



Survey of food-borne disease causing bacteria among small-scale broiler operations in Gauteng Province

Campylobacter spp. and non-typhoidal *Salmonella enterica* (NTSE) serovars are leading causes of bacterial food-borne disease globally. The African continent has a disproportionately high death rate due to food-borne disease (14 deaths per 100 000 population), compared to a low of 0.5 deaths per 100 000 population in Europe. Poultry products are often implicated in food-borne campylobacteriosis and salmonellosis outbreaks. Bacterial colonisation of broilers during the rearing period may result in contaminated poultry products and compromised food safety for consumers. Once colonised, the chicken acts as a bacterial reservoir and contaminates the rearing environment, spreading these bacteria throughout the flock. Intestinal microflora from colonised broilers may also contaminate additional broiler carcasses during the slaughter process.

Despite investigations into bacterial prevalence and associated risk factors in large-scale commercial poultry, there is scarce literature available concerning the small-scale poultry sector. In South African small-scale broiler systems, few published *Campylobacter* spp. and NTSE serovars prevalence studies are available. Furthermore, biosecurity measures practiced in these systems that may reduce the bacterial burden of broilers are not documented. During 2020-2021, Gauteng Veterinary Services (GVS) performed a cross-sectional survey to estimate the prevalence of *Campylobacter* spp. and NTSE serovars among small-scale broilers and examine the correlation of biosecurity practices with disease positivity in Gauteng Province.

Ten small-scale broiler farms were randomly selected per state veterinarian area from a list of known farms. At each

Table 1. Prevalence of *Campylobacter* spp., small-scale broiler farms, Gauteng Province.

	Prevalence	95% CI
Farm level	27/30 (90%)	73 - 98%
Bird level	448/900 (49.8%)	47 - 53%

farm, cloacal swabs (in Amies charcoal transport medium) were collected from 30 broilers, which were selected by simple random sampling. Standard bacterial culture methods for *Campylobacter* spp. and *Salmonella* were applied and any isolates were identified using a real-time polymerase chain reaction test. A GVS official simultaneously conducted an inspection of the farm and completed an electronic questionnaire with the farmer using the EpiCollect5 mobile application. Biosecurity correlates of *Campylobacter* positivity were identified using univariable and multivariable logistic regression while accounting for clustering of broilers by farm, using Stata v15. Potential confounders such as season, antibiotic use and age at slaughter were adjusted for in the analysis.

No NTSE serovars were detected in sampled small-scale broiler farms. In contrast, *Campylobacter* spp. were detected in 49.8% of broilers (448/900, 95% CI (47–53%)) with an overall farm prevalence of 90% (27/30, 95% CI (73–98%)). Among the *Campylobacter* spp. isolated, *C. coli* was predominant (65.4%, 316/483) compared to *C. jejuni* (34.6%, 167/483).



Fig 1. Inside of a small-scale broiler house sampled in the survey.

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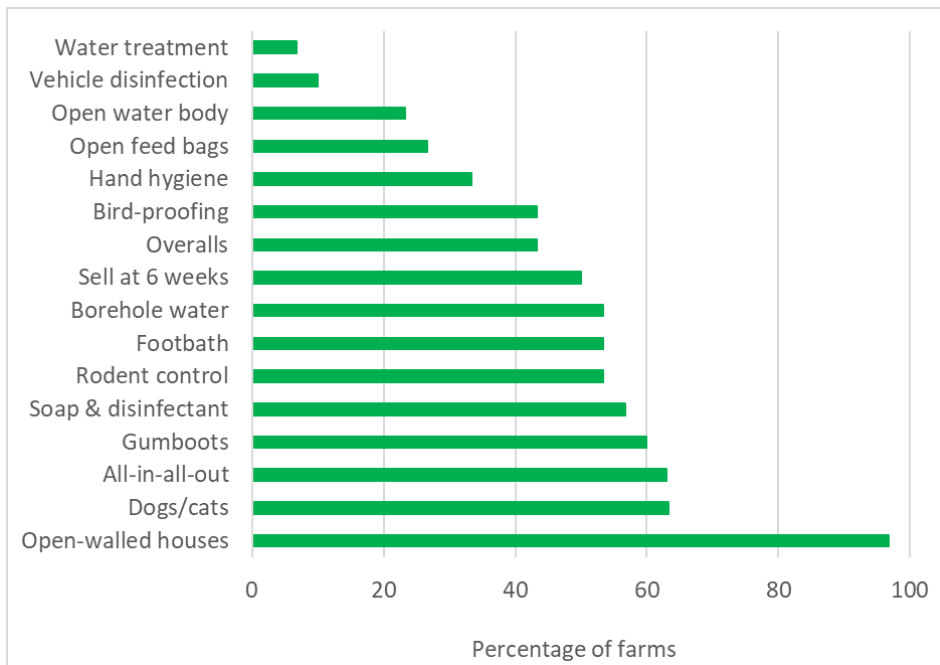


Fig 2. Biosecurity and management practices of 30 small-scale broiler farms, Gauteng Province.

Overall, there was much room for improvement of the biosecurity practices in the sampled small-scale farms. Spillage of feed (16/30, 53.3%) occurred in a third of positive farms (8/27, 29.6%) and the presence of dogs or cats near to the poultry houses was common (19/30, 63.3%). Use of footbaths

compared to free-range housing (OR= 3.8 95% CI (2 – 7)), drinking water treatment (OR=86.8 95% CI (5 – 1652)) and unsealed feed bags or feed spillage (OR= 12.5, 95% CI (3 – 54)). Conversely, the summer season (OR=0.1, 95% CI (0.02–0.2)) appeared protective against *Campylobacter* positivity.

The survey showed that *Campylobacter* spp. were highly prevalent in sampled broilers while NTSE serovars appeared to pose a lesser public health risk. This finding serves as a reminder of the importance of hygiene practices to prevent cross contamination in the abattoir and the kitchen. Biosecurity and farm management practices that may reduce the odds of *Campylobacter* positivity in small-scale systems were identified. These include appropriate drinking water treatment; regular water quality testing; correct feed storage; management of high-quality feed; and improved hygiene of poultry houses. These results may be used to improve the health of broilers produced in small-scale systems and promote food safety for consumers in this market sector.

Shira Amar

Updates on Animal Disease Outbreaks during January

One new outbreak of **African swine fever (ASF)** was detected. This outbreak involved two small-scale pig keepers. One of the owners had bought two new pigs from an auction five days before they started showing illness and then died.

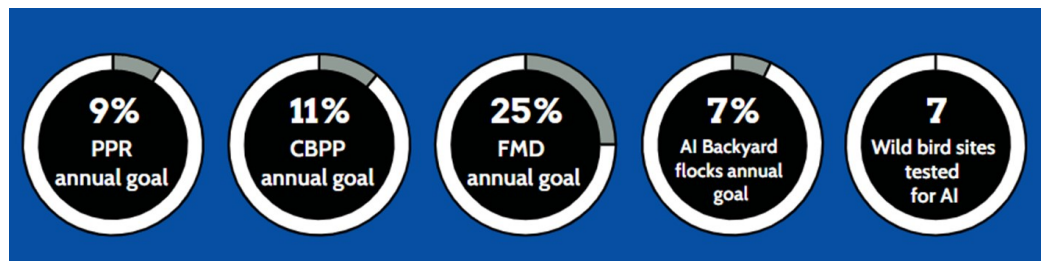
There were five new outbreaks of **highly pathogenic avian influenza (HPAI) H5**. Four of these were in the Bapsfontein area, with two outbreaks affecting peacocks kept by hobbyists and two sites being a commercial layer farm. The fifth outbreak involved racing pigeons. About 50 out of 90 racing pigeons died unexpectedly in their loft and were confirmed to have had HPAI H5. This was about 8km away from the other outbreaks outside Nigel.

Three separate outbreaks of **lumpy skin disease (LSD)** were reported during January in the Pretoria State Veterinarian area. All were in the north-east part of the province around the **Bronkhorstspuit** area, and none of the three affected herds had received prior LSD vaccinations. In total, 17 out of 61 cattle showed symptoms which varied between skin lesions only and signs of systemic illness such as pyrexia.

One **African horse sickness (AHS)** outbreak was detected in Tshwane. This was based on a clinical diagnosis. The horse had difficulty breathing on one day and died the next day.

A feral domestic cat, which had bitten someone, was trapped and taken to the West Rand SPCA. Although the person was concerned about possible rabies exposure, the cat was euthanased and disposed of before GVS officials could test it. The person who was bitten received PEP regardless and the facility was reminded of the importance of testing possible rabies cases considering that recent outbreaks occurred in animals in this area.

Fig 3. Cumulative Surveillance Summary 2022. Active surveillance for contagious bovine pleuro-pneumonia (CBPP), peste des petits ruminants (PPR), foot and mouth disease (FMD), and avian influenza (AI) is done monthly or quarterly (FMD) in Gauteng. All suspected cases are investigated.



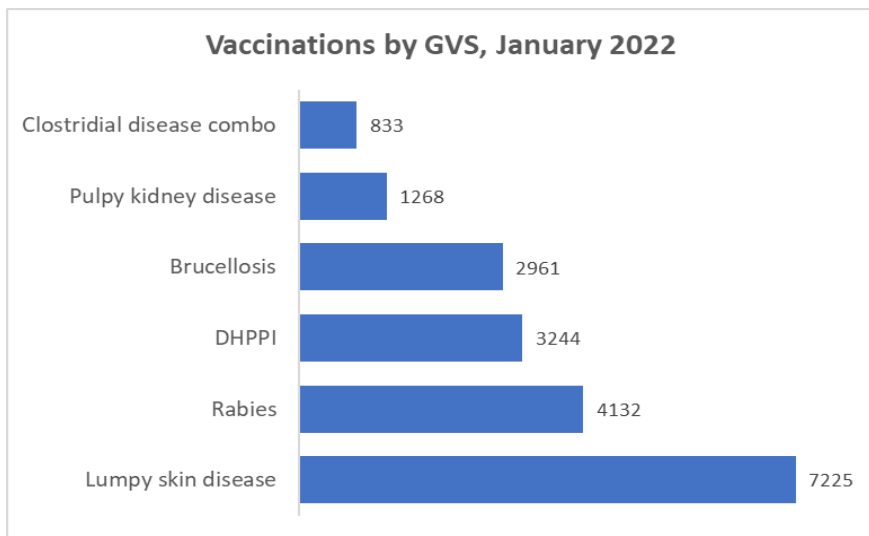
Animal disease vaccination activities

GVS primary animal health and regulatory officials administer vaccinations to pets and livestock on a daily basis. The total number of vaccines administered in January was **19 717**.

A breakdown of the types of vaccines and their geographic distribution are provided on the right hand side.

Livestock Farmers Urged To Vaccinate Livestock Against Insect-Borne Diseases

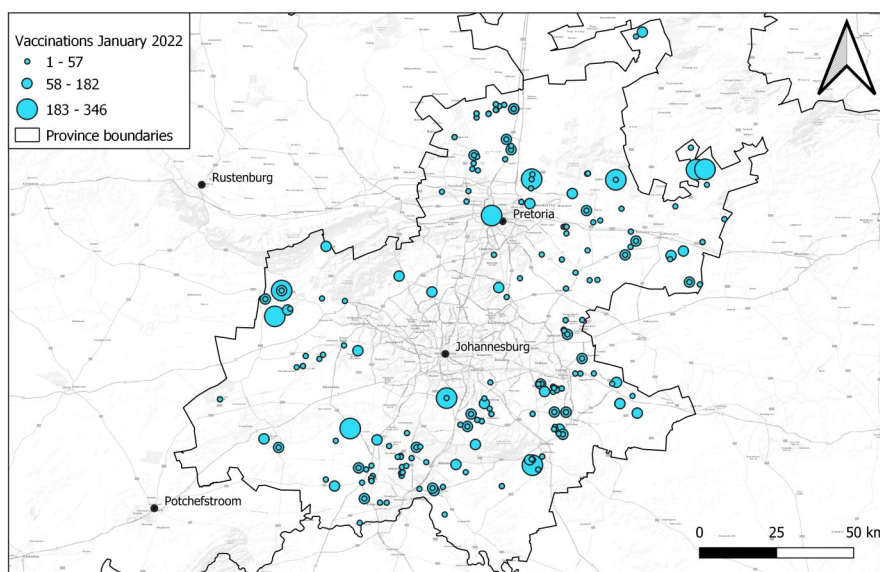
Vector-borne diseases are expected to increase after heavy rainfall has been recorded across the country. This includes diseases spread by mosquitoes, *Culicoides* midges or biting flies; e.g., Rift valley fever (RVF), African horse sickness, bluetongue, lumpy skin disease, bovine ephemeral fever, and Wesselsbron disease. We urge people to protect their animals by vaccination and vector avoidance. Rift valley fever may cause severe disease in people ([WHO info](#)). Any sudden increase in abortions or deaths of young livestock should be reported to the local state veterinarian. People in RVF outbreak areas should protect themselves from mosquito bites. If aborted material or carcasses from animals suspected to have RVF must be handled, appropriate personal protective equipment must be worn.



DHPPI: Canine distemper, infectious hepatitis, parvo & parainfluenza virus.

Clostridial disease combo: Anthrax, botulism & black quarter.

(Data may change)



Vaccination Reports by GVS, January 2022

Created by Epidemiology, Gauteng Vet Services Using QGIS (<http://qgis.osgeo.org>)

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agriculture and rural development

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GAUTENG PROVINCE