Comparison of the Carrier Status of Pasteurella multocida between Farm and Live Market Indigenous Birds


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Abstract
A total of one hundred and seventy one indigenous birds from smallholder farms and those traded in market centers in Nairobi were examined for the presence of Pasteurella multocida. Of these, 135 were farmed and 36 were market birds. They comprised of 117 indigenous chickens and 54 ducks. Three hundred and forty two oropharyngeal and cloacal swabs were collected from them and cultured onto blood agar and other media. The recovered isolates were characterized using colonial morphology, biochemical and other tests. Twenty three Pasteurella multocida isolates were recovered: 11/135 (8%) from farm and 12/36 (33%) from the market birds. Majority of the Pasteurella multocida isolates were Pasteurella multocida gallicida 11/23 (48%) followed by Pasteurella multocida multocida 7/23 (30%) and Pasteurella multocida septica 5/23 (22%). Pasteurella multocida gallicida isolates were encountered more in the market birds, while Pasteurella multocida multocida isolates were more in farm birds. Ducks had more isolates than chickens. The concentration of the birds at market areas appeared to favour the maintenance of Pasteurella multocida in the cages, crates and pens. Market birds may, therefore, play a major role in the spreading of Pasteurella multocida.

Introduction
Indigenous birds are the most abundant livestock in Kenya. They are found virtually in all households (Mbugua, 1990a; Njue et al., 2002). These birds contribute 71% of all the eggs and poultry meat produced in the country. Most of these are farmed by smallholder farmers especially women (Nyaga et al., 2002). Mature and some of the replacement birds are sold at farm gates, open-retail markets and market centers in various towns and trading centers in Kenya (Mbugua, 1990a; Njue, 2002; Nyaga et al., 2002). Like in many poultry production systems, diseases are major constraints as they cause heavy losses in terms of mortality and drop in egg production (Rhoades and Rimal, 1989; Barnum, 1990; Mbugua et al., 2002). One disease of great economic importance to both commercial and indigenous birds is fowl cholera, caused by Pasteurella multocida (Pasteurella multocida) (Rhoades and Rimal, 1989; Christensen and Bissgaard, 2003; Glisson et al., 2003). The three subspecies of Pasteurella multocida have been diagnosed in indigenous birds in some African countries (Kelly et al., 1994; Oladele et al., 1999; Muhiirwa et al., 2001). Sources of Pasteurella multocida infections into a poultry flock are , however, not known (Gooch, 1999; Christensen and Bissgaard, 2003; Petersen et al., 2001). The indigenous chicken and duck trade between poultry farmers and traders may be one such source of Pasteurella multocida transfer. The Pasteurella multocida carrier infectivity rate for indigenous chickens and ducks has not been documented.

The objective of the study was to compare the Pasteurella multocida carriage in farm and live market indigenous chickens and ducks, thus determine which birds are likely to play a major role in the spread of this organism.

Materials And Methods
Source of birds and sampling procedure
A total of 171 indigenous birds were sampled from smallholder farms and trading centers in Nairobi and its environs. They comprised of 135 birds (88 chickens, 47 ducks) from farms and 36 birds (29 chickens, 7 ducks) from the trading centers. The overall totals were 117 indigenous chickens and 54 ducks.

Each bird was swabbed on the oropharynx and cloaca separately using sterile cotton-tipped applicator swabs. A total of 342 swabs were collected. Each swab was placed in 2 ml of sterile physiological saline and transported in a cool box to the laboratory for screening of Pasteurella species.

Isolation and characterization of bacterial isolates
Each swab was thoroughly vortexed, streaked on blood agar and incubated aerobically at 37ºC, for 24 hours for initial culture. Bacterial colonies from these cultures were sub-cultured on blood agar and MacConkey agar. The bacteria were identified according to the criteria given in the Bergey’s manual (1994). The characterization of the Pasteurella multocida subspecies followed procedures described elsewhere (Dorsey, 1963; Bissgaard and Mutters, 1986). The biochemical reactions of the isolates were compared with a known P. multocida NCTC 10322T. P. multocida isolates recovered from cloacal and oropharyngeal swabs of the same bird were regarded as one isolate.