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Assessment of Bio-security Situation and Practices in Live Poultry Markets of Addis Ababa, Ethiopia

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ABSTRACT

A study on assessment of bio-security situation and practices of live poultry markets in Addis Ababa was conducted from November 2009 to January 2010 using structured, pre-tested questionnaire as well as observation. A total of 104 respondents from 8 purposively selected live poultry markets were interviewed on different factors that contribute to bio-security situation and practices. Moreover, data about the status of bio-security was collected through observation. The result showed that 52.8% of the traders used public transport type together with people while 47.1% used lorry. The materials used for packing the poultry were sack 49 (47.1%), bamboo cage 48 (46.2%) and wooden cage 7 (6.7%). It was discovered that these materials were poor from bio-security point of view, as they are neither easily washable nor disinfectable. Virtually all of the markets dwell with poor sanitary and hygienic practices. In connection, 71.2% of the respondents claimed that sick poultry were either sold to hotels or simply thrown everywhere rendering high potential for dissemination of diseases both to poultry and human beings. Finally, the survey revealed that there was high risk of diseases transmission and dissemination related to bio-security of live poultry market in the study area. Hence, systematic and integrated intervention should be undertaken by the government and concerned bodies to mitigate the problem.

Key words: Addis Ababa, avian influenza, bio-security, poultry, market

INTRODUCTION

In Ethiopia, poultry rearing is one of the economically important agricultural activities. The national chicken population is estimated to be more than 38 million (CSA, 2008). Poultry are kept in traditional, small-scale intensive, breed improvement multiplication centers and in large scale commercial system. The traditional backyard poultry production system which accounts for more than 98% of the poultry in the country is reared for two purposes i.e., for egg and meat production (Ahamed, 2000). The largest proportion of eggs and poultry meat consumed in the country comes from indigenous birds produced by rural growers. Therefore, the main movement of poultry and poultry products is one of rural producer to urban consumer (i.e., from the periphery to the centre) which from bio-security point of view is very important, since it favors spread of diseases all over the country (Dessie and Ogle, 2001).

The current live poultry marketing system represents a significant and potential hazard to both buyers and sellers, yet implementation of bio-security and hygienic practices in such a system is generally difficult (FAO, 2007). The Newcastle disease experience and the attitude of communities in handling sick birds (which are often sold) shows that marketing systems play a considerable role in the dissemination of diseases over a wide geographical areas in a relatively short period of time (Gebreab, 1995). Hence, the pursue of bio-security rules and of hygiene measures are crucial element for the control of poultry infectious diseases (Babiker *et al*., 2009).

In relation to bio-security, this sector requires special attention, particularly this time when bird flu is threatening the world. There is no recorded study of the bio-security situation and roles of the poultry markets in disease dissemination in the country. Therefore, the objectives of this study were to assess the bio-security status and major prevailing risk factors as well as associated common practices of the live poultry markets in Addis Ababa.

MATERIALS AND METHODS

Study area: The study was conducted in Addis Ababa city administration, the capital of Federal Democratic Republic of Ethiopia. The city covers an area of 530.14 km^2 and subdivided into ten sub cities. Addis Ababa lies at an altitude of 2,300 m above sea level and is a grassland biome, located between 9.03° North and 38.74° East; latitude and longitude, respectively. This study was planned to be conducted in live poultry markets of Addis Ababa. Addis Ababa was chosen because it has big poultry markets that host chickens originating from radiuses of more than 300 km such as Wolayta, Dessie, Harare, Jimma, etc.

Study population: Poultry traders, buyers, transporters and sell dealers were interviewed to generate all the information required to assess the risk factors. The veterinarians in the clinics and Shola laboratory were interviewed to assess whether they provide any support to this sector. Marketing department in the Addis Ababa City Agriculture Department was also visited to gather market related data.

Study design: A cross sectional study was conducted from November 2009 to January 2010 using structured pre-tested questionnaire survey and observation to collect data on bio-security situation and practices of live poultry market in Addis Ababa.

Sample size: There are about thirteen poultry markets in Addis Ababa with average of 30 traders per market. A total of 104 respondents were interviewed from 8 purposively selected poultry markets. In addition, data were collected from 50 consumers, 10 animal health workers, 20 sell dealers and 20 transport people. The questionnaire was administered in two rounds during festivals and during regular days.

Study methodology

Observational study: This type of study was conducted by visiting the poultry markets and collecting information pertaining to bio-security situation.

Questionnaire survey: Structured questionnaires with regard to all possible risk factors and common practices contributing to disease dissemination and transmission were prepared and used to collect data. The questionnaires were pre-tested before the actual work began.

Data analysis: Data collected from the study area were loaded in Microsoft excel; descriptive statistics were commuted and were analyzed using statistical package SPSS version 16 for widows.

RESULTS

The study conducted in 8 live poultry markets of Addis Ababa to assess the bio-security situation and practices, showed that 52.9% of the trader used public transport type (bus) together with people and 47.1% of the traders used the lorry. Sack was the most widely used packing material to transport poultry followed by bamboo-cage; wooden-cage was the least used one (Fig. 1). Virtually all of the markets dwell with poor sanitary and hygienic practices. Lorries were not cleaned after unloading. Even if 103 (99.9%) of the respondents reported that they practice cleaning the feces and litter, layers are usually formed in the holding cages. Most of the traders and those having contact to poultry one way or another do not have the habit of washing their hands after handling both healthy and sick poultry; moreover, there was no any facility to do so in any of the markets (Table 1). According to 74 (71.2%) of the respondents, sick poultry were either sold to hotels or simply thrown everywhere rendering high potential for dissemination of diseases both to poultry and human beings (Table 2).

Whenever they do it, almost all of respondents used mere water for cleaning practice, against only one respondent who claimed to use soap; moreover, none of the respondents used disinfection as a sanitary measure (Table 1). Most of the traders used to dispose manure twice a week except few who do so only once per batch. Greater proportion of live poultry traders have been mixing old and new batches (Table 1). Only few respondents had awareness about hazardous diseases associated with poultry (Table 2). More than half of the respondents have their own freshly edible food markets having contact with a nearby poultry market within short, medium and very close distances (Table 3). Most of the respondents reported to purchase live poultry for consumption

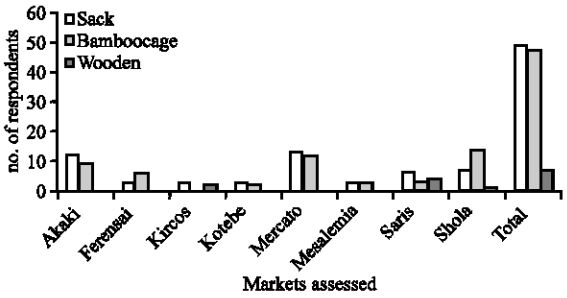

Fig. 1: Types of transport materials that live poultry traders use

Table 1: Markets assessed and sources of poultry

Market	Sources
Akaki	Meki, Sire (Arsi), Harare and Diredawa
Ferensai	Selale, Arsi, Jimma and Wolayta
Kircos	Merkato
Kotebe	Arsi, Harare, Modjo, Merkato, Wollo, Gojam and Dessie
Marcato	Bale, Alaba, Harare, Wollo Jimma, Wolayta, Arsi, Arbaminch and Gojjam
Mesalemia	Arbaminch and Wollo Wolayeta
Saris	Arsi Harar, Modjo, Merkato and Meki
Shola	Wolayeta, Wollo, merkato, Gojam, Jimma, Harare, Arsi and Selale

Table 2: Bio-security practices associated with diseases control and prevention aspect

	No. of respondents				
Mixing practices (Mixing of old and new batch)	Yes		No		Total (%)
	77 (74.0)		27 (25.9)		104 (100)
Transport type	Public		Lorry		Total (%)
	55 (52.9)		49 (47.1)		104 (100)
Frequency of cleaning practices	Daily	Twice a week	Once a week		Total (%)
	47 (45.2)	13 (12.5)	44 (42.3)		104 (100)
Type of chemicals used for cleaning	Only water		Soap		Total (%)
	103 (99.0)		1 (0.96)		104 (100)
Frequency of manure disposal	Once/week	Once/month	Once/batch		Total (%)
	92 (88.5)	0	12 (11.5)		104 (100)
Disease control and prevention methods	Drug use	Cleaning	Disinfection	Traditional medication	Total (%)
practiced by the traders	17 (16.4)	70 (67.3)	0	17 (16.4)	104 (100)

Values inside brackets shows percentage

Table 3: General causes of mortality and measure taken on sick and dead ponltry

	No. of respondents				
Knowledge about hazardous ponltry diseases	Yes	No			Total (%)
	31 (29.8)	73 (70.2)			104 (100)
Measure taken on sick	Isolation	Sale	Slaughter		Total (%)
	18 (17.3)	74 (71.2)	12 (11.5)		104 (100)
Major cause of mortality in the market	Infectious diseases	Mechanical trauma			Total (%)
	96 (92.3)	8 (7.9)			104 (100)
Measure taken on dead	Throwing	Burial	Burn	Sale for food	Total (%)
	74 (71.2)	5 (48)	3 (2.9)	22 (21.2)	104 (100)

Values inside brackets shows percentage

whereas some of them for rearing purposes (Table 3). Virtually all of the respondents reported that the major causes of mortality in the live poultry markets were infectious diseases (Table 2).

There was no any veterinary inspection in all of the poultry markets. All observed and interviewed markets have no support from veterinary clinics and also none of them used to report disease occurrences to the concerned bodies so far.

DISCUSSION

Unlike most of the developed world, there is disorganized and informal information on the role of live poultry market in Ethiopia which play role in the dissemination of diseases of poultry that have both economic and public health importance. To this effect, assessment on bio-security and related practice in Addis Ababa poultry markets has been conducted from November 2009 to January 2010 to identify major risk factors and practices affecting bio-security.

Our work disclosed that, there was high rate of mixing of poultry originated from different parts of the country in Addis Ababa poultry markets. The major sources of poultry for all surveyed markets is as far as Jimma, Wolayta, Wollo, Gojam, Harare, Arsi and Dessie, most of them located at a distance of grater than 300 km (Table 4). Mixing of chicken from different origin with their own health problems creates fertile ground for exchanging and dispatching the pathogens which is in agreement with the studies done by Grandin (2000) and Mullaney (2003).

Table 4: Purpose of purchasing of live poultry and distance of freshly edible food markets near by the poultry market

	No. of respondents				
Food markets nearby	Yes	No			Total (%)
	61 (58.7)	43 (41.4)			104 (100)
Purpose of purchasing	For food consumption	For production			Total (%)
	71 (68.3)	33 (31.7)			104 (100)
Distance of live poultry markets from other	Short (<10 m)	Medium (10-15 m)	Very short (<5 m)	No market	Total (%)
food markets	33 (31.7)	19 (18.3)	9 (8.7)	43 (41.4)	104 (100)

Values inside brackets shows percentage

According to our observation, people and poultry share the same transportation as witnessed by 52.9% of the respondents. The poultry traders and those who buy them use vehicles such as buses, taxis, minibuses or lories for transportation. This condition favors the transmission of diseases of poultry as well as those diseases having huge public health significance. In support of our finding, Jordan and Pattison (1996) and Wossene (2006) reported that there is high risk in sharing transportation with poultry; hence, poultry traders as well as those professionals having direct contact could be at risk of occupational hazards as supported by Ajetombi *et al*. (2010).

Virtually all transport materials used to pack poultry in Addis Ababa markets (sack, bamboo and wooden cages) have great role in diseases transmission and dissemination. The use of cages to keep poultry was also reported in other African countries like Nigeria (Ajetomobi and Adepoju, 2010). These materials were poor from bio-security point of view, since they are not easily washable and disinfectable; hence they are all risky with different levels of risk. The poultry are usually pooled and tied inside the sack with less ventilation. And the cages have higher risk of disseminating pathogens throughout the routes of transport since they are porous allowing excretions, secretions and dropping to come out of them. This is in accordance with the report of Grandin (2000).

Even if 103 (99.9%) of the respondents claimed that they practice cleaning the feces and litter, our observation disclosed that layers of wastes are usually formed in the holding cages. As indicators of poor sanitary and hygienic practices, waste management is not being properly undertaken; thus dead poultry are seen thrown anywhere on and around the markets as stated by 71.12% of the respondents. This is against the terrestrial animal health standards commission report on bio-security procedures in poultry production (OIE, 2009).

Besides, our finding highlighted the likelihood of disseminating highly contagious poultry and zoonotic diseases through different ways. Some among others were selling of sick poultry as witnessed by 71.12% and slaughtering of sick by 11.54%. In agreement with our work, Wossene (2006) reported that there is a high influx of poultry into market during high poultry disease seasons.

FAO-WHO (2008) warn that keeping poultry with food markets especially freshly edible one has high risk of disseminating diseases such as HPAI (highly pathogenic avian influenza). During this survey, 61 (58.65%) of the respondents reported that there are food markets nearby their poultry markets at a distance from 2-15 m. According to WHO definition, droplets can move 1 m but the risk in this area is due to wind and contact. Similar situation has been reported even in northern USA by Mullaney (2003). There is also a report of effective government and donors' intervention in Cambodia against HPAI (Ear, 2011).

Furthermore, our work revealed the weak point of the markets in relation to disease control and prevention practices. Thus, there was a mixing up of the sick and healthy poultry and of different batches as well as those coming from various corners of the country with out following any of the quarantine regulations. When poultry get sick, there is no practice of seeking services from veterinary clinics; instead the traders used to give them tetracycline capsules and/or traditional medication (onion, garlic, pepper) by their own decision without any appropriate diagnostic procedures. In connection there is a practice of selling of poultry with out waiting for the drugs withdrawal time. Above all, still very little is done with regard to veterinary inspection and awareness creation activity from the government side. Obviously it has been indicated by other researchers that measures for the control and management of poultry diseases should be focused on behavioral changes and marketing practices (Burgos and Burgos, 2008).

Finally, this survey revealed that there is high risk of diseases transmission and dissemination associated with the status of bio-security of live poultry market in the study area. Hence, systematic and integrated intervention should be undertaken by the government and concerned bodies to mitigate the problem.

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