 36, 28 choose by brand name when buying poultry. They indicated the brand name as the name of the market or shop, such as Lucky Supermarket, CEDAC Shop and Sidney Market. It could be concluded that recognition of the shop is more important than that of the brand.

- Overall, 56 percent of respondents reported that the current prices of poultry products are reasonable and acceptable for their income levels: 63 percent of higher-income households and 44 percent of lower-income households. When comparing with the prices of substitute products, 74 percent of respondents said that the prices of poultry products are reasonable and acceptable: 80 percent of higher-income households and 63 percent of lower-income ones.

- If poultry prices increase, fish, pork, beef and vegetables are the main substitute products. Fish tends to be the first choice, followed by pork. Lower-income households change before higher-income ones, when they find the price of poultry too high relative to those for the substitute products they have mentioned.

- Almost all interviewed households reported that domestic poultry tastes better than exotic poultry species. The main reason they give for this is that domestic poultry is fed with natural feed, and without chemical (concentrated) feeds. They also remarked that chilled poultry products taste worse than fresh ones. They say the meat loses its flavour if preserved for a long time.

- Of the household respondents, 14 percent had recently purchased live chickens: 20 percent of lower-income households buy live chickens, compared with 11 percent of higher-income households. The main reason for opting not to buy live chickens is not related to perceptions of risk from HPAI, but rather to religious beliefs: fear of sin, not daring to kill, and so on. It is important to note that most poultry are slaughtered at the market for sale.

- Comparing the present situation with that before the HPAI outbreak, 78 percent of household respondents said that the diversity of poultry packaging has not changed, while about 18 percent replied that they do not know.

- Almost 92 percent of the respondents agreed that poultry meat should be packaged and labelled; this was especially the case among respondents from the highest-income households (100 percent). About 30 percent of respondents believe that packaging is necessary to ensure food safety (i.e., freedom from HPAI), 23 percent that packaging is important in providing a clear choice of products when purchasing, and 13 percent that packaging serves sanitation purposes.

- About 60 percent of the household respondents agree that retailers should use a refrigerator or cold box, while about 35 percent do not think this is necessary. Higher-income households do not support the idea of retailers using refrigeration or cold boxes because they prefer fresh products. Having a chilling facility implies that a retailer sells chilled rather than fresh meat.

- About 83 percent of household respondents agree that labelling of eggs would be useful, while 10 percent feel it is unnecessary. The most frequently mentioned reasons for labelling were to identify the sources of products and to assure their safety. 70 percent of household respondents believe that labelled meat or eggs are safer.

- Regarding price rises to ensure food safety, most household respondents think that they would be worthwhile and affordable: 92 percent said they could afford a 10 percent price increase, 73 percent a 20 percent increase, and 54 percent a 30 percent increase. 68 percent of higher-income households could afford a 30 percent increase in poultry prices.

- Regarding government interventions for HPAI control, 16 percent of respondents said that these have ensured consumer safety, while 60 percent said that they have not, and 24 percent that they do not know. Most of those who feel that government interventions have ensured consumer safety rate this assurance as fair (29.5 percent of respondents) or medium (50 percent).

- Over the past two years, almost all respondents have received recommendations about food and poultry safety from the media and sources: television, radio, billboards and relatives or neighbours:

- Food safety recommendations: from television (95 percent), radio (55 percent), billboards (38 percent), and relatives or neighbours (27 percent);

- Recommendations on poultry safety: television (97 percent), radio (64 percent), billboards (45 percent) and relatives or neighbours (34 percent).

- Based on respondents' suggestions, three main ideas are crucial to increasing households' consumption of poultry products: 1) more strict control of illegal imports (23 percent of respondents); 2) approval of poultry products before they can be sold at markets (70 percent); and 3) maintenance of affordable prices (11 percent).

From these survey findings, the following conclusions can be drawn

- Household consumers prefer fresh domestic poultry products. Buyers feel that fresh poultry has higher flavour qualities than chilled meat. Because of their religious beliefs, people are not inclined to purchase live poultry, but as they demand freshly slaughtered meat, sellers are obliged to slaughter on demand. Such slaughtering services are commonly available at formal markets.

- Household consumers are very discerning and prefer fresh meat from natural, domestic sources. They would support a logo or label to differentiate imported or industrial products from domestic farm products, especially eggs. However, consumers feel that they are misled in many ways when purchasing poultry or ordering poultry when eating out. This makes many people reluctant to trust the authorities and agencies concerned with food safety, preferring to trust their own trader-client relations and visual inspection. Because poultry is commonly traded live, being able to select their birds prior to slaughter allows consumers to assess such characteristics as the health of the poultry.

- Poultry products are popular among Cambodian consumers. Even after the HPAI outbreak, consumption decreased for only a short period. Encouraging an approval system that officially assures the quality of live, pre-slaughtered poultry products would be a good way of increasing consumers' confidence and tracing future outbreaks. Households, rather than restaurants, would be good partners in promoting food safety because they have more self-accountability. This survey shows that many consumers are also willing to pay more for greater food safety, especially better-off house.

INTRODUCTION

Poultry raising in Cambodia is characterized by small-scale production. Domestic poultry plays an important role in the livelihoods of smallholder producers, especially poor and woman-headed families, as they engage in fewer income-generating activities than other economic groups do (Suon Seng, 2007; Suon Seng et al., 2008). Statistics from the Ministry of Agriculture, Fisheries and Forestry (MAFF) show that poultry numbers have declined since 2000, reaching their lowest levels in 2004 to 2005 (MAFF, 1990–2007). The decrease in poultry production in Cambodia could be an indirect impact of highly pathogenic avian influenza (HPAI) outbreaks in neighbouring countries as well as a direct impact of HPAI within Cambodia itself.

Surprisingly, smallholder poultry producers in Cambodia seem not to be very worried about the HPAI outbreaks in 2004 and 2005. Poultry numbers have increased significantly since then (Suon Seng, 2007; Suon Seng et al., 2008; MAFF, 2006, 2007), fuelled by increasing demand for poultry meat. Poultry meat prices have also increased. Poultry products are largely marketed as live birds brought from the community to the market, rather than as slaughtered birds, especially in small markets; in large markets, some poultry is sold already slaughtered. Consumers believe that live birds are healthier. This poses a particular challenge for the organization of safe marketing chains. Marketing systems for freshly slaughtered or frozen birds are less popular. Consumer preferences affect the production and marketing systems for poultry products, so knowledge and understanding of these preferences is required for the design of appropriate new interventions.

FAO called for a survey of consumer preferences for poultry products in the two main cities of Phnom Penh and Siem Reap, with the aim of gathering ideas for the introduction of safe marketing systems for poultry products in Cambodia. This survey was funded by FAO project GCP/INT/010/GER.

In response to FAO's call, the Center for Development-Oriented Research in Agriculture and Livelihood Systems (CENTDOR), a Cambodian non-governmental organization (NGO) involved in research, conducted the survey, which had the following objectives:

- to analyse consumers' preferences for poultry products, and identify preference criteria and the factors determining preferences;
- to analyse the feasibility of introducing safe marketing systems for poultry products in Cambodia.

METHODOLOGY

Survey framework

The fieldwork for data collection was conducted in March and April 2009. Data entry and analysis were done in May and the report was finalized in June 2009, after comments had been received from FAO.

Site and sample selection

The study samples were selected to cover different locations, economic profiles and wealth categories. It is often difficult to conduct interviews with urban people for many reasons: they spend more time on their economic activities than rural people do; they are not enthusiastic about being interviewed by people they do not know well; and they are concerned about the safety of their families. To overcome these difficulties, the survey team started the sample selection process from its own informal social network of relatives and friends. Team members then asked these relatives and friends to introduce them to other people. From this broader informal network, the team selected sample respondents according to the needs of the survey.
To select the sample, the team first reviewed and selected the markets to be studied. It identified urban markets in Phnom Penh and Siem Reap and then investigated where the people using each market come from. Team members then decided the number of households and restaurants to be included in the sample from each market, based on the size of the market. Most of the restaurants were located close to the market, while household samples were at various distances from it.

The final survey involved a sample of 266 households (160 in Phnom Penh and 106 in Siem Reap) and 25 restaurants (15 in Phnom Penh and ten in Siem Reap). For details of the sample survey please refer to Annexes 1 and 2.

Data entry and analysis

Microsoft Access Format was used for data entry. The entry format looked similar to the survey questionnaires, which made it easer to avoid errors during data entry. After entry, data were double-checked and transferred to SPSS and Excel for analysis.

Two sets of data – household and restaurant – are elaborated together in this report. The findings presented are based mainly on household data, while restaurant data are used to support and verify these findings wherever applicable.
Under each sub-heading, data from each variable is presented, based on its distribution. Data and findings are grouped into appropriate classifications. Household profiles were used as the factors for cross analysis with other variables. This allowed assessment of how different categories of consumers prefer different types of poultry product, and of how preferences have evolved following the HPAI outbreak.

The household profile factors used in the analysis are respondent's education level, household size, and household income level. This report presents the variables from analysis of only these three factors. The number of samples (N) in each factor sub-group is presented in Table 1.

TABLE 1 FACTORS AND NUMBERS OF CASES USED IN THE ANALYSIS

Factor group	Sub-group	No. of samples in sub-group in Phnom Penh	No. of samples in sub-group in Siem Reap	No. of samples in total
Education level	No education	21	12	33
	Primary diploma	42	33	75
	Lower secondary diploma	64	39	103
	Upper secondary diploma	28	16	44
	College/university diploma	5	6	11
	Total	160	106	266
Household size	Fewer than 4 members	55	31	86
	4 to 6 members	64	33	97
	More than 7 members	41	42	83
	Total	160	106	266
Monthly income level	Less than 1 million riel	42	17	59
	1 to < 3 million riel	87	40	127
	3 to < 5 million riel	19	23	42
	More than 5 million riel	12	26	38
Total		160	106	266

DESCRIPTION OF SAMPLE PROFILE

Respondent profile

As the survey team interviewed the person responsible for preparing food in each household, 96 percent of the respondents in Siem Reap and 93 percent in Phnom Penh were female. Classification of respondents' age groups showed that the number of respondents in each decreased slightly from younger to older age groups (Annex 3).

Classification of respondents' education levels showed that the majority of respondents have reached primary or lower secondary school level (in Phnom Penh, 26 percent primary and 40 percent lower secondary; in Siem Reap, 31 percent primary and 37 percent lower secondary). Very few of the respondents finished college or university: 3 percent in Phnom Penh and 6 percent in Siem Reap. The distributions of respondents' education levels in Siem Reap and Phnom Penh were similar.

TABLE 2 DISTRIBUTION OF RESPONDENTS, BY EDUCATION LEVEL

Education level	Phnom Penh		Siem Reap		Total	
	N	%	N	%	N	%
No education (did not finish primary school)	21	13	12	11	33	12
Primary school	42	26	33	31	75	28
Lower secondary school	64	40	39	37	103	39
Upper secondary school	28	18	16	15	44	17
College/university diploma	5	3	6	6	11	4
Total	160	100	106	100	266	100

Regarding the position in the family, the majority of respondents were family heads or spouses of family heads (in Phnom Penh, 19 percent family heads and 70 percent spouses; in Siem Reap, 6 percent family heads and 80 percent spouses). The rest were children, parents and relatives living in the household and responsible for purchasing its food.

Regarding occupation, two groups were dominant: 1) traders, shop owners and sellers at market, accounting for about 50 percent of respondents; and 2) housewives, accounting for

40 percent. Housewife refers to a woman who remains at home with no income-generating activities and whose husband is the main income-generator in the family (Annex 4).

Household profile

Among the sampled households, 82 percent were couple-headed families (husband and wife living together with their family), and 18 percent were single-headed families (separated or divorced couples).

Household size and health insurance

The average size of the sampled households in Siem Reap (6.2 people/household) was larger than that in Phnom Penh (5.4 people). It is important to note that household size can be the same as or larger than family size, as a household can include non-family members. When counting household members, people who do not belong to the family but live and have meals with it are also considered. Normally, these are relatives, such as those from rural areas who are accommodated by urban families while they study or work in the city.

TABLE 3 SIZE OF SAMPLED HOUSEHOLDS

	Total HH members Fewer than 4 members		4 to 6 members		More than 7 members		Total	
City	N	%	N	%	N	%	N	%
Phnom Penh	55	34%	64	40%	41	26%	160	100%
Siem Reap	31	29%	33	31%	42	40%	106	100%
Total	86	32%	97	36%	83	31%	266	100%

It should be noted that none of the respondents reported having formal health insurance; formal health insurance is not yet common in Cambodia.

Monthly household income

Among the sampled households, 48 percent reported monthly income of 1 to 3 million riel, 22 percent less than 1 million riel, and about 30 percent more than 3 million riel. More households had monthly income above 3 million riel in Siem Reap (46 percent) than in Phnom Penh (19 percent).

TABLE 4 MONTHLY INCOME LEVEL OF SAMPLED HOUSEHOLDS

Monthly household income (riel/month)	Phnom Penh		Siem Reap		Total	
	N	%	N	%	N	%
Less than 1 million	42	26	17	16	59	22
1 – < 3 million	87	54	40	38	127	48
3 – < 5 million	19	12	23	22	42	16
5 – < 7 million	7	4	12	11	19	7
7 – < 9 million	0	0	4	4	4	2
More than 9 million	5	3	10	9	15	6
Total	160	100	106	100	266	100

Household economic activities

Respondents were asked to give a maximum of three main economic activities or occupations. From these responses, three main groups of occupations and economic activities are observed in the two cities.

In Phnom Penh

Group 1: civil servants and employees of local companies (about 43 percent);
Group 2: employees of international companies (21 percent), owners of businesses (shops, 23 percent) and small traders (27 percent);
Group 3: sellers in the market (13 percent) and skilled workers (12 percent).

TABLE 5 ECONOMIC ACTIVITIES OF SAMPLED HOUSEHOLDS IN PHNOM PENH

Main occupations of family members	Income level				
	Less than 1 million	1 to < 3 million riel (N = 87)	3 to < 5 million riel (N = 19)	More than 5 million riel (N = 12)	Total* (N = 160)
Employed by international companies/organizations or joint ventures	10%	23%	37%	25%	21%
Small traders or shop owners	2%	28%	32%	42%	23%
Small retailers	29%	30%	5%	33%	27%
Civil servants or employed by small local companies	29%	44%	47%	75%	43%
Sellers	24%	9%	5%	8%	13%
Craft and skilled workers	24%	9%	5%	0%	12%
Unskilled workers	10%	3%	0%	0%	4%
Employed by State companies	5%	7%	0%	8%	6%
Others	2%	18%	11%	8%	13%

* The percentages in this table indicate the percentage of sampled households involved in each activity. As each household can be involved in more than one economic activity, the sum of these totals can be more than 100 percent.

In Siem Reap

Group 1: civil servants and employees of local companies (about 37 percent);
Group 2: employees of international companies (20 percent), owners of businesses (shops, 26 percent) and small traders (17 percent);
Group 3: sellers in the market (15 percent) and skilled workers (10 percent).

Table 6 Economic activities of sampled households in Siem Reap

Main occupations of family members	Level of income				
	Less than 1 million riel (N = 17)	1 to < 3 million riel (N = 40)	3 to < 5 million riel (N = 23)	More than 5 million riel (N = 26)	Total* (N = 106)
Employed by international companies /organizations or joint ventures	12%	18%	17%	31%	20%
Small traders or shop owners	0%	8%	48%	54%	26%
Small retailers	6%	13%	22%	27%	17%
Civil servants or employed by small local companies	24%	55%	26%	27%	37%
Sellers	12%	15%	13%	19%	15%
Craft and skilled workers	12%	10%	13%	8%	10%
Unskilled workers	6%	13%	9%	4%	8%
Employed by State companies	0%	5%	0%	4%	3%
Others	53%	13%	17%	15%	21%

* The percentages in this table indicate the percentage of sampled households involved in each activity. As each household can be involved in more than one economic activity, the sum of these totals can be more than 100 percent.

Key assets of sampled households

Most of the sampled households (from 84 to 99 percent) have gas cooking stoves, televisions, telephones and motorbikes. About 40 percent have refrigerators.

TABLE 7 KEY ASSETS OF SAMPLED HOUSEHOLDS

City	Refrigerator	Gas cooking stove	Television	Telephone	Computer	Motorbike
Phnom Penh (N = 160)	68 (43%)	144 (90%)	158 (99%)	154 (96%)	65 (42%)	135 (84%)
Siem Reap (N = 106)	38 (36%)	90 (85%)	99 (93%)	102 (96%)	32 (30%)	92 (87%)
Total (N = 266)	106 (40%)	234 (88%)	257 (97%)	256 (96%)	97 (36%)	227 (85%)

Among the sampled households, 11 percent in Phnom Penh and 22 percent in Siem Reap have helpers at home. It was observed that the possibility of having helpers increases with the household income level. About 50 percent of the households with income over 5 million riel/month have helpers at home.

TABLE 8 HELPERS IN THE SAMPLED HOUSEHOLDS

Household income (riel/month)	Phnom Penh		Siem Reap	
	Subtotal samples	Helper at home	Subtotal samples	Helper at home
Less than 1 million	42	2 (5%)	17	0 (0%)
1 – < 3 million	87	6 (7%)	40	6 (15%)
3 – < 5 million	19	3 (16%)	23	4 (17%)
More than 5 million	12	6 (50%)	26	13 (50%)
Total	160	17 (11%)	106	23 (22%)

Monthly food expenditure of sampled households

The classification of household expenditure on food showed that 53 percent of the sampled households spend between 410 000 and 800 000 riel/month, and 25 percent between 810 000 and 1.2 million riel/month. Only 5 percent can afford to spend more than 1.2 million riel/month on food items. The proportion of households that can afford to spend more than 0.8 million riel/month is higher in Siem Reap (41 percent) than Phnom Penh (22 percent). This reflects the monthly income level of the sampled households, which is higher in Siem Reap than Phnom Penh. The result shows that when people have higher income they can afford to spend more on food items.

TABLE 9 EXPENDITURE ON FOOD ITEMS BY SAMPLED HOUSEHOLDS

Food expenditure (riel/month)	Phnom Penh		Siem Reap		Total	
	Number	%	Number	%	Number	%
150 000–400 000	32	20	15	14	47	18
410 000–800 000	93	58	48	45	141	53
810 000–1 200 000	31	19	35	33	66	25
1 210 000–1 800 000	4	3	8	8	12	5
Total	160	100	106	100	266	100

Eating out habits

Meals eaten outside the home were mainly observed to be breakfast or dinner. Lunch out is not a common practice. It was observed that the number of meals eaten out of the home increases with the household size, especially for breakfast (In Phnom Penh: 29 percent and 34% in Siem Reap for the households of seven members or more). Some of the people eating

meals outside the home are partly financed by their parents or families living in their home towns, or are self-financed. They go out for breakfast to reduce the burden for the hosting family.

The proportions of middle-income households (1 to > 3 million riel/month and 3 to > 5 million riel/month) having breakfast outside the home are higher than those of other groups (low- or high-income households). High-income households normally have more social connections; breakfast outside the home is an occasion for them to meet business partners or friends.

TABLE 10 HABITUAL PRACTICE OF HAVING MEALS OUTSIDE THE HOME, BY HOUSEHOLD SIZE

City	Meal most often eaten out	Number of household members			Total
		Fewer than 4	4 to 6	More than 7	
Phnom Penh		N = 55	N = 64	N = 41	N = 160
	Breakfast	22%	11%	24%	18%
	Lunch	9%	9%	2%	8%
	Dinner	13%	33%	24%	24%
Siem Reap		N = 31	N = 33	N = 42	N = 106
	Breakfast	16%	13%	34%	25%
	Lunch	0%	0%	2%	1%
	Dinner	19%	14%	7%	17%
Total		N = 86	N = 97	N = 83	N = 266
	Breakfast	20%	15%	29%	21%
	Lunch	6%	7%	2%	5%
	Dinner	15%	35%	15%	21%

The percentages in this table refer to the percentages of sampled households reporting the eating of meals outside the home. The remaining households did not report eating meals outside the home.

Table 11 Habitual practice of having meals outside the home, by household income level

City	Meal most often eaten out	Level of monthly income				Total
		Less than 1 million riel	1 to < 3 million riel	3 to < 5 million riel	More than 5 million riel	
Phnom Penh		N = 42	N = 87	N = 19	N = 12	N = 160
	Breakfast	10%	21%	32%	8%	18%
	Lunch	2%	11%	5%	0%	8%
	Dinner	10%	26%	32%	42%	24%
Siem Reap		N = 17	N = 40	N = 23	N = 26	N = 106
	Breakfast	41%	30%	17%	15%	25%
	Lunch	0%	0%	0%	4%	0%
	Dinner	12%	10%	26%	23%	18%
Total	N Total	N = 59	N = 127	N = 42	N = 38	N = 266
	Breakfast	19%	24%	24%	13%	21%
	Lunch	2%	8%	2%	3%	5%
	Dinner	10%	21%	29%	29%	21%

The percentages in this table refer to the percentages of sampled households reporting the eating of meals outside the home. The remaining households did not report eating meals outside the home.

Restaurant profile

Of the 25 restaurant respondents, 22 were the owners, two were relatives of the owner and one was a salaried worker; 20 of them were female and five male; 11 were educated to lower secondary, and nine to higher secondary school.

The average gross income of the restaurants was about 25 million riel/month (ranging from 6 million to 89 million). About 72 percent of respondents reported that their gross income

does not vary much, while the other 28 percent (seven restaurant respondents) reported that it varied by month. Three of these respondents reported that their best selling month was April (the Khmer New Year), and the other four that it was at the end of the rainy season or the dry season, owing to the inflow of tourists in that period.

TABLE 12 INCOMES OF SAMPLED RESTAURANTS IN RIEL / MONTH

City	Income	Meals served			Total
		Breakfast, lunch and dinner	Breakfast and lunch	Breakfast only	
Phnom Penh		N = 6	N = 3	N = 6	N = 15
	Average gross income	34 000 000	35 733 000	26 300 000	31 267 000
	Minimum gross income	12 000 000	8 600 000	10 400 000	8 600 000
	Maximum gross income	60 000 000	89 600 000	83 000 000	89 600 000
Siem Reap		N = 5	N = 1	N = 4	N = 10
	Average gross income	17 560 000	18 000 000	12 750 000	15 680 000
	Minimum gross income	12 000 000	18 000 000	6 000 000	6 000 000
	Maximum gross income	24 000 000	18 000 000	1 8000 000	24 000 000
Total		N = 11	N = 4	N = 10	N = 25
	Average gross income	26 527 000	31 300 000	20 880 000	25 032 000
	Minimum gross income	12 000 000	8 600 000	6000 000	6 000 000
	Maximum gross income	60 000 000	89 600 000	83 000 000	89 600 000

POULTRY CONSUMPTION AND ITS EVOLUTION

Poultry consumption by households

The poultry purchased by consumers are domestic chickens, industrial chickens and domestic ducks (including Muscovy). Semi-scavenging chickens, semi-scavenging ducks and industrial ducks were not mentioned by the respondents. In domestic poultry production (chickens and ducks), poultry can be raised by free scavenging, or semi-fencing and the provision of additional concentrate feed when farmers can afford it. The poultry production system is still a traditional one.

Domestic chickens

Most consumers of domestic or backyard chickens purchase whole or half birds (94 percent) rather than specific parts (13 percent). Purchasing practices are not remarkably different among households of different sizes and income levels.

The whole chickens bought by consumers weigh an average of about 1.2 kg each. When specific parts are bought, the average weight is about 0.9 kg. The amounts purchased are not remarkably different in the two cities or among households of different sizes and income levels.

TABLE 13 PURCHASING PRACTICES FOR DOMESTIC CHICKENS, BY HOUSEHOLD SIZE

City	Purchasing practice	Statistics	Household size			Total
			Fewer than 4 members	4 to 6 members	More than 7 members	
Phnom Penh			N = 55	N = 64	N = 41	N = 160
	Buy whole or half (kg/time)	Mean	1.2	1.2	1.4	1.2
		%	91%	95%	98%	94%
	Buy parts (kg/time)	Mean	1.1	0.9	1.0	1.0
		%	16%	22%	15%	18%
Siem Reap			N = 31	N = 33	N = 42	N = 106
	Buy whole or half (kg/time)	Mean	1.2	1.2	1.4	1.3
		%	90%	91%	98%	93%
	Buy parts (kg/time)	Mean	0.7	0.8	1.0	0.8
		%	10%	3%	5%	6%
Total			N = 86	N = 97	N = 83	N = 266
	Buy whole or half (kg/time)	Mean	1.2	1.2	1.4	1.2
		%	91%	94%	98%	94%
	Buy parts (kg/time)	Mean	1.0	0.9	1.0	0.9
		%	14%	15%	10%	13%

The percentages in this table refer to the percentage of sampled households reporting each practice. The remaining households did not report the practice, so the total percentages in the table are less than 100 percent.

TABLE 14 PURCHASING PRACTICES FOR DOMESTIC CHICKENS, BY HOUSEHOLD INCOME LEVEL

City	Purchasing practice	Statistics	Income level (riel/month)				Total
			Less than 1 million	1 to < 3 million	3 to < 5 million	More than 5 million	
Phnom Penh			N = 42	N = 87	N = 19	N = 12	N = 160
	Buy whole or half (kg/time)	Mean	1.1	1.2	1.2	1.3	1.2
		% N	83%	98%	100%	100%	94%
	Buy parts (kg/time)	Mean	0.8	1.1	1.2	0.7	1.0
		% N	19%	15%	26%	25%	18%
Siem Reap			N = 17	N = 40	N = 23	N = 26	N = 106
	Buy whole or half (kg/time)	Mean	1.1	1.2	1.5	1.3	1.3
		% N	82%	93%	96%	100%	91%
	Buy parts (kg/time)	Mean	0.7	0.8	1		0.8
		% N	12%	8%	4%	0%	2%
Total			N = 59	N = 127	N = 42	N = 38	N = 266
	Buy whole or half (kg/time)	Mean	1.1	1.2	1.4	1.3	1.2
		% N	83%	96%	98%	100%	94%
	Buy parts (kg/time)	Mean	0.8	1.0	1.1	0.7	0.9
		% N	17%	13%	14%	8%	13%

The percentages in this table refer to the percentage of sampled households reporting each practice. The remaining households did not report the practice, so the total percentages in the table are less than 100 percent.

Industrial chickens

The survey found that only 15 percent of respondents purchase industrial chicken, as whole, half or specific parts of the bird. This is because industrial chicken production has not been widely adopted in Cambodia. A higher proportion of households purchase industrial chicken in Phnom Penh (about 20 percent) than Siem Reap (about 10 percent). Households buying industrial poultry products are distributed across all income levels and household sizes. It was also observed that higher-income households purchase mainly whole or half chickens, while lower-income households purchase parts.

When buying a whole chicken it is often in roasted form, while specific parts are bought uncooked. It was observed that the purchase of roasted chickens has increased over the last ten years. The reasons commonly given for this were: low cost, cooking convenience, and the proximity of market stores to respondents' homes.

The whole chickens bought weigh an average of about 1.2 kg each. When specific parts are bought, the average weight is about 0.8 kg.
It was observed that the purchasing of industrial chicken parts is more frequent in Phnom Penh (21 percent) than Siem Reap (5 percent).

TABLE 15 PURCHASING PRACTICES FOR OF INDUSTRIAL CHICKENS, BY HOUSEHOLD SIZE

City	Purchasing practice	Statistics	Household size			Total
			Fewer than 4 members	4 to 6 members	More than 7 members	
Phnom Penh			N = 55	N = 64	N = 41	N = 160
	Buy whole or half (kg/time)	Mean	1.2	0.9	1.5	1.2
		%N	16%	16%	27%	19%
	Buy parts (kg/time)	Mean	0.7	0.8	0.8	0.7
		%N	29%	16%	20%	21%
Siem Reap			N = 31	N = 33	N = 42	N = 106
	Buy whole or half (kg/time)	Mean	0.9	1.2	1.4	1.2
		%N	6%	9%	12%	9%
	Buy parts (kg/time)	Mean	1	0.5	1	0.9
		%N	6%	3%	5%	5%
Total			N = 86	N = 97	N = 83	N = 266
	Buy whole or half (kg/time)	Mean	1.2	1.0	1.4	1.2
		%N	13%	13%	19%	15%
	Buy parts (kg/time)	Mean	0.7	0.8	0.9	0.8
		%N	21%	11%	12%	15%

The percentages in this table refer to the percentage of sampled households reporting each practice. The remaining households did not report the practice, so the total percentages in the table are less than 100 percent.

TABLE 16 PURCHASING PRACTICES FOR INDUSTRIAL CHICKENS, BY HOUSEHOLD INCOME LEVEL

City	Purchasing practice	Statistics	Income level (riel/month)				Total
			Less than 1 million r	1 to < 3 million	3 to < 5 million	More than 5 million	
Phnom Penh			N = 42	N = 87	N = 19	N = 12	N = 160
	Buy whole or half (kg/time)	Mean	1.2	1.1	1.2	1.6	1.2
		%N	12%	20%	21%	33%	19%
	Buy parts (kg/time)	Mean	0.8	0.7	1.0		0.7
		%N	17%	30%	5%	0%	21%
Siem Reap			N = 17	N = 40	N = 23	N = 26	N = 106
	Buy whole or half (kg/time)	Mean	0.9	1.1	1.5	1.4	1.2
		%N	12%	8%	9%	12%	9%
	Buy parts (kg/time)	Mean	0.5	1.2		0.5	0.9
		%N	6%	8%	0%	4%	5%
Total		N Total	N = 59	N = 127	N = 42	N = 38	N = 266
	Buy whole or half (kg/time)	Mean	1.1	1.1	1.3	1.5	1.2
		%N	12%	16%	14%	18%	15%
	Buy parts (kg/time)	Mean	0.7	0.8	1.0	0.5	0.8
		%N	14%	23%	2%	3%	15%

The percentages in this table refer to the percentage of sampled households reporting each practice. The remaining households did not report the practice, so the total percentages in the table are less than 100 percent.

Domestic ducks

Duck meat (including Muscovy duck) is less commonly traded than chicken meat. However, over the last ten years duck and Muscovy duck meat has become increasingly popular. The survey showed that about 26 percent of customers purchase whole ducks, and 10 percent

purchase duck parts. It is important to note that goose meat is rarely sold in markets. Although goose meat is tasty, it is very expensive. Cambodian people believe that if a pregnant woman consumes goose eggs, her baby will be born healthy and clever, so farmers do not keep goose eggs for hatching but often sell them at a high price: one goose egg sells for about US$2, compared with US$0.10 for a duck egg.

Analysis of purchasing practices according to household size and income level showed that people purchasing duck meat are found at all levels of each category. Higher-income households (34 percent) consume remarkably more duck meat than lower-income households (20 percent).

The whole or parts of ducks bought weigh an average of about 1.4 kg each. The proportions of people purchasing ducks are not remarkably different in Siem Reap and Phnom Penh.

TABLE 17 PURCHASING PRACTICES FOR DOMESTIC AND MUSCOVY DUCKS, BY HOUSEHOLD SIZE

City	Purchasing practice	Statistics	Household size			Total
			Less than 4 members	4 to 6 members	More than 7 members	
Phnom Penh			N = 55	N = 64	N = 41	N = 160
	Buy whole or half (kg/time)	Mean	1.0	1.2	2.0	1.4
		%N	20%	31%	22%	25%
	Buy parts (kg/time)	Mean	1.4	0.8	1.7	1.3
		%N	7%	6%	12%	8%
Siem Reap		N Total	N = 31	N = 33	N = 42	N = 106
	Buy whole or half (kg/time)	Mean	0.9	1.1	2.1	1.5
		%N	32%	15%	33%	27%
	Buy parts (kg/time)	Mean	1.3	1.0	1.9	1.5
		%N	16%	9%	12%	12%
Total		N Total	N = 86	N = 97	N = 83	N = 266
	Buy whole or half (kg/time)	Mean	1.0	1.2	2.0	1.4
		%N	24%	26%	28%	26%
	Buy parts (kg/time)	Mean	1.3	0.8	1.8	1.4
		%N	10%	7%	12%	10%

The percentages in this table refer to the percentage of sampled households reporting each practice. The remaining households did not report the practice, so the total percentages in the table are less than 100 percent.

TABLE 18 PURCHASING PRACTICES FOR DOMESTIC AND MUSCOVY DUCKS, BY HOUSEHOLD INCOME LEVEL

City	Purchasing practice	Statistics	Income level (riel/month				Total
			Less than 1 million	1 to < 3 million	3 to < 5 million	More than 5 million	
Phnom Penh			N = 42	N = 87	N = 19	N = 12	N = 160
	Buy whole or half (kg/time)	Mean	1.2	1.4	1.4	1.3	1.4
		%N	21%	24%	32%	33%	25%
	Buy parts (kg/time)	Mean	1	1.2	3		1.3
		%N	7%	10%	5%	0%	8%
Siem Reap			N = 17	N = 40	N = 23	N = 26	N = 106
	Buy whole or half (kg/time)	Mean	0.8	1.8	1.2	1.7	1.5
		%N	18%	23%	35%	35%	27%
	Buy parts (kg/time)	Mean	1.3	1.5	0.8	2.0	1.5
		%N	24%	8%	9%	15%	12%
Total			N = 59	N = 127	N = 42	N = 38	N = 266
	Buy in whole or half (kg/time)	Mean	1.1	1.5	1.3	1.6	1.4
		%N	20%	24%	33%	34%	26%
	Buy in parts (kg/time)	Mean	1.1	1.3	1.5	2.0	1.4
		%N	12%	9%	7%	11%	10%

The percentages in this table refer to the percentage of sampled households reporting each practice. The remaining households did not report the practice, so the total percentages in the table are less than 100 percent.

Chicken and duck eggs

Purchase of chicken eggs for home consumption is less common than purchase of duck eggs. About 40 percent of respondents reported that they purchase chicken eggs, usually weekly. Such consumers were reported from all household sizes and income levels. Cooking convenience was the main reason for purchasing chicken eggs, ahead of other preference criteria such as price, safety and freshness. Consumers purchase mainly from markets and grocery stores near their homes.

Duck eggs are common for home consumption. Most respondents (94 percent) reported that they purchase duck eggs either weekly or daily. This was observed in all household sizes and income levels. Cooking convenience was the main reason for purchasing duck eggs, ahead of other preference criteria such as price, safety and freshness. Consumers purchase mainly from markets and grocery stores near their homes.

Consumers usually buy an average of seven eggs at a time. This number was the same for both chicken and duck eggs, but it was observed that low-income households buy fewer eggs on average (five at a time) than high-income households (nine). Results were similar in both cities.

It was noted that the number of eggs consumed per household does not vary by household size, but does vary by income level. This does not mean that high-income households consume more eggs than low-income households do. Although low-income households consume fewer eggs at a time they also consume eggs more frequently than high-income households do.

TABLE 19 PURCHASING PRACTICES FOR CHICKEN AND DUCK EGGS, BY HOUSEHOLD SIZE

City	Purchasing practice	Statistics	Household size			Total
			Fewer than 4 members	4 to 6 members	More than 7 members	
Phnom Penh			N = 55	N = 64	N = 41	N = 160
	Number of chicken eggs	Mean	7.2	5.4	7.7	6.5
		%N	38%	45%	34%	40%
	Number of duck eggs	Mean	6.9	6.5	7.5	6.9
		%N	93%	94%	98%	94%
Siem Reap			N = 31	N = 33	N = 42	N = 106
	Number of chicken eggs	Mean	7.8	6.3	7.7	7.4
		%N	42%	27%	45%	39%
	Number of duck eggs	Mean	7.5	5.9	8.3	7.4
		%N	90%	91%	98%	93%
Total			N = 86	N = 97	N = 83	N = 266
	Number of chicken eggs	Mean	7.4	5.6	7.7	6.9
		%N	40%	39%	40%	39%
	Number of duck eggs	Mean	7.1	6.3	7.9	7.1
		%N	92%	93%	98%	94%

The percentages in this table refer to the percentage of sampled households reporting each practice. The remaining households did not report the practice, so the total percentages in the table are less than 100 percent.

TABLE 20 PURCHASING PRACTICES FOR CHICKEN AND DUCK EGGS, BY HOUSEHOLD INCOME LEVEL

City and egg number of eggs	Statistics	Income level (riel/month)				Total
		Less than 1 million	1 to < 3 million	3 to < 5 million	More than 5 million	
		N = 42	N = 87	N = 19	N = 12	N = 160
Phnom Penh: Chicken eggs	Mean	4.8	5.8	8.3	15.0	6.5
	% N	36%	44%	32%	42%	40%
Duck eggs	Mean	5.2	6.4	10.5	10.1	6.9
	% N	93%	93%	100%	100%	94%
		N = 17	N = 40	N = 23	N = 26	N = 106
Siem Reap: Chicken eggs	Mean	6.2	8.5	7.9	5.7	7.4
	% N	29%	43%	43%	35%	39%
Duck eggs	Mean	7.4	7.5	7.9	6.7	7.4
	% N	94%	90%	100%	92%	93%
		N = 59	N = 127	N = 42	N = 38	N = 266
Total Chicken eggs	Mean	5.2	6.6	8.1	9.0	6.9
	% N	34%	43%	38%	37%	39%
Duck eggs	Mean	5.8	6.7	9.0	7.8	7.1
	% N	93%	92%	100%	95%	94%

The percentages in this table refer to the percentage of sampled households reporting each practice. The remaining households did not report the practice, so the total percentages in the table are less than 100 percent.

Poultry consumption by restaurants

Only normal-standard restaurants were included in the sample of 25 restaurants. The study did not include luxury restaurants. It was noted that restaurants commonly use more chicken than duck meat: only one sampled restaurant sells duck meat. Thus the following discussion on poultry consumption by restaurants covers only chicken meat.

Consumption of chicken meat

Of the 25 restaurants interviewed, 21 reported that they buy only domestic chickens. Four buy industrial poultry or both industrial and domestic. It was observed that the restaurants serving breakfast use only domestic chickens, as clients can recognize the meat easily. In restaurants serving lunch or dinner, industrial can be mixed with domestic chicken, as clients cannot recognize the difference so easily. By doing this, restaurants can increase their profits.

In Siem Reap, none of the restaurants reported purchasing industrial poultry. By observation, the clients of small restaurants are mostly local people, who prefer local poultry. In luxury restaurants, customers are mostly foreigners, and do not mind consuming industrial poultry.

On average, the restaurants need about 6.6 kg of poultry meat a day. It was noted that the restaurants in Phnom Penh selling only breakfast or breakfast and lunch consume more chicken meat than the same type of restaurants in Siem Reap.

TABLE 21 POULTRY MEAT CONSUMPTION BY RESTAURANTS

City	Type of poultry		Meals served			Total
			Breakfast, lunch and dinner	Breakfast and lunch	Breakfast only	
Phnom Penh	Domestic and industrial chicken (kg/day)	Mean	5.6	9	0	7.3
		N valid	1	1	0	2
	Domestic chicken (kg/day)	Mean	7.5	14.5	7.6	8.8
		N valid	4	2	5	11
	Industrial chicken (kg/day	Mean	4	0	2	3
		N valid	1	0	1	2
	Total	Mean	6.6	12.7	6.7	7.8
		N valid	6	3	6	15
Siem Reap	Domestic chicken (kg/day)	Mean	6.0	7.2	2.8	4.8
		N valid	5	1	4	10
Total	Domestic and industrial chicken (kg/day)	Mean	5.6	9	0	7.3
		N valid	1	1	0	2
	Domestic chicken (kg/day)	Mean	6.7	12.1	5.4	6.9
		N valid	9	3	9	21
	Industrial chicken (kg/day)	Mean	4	0	2	3
		N valid	1	0	1	2
	Total	Mean	6.3	11.3	5.1	6.6
		N valid	11	4	10	25

All restaurants purchase whole chickens. Five buy live chickens, while 20 buy slaughtered birds. The reasons for their purchasing choices are: convenience of cooking, freshness and low price. Most restaurants buy chickens from markets (ten restaurants), while eight buy from wholesalers. Client relations and proximity to their restaurants are the main criteria for deciding where to buy chickens.

TABLE 22 CONSUMPTION OF DOMESTIC CHICKENS BY RESTAURANTS

Factor	Category	Responses (N)	Percentage
Form of chicken bought	Alive	5	20%
	Freshly plucked	20	80%
Reason for choosing this form	Low price	4	16%
	Fresh	12	48%
	Easy to cook	16	64%
Source of purchase	Poultry farm	2	8%
	Intermediary	1	4%
	Market	10	40%
	Poultry wholesaler	8	32%
Reason for choosing this source	Low price	2	8%
	Have confident on seller	4	16%
	Get used to, regular clients	14	56%
	Near the restaurant	7	28%
	Relatives	1	4%

Consumption of chicken and duck eggs

On average, each restaurant consumes about 26 eggs per day. The egg consumption of restaurants in Phnom Penh was higher than restaurants in Siem Reap. Restaurants normally buy chicken and duck eggs without packaging, as they are cheaper.

TABLE 23 CONSUMPTION OF POULTRY EGGS BY RESTAURANTS (EGGS / DAY)

City	Breakfast, lunch and dinner	Breakfast and lunch	Breakfast only	Total
Phnom Penh	57.5	14.7	28.3	37.3
Siem Reap	17.0	0.0	2.5	9.5
Total	39.1	11.0	18.0	26.2

Places of purchase for poultry products, and changes related to HPAI outbreaks

Common places to buy poultry products are formal markets (about 90 percent), supermarkets (about 7 percent) and poultry stores (about 3 percent). The places for purchasing poultry products are not remarkably different across different education and income levels.

Regarding the purchase or obtaining of poultry products, there were slight changes during and after the HPAI events. Purchases of poultry decreased during the HPAI outbreaks, increasing again after 2007. The most interesting observation was that high-income households have changed their purchasing places noticeably. Their consumption of poultry decreased a lot during the HPAI outbreaks, and they increased their purchases from supermarkets, which they believe are safer than normal markets (Annex 5).

TABLE 24 PLACES OF PURCHASE FOR POULTRY PRODUCTS, BY HOUSEHOLD INCOME LEVEL

Place of purchase	Period **	Income level (riel/month) Less than 1 million N = 59	1 to < 3 million N = 127	3 to < 5 million N = 42	More than 5 million N = 38	Total* N = 266
Market stalls	Before AI outbreak	84.7%	96.9%	95.2%	92.1%	93.2%
	During AI outbreak	83.1%	92.1%	85.7%	57.9%	84.2%
	After AI outbreak	83.1%	96.9%	92.9%	92.1%	92.5%
Supermarkets	Before AI outbreak	5.1%	7.9%	7.1%	5.3%	6.8%
	During AI outbreak	5.1%	7.1%	4.8%	5.3%	6.0%
	After AI outbreak	5.1%	7.9%	11.9%	7.9%	7.9%
Poultry stores	Before AI outbreak	0.0%	2.4%	2.4%	7.9%	2.6%
	During AI outbreak	0.0%	2.4%	2.4%	2.6%	1.9%
	After AI outbreak	0.0%	2.4%	2.4%	10.5%	3.0%

* The percentages in this table refer to the percentage of respondents reporting each place of purchase. The remaining respondents did not report these places, so the total percentages are less than 100 percent.
** Before= until 2004, During=2004-2007, After=2008 onwards

Changes in poultry consumption during and after HPAI outbreaks

Comparison of poultry consumption patterns before, during and after the HPAI outbreaks show that about 31 percent of respondents maintained the same level of consumption. About 68 percent reported reducing their poultry consumption by about half. Regarding the reasons for reducing poultry meat consumption, fear of HPAI was the most important for 58 percent of respondents, while 48 percent reported that they got used to avoiding poultry during the outbreak, so continued not eating it afterwards; implicitly, this too was caused by fear of HPAI. The third most important reason for reducing poultry consumption was the increase in price after the outbreak (from 2007). These findings were similar in both cities.

TABLE 25 POULTRY CONSUMPTION TRENDS BEFORE AND AFTER THE HPAI PERIOD, BY EDUCATION LEVEL OF RESPONDENT

City	Trend	Education level of respondent					Total
		No education	Primary diploma	Lower secondary diploma	Upper secondary diploma	College/ university diploma	
Phnom Penh		N = 21	N = 42	N = 64	N = 28	N = 5	N = 160
	Same	29%	24%	38%	32%	20%	31%
	Increase	0%	0%	0%	4%	0%	1%
	Decrease	71%	76%	63%	64%	80%	68%
Siem Reap		N = 12	N = 33	N = 39	N = 16	N = 6	N = 106
	Same	50%	33%	28%	25%	17%	31%
	Increase	0%	0%	3%	0%	0%	1%
	Decrease	50%	67%	69%	75%	83%	68%
Total		N = 33	N = 75	N = 103	N = 44	N = 11	N = 266
	Same	36%	28%	34%	30%	18%	31%
	Increase	0%	0%	1%	2%	0%	1%
	Decrease	64%	72%	65%	68%	82%	68%

TABLE 26 POULTRY CONSUMPTION TRENDS BEFORE AND AFTER THE HPAI PERIOD, BY HOUSEHOLD SIZE

City	Trend	Household size			Total
		Fewer than 4 members	4 to 6 members	More than 7 members	
Phnom Penh		N = 55	N = 64	N = 41	N = 160
	Same	29%	30%	37%	31%
	Increase	2%	0%	0%	1%
	Decrease	69%	70%	63%	68%
Siem Reap		N = 31	N = 33	N = 42	N = 106
	Same	29%	33%	31%	31%
	Increase	0%	0%	2%	1%
	Decrease	71%	67%	67%	68%
Total		N = 86	N = 97	N = 83	N = 266
	Same	29%	31%	34%	31%
	Increase	1%	0%	1%	1%
	Decrease	70%	69%	65%	68%

TABLE 27 POULTRY CONSUMPTION TRENDS BEFORE AND AFTER THE HPAI PERIOD, BY HOUSEHOLD INCOME LEVEL

City	Trend	Income level (riel/month)				Total
		Less than 1 million	1 to < 3 million	3 to < 5 million	More than 5 million	
Phnom Penh		N = 42	N = 87	N = 19	N = 12	N = 160
	Same	31%	32%	21%	42%	31%
	Increase	0%	1%	0%	0%	1%
	Decrease	69%	67%	79%	58%	68%
Siem Reap		N = 17	N = 40	N = 23	N = 26	N = 106
	Same	24%	20%	48%	38%	31%
	Increase	0%	0%	0%	4%	1%
	Decrease	76%	80%	52%	58%	68%
Total		N = 59	N = 127	N = 42	N = 38	N = 266
	Same	29%	28%	36%	39%	31%
	Increase	0%	1%	0%	3%	1%
	Decrease	71%	71%	64%	58%	68%

Of the restaurant respondents, 76 percent reported that there was no change in the demand for poultry products in their restaurants since the HPAI outbreak. The remaining 24 percent reported that the demand decreased by an average of about 40 percent (ranging from 15 to 60 percent). Restaurant respondents reported that they did not change their places of purchase for poultry products, owing to client relations and proximity to their restaurants.

Changes in eating habits outside the home since the HPAI outbreaks

Eating habits outside the home among the sampled households

In the survey, meals eaten outside the home included those bought from street vendors (street stalls), small specialized restaurants, family-run food houses and luxury restaurants. Results showed that 22 of the 266 sample households eat at street stalls, 27 at small specialized restaurants, 17 at family-run food houses, and 28 at luxury restaurants. No or only small changes in these habits were noted after the HPAI outbreak (Annex 6).

Observation of eating habits in restaurants

Regarding poultry consumption at restaurants, about 40 percent of the restaurant respondents reported that their clients changed habits immediately after learning about HPAI, by either avoiding poultry meat or asking for chicken to be well cooked.

Almost 92 percent of the restaurants reported that their customers have confidence in the food safety of their restaurants, while the remaining restaurants were not confident.

Clients were confident in the restaurants for the following reasons:

The restaurant owners themselves buy live or freshly slaughtered chickens from the market. They claim not to have ever bought sick chickens, and are afraid of losing clients. They also cook the chicken meat well.

Restaurants use family-raised local chickens, not industrial birds. They also claim that they can easily distinguish between sick and healthy chickens, as they have been in the business for a long time.

Some restaurant owners also said that they trust their poultry suppliers and are confident of getting good chickens as they buy large quantities. If their supplier does not provide good chickens, the restaurant owners change supplier, and the supplier may lose benefits.

Consumer knowledge and choices of poultry product brand names

Of the 266 respondents, 36 (13.5 percent) said that they know or have heard the brand names of poultry products, but only 28 of these 36 choose the brand name when buying poultry products. Consumers mentioned various brand names, including names of markets or shops: Lucky Supermarket, CEDAC Shop, Sidney Market and so on. They choose to buy poultry products from these supermarkets because they can bring their children to play with the toys there while they purchase. Respondents did not mention brand names in normal markets, and it was clear that there are no poultry product brand names in normal markets. It is worth noting that respondents give importance to the shop rather than the brand name.

TABLE 28 HOUSEHOLD CONSUMERS' KNOWLEDGE OF POULTRY PRODUCT BRAND NAMES, BY HOUSEHOLD INCOME LEVEL

City	Know any brand names?	Income level (riel/month) Less than 1 million	1 to < 3 million	3 to < 5 million	More than 5 million	Total
Phnom Penh		N = 42	N = 87	N = 19	N = 12	N = 160
	Yes	10%	21%	5%	0%	14%
	No	90%	79%	95%	100%	86%
Siem Reap		N = 17	N = 40	N = 23	N = 26	N = 106
	Yes	29%	13%	4%	8%	12%
	No	71%	88%	96%	92%	88%
Total		N = 59	N = 127	N = 42	N = 38	N = 266
	Yes	15%	18%	5%	5%	14%
	No	85%	82%	95%	95%	86%

TABLE 29 PRACTICES OF POULTRY BUYERS REGARDING BRAND NAMES

Practice	Response	No. responding
Do you choose according to brand names at poultry shops?	Yes	3
If yes, what brand(s) do you buy at poultry shops?	CEDAC	1
	Lucky	1
	Sidney	1
	Soriya	1
What poultry do you buy at poultry shops?	Chicken	3
Do you choose according to brand names at supermarkets?	Yes	28
If yes, what brand(s) do you buy at supermarkets?	Lucky	17
	Soriya	14
	Sidney	4
	Sovanna	4
	Paragon	1

Five of the 25 restaurants reported knowing brand names. Four restaurants mentioned Lucky Market and one mentioned CP Company, but they do not consider the brand name when buying poultry at any of these places.

To ensure safe poultry products, household respondents depend on their own visual inspection (57 percent) and trust in the sellers (22 percent). Some 18 percent of respondents reported that they do not know how to ensure safe poultry products.

TABLE 30 KNOWLEDGE OF SAFE POULTRY PRODUCTS

Safety ensured by:	Phnom Penh N = 160	Siem Reap N = 106	Total N = 266
Visual inspection	60%	53%	57%
Trust in seller	26%	16%	22%
Self-raising of birds	0%	5%	2%
Do not know	14%	25%	18%

Like the household respondents, restaurant respondents also reported that to ensure safe poultry products they depend on their own visual inspection (60 percent) and trust in sellers (36 percent), while the remainder do not know how to ensure such safety.

Price and quality of poultry products

Current price of poultry

Regarding price, 56 percent of respondents reported that the present prices of poultry products are reasonable and acceptable for their level of income. Among the different income levels, this figure varied from 63 percent of higher-income household to 44 percent of lower-income ones.

TABLE 31 OPINION REGARDING THE REASONABILITY AND ACCEPTABILITY OF POULTRY PRICES, BY EDUCATION LEVEL OF RESPONDENT

City	Response	Education level					Total
		No education	Primary diploma	Lower secondary diploma	Upper secondary diploma	College/ university diploma	
Phnom Penh		N = 21	N = 42	N = 64	N = 28	N = 5	N = 160
	Yes	62%	64%	63%	43%	40%	59%
	No	38%	36%	34%	57%	60%	40%
	N/A (raises own poultry)	0%	0%	3%	0%	0%	1%
Siem Reap		N = 12	N = 33	N = 39	N = 16	N = 6	N = 106
	Yes	58%	52%	41%	56%	100%	52%
	No	33%	42%	59%	44%	0%	45%
	N/A (raises own poultry)	8%	6%	0%	0%	0%	3%
Total		N = 33	N = 75	N = 103	N = 44	N = 11	N = 266
	Yes	61%	59%	54%	48%	73%	56%
	No	36%	39%	44%	52%	27%	42%
	N/A (raises own poultry)	3%	3%	2%	0%	0%	2%

TABLE 32 OPINION REGARDING THE REASONABILITY AND ACCEPTABILITY OF POULTRY PRICES, BY HOUSEHOLD SIZE

City	Response	Household size Fewer than 4 members	4 to 6 members	More than 7 members	Total
Phnom Penh		N = 55	N = 64	N = 41	N = 160
	Yes	53%	55%	73%	59%
	No	47%	42%	27%	40%
	N/A (raises own poultry)	0%	3%	0%	1%
Siem Reap		N = 31	N = 33	N = 42	N = 106
	Yes	48%	43%	52%	52%
	No	45%	33%	48%	45%
	N/A (raises own poultry)	6%	2%	0%	3%
Total		N = 86	N = 97	N = 83	N = 266
	Yes	51%	55%	63%	56%
	No	47%	42%	37%	42%
	N/A (raises own poultry)	2%	3%	0%	2%

TABLE 33 OPINION REGARDING THE REASONABILITY AND ACCEPTABILITY OF POULTRY PRICES, BY HOUSEHOLD INCOME LEVEL

Response		Income level (riel/month)				Total
		Less than 1 million	1 to < 3 million	3 to < 5 million	More than 5 million	
Phnom Penh		N = 42	N = 87	N = 19	N = 12	N = 160
	Yes	45%	61%	63%	83%	59%
	No	55%	37%	37%	17%	40%
	N/A (raises own poultry)	0%	2%	0%	0%	1%
Siem Reap		N = 17	N = 40	N = 23	N = 26	N = 106
	Yes	41%	45%	70%	54%	52%
	No	53%	53%	30%	42%	45%
	N/A (raises own poultry)	6%	3%	0%	4%	3%
Total		N = 59	N = 127	N = 42	N = 38	N = 266
	Yes	44%	56%	67%	63%	56%
	No	54%	42%	33%	34%	42%
	N/A (raises own poultry)	2%	2%	0%	3%	2%

Comparison of poultry price with those of substitute products

Compared with substitute products, 74 percent of respondents said that the prices of poultry products are reasonable and acceptable. Again, this varied among income groups, from more than 80 percent of higher-income consumers to only 63 percent of the lower-income group.

TABLE 34 OPINION REGARDING THE REASONABILITY AND ACCEPTABILITY OF POULTRY PRICES COMPARED WITH THOSE OF SUBSTITUTES, BY EDUCATION LEVEL OF RESPONDENT

City	Response	Education level of respondent					Total
		No education	Primary diploma	Lower secondary diploma	Upper secondary diploma	College/ university diploma	
Phnom Penh		N = 21	N = 42	N = 64	N = 28	N = 5	N = 160
	Yes	81%	64%	72%	64%	20%	68%
	No	19%	36%	27%	32%	80%	31%
	Other	0%	0%	2%	4%	0%	1%
Siem Reap		N = 12	N = 33	N = 39	N = 16	N = 6	N = 106
	Yes	83%	73%	87%	88%	83%	82%
	No	8%	21%	13%	13%	17%	15%
	Other	8%	6%	0%	0%	0%	3%
Total		N = 33	N = 75	N = 103	N = 44	N = 11	N = 266
	Yes	82%	68%	78%	73%	55%	74%
	No	15%	29%	21%	25%	45%	24%
	Other	3%	3%	1%	2%	0%	2%

TABLE 35 OPINION REGARDING THE REASONABILITY AND ACCEPTABILITY OF POULTRY PRICES COMPARED WITH THOSE OF SUBSTITUTES, BY HOUSEHOLD SIZE

City	Response	Household size			Total
		Fewer than 4 members	4 to 6 members	More than 7 members	
Phnom Penh		N = 55	N = 64	N = 41	N = 160
	Yes	58%	70%	78%	68%
	No	40%	28%	22%	31%
	Other	2%	2%	0%	1%
Siem Reap		N = 31	N = 33	N = 42	N = 106
	Yes	87%	62%	81%	82%
	No	6%	14%	19%	15%
	Other	6%	2%	0%	3%
Total		N = 86	N = 97	N = 83	N = 266
	Yes	69%	73%	80%	74%
	No	28%	25%	20%	24%
	Other	3%	2%	0%	2%

TABLE 36 OPINION REGARDING THE REASONABILITY AND ACCEPTABILITY OF POULTRY PRICES COMPARED WITH THOSE OF SUBSTITUTIONS, BY HOUSEHOLD INCOME LEVEL

Response		Income level (riel/month				Total
		Less than 1 million	1 to < 3 million	3 to < 5 million	More than 5 million	
Phnom Penh		N = 42	N = 87	N = 19	N = 12	N = 160
	Yes	57%	70%	74%	83%	68%
	No	43%	28%	26%	17%	31%
	Other	0%	2%	0%	0%	1%
Siem Reap		N = 17	N = 40	N = 23	N = 26	N = 106
	Yes	76%	85%	83%	81%	82%
	No	18%	13%	17%	15%	15%
	Other	6%	3%	0%	4%	3%
Total		N = 59	N = 127	N = 42	N = 38	N = 266
	Yes	63%	75%	79%	82%	74%
	No	36%	23%	21%	16%	24%
	Other	2%	2%	0%	3%	2%

Price stability for poultry products

Most of the respondents also think that the price of poultry products is stable or rather stable. In fact, the price of poultry has gradually increased since 2007. People consider the price to be stable or rather stable if they can afford it; in general, people perceive the price as instable if it is difficult to afford.

TABLE 37 STABILITY OF POULTRY PRICES DURING THE LAST YEAR (EXCLUDING FOR SPECIAL EVENTS), BY EDUCATION LEVEL OF RESPONDENT

City	Response	Education level					Total
		No education	Primary diploma	Lower secondary diploma	Upper secondary diploma	College/ university diploma	
Phnom Penh		N = 21	N = 42	N = 64	N = 28	N = 5	N = 160
	Very stable	62%	36%	30%	36%	20%	36%
	Rather stable	29%	33%	48%	32%	60%	39%
	Not stable	10%	19%	20%	25%	20%	19%
	Very unstable	0%	12%	2%	7%	0%	5%
Siem Reap		N = 12	N = 33	N = 39	N = 16	N = 6	N = 106
	Very stable	25%	33%	33%	50%	17%	34%
	Rather stable	50%	61%	49%	25%	67%	50%
	Not stable	25%	6%	15%	25%	17%	15%
	Very unstable	0%	0%	3%	0%	0%	1%
Total		N = 33	N = 75	N = 103	N = 44	N = 11	N = 266
	Very stable	48%	35%	31%	41%	18%	35%
	Rather stable	36%	45%	49%	30%	64%	44%
	Not stable	15%	13%	18%	25%	18%	18%
	Very unstable	0%	7%	2%	5%	0%	3%

TABLE 38 STABILITY OF POULTRY PRICES DURING THE LAST YEAR (EXCLUDING FOR SPECIAL EVENTS), BY HOUSEHOLD SIZE

City	Response	Household size			Total
		Fewer than 4 members	4 to 6 members	More than 7 members	
Phnom Penh		N = 55	N = 64	N = 41	N = 160
	Very stable	38%	41%	27%	36%
	Rather stable	36%	36%	49%	39%
	Not stable	22%	16%	22%	19%
	Very unstable	4%	8%	2%	5%
Siem Reap		N = 31	N = 33	N = 42	N = 106
	Very stable	39%	19%	38%	34%
	Rather stable	42%	48%	48%	50%
	Not stable	19%	12%	12%	15%
	Very unstable	0%	0%	2%	1%
Total		N = 86	N = 97	N = 83	N = 266
	Very stable	38%	35%	33%	35%
	Rather stable	38%	44%	48%	44%
	Not stable	21%	15%	17%	18%
	Very unstable	2%	5%	2%	3%

TABLE 39 STABILITY OF POULTRY PRICES DURING THE LAST YEAR (EXCLUDING FOR SPECIAL EVENTS), BY HOUSEHOLD INCOME LEVEL

Response		Income level (riel/month)				Total
		Less than 1 million	1 to < 3 million	3 to < 5 million	More than 5 million	
Phnom Penh		N = 42	N = 87	N = 19	N = 12	N = 160
	Very stable	50%	30%	37%	33%	36%
	Rather stable	29%	46%	37%	33%	39%
	Not stable	14%	22%	11%	33%	19%
	Very unstable	7%	2%	16%	0%	5%
Siem Reap		N = 17	N = 40	N = 23	N = 26	N = 106
	Very stable	53%	45%	26%	12%	34%
	Rather stable	35%	38%	52%	77%	50%
	Not stable	12%	18%	22%	8%	15%
	Very unstable	0%	0%	0%	4%	1%
Total		N = 59	N = 127	N = 42	N = 38	N = 266
	Very stable	51%	35%	31%	18%	35%
	Rather stable	31%	43%	45%	63%	44%
	Not stable	14%	20%	17%	16%	18%
	Very unstable	5%	2%	7%	3%	3%

Among the restaurant respondents, 72 percent agree that the current prices of poultry meat are reasonable and acceptable compared with the prices of substitute products. 36 percent reported that poultry prices have been stable throughout this year (except on special occasions), while 60 percent said they did not vary much, and 4 percent that they varied throughout the year.

Substitutes for poultry products

If poultry prices increase, fish, pork, beef and vegetables are the main substitute products. Fish is the first choice, followed by pork. Lower-income households change first when they cannot afford the price of poultry, and switch to the substitute products that they identified in the survey.

TABLE 40 SUBSTITUTE PRODUCTS FOR POULTRY, BY EDUCATION LEVEL OF RESPONDENT

City	Product	Education level					Total*
		No education	Primary diploma	Lower secondary diploma	Upper secondary diploma	College/ university diploma	
Phnom Penh		N = 21	N = 42	N = 64	N = 28	N = 5	N = 160
	Fish	90%	88%	80%	93%	100%	86%
	Pork	86%	83%	69%	79%	100%	78%
	Beef	71%	43%	50%	36%	60%	49%
	Shrimp	5%	7%	5%	4%	20%	6%
	Vegetables	24%	26%	36%	14%	40%	28%
	Tofu	0%	2%	2%	0%	0%	1%
	Other	5%	0%	6%	4%	0%	4%
Siem Reap		N = 12	N = 33	N = 39	N = 16	N = 6	N = 106
	Fish	75%	94%	87%	81%	100%	88%
	Pork	83%	88%	82%	75%	83%	83%
	Beef	25%	39%	44%	38%	83%	42%
	Shrimp	0%	3%	3%	6%	17%	4%
	Vegetables	42%	58%	44%	31%	83%	48%
	Tofu	0%	3%	5%	19%	67%	5%
	Other	8%	3%	0%	0%	0%	2%
Total		N = 33	N = 75	N = 103	N = 44	N = 11	N = 266
	Fish	85%	91%	82%	89%	100%	87%
	Pork	85%	85%	74%	77%	91%	80%
	Beef	55%	41%	48%	36%	73%	46%
	Shrimp	3%	5%	4%	5%	18%	5%
	Vegetables	30%	40%	39%	21%	64%	36%
	Tofu	0%	1%	1%	0%	0%	1%
	Other	6%	1%	4%	2%	0%	3%

* The percentages in this table refer to the percentage of sampled households mentioning each substitute. When the total percentage is less than 100 percent, it is because some respondents do not use that substitute. This is a multiple-choice question, so the total percentages can also add up to more than 100 percent.

TABLE 41 SUBSTITUTE PRODUCTS FOR POULTRY, BY HOUSEHOLD INCOME LEVEL

City	Product	Income level (riel/month				Total
		Less than 1 million riel	From 1 to <3 million	From 3 to <5 million	More than 5 million	
Phnom Penh		N = 42	N = 87	N = 19	N = 12	N = 160
	Fish	95%	84%	84%	67%	86%
	Pork	86%	72%	84%	75%	78%
	Beef	48%	49%	47%	50%	49%
	Shrimp	5%	6%	5%	8%	6%
	Vegetables	21%	33%	26%	17%	28%
	Tofu	2%	1%	0%	0%	1%
	Other	0%	3%	5%	17%	4%
Siem Reap		N = 17	N = 40	N = 23	N = 26	N = 106
	Fish	94%	83%	91%	88%	88%
	Pork	82%	80%	91%	81%	83%
	Beef	29%	33%	22%	81%	42%
	Shrimp	0%	3%	4%	8%	4%
	Vegetables	24%	40%	52%	73%	48%
	Other	6%	3%	0%	0%	2%
Total		N = 59	N = 127	N = 42	N = 38	N = 266
	Fish	95%	83%	88%	82%	87%
	Pork	85%	75%	88%	79%	80%
	Beef	42%	44%	33%	71%	46%
	Shrimp	3%	5%	5%	8%	5%
	Vegetables	22%	35%	40%	55%	36%
	Tofu	2%	1%	0%	0%	1%
	Other	2%	3%	2%	5%	3%

* The percentages in this table refer to the percentage of sampled households mentioning each substitute. When the total percentage is less than 100 percent, it is because some respondents do not use that substitute. This is a multiple-choice question, so the total percentages can also add up to more than 100 percent.

As with household consumers, restaurants also change to fish, pork or beef when they cannot sell poultry products.

ASSESSMENT OF CONSUMERS' SATISFACTION

Comparison of domestic and industrial poultry

Almost all the sampled households reported that the flavour of domestic poultry is better than that of exotic poultry species. The answers were consistent across all education and household income levels. Respondents explained that domestic poultry tastes better because it is fed with natural rather than chemical feed (concentrate feed).

TABLE 42 COMPARISON OF FLAVOUR AND TEXTURE BETWEEN LOCAL POULTRY AND EXOTIC BREEDS, BY EDUCATION LEVEL OF RESPONDENT

City	Flavour and texture of local poultry is:	Education level					Total
		No education	Primary diploma	Lower secondary diploma	Upper secondary diploma	College/ university diploma	
Phnom Penh		N = 21	N = 42	N = 64	N = 28	N = 5	N = 160
	Better	100%	95%	98%	100%	100%	98%
	The same	0%	2%	2%	0%	0%	1%
	No view	0%	2%	0%	0%	0%	1%
Siem Reap		N = 12	N = 33	N = 39	N = 16	N = 6	N = 106
	Better	100%	100%	97%	100%	100%	99%
	The same	0%	0%	0%	0%	0%	0%
	No view	0%	0%	3%	0%	0%	1%
Total		N = 33	N = 75	N = 103	N = 44	N = 11	N = 266
	Better	100%	97%	98%	100%	100%	98%
	The same	0%	1%	1%	0%	0%	1%
	No view	0%	1%	1%	0%	0%	1%

TABLE 43 COMPARISON OF FLAVOUR AND TEXTURE BETWEEN LOCAL POULTRY AND EXOTIC BREEDS, BY HOUSEHOLD INCOME LEVEL

City	Flavour and texture of local poultry is:	Income level (riel/month)				Total
		Less than 1 million	1 to < 3 million	3 to < 5 million	More than 5 million	
Phnom Penh		N = 42	N = 87	N = 19	N = 12	N = 160
	Better	95%	100%	100%	92%	98%
	The same	2%	0%	0%	8%	1%
	No view	2%	0%	0%	0%	1%
Siem Reap		N = 17	N = 40	N = 23	N = 26	N = 106
	Better	100%	100%	96%	100%	99%
	The same	0%	0%	0%	0%	0%
	No view	0%	0%	4%	0%	1%
Total		N = 59	N = 127	N = 42	N = 38	N = 266
	Better	96%	100%	98%	98%	94%
	The same	2%	0%	0%	2%	3%
	No view	2%	0%	2%	0%	3%

Almost all respondents reported that chilled poultry products taste worse than fresh ones. Most of them reported that the meat does not taste good when it has been kept for a long time.

TABLE 44 COMPARISON OF FLAVOUR AND TEXTUREOF CHILLED AND FRESH POULTRY PRODUCTS, BY EDUCATION LEVEL OF RESPONDENT

City	Flavour and texture of chilled poultry is:	Education level					Total
		No education	Primary diploma	Lower secondary diploma	Upper secondary diploma	College/ university diploma	
Phnom Penh		N = 21	N = 42	N = 64	N = 28	N = 5	N = 160
	Better	0%	0%	0%	0%	0%	0%
	Worse	86%	88%	97%	96%	100%	93%
	The same	14%	5%	3%	0%	0%	4%
	No view	0%	7%	0%	4%	0%	3%
Siem Reap		N = 12	N = 33	N = 39	N = 16	N = 6	N = 106
	Better	0%	0%	0%	0%	0%	0%
	Worse	100%	97%	95%	100%	100%	97%
	The same	0%	0%	0%	0%	0%	0%
	No view	0%	3%	5%	0%	0%	3%
Total		N = 33	N = 75	N = 103	N = 44	N = 11	N = 266
	Better	0%	0%	0%	0%	0%	0%
	Worse	91%	92%	96%	98%	100%	95%
	The same	9%	3%	2%	0%	0%	3%
	No view	0%	5%	2%	2%	0%	3%

TABLE 45 COMPARISON OF FLAVOUR AND TEXTURE OF CHILLED AND FRESH POULTRY PRODUCTS, BY HOUSEHOLD INCOME LEVEL

City	Flavour and texture of chilled poultry is:	Income level (riel/month)				Total
		Less than 1 million	1 to < 3 million	3 to < 5 million	More than 5 million	
Phnom Penh		N = 42	N = 87	N = 19	N = 12	N = 160
	Worse	90%	95%	84%	100%	93%
	The same	7%	5%	0%	0%	4%
	No view	2%	0%	16%	0%	3%
Siem Reap		N = 17	N = 40	N = 23	N = 26	N = 106
	Worse	100%	100%	96%	92%	97%
	The same	0%	0%	0%	0%	0%
	No view	0%	0%	4%	8%	3%
Total		N = 59	N = 127	N = 42	N = 38	N = 266
	Worse	93%	97%	90%	95%	95%
	The same	5%	3%	0%	0%	3%
	No view	2%	0%	10%	5%	3%

Of the restaurant respondents, 92 percent think that poultry meet kept in a refrigerator is less tasty than fresh poultry meat. They also think that when poultry meat is kept in a refrigerator for a long time it loses flavour. Exotic poultry meat is not as good and not as tasty as domestic poultry.

Views about packaging and labelling

It is interesting to note that only 14 percent of the respondents recently purchased live chickens. The proportion of lower-income households (20 percent) doing so is higher than that of higher-income households (11 percent). The reason for not buying live chickens is not explicitly related to an understanding of the risks from HPAI, but is instead related to religious beliefs such as fear of sin and not wanting to kill.

TABLE 46 RECENT PURCHASES OF LIVE CHICKENS, BY EDUCATION LEVEL OF RESPONDENT

City	Recently bought live chickens?	Education level					Total
		No education	Primary diploma	Lower secondary diploma	Upper secondary diploma	College/ university diploma	
Phnom Penh		N = 21	N = 42	N = 64	N = 28	N = 5	N = 160
	Yes	24%	10%	19%	4%	0%	14%
	No	76%	90%	81%	96%	100%	86%
Siem Reap		N = 12	N = 33	N = 39	N = 16	N = 6	N = 106
	Yes	8%	15%	15%	6%	33%	14%
	No	92%	85%	85%	94%	67%	86%
Total		N = 33	N = 75	N = 103	N = 44	N = 11	N = 266
	Yes	18%	12%	17%	5%	18%	14%
	No	82%	88%	83%	95%	82%	86%

TABLE 47 RECENT PURCHASES OF LIVE CHICKENS, BY HOUSEHOLD INCOME LEVEL

City	Recently bought live chickens?	Income level (riel/month)				Total
		Less than 1 million	1 to < 3 million	3 to < 5 million	More than 5 million	
Phnom Penh		N = 42	N = 87	N = 19	N = 12	N = 160
	Yes	14%	13%	16%	17%	14%
	No	86%	87%	84%	83%	86%
Siem Reap		N = 17	N = 40	N = 23	N = 26	N = 106
	Yes	35%	13%	9%	8%	14%
	No	65%	88%	91%	92%	86%
Total		N = 59	N = 127	N = 42	N = 38	N = 266
	Yes	20%	13%	12%	11%	14%
	No	80%	87%	88%	89%	86%

Similar to the household respondents, restaurant respondents reported that they do not buy live chickens because they do not want to kill and have no time to slaughter as they are busy with other activities. Only 16 percent of the restaurants buy live chickens.

Comparing the current situation with that prior to the HPAI outbreak, most respondents (78 percent) reported that the diversity of poultry package forms has not changed; about 18 percent said that they do not know. This result is similar across all education and income levels.

TABLE 48 PERCEIVED CHANGES IN DIVERSITY OF PACKAGE FORMS FOR POULTRY PRODUCTS SINCE THE HPAI OUTBREAK, BY EDUCATION LEVEL OF RESPONDENT

City	Change	Education level					Total
		No education	Primary diploma	Lower secondary diploma	Upper secondary diploma	College/ university diploma	
Phnom Penh		N = 21	N = 42	N = 64	N = 28	N = 5	N = 160
	More	0%	0%	0%	0%	0%	0%
	Less	0%	0%	0%	0%	20%	1%
	The same	90%	79%	84%	75%	60%	81%
	No view	10%	21%	16%	25%	20%	18%
Siem Reap		N = 12	N = 33	N = 39	N = 16	N = 6	N = 106
	More	17%	3%	5%	0%	0%	5%
	Less	0%	3%	8%	0%	0%	4%
	The same	58%	85%	69%	56%	100%	73%
	No view	25%	9%	18%	44%	0%	19%
Total		N = 33	N = 75	N = 103	N = 44	N = 11	N = 266
	More	6%	1%	2%	0%	0%	2%
	Less	0%	1%	3%	0%	9%	2%
	The same	79%	81%	79%	68%	82%	78%
	No view	15%	16%	17%	32%	9%	18%

TABLE 49 PERCEIVED CHANGES IN DIVERSITY OF PACKAGE FORMS FOR POULTRY PRODUCTS SINCE THE HPAI OUTBREAK, BY HOUSEHOLD INCOME LEVEL

City	Change	Income level (riel/month)				Total
		Less than 1 million	1 to < 3 million	3 to < 5 million	More than 5 million	
Phnom Penh		N = 42	N = 87	N = 19	N = 12	N = 160
	More	0%	0%	0%	0%	0%
	Less	0%	0%	0%	8%	1%
	The same	81%	85%	89%	42%	81%
	No view	19%	15%	11%	50%	18%
Siem Reap		N = 17	N = 40	N = 23	N = 26	N = 106
	More	6%	8%	0%	4%	5%
	Less	0%	5%	4%	4%	4%
	The same	76%	70%	65%	81%	73%
	No view	18%	18%	30%	12%	19%
Total		N = 59	N = 127	N = 42	N = 38	N = 266
	More	2%	2%	0%	3%	2%
	Less	0%	2%	2%	5%	2%
	The same	80%	80%	76%	68%	78%
	No view	19%	16%	21%	24%	18%

Among restaurant respondents, 64 percent reported no change in the diversity of package forms, and 32 percent did not know.

Regarding whether poultry products need packaging and labels, 92 percent of respondents believe that they should be packaged and labelled, especially those in the highest-income households (100 percent). About 30 percent of respondents support packaging practices as a way of ensuring safety and freedom from HPAI, while 23 percent support it because it allows free choice of products when purchasing, and 13 percent for sanitation purposes.

TABLE 50 PERCEIVED NEED FOR PACKAGING AND LABELS FOR POULTRY PRODUCTS, BY EDUCATION LEVEL OF RESPONDENT

City	Package required?	Education level					Total
		No education	Primary diploma	Lower secondary diploma	Upper secondary diploma	College/ university diploma	
Phnom Penh		N = 21	N = 42	N = 64	N = 28	N = 5	N = 160
	Yes	90%	88%	94%	89%	100%	91%
	No	0%	5%	5%	7%	0%	4%
	No view	10%	7%	2%	4%	0%	4%
Siem Reap		N = 12	N = 33	N = 39	N = 16	N = 6	N = 106
	Yes	92%	91%	90%	100%	100%	92%
	No	0%	3%	10%	0%	0%	5%
	No view	8%	6%	0%	0%	0%	3%
Total		N = 33	N = 75	N = 103	N = 44	N = 11	N = 266
	Yes	91%	89%	92%	93%	100%	92%
	No	0%	4%	7%	5%	0%	5%
	No view	9%	7%	1%	2%	0%	4%

TABLE 51 PERCEIVED NEED FOR PACKAGING AND LABELS FOR POULTRY PRODUCTS, BY HOUSEHOLD INCOME LEVEL

City	Package required?	Income level (riel/month)				Total
		Less than 1 million	1 to < 3 million	3 to < 5 million	More than 5 million	
Phnom Penh		N = 42	N = 87	N = 19	N = 12	N = 160
	Yes	90%	91%	89%	100%	91%
	No	5%	6%	0%	0%	4%
	No view	5%	3%	11%	0%	4%
Siem Reap		N = 17	N = 40	N = 23	N = 26	N = 106
	Yes	94%	90%	87%	100%	92%
	No	6%	8%	4%	0%	5%
	No view	0%	3%	9%	0%	3%
Total		N = 59	N = 127	N = 42	N = 38	N = 266
	Yes	92%	91%	88%	100%	92%
	No	5%	6%	2%	0%	5%
	No view	3%	3%	10%	0%	4%

It was noted that the reasons for favouring or not favouring the packaging of poultry products contradict each other. For example, some respondents reported that the purpose of packaging is to avoid corruption, but others claimed that packaging creates opportunities for corruption.

Among the restaurant respondents, 80 percent said that both meat and eggs should be packaged and labelled. Their reasons are:

- safety from HPAI (seven respondents);
- identification of the sources of products; knowing the quality makes choices easier (11 respondents);
- good sanitation (one respondent);
- preventing intermediaries and sellers from misleading consumers (one respondent).

One restaurant respondent thinks that packaging is not important for poultry meat because the better-quality poultry can easily be identified and sellers do not sell large volumes.

Regarding whether poultry retailers need fridges or cold boxes, about 60 percent of respondents agreed that they need them, while 35 percent think that they do not. Having a fridge or cold box is related to business performance. For example, when sellers do not sell all

their meat, they can keep it in fridges for sale later or the next day. Clients also like it when the meat is sold with better sanitation. However, higher-income households do not support the use of fridges or cold boxes because they prefer fresh products. A seller with a fridge or cold box can sell chilled products that may be less fresh. Some respondents are of the view that retailers know the quantity they are likely to sell each day, so do not need fridges or cold boxes.

TABLE 52 PERCEIVED NEED FOR FRIDGE/COLD BOX FOR POULTRY RETAILERS, BY EDUCATION LEVEL OF RESPONDENT

City	Need for fridge or chill box?	Education level					Total
		No education	Primary diploma	Lower secondary diploma	Upper secondary diploma	College/ university diploma	
Phnom Penh		N = 21	N = 42	N = 64	N = 28	N = 5	N = 160
	Yes	71%	62%	55%	54%	100%	60%
	No	14%	31%	41%	29%	0%	31%
	No view	14%	7%	5%	18%	0%	9%
Siem Reap		N = 12	N = 33	N = 39	N = 16	N = 6	N = 106
	Yes	50%	55%	49%	75%	83%	57%
	No	50%	45%	44%	13%	17%	39%
	No view	0%	0%	8%	13%	0%	5%
Total		N = 33	N = 75	N = 103	N = 44	N = 11	N = 266
	Yes	64%	59%	52%	61%	91%	59%
	No	27%	37%	42%	23%	9%	34%
	No view	9%	4%	6%	16%	0%	7%

TABLE 53 PERCEIVED NEED FOR FRIDGE/COLD BOX FOR POULTRY RETAILERS, BY HOUSEHOLD INCOME LEVEL

City	Need for fridge or chill box?	Income level (riel/month)				Total
		Less than 1 million	1 to < 3 million	3 to < 5 million	More than 5 million	
Phnom Penh		N = 42	N = 87	N = 19	N = 12	N = 160
	Yes	55%	61%	63%	67%	60%
	No	31%	34%	21%	25%	31%
	No view	14%	5%	16%	8%	9%
Siem Reap		N = 17	N = 40	N = 23	N = 26	N = 106
	Yes	76%	75%	48%	23%	57%
	No	18%	20%	52%	69%	39%
	No view	6%	5%	0%	8%	5%
Total		N = 59	N = 127	N = 42	N = 38	N = 266
	Yes	61%	65%	55%	37%	59%
	No	27%	30%	38%	55%	34%
	No view	12%	5%	7%	8%	7%

Regarding the need to label eggs, 83 percent of the sampled households agreed that it would be useful, while 10 percent perceive no need, and about 7 percent have no view. The reasons for labelling eggs were reported as to identify the source, and to ensure safety and freedom from HPAI.

TABLE 54 PERCEIVED NEED FOR EGG BOXES AND LABELS, BY EDUCATION LEVEL OF RESPONDENT

City	Need for box and label?	Education level					Total
		No education	Primary diploma	Lower secondary diploma	Upper secondary diploma	College/ university diploma	
Phnom Penh		N = 21	N = 42	N = 64	N = 28	N = 5	N = 160
	Yes	86%	69%	84%	75%	100%	79%
	No	5%	21%	13%	18%	0%	14%
	No view	10%	10%	3%	7%	0%	6%
Siem Reap		N = 12	N = 33	N = 39	N = 16	N = 6	N = 106
	Yes	92%	85%	85%	100%	100%	89%
	No	0%	3%	8%	0%	0%	4%
	No view	8%	12%	8%	0%	0%	8%
Total		N = 33	N = 75	N = 103	N = 44	N = 11	N = 266
	Yes	88%	76%	84%	84%	100%	83%
	No	3%	13%	11%	11%	0%	10%
	No view	9%	11%	5%	5%	0%	7%

TABLE 55 PERCEIVED NEED FOR EGG BOXES AND LABELS, BY HOUSEHOLD INCOME LEVEL

City	Need for box and label?	Income level (riel/month)				Total
		Less than 1 million	1 to < 3 million	3 to < 5 million	More than 5 million	
Phnom Penh		N = 42	N = 87	N = 19	N = 12	N = 160
	Yes	71%	82%	84%	83%	79%
	No	21%	13%	11%	8%	14%
	No view	7%	6%	5%	8%	6%
Siem Reap		N = 17	N = 40	N = 23	N = 26	N = 106
	Yes	94%	90%	91%	81%	89%
	No	6%	0%	4%	8%	4%
	No view	0%	10%	4%	12%	8%
Total		N = 59	N = 127	N = 42	N = 38	N = 266
	Yes	78%	84%	88%	82%	83%
	No	17%	9%	7%	8%	10%
	No view	5%	7%	5%	11%	7%

Regarding their views on the safety of labelled eggs or poultry at markets, 67 percent of the sampled households agreed that they are safe. Surprisingly, this proportion is lower in the higher-income households, creating a constraint for introducing the use of labels for eggs or poultry products in markets. Consumers feel that eggs or poultry products should be labelled, but some do not believe that labelled products are necessarily safer, or that such measures would work well in markets.[2]

[2] In this document, the term "market" refers to normal markets, unless specific reference is made to supermarkets, e.g., Lucky, CEDAC Shop.

TABLE 56 PERCEIVED EFFECTIVENESS OF STAMPING EGGS AND POULTRY PRODUCTS AT MARKETS TO PROVE SAFE PRODUCTS, BY EDUCATION LEVEL OF RESPONDENT

City	Effective?	Education level					Total
		No education	Primary diploma	Lower secondary diploma	Upper secondary diploma	College/ university diploma	
		N = 21	N = 42	N = 64	N = 28	N = 5	N = 160
Phnom Penh	Yes	76%	62%	81%	75%	40%	73%
	No	10%	10%	11%	14%	60%	13%
	No view	14%	29%	8%	11%	0%	14%
		N = 12	N = 33	N = 39	N = 16	N = 6	N = 106
Siem Reap	Yes	67%	52%	64%	50%	50%	58%
	No	17%	12%	18%	25%	33%	18%
	No view	17%	36%	18%	25%	17%	25%
		N = 33	N = 75	N = 103	N = 44	N = 11	N = 266
	Yes	73%	57%	75%	66%	45%	67%
	No	12%	11%	14%	18%	45%	15%
Total	No view	15%	32%	12%	16%	9%	18%

TABLE 57 PERCEIVED EFFECTIVENESS OF STAMPING EGGS AND POULTRY PRODUCTS AT MARKETS TO PROVE SAFE PRODUCTS, BY HOUSEHOLD INCOME LEVEL

City	Effective?	Income level (riel/month)				Total
		Less than 1 million	1 to < 3 million	3 to < 5 million	More than 5 million	
		N = 42	N = 87	N = 19	N = 12	N = 160
	Yes	69%	80%	68%	42%	73%
Phnom Penh	No	14%	8%	21%	25%	13%
	No view	17%	11%	11%	33%	14%
		N = 17	N = 40	N = 23	N = 26	N = 106
	Yes	76%	78%	39%	31%	58%
Siem Reap	No	18%	10%	30%	19%	18%
	No view	6%	13%	30%	50%	25%
		N = 59	N = 127	N = 42	N = 38	N = 266
	Yes	71%	80%	52%	34%	67%
	No	15%	9%	26%	21%	15%
Total	No view	14%	12%	21%	45%	18%

Among restaurant respondents, 52 percent (13) think that labelled products are safe because sellers would not want to lose the credibility of their brand name by making false claims. One respondent thinks they may not be safe because she had never heard about the national laboratory working on poultry disease in Cambodia.

Affordability of safe poultry products for consumers

Were poultry prices to rise by 10, 20 or 30 percent to guarantee their safety, most sampled households think they would still be able to afford them. About 92 percent reported that they can afford a 10 percent increase in price; about 73 percent can afford a 20 percent increase; and about 54 percent a 30 percent increase. A higher proportion of higher-income households (68 percent) can afford a 30 percent increase.

TABLE 58 AFFORDABILITY OF A 10 PERCENT PRICE RISE FOR POULTRY PRODUCTS SOLD WITH PACKAGING AND LABELS, BY EDUCATION LEVEL OF RESPONDENT

City	Affordable?	Education level					Total
		No education	Primary diploma	Lower secondary diploma	Upper secondary diploma	College/ university diploma	
		N = 21	N = 42	N = 64	N = 28	N = 5	N = 160
Phnom Penh	Yes	90%	86%	94%	86%	100%	90%
	No	10%	12%	6%	11%	0%	9%
	No view	0%	2%	0%	4%	0%	1%
		N = 12	N = 33	N = 39	N = 16	N = 6	N = 106
Siem Reap	Yes	92%	94%	95%	100%	83%	94%
	No	8%	0%	5%	0%	0%	3%
	No view	0%	6%	0%	0%	17%	3%
		N = 33	N = 75	N = 103	N = 44	N = 11	N = 266
	Yes	91%	89%	94%	91%	91%	92%
	No	9%	7%	6%	7%	0%	6%
Total	No view	0%	4%	0%	2%	9%	2%

TABLE 59 AFFORDABILITY OF A 20 PERCENT PRICE RISE FOR POULTRY PRODUCTS SOLD WITH PACKAGING AND LABELS, BY EDUCATION LEVEL OF RESPONDENT

City	Affordable?	Education level					Total
		No education	Primary diploma	Lower secondary diploma	Upper secondary diploma	College/ university diploma	
		N = 21	N = 42	N = 64	N = 28	N = 5	N = 160
Phnom Penh	Yes	76%	60%	69%	75%	80%	69%
	No	24%	36%	22%	21%	0%	25%
	No view	0%	5%	9%	4%	20%	6%
		N = 12	N = 33	N = 39	N = 16	N = 6	N = 106
Siem Reap	Yes	83%	64%	92%	81%	67%	79%
	No	17%	27%	8%	13%	17%	16%
	No view	0%	9%	0%	6%	17%	5%
		N = 33	N = 75	N = 103	N = 44	N = 11	N = 266
	Yes	79%	61%	78%	77%	73%	73%
	No	21%	32%	17%	18%	9%	21%
Total	No view	0%	7%	6%	5%	18%	6%

TABLE 60 AFFORDABILITY OF A 30 PERCENT PRICE RISE FOR POULTRY PRODUCTS SOLD WITH PACKAGING AND LABELS, BY EDUCATION LEVEL OF RESPONDENT

City	Affordable?	Education level					Total
		No education	Primary diploma	Lower secondary diploma	Upper secondary diploma	College/ university diploma	
		N = 21	N = 42	N = 64	N = 28	N = 5	N = 160
Phnom Penh	Yes	57%	38%	47%	54%	40%	47%
	No	38%	52%	45%	39%	40%	45%
	No view	5%	10%	8%	7%	20%	8%
		N = 12	N = 33	N = 39	N = 16	N = 6	N = 106
Siem Reap	Yes	75%	39%	79%	63%	67%	63%
	No	17%	48%	18%	31%	17%	29%
	No view	8%	12%	3%	6%	17%	8%
		N = 33	N = 75	N = 103	N = 44	N = 11	N = 266
	Yes	64%	39%	59%	57%	55%	53%
	No	30%	51%	35%	36%	27%	39%
Total	No view	6%	11%	6%	7%	18%	8%

TABLE 61 AFFORDABILITY OF A 10 PERCENT PRICE RISE FOR POULTRY PRODUCTS SOLD WITH PACKAGING AND LABELS, BY HOUSEHOLD INCOME LEVEL

City	Affordable?	Income level (riel/month)				Total
		Less than 1 million	1 to < 3 million	3 to < 5 million	More than 5 million	
Phnom Penh		N = 42	N = 87	N = 19	N = 12	N = 160
	Yes	79%	92%	100%	100%	90%
	No	21%	6%	0%	0%	9%
	No view	0%	2%	0%	0%	1%
Siem Reap		N = 17	N = 40	N = 23	N = 26	N = 106
	Yes	94%	100%	96%	85%	94%
	No	6%	0%	0%	8%	3%
	No view	0%	0%	4%	8%	3%
Total		N = 59	N = 127	N = 42	N = 38	N = 266
	Yes	83%	94%	98%	89%	92%
	No	17%	4%	0%	5%	6%
	No view	0%	2%	2%	5%	2%

TABLE 62 AFFORDABILITY OF A 20 PERCENT PRICE RISE FOR POULTRY PRODUCTS SOLD WITH PACKAGING AND LABELS, BY HOUSEHOLD INCOME LEVEL

City	Affordable?	Income level (riel/month)				Total
		Less than 1 million	1 to < 3 million	3 to < 5 million	More than 5 million	
Phnom Penh		N = 42	N = 87	N = 19	N = 12	N = 160
	Yes	55%	70%	79%	92%	69%
	No	38%	23%	16%	8%	25%
	No view	7%	7%	5%	0%	6%
Siem Reap		N = 17	N = 40	N = 23	N = 26	N = 106
	Yes	71%	85%	83%	73%	79%
	No	29%	15%	4%	19%	16%
	No view	0%	0%	13%	8%	5%
Total		N = 59	N = 127	N = 42	N = 38	N = 266
	Yes	59%	75%	81%	79%	73%
	No	36%	20%	10%	16%	21%
	No view	5%	5%	10%	5%	6%

TABLE 63 AFFORDABILITY OF A 30 PERCENT PRICE RISE FOR POULTRY PRODUCTS SOLD WITH PACKAGING AND LABELS, BY HOUSEHOLD INCOME LEVEL

City	Affordable?	Income level (riel/month)				Total
		Less than 1 million	1 to < 3 million	3 to < 5 million	More than 5 million	
Phnom Penh		N = 42	N = 87	N = 19	N = 12	N = 160
	Yes	38%	46%	53%	75%	47%
	No	60%	43%	37%	25%	45%
	No view	2%	11%	11%	0%	8%
Siem Reap		N = 17	N = 40	N = 23	N = 26	N = 106
	Yes	53%	73%	52%	65%	63%
	No	41%	23%	30%	31%	29%
	No view	6%	5%	17%	4%	8%
Total		N = 59	N = 127	N = 42	N = 38	N = 266
	Yes	42%	54%	52%	68%	53%
	No	54%	36%	33%	29%	39%
	No view	3%	9%	14%	3%	8%

Of the restaurant respondents, 72 percent said that they can afford a 10 percent price increase, 48 percent a 20 percent increase, and 44 percent a 30 percent increase.

Consumers' awareness of and suggestions for quality and safety controls

Household respondents

About 16 percent of household respondents said that government interventions to control HPAI have assured consumers' safety, while about 60 percent said that they have not, and 24 percent were not sure about this issue. Lower-income households are less aware of government interventions; many of them have no opinions on whether such interventions assure consumers' safety.

TABLE 64 PERCEPTION OF THE EFFECTIVENESS OF GOVERNMENT INTERVENTIONS IN ENSURING CONSUMERS' SAFETY, BY EDUCATION LEVEL OF RESPONDENT

City	Effective?	Education level					Total
		No education	Primary diploma	Lower secondary diploma	Upper secondary diploma	College/ university diploma	
Phnom Penh		N = 21	N = 42	N = 64	N = 28	N = 5	N = 160
	Yes	0%	19%	20%	14%	20%	16%
	No	71%	45%	61%	64%	60%	59%
	No view	29%	36%	19%	21%	20%	25%
Siem Reap		N = 12	N = 33	N = 39	N = 16	N = 6	N = 106
	Yes	33%	15%	13%	19%	0%	16%
	No	50%	52%	67%	69%	83%	61%
	No view	17%	33%	21%	13%	17%	23%
Total		N = 33	N = 75	N = 103	N = 44	N = 11	N = 266
	Yes	12%	17%	17%	16%	9%	16%
	No	64%	48%	63%	66%	73%	60%
	No view	24%	35%	19%	18%	18%	24%

TABLE 65 PERCEPTION OF THE EFFECTIVENESS OF GOVERNMENT INTERVENTIONS IN ENSURING CONSUMERS' SAFETY, BY HOUSEHOLD INCOME LEVEL

City	Effective?	Level of income				Total
		Less than 1 million	1 to < 3 million	3 to < 5 million	More than 5 million	
Phnom Penh		N = 42	N = 87	N = 19	N = 12	N = 160
	Yes	17%	14%	21%	25%	16%
	No	50%	63%	63%	50%	59%
	No view	33%	23%	16%	25%	25%
Siem Reap		N = 17	N = 40	N = 23	N = 26	N = 106
	Yes	18%	20%	9%	15%	16%
	No	59%	53%	65%	73%	61%
	No view	24%	28%	26%	12%	23%
Total		N = 59	N = 127	N = 42	N = 38	N = 266
	Yes	17%	16%	14%	18%	16%
	No	53%	60%	64%	66%	60%
	No view	31%	24%	21%	16%	24%

Most of those who said that government interventions have assured consumers' safety rated the interventions as providing a fair (29 percent) or medium level of assurance (50 percent). Respondents could provide few reasons to support their answers, but they know about the banning of illegal imports, the wide-scale media broadcasting and that not many people are affected by HPAI in Cambodia. This leads them to rate the assurance as fair or medium.

TABLE 66 LEVEL OF ASSURANCE PROVIDED BY GOVERNMENT INTERVENTIONS

Level of assurance	Phnom Penh			Siem Reap			Total		
	No of responses	% of total responses	% of total sample	No of responses	% of total responses	% of total sample	No of responses	% of total responses	% of total sample
Very high	3	12	2	3	17	3	6	14	2
Fair	8	31	5	5	28	5	13	30	5
Medium	12	46	8	10	56	9	22	50	8
Very low	3	12	2	0	0	0	3	7	1
Total	26	100	16	18	100	17	44	100	17

In the last two years, almost all respondents have received recommendations about food and poultry safety through television, radio and billboards and from relatives or neighbours. About 10 percent of respondents reported that they have received recommendations from doctors or health care professionals. Higher-income households reported receiving more recommendations about food and poultry safety. Higher-income households received this information from public media, such as billboards, which are also available to lower-income households. The issue is therefore one of paying attention to health issues. For example, only about 39 percent of low-income households noted recommendations on billboards, compared with 54 percent of high-income households:

- Recommendations on food safety were received from television (95 percent), radio (55 percent), billboards (38 percent), and relatives or neighbours (27 percent).
- Recommendations on poultry safety were received from television (97 percent), radio (64 percent), billboards (45 percent) and relatives or neighbours (34 percent).

TABLE 67 MEDIA OUTREACH ON FOOD AND POULTRY SAFETY, BY EDUCATION LEVEL OF RESPONDENT

Type of recommendation	Source	Education level					Total
		No education	Primary diploma	Lower secondary diploma	Upper secondary diploma	College/ university diploma	
		N = 33	N = 75	N = 103	N = 44	N = 11	N = 266
In the past two years, have you seen or heard recommendations on food safety from:	Television	97.0%	93.3%	96.1%	95.5%	100.0%	95.5%
	Radio	36.4%	58.7%	53.4%	59.1%	72.7%	54.5%
	Newspapers	9.1%	13.3%	16.5%	27.3%	36.4%	17.3%
	Billboards, brochures	39.4%	37.3%	35.0%	40.9%	54.5%	38.0%
	Internet	0.0%	0.0%	2.9%	0.0%	9.1%	1.5%
	Relatives, neighbours	12.1%	34.7%	25.2%	25.0%	45.5%	27.1%
	Doctors/health care professionals	9.1%	5.3%	13.6%	20.5%	9.1%	11.7%
In the past two years, have you seen or heard recommendations on poultry safety from:	Television	100.0%	94.7%	97.1%	95.5%	100.0%	96.6%
	Radio	51.5%	66.7%	62.1%	65.9%	81.8%	63.5%
	Newspapers	9.1%	17.3%	22.3%	27.3%	54.5%	21.4%
	Billboards, brochures	39.4%	45.3%	42.7%	47.7%	72.7%	45.1%
	Internet	3.0%	0.0%	1.0%	0.0%	27.3%	1.9%
	Relatives, neighbours	18.2%	41.3%	32.0%	31.8%	54.5%	33.8%
	Doctors/health care professionals	6.1%	4.0%	13.6%	20.5%	9.1%	10.9%

The percentages in this table refer to the percentage of sampled households mentioning each source of information. When the total percentage is less than 100 percent, it is because some respondents did not mention that source. This is a multiple-choice question, so the total percentages can also add up to more than 100 percent.

TABLE 68 MEDIA OUTREACH ON FOOD AND POULTRY SAFETY, BY HOUSEHOLD INCOME LEVEL

Type of recommendation	Source	Level of monthly incomes				Total
		Less than 1 million N = 59	1 to < 3 million N = 127	3 to < 5 million N = 42	More than 5 million N = 38	N = 266
In the past two years, have you seen or heard recommendations on food safety from:	Television	96.6%	94.5%	95.2%	97.4%	95.5%
	Radio	55.9%	48.0%	61.9%	65.8%	54.5%
	Newspapers	13.6%	18.1%	19.0%	18.4%	17.3%
	Billboards, brochures	42.4%	32.3%	28.6%	60.5%	38.0%
	Internet	0.0%	1.6%	0.0%	5.3%	1.5%
	Relatives, neighbours	16.9%	15.7%	42.9%	63.2%	27.1%
	Doctors/health care professionals	13.6%	7.9%	19.0%	13.2%	11.7%
In the past two years, have you seen or heard recommendations on poultry safety from:	Television	98.3%	95.3%	95.2%	100.0%	96.6%
	Radio	64.4%	58.3%	69.0%	73.7%	63.5%
	Newspapers	13.6%	22.8%	26.2%	23.7%	21.4%
	Billboards, brochures	47.5%	43.3%	33.3%	60.5%	45.1%
	Internet	1.7%	1.6%	2.4%	2.6%	1.9%
	Relatives, neighbours	16.9%	27.6%	47.6%	65.8%	33.8%
	Doctors/health care professionals	8.5%	7.1%	23.8%	13.2%	10.9%

The percentages in this table refer to the percentage of sampled households mentioning each source of information. When the total percentage is less than 100 percent, it is because some respondents did not mention that source. This is a multiple-choice question, so the total percentages can also add up to more than 100 percent.

Regarding ways of increasing household consumption of poultry products, respondents reported two main ideas: 1) banning illegal imports from outside Cambodia (23 percent); and 2) quality control of poultry products before allowing their sale at markets (70 percent). Keeping prices at reasonable levels (11 percent) was another suggestion.

TABLE 69 RESPONDENTS' SUGGESTIONS REGARDING HOW TO INCREASE POULTRY CONSUMPTION, BY HOUSEHOLD INCOME LEVEL

Suggested action by government or processing industry to help increase consumption of poultry products	Income level (riel/month)				Total
	Less than 1 million N = 59	1 to < 3 million N = 127	3 to < 5 million N = 42	More than 5 million N = 38	N = 266
Block illegal imported poultry from outside Cambodia	14%	24%	26%	32%	23%
Properly control that products are free from HPAI before they can be sold in markets	78%	72%	57%	66%	70%
Keep the prices of poultry reasonable	2%	5%	12%	0%	5%

The percentages in this table refer to the percentage of sampled households mentioning each suggestion. When the total percentage is less than 100 percent, it is because some respondents did not mention that suggestion.

Restaurant respondents

Of the restaurant respondents, 24 percent think that consumers are protected by government interventions to control HPAI, because they have seen television reports about such interventions. However, about 32 percent think that consumers are not well protected, because a short broadcast about HPAI on TV and radio is not enough. They think that no serious control measures have yet been taken.

Media outreach to restaurants is mainly through TV. This might be because the TV is almost always on during restaurants' business hours. Fewer than 50 percent of restaurant respondents have received information about HPAI and food safety through other means. Details about the media outreach to restaurants are presented in Table 70.

TABLE 70 MEDIA OUTREACH ON FOOD AND POULTRY SAFETY AMONG RESTAURANTS

In the past two years, have you seen or heard recommendations from:	On food safety	On poultry safety
Television	100%	100%
Radio	44%	52%
News paper	32%	32%
Brochure	48%	56%
Relatives/neighbor	24%	36%
Doctor/health care specialist	8%	4%

The percentages in this table refer to the percentage of sampled restaurants mentioning each source of information. When the total percentage is less than 100 percent, it is because some respondents did not mention that source. This is a multiple-choice question, so the total percentages can also add up to more than 100 percent

The restaurant respondents also suggested that proper control measures from the concerned authority are important.

CONCLUSIONS AND RECOMMENDATIONS

From this survey, the following can be concluded:

- Household consumers prefer domestic poultry meat in fresh forms. Live poultry is commonly traded, but before sale to household consumers the birds are slaughtered. Buyers feel that such practices ensure good poultry products. Cooled products are not preferred by household consumers, who perceive such products as not fresh, not good, and reduced in flavour after long storage. Religious beliefs prevent people from purchasing live poultry, but they do not favour chilled products. This has led to the present situation in which sellers slaughter the birds at the time of sale. Slaughtering commonly takes place in formal markets.
- Industrial birds are traded in parts, with consumers choosing the parts of the bird that they wish to buy. However, only about 10 to 15 percent of household respondents reported buying industrial products. When industrial poultry is sold in whole form, it is usually roasted. Roasted poultry has become increasingly common.
- It was noted that during the HPAI outbreak period, the consumption of poultry decreased, but increased again a few weeks later. When consumption increased again, purchasing practices also returned to the same as before the HPAI outbreak, regarding where poultry products are purchased and the forms they take, for example. Since the HPAI outbreak, people who often eat outside the home continue to do so, but ask for poultry meat or eggs to be well cooked.
- The quantity of industrial poultry consumed by households and restaurants is relatively small compared with that of domestic poultry. It was observed that a large amount of industrial poultry products are cooked and sold, especially at luxury restaurants where young people often eat.
- Most household and restaurant respondents think that they can recognize good poultry products through visual inspection. However, they also believe that it is important to have official labels or stamps assuring the quality of poultry products. For them, the purpose of an official stamp or label is to recognize the source of the product and avoid being cheated by sellers, rather than to ensure HPAI control. Respondents also think that domestic poultry is not contaminated by diseases or, if it is, the diseases are not passed on to humans; for example, they believe that HPAI occurs only with industrial poultry.
- Many household respondents are willing to purchase poultry products with a 10, 20 or 30 percent increase in price if the products are assured free from HPAI or safe to consume. The role of government in controlling HPAI is perceived as important, but so far interventions have been less concerned with controlling HPAI than with awareness raising.
- Household consumers are interested in having stamps or labels to differentiate imported products or industrial products from domestic ones. Consumers purchasing fresh poultry products at markets or eating in restaurants are misled in many ways about the poultry products they consume. This makes many people reluctant to trust the agencies working on food safety, and prefer to trust their own client relations and visual inspection.
- It can be concluded that poultry products are popular among Cambodian consumers. Even after the outbreak of HPAI, the consumption of poultry products decreased for only a short time and soon returned to normal. The introduction of stamps and labels on assured poultry products is considered a good option.

- Restaurants are not good partners in promoting safe food as they earn more from continuing their present practices. Adopting safe food practices might reduce their business until consumers understand the importance of safe food and realize that they can trust the restaurants to provide it. Better-off households would rather consume assured poultry products than take risks with uncertain products at markets. Working to promote safe poultry meat with specialized shops or supermarkets is recommended as a good option.

REFERENCES

MAFF. 1990–2007. Annual Agricultural Statistics, Department of Planning and Statistics, Ministry of Agriculture, Forestry and Fisheries (1990-2007).

Suon Seng, 2007. Livelihood Study: Gender and Socio-economic Impact of Highly Pathogenic Avian Influenza (HPAI) to the Rural Livelihood System in Four provinces of Cambodia (Kampong Cham, Takeo, Kampong Speu and Kampot). Report for FAO.

Suon Seng, Yun Samnol, Ly Sok, Khieu Khemrin, Uy Thol. 2008. Livelihood Study: Gender and Socio-economic Impact of Highly Pathogenic Avian Influenza (HPAI) to the Rural Livelihood System in Siem Reap Province. Report for FAO.

ANNEXES

Annex 1: Distribution of sample survey in Siem Reap and Phnom Penh, by nearest market centre

No.	Location: name of market	No. of household samples	No. of restaurant samples
	In Phnom Penh		
1	Phsar Boeng Keng Kang	5	1
2	Phsar Beong Trabek	3	1
3	Phsar Chbar Ampov	11	1
4	Phsar Chumpou Voan	4	1
5	Phsar Doem Kor	9	1
6	Phsar Kilo 4	7	1
7	Phsar Olympic	12	1
8	Phsar Orussey	8	1
9	Phsar Sameki	17	1
10	Phsar Chas	6	0
11	Phsar Depo	8	0
12	Phsar Doem Thkov	12	0
13	Phsar Kandal	8	1
14	Phsa Moan Aing	4	0
15	Phsar 7 Makara	8	0
16	Phsae Thmey	4	1
17	Phsar Toek Thlar	4	0
18	Phsar Pochintong	5	1
19	Phsar Stung Meanchey	9	1
20	Phsar Tuoltompoung	6	1
21	Phsar Tuol Kork	3	1
22	Phsar Tuol Sangke	2	0
23	Phsar Dumix	3	0
24	Phsar Canadia	1	0
25	Phsar Sereypheap	1	0
Total in Phnom Penh		160	15
	In Siem Reap		
1	Phsar Chas	19	1
2	Phsar Leu	32	2
3	Phsar Kroam	15	0
4	Phsar Sameki	3	1
5	Phsar Thmey Angkor	7	2
6	Phsar Deom Krolanh	28	2
7	Phsar Nhe	1	1
8	Phsar Korkthol	1	0
9	Angkor Vat temple	0	1
Total in Siem Reap		106	10

Annex 2: Distribution of sample survey in Siem Reap and Phnom Penh, by geographical administration

City	District/Khan	Commune/Sangkat	Number of interviewees
Phnom Penh	Prampir Makara	Beong Salang	1
		Oreusey III	1
		Oreusey II	7
		Veal Vong	4
		Total	13
	Chamka Morn	Boeng Kengkorng	5
		Olympic	8
		Toul Tumpong I	4
		Toul Tumpong II	7
		Tuol Svaypray	2
		Total	26
	Daun penh	Cheychom Neas	2
		Phsar Kondal II	1
		Phsar Thmey II	2
		Phsar Thmey III	3
		Sras Chork	4
		Vat Phnom	7
		Total	19
	Dorng Kor	Choam Chao	4
		Ka Karb	4
		Total	8
	Reussey Keo	Beong Salang	1
		Pnom Penh Thmey	1
		Sorng Ke	1
		Toek Thlar	4
		Tuol Sorngke	6
		Total	13
	Stoeng Meanchey	Boeng Tumpun	11
		Chbar Ampov	5
		Chbar Ampov I	2
		Chbar Ampov II	2
		Stoeng Meanchey	10
		Total	30
	Tuol Kork	Beong Salang	8
		Boeng Kork I	4
		Boeng Kork II	7
		Doem Kor	2
		Phsar Depo	4
		Phsar Depo I	7
		Phsar Depo II	6
		Phsar Depo III	1
		Toek Laork I	5
		Toek Laork II	5
		Toek Thlar	1
		N/A	1
		Total	51
Siem Reap	Siem Reap	Sala Kom Roeuk	15
		Kork Chork	21
		N/A	3
		Sala kom Vek	4
		Salakomdok	1
		Siem Reap	7
		Slor Kram	17
		Sror Nhea	1
		Sror tea	1
		Suo Kroam	2

City	District/Khan	Commune/Sangkat	Number of interviewees
Siem Reap	Siem Reap	Svay Dorng Kum	32
		Vat Bo	1
		Chrors	1
		Total	106

Annex 3: Distribution of samples, by age group

City	Age group of respondent	Number of respondents	Female respondents	% female respondents
Phnom Penh	30 years or less	37	35	95%
	31 to 40 years	33	30	91%
	41 to 50 years	42	39	93%
	51 to 60 years	37	34	92%
	More than 60 years	11	10	91%
	Total	160	148	93%
Siem Reap	30 years or less	44	43	98%
	31 to 40 years	22	21	95%
	41 to 50 years	23	22	96%
	51 to 60 years	17	16	94%
	More than 60 years	0	0	0%
Total		106	102	96%

Annex 4: Occupations of the household respondents

Occupation of respondent now or before retiring	Phnom Penh N = 160	Siem Reap N = 106	Total N = 266
Employed by international company/organization or joint venture	3%	3%	3%
Small trader or shop owner	21%	17%	20%
Small retailer	29%	14%	23%
Civil servant or employed by small local company	3%	8%	5%
Seller at market stores	8%	14%	11%
Craft worker, skilled worker	4%	4%	4%
Unskilled worker	1%	0%	0%
Farmer, forester, fisher	0%	3%	1%
Housewife	38%	42%	39%
Employed by State company	2%	2%	2%
Others	6%	8%	7%

The percentages in this table refer to the percentages of sampled households reporting involvement in each activity, so some totals are less than 100 percent. This question allowed multiple-answers, so totals can also be more than 100 percent.

Annex 5: Changing sources of poultry product purchases, by household income level

Source of poultry	Period *	Income level (riel/month)				Total
		Less than 1 million	1 to < 3 million	3 to < 5 million	More than 5 million	
		N = 59	N = 127	N = 42	N = 38	N = 266
Own production	Before AI outbreak	15.3%	4.7%	16.7%	13.2%	10.2%
	During AI outbreak	15.3%	3.9%	16.7%	13.2%	9.8%
	After AI outbreak	15.3%	3.9%	16.7%	13.2%	9.8%
Gift	Before AI outbreak	8.5%	6.3%	9.5%	5.3%	7.1%
	During AI outbreak	8.5%	6.3%	9.5%	2.6%	6.8%
	After AI outbreak	8.5%	6.3%	9.5%	5.3%	7.1%
Direct purchases from farmers	Before AI outbreak	0.0%	3.9%	0.0%	2.6%	2.3%
	During AI outbreak	0.0%	3.9%	0.0%	0.0%	1.9%
	After AI outbreak	0.0%	3.9%	0.0%	2.6%	2.3%
Street vendor	Before AI outbreak	8.5%	10.2%	2.4%	7.9%	8.3%
	During AI outbreak	8.5%	11.0%	2.4%	7.9%	8.6%
	After AI outbreak	8.5%	11.0%	2.4%	7.9%	8.6%
Market stalls	Before AI outbreak	84.7%	96.9%	95.2%	92.1%	93.2%
	During AI outbreak	83.1%	92.1%	85.7%	57.9%	84.2%
	After AI outbreak	83.1%	96.9%	92.9%	92.1%	92.5%
Supermarkets	Before AI outbreak	5.1%	7.9%	7.1%	5.3%	6.8%
	During AI outbreak	5.1%	7.1%	4.8%	5.3%	6.0%
	After AI outbreak	5.1%	7.9%	11.9%	7.9%	7.9%
Poultry Store	Before AI outbreak	0.0%	2.4%	2.4%	7.9%	2.6%
	During AI outbreak	0.0%	2.4%	2.4%	2.6%	1.9%
	After AI outbreak	0.0%	2.4%	2.4%	10.5%	3.0%
Groceries store	Before AI outbreak	0.0%	3.1%	7.1%	5.3%	3.4%
	During AI outbreak	6.8%	2.4%	4.8%	0.0%	3.4%
	After AI outbreak	6.8%	2.4%	4.8%	0.0%	3.4%

The percentages in this table refer to the percentage of sampled households purchasing from each source, so some totals are less than 100 percent. This question allowed multiple-answers, so totals can also be more than 100 percent.
*Before = up to 2004, during = 2004-2007, After = 2008 onwards.

Annex 6: Changing habits for eating outside the home, by household income level

Eating out habit		Income level (riel/month)				Total
		Less than 1 million	1 to < 3 million	3 to < 5 million	More than 5 million	
At street stall						
Before AI outbreak	Yes	100%	92%	100%	100%	95%
	No	0%	8%	0%	0%	5%
During AI outbreak	Yes	100%	92%	100%	100%	95%
	No	0%	8%	0%	0%	5%
After AI outbreak	Yes	100%	92%	100%	100%	95%
	No	0%	8%	0%	0%	5%
Total responses		3	12	4	3	22
At small specialized restaurant						
Before AI outbreak	Yes	100%	100%	100%	100%	100%
	No	0%	0%	0%	0%	0%
During AI outbreak	Yes	100%	100%	50%	75%	93%
	No	0%	0%	50%	25%	7%
After AI outbreak	Yes	100%	100%	50%	100%	96%
	No	0%	0%	50%	0%	4%
Total responses		3	18	2	4	27
At family-run food house						
Before AI outbreak	Yes	100%	93%	100%	100%	94%
	No	0%	7%	0%	0%	6%
During AI outbreak	Yes	100%	100%	100%	100%	100%
	No	0%	0%	0%	0%	0%
After AI outbreak	Yes	100%	100%	100%	100%	100%
	No	0%	0%	0%	0%	0%
Total responses		1	14	1	1	17
At luxury restaurant						
Before AI outbreak	Yes	100%	100%	100%	100%	100%
	No	0%	0%	0%	0%	0%
During AI outbreak	Yes	100%	100%	100%	80%	93%
	No	0%	0%	0%	20%	7%
After AI outbreak	Yes	100%	100%	100%	100%	100%
	No	0%	0%	0%	0%	0%
Total responses		1	10	7	10	28

*Before = up to 2004, during = 2004-2007, After = 2008 onwards.