RESPIRATORY PATHOGENS IN AN INTENSIVE POULTRY FARM IN DEBRE ZEIT, ETHIOPIA

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Introduction

- Chickens are a valuable commodity in Ethiopia, as a source of protein and of income through the sale of birds and eggs. They also play important socio-cultural roles.
- The breeder farm in Debre Zeit is a centre of chicken production and expertise, and aims to improve productivity of chickens in Ethiopia.
- The farm has experimental selective and cross breeding programmes using indigenous and exotic breeds, but is hampered by the unknown disease status of the breeding flocks. Only Newcastle disease vaccination is currently used.
- The aim of this study was to investigate the farm status with regards to the following respiratory pathogens:
  - Infectious Bronchitis virus (IBV)
  - Avian Metapneumovirus (aMPV)
  - Newcastle disease virus (NDV)
  - Infectious Laryngotracheitis virus (ILT)
  - *Mycoplasma synoviae* (Ms)
  - *Mycoplasma gallisepticum* (Mg)

Materials and Methods

Serological screening

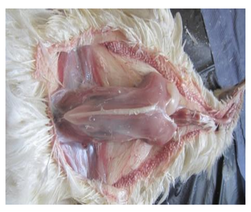
Grandparent (GP), parent (P) and juvenile (JV) sheds were sampled. Three birds were sampled from each pen in the shed.

1ml of blood was taken from the wing vein of each bird.

Commercial Biocheck ELISA kits were used to detect antibodies present in the blood samples. These were performed in the laboratory in Debre Zeit.

Pathogen detection

Pooled oro-pharyngeal swabs from each pen, vortexed in sterile water and samples collected at post mortem were applied to FTA cards.



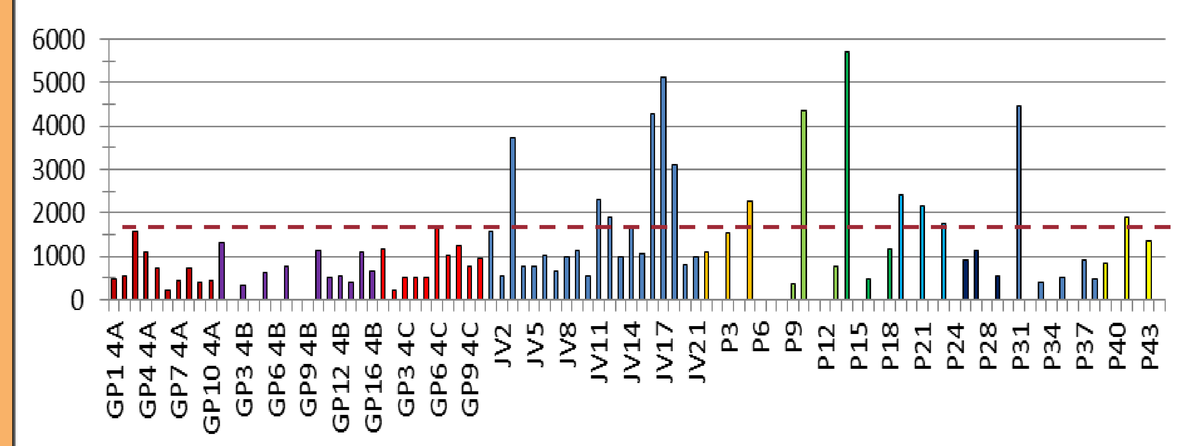
FTA cards deactivate infectious material and preserve genomes.

Samples were then able to be safely taken to the UK for further processing

DNA and RNA extraction

PCR and real time (RT)-PCR protocols for antigen detection

NDV IBV aMPV Mg Ms ILTV



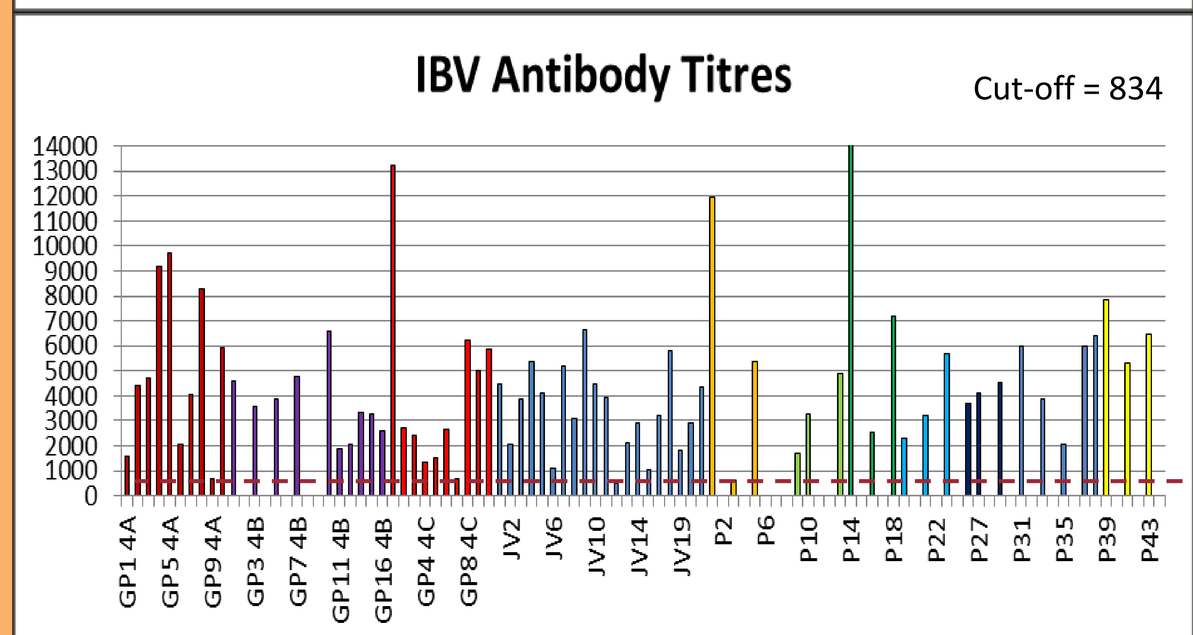


Figure 1. Bars of the same colour represent different groups of poultry. Groups were defined as birds of the same ages and breed, living in the same shed.

Results

- IBV and aMPV antigens were both detected using RT-PCR.
  - All aMPVs belonged to subytpe B.
  - All IBVs were genotyped as 793B.
- A number of birds showed ELISA antibody titres for aMPV and IBV far above the positive cut-off, suggesting strong and repeated exposure.
- Both Mg and Ms antigens were also detected using PCR
- All samples were antigen negative for NDV and ILT

Discussion

- Circulation of aMPV, subtype B and IBV, genotype 793B have been confirmed on this breeding establishment, in the absence of vaccination. To our knowledge, this is the first time these have been confirmed in Ethiopia.
- The high presence of Ms could be due to the high stress levels, stocking densities and access of wild birds to the sheds. Addressing those issues may help to decrease mortality and increase productivity.
- The introduction of vaccines against IBV and aMPV could also decrease the levels of mortality and increase productivity in this farm.
- Increased biosecurity measures are required to decrease the risk of introduction and spread of these pathogens.
- Further studies would be beneficial to increase the understanding of the presence of these pathogens across Ethiopia, including backyard poultry.

References and Acknowledgments
RNA extraction:(Chomczynski & Sacchi, 1987; Li et al., 1993)Modified by Worthington et al., 2008.
DNA extraction: Qiagen QIAamp DNA mini kit
PCRS: NDV:Aldous and Alexander, 2001; IBV and aMPV: Cavanagh et al., 1999; ILT: Diallo et al, 2010; Mg /Ms: Adiagen, Adiavet-myco-AV PCR kit
Many thanks to Biocheck, for the kind provision of the ELISA kits and to the Ethiopian Institute of Agricultural Research for the use of their premises and the help of their staff.