

Assessment of poultry markets and sellers in 25 Provinces and Cities of Cambodia



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Executive summary

An assessment of the main poultry markets in Cambodia was carried out with the financial support of the Food and Agriculture Organization of the United Nations (FAO), with the overall aim of identifying the main poultry markets in 24 provinces and cities of the country and collecting information from market officials and sellers of poultry and poultry products. Baseline data collected at these markets through observation and structured interviews with key informants were used for developing a user-friendly database. A total of 305 sellers of poultry and poultry products, and 75 market officials and assistants in 75 main markets of 24 provinces and cities in Cambodia were randomly selected for the interview (four licensed and unlicensed sellers in each market) using structured questionnaires for sellers and officials.

Seventy-six percent of the markets were public-owned by the government and 24 percent were owned by private people. Among the markets visited, 48 percent and 36 percent serve the district level and the province, respectively, while 5.3 percent had links with other markets, especially in Koh Kong, Kratie, Siem Reap and Sihanouk Ville. All main markets operated in seven days a week from 4:00–7:00 am to 5:00–6:00 pm. On average, sellers were in the poultry business since 7.95 years and sold 6.7 days a week. Among the 305 sellers, 5.24 percent sold in other markets. Most sellers paid a daily market fee of 478 riel for hygiene and waste management.

All markets sold beef, pork and fish; 69.3 percent also sold seafood; 77.3 percent sold live chickens and 49.3 percent sold ducks; and 88 percent sold slaughtered chickens and 56 percent sold slaughtered ducks. In addition, quails and wild birds were also sold in some



markets in Banteay Meanchey, Battambang, Koh Kong, Kratie, Phnom Penh and Prey Veng. Chicken and duck eggs were commonly sold in all markets.

All the licensed sellers were traders, while the unlicensed sellers were both traders and smallholder producers. On average, 2 045 eggs were sold daily by those who only sold eggs, and 380 eggs were sold daily by those who sold eggs and other food items. Thirty percent of licensed sellers lived near the markets, 29.1 percent within the commune, and 30.9 percent within the district, and a few lived in other places within the province; 46 percent of the unlicensed sellers lived within the district and province. Fifty-three percent of unlicensed sellers operated their business daily, while others sold once a week, once a month, twice a year, during festivities or seasonally.

On average, for all markets, licensed and unlicensed sellers daily sold 119.1 and 63.6 chickens and 33.8 and 60.7 ducks, respectively. The average number of chickens sold by these sellers, as live or slaughtered birds, was 77.6 and 111.0 per day, respectively, and 24.8 and 53.4 ducks per day, respectively. On average, there were 4.3 licensed sellers who sold live birds compared to 6.6 unlicensed sellers. On average, each seller sold 38 birds per day, of which 37.4 were adult birds, and only 20.5 chicks/ducklings, which were sold for further raising, mainly by unlicensed sellers in the markets of Kampot, Kratie, Mondulhiri, Phnom Penh, Prey Veng, Sihanouk Ville and Steung Treng.

More than 62 percent sellers got their poultry and eggs supplies from traders, while 52.8 percent bought them from smallholder producers, and only 5.2 percent obtained them from their own farms. More than 55 percent got their supply of chickens within the district, 20.9 percent within the province, more than 18 percent from other provinces and 4.6 percent from other countries. More than 50 percent got their duck supply within the district, 25.7 percent within the province and 23.8 percent from other provinces. For chicken eggs, 14.3 percent sellers bought them within the district, 27.3 percent obtained their supply within the province, 47.2 percent bought them from other provinces and 11.1 percent bought them from other countries. The supply of duck eggs came from three main sources: 35.6 percent from within the district, 22.3 percent from within the province and 36.1 percent from other provinces. In the markets visited, 89.4 percent sellers sold local chickens, 10.6 percent sold chicken from improved breeds, and 96.5 percent sold local ducks.

On average, sellers sold poultry and poultry products to 21.9 households, 11.5 dealers and 4.6 restaurants. In addition, sellers in the Rattanakiri, Steung Treng and Svay Rieng supplied wedding parties. The share of volume of poultry and poultry products was highest for households (54.9 percent), followed by dealers (24.7 percent) and restaurants (19.3 percent) and a small percentage for wedding parties and embryonic eggs. On average, each seller daily sold 37.0 live and 28.4 slaughtered chickens and 712 eggs. Sellers in Koh Kong and Pailin sold the internal organs and bones to the customers. Each seller sold on average 27.0 live and 11.7 slaughtered ducks, and 1 536 duck eggs daily.

The average traders' and smallholder producers' purchase price was 14 696 riels/kg for live chickens and 8 366 riels/kg for live ducks. The price was 407 riels/duck egg compared with 369 riels/chicken egg. When poultry was sold to customers, the consumer price was 16 855 riels/kg for live chicken and 18 490 riels/kg for slaughtered chicken. The average consumer price for live and slaughtered ducks was 10 526 riels/kg and 11 182 riels/kg, respectively. Among sellers interviewed, 40.6 percent had an agreement with suppliers of poultry and poultry products, of which 92.7 percent were verbal and only a few written. More than 34 percent of the sellers had fixed suppliers and 65.2 percent received their supply from several sources. Both market officials and sellers believed that the volume of poultry and poultry products sold at the markets had increased and varies over time, with significant increases



mainly during festivities (93.7 percent); some said that it increased during the dry season. A decrease in poultry sales was reported for the period of the fish harvest (December-February) by 88.6 percent of the sellers, while some reported a decrease during AI outbreak and after festivities.

Almost 90 percent of the sellers slaughter poultry themselves and only 10 percent employ other people to do so. In ten of the markets visited in Kampong Chhnang, Kampong Thom, Phnom Penh, Prah Vihear, Siem Reap and Sihanouk Ville, there were slaughtering places in the markets, but only 19.2 percent of sellers slaughtered their birds there and only 7.5 percent sellers separated their animals by species, especially chickens and ducks. Among poultry sellers, 47.1 percent freeze leftover slaughtered birds for the next day, while 38.9 percent take them back home alive, and 30.8 percent sell them at a lower price (10-20 percent lower than the normal price) or keep them in the markets, respectively.

Regarding poultry waste management, 40.4 percent sellers pack the waste and take it to a disposal site outside the markets, 36.1 percent pack it and take it home for burial, 11.1 percent sell it and 7.8 percent use it as animal feed. Only 28 percent of the markets visited had regulations to control the bird flu; 55.5 percent of which had regulations to avoid poultry disposal without proper packing; 36.1 percent of the markets did not allow selling poultry from an infected area; 33.3 percent did not allow selling sick and death poultry in the markets; 30.5 percent practised proper packaging of poultry for sale to customers; and 25.5 percent had regulations to avoid keeping ducks and chickens together in the same cage. About 40 percent of birds sold at these markets were health-checked by district veterinarians (31 percent), provincial veterinarians (62.1 percent) and market officials (6.9 percent).

Family members – on average 1.3 women and 0.6 men – were involved full-time in the selling of poultry and its products. The women were almost always responsible for selling birds at the market and 46.1 percent for cleaning their stalls before the end of the market day, while 90.8 percent of cases the men were responsible for transporting birds to the markets, 57.9 percent for slaughtering and 41.5 percent for cleaning. For about 60 percent of the sellers, an average of 67.6 percent of their total family income came from the poultry business.

Many market officials (66.7 percent) and sellers (57.4 percent) agreed that their poultry markets had been growing in the last five years, while 24-28 percent said they were stable and 9.33-14.1 percent said they decreased. This growth was mainly due to the increase in consumers and improvement in family economy that allowed people to eat more meat. The main reason for mentioning stable and declining business by other sellers was the migration of people to other places.

Introduction

The Royal Government of Cambodia (RGC) officially confirmed the presence of Highly Pathogenic Avian Influenza (HPAI) H5N1 in Cambodia on 23 January 2004, when identified in a broiler farm in Phnom Penh. Since then, a total of 22 outbreaks have been reported and more than 18 000 poultry died and 9 518 of birds were culled. Seven human cases were H5N1 positive, most of which had direct contact with sick and dead poultry. The provinces of Kampong Speu, Kampot, Takeo, Kandal, Kampong Cham, Prey Veng, Siem Reap and Phnom Penh had HPAI outbreaks (FAO/MAFF, 2006). The greatest risks of spreading AI are the movement of live poultry, their products and contaminated materials. Live bird markets and transporting systems that carry birds from place to place and from farms to markets or slaughterhouses are, among others, the main reasons of the disease spread. Markets that



operate daily pose a higher risk than those with closing days when premises are disinfected. A great opportunity for the virus to spread to wider areas occurs when birds of different ages and different species from different locations are mixed at the markets, and then return to their farm of origin or sold to other farms.

The Food and Agriculture Organization of the United Nations (FAO) contracted the Centre for Livestock and Agriculture Development (CelAgrid) to conduct a survey on poultry and poultry products and marketing to better understand the risks of spreading HPAI along the market chain. The results of the survey assist the National Animal and Veterinary Research Institute (NAVRI) in HPAI outbreak preparedness and strengthen its animal disease control strategies.

Objectives

The overall aim of the survey was to identify the main poultry markets in the 23 provinces and Phnom Penh City of Cambodia and to collect information and data from market officials and sellers of poultry and poultry products. The specific aims were:

To map out the main live bird markets in each of the 23 provinces and Phnom Penh City in Cambodia and to collect basic data and information from them.

To develop a user-friendly database with market characteristics that can be regularly updated to help government institutions and other organizations concerned to manage and support of the poultry sectors and other subsectors.

Material and Methods

Pretesting

The FAO ECTAD team, together with CelAgrid, developed questionnaires for market officials and sellers, and pre-tested them in Siem Reap Province. During the pre-testing, the team also visited farms, slaughterhouses, market sellers, market managers and egg-producing farms. After the pre-testing and visits in Siem Reap, the team concluded as follows: Although there had been AI outbreaks in Siem Reap Province, the places that the team visited did not experience them.

Poultry and poultry products (eggs) produced in Siem Reap Province did not yet meet demand, since live poultry and eggs were still being imported from other provinces.

Poultry production increased and its output doubled in Siem Reap Province during the last five years due to the increase in population and tourism.

After the pre-testing, the team decided on having two questionnaires, one for market managers and one for poultry sellers. CelAgrid then revised and divided up appropriate questions to make new questionnaires (Annex 1 and 2).

The key questions in the questionnaires cover the general profile of market officials, poultry sellers and poultry buyers, the destination of poultry sold, handling practices with respect to AI risk and control, the contribution of selling poultry to income and the gender issue.

Training and management of the team

Two sets of questionnaires were provided for the enumerators to read and understand with guidance from CelAgrid senior researchers. The questionnaires were then tested in the main



markets in Phnom Penh and a meeting was organized with enumerators to discuss and clarify their concerns.

The enumerators first went in pairs to conduct interviews in the main markets of Phnom Penh. Some of the teams were not allowed to interview sellers in the markets such as Boeung Keng Kang, Olympic, Kbal Thnol, despite presenting official letters from CelAgrid, because market officials requested approval letters from the district governors.

In the first days of the interview, the team members met in each province with officials at the Offices of Animal Health and Production to inform them about the study and ask them for advice. At the beginning of the interview, team members were allowed to work in pairs to gain experience and become more familiar with the questions. The team members met every afternoon and the team leaders reviewed the questionnaires daily.

There were four teams for the survey, with four persons each (one team leader and three enumerators).

Team 1 = Mondulkiri, Rattanakiri, Steung Treng, Kratie, Kampong Cham and Phnom Penh.

Team 2 = Kampong Thom, Prah Vihear, Otdor Meanchey, Siem Reap and Banteay Meanchey.

Team 3 = Battambang, Pursat, Pailin, Kampong Chhnang, Kandal and Sihanouk Ville.

Team 4 = Prey Veng, Svay Rieng, Takeo, Kampot, Kep, Kampong Speu and Koh Kong.

Sampling

A total of 305 sellers of poultry and poultry products from 75 markets of the 24 provinces and cities were randomly selected for the interview (Map 1). On average, in each market, four sellers were selected for the interview, but when possible, five sellers were interviewed (Table 1). These sellers, both licensed and unlicensed, sold slaughtered and live chickens and ducks and eggs. The licensed sellers were categorized as those who permanently sell poultry and poultry products in the markets. They paid daily market fees, had a business license for annual taxes, and were registered. The unlicensed sellers were categorized as those who sell products outside the markets; some pay market fees and some do not. It was observed that the unlicensed sellers sold the products occasionally or seasonally, and most were smallholder farmers who occasionally brought birds to the markets. The unlicensed sellers sometimes sold their birds and products to the licensed sellers.

The field data collection was done from 18 February to 13 March 2008.

Scope and limitations

The early morning was the most appropriate time for allowing enumerators to observe the activities of both licensed and unlicensed sellers in all markets, particularly of the unlicensed sellers who sold all their poultry and returned home early. The tasks were well divided and organized among the enumerators and team leaders. The team leader interviewed market officials, while team members interviewed sellers.

There was no map in Cambodia showing locations of the markets. Main markets are generally located in the provincial and district towns; however, the administrative map indicating provincial and district towns was not always appropriate for the selection of main markets. Consultation with local people was a better way to locate the main markets.

It was difficult to organize the interview of sellers and market officials in Phnom Penh. Officials did not allow the team to interview them or the sellers, despite the team's presentation of the letter from CelAgrid; the former requested authorization letters from district governors. However, the team managed to complete the interviews with market security guards or/and persons who collected fees at the markets and to interview sellers at their home. When this strategy was still inappropriate, the team changed to another main



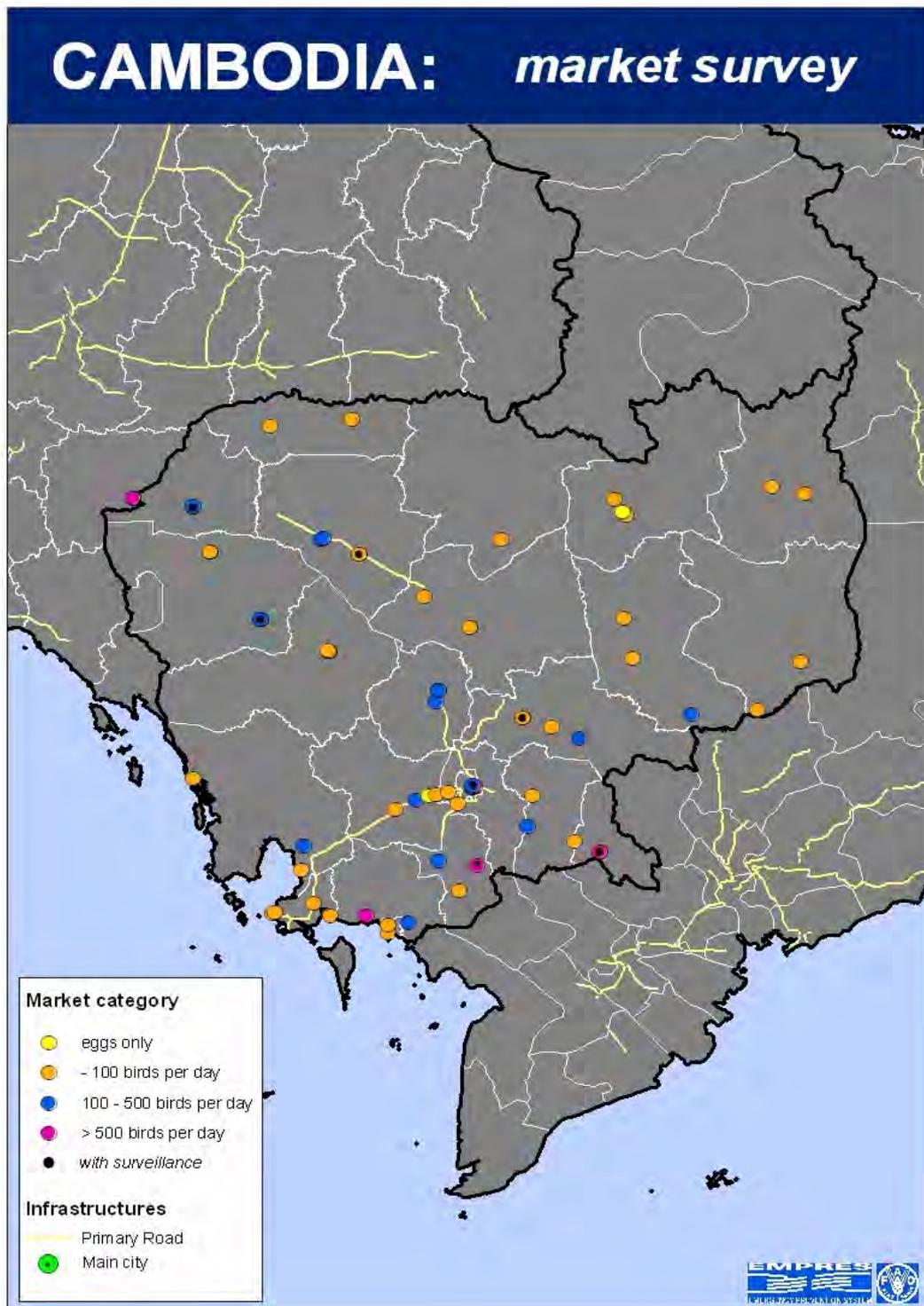
market in Phnom Penh. The team did not experience problems with market officials in the provinces.

Table 1 Number of markets visited and poultry sellers interviewed

No.	Provinces/cities	Market names	Sellers interviewed	Markets visited
1	Banteay Meanchey	Mongkol Borei, Akek and Serey Sorphoan	12	3
2	Battambang	Beoung Chouk, Phar Thmey Mong Roeusey, Psar Thom and Thmorkol	20	5
3	Kampong Cham	Salachen, Phoav, Prey Turtoeng, Soung and Skun	22	5
4	Kampong Chhnang	Psar Leu, Prey Khmer and Sala Lek 5	11	3
5	Kampong Speu	Prey Pdao, Kampong Speu, Trapaing Kroloeng,	12	3
6	Kampong Thom	Kampong Thom, Kampong Thmor and Stoung	13	3
7	Kampot	Kampong Trach, Samaki and Trapang Ropov	12	3
8	Kandal	Baek Chan, Kampong Kantout, Sa Ang, Ta Khmao and Thnoal Tortueng	18	5
9	Kep	Domnak Chang Oeur and Kep	8	2
10	Koh Kong	Dorng Tung, Sre Ambel and Steung Chhay	11	3
11	Kratie	Kratie, Sambo and Snoul	12	3
12	Mondulkiri	Keo Seyma, and Sen Monorom	9	2
13	Otdor Meanchey	Anglong Veng Thmey and Samroung	8	2
14	Pailin	Samaki, and Salakrao	8	2
15	Phnom Penh	Puchentong, Depo, Kab Ko, O' Reusey and Toul Tumpung	20	5
16	Prah Vihear	Kampong Pronak and Ror Vieng	8	2
17	Prey Veng	Kampong Trabek, Neak Leoung and Prey Veng	14	3
18	Pursat	Krokor, Psar Thmey Pursat and Tropaing Chornng	12	3
19	Rattanakiri	Bokeo, and Banlung	9	2
20	Siem Reap	Phar Chas, Dom Dek, Kampong Kdey, Phar Leu and Samaki	20	5
21	Sihanouk Ville	Klain Leu, Phar Thmey and Veal Rign	12	3
22	Steung Treng	Stoeng Treng and Thalaborivat	8	2
23	Svay Rieng	Bavet, Veal Yun and Kroal Ko	12	3
24	Takeo	Ang Ta Som, Kampong Chrey and Takeo	14	3
	Total		305	75



Map 1: Locations of visited markets



Data analysis

The coded data, both qualitative and quantitative, were entered into Excel spreadsheets. The Excel program was used to calculate the percentages in terms of percentages according to multiple-choice responses. The percentages, mean values by province/city, overall mean and standard errors were analysed using the descriptive statistical package for social sciences (SPSS), version 14.0.

Results and discussion

Profile of the markets

Out of the 75 markets in this survey, 76 percent operated under local government control and management, while 24 percent were owned and managed privately (Table 2). A high percentage of markets are owned, controlled and managed privately in Banteay Meanchey, Battambang, Pailin and Sihanouk Ville. Through bidding, local investors were allowed to rebuild and manage the markets for a number of years and return them to the control of the local government at the end of the contract.

Forty-eight percent of the market officials reported that their markets served the district population, while 36 percent and 10.7 percent served people at the commune and provincial levels, respectively. Only 5.3 percent of the markets served a larger population, such as those in Koh Kong, Kratie, Siem Reap and Sihanouk Ville, which were linked to the markets at Phnom Penh.

All markets in this survey operate every day (Table 3). Among 75 market officials interviewed, 44 percent reported that their markets stayed open daily for approximately 12 hours, from 6:00 am–6:00 pm, while 24 percent, 16 percent, 13.3 percent and 2.7 percent reported that their markets operated from 5:00 am–6:00 pm, 6:00 am–5:00 pm, 4:00 am–5:00 pm and 7:00 am–6:00 pm, respectively. Some markets closed approximately one hour later and opened approximately one hour before, depending on the market type. For example, one of the visited markets in Phnom Penh (Phsar Doeun Kor) had shorter opening hours.



Table 2 Types of the markets and their coverage

Provinces	Type of market (%)		Market coverage (%)			
	Public	Private	Commune	District	Province	Country
Banteay Meanchey	33.0	67.0	–	100	–	–
Battambang	40.0	60.0	–	40.0	60.0	–
Kampong Cham	100	–	–	80.0	20.0	–
Kampong Chhnang	67.0	33.0	–	67.0	33.0	–
Kampong Speu	100	–	–	67.0	33.0	–
Kampong Thom	100	–	33.0	33.0	33.0	–
Kampot	67.0	33.0	33.0	33.0	33.0	–
Kandal	100	–	20.0	60.0	20.0	–
Kep	100	–	50.0	–	50.0	–
Koh Kong	67.0	33.0	33.0	33.0	–	33.0
Kratie	67.0	33.0	–	33.0	33.0	33.0
Monduliri	50.0	50.0	–	50.0	50.0	–
Otdor Meanchey	100	–	–	–	100	–
Pailin	-	100	–	100	–	–
Phnom Penh	80.0	20.0	–	40.0	60.0	–
Prah Vihear	100	–	–	50.0	50.0	–
Prey Veng	67.0	33.0	–	67.0	33.0	–
Pursat	67.0	33.0	–	67.0	33.0	–
Rattanakiri	100	–	–	50.0	50.0	–
Siem Reap	80.0	20.0	20.0	20.0	40.0	20.0
Sihanouk Ville	33.0	67.0	33.0	33.0	0.00	33.0
Steung Treng	100	–	–	50.0	50.0	–
Svay Rieng	100	–	–	33.0	67.0	–
Takeo	100	–	33.0	33.0	33.0	–
Mean value	76.0 (n=57)	24.0 (n=18)	10.7 (n=8)	48.0 (n=36)	36.0 (n=27)	5.33 (n=4)



Table 3 Times of markets operation

Provinces	Opening hours of markets				
	4.00 am – 5.00 pm	5.00 am – 6.00 pm	6.00 am – 5.00 pm	6.00 am – 6.00pm	7.00 am – 6.00 pm
Banteay Meanchey	2	–	–	1	–
Battambang	1	1	1	2	–
Kampong Cham	–	1	1	3	–
Kampong Chhnang	–	1	1	1	–
Kampong Speu	–	2	–	1	–
Kampong Thom	–	1	–	2	–
Kampot	–	–	1	1	1
Kandal	–	1	1	2	1
Kep	–	–	–	2	–
Koh Kong	–	1	–	2	–
Kratie	1	–	1	1	–
Monduliri	–	–	–	2	–
Otdor Meanchey	–	1	–	1	–
Pailin	–	2	–	–	–
Phnom Penh	1	2	–	2	–
Prah Vihear	–	–	1	1	–
Prey Veng	–	–	3	–	–
Pursat	–	2	–	1	–
Rattanakiri	1	1	–	–	–
Siem Reap	3	1	–	1	–
Sihanouk Ville	1	–	1	1	–
Stung Treng	–	1	–	1	–
Svay Rieng	–	–	1	2	–
Takeo	–	–	–	3	–
Mean value	13.3 (n=10)	24.0 (n=18)	16.0 (n=12)	44.0 (n=33)	2.67 (n=2)

Source: Reported by market officials; N= number of markets

Profile of market officials and sellers

The average age of a market official was 42.5 years; 77.3 percent were men (Table 4). The overall average age for sellers was 35.5 years; 88.2 percent were female (Table 5). Among the market officials interviewed, 49.3 percent, 8 percent, 21.3 percent and 21.3 percent were managers, vice-managers, fee collectors and market guards, respectively; higher officials or those in other high positions at the markets were unavailable or inaccessible. It should be noted that fee collectors and guards circulate in the markets and can therefore observe the daily dynamics of the market.



Table 4 Category of market officials interviewed

Provinces	Men interviewed (%)	Number of managers	Number of vice-managers	Number of fee collectors	Number of market guards
Banteay Meanchey	100	–	–	–	3
Battambang	80	2	–	–	3
Kampong Cham	60	–	–	3	2
Kampong Chhnang	100	2	–	1	–
Kampong Speu	100	1	2	–	–
Kampong Thom	100	3	–	–	–
Kampot	33.3	1	–	1	1
Kandal	80	2	–	1	2
Kep	–	–	–	2	–
Koh Kong	100	1	1	–	1
Kratie	100	3	–	–	–
Mondulhiri	100	2	–	–	–
Otdor Meanchey	50	2	–	–	–
Pailin	100	2	–	–	–
Phnom Penh	100	3	2	–	–
Prah Vihear	50	2	–	–	–
Prey Veng	66.7	2	–	1	–
Pursat	33.3	2	–	1	–
Rattanakiri	100	1	–	–	1
Siem Reap	80	4	–	1	–
Sihanouk Ville	66.7	2	–	1	–
Steung Treng	50	–	–	1	1
Svay Rieng	66.7	–	–	2	1
Takeo	50	–	1	1	1
Mean value	77.3	37	6	16	16

Source: Reported by 75 market officials

On average, sellers had 7.9 years experience in selling poultry and its products in the markets. More experienced sellers were found in the provinces of Takeo, Svay Rieng, Prey Veng, Banteay Meanchey, Kampong Speu and Kandal. New sellers with 2-3 years experience were found in Mondulhiri and Pailin (Table 5). On average, sellers operated 6.7 days per week, and 5.2 percent reported that they also sold in other markets.

Most sellers paid daily fees for their business operations in the markets, except in Pailin, Rattanakiri and Kampong Speu, where only 50, 55.6, and 66.7 percent of sellers paid market fees, respectively. On average, sellers paid a daily market fee of 478 riels. Market managers claimed that all licensed sellers in their markets paid daily fees, except in one market in Rattanakiri (Bo Keo), where sellers had not yet paid because it was a new market. In addition, licensed sellers paid monthly taxes and annual licence fees. Unlicensed sellers in the markets in Kampong Speu, Mondulhiri, Phnom Penh, Rattanakiri and Steung Treng were not charged daily fees.



Table 5 General information of sellers of poultry and poultry products

Provinces	Proportion women (%)	Years of operation	Selling (days/week)	Selling in other markets (%)	Payment fee (%)	Fee riels/day
Banteay Meanchey	100	9.2	6.7	—	100	758
Battambang	95.0	9.3	7.0	5.0	100	390
Kampong Cham	81.8	6.6	6.6	9.1	86.4	384
Kampong Chhnang	81.8	7.1	7.0	—	100	236
Kampong Speu	83.3	9.4	7.0	—	66.7	587
Kampong Thom	100	8.2	6.1	—	100	276
Kampot	83.3	10.1	6.7	25.0	83.3	260
Kandal	77.8	9.1	6.9	—	100	350
Kep	100	5.2	5.9	—	87.5	228
Koh Kong	81.8	5.7	6.7	—	100	745
Kratie	91.7	5.4	6.3	—	83.3	300
Mondulkiri	77.8	2.6	7.0	—	100	277
Otdor Meanchey	75.0	5.6	6.1	—	100	275
Pailin	100	3.9	6.5	—	50.0	400
Phnom Penh	95.0	13.3	6.9	25.0	100	435
Prah Vihear	100	4.4	6.5	—	100	200
Prey Veng	71.4	10.0	6.1	—	85.7	823
Pursat	75.0	5.5	7.0	8.3	100	312
Rattanakiri	100	5.1	5.9	—	55.6	320
Siem Reap	90.0	6.5	6.8	15.0	100	790
Sihanouk Ville	83.3	9.3	7.0	—	75.0	677
Steung Treng	87.5	6.6	5.9	—	75.0	417
Svay Rieng	100	10.2	7.0	—	100	600
Takeo	92.9	11.3	6.8	7.2	92.8	915
Mean value	88.2 (n=269)	7.95±0.39	6.66±0.06	5.24 (n=16)	90.8 (n=277)	478±33.2

Source: Reported by 305 sellers in 75 main markets.

Of those interviewed, 64.3 percent were licensed sellers; a higher number of unlicensed sellers was found in Kep and Prah Vihear (Table 6). Unlicensed sellers are those who come to the markets to sell their own birds and have not been registered with the market authorities. About 90 percent of sellers said they operated in the market on a regular basis, and 10 percent operated seasonally and occasionally, bringing their home produce for sale. It could be interpreted that more than 20 percent of the unlicensed sellers also sold their poultry and poultry products in the markets on a regular basis. About 68 percent sold mainly chickens and 31.8 percent sold chicken and duck eggs.



Table 6 Type and Frequency of Operations and Products sold

Provinces	Type of operation (%)		Frequency of operations (%)		Products sold (%)	
	Licensed	Unlicensed	Regularly	Seasonally	Poultry	Eggs
Banteay Meanchey	50.0	50.0	100		75.0	25.0
Battambang	65.0	35.0	95.0	5.00	70.0	30.0
Kampong Cham	40.9	59.1	86.4	13.6	63.6	36.4
Kampong Chhnang	81.8	18.2	100	—	72.7	27.3
Kampong Speu	66.7	33.3	100	—	41.7	58.3
Kampong Thom	46.2	53.8	69.2	30.8	76.9	23.1
Kampot	41.7	58.3	100	—	75.0	25.0
Kandal	83.3	16.7	83.3	16.7	66.7	33.3
Kep	25.0	75.0	62.5	37.5	87.5	12.5
Koh Kong	100	—	—	9.10	54.5	45.5
Kratie	50.0	50.0	83.3	16.7	83.3	16.7
Mondulkiri	88.9	11.1	100	—	77.8	22.2
Otdor Meanchey	87.5	12.5	75.0	25.0	62.5	37.5
Pailin	100	—	100	—	75.0	25.0
Phnom Penh	85.0	15.0	90.0	10.0	70.0	30.0
Prah Vihear	37.5	62.5	87.5	12.5	37.5	62.5
Prey Veng	57.1	42.9	78.6	21.4	78.6	21.4
Pursat	50.0	50.0	100	—	66.7	33.3
Rattanakiri	55.6	44.4	77.8	22.2	55.6	44.4
Siem Reap	70.0	30.0	95.0	5.00	65.0	35.0
Sihanouk Ville	58.3	41.7	100	—	75.0	25.0
Steung Treng	75.0	25.0	75.0	25.0	62.5	37.5
Svay Rieng	75.0	25.0	100	—	58.3	41.7
Takeo	57.1	42.9	92.8	7.20	78.6	21.4
Mean value	64.3 (n=196)	35.7 (n=109)	89.8 (n=274)	10.2 (n=31)	68.2 (n=208)	31.8 (n=97)

Source: Reported by 75 market officials.





Picture 1. Regular seller of eggs at Srer Ambel Koh Kong



Picture 2. Regular seller of slaughtered chickens at Market in Kampong Trach Market, Kampot



Picture 3. Seasonal seller (producer) of live ducks at the Kampong Trach Market, Kampot



Picture 4. Black and yellow legged chicken, Dorn Tong market, Smach Meanchey, Koh Kong province

Sale of poultry and other animals in markets

The poultry sold in the markets included chickens, ducks, quails and wild birds. According to reports from the officials, 77.3 percent of markets sold live chickens, while 88 percent also sold slaughtered birds in the market (Table 7). Ducks for meat, either live or slaughtered, are not commonly sold in the markets and are generally bought for special purposes such as barbeques, restaurants, weddings and ceremonies. Only 49.3 percent and 56 percent of the surveyed sellers sold live and slaughtered ducks, respectively. The selling of live ducks was not reported for the markets of Kep and Prah Vihear and there was no selling of slaughtered ducks in markets of Koh Kong and Mondulhiri Provinces.

Quails were found in the markets of Banteay Meanchey, Koh Kong, Kratie, Phnom Penh, and Prey Veng, while live quails were sold in markets in Phnom Penh and Prey Veng. Quails are not often kept by farmers in Cambodia; their supply in these markets could have come from imports from neighbouring countries and a few commercial farms, mainly around Phnom Penh and a few other provincial towns. About 2 percent and 6.7 percent of the markets reported that they sold live and slaughtered quails, respectively. Only a few markets – Banteay Meanchey, Battambang, Koh Kong, Phnom Penh and Prey Veng – sold live (4 percent) or slaughtered (6.7 percent) wild bird species such as sparrow, white heron and pelican.



Table 7 Proportion of markets selling live and slaughtered poultry

Provinces	Live poultry (%)		Slaughtered poultry (%)	
	Chicken	Duck	Chicken	Duck
Banteay Meanchey	100	100	100	100
Battambang	100	80.0	100	80.0
Kampong Cham	40.0	20.0	100	40.0
Kampong Chhnang	100	100	66.7	66.7
Kampong Speu	66.7	33.3	66.7	33.3
Kampong Thom	66.7	66.7	100	66.7
Kampot	100	66.7	66.7	66.7
Kandal	60.0	20.0	100	20.0
Kep	100	—	50.0	100
Koh Kong	100	33.3	100	—
Kratie	100	33.3	66.7	33.3
Mondulkiri	100	50.0	50.0	—
Otdor Meanchey	100	50.0	100	100
Pailin	50.0	50.0	100	50.0
Phnom Penh	60.0	40.0	100	80.0
Prah Vihear	100	—	100	50.0
Prey Veng	100	100	100	66.7
Pursat	66.7	66.7	66.7	33.3
Rattanakiri	100	50.0	50.0	50.0
Siem Reap	20.0	20.0	100	60.0
Sihanouk Ville	100	33.3	100	66.7
Steung Treng	50.0	50.0	50.0	50.0
Svay Rieng	66.7	66.7	100	66.7
Takeo	100	66.7	100	66.7
Mean value	77.3 (n=58)	49.3 (n=37)	88.0 (n=66)	56.0 (n=42)

Source: Based on multiple-choice questionnaires.

As reported by the interviewed market officials, the meat other than poultry sold in all markets was beef, pork and fish, while except for markets in Mondulkiri Province, 69.3 percent of them also sold seafood (Table 8). Other poultry products such as eggs from ducks, chickens and geese, and internal organs such as livers, hearts and gizzards are also sold in the markets. The market officials reported that 100 percent of the markets sold duck eggs, 94.7 percent sold chicken eggs, 64 percent sold bird internal organs and 33.3 percent sold goose eggs. Goose eggs were not found in markets of Kampong Thom, Mondulkiri, Otdor Meanchey, Pailin, Prah Vihear, Prey Veng, Rattanakiri and Steung Treng, and internal organs were not sold in Prah Vihear.



Table 8 Proportion of markets selling animal meat and poultry products

Provinces	Meat other than poultry (%)				Poultry products (%)			
	Pig	Cattle	Fish	Seafood	Duck eggs	Chicken eggs	Goose eggs	Internal organs
Banteay Meanchey	100	100	100	100	100	100	100	100
Battambang	100	100	100	60.0	100	100	60.0	80.0
Kampong Cham	100	100	100	80.0	100	100	—	60.0
Kampong Chhnang	100	100	100	66.7	100	100	66.7	66.7
Kampong Speu	100	100	100	33.3	100	100	33.3	33.3
Kampong Thom	100	100	100	66.7	100	100	33.3	33.3
Kampot	100	100	100	100	100	100	66.7	33.3
Kandal	100	100	100	40.0	100	80.0	20.0	40.0
Kep	100	100	100	100	100	100	50.0	100.
Koh Kong	100	100	100	100	100	100	33.3	66.7
Kratie	100	100	100	66.7	100	100	33.3	66.7
Mondulkiri	100	100	100	—	100	100	—	100
Otdor Meanchey	100	100	100	50.0	100	100	—	50.0
Pailin	100	100	100	100	100	100	—	50.0
Phnom Penh	100	100	100	100	100	80.0	40.0	100
Prah Vihear	100	100	100	50.0	100	100	—	—
Prey Veng	100	100	100	66.7	100	100	—	33.3
Pursat	100	100	100	66.7	100	66.7	66.7	66.7
Rattanakiri	100	100	100	50.0	100	100	—	100
Siem Reap	100	100	100	60.0	100	100	20.0	100
Sihanouk Ville	100	100	100	100	100	100	66.7	66.7
Steung Treng	100	100	100	50.0	100	100	—	50.0
Svay Rieng	100	100	100	66.7	100	100	33.3	33.3
Takeo	100	100	100	66.7	100	66.7	33.3	66.7
Mean value	100 (n=75)	100 (n=75)	100 (n=75)	69.3 (n=52)	100 (n=75)	94.7 (n=71)	33.3 (n=25)	64.0 (n=48)

Source: Based on multiple-choice questionnaires.

The number of traders and producers selling poultry

None of the licensed sellers were producers, while the unlicensed sellers were both sellers and producers, except in the markets in Kampong Speu, Kampong Thom, Otdor Meanchey, Prah Vihear, Pursat and Siem Reap Provinces, where unlicensed sellers were not producers (Table 6). It was observed that the unlicensed sellers in Mondulkiri and some in Rattanakiri were ethnic minorities who brought their birds to sell in the markets when they needed money to buy food back home.



TABLE 9 Average numbers of traders and producers selling poultry at the surveyed markets

Provinces	Licensed sellers		Unlicensed sellers	
	Number of traders	Number of traders	Number of traders	Number of producers
Banteay Meanchey	6.0	23.5	5.0	
Battambang	9.2	4.7	11.0	
Kampong Cham	4.7	2.7	4.0	
Kampong Chhnang	2.3	3.0	20.0	
Kampong Speu	5.5	2.0	—	
Kampong Thom	6.0	9.3	—	
Kampot	1.5	9.0	9.3	
Kandal	3.5	6.0	1.5	
Kep	1.0	—	4.0	
Koh Kong	3.0	—	7.3	
Kratie	4.0	4.0	2.0	
Monduliri	3.0	—	2.0	
Otdor Meanchey	12.0	6.0	—	
Pailin	4.5	—	2.0	
Phnom Penh	9.8	1.0	2.0	
Prah Vihear	1.0	3.5	—	
Prey Veng	6.0	3.5	11.7	
Pursat	5.0	4.0	—	
Rattanakiri	5.0	—	3.0	
Siem Reap	11.7	5.0	—	
Sihanouk Ville	5.5	7.0	4.0	
Steung Treng	4.0	—	3.0	
Svay Rieng	3.0	7.0	9.0	
Takeo	4.3	7.0	7.5	
Mean value	5.52	6.05	6.60	

Note: The list of poultry sellers was provided by market officials.



Picture 5. Unlicensed sellers selling their slaughtered chickens and ducks outside Kampong Thom market town.



Picture 6. Unlicensed sellers (producers and traders) selling ducks on a road nearby the market in Kampong Speu Province

Egg sellers

On average, there were 4.6 sellers per market who sold eggs only, selling on average 2 045 eggs daily; an average of 12.3 egg sellers who sold on average 380 eggs daily also sold other food items such as vegetable and spices (Table 10). Among sellers of eggs only, 33.9 percent sold 70-500 eggs, 35.8 percent sold 501-1 000 eggs, 18.9 percent sold 1 001-5 000 eggs and 11.3 percent sold 5 001-20 000 eggs daily. Among the sellers of other food items, 54.5 percent sold 20-100 eggs, 29.1 percent sold 101–500 eggs, and 10.9 percent sold from 1 001-4 150 eggs. Most sellers dealing only with eggs are wholesalers who generally supply them to those who also sell other food items and in other retail establishments and restaurants.



Picture 7. Eggs sellers in Srer Ambel Market, Koh Kong



Picture 8. Fresh and fermented eggs and other food items in Srer Ambel Market, Koh Kong

Table 10 Average number of sellers and eggs sold daily for two categories of egg sellers

Provinces	Selling eggs only		Selling eggs and other food items	
	No. of sellers	No. of eggs/day	No. of sellers	No. of eggs/day
Banteay Meanchey	2.5	750	5.3	76.7
Battambang	5.0	575	5.3	433
Kampong Cham	6.2	387	2.5	225
Kampong Chhnang	2.7	3 383	6.0	575
Kampong Speu	5.5	750	9.3	100
Kampong Thom	5.3	1 416	9.0	50.0
Kampot	5.5	1 000	7.5	149
Kandal	5.3	933	6.5	90.0
Kep	—	-	10.0	100
Koh Kong	4.0	750	7.0	66.7
Kratie	2.0	10 000	2.5	542
Monduliri	-	-	6.0	4 150
Otdor Meanchey	6.0	3 000	5.0	95.0
Pailin	-	-	4.7	850
Phnom Penh	5.8	2506	4.5	675
Prah Vihear	5.5	2000	1.0	1 500
Prey Veng	5.0	850	8.0	175
Pursat	4.7	467	2.5	225
Rattanakiri	2.0	1 000	5.5	443
Siem Reap	4.8	770	3.5	175
Sihanouk Ville	1.5	450	3.3	190
Steung Treng	4.0	10 000	2.3	333
Svay Rieng	4.5	735	5.6	374
Takeo	3.3	10 333	2.3	333
Mean value	4.60±0.47	2 045±494	12.3±5.25	380±93.7

Source: Reported by 305 sellers of 75 main markets.

Residence of licensed and unlicensed sellers

According to market officials, 30 percent of licensed sellers lived near the markets, 29.1 percent lived within the communes, 30.9 percent lived within the districts, and 9.1 percent, who lived mainly in Kampong Cham, Kampong Chhnang, Phnom Penh and Siem Reap Provinces, lived outside the district but within the province of the marketplace (Table 11). Among unlicensed sellers, 17.7 percent lived near the markets, 33.9 percent lived within the commune and 35.5 percent lived within the districts, while 11.3 percent lived outside the district but within the province; only a few sellers, mainly in Kratie, were from other provinces. Officials of the markets in Snoul, Kratie Province, reported that the unlicensed sellers who transported products to sell and supply this market were from Kampong Cham and Prey Veng.



Table 11 Residence of poultry and poultry product sellers

Provinces	Residence of licensed sellers (%)				Residence of unlicensed sellers (%)				
	Near market	Same commune	Same district	Same province	Near market	Same commune	Same district	Same province	Other provinces
Banteay Meanchey	50	50.0	—	—	33.0	—	67.0	—	—
Battambang	—	40.0	60.0	—	—	—	60.0	40.0	—
Kampong Cham	—	—	67.0	33.0	—	25.0	75.0	—	—
Kampong Chhnang	33.0	—	—	67.0	33.0	—	67.0	—	—
Kampong Speu	—	—	100	—	—	100	—	—	—
Kampong Thom	—	100	—	—	—	34.0	33.0	33.0	—
Kampot	50.0	50.0	—	—	33.0	67.0	—	—	—
Kandal	—	33.0	67.0	—	—	50.0	25.0	25.0	—
Kep	100	—	—	—	50.00	50.0	—	—	—
Koh Kong	67.0	—	33.0	—	67.0	—	33.0	—	—
Kratie	33.0	67.0	—	—	—	67.0	—	—	33.0
Mondulkiri	50.0	50.0	—	—	—	100	—	—	—
Otdor Meanchey	—	—	100	—	100	—	—	—	—
Pailin	—	50.0	50.0	—	—	—	100	—	—
Phnom Penh	20.0	—	60.0	20.0	—	33.0	33.0	34.0	—
Prah Vihear	100	—	—	—	100	—	—	—	—
Prey Veng	—	100	—	—	—	100	—	—	—
Pursat	—	50.0	50.0	—	—	—	100	—	—
Rattanakiri	50.0	50.0	—	—	—	50.0	50.0	—	—
Siem Reap	34.0	—	33.0	33.0	33.0	—	33.0	34.0	—
Sihanouk Ville	100	—	—	—	67.0	33.0	—	—	—
Steung Treng	—	100	—	—	—	—	—	100	—
Svay Rieng	—	100	—	—	—	50.0	50.0	—	—
Takeo	67.0	33.0	—	—	—	67.0	33.0	—	—
Mean value	30.9	29.1	30.9	9.09	17.7	33.9	35.5	11.3	1.61

Source: Results from interviewing 305 sellers of 75 main markets.



Frequency of unlicensed selling in the markets

Among the unlicensed sellers, 50.9 percent sold their poultry and poultry products daily and 27 percent sold them during festivities. The remaining 8.6 percent, 6.0 percent and 0.8 percent sold once a week, once a month, and when their birds were ready for market (irregularly), respectively (Table 12). Results from this survey showed that about 50 percent of the unlicensed sellers were also producers who sold their poultry and poultry products at lower prices, which significantly affected the licensed sellers. Inspections are provided by the Offices of Animal Health and Production in each province, but for large animals such as cattle, buffalo and pigs, only the sanitation and hygiene of the slaughterhouses are generally examined. No inspection capacity and facilities have yet been created for diseases, especially those related to poultry.

Table 12 Frequency of unlicensed sellers in the markets

Provinces	Daily	Once a week	Once a month	During festivities	Irregularly
Banteay Meanchey	67.0	—	—	33.0	—
Battambang	80.0	—	—	—	20.0
Kampong Cham	50.0	—	25.0	25.0	—
Kampong Chhnang	67.0	33.0	—	—	—
Kampong Speu	50.0	50.0	—	—	—
Kampong Thom	100	—	—	—	—
Kampot	67.0	—	33.0	—	—
Kandal	25.0	—	25.0	50.0	—
Kep	50.0	—	—	50.0	—
Koh Kong	-	—	33.0	67.0	—
Kratie	67.0	—	—	33.0	—
Monduliri	50.0	—	—	50.0	—
Otdor Meanchey	-	—	—	—	—
Pailin	50.0	—	—	50.0	—
Phnom Penh	-	—	33.0	67.0	—
Prah Vihear	100	—	—	—	—
Prey Veng	67.0	33.0	—	—	—
Pursat	50.0	—	—	50.0	—
Rattanakiri	-	—	—	100	—
Siem Reap	67.0	—	—	33.0	—
Sihanouk Ville	34.0	33.0	—	33.0	—
Steung Treng	100	—	—	—	—
Svay Rieng	33.0	67.0	—	—	—
Takeo	67.0	—	—	33.0	—
Mean value*	50.9	8.6	6.0	27.0	0.8

Source: Results reported by market managers. *no information from 6.7% of sellers

Numbers of poultry sold by licensed and unlicensed sellers

On average, licensed and unlicensed sellers sold 119.1 and 63.6 chickens each market day, respectively (Table 13). On the other hand, the unlicensed sellers sold more ducks than the licensed sellers (12.1 heads for licensed sellers and 30.5 heads for unlicensed sellers) and no ducks were sold in the Monduliri and Rattanakiri Provinces, which are upland regions. Ducks are commonly kept by farmers in lowland regions, due to the availability of water sources for ducks to seek food and swim in. These upland provinces do not have water sources for ducks



Farmers start keeping ducks in the early rainy season and allow them to feed on insects, water plants, small snails and fish in paddy fields, canals and ponds, etc. The supply of ducks to the markets therefore mainly occurs in the early dry season, whereas chickens are regularly supplied year-round.

Box 1: Poultry production in Takeo province

Takeo, one of the most populated provinces (222 persons per km²), about 80 km south of Phnom Penh City, supplies poultry to Phnom Penh markets. Farmers in Takeo, especially in Prey Kabas, Samroung and Tramkak, traditionally raise ducks on a semi-commercial scale for both eggs and meat. As observed, duck keeping has been moved to Siem Reap Province, due to (i) insufficient space for scavenging; (ii) abundant natural resources such as snails, small shrimps and crabs; and (iii) market demand for eggs. In addition to the supply of duck eggs and meat to other places, especially Phnom Penh markets, Takeo Market, located in the provincial town, sells up to 1 000 live and slaughtered ducks, and about 10 000 duck eggs daily. About 95 percent of ducks sold in these markets are from unlicensed sellers and are mostly culled laying ducks. Farmers cull their laying ducks after 2-3 months without laying eggs, because they can not afford to pay for feed.

Quails are not commonly kept by farmers in Cambodia. They were introduced in the country in the 1980s and currently, the production is mainly in the suburbs of cities and towns to serve restaurants and the tourist industry. Quails are mainly sold in the markets of Kratie, Phnom Penh and Prey Veng by licensed sellers and in the markets of Banteay Meanchey, Koh Kong, Phnom Penh and Prey Veng by unlicensed sellers. The daily quantity sold per market was 6-420 quails, with the highest number in Phnom Penh. Wild birds were mainly sold at the markets in Koh Kong, Prey Veng and Phnom Penh, with daily quantities of 5-95 birds, the highest number being in Prey Veng. According to market officials, 56 percent sellers sold 1-100 birds daily of all poultry categories; 36 percent sold 101-500 heads; and 8.1 percent sold more than 500 heads.

Box 2: Characteristics of the Akek market in Banteay Meanchey

The Akek market, which was one of the three markets visited in Banteay Meanchey Province, has the largest number of poultry sold daily of all surveyed markets (up to 1,700 chickens and 310 ducks). It also sells about 830 eggs daily. Akek is about 362 km northwest of Phnom Penh and borders Thailand. According to market officials, there are 35 licensed and unlicensed poultry sellers, of which 68.6 percent are traders that play several roles in the poultry business as traders, whole sellers and retailers. Only 17 percent of the licensed sellers that are registered in this market sell poultry daily. Among all sellers, 14.3 percent are poultry raisers, of whom 67 percent sell their poultry daily and 33 percent only sell poultry during festivals.

About 70 percent of poultry sold at this market comes from traders and the remaining comes from smallholder producers. The proportion of chickens supplied to this market from Battambang Province is 87 percent and the remaining 13 percent is imported from Thailand. The proportion of chicken eggs sold in the Akek Market that come from Thailand is 33 percent. The ducks sold are entirely of local produce. Since the market is located in Poipet, an important trading point between Cambodia and Thailand with many merchants that come



Table 13 Range of poultry sold daily on each market, by type of seller and species

Provinces	Licensed sellers		Unlicensed sellers	
	Number of chickens	Number of ducks	Number of chickens	Number of ducks
Banteay Meanchey	100–1600	50–64	60–300	60–250
Battambang	33–300	1–100	1–70	1–70
Kampong Cham	25–250	10	30–100	60
Kampong Chhnang	5–100	5–20	10–120	3–15
Kampong Speu	20–300	10–50	50–70	10
Kampong Thom	90	15	65–140	10–50
Kampot	5–200	—	9–500	68–70
Kandal	30–100	10	4–200	40
Kep	10	10–20	10	6
Koh Kong	3–80	3	2–15	20
Kratie	20–100	40	8–50	30
Mondulkiri	10–40	4	3–5	—
Otdor Meanchey	110	10	60	10
Pailin	17–30	3	4	2
Phnom Penh	40–700	13–100	20–50	10
Prah Vihear	40	—	36	10
Prey Veng	30	10	30–100	20–100
Pursat	25–40	20	30–60	4–5
Rattanakiri	10–25	1–10	5	—
Siem Reap	30–500	12–30	100–170	14–20
Sihanouk Ville	12–50	12–18	10–55	10–15
Steung Treng	40	5	20	3
Svay Rieng	60	—	20–58	3–20
Takeo	5–100	15–50	10–300	150–1000
Mean value/market	119.1	33.8	63.6	60.7

Source: Results from selling market officials interviewed.

On average, 77.6 live and 111 slaughtered chickens, and 24.8 live and 53.4 slaughtered ducks were sold daily in each market (Table 14). On average, they sold 20–210 live and 15–72 slaughtered quails daily in each market. Mainly provinces bordering either Thailand or Viet Nam sold quails that are generally imported, while quails sold in markets in Phnom Penh could be imported or produced on some nearby farms. Wild birds were also sold live and slaughtered in markets in Battambang and Prey Veng, whereas only slaughtered birds were sold in Koh Kong and Phnom Penh. On average, 6–20 live and 6–50 slaughtered wild birds were sold daily in each market.



Table 14. Range of poultry sold daily on each market, by type of product and species

Provinces	Live birds		Slaughtered birds	
	Number of chickens	Number of ducks	Number of chickens	Number of ducks
Banteay Meanchey	60–100	60–80	100–1520	50–64
Battambang	10–70	2–70	33–300	20–100
Kampong Cham	30–100	10	25–250	40–60
Kampong Chhnang	50–125	3–10	55–60	5
Kampong Speu	50–200	50	20–100	10
Kampong Thom	10–65	15–20	70–130	10–30
Kampot	9–500	50–60	5–200	8–20
Kandal	5–30	10	10–100	20
Kep	10	—	10	16–20
Koh Kong	7–15	3	3–80	20
Kratie	5–50	50	30–100	20
Mondulkiri	5–13	4	40	—
Otdor Meanchey	10–50	5	50–60	5–10
Pailin	4	2	15–30	3
Phnom Penh	15–800	8–100	40–800	5–30
Prah Vihear	10–15	—	25–26	10
Prey Veng	30	2–30	3–100	10–100
Pursat	30–60	4–5	25–40	20
Rattanakiri	5–15	1	25	10
Siem Reap	170	14	30–500	12–30
Sihanouk Ville	20–50	12	10–20	28–45
Steung Treng	20	3	40	5
Svay Rieng	520	20	20–60	3
Takeo	10–300	15–50	5–300	150–1000
Mean value	77.6	24.8	111.0	53.4

Source: Results from market officials interviewed.

Photo 9. Selling slaughtered chickens and ducks in a market in Stung, Kampong



Photo 10. Selling bantam chicken for medicine, Moan Sohmlah, Kab Ko market, Phnom Penh



Photos 11 and 12. Selling of live chickens and ducks at Kampong Trach Market, Kampot



Numbers of sellers in the markets for live and slaughtered birds

Among markets visited, more licensed sellers brought slaughtered birds to the markets than unlicensed sellers (Table 15). Live poultry is brought to the market on average by 4.3 licensed sellers compared with 6.6 unlicensed sellers, while slaughtered birds are brought to the markets on average by 5.7 licensed sellers and 5.2 unlicensed sellers. Unlicensed sellers sold live birds in the markets in Battambang, Kampong Cham, Kampong Thom, Kep, Pailin, Prey Veng, Pursat, Siem Reap, Steung Treng, Svay Rieng and Takeo Provinces. Since unlicensed sellers did not have regular customers, in all visited markets they brought such a quantity of live poultry to the markets that would allow them to take the unsold birds back home. About 50 percent of unlicensed sellers were poultry keepers, particularly in the remote provinces, and brought their chickens to the markets when they needed cash or exchanged them for other food items.

Table 15 Number of sellers dealing with live and slaughtered birds

Provinces	No. of licensed sellers		No. of unlicensed sellers	
	Live birds	Slaughtered birds	Live birds	Slaughtered birds
Banteay Meanchey	8	4–8	2–5	1–40
Battambang	—	4–20	2–20	1–2
Kampong Cham	—	2–8	3–6	2–7
Kampong Chhnang	1	5	1–20	—
Kampong Speu	2	5	10	1–2
Kampong Thom	—	6	1–10	2–7
Kampot	2	1	3–27	1
Kandal	1–15	1–40	16	4–11
Kep	—	1	3–5	—
Koh Kong	2	2–5	2–10	—
Kratie	1	1–7	2–4	—
Monduliri	1–3	2	2	—
Otdor Meanchey	5	7	1	1–5
Pailin	—	3–5	2–3	—
Phnom Penh	2–24	2–7	3	1
Prah Vihear	1	1	2	1–4
Prey Veng	—	6	5–20	2–5
Pursat	—	2–20	3–5	—
Rattanakiri	4	6	2–4	—
Siem Reap	—	2–12	5	3–4
Sihanouk Ville	3	2–6	3–5	1–4
Steung Treng	—	4	3	—
Svay Rieng	—	3	4–10	2–4
Takeo	—	2–8	4–20	—
Mean value	4.3	5.7	6.6	5.2

Note: These figures represent the number of sellers counted during the day of the survey.

Age group of poultry sold in the market

On average, each seller sold 37.4 adult chickens and ducks daily, compared with 20.5 chicks and ducklings (Table 16). The sellers who sold more poultry than the average were found in markets in Banteay Meanchey, Battambang, Kampong Speu, Phnom Penh, Prey Veng, Pursat, Takeo and Svay Rieng Provinces. Due to the large population in Phnom Penh and tourism in Siem Reap Province, there should be more poultry sold in the markets there; however, since there are also more restaurants, traders might bring live or slaughtered birds directly to the restaurants without passing through the markets.

Ducklings are mainly sold by unlicensed sellers in a few markets such as Kampot, Kratie, Monduliri, Phnom Penh, Prey Veng, Sihanouk Ville, and Steung Treng. The largest number of ducklings, 200, was found in the markets of Prey Veng and they were for eggs or meat production. In Prey Veng, several duck farms for eggs production were observed on the road side. In Phnom Penh, few chicks are sold in the markets and are mainly kept as pets. Except for the semi-commercial or commercial farms, which obtained their supply of chicks from commercial hatcheries, neighbouring countries and companies, smallholder farmers produce their own chicks from broody hens. Farmers also get their new birds from other farmers either inside or outside the village, but they are mainly as adult chickens.



Table 16 Age group of live poultry sold daily per seller

Provinces	No. of adults	No. of chicks/ducklings
Banteay Meanchey	16–375	—
Battambang	10–120	—
Kampong Cham	10–60	—
Kampong Chhnang	2–85	—
Kampong Speu	5–185	—
Kampong Thom	10–80	—
Kampot	2–100	12
Kandal	10–50	—
Kep	3–60	—
Koh Kong	3–34	—
Kratie	5–40	1
Monduliri	2–38	2
Otdor Meanchey	10–38	—
Pailin	10–60	—
Phnom Penh	14–120	20
Prah Vihear	8–30	—
Prey Veng	10–700	200
Pursat	9–120	—
Rattanakiri	2–35	1
Siem Reap	10–70	—
Sihanouk Ville	2–35	6
Steung Treng	2–24	4
Svay Rieng	4–140	—
Takeo	5–200	—
Mean value	37.4	20.5

Source: Results of interviewing 305 sellers of 75 main markets.

Supplies and sources of poultry and eggs

Poultry and eggs suppliers

Among the 305 sellers, more than 62 percent reported that the supplies of the poultry and eggs were from traders, while 52.8 percent said they bought from smallholder producers, which were mainly those sold as live poultry; only 5.2 percent produced on their own farm for the markets (Table 17). In Cambodia, about 90 percent of smallholders keep chicken and 24 percent of smallholders keep ducks, with average flock sizes of 12.7 chickens (5-23 heads) and 6.4 ducks (1-40 heads) (FAO and CelAgrid. 2008).

The smallholder producers' finishing products ready for the markets were mainly live chickens and ducks, and duck eggs, which they could sell through traders/collectors who travel to their villages regularly, or they could go to the markets themselves as unlicensed sellers. The chicken eggs mainly come from commercial farms.



Table 17 Sources of supply of poultry and poultry products in the markets (%)

Provinces	Own produced	From smallholder farmers	From traders
Banteay Meanchey	-	33.3	75.0
Battambang	5.0	50.0	75.0
Kampong Cham	13.6	59.1	54.5
Kampong Chhnang	-	45.5	63.6
Kampong Speu	-	50.0	91.7
Kampong Thom	7.7	84.6	30.8
Kampot	16.7	66.7	25.0
Kandal	11.1	50.0	72.2
Kep	—	87.5	25.0
Koh Kong	—	18.2	90.9
Kratie	—	50.0	100
Mondulkiri	—	22.2	66.7
Otdor Meanchey	—	62.5	75
Pailin	—	12.5	87.5
Phnom Penh	5.0	25.0	100
Prah Vihear		75.0	50.0
Prey Veng	7.1	64.3	35.7
Pursat	8.3	58.3	66.7
Rattanakiri	—	66.7	44.4
Siem Reap	5.0	70.0	55.0
Sihanouk Ville	8.3	33.3	58.3
Steung Treng	12.5	37.5	50.0
Svay Rieng	—	58.3	50.0
Takeo	7.1	78.6	35.7
Mean value	5.25 (n=16)	52.8 (n=161)	62.6 (n=191)

Source: Results of interviewing 305 sellers of 75 main markets.

Sources of poultry and eggs supplies

The market officials reported that most chicken and duck supplies in the markets came from within the district (60.1 percent for chickens and 62.9 percent for ducks), while for chicken 22 percent came from within the province, 17.2 percent from within the country, and 0.5 percent from other countries. For markets near the border, the main chicken suppliers (broiler meat and eggs) were from Thailand, which supplied 13 percent of chicken in the markets of Banteay Meanchey Province. With respect to duck supplies for the markets, 25.8 percent came from within the province and 11.2 percent from other provinces. Half of the quails supplied in the markets came from within the country and half from neighbouring countries. Wild birds were mainly supplied from within the province, except for Phnom Penh, whose supply came from other provinces.



Table 18 Origin of poultry supplied to the markets

Provinces	Chickens				Ducks		
	Within the district	Within the province	Within the country	Other countries	Within the district	Within the province	Within the country
Banteay Meanchey	81.7	5.0	—	13.3	96.7	3.3	—
Battambang	51.0	49.0	—	—	66.0	34.0	—
Kampong Cham	94.0	6.0	—	—	100	—	—
Kampong Chhnang	66.7	33.3	—	—	70.0	30.0	—
Kampong Speu	50.0	50.0	—	—	40.0	50.0	10.0
Kampong Thom	93.3	6.7	—	—	93.3	6.7	—
Kampot	73.3	26.7	—	—	60.0	40.0	—
Kandal	34.0	4.0	62.0	—	—	10.0	90.0
Kep	75.0	25.0	—	—	—	100	—
Koh Kong	33.3	56.7	10.0	—	100	—	—
Kratie	76.7	—	23.3	—	50.0	—	50.0
Mondulkiri	50.0	15.0	35.0	—	—	50.0	50.0
Otdor Meanchey	75.0	25.0	—	—	100	—	—
Pailin	10.0	—	90.0	—	50.0	—	50.0
Phnom Penh	4.4	23.6	72.0	—	3.0	24.5	72.5
Prah Vihear	90.0	10.0	—	—	60.0	40.0	—
Prey Veng	90.0	10.0	—	—	100	—	—
Pursat	66.7	33.3	—	—	66.7	33.3	—
Rattanakiri	50.0	20.0	30.0	—	50.0	50.0	—
Siem Reap	66.0	30.0	4.0	—	60.0	40.0	—
Sihanouk Ville	23.3	23.3	53.3	—	50.0	50.0	—
Steung Treng	30.0	70.0	—	—	40.0	60.0	—
Svay Rieng	66.7	33.3	—	—	66.7	33.3	—
Takeo	100	—	—	—	100	—	—
Mean value	60.1	22.0	17.2	0.54	62.9	25.8	11.2

Source: Reported by market officials

The interviewed sellers reported that more than 56 percent of their chickens sold in the markets were from within the same district, except for the Phnom Penh markets – 79.2 percent of their chicken supply came from other provinces. Smallholder poultry producers are not common in Phnom Penh and commercial poultry farms supply their chickens mainly to the restaurants, although some might also sell in the regular markets. Sellers in Phnom Penh also reported that 20.9 percent of chickens were from within the province (Table 19). On a general average for the country, 18.5 percent of the chickens sold at the markets were from other provinces; the percentages were higher for Kandal, Phnom Penh and Sihanouk Ville. In the provinces of Banteay Meanchey, Battambang, and provinces with supplies from neighbouring countries, such as Koh Kong, Pailin bordering Thailand and Svay Rieng bordering Viet Nam, the proportion ranged from 17-67 percent.

No ducks were sold in the surveyed markets in Otdor Meanchey and Prah Vihear. These two upland provinces have no common water sources and no tradition of keeping ducks, although farmers might keep a few Muscovic ducks mainly for home consumption. More than 50 percent of the market sellers reported that their duck supply came from within the district, but percentages were higher in Banteay Meanchey, Battambang, Kampong Thom, Pailin, Pursat and Siem Reap; 25.7 percent of the sellers reported their duck supply came from within the province and 23.8 percent of the sellers reported that it came from other provinces,



with higher percentages found in the provinces of Kep, Koh Kong, Kratie, Phnom Penh and Sihanouk Ville.

Table 19 Origin of poultry supplied to the markets as reported by sellers

Provinces	Chickens				Ducks		
	Within district	Within province	Within country	Other countries	Within district	Within province	Within country
Banteay Meanchey	75.5	12.8	0.5	11.1	100	—	—
Battambang	66.1	18.2	8.6	7.1	72.8	27.1	—
Kampong Cham	73.8	10.8	15.3	—	—	100	—
Kampong Chhnang	62.5	25.0	12.5	—	33.3	53.3	13.3
Kampong Speu	62.0	38.0	—	—	50.0	50.0	—
Kampong Thom	95.0	5.00	—	—	100	—	—
Kampot	100	—	—	—	50.0	25.0	25.0
Kandal	34.2	17.5	48.3	—	—	50.0	50.0
Kep	75.0	8.3	16.7	—	16.7	23.3	60.0
Koh Kong	24.0	—	36.0	40.0	—	—	100
Kratie	50.0	16.0	34.0	—	—	—	100
Mondulkiri	54.0	18.0	28.0	—	7.0	62.0	31.0
Otdor Meanchey	100	—	—	—	—	—	—
Pailin	18.3	—	15.0	66.7	100	—	—
Phnom Penh	—	20.8	79.2	—	—	1.0	99.0
Prah Vihear	56.7	43.3	—	—	—	—	—
Prey Veng	75.0	23.0	2.0	—	63.3	36.7	—
Pursat	59.4	40.6	—	—	100	—	—
Rattanakiri	34.0	53.0	13.0	—	50.0	50.0	—
Siem Reap	70.9	16.4	12.7	—	100	—	—
Sihanouk Ville	42.5	6.25	51.2	—	35.0	15.0	50.0
Steung Treng	52.0	48.0	—	—	50.0	50.0	—
Svay Rieng	26.7	56.7	—	16.7	60.0	40.0	—
Takeo	37.0	56.0	7.0	—	24.0	76.0	—
Mean value	56.0	20.9	18.5	4.63	51.5	25.7	23.8

Source: Reported by the sellers.



The interviewed sellers reported that 14.3 percent of their chicken egg supply came from within the district, 27.3 percent from within the province, 47.2 percent from other provinces and 11.1 percent from other countries (Table 20). In the markets of Banteay Meanchey, Battambang, Pailin and Svay Rieng, which border Thailand and Viet Nam, the supply of eggs mainly came from other countries. The supply of duck eggs came from three important sources: 35.6 percent from within the district; 22.3 percent from within the province and 36.1 percent from other provinces. No supply of duck eggs was reported from other countries.

Table 20 Origin of eggs supplied to the markets as reported by sellers

Provinces	Chicken eggs				Duck eggs		
	Within the district	Within the province	Within the country	Other countries	Within the district	Within the province	Within the country
Banteay Meanchey	—	32.3	34.3	33.3	33.3	33.3	—
Battambang	30.0	20.0	25.0	25.0	76.0	24.0	—
Kampong Cham	—	—	—	—	75.0	16.2	8.7
Kampong Chhnang	—	—	100	—	—	33.3	66.7
Kampong Speu	16.2	37.5	46.2	—	14.3	35.7	50.0
Kampong Thom	—	—	—	—	100	—	—
Kampot	35.0	65.0	—	—	40.0	60.0	—
Kandal	20.0	40.0	40.0	—	25.0	2.5	55.0
Kep	—	100	—	—	—	100	—
Koh Kong	—	20.0	80.0	—	—	14.0	86.0
Kratie	—	50.0	50.0	—	—	—	100
Mondulhiri	—	—	—	—	—	—	80.0
Otdor Meanchey	—	—	100	—	—	—	100
Pailin	—	—	—	100	—	—	100
Phnom Penh	5.0	45.0	50.0	—	—	33.3	66.7
Prah Vihear	10.0	90.0	—	—	25.0	—	75.0
Prey Veng	—	—	100	—	73.3	23.3	3.3
Pursat	—	—	—	—	62.5	37.5	—
Rattanakiri	26.7	6.7	66.7	—	40.0	10.0	15.0
Siem Reap	42.8	28.6	28.6	—	68.6	20.0	11.4
Sihanouk Ville	—	—	100	—	50.0	—	50.0
Steung Treng	—	—	100	—	—	33.3	66.7
Svay Rieng	—	—	33.3	66.7	14.0	31.0	5.0
Takeo	—	—	100	—	33.3	33.3	33.3
Mean value	14.3	27.3	47.2	11.1	35.6	22.3	36.1

Source: Reported by the sellers.



Photos 13 and 14. Distribution of poultry eggs within the province and across the country



Poultry breeds sold in markets

Chicken and duck production in Cambodia is dominated by smallholders, of which more than 80 percent keep local breed and a few raise fighting cocks and layer hens for reproduction. Although the crossbreeding of fast-growing breeds within local breeds would help to improve the productivity of the birds, it is not commonly practised. There are different types of skin and meat colours that are preferred by consumers for specific needs and activities. Yellow skin and legs are preferred by most consumers, particularly in the cities, while, due to their scarcity, chickens with dark meat and bones are only consumed during weddings and occasional family parties. The market officials reported that 89.4 percent of chickens sold in their markets were from local breeds, except for the markets in Battambang, Kandal, Phnom Penh, Koh Kong, Pailin and Svay Rieng, where 10-48 percent of the sold birds were from improved breeds. Koh Kong and Pailin had easy access to the suppliers from Thailand, while Svay Rieng had access to suppliers from Viet Nam (Table 20). The market officials reported that 96.5 percent of the ducks sold in the markets were local breeds. The improved breed (Peking duck) was mainly kept by semi-commercial farms near Phnom Penh and is usually supplied to restaurants and processors for barbeques. It is hard to explain, however, why Mondulhiri also reported sales of improved duck breeds.



Table 21 Breed of poultry supplied to the markets

Provinces	Chickens		Ducks	
	Local	Improved	Local	Improved
Banteay Meanchey	98.3	1.7	100	—
Battambang	76.0	24.0	100	—
Kampong Cham	100	—	100	—
Kampong Chhnang	100	—	100	—
Kampong Speu	66.7	33.3	93.3	6.7
Kampong Thom	100	—	100	—
Kampot	99.7	0.3	100	—
Kandal	65.0	35.0	100	—
Kep	100	—	100	—
Koh Kong	56.7	43.3	100	—
Kratie	100	—	100	—
Monduliri	100	—	20	80.0
Otdor Meanchey	100	—	100	—
Pailin	52.5	47.5	100	—
Phnom Penh	83.8	16.2	77.2	22.7
Prah Vihear	100	—	100	—
Prey Veng	100	—	100	—
Pursat	100	—	100	—
Rattanakiri	100	—	100	—
Siem Reap	94.0	6.00	100	—
Sihanouk Ville	93.3	6.67	100	—
Steung Treng	100	—	100	—
Svay Rieng	90.0	10.0	100	—
Takeo	100	—	100	—
Mean value	89.4	10.6	96.5	3.5

Source: Proportions reported by market officials.

The sellers reported that 86.7 percent of the chickens and 99.3 percent of the ducks that they sold were from local breeds (Table 22). The sellers also said that 94.5 percent of the sold duck eggs were local, whereas, conversely, 82.6 percent of the sold chicken eggs came from improved breeds. Semi-intensive duck farms keep improved breeds, mainly Kaki Campbell, for eggs production, which are mostly found in Takeo, Kampong Cham, Siem Reap and Kandal, while local ducks are kept by small-scale egg producers in most provinces of Cambodia. The chicken eggs are generally bought and used by restaurants and cake production shops, while duck eggs are bought by individual families, restaurants, food sellers, and for embryonic egg production. Consumers still prefer meat and eggs from local breeds because they are kept by smallholder farmers. The general belief is that local breeds kept by farmers are safer because they hardly use antibiotics and growth hormones and that some consumers like tough meat. CelAgrid and ILRI (2007) reported similar results for pigs. Consumers preferred local breeds of pigs to improved breeds. Local breeds scored 9.1 and 8.9 out of 10 on a preference score in Phnom Penh and Takeo, respectively, while lower scores were for exotic breeds.



**Table 22 Breed of poultry and type of eggs supplied to the markets
(proportions reported by the sellers)**

Provinces	Chickens (%)		Chickens eggs (%)		Ducks (%)		Duck eggs (%)	
	Local breeds	Improved breeds	Local breeds	Improved breeds	Local breeds	Improved breeds	Local breeds	Improved breeds
Banteay Meanchey	87.9	12.1	—	100	100	—	66.7	33.3
Battambang	72.4	27.6	—	100	100	—	100	—
Kampong Cham	100	—	100	—	100	—	100	—
Kampong Chhnang	87.5	12.5	100	—	90.0	10.0	100	—
Kampong Speu	100	—	—	100	100	—	92.8	7.1
Kampong Thom	98.0	2.0	—	—	95.0	5.0	100	—
Kampot	100	—	50.0	50.0	100	—	100	—
Kandal	64.6	35.4	—	100	100	—	100	—
Kep	83.3	—	—	100	100	—	100	—
Koh Kong	40.0	40.0	—	100	100	—	100	—
Kratie	80.0	20.0	—	100	100	—	100	—
Mondulkiri	100	—	—	100	100	—	80.0	20.0
Otdor	—	—	—	—	—	—	—	—
Meanchey	100	—	—	100	—	—	100	—
Pailin	33.3	66.7	—	100	100	—	100	—
Phnom Penh	86.9	13.1	20.0	80.0	100	—	100	—
Prah Vihear	100	—	100	—	—	—	100	—
Prey Veng	100	6.0	—	100	100	—	100	—
Pursat	100	—	100	—	100	—	100	—
Rattanakiri	95.0	5.0	100	—	100	—	76.7	23.3
Siem Reap	84.5	15.4	21.4	78.6	100	—	100	—
Sihanouk Ville	100	—	—	100	100	—	100	—
Steung Treng	100	—	50.0	50.0	100	—	100	—
Svay Rieng	83.3	16.7	—	100	100	—	50.0	50.0
Takeo	100	—	—	100	100	—	100	—
Mean value	86.7	12.6	19.4±5.4	82.6	99.3	0.71	94.5	5.54

Source: Results from interviewing 305 sellers

Photo 15. Slaughtered local chicken sold at Veal Youn Market, Svay Rieng



Photo 16. Slaughtered improved chicken sold at Samaki Market, Pailin



Customers of poultry and poultry products

On average, sellers of poultry and poultry products supply 21.9 households (54.9 percent), 11.5 dealers (24.7 percent) and 4.6 restaurants (19.3 percent) (Table 23). In addition, sellers in the Rattanakiri, Steung Treng and Svay Rieng Provinces supply wedding parties, and in Takeo, they supply producers of embryonic duck eggs. These eggs are incubated for 15 days, then boiled and served at food shops along the markets and local tourist places in the evening. The number of customers in all categories was highest in Phnom Penh, while in Kandal, sellers served the largest number of dealers. Poultry is a preferred meat of consumers, at home, in restaurants, and in food shops/stalls during the festivities, especially the Khmer and Chinese New Years and during weekends in tourist areas. Poultry meat is served boiled, barbequed and roasted.

Table 23 Number of customers per day supplied by poultry and poultry products sellers

Provinces	Households	Dealers	Restaurants
Banteay Meanchey	27.6	6.6	5.6
Battambang	27	8.9	4.3
Kampong Cham	26.4	6.4	3.9
Kampong Chhnang	24.7	6.0	4.4
Kampong Speu	21.0	9.7	2.7
Kampong Thom	20.6	9.5	2.7
Kampot	12.5	7.4	4.4
Kandal	24.0	49.8	10.5
Kep	10.5	13.0	3.0
Koh Kong	22.4	1.0	1.3
Kratie	15.6	7.6	3.3
Mondulkiri	11.6	3.5	2.5
Otdor Meanchey	24.1	2.7	2.2
Pailin	25.9	3.0	2.3
Phnom Penh	32.8	17.2	10.2
Prah Vihear	28.1	7.0	3.3
Prey Veng	25.7	4.7	3.0
Pursat	21.6	16.9	2.8
Rattanakiri	11.6	2.0	2.5
Siem Reap	26.9	32.4	5.8
Sihanouk Ville	10.8	7.4	5.7
Steung Treng	18.0	7.0	3.3
Svay Rieng	14.8	3.0	2.0
Takeo	13.1	6.8	3.9
Mean value	21.9	11.5	4.60

Source: Reported by 305 sellers

Quantity of poultry and poultry products daily sold per seller

The average numbers of chicken and chicken products sold daily per seller was 37 live chickens, 28.4 slaughtered birds and 712 eggs (Table 24). In Otdor Meanchey, Pailin and Siem Reap, the interviewed sellers did not sell live birds, and in Kampot, they did not sell slaughtered birds. Internal organs and bones (10 kg each daily) were sold to customers only on markets in Koh Kong and Pailin, and mainly originated from Thailand.



Table 24 Number of chickens and chicken eggs sold daily per seller

Provinces	Chickens		
	No. of live	No. of slaughtered	No. of eggs
Banteay Meanchey	2–75	14–150	40–1 000
Battambang	2–97	10–120	300–1 750
Kampong Cham	9–25	10–60	1 500
Kampong Chhnang	3–105	8–60	30–280
Kampong Speu	2–155	5–30	30–600
Kampong Thom	10–25	10–80	300
Kampot	4–100	—	50
Kandal	2–50	10–50	30–100
Kep	3–10	5–10	10
Koh Kong	2–10	3–34	30–200
Kratie	1–40	5–30	40–300
Mondulkiri	2–15	10–20	20
Otdor Meanchey	—	10–38	20–300
Pailin	—	10–60	200–250
Phnom Penh	8–60	10–100	30–3 000
Prah Vihear	3–10	4–20	—
Prey Veng	2–900	4–60	30
Pursat	6–100	5–60	300
Rattanakiri	2–4	1–60	—
Siem Reap	—	10–75	70–18 000
Sihanouk Ville	10–30	2–15	20
Steung Treng	1–20	2–23	100–300
Svay Rieng	60–120	5–40	10–100
Takeo	20–60	5–60	20
Mean value	37.0	28.4	712

Source: Reported by 305 sellers.

The average number of ducks and duck eggs sold daily per seller was 27.0 live ducks, 11.7 slaughtered birds and 1 536 eggs (Table 25). The most eggs were sold in the markets of Banteay Meanchey, Kampong Cham, Phnom Penh, Siem Reap and Steung Treng. Sale of salty eggs (70 eggs) occurred only in the markets of Takeo, while embryonic eggs (80–1500 eggs) were sold in markets in Kep and Sihanouk Ville. Only two sellers in markets in Battambang and Phnom Penh sold goose eggs. Geese are not commonly kept by Cambodian farmers and are seen mainly in pagoda-related religious festivities. The market of Mondulkiri in Sen Monorom sold slaughtered quails (20 heads), which might have been imported from Viet Nam, since it lies near the country's border.



Table 25 Number of ducks and duck eggs sold daily per seller

Provinces	No. of live ducks	No. of slaughtered ducks	No. of duck eggs
Banteay Meanchey	1–200	2–60	130–4 000
Battambang	3	3–25	150–2 800
Kampong Cham	—	20	100–10 000
Kampong Chhnang	2–5	4–10	400–670
Kampong Speu	30	3	50–900
Kampong Thom	—	—	600–1 725
Kampot	—	8	150–1 500
Kandal	1	7	100–6 000
Kep	—	10–50	30–500
Koh Kong	—	4	20–320
Kratie	—	—	230–3 000
Mondulkiri	—	20	100–300
Otdor Meanchey	—	—	150–200
Pailin	—	3	350
Phnom Penh	2	1–30	100–9 000
Prah Vihear	—	10	300–2000
Prey Veng	3–50	2–10	400–850
Pursat	3	5	650–2 300
Rattanakiri	1–2	—	40–300
Siem Reap	—	10–40	100–40 000
Sihanouk Ville	—	25	250–1 000
Steung Treng	—	1–10	5–5 000
Svay Rieng	4–20	2	20–500
Takeo	5–200	1–15	500–10 000
Mean value	27.0	11.7	1536

Source: Reported by 305 sellers.

Price of poultry and poultry products

Prices of poultry and poultry products paid to suppliers

The average price of live chickens bought from suppliers (traders and smallholder producers) was 14 696 riels/kg, while the average price of ducks was 8 366 riels/kg (Table 26). The highest prices for chicken were found in Kampong Cham, Kampong Speu, Koh Kong and Mondulkiri. Sellers at markets in Rattanakiri and Steung Treng did weigh the birds, but sold them per head at 19 000 riel. The ducks in Kampong Thom, Kampot, Kep, Koh Kong, Kratie, Mondulkiri, Otdor Meanchey, Pailin, Prah Vihear, Rattanakiri, Sihanouk Ville, Steung Treng and Takeo were sold per head, at an average price of 8 612 riels. The price of duck eggs was 407 riels per egg, compared with 369 riels per commercial chicken egg; the price of local chicken eggs was 600–700 riels per egg, yet were not common found in the markets.



Table 26 Prices of poultry and eggs paid to suppliers

Provinces	Live chickens	Chicken eggs	Live ducks	Duck eggs
	Riels/kg	Riels/egg	Riels/kg	Riels/egg
Banteay Meanchey	12 500—15 000	350—370	4 500—10 000	380—400
Battambang	6 500—18 000	300—380	5 500—13 000	380—400
Kampong Cham	14 000—17 000	—	6500	340—420
Kampong Chhnang	12 000—15 500	350—380	7 000—10 000	370—460
Kampong Speu	15 000—17 000	360—400	8 500-9000	350—450
Kampong Thom	13 500—15 000	370	5000	370—400
Kampot	10 000—17 000	380	8 500—11000	380—430
Kandal	5 500—17 000	350—420	7 000	400—450
Kep	13 000—16 000	450	7 000—8 000	400—480
Koh Kong	15 000—16 000	290—380	—	390—500
Kratie	14 000—18 000	380	—	400—450
Mondulkiri	17 000—20 000	450	14 000	420—480
Otdor Meanchey	12 500—14 000	390—400	—	450—470
Pailin	13 000—22 000	250—380	8000	450
Phnom Penh	12 000—17 000	290—420	6 000—10 000	380—450
Prah Vihear	12 000—15 000	—	—	400—430
Prey Veng	12 000—15 000	380	6 500—9 000	320—360
Pursat	12 000—17 000	380	8 000-9000	350—400
Rattanakiri	12 000—28 000	—	12 000—15 000	380—450
Siem Reap	13 000—16 000	300—400	7 000	380—440
Sihanouk Ville	14 000—15 000	380	9000	400—430
Steung Treng	15 000—25 000	360—400	12 000—16 000	380—500
Svay Rieng	14 000—14 500	350—450	7 500—12 000	350—450
Takeo	11 000—15 000	350	5000—9000	350—380
Mean value	14 696	369	8 366	407

Source: Results from sellers' interviews.

Consumer prices of poultry and poultry products

The average consumer prices were 16 855 riels per kg of live chickens and 18 490 riels per kg of slaughtered chickens (Table 27). In a few provinces, such as Kampot, Rattanakiri and Steung Treng, the sellers sold live chickens without weighing them, but estimated the price per head at 15 300-22 700 riels. In the provinces of Battambang, Prah Vihear, Rattanakiri, Siem Reap and Steung Treng, the cost of one slaughtered bird was 18 600-30 000 riels. Higher prices of live chicken at 18 000-23 000 riel per kg were found in Kampong Speu, Mondulkiri and Kratie. This is difficult to explain when most supplies of chickens were from within the district and province, with no additional transaction cost such as transportation and road police fee. A possible explanation is that due to insufficient demand and lack of supply, prices were high. The consumer price of chicken eggs was 404 riels/egg.

The average consumer price of live ducks was 10 526 riels per kg and 11 182 riels per kg for slaughtered ducks (Table 27). Live ducks for meat were not very common in the markets; only 20.8 percent of the 24 provinces sold them, but 66.7 percent of the provinces sold slaughtered ducks. The consumer price of duck eggs was 451 riels/egg. The price of salty eggs was approximately 500 riels per egg, while the cost of geese eggs was 4 000 riels per egg.



Table 27 Consumer prices of poultry and poultry products

Provinces	Live chickens	Slaughtered chickens	Chicken eggs	Live ducks	Slaughtered ducks	Duck eggs
	Riels/kg	Riels/kg	Riels/egg	Riels/kg	Riels/kg	Riels/egg
Banteay Meanchey	13500—14000	7000—20000	380—400	6000—7500	8000—14000	400—450
Battambang	15000-16500	8500—25000	370—400	10000—15000	6000-9000	390—440
Kampong Cham	15000—16500	17000—22000	—	—	8000	400—450
Kampong Chhnang	13000—17000	17000—18000	400	12000	10000	400—480
Kampong Speu	16000—20000	18000—22000	390—450	9000	11000	400—500
Kampong Thom	16000	17000—19000	380	—	6000	380—430
Kampot	12000—20000	—	400	9500	13000	400—460
Kandal	6000—15000	9000—22000	380—450	10000	12000	440—500
Kep	15000—17000	16000-17000	450	—	9000-12000	500
Koh Kong	15000—17000	8000—18000	340—420	—	13000	420—600
Kratie	16000—21000	12500-26000	390	—	—	450—500
Monduliri	22000—25000	25000-29000	500	—	20000	500
Otdor Meanchey	—	15000-22000	450	—	—	480—500
Pailin	—	8000-25000	400	—	16000	500
Phnom Penh	13000—19000	15500-25000	320—450	10000-13000	9000—13000	450—500
Prah Vihear	15000—17000	17000-20000	—	—	9500	450—500
Prey Veng	14000—18000	18000-22000	420	7500-10000	15000	350—380
Pursat	12000—18000	17000-27000	400	10000	11000-13000	400—450
Rattanakiri	20000—25000	25000—35000	—	25000	17000-18000	420—600
Siem Reap	18000	15000-20000	360—420	—	8000-9000	400—550
Sihanouk Ville	16000—18000	17000-20000	400	—	10000	450
Steung Treng	20000—25000	25000—27000	400—420	—	17000-18000	430—600
Svay Rieng	15000—17000	13000-19000	380—500	8500—12000	15000	390—500
Takeo	14000—16500	13000-20000	450	5500-7500	8000-12000	370—400
Mean value	16855	18490	404	10526	11182	451

Source: Reported by 305 sellers of 75 main markets.

Agreement and types of supply

Of the sellers interviewed, 40.6 percent reported that they had agreements with suppliers of poultry and poultry products, but 92.7 percent of them were verbal agreements only and 7.3 percent, written (Table 28). About 35 percent of the sellers had specific suppliers, while 65.2 percent obtained their poultry and poultry products from any source. Cambodian rural small businesses are still practised by very traditional types of business deals, which can easily break down and damage the business relationship. Trust without paper or documents does not work in a business environment where competition is high; however, since this kind of business dealing system has been practised for generations, the parties concerned are not affected by or resistant to problems when verbal agreements are broken. This practice might shift towards proper business agreements if verbal contracts increasingly fail.



Table 28 Type of agreements made between suppliers and market sellers

Provinces	Agreements are made(%)	Type of Agreements		Types of supply	
		Verbal (%)	Written (%)	Fixed (%)	Variable (%)
Banteay Meanchey	50.0	83.3	16.7	33.3	66.7
Battambang	35.0	100	—	45.0	55.0
Kampong Cham	59.1	100	—	22.7	77.3
Kampong Chhnang	27.3	100	—	45.5	54.5
Kampong Speu	16.7	100	—	25.0	75.0
Kampong Thom	38.5	100	—	23.1	76.9
Kampot	41.7	100	—	33.3	66.7
Kandal	44.4	75.0	25.0	22.2	77.8
Kep	25.0	50.0	50.0	37.5	62.5
Koh Kong	18.2	100	—	27.3	72.7
Kratie	33.3	75.0	25.0	33.3	66.7
Mondulkiri	33.3	100	—	55.6	44.4
Otdor Meanchey	50.0	75.0	25.0	50.0	50.0
Pailin	25.0	100	—	62.5	37.5
Phnom Penh	40.0	87.5	12.5	55.0	45.0
Prah Vihear	75.0	100	—	37.5	62.5
Prey Veng	35.7	80.0	20.0	35.7	64.3
Pursat	33.3	100	—	16.7	83.3
Rattanakiri	44.4	100	—	33.3	66.7
Siem Reap	65.0	92.3	7.7	30.0	70.0
Sihanouk Ville	41.7	100	—	25.0	75.0
Steung Treng	12.5	100	—	37.5	62.5
Svay Rieng	25.0	100	—	50.0	50.0
Takeo	64.3	100	—	21.4	78.6
Mean value	40.6 (n=124)	92.7 (n=115)	7.26 (n=9)	34.7 (n=106)	65.2 (n=199)

Source: Reported by sellers.

Seasonality of volume of poultry sold in the market

Both, market officials (92 percent) and sellers (88 percent) reported that the volume of poultry meat and eggs sold in the markets increases during festivities such as Pchum Bin, the Chinese New Year, the Khmer New Year, traditional and religious ceremonies and celebrations and the number of chickens sold at the markets decreased at the beginning of the fish harvest (December-February annually). In the report of the Consumer demand study on pigs and pig meat, a few sellers claimed a decrease of poultry sales due to AI outbreaks. Traders, wholesalers, retailers and butchers stated a similar decrease in poultry sales in Takeo and Phnom Penh, in which chickens were ranked third after fish and pig meat as protein sources for Cambodians (CeIAgrid and ILRI, 2007). The demand of chickens is commonly high after the seasonal fish harvest due to the Chinese traditional celebration and the Khmer New Year. Nevertheless, the supply could be short, because in general, the outbreak of Newcastle disease and cholera also occur at this time of year.



Handling practices and waste management in the markets

Slaughtering and share of live and slaughtered birds

Poultry is easy to handle, and 89.4 percent of the sellers normally slaughter them by themselves; only 10.6 percent of the sellers hired slaughtering services. The service charge for slaughtering was 200-300 riels per head. Sellers had not yet paid attention to potential disease transmission, especially the AI risk. People handling slaughtered poultry did not use or were not instructed to use masks and gloves for protection. These are the people most vulnerable to AI risk because they handle poultry from many sources, which could include sick animals. There were ten markets visited in Kampong Chhnang, Kampong Thom, Phnom Penh, Prah Vihear, Siem Reap and Sihanouk Ville that had slaughtering places, but only 19.2 percent of the sellers slaughtered their birds at these markets.

Only 7.5 percent of the visited sellers separated their animals by species, especially chickens and ducks.

Photo 17. Slaughtering practised in Kampong Thmar Market, Kampong Thom



Photo 18. Cleaning of slaughtered chickens and internal organs at Veal Rinh Market, Sihanouk Ville



Management of unsold birds

If birds cannot be sold the same day, 47.1 percent of the poultry sellers reported that they froze the slaughtered birds, 38.9 percent took the live birds back home, and 5.3 percent in Kampong Cham, Kampong Chhnang, Kandal, Kep, Koh Kong, Monduliri and Phnom Penh kept live birds in the markets. Also, 30.8 percent of sellers reported that they sold the slaughtered birds at lower prices (10-20 percent lower than the normal price) in the afternoon before going home, because they do not have facilities to keep them until the next day (Table 29). Selling slaughtered birds at discounted prices on the same day is a good option for sellers to deal with unsold birds, because frozen birds will fetch even lower prices and freezing involves additional costs such as transportation and freezers. If not properly managed, taking live birds home after market hours involves the risk of spreading disease such as AI.



Table 29 Management of unsold birds

Provinces	Take them home (%)	Freeze slaughtered birds (%)	Sell them at lower prices (%)
Banteay Meanchey	44.4	77.8	11.1
Battambang	42.8	71.4	21.4
Kampong Cham	35.7	21.4	61.5
Kampong Chhnang	25.0	37.5	25.0
Kampong Speu	80.0	60.0	20.0
Kampong Thom	30.0	40.0	20.0
Kampot	77.8	—	22.2
Kandal	58.3	33.3	33.3
Kep	14.3	14.3	14.3
Koh Kong	16.7	50.0	—
Kratie	30.0	60.0	20.0
Mondulkiri	14.3	57.1	14.3
Otdor Meanchey	—	60.0	—
Pailin	16.7	83.3	50.0
Phnom Penh	35.7	57.1	21.4
Prah Vihear	—	—	66.7
Prey Veng	27.3	81.8	45.4
Pursat	25.0	25.0	77.8
Rattanakiri	60.0	40.0	20.0
Siem Reap	30.8	46.1	53.8
Sihanouk Ville	88.9	44.4	11.1
Steung Treng	20.0	60.0	—
Svay Rieng	42.8	42.8	28.6
Takeo	63.6	45.4	54.5
Mean value	38.9 (n=81)	47.1 (n=98)	30.8 (n=64)

Source: Reported by sellers.

Waste management

With respect to poultry waste management, 40.4 percent of the sellers pack the waste and take it to disposal outside the markets; 36.1 percent pack and bury it at home; 11.1 percent sell it; and 7.8 percent use it as animal feed (Table 30). However, the poultry waste used as animal feed is composed mainly of intestines, while the internal organs such as gizzards and hearts are cleaned and sold to customers. The intestines are fed to pigs and fish. The sellers (25-60 percent) who use poultry waste for animal feed were mainly from Battambang, Otdor Meanchey and Pursat Province, while a small percentage of sellers (7-16 percent) in Kampong Cham, Kampong Thom, Koh Kong, Kratie and Mondulkiri also feed poultry waste to their animals. This can be a risky practice if the waste is derived from birds infected with H5N1. Also, the part of the waste that is sold by the sellers might be used for feeding animals. It was observed in the markets of Siem Reap that sellers dried duck feathers and sold them to people for making brushes and cleaning tools.



Table 30 Management of poultry waste

Provinces	Pack waste and take it to disposal outside markets (%)	Pack waste and bury it at home (%)	Sell (%)	Use for animal feed (%)
Banteay Meanchey	22.2	66.7	—	—
Battambang	50.0	28.6	—	50.0
Kampong Cham	21.4	50.0	7.1	7.1
Kampong Chhnang	50.0	37.5	—	—
Kampong Speu	40.0	60.0	20.0	—
Kampong Thom	30.0	40.0	—	10.0
Kampot	33.3	11.1	11.1	—
Kandal	66.7	50.0	33.3	—
Kep	14.3	28.6	14.3	—
Koh Kong	33.3	-	—	16.7
Kratie	20.0	30.0	20.0	10.0
Mondulhiri	42.8	42.8	—	14.3
Otdor Meanchey	-	60.0	20.0	60.0
Pailin	66.7	33.3	—	—
Phnom Penh	42.8	28.6	35.7	—
Prah Vihear	33.3	33.3	—	—
Prey Veng	45.4	27.3	27.3	—
Pursat	50.0	12.5	—	25.0
Rattanakiri	20.0	80.0	—	—
Siem Reap	53.8	15.4	15.4	—
Sihanouk Ville	77.8	-	—	—
Steung Treng	-	80.0	—	—
Svay Rieng	71.4	42.8	28.6	—
Takeo	36.4	54.5	—	—
Mean value	40.4 (n=84)	36.1 (n=75)	11.1 (n=23)	7.8 (n=16)

Source: Reported by the interviewed sellers.

Market regulations and sanitation control

Market regulations for bird flu control and poultry health inspection

According to the response from the market officials, only 21 out of 75 markets visited had market regulations to control the bird flu. In Kep, Kampong Speu, Pailin, Phnom Penh and Prah Vihear, more than 50 percent of the markets had regulations for AI control, while in Kampong Chhnang, Kampong Thom, Koh Kong, Mondulhiri, Otdor Meanchey, Prey Veng, Pursat, Rattanakiri, Steung Treng and Svay Rieng, none had any regulations at all (Table 31). The regulations in practice were as follows:

- Poultry disposal without proper packing must be avoided in the market.
- Poultry from infected areas must not be sold.
- Sick and dead poultry must not be sold in the markets.
- Slaughtered poultry sold to customers must have proper packaging.
- Ducks and chickens must not be kept together in the same cage.



Out of the 21 markets with AI control, 95.2 percent did not allow poultry disposal without proper packing in the markets; 61.9 percent did not allow selling poultry from infected areas; 57.1 percent did not allow selling sick and dead poultry in the markets; 52.4 percent asked sellers to properly pack slaughtered birds for customers; and 42.9 percent asked sellers not to place chickens and ducks in the same cage. It is difficult to practise some of these measures, especially measure (ii). If the sellers are not traders as well, they cannot know where the poultry is coming from unless the traders have to follow the same regulations.

There were a few other regulations in addition to those for bird flu control. Only 28 percent of the sellers said that they were asked to respect market rules and regulations; 15.4 percent of sellers said that they were asked not to place slaughtered birds on the floor; and 7.7 percent said that they should not provoke conflict and keep things in order. A few sellers also reported that inflammable materials were not allowed in the markets or that bikes were not allowed inside the market and stores.

Among the market officials, 38.7 percent reported inspections of poultry in their markets, but no inspections were carried out in Prey Veng, Pursat, Rattanakiri and Steung Treng markets. Inspections were performed by district veterinarians (31 percent), provincial veterinarians (62.1 percent) and market officials and/or their assistants (6.9 percent). CelAgrid and ILRI (2008) reported that pigs needed to be inspected by veterinarians prior to slaughtering, and slaughtered healthy pig carcasses had to be stamped. A penalty of 10 000 riels per head was charged for selling pig meat at the markets without a stamp. Consumers in Takeo and Phnom Penh gave scores of 8.9 and 9.3 out of 10 on quality, respectively, which indicated that consumers trusted the certification (CelAgrid and ILRI, 2007). However, an inspection system for poultry certification is a new concept not yet in place and human capacities might be limited to do so, particularly at the district level.

Photo 19. Packaging slaughtered chicken waste in Srer Ambel, Koh Kong



Photo 20. Drying feathers for sale in Skun, Kampong Cham



Table 31 Market regulations and poultry inspection

Provinces	Market regulation to control AI, (%)	Check of poultry health in the markets (%)	Who inspects the poultry?		
			District vet (%)	Provincial vet (%)	Market officials (%)
Banteay Meanchey	33.3	66.7	100	0.0	0.0
Battambang	40.0	40.0	0.0	100	0.0
Kampong Cham	20.0	20.0	100	0.0	0.0
Kampong Chhnang	—	33.3	0.0	100	0.0
Kampong Speu	66.7	33.3	0.0	100	0.0
Kampong Thom	—	33.3	0.0	100	0.0
Kampot	33.3	33.3	100	0.0	0.0
Kandal	20.0	20.0	0.0	100	0.0
Kep	50.0	50.0	0.0	100	0.0
Koh Kong	—	33.3	0.0	100	0.0
Kratie	33.3	66.7	50.0	50.0	0.0
Mondulkiri	—	50.0	0.0	100	0.0
Otdor Meanchey	—	100	50.0	0.0	50.0
Pailin	50.0	100	50.0	50.0	0.0
Phnom Penh	80.0	40.0	0.0	100	0.0
Prah Vihear	100.0	50.0	0.0	100	0.0
Prey Veng	—	0.0	—	—	—
Pursat	—	0.0	—	—	—
Rattanakiri	—	0.0	—	—	—
Siem Reap	40.0	80.0	25.0	50.0	25.0
Sihanouk Ville	33.3	33.3	100	0.0	0.0
Steung Treng	—	0.0	—	—	—
Svay Rieng	—	33.3	0.0	100	0.0
Takeo	33.3	33.3	0.0	100	0.0
Mean value	28.0 (n=20)	38.7 (29)	31.0 (n=9)	62.1 (n=18)	6.90 (n=2)

Source: Reported by market officials and guards.

Sanitation measures and responsibility

Most of visited markets had strict hygiene control; 80 percent of officials reported that cleaning had to be done before market closing, except for some markets in rural provinces such as Kratie, Pursat and Takeo, where not much attention was given to sanitation. Market officials (80 percent) also said that poultry waste must be taken to a disposal outside the market at the end of the market day and about 23 percent of them reported that unsold live birds must be taken home (Table 32). Only 27.2 percent of the sellers used protective masks and none used them in Kep, Koh Kong and Prah Vihear Provinces. About 13 percent of the sellers said that they were not allowed to slaughter birds in the markets and 4.9 percent in Banteay Meanchey, Kampong Cham, Kampong Chhnang, Kampong Thom, Kampot, Kandal, Phnom Penh and Takeo reported that they were asked to use gloves. Sanitation could help to some extent with keeping markets clean; however, if the slaughtered or live birds are infected, in particular by the H5N1 virus, disease would spread by market customers who take birds home.

Among the sellers, 44.2 percent said that the market officials/assistants were responsible for sanitation measures and 73.5 percent said that they themselves were responsible where they sell the birds. Although the sellers pay monthly sanitation fees, they should also help to implement market regulations. Therefore, if the sellers were responsible for their own selling



areas, this would allow market officials to provide overall supervision of the markets, including sanitation, market security and public orders. Few sellers (9.1 percent) said that veterinarians were also involved in sanitation, but this referred mainly to the sanitation of meat sold, not to the selling area.

Table 32 Sanitation measures applied in the markets

Provinces	Sanitation				Who is responsible for sanitation?		
	Market officials (%)		Sellers (%)		Markets (%)	Sellers (%)	Veterinarians (%)
	I	II	III	IV			
Banteay Meanchey	100	100	50.0	25.0	27.3	54.5	18.2
Battambang	100	80.0	30.0	10.0	62.5	68.8	6.3
Kampong Cham	100	80.0	31.8	4.54	45.5	63.6	45.5
Kampong Chhnang	66.7	66.7	18.2	18.2	42.9	85.7	0.0
Kampong Speu	66.7	33.3	8.33	16.7	8.3	100	0.0
Kampong Thom	100	100	30.8	7.69	28.6	57.1	42.9
Kampot	100	100	16.7	—	9.1	90.9	0.0
Kandal	80.0	80.0	38.9	27.8	50.0	64.3	0.0
Kep	100	100	—	—	25.0	87.5	0.0
Koh Kong	66.7	100	—	—	54.5	45.5	9.1
Kratie	33.3	33.3	33.3	—	54.5	81.8	9.1
Mondulkiri	100	100	22.2	—	44.4	77.8	0.0
Otdor Meanchey	100	100	12.5	12.5	20.0	80.0	0.0
Pailin	100	100	25.0	25.0	33.3	0.0	66.7
Phnom Penh	80.0	100	50.0	30.0	85.0	55.0	0.0
Prah Vihear	100	100	—	—	66.7	100	0.0
Prey Veng	100	33.3	50.0	21.4	30.0	100	10.0
Pursat	33.3	66.7	16.7	25.0	77.8	66.7	0.0
Rattanakiri	50.0	50.0	22.2	33.3	37.5	100	0.0
Siem Reap	100	100	20.0	15.0	57.1	85.7	14.3
Sihanouk Ville	66.7	66.7	8.33	—	50.0	58.3	0.0
Steung Treng	50.0	50.0	37.5	—	33.3	66.7	0.0
Svay Rieng	66.7	33.3	41.7	25.0	30.0	90.0	20.0
Takeo	33.3	33.3	35.7	—	28.6	78.6	14.3
Mean value	80.0 (n=60)	76.0 (n=57)	27.2 (n=83)	13.1 (n=40)	44.2 (n=107)	73.5 (n=178)	9.10 (n=22)

Note: I= Clean and wash place after the market day; II= Take poultry waste to disposal; III= Use mask for protection; IV= Do not allow slaughtering of birds in the markets. Source: Reported by market officials and sell



Table 33 Family members and gender roles in the poultry selling business

Provinces	Persons involved full-time		Women's responsibilities (%)					Men's responsibilities (%)				
	No. of women	No. of men	I	II	III	IV	V	I	II	III	IV	V
Banteay Meanchey	1.58	0.92	25.0	12.5	—	100	50.0	87.5	—	87.5	37.5	50.0
Battambang	1.50	1.05	14.3	—	21.4	100	28.6	85.7	21.4	78.3	35.7	42.8
Kampong Cham	1.32	0.77	5.9	—	5.88	100	58.8	100	35.3	52.9	11.8	47.1
Kampong Chhnang	1.00	0.73	14.3	—	—	100	42.8	100	14.3	71.4	28.6	71.4
Kampong Speu	1.33	0.50	14.3	28.3	14.3	85.7	85.7	100	28.6	28.6	—	14.3
Kampong Thom	1.54	0.62	22.2	—	22.2	100	88.9	77.8	33.3	66.7	—	66.7
Kampot	1.08	0.50	—	16.7	—	66.7	16.7	66.7	33.3	—	16.7	—
Kandal	1.33	0.50	7.1	—	7.1	92.8	7.1	92.8	—	71.4	21.4	64.3
Kep	1.25	0.38	—	—	—	100	66.7	100	66.7	33.3	33.3	—
Koh Kong	1.36	0.27	—	—	—	100	66.7	100	66.7	—	33.3	—
Kratie	1.08	0.33	—	12.5	—	100	12.5	87.5	25.0	50.0	25.0	25.0
Mondulkiri	1.22	0.67	—	—	—	100	100	100	100	100	—	100
Otdor Meanchey	1.25	0.62	—	16.7	16.7	100	66.7	100	33.3	66.7	16.7	66.7
Pailin	1.00	0.75	—	—	—	100	20.0	100	20.0	—	—	20.0
Phnom Penh	1.55	0.90	6.2	0.00	6.2	100	43.7	93.7	12.5	68.7	6.25	37.5
Prah Vihear	1.25	0.75	—	16.7	—	100	83.3	83.3	16.7	66.7	33.3	66.7
Prey Veng	1.07	1.21	44.4	22.2	22.2	88.9	33.3	77.8	33.3	66.7	—	66.7
Pursat	1.50	0.67	11.1	—	—	100	22.2	100	11.1	33.3	55.6	22.2
Rattanakiri	1.11	0.11	—	—	—	100	33.3	100	66.7	66.7	—	66.7
Siem Reap	1.45	0.65	—	18.7	18.7	100	56.2	93.7	31.2	56.2	12.5	37.5
Sihanouk Ville	1.58	0.58	—	—	16.7	100	83.3	83.3	50.0	66.7	33.3	50.0
Stoeng Treng	0.87	0.62	—	25.0	50.0	100	50.0	75.0	100	100	—	—
Svay Rieng	1.17	0.25	50.0	12.5	—	100	50.0	87.5	50.0	50.0	—	25.0
Takeo	1.14	0.71	10.0	10.0	30.0	100	40.0	90.0	80.0	60.0	20.0	30.0
Mean value	1.30±0.04	0.65±0.05	10.8	7.69	10.8	97.4	46.1	90.8	30.8	57.9	17.9	41.5
N			21	15	21	190	90	177	60	113	35	81

Note: I=transporting; II=supplying; III=slaughtering; IV=selling; V=cleaning. Source: Reported by the interviewed sellers.



Labour share, income and gender

Labour in poultry marketing

On average, 1.3 women and 0.6 men were engaged full-time from each family in the poultry-selling business, except in the Prey Veng and Battambang Provinces, where women and man were equally involved (Table 33). In addition, other family members (0.5 men and 0.3 women) were also involved part-time in the poultry business of the interviewed sellers. The important jobs for women in the poultry business were selling birds at the market (97.4 percent) and cleaning the slaughtering place and their market stands (46.1 percent). Men (90.8 percent) were involved in transporting birds from home to the market, or if the sellers were also traders, then the men transported birds from the collecting points and/or villages. With respect to slaughtering and cleaning the birds, 57.9 percent of men were involved or responsible, and 41.5 percent men also cleaned the slaughtering place and market stand. However, only 17.9 percent of the men were involved in selling birds at the markets.

Contribution of the poultry business to total income

It was reported that 57.4 percent of the sellers had other income, which reached between 70–100 percent for sellers in Kampong Speu, Kampot, Kep, Koh Kong, Mondulhiri, Prah Vihear, Rattanakiri and Svay Rieng Provinces, depending on their other activities for income (Table 34). The average contribution to income from the poultry business was 67.6 percent, and for sellers in 19 cities and provinces, it was more than 50 percent. The markets in Kep and Kampot serve a small population only, in which seafood is the most important food, while the market in Rattanakiri is even smaller and serves just a few dozen families and restaurants.

Table 34 Contribution of poultry business to income of market sellers

Provinces	Have other income (%)	Proportion income from poultry selling (%)
Banteay Meanchey	41.7	77.7
Battambang	55.0	81.3
Kampong Cham	59.1	73.2
Kampong Chhnang	63.6	72.7
Kampong Speu	75.0	55.0
Kampong Thom	38.5	86.5
Kampot	75.0	41.0
Kandal	44.4	76.9
Kep	87.5	33.1
Koh Kong	90.9	27.5
Kratie	58.3	64.2
Mondulhiri	100	27.8
Otdor Meanchey	50.0	68.1
Pailin	62.5	57.9
Phnom Penh	55.0	80.5
Prah Vihear	75.0	58.8
Prey Veng	35.7	86.8
Pursat	41.7	80.7
Rattanakiri	77.8	47.2
Siem Reap	40.0	86.0
Sihanouk Ville	33.3	61.3
Steung Treng	62.5	66.3
Svay Rieng	75.0	52.1
Takeo	42.8	71.8
Mean value	57.4 (n=175)	67.6±1.98

Source: Reported by sellers



Situation of the poultry business during the last five years

About 66.7 percent of the market officials and 57.4 percent of the sellers reported that the volume of poultry sold in their markets increased, while 24 percent market officials and 28.5 percent sellers reported that it was stable, and 9.3 percent of the market officials and 14.1 percent of the sellers said that it decreased in the last five years (Table 35). All market officials in Banteay Meanchey, Kampong Chhnang, Kep, Mondulhiri, Pailin, Phnom Penh and Rattanakiri said that the poultry business increased.

Increases in sales of poultry and its products were due to: (i) the increased number of consumers (according to 59.4 percent of the sellers and 74 percent of the market officials); and (ii) improved family economic, which allowed people to eat more meat (according to 25.1 percent of the sellers). The reasons for the stability of the poultry business were (i) the increase in new sellers in the markets (according to 28.7 percent of the sellers) and (ii) the increased price of poultry (according to 13.8 percent of the sellers). Decreases in the poultry business were due to: (i) low income from the poultry business; (ii) outbreaks of the bird flu; (iii) consumer preference for other meat such as beef, pigs and fish.

Table 35 Development of poultry sales during the last five years (2002-2007)

Provinces	Market officials (%)			Sellers (%)		
	Growing	Stable	Shrink	Growing	Stable	Shrink
Banteay Meanchey	100	—	—	58.3	41.7	—
Battambang	80.0	20.0	—	75.0	15.0	10.0
Kampong Cham	40.0	60.0	—	68.2	27.3	4.54
Kampong Chhnang	100	—	—	72.7	18.2	9.09
Kampong Speu	66.7	33.3	—	25.0	50.0	25.0
Kampong Thom	66.7	33.3	—	69.2	23.1	7.69
Kampot	66.7	33.3	—	66.7	25.0	8.33
Kandal	40.0	40.0	20.0	50.0	27.8	22.2
Kep	100	—	—	50.0	12.5	37.5
Koh Kong	66.7	—	33.3	18.2	81.8	—
Kratie	33.3	33.3	33.3	41.7	33.3	25.0
Mondulhiri	100	—	—	55.6	22.2	22.2
Otdor Meanchey	100	—	—	75.0	25.0	—
Pailin	100	—	—	25.0	50.0	25.0
Phnom Penh	100	—	—	75.0	—	25.0
Prah Vihear	50.0	50.0	—	62.5	25.0	12.5
Prey Veng	66.7	33.3	—	35.7	42.8	21.4
Pursat	66.7	—	33.3	75.0	16.7	8.33
Rattanakiri	100	—	—	22.2	66.7	11.1
Siem Reap	60.0	40.0	—	75.0	25.0	—
Sihanouk Ville	66.7	33.3	—	25.0	58.3	16.7
Steung Treng	50.0	50.0	—	100	—	—
Svay Rieng	—	66.7	33.3	58.3	16.7	25.0
Takeo	33.3	—	66.7	57.1	14.3	28.6
Mean value	66.7 (n=50)	24.0 (n=18)	9.33 (n=7)	57.4 (n=175)	28.5 (n=87)	14.1 (n=43)

Source: Reported by market officials and sellers.



Conclusions and Recommendations

- Getting permission from market officials to interview sellers was problematic in some markets in Phnom Penh, particularly since the interview dates were close to the national general elections. Markets officials asked for permission letters from the district or municipality government before allowing the teams to work with the sellers. However, since there are several larger markets, the CelAgrid team was able to access some of the markets by presenting the scope of work from FAO and a letter from CelAgrid.
- Most of the markets opened very early and some sellers, especially unlicensed ones who only occasionally brought their birds for sale while buying food items, returned home quickly. The strategy was, therefore, to approach these people first in the early morning while seeking others for later interviews.
- The visited markets were mainly located on the important roads that could be accessed not only by the local population, but also by travellers who stop by for food. Some of the markets served as distributing points to other markets within the province and/or to other provinces, and for exportation to other countries (for those markets near borders). Considering biosecurity concerns, the selling place, particularly of live birds, should be allocated to an area exclusively for customers seeking live birds. The sale of live poultry particularly by the unlicensed sellers on roadsides with many people passing by, poses significant risk of AI. This can lead to quickly spreading the disease and therefore placing public health at risk.
- None of the licensed sellers were poultry producers; however, 50 percent of the unlicensed sellers were smallholder poultry producers. Most of the unlicensed sellers sold mainly live birds at the markets and leftovers at the end of the market day were taken home, which could cause significant problems with disease transmission, particularly of AI. Birds were exposed to stress such as rain or sun, lack of feed and water, and were placed near other birds from other sellers brought from other villages or areas. It is important, therefore, to take necessary measures and pay attention to this group of sellers to ensure that birds are not from infected areas or villages.
- Most of the poultry supplies in the markets for urban and rural areas came either directly from smallholder producers or from traders who generally brought birds from small-scale smallholders. Significant efforts should thus be made in educating and raising awareness of these groups. It is not helpful that low capacity and incapable veterinarian inspectors perform poultry health inspections while infected or sick birds, either with AI or other poultry diseases, are already in the market chain. Disease surveillance and a reporting system organized through village animal health workers (VAHWs) would be an advantage in fighting AI and other animal diseases.



- Although poultry meat was sold separately from other types of meat such as beef, pork, fish and seafood, the stalls were near each other without physical separations. Among the 75 markets visited, only 20 have market regulations on the control of AI, and 30 are inspected by a poor veterinary system. Veterinarian inspectors might have experience in inspecting pigs and pig meat, but none in poultry: they require training to carry out the task effectively. It is essential, therefore, to provide them with training and necessary tools, particularly for those working at the district levels.
- The poultry supply came mainly from local breeds from within the district, province or from other provinces. AI surveillance and information-sharing on the outbreak are thus important for veterinary services across the country. The information technology is growing very fast in Cambodia and most of the veterinarians have mobile phones. Using mobile phone text messages to regularly update veterinarian inspectors on the situation would not only help them respond to AI, but also other infectious diseases.
- Market regulations state that sellers should clean their stalls before the end of the market day; however, rubbish at the disposal places outside the markets with or without rubbish bins are not taken away daily or regularly. This causes significant pollution and bad odours, particularly from meat waste, including poultry, which attract dogs, who then take scraps to other places. Due to the large amount of waste brought daily to the disposal sites, waste from poultry in particular should be collected in one place and taken to a designated burial site.
- Sellers generally do not use masks to protect themselves while slaughtering and while selling slaughtered or live birds in the markets. This could pose a great risk to their health if birds are infected with AI. It is recommended that cascade training be organized for market officials and their assistants, who would in turn organize meetings or training with sellers. A convenient time would be after 12:00, when less customers visit the markets; special meetings or training sessions should also be organized for unlicensed sellers as they normally return home after 12:00.
- Restrictions on the movement of live poultry, both within and between countries, are another important control measure. This is a key issue to prevent the mixing of species in these wet markets to control the spread of disease; however, the practises in the markets have a long tradition and are difficult to change.
- Information on the markets and their locations is not well documented. The decision to select the main markets based on population density and their location on the main roads (national roads) might not have completely covered the main poultry markets in Cambodia. However, markets located on the roadside generally provide their services to cover larger populations in the rural areas and also travellers.



References

CELAGRID AND INT. Livestock Research Institute (ILRI). 2007. Consumer demand and market outlets for pig meat and meat products in rural and urban areas in Cambodia. (unpublished data)

CELAGRID AND INT. Livestock Research Institute (ILRI). 2008. Assessment and research on production systems, management, feeding and economic return in Sras Takoun, Louk and Krom Village, Sanlong Communes, Treang District, Takeo Province, Cambodia. (unpublished data).

FAO and the Ministry of Agriculture, Forestry and Fisheries (MAFF), Cambodia. 2006. Building capacity at the grass-roots level to control avian influenza. Inception report for Workshop GCP/CMB/027/GER, Himawari Hotel, Phnom Penh, Cambodia, 28–29 September 2006.



Annexes

Annex 1

Identification of main poultry markets in Cambodia
 Food and Agriculture Organization of the United Nations (FAO)
 Questionnaire for key informant interview
 Market seller

Data collector(s): _____

Date of interview: _____

Name of market: _____

District: _____

Province: _____

Market location: _____

GPS coordinates: _____

Key informant name: _____

Key informant function: _____ Age: _____

Sex: Male Female

Contact details of key informant: _____

PART 1: GENERAL INFORMATION ON THE POULTRY SELLER						
1	How many years have you run this business?	_____ years				
2	How is your business operation in terms of market regulations?	<input type="checkbox"/> Licensed <input type="checkbox"/> Unlicensed				
3	Who is the authority in charge of the market?	<input type="checkbox"/> Public sector <input type="checkbox"/> Private sector				
4	How would you describe your business operation?	<input type="checkbox"/> Regular (throughout the year) <input type="checkbox"/> Seasonal (part of the year) <input type="checkbox"/> Other: _____				
5	On average, how many days per week do you sell at the market?	_____ days				
6	Do you also sell at other markets?	<input type="checkbox"/> Yes <input type="checkbox"/> No				
7	Do you have to pay any fees to sell in the market? If "Yes", how much?	<input type="checkbox"/> Yes <input type="checkbox"/> No _____ riels				
PART 2: POULTRY BUYERS AND DESTINATION OF POULTRY SOLD AT THE MARKET						
8	From whom do you buy poultry in order to sell it?	<input type="checkbox"/> Own produce <input type="checkbox"/> Buy from producer <input type="checkbox"/> Buy from trader				
9	Where do these birds/eggs come from and what is the percentage of the different sources out of the total?	% of total	No. within district	No. within Province	No. within country	No. from other countries
		Chicken				
		Duck				
		Other: _____				
<u>Comments:</u>						
10	Which customer segments do you	<input type="checkbox"/> Household consumers <input type="checkbox"/> Dealers <input type="checkbox"/> Restaurants/food seller s				



	mainly serve?	<input type="checkbox"/> Other: _____			
11	On a daily basis, how many customers buy your poultry or poultry products?	Household consumers	Dealers	Restaurants	Other: _____
		No. of buyers			
		% of total volume			
		Comments:			
12	What is the average number of poultry species sold each day?	Poultry types	No. of live birds	No. of slaughtered birds	No. of eggs
		Chicken			
		Duck			
		Other: _____			
		Comments:			
13	What is the percentage of total breeds sold daily?	% of total breeds	No. of local birds	No. of improved	No. of others: _____
		Chicken			
		Duck			
		Other: _____			
		Comments:			
14	What is the percentage of adult birds and chicks sold out of the total?	No. of adult birds		No. of chicks	
		Comments:			
15	What is the average purchase price from traders or producers?	<input type="checkbox"/> riel/kg or <input type="checkbox"/> riel/unit	Live birds	Slaughtered birds	Eggs
		Chicken			
		Duck			
		Other: _____			
		Comments:			
16	What is the average price of poultry sold to costumers in the market?	<input type="checkbox"/> riel/kg or <input type="checkbox"/> riel/unit	Live birds	Slaughtered birds	Eggs
		Chicken			
		Duck			
		Other: _____			
		Comments:			
17	Do you have an arrangement/agreement with a poultry supplier?	<input type="checkbox"/> Yes <input type="checkbox"/> No			
18	If "yes" what kind of arrangement/agreement is it?	<input type="checkbox"/> Verbal <input type="checkbox"/> Written			
19	Do you depend on certain fixed suppliers or are you flexible according to demand?	<input type="checkbox"/> Fixed trader(s) <input type="checkbox"/> Different suppliers			
20	Do the volumes of sale change over time?	<input type="checkbox"/> Yes <input type="checkbox"/> No			



	If "Yes", please explain:	How:		
		Why:		
PART 3: HANDLING PRACTICES				
21	Do you slaughter birds yourself or do you employ a slaughtering service?	<input type="checkbox"/> Slaughtering by the seller <input type="checkbox"/> By a slaughtering service <input type="checkbox"/> Other: _____		
22	Do you bring live birds to the market?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
23	If "Yes", what is the average proportion of live bird and slaughtered birds that you bring to market per day?	No. of live birds	No. of slaughtered birds	
		Comments:		
24	Do you slaughter birds in the market?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
25	Does the market have a slaughtering place?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
26	Do you keep various poultry species separated in the market?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
27	What do you do with birds that are not sold the same day?	<input type="checkbox"/> Take them home <input type="checkbox"/> Keep them in the market <input type="checkbox"/> Slaughter and freeze them <input type="checkbox"/> Other:.....		
28	How and where do you dispose of offal?	<input type="checkbox"/> Pack it and take to the waste disposal at the market <input type="checkbox"/> Pack it and bury it at home <input type="checkbox"/> Sell it <input type="checkbox"/> Other:.....		
29	What sanitary and health regulations are in place? Who is responsible for the control?	Sanitation and health regulations		
		<input type="checkbox"/> Prohibit slaughtering birds at the market <input type="checkbox"/> Clean and wash the place after each market day <input type="checkbox"/> Use a mask for protection <input type="checkbox"/> Other:.....		
29		Responsibility		
		<input type="checkbox"/> Sellers <input type="checkbox"/> Market <input type="checkbox"/> Other:		
30	What other market regulations exist?	<input type="checkbox"/> Yes <input type="checkbox"/> No If "Yes" what are they? 1:..... 2:..... 3:.....		
PART 4: LABOUR SHARE, INCOME AND GENDER CONCERNS				
32	How many people from your household are involved in the poultry trade business?		No. of persons involved full-time	No. of persons involved part-time
		Women		
		Men		
33	Are there gender-specific jobs in the poultry market?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
33	If "Yes", what are they (check inside box for chosen answers)?	Woman: <input type="checkbox"/> Transporting <input type="checkbox"/> Supplying <input type="checkbox"/> Slaughtering <input type="checkbox"/> Selling <input type="checkbox"/> Cleaning of birds <input type="checkbox"/> Other:		
		Man: <input type="checkbox"/> Transporting <input type="checkbox"/> Supplying <input type="checkbox"/> Slaughtering <input type="checkbox"/> Selling <input type="checkbox"/> Cleaning of birds <input type="checkbox"/> Other:		
34	Do you have other income-generating			



	activities in addition to poultry selling?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
35	What is the average percentage (%) of total income from poultry sales contributing to the total household income?	_____ %		
PART 5: OUTLOOK				
36	Has the sale of live birds increased, stabilized or declined over the past five years? What is the reason for this?	<input type="checkbox"/> Increased	<input type="checkbox"/> Stabilized	<input type="checkbox"/> Declined
		<u>Reason:</u>	<u>Reason:</u>	<u>Reason:</u>



Annex 2

Identification of main poultry markets in Cambodia

Food and Agriculture Organization of the United Nations (FAO) Questionnaire for key informant interview - Market Manager

Data collector(s): _____

Date of interview: _____

Name of market: _____

District: _____

Province: _____

Market location: _____

GPS coordinates: _____

Key informant name: _____

Key informant function: _____ Age _____ (Year)

Sex: Male Female

Contact details of key informant: _____



PART 1: GENERAL MARKET CHARACTERISTICS																												
1	What is the coverage area of your market?	<input type="checkbox"/> Commune level <input type="checkbox"/> District level <input type="checkbox"/> Provincial level <input type="checkbox"/> National level																										
2	Who is the authority in charge of the market?	<input type="checkbox"/> Public sector <input type="checkbox"/> Private sector																										
3	On what day(s) is the market open?	<input type="checkbox"/> Mon. <input type="checkbox"/> Tue. <input type="checkbox"/> Wed. <input type="checkbox"/> Thurs. <input type="checkbox"/> Fri. <input type="checkbox"/> Sat. <input type="checkbox"/> Sun.																										
4	At what times does the market operate?	<input type="checkbox"/> 00.01 a.m. – 06.00 a.m. <input type="checkbox"/> 06.00 a.m.–12.00 a.m. <input type="checkbox"/> 12.00 p.m. – 18.00 p.m. <input type="checkbox"/> 18.00 p.m.– 24.00 p.m.																										
5	What type of animals and animal products are sold at the market?	<p>a. Animals beside birds:</p> <input type="checkbox"/> pigs <input type="checkbox"/> duck eggs <input type="checkbox"/> cattle <input type="checkbox"/> chicken eggs <input type="checkbox"/> fish <input type="checkbox"/> goose eggs <input type="checkbox"/> seafood <input type="checkbox"/> other eggs: _____ <input type="checkbox"/> goats/rabbits <input type="checkbox"/> poultry offal (kidneys, liver, etc.) <input type="checkbox"/> other: _____ <input type="checkbox"/> other: _____																										
		<p>c. Poultry</p> <table border="0"> <thead> <tr> <th></th> <th>Live birds</th> <th>Slaughtered birds</th> </tr> </thead> <tbody> <tr> <td>chickens</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>duck</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>geese</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>quail</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>wild birds*</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Other: _____</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </tbody> </table> <p><i>*Wild birds recognized at the market often are: sparrow, woodcock</i></p>							Live birds	Slaughtered birds	chickens	<input type="checkbox"/>	<input type="checkbox"/>	duck	<input type="checkbox"/>	<input type="checkbox"/>	geese	<input type="checkbox"/>	<input type="checkbox"/>	quail	<input type="checkbox"/>	<input type="checkbox"/>	wild birds*	<input type="checkbox"/>	<input type="checkbox"/>	Other: _____	<input type="checkbox"/>	<input type="checkbox"/>
	Live birds	Slaughtered birds																										
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wild birds*	<input type="checkbox"/>	<input type="checkbox"/>																										
Other: _____	<input type="checkbox"/>	<input type="checkbox"/>																										
		Comments:																										
PART 2: CHARACTERISTICS OF POULTRY SELLERS																												
6	How many licensed/unlicensed sellers of live or slaughtered poultry sell at the market?	No. of sellers		Live poultry		Slaughtered poultry																						
		Licensed																										
		Unlicensed																										
		Comments:																										
7	Where are the sellers from?	<p><u>Licensed sellers</u></p> <input type="checkbox"/> Near the market <input type="checkbox"/> Within the commune <input type="checkbox"/> Within the district <input type="checkbox"/> Another place:																										
		<p><u>Unlicensed sellers</u></p> <input type="checkbox"/> Near the market <input type="checkbox"/> Within the commune <input type="checkbox"/> Within the district <input type="checkbox"/> Another place:																										
8	How regularly do the unlicensed sellers come to sell at the market?	<input type="checkbox"/> Daily <input type="checkbox"/> Once a week <input type="checkbox"/> Once a month <input type="checkbox"/> Twice a year <input type="checkbox"/> At the busiest time <input type="checkbox"/> Other:																										
9	What poultry species are commonly sold by licensed and unlicensed sellers?	Seller	No. of chickens	No. of ducks	No. of geese	No. of quail	No. of wild birds	No. of other species																				
		Licensed		<input type="checkbox"/>																								



		Unlicensed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Comments:						
10	What is the number of traders and producers (licensed and non-licensed)?	No.	Traders		Producers			
		Licensed						
		Unlicensed						
		Comments:						
11	What is the average number of chicken, ducks and other poultry species sold at the market each day?	No.	Chicken	Ducks	Quails	Other:_____		
		Live						
		Slaughtered						
		Comments:						
12	Where do these birds come from and what is the share of the source out of the total?	Share of total (%)	No. within district	No. within province	No. within country	No. from other countries		
		Chicken						
		Duck						
		Other:						
Comments:								
13	What type of chicken and ducks are sold at this market and what is the share of the total?	Share of total (%)	No. of local	No. of improved	No. of other species _____			
		Chicken						
		Duck						
		Other:						
Comments:								
14	How many market sellers sell poultry eggs at the market?	A. Sellers who sell only eggs: _____ market stalls. Average eggs/seller _____						
		B. Sellers selling egg together with other products: _____ market stalls Average no. of eggs/seller _____						
Comments:								
15	What is the average price of poultry sold to customers in the market?	<input type="checkbox"/> riels/kg or <input type="checkbox"/> riels/head	Live birds	Slaughtered birds	Eggs			
		Chicken						
		Duck						
		Other:						
Comments:								
16	Do the volumes of sale change over time (e.g. within a year)?	<input type="checkbox"/> Yes <input type="checkbox"/> No						
17	If "yes", please explain:	How:						
		Why:						
PART 3: HANDLING PRACTICES								
18	Of all the poultry sellers, how many sellers	No. of sellers who bring live birds to market: _____						
		No. of sellers who bring slaughtered birds to the market: _____						



	bring live birds to the market and how many slaughter birds at home and bring them to the market?	Comments:		
19	Are birds slaughtered in the market?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
20	Is there a separate slaughtering place in the market?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
21	Are there market regulations controlling AI?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
22	What are these regulations and practices?	<input type="checkbox"/> Avoid poultry disposal without proper packing in the market. <input type="checkbox"/> Avoid keeping ducks and chickens together in the same cage. <input type="checkbox"/> Prohibit selling of live birds at the market. <input type="checkbox"/> Prohibit selling of poultry from an infected area. <input type="checkbox"/> Prohibit selling sick and dead poultry in the market. <input type="checkbox"/> Properly package the slaughtered poultry sold to customers <input type="checkbox"/> Other: _____		
23	Is there any health control of poultry in the market?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
24	If “yes”, who is responsible?	<input type="checkbox"/> District vet <input type="checkbox"/> Provincial veterinarian <input type="checkbox"/> Market manager/assistant <input type="checkbox"/> Other: _____		
25	What sanitary measures are in place?	<input type="checkbox"/> Cleaning the place and packing poultry waste before market closing. <input type="checkbox"/> Taking the poultry waste to the disposal site. <input type="checkbox"/> Taking the unsold live birds home. <input type="checkbox"/> Other: _____		
	Who is responsible?	<input type="checkbox"/> District veterinarian <input type="checkbox"/> Provincial veterinarian <input type="checkbox"/> Market manager/assistant <input type="checkbox"/> Other: _____		
24	Must the sellers pay fees to participate in the market?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
	If “Yes”, how much?		Licensed	Unlicensed
		Market stall (monthly)		
		Tariff (monthly)		
		Tax (year)		
		Other:.....		
PART 4: OUTLOOK				
25	Has the sale of poultry and poultry products increased, declined or stabilized over the past five years? What is the reason for this?	<input type="checkbox"/> Increased	<input type="checkbox"/> Remained stable	<input type="checkbox"/> Declined
		Reason:	Reason:	Reason:

Thank you for your time, patience and help!

