411 Characterization of *Ornithobacterium rhinotracheale* from commercial chicken and turkey flocks in Russia. A. V. Cherny-shev*, A. V. Sprygin, O. I. Ruchnova, N. S. Mudrak, O. V. Pruntova, and V. V. Drygin, Laboratory of Molecular Diagnosis of Poultry Diseases, Federal Centre for Animal Health, Vladimir, Russia.

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413 Evaluation and validation studies of real-time PCR assay for the detection of *Chlamydia psittaci*. H. Lu*, S. Myers, R. Schneider, and L. Lin, Penn State University.

AAAP abstract†

414 Characterization and distribution of avian pathogenic *Escherichia coli* isolates from broilers in Peru. C. Carranza*, A. Neumann, C. Kromm, N. Falcon, and R. Leon, Technical Department of Innova Andina S.a., Lima, Peru.

AAAP abstract†

415 Serum survival in avian pathogenic *Escherichia coli*. L. K. Nolan* and G. Li, Iowa State University, College of Veterinary Medicine.

AAAP abstract†

416 Characterization of attaching and effacing *Escherichia coli* (AEEC) isolated from poultry. T. Denagamage*, J. Blair, and S. Kariyawasam, Department of Veterinary and Biomedical Sciences, The Pennsylvania State University, University Park.

AAAP abstract†

417 Efficacy of BMD versus probiotics in the feed for the control of necrotic enteritis by *Clostridium perfringens* in broiler chickens. S. H. Miller* and S. W. Davis, Alpharma.

AAAP abstract†


AAAP abstract†

419 Rapid detection of *Campylobacter jejuni* using quantum dots and nanobeads based optical biosensor. H. Wang*, Y. Li, and M. F. Slavik, University of Arkansas, Fayetteville.

*Campylobacter jejuni* is estimated to cause 2.1 to 2.4 million cases of foodborne illness in the United States each year. Some of the previous cases have been linked to eating or handling undercooked or raw poultry products. A rapid, specific method is needed to detect *C. jejuni* in real-time to ensure food safety. The objective of this research was to develop a sensitive biosensor method for rapid detection of *C. jejuni* by using both magnetic nanobeads to separate and concentrate the target bacteria and quantum dots (QDs) as fluorescent markers. In this research, both streptavidin conjugated QDs 605 (15–20 nm diameter) and magnetic nanobeads (150 nm diameter) were separately coated with the specific biotin conjugated anti-*C. jejuni* antibody. The conjugated magnetic nanobeads then were mixed with a sample containing *C. jejuni*. After immunomagnetic separation, the magnetic nanobeads- *C. jejuni* conjugates were mixed with the conjugated QDs. Unattached conjugated QDs were removed using immunomagnetic separation. A spectrometer was used to measure the fluorescence of the complexes of magnetic beads-*C. jejuni*-QDs. The results showed that this method could detect *C. jejuni* in pure culture and chicken wash solution at a concentration of 2–3 cells/0.1 mL sample (20–30 cfu/ml). A linear correlation with $r^2 = 0.97$ was found between the fluorescence intensity and the concentration of *C. jejuni* in a range of $10^1$ to $10^5$ cfu/ml. The total detection time was less than 2 h. Based on the result of this study, it should be very possible to develop a sensitive biosensor instrument for applications in the rapid detection of *C. jejuni*.

Key Words: *Campylobacter jejuni*, optical biosensor, quantum dots, nanobeads, immunoseparation


Japanese quail selected for divergent corticosterone response to restraint stress were evaluated for their resistance to heat stress and aerosol challenge with avian pathogenic *Escherichia coli* (APEC) to determine the impact of stress response on APEC pathogenesis and colonization with food-borne pathogens. These quail lines are designated as the high stress line (HS), low stress line (LS), and the random-bred control line (CS). Heat stress (35°C, 8h/d) was initiated at 24d until the end of the study. Birds were challenged with an aerosol spray containing $2 \times 10^9$ cfu of *E. coli* at 25d and 32d. At 38d the birds were necropsied and the intestinal tract was screened for both *Salmonella* and *Campylobacter*. Body weights of the CS birds were higher than both HS and LS at 17d, 25d, and 32d, but there were no line differences at 38d. At 32d there was no difference in mortality between males and females and the CS line had significantly higher mortality compared with the LS line with the HS line being intermediate. At
38d, females of the CS line that were both heat stressed and challenged had a mortality incidence of 25%, which was significantly higher than male birds of the same line and treatment (5.3%) suggesting a change in susceptibility to heat stress and E. coli challenge in females coming into lay. While Campylobacter was not recovered, we observed an increased incidence in Salmonella enterica serotype Agona isolation in the intestine of quail subjected to heat stress, suggesting that a resident population of Salmonella is present in these quail lines. There was a differential effect of heat stress on Salmonella isolation from male and female quail suggesting that the additional stress of coming into lay may have confounded the female isolation data. Further work using this model will lead to an understanding of the influence of sex and stress hormones on host immunity, APEC pathogenesis, and pathogen colonization. The failure to isolate Campylobacter from these birds suggests that they will be useful for Campylobacter challenge studies.

**Key Words:** heat stress, genetics, Escherichia coli, Salmonella, quail

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