Expertise & Focus Areas

- Genetics – Paul Siegel
- Neurobiology – Mark Cline
- Nutrition – Elizabeth Gilbert
- Nutrition – Mike Persia
- Mol. Nutrition – Eric Wong
- Genomics – Ed Smith
- Health – Rami Dalloul
- Welfare – Leonie Jacobs

Department of Animal and Poultry Sciences at Virginia Tech
Genetics – Paul Siegel

Red jungle fowl

Broiler CB-1

Broiler CB-2

High growth line

Low growth line

Rhode Island Red

Obese strain

White Leghorn WL-A

White Leghorn WL-B

Nature 464, 587-591
• Signaling mechanisms associated with energy metabolism in skeletal muscle and adipose tissue
• Improving bird production traits and meat quality
• Elucidating mechanisms underlying differences in food intake and adiposity in chickens
• Investigating the use of flavonoids as anti-obesity/diabetic compounds
Explore the nutritional needs and requirements of poultry
- Amino acid and other nutrient requirements
- New feed ingredient evaluation
- Understand the effects of higher than normal feeding of nutrients or feed additives on poultry health and growth (vitamin D and phytase)
- Nutrient interactions (dietary Ca and fat)

Feed poultry antibiotic-free diets resulting in healthful and efficient production
- Evaluation of various feed ingredients (DFM, prebiotic, etc.)
- Effects of stress on performance and nutrient partitioning

Emerging issues in the industry – Extension needs
Nutrient transporter expression during normal and disease conditions

- Molecular mechanisms associated with impacts of intestinal pathogens on epithelial cells and function
- Focus on nutrient transporters and antimicrobial peptides
- Better manipulate diets based on disease status
Avian Immunobiology Laboratory

Poultry Health

Immunomodulators
- Probiotics, beta-glucan, phytogenics
- In vivo / in ovo applications
- Immune system development
- Gut integrity and health

Sequenced the “Hokie Bird” Genome

Resistance to pathogen/disease
- Eimeria (coccidiosis)
- Clostridium sp. (necrotic enteritis/cellulitis)
- Salmonella, E. coli (APEC)
- Cochlosoma (Bill Pierson)

Turkey genome sequence
- Genomic-based selection
Sequencing the Turkey (Hokie Bird) genome: Generating a valuable resource for academic and industry researchers, like providing turkey breeders with tools to improve commercial breeds for production, disease resistance, and reproductive traits.

Avian Immunobiology Laboratory

Characterize genetic resistance to enteric disease in chicken and turkeys to help reduce their impact on poultry industry.

Research host-pathogen interactions: Elucidate molecular mechanisms of immunity to poultry diseases of significant economic impact (e.g. coccidiosis, enteritis, cellulitis).

Alternatives to drugs in poultry: Modulation of immune function to enhance immune competence, thus leading to improved health and production efficiency.
Research Importance

- Sub-therapeutic use of antibiotic-growth promoters under scrutiny – loss / ban
- Increased consumer demand for ‘drug-free’ and ‘organic’ poultry
- Importance of GIT for optimal animal performance and health
- Critical role of commensal microbiota
- Need for alternatives...
- Early intervention (*in ovo*)
PhD Veterinary Science – Ghent University

- Applied research largely based on industry needs and input, and evaluated by stakeholders – team approach

- Routine welfare assessments in practical and field settings

- Training of stakeholders with on-farm health and welfare aspects

- Stunning techniques

- Improvement of sustainability, health and welfare to reduce antibiotics use
Thank you...  Questions?

APSC

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