

A Study on Effectiveness of Seven Disinfectants against Possible Bacteria Contaminants of Coops and Premises Inhabited by Indigenous Chickens and Ducks

Njagi, L.W¹., P.G. Mbutia¹, L.C. Bebora¹, P.N. Nyaga¹, U.Minga² and J.E. Olsen³.

¹Department of Veterinary Pathology, Microbiology and Parasitology, University of Nairobi, P.O. Box 29053, Nairobi, Kenya.

²Department of Veterinary Microbiology and Parasitology, Sokoine University of Agriculture, P.O.Box 3019, Morogoro, Tanzania.

³Department of Veterinary Microbiology, The Royal Veterinary and Agricultural University, Stigbojlen 4, 1870 Frb. C. Denmark.

Abstract

Seven commonly used disinfectants abbreviated as A, B, C, D, E, F and G (A is, Glutaraldehyde and Coco – benzyl dimethyl ammonium chloride; B is, Didecyl dimethyl ammonium bromide 50% w/v; C is, Sodium hypochlorite; D is, pine disinfectant and antiseptic; E is, chloroxylenol; F is, phenol and that for disinfectant G is, cresol and soap solution) were evaluated for their effectiveness in disinfecting coops and premises of indigenous chickens and ducks. Bacterial isolates from 14 samples (each sample comprising of a pharyngeal and a cloacal swab from one bird pooled together) from village chickens and ducks were used in this study. The isolates were taken to represent microorganisms in the birds' environment. Results showed that effectiveness amongst the disinfectants varied markedly. Two disinfectants were very effective (sensitivity of 80% and 60% respectively), three were moderate (30% sensitivity, each) and two were ineffective. Some of them were effective only at a concentration higher than that recommended by the manufacturer. For effective disinfection occasional sensitivity testing is therefore recommended.

Introduction

Chicken population in Kenya stands at around 29 million (Njue *et al.*, 2002). Of these, over 70% are rural free - range chicken, kept in small numbers, mainly in the villages (MLD, 1989; Minga *et al.*, 1989; Aini, 1999). They are kept for meat and eggs, socio-cultural gifts, and to provide income after sale of birds and eggs (Nyaga *et al.*, 2002). They thus play an important role in alleviating poverty and economically empowering women. Their meat and eggs are tastier better than those of their commercial hybrids due to the variety of scavenged feed in form of leaves, seeds, insects, worms, mineral and vitamin rich vegetation (Minga *et al.*, 1989; Aini, 1999). At the village level, a mixture of free -range birds comprising chickens, ducks, turkeys and geese are found. In Kenya the ducks are the second most common domesticated birds (Mbutia *et al.*, 2002) and hence their inclusion in this study. The main constraints to production in free – range rural poultry are predation, disease and theft, with disease as the most important despite the fact that these birds are

taken to be normally more resistant to local diseases and stresses than the exotic ones (Aini, 1999). During the day, these birds scavenge around, but at night they retire to an area specifically constructed for them or, as is common practice, at a specific corner within the main house (Nyaga *et al.*, 2002). Once the birds identify a place, they tend to retire to the same spot constantly. Thus, these occupied areas end up being heavily contaminated with faeces and discharges from the eyes, mouth and nose. Of the organisms harboured and shed by birds, bacteria are the most common (Saif *et al.*, 2003). Some of these cause clinical and subclinical infections, and the latter stress the birds and reduce their growth and production. Other bacteria are zoonotic (Njagi *et al.*, 2004a; Njagi, 2003).

In this study, sensitivities of the mixed bacterial flora from cloacal and oropharyngeal swabs to seven commonly used disinfectants were studied. The bacteria were taken as being representative of the environmental contaminants. The pooled bacterial cultures from cloacal and oropharyngeal swabs were used because swabbing of the surfaces for isolation of contaminants may be complicated, and may only remove a small portion of the bacteria on the surface (Patterson, 1971).

MATERIALS AND METHODS

Birds used and sample collection: Twenty-eight swabs (14 pharyngeal and 14 cloacal) were collected from 14 indigenous birds (8 chickens and 6 ducks) from five farms using sterile cotton – tipped applicator swabs. The 16 chicken swabs were collected from three farms in Katani, (in Machakos district) and one farm in Ruai (in Nairobi district), while the 12 duck swabs were from two farms in Ruai. One of the Ruai farms had both chickens and ducks. The swabs were each placed in 2 ml of sterile physiological saline and transported in a cool box to the laboratory for bacterial culture.

Sample processing, bacterial isolation and characterization: The oropharyngeal and cloacal swab extracts of each bird were then pooled, and were taken to be representative of the birds' environmental