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ABSTRACT

Background: Meat is a major source of food and raw materials for a number of industries, yet a lot of meat is wasted each year due to deterioration as a result of spoilage by micro-organisms such as *Pseudomonas*, *Acinetobacter*, *Moraxella*, *Bacillus*, *Campylobacter*, *Escherichia*, *Listeria*, *Clostridium*, *Salmonella* and *Staphylococcus* species.

Objective: To determine efficacy of antimicrobial activity of garlic extracts on bacterial pathogens commonly found to contaminate meat.

Design: A cross sectional study.

Setting: The Department of Public Health, Pharmacology and Toxicology, Faculty of Veterinary Medicine University of Nairobi.

Subjects: Garlic from Nganoini farm in Laikipia County, Kenya

Results: The results indicated that garlic absolute ethanol extract had the highest efficacy of antimicrobial activity inhibiting all test micro-organisms.

Conclusion: Ethanolic extract can be used as a meat preservative or decontaminant.

INTRODUCTION

Meat is generally an animal muscle, which is a compound of water, protein and fat used as food (1). It is a major source of protein other than plants. Sources of meat include chicken, beef, camel, pork and other domestic and wild animals, which range from small bats and lizards, to larger mammals such as antelope and buffalo. Seafood includes fish, shrimps, oysters, crab meat (2). Its consumption regulates vitamin D metabolism and prevents metabolic borne diseases such as bone fractures and rickets (3). Various trace elements such as iron, (haem iron) in a form that can be well absorbed are found in it.

Global meat production has tripled in the past three decades and could double its present level by 2050 (4). In Kenya the livestock sector contributes 3.3% of the gross domestic product (GDP), mainly from cows, sheep, goats and poultry (5). In the World livestock sector contributes 46% of the gross domestic product (GDP) (4). The quality and safety of meat can easily deteriorate when improperly preserved due to spoilage. The most common cause of meat spoilage is the micro-organisms (6). Indication of spoilage

includes production of ammonia or sulfur smell, and bad odor, due to degradation of proteins, lipids (fats) and carbohydrates caused by bacteria and/or enzymes naturally present in meat (6). Some micro-organisms produce toxins on meat making it unfit for human consumption. For example *S. typhi* contains an endotoxin typical of Gram negative organisms, as well as the Vi antigen which is thought to increase virulence. *B. cereus* causes food poisoning due to the toxins it produces when the *bacilli* sporulates especially on foods like meat, and meat products (7).

Meat contamination by micro-organisms mainly occurs through operations carried out in animal husbandry, processing, preparation, treatment, packaging and transporting and also from the environment (3). There were many experiments undertaken to prolong the shelf-life of meat and meat products. Organic acids are generally recognised as safe (GRAS) antimicrobial agents, and the dilute solutions of organic acids (1-3%) are generally without effect on desirable sensory properties of meat when used as a carcass decontaminant (8). It is clear that the surface treatment of carcasses by spraying with organic acids solution reduces the surface microbial