

I. INTRODUCTION

Vietnam is an agricultural country. About 75 % of the population resides in rural areas and is employed in the agricultural production. The agricultural production provides around 24.3 % of the gross domestic products (GDP) in the country. Livestock production is one of the major sectors of agricultural production besides paddy rice farming, accounting for 22.3 % of the production value or 5.4 % of the GDP in Vietnam (FAO, 2004).

Pork is the staple product of livestock production in Vietnam. According to statistic data collected by the Ministry of Agriculture and Rural Development (MARD), annual pork production reached 1.8 million tons in 2003, accounting for 77 % of the total meat production in the country (Mạnh and Toàn, 2003). The majority of the pork production is domestically consumed, and the rest is exported. Hanoi, the capital city of the country with a population of 3.029 million people (VietnamNet, 2004), excluding a quite big number of tourists and in-official immigrants, daily consumes between 180 and 200 tons of pork (Kim Liên, 2004). Nevertheless, meat quality and safety is remaining a public health issue. Studying and monitoring residues in meat, including antibiotics, is a quite new field in the country.

Tetracyclines, antibiotics produced by the *Streptomyces* bacterium, is a broad-spectrum antibiotic which show activity against gram-positive and gram-negative bacteria, including anaerobes (Goodman *et al.*, 1985) and have been widely used for the treatment of infectious diseases and as an additive in animal foodstuffs (Pilar *et al.*, 2004). This is one of the five most commonly used groups of antimicrobials in food animals (Mitchell *et al.*, 1998). Among more than 3,000 antimicrobial-containing veterinary medical products (VMPs) registered to be imported, manufactured, and marketed by 51 veterinary pharmaceutical companies in Vietnam,

257 VMPs contain oxytetracycline – a compound of the tetracycline group (Boisseau, 2002).

The widespread use of antibiotics, especially along with a poor management and imprudent use of antibiotics, in livestock industry may pose a very high risk of antibiotic residue in meat and other animal products. With regard to public health, the consumers incur adverse consequences of antibiotic residues in food. No one is alert to the risk of antibiotic residue because of the lack of comprehensive studies on this issue. In addition, it do not exist any information about antibiotic residue so that people could choose or buy meat products without antibiotic residue. Furthermore, the farmer household small-sized or backyard animal raising model and the uncontrolled animal slaughtering is resulting in the fact that a lot of poor quality meat, including meat with high antibiotic residue or contamination, is marketed and is adversely affecting human health.

Therefore, it should also be one of the most emerging issues regarding food hygiene and safety.

The objectives of this study were therefore (i) to investigate the proportion of tetracycline residues in raw pork marketed on Hanoi's markets and to preliminarily identify potential risk factors; and, (ii) to quantitatively analyze tetracycline residues in the pork samples that had showed positive or inconclusive results in the previous qualitative analysis.

Results of the study would primarily help food professionals, veterinary authorities, and the consumers to be aware of possible antibiotic residual risks confronting them in their product or food. They possibly know that this problem prompts to take urgent measures of dealing, prevention and control. In addition, this study would provide the information about the factors associated with the antibiotic residues. The information would be useful for consumers to choose products with the lowest risk.