

CHAPTER 1

INTRODUCTION AND OBJECTIVES

Vietnam occupies the eastern part of the Indochinese peninsula, bordered by China in the north, by the South China Sea in the east and south and by Lao PDR and Cambodia in the west. Its area is 331,211.6 sq km. Vietnam has a population of almost 86 million, which consists of 54 ethnic groups. Hanoi is the capital of Vietnam with approximately 6.12 million inhabitants in an area of 3,349 sq km (GSO, 2008).

In 2008, the livestock population in Vietnam was 2,898 thousand buffaloes, 6,338 thousand cattle, 26,702 thousand pigs and 247,320 thousand poultry which supplied 71.5 thousand tons of buffalo in living weight, 227.2 thousand tons of beef, 2,771 thousand tons of pork and 417 thousand tons of slaughtered poultry. These mean meat consumption per capita per year was 0.8 kg of buffalo living weight, 2.6 kg of beef, 32.1 kg of pork, and 4.8 kg of poultry meat (GSO, 2008).

There are 491 concentrative slaughterhouses and 8,458 slaughter points (slabs) for livestock, meanwhile 96 concentrative slaughterhouses and 801 slaughter points for poultry in the whole country (DAH, 2007). However, only 58.1% of slaughtering was controlled by competent authorities in the year 2008 (Hanoimoi 2009). In addition, poor practices of quality management and hygienic control, and lack of appropriate processing equipment have adversely affected both meat quality and food safety. Very few slaughterhouses, meat processors and meat traders have cold transport or storage facilities (Ministry of Foreign Affairs of Denmark, 2008).

In fact, Vietnamese consumers typically prefer fresh food products to frozen and chilled, and they shop primarily at traditional wet markets for fresh food products. As many consumers do not own refrigerators, they tend to purchase fresh meat products on a daily basis to avoid food spoilage (Foreign Affairs and International Trade Canada, 2006).

The public health significance of food safety in Vietnam is not well known, with little quantitative data on the actual incidence of foodborne diseases. The incidence of diarrhoeal disease, including foodborne and waterborne, may be considered quite high, with passive diarrhoeal disease surveillance resulting in

984,671 cases of acute-unspecified diarrhoea reported to the National Institute of Hygiene and Epidemiology in 2000. In 2001, 245 outbreaks of foodborne diseases have been reported with 3,901 cases and 63 deaths. Approximately 38% of such outbreaks were due to microbiological agents (Vietnam Food Administration 2002).

Foodstuff poisoning in Vietnam in the period of 1999-2001 had been increasing, there were 2,500 to 7,500 people infected per year, among them 50 to 70 deaths with 13.4% cases from animal meat and meat product consumption (SEARUSYN 2002). There were 205 outbreaks of foodstuff poisoning with 7,828 patients in 2008 in the whole country. The morbidity was 9.1 per 100,000 people per year and mortality was 0.07 per 100,000 people per year (Hanoimoi 2009). In the first 5 months in 2009, there were 28 outbreaks of foodstuff poisoning with 1,900 infections reported (Vietnam Government, 2009).

At present, there exist one slaughter complex consisting of 27 pig slaughterhouses and another 9 pig slaughterhouses in Hanoi. These slaughterhouses are under the control of veterinary services and they are supplying pork to urban areas (with approximately 2,000 pigs slaughtered daily). Besides, there are several small slaughter points (slabs) existing in the Hanoi area with a capacity each of less than 40 pigs per day, most of them slaughter about 7 - 10 pigs per day, and other slaughterings are practised in houses of pig traders or on small farms with 1 - 3 pigs slaughtered per day. Such slaughtering is popular in suburban districts. Animals are slaughtered in a yard, near a water well area or other, which is normally narrow. Slaughter is carried out without inspection by veterinary officers.

Overall, little research has been carried out on the hygienic conditions in pig slaughterhouses in Hanoi. Particularly the pig slaughter areas and equipment are considerably responsible for cross-contamination of microorganisms, of which some pathogens cause foodborne diseases.

Objectives of the study

Nowadays, food safety is becoming a crucial issue, and it plays an important role in veterinary public health aspects. The term “From the Farm to the Fork” in food safety covers a whole food chain control, beginning with primary production on

farms, then throughout the next production stages such as slaughterhouses, meat processing plants, storage, transportation, markets and even home kitchens.

Pig slaughterhouses do possess potential risks of microbial cross-contamination between living animals, as well as between carcasses via slaughter areas and equipment. Therefore, this research aimed to gain more knowledge and understanding about hygienic conditions, especially before and after cleaning and sanitation (C&S) in pig slaughterhouses in Hanoi, focusing on:

- Enumeration of Enterobacteriaceae (as an indicator microorganism for hygienic conditions) before and after cleaning and sanitation in pig slaughterhouses.
- Assessment of Enterobacteriaceae counts in different types of pig slaughterhouses.
- Comparison of Enterobacteriaceae counts between areas within slaughterhouses.
- Identification of risk factors for cross-contamination during the slaughter process.

The information obtained from the study is expected to provide a scientific base for Enterobacteriaceae contamination loads that can be used to set up strategic measures against Enterobacteriaceae contamination in pig slaughterhouses.