Poultry Research Agenda for Guelph

An Overview

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Objectives of Presentation

The Coles Notes Version!

• Snapshot of Existing Infrastructure
• Breadth and Depth of Intellectual Capacity
• Research Drivers
• Strategic Research Directions
• Enabling Design Features for New Infrastructure
• Take Home Messages
Current Infrastructure

Arkell Poultry Research Station
Commissioned in 1975
Arkell Poultry Research Station

• Located 10 minutes south of the University of Guelph

• Comprised of 5 individual barns

• Houses a diverse poultry operation providing support for a diverse array of research projects
Current Infrastructure

• **Hatchery**
  - two 14,000 chicken egg incubators
  - one 10,000 turkey egg incubator
  - two 5,000 egg hatcher

• **Brooder Barn**
  - Capacity for 2,400 broilers, roasters, or grower turkeys plus 6,000 pullets

• **Adult Barn**
  - Capacity for 5,000 layers including conventional, aviary and enriched layer housing as well as rooms with floor space for broiler-breeders
Current Infrastructure

• Special Studies Barn
  • Capacity for 1,500 layers including some floor space for broiler and turkey breeders

• Turkey Barn
  • Capacity for 1,500 layers and currently housing four heritage strains as well as floor space for broilers or turkeys

• Processing Plant
  • For evisceration and further processing of broilers, roasters, spent fowl, and turkeys
Embedded faculty in tenure stream appointments across multiple colleges and departments

But also.........A full cadre of highly skilled technical staff, research stations operational team, and HQP
Health and Pathobiology
• Dr. Éva Nagy
• Dr. John Prescott
• Dr. Shayan Sharif
• Dr. Dale Smith
• Dr. Leonardo Susta
• Dr. Patricia V. Turner

Food Safety
• Dr. Mansel W. Griffiths
• Dr. Keith Warriner

Engineering
• Dr. Bill Van Heyst
• Dr. Suresh Neethirajan

Marketing and Economics
• Dr. Sylvain Charlebois
• Dr. John Cranfield
Intellectual Capacity – Researchers
Multi-Disciplinary Competencies

Public Health and Policy
- Dr. Jan Sargeant

Physiology, Molecular Studies
- Dr. John Barta
- Dr. Gregoy Bédécarrats
- Dr. Andrew Bendall
- Dr. Trevor K. Smith
- Dr. Jim Squires
- Dr. Elijah Kairie*

Epidemiology
- Dr. Patrick Boerlin
- Dr. Michele Guerin

Diagnostics and Analytics
- Dr. Marina Brash
- Dr. Hugh Cai
- Dr. Gordon Kirby
- Dr. Emily Martin
- Dr. Davor Ojkic
- Dr. Durda Slavic
Computational Modelling
• Dr. Rozita Dara
• Dr. Deborah Stacey

Welfare
• Dr. Tina Widowski
• Dr. Alexandra Harlander

Social Impacts
• Dr. Alice Hovorka
Factors Influencing the Sector

- Evolution of Supply Management and Trading Policies
- Import and Export Competitiveness
- Market-Driven Concerns (e.g. antimicrobials)
- Broader Societal Pressures on Livestock Farming
- Environmental Footprint Management
- Rising Energy and Input Costs
- Worker Health and Safety
Maximize Production Efficiency and Market Competitiveness, While Reducing Environmental Footprint and Enhancing Animal Welfare
Research Priorities Emphasized

- Health Promotion
- Pathogen Control and Biosecurity
- Disease Management, Vaccine Development
- Engineering and Environmental Impacts
- Production Technologies
- Processing Technologies
- Housing Systems
- Stress Physiology and Genetics

Arkell is home to breeding stock of poultry lines donated to UofG 11 years ago by Canadian poultry breeder Donald Shaver.

(Photo: March 2014)
Research Priorities Emphasized

- Nutrition and Feeding Systems
- Economics
- Trade and Policy
- Population/Pathogen Modelling
- Product Development
- Food Safety and Zoonosis
- Animal Welfare connected to all disciplines
Infrastructure Design Considerations

- “Precision”, Smart Tools and Technology
- Monitoring - Environmental and Biological
- Flexible, Plug-n-Play Design
- Data Acquisition and Management
- Wireless, Broadband, Interactive
- Possible CL-2, Bio-Containment
- Quarantine and Isolation Facilities
- Seasonal Climate Controls
- HQP, Industry Training and Collaboration

- Significant Work Already Completed for M2050 Project
Smart Agrifood Initiatives at UofG

- Economics
  - Sensors (engineering)
  - Data science (computing)
- Animals
- Plants
- Environment
Take Home Messages?

- **Strong Commitment** of UofG to the poultry sector
- **Broad and deep intellectual capacity** in and around the Guelph Region (U of G, Government and private sector)
- Current infrastructure will become *obsolete* soon (5 – 7 years maximum)
- Infrastructure will be a *primary limiter* of the type of research needed to prepare industry for the next 50 years
Questions?
From Data to Information to Action

- Identify Data
- Collect Data:
  - Data Quality
  - Data Integrity
- Policies
- Protocols
- Privacy

Cloud-based & in-house Security & privacy
Policies
Protocols

- Data cleansing
- Data integrity and quality
- Analytics
- Privacy
- Policies
- Protocols

Knowledge
Action
Decision
Privacy
Visualization

Slide courtesy of Dr. Rozita Dara
Examples of ‘Smart ‘Animal Management

More rapid improvement in the animals’ genetic performance potential and ability to deal with environmental stressors

Early detection and effective management of animal disease and health

More effective use of co-products from food and biomaterials industries as feedstuffs for animals

Optimized environmental conditions for individual animals, improving animal productivity, wellbeing and longevity, as well as the efficiency of nutrient use

Reduced environmental footprint

Increased profitability