CONCLUSIONS
- 46% of E. coli recovered from commercial broiler production in Brazil was potentially pathogenic, although levels of the most virulent isolates were low.
- Inhibition and delay of E. coli growth in vitro by probiotic Bacillus strains was variable compared to previous reports.
- These results emphasize the need to understand regional APEC virulence profiles in a flock, in order to allow the use of targeted prevention and treatment measures, reducing the underlying risk these E. coli populations pose to poultry health and welfare.

RESULTS (cont)
Growth inhibition by Bacillus probiotic strains
- Compared to previous reports of E. coli inhibition by Bacillus CFS (Wealleans et al., 2016), inhibition and delay of the growth of Brazilian E. coli was highly variable.
- Inhibition was highly variable, both between E. coli and Bacillus strains
  - Maximum growth inhibition was 97%; average positive inhibition was 37.64%
  - 47% of tested Bacillus CFS/E. coli combinations increased E. coli growth, by a maximum of 20% above control
- Delay in E. coli growth averaged 25 minutes (Figure 2), though maximum delay was 500 minutes – longer than the average gut transit times of a chicken – meaning the Bacillus CFS completely inhibited E. coli growth
- 35% of tested Bacillus CFS/E. coli combinations increased rate of E. coli growth, by a maximum of 60 minutes earlier than control

INTRODUCTION
This study aimed to investigate the prevalence of virulence associated genes of E. coli isolates from commercial Brazilian broiler production and to determine the efficacy of the cell free supernatants (CFS) of 11 Bacillus strains to inhibit the growth of a subset of the isolated potential avian pathogenic E. coli (APEC) in vitro.

METHODS
- Whole intestinal tracts were excised from 4 commercial broiler farms in 2 regions of Brazil and used to isolate and characterize E. coli
- A previously defined pentaplex PCR protocol was used to test for the presence of 5 virulence associated genes (cvaC, iss, iucC, tsb, irp2); isolates harbouring ≥2 genes were identified as APEC
- Probiotic inhibition assays monitored OD at 595 nm of E. coli cultures with or without Bacillus CFS. % inhibition was calculated by comparing the OD of the treated well at the point at which the OD of the control well was 0.4
- Delay in growth was measured by comparing the time taken to reach OD 0.4 by the control and treated wells

RESULTS
Virulence
- 45.83% of all isolates contained ≥2 virulence genes, and so were considered potentially pathogenic
- Prevalence of high virulence isolates was low; only 0.67% contained all 5 genes
- There were geographical differences between sampled farms (58.7% APEC Paraná vs 33.0% APEC Minas Gerais, P<0.0001, Figure 1), emphasizing the need to understand microbial populations at a regional level