

RESEARCH INVESTMENT STRATEGY FOR THE ONTARIO POULTRY INDUSTRY

2014-2020



Foreword:

The Ontario Poultry Industry Research Strategy 2014-2020 (Strategy) is intended as a guide for use by the sector when investing in research.

This strategy was developed in consultation with each of the major poultry groups and is cognizant of the Canadian Poultry Research Council national poultry research strategy.

The Strategy articulates a clear desire on the part of the industry in this Province to utilize science, technology and research as tools to grow the industry in a *sustainable and profitable* manner.

Common Themes

A shared theme by all parties is the need for research that will lead to a better understanding of what constitutes good welfare, incorporating health and food safety in production systems, coupled with an understanding that good welfare will lead to a more sustainable industry by ensuring continued market presence.

Collaboration is a key element for all sectors with a strong emphasis on understanding how the various partners within the value chain can leverage each other for mutual benefit.

All sectors are strongly supportive of research that underpins the safety of the products that they produce. Once again, this is connected not only to poultry health but also relates to ensuring market sustainability and consumer confidence in the products being produced in Ontario.

All sectors are looking to increase market share, and as a result, are interested in understanding where the market is moving. This will involve investigating differentiated products (niche over commodity) and products that enhance the health of consumers. This element comes through strongly from all sectors as they increasingly recognize that consumers are looking for more than nutritional benefits from the food they consume, and that there are production technologies available to produce natural products that satisfy emerging needs and expectations.

The welfare aspect of poultry husbandry also plays into the human element of occupational health and safety, which is a factor for two of the four sectors with a particular focus on the internal environment in poultry barns. Internal environment features strongly in the layer industry priorities as they seek to develop acceptable physical environments for hens that meet productivity and welfare needs, as well as consumer expectation.

Nutrition is also key, not only in relation to providing higher efficiencies and productivity (cost reductions) but also in relation to environmental management – particularly using nutrition to reduce emissions. More effective systems for managing nutrition are particularly important to the broiler hatching egg sector.

The health of poultry and health management features strongly in the priorities with a reduction in antimicrobial resistance (AMR) being important.

Developing a more robust bird that can withstand disease challenges as an alternative to reliance on medication is strongly supported. Toward this end, the development of genetic and genomic tools is needed to produce a more robust, disease resistant, highly productive bird.

In summary, the sectors align on priorities with a cognizance of the need to better meet consumer expectation, while at the same time understanding that cost of production must always be a major consideration if the sectors are to remain competitive and sustainable in the long term.

This Strategy lays down the roadmap for investment in order to secure this future, through research.

There are overarching “themes” in the Strategy. Each theme area is introduced with a desired “outcome” which may be used as a performance measure in 2020. Beneath that is an objective designed as a more specific target for the theme, and cascading from that are some potential areas of research investment that the stakeholders believe will enable them to achieve their objective and consequently the outcome.

There is no priority on the themes – the whole being greater than the sum of its parts – and therefore each component of this strategy is important and relies on the others for ultimate success.

In any industry research strategy there will be areas that overlap into other jurisdictions. In this case there are objectives that clearly cross into areas of national significance and the document should therefore be read in concert with the Poultry Industry National Strategy.



Theme 1. Layer Welfare

Theme Outcome: Decisions, management guidelines and legislation are based on scientific evidence and as a result positive bird care practices are understood, accepted being utilized by 100% of Ontario egg producers.

Theme Objective: By 2020 critics of the way in which we farm are unable to find any cause to censure poultry welfare practices in Ontario layer production.

Potential Areas of Investigation:

- 1.1 Work to resolve issues with newly developed and recently adopted housing systems
- 1.2 Improve housing systems - Investigate layer housing systems designed for Ontario conditions that provide a healthy environment for layers and meet or exceed accepted welfare guidelines
- 1.3 Reproduction as it relates to welfare: Investigate mechanisms to identify gender of fertile eggs on day of lay.

Theme 2. Product Quality (Defined as fitness for use)

Theme Outcome: Eggs producers in Ontario confidently claiming that they are meeting the many and varied quality requirements of the end users.

Theme Objective: Consumer satisfaction with eggs and egg products produced in Ontario, as measured by survey, is increasing year on year.

The potential areas of investigation section has been separated into two recognizing pre-consumer quality areas for research and those related to consumer experience.

Potential Areas of Investigation - Egg Quality:

- 2.1 Investigate technologies that will prolong shelf life
- 2.2 Use genetics and/or nutrition to develop technologies that improve exterior (shell & membrane) and interior qualities (physical, functional and nutritional qualities of albumen and yolk).
- 2.3 Use genetics/genomics to develop a bird with extended productive life without compromising egg quality towards end of lay.

*Egg Quality – specific project.

Develop research on the impact of feed inputs and breed selection on internal egg quality, particularly egg white.

Project should be completed within two years.

Potential Areas of Investigation - Consumer Experience:

- 2.4 Develop more definitive methods of assessing consumers' perception and experience of quality.
- 2.5 Research to indisputably establish the nutritional elements in eggs that lead to better health outcomes for consumers
- 2.6 Demonstrate that the nutritional attributes of value-added eggs are no different to those of non-value added eggs.
- 2.7 Elucidate the potential health benefit of eggs in mitigating the impact of diseases such as arthritis, cancer and Alzheimer's

Theme 3. Understanding the Market

Theme Outcome: Egg industry is predicting future market trends with >90% accuracy.

Theme Objective: The Ontario egg industry is developing profitable products concurrently or in anticipation of with emerging trends.

Potential Areas of Investigation:

- 3.1 Develop more precise tools (for example customizing aggregate market demand curve analysis) for predicting future consumer trends
- 3.2 Develop tools to provide more accurate analysis of current and future market needs and requirements
- 3.3 Research to clearly differentiate between the production and market economics and social impacts of niche vs. mainstream markets (see also Theme 5. Economics)

Theme 4. Food Safety

Theme Outcome: The egg production and processing food safety system in Ontario is recognized as best in class, a national leader.

Theme Objective: An (ISO 22000 certified) internationally recognized transparent, auditable, credible food safety system that assures our customers and consumers of the safety of Ontario produced eggs and egg products.

Potential Areas of Investigation:

- 4.1 Develop a program to reduce food safety related non conformances by 5% (the OFFSAP Hazard Analysis Critical Control Point (HACCP) system currently in place being the benchmark)
- 4.2 Investigate the benefits of International Standards Organization (ISO 22000) certification for a food safety system, as opposed to developing a comprehensive system of food safety audits that are practical, realistic and transparent

***Food Safety – Specific project**

Develop and initiate a program for third-party audits relating to food safety. Evaluation would be on a mark out of 100 in relation to Hazard Analysis and Critical Control Point (HACCP). All producers should be well positioned to respond to these audits which should be completed by 2014.

Theme 5. Economics

Theme Outcome: The egg industry in Ontario is attracting business investment and providing opportunities for new entrants with returns that adequately compensate producers.

Theme Objective: To ensure that producers understand the economics of the industry and are using the information to their financial advantage when making business decisions.

Potential Areas of Investigation:

- 5.1 Develop algorithms to ensure that the cost of production (COP) formula reflects the variety of new and niche egg product offerings to ensure that farmers are adequately compensated for specialty egg production
- 5.2 Understand and benchmark the cost of producing specialty eggs.
- 5.3 Accurately cost egg production from the new production systems and benchmark against traditional system COP.

Theme 6. Production Systems

Theme Outcome: Cost effective, welfare 'endorsed' housing systems

Theme Objective: To design and develop an optimal housing and management system for Ontario egg production.

Potential Areas of Investigation:

- 6.1 Research production systems in similar (geographical and climatological) regions of the world and develop a layer hen housing design specifically for Ontario conditions
- 6.2 Create a management system, taking into account all inputs and outputs form a layer system that best meets the needs of the Ontario egg production system.
- 6.3 Create a facility in which commercial trials of new and evolving production systems can be undertaken.
- 6.4 Create a systematic approach to investigating new production initiatives under commercial conditions to reduce risk to farmers subsequently implementing such systems.

Theme 7. Nutrition

Theme Outcome: Poultry nutrition is being used creatively as a management tool as well as a source of feed.

Theme Objective: To explore the potential of nutritional management to mitigate behavioural and environmental issues.

Potential Areas of Investigation:

- 7.1 Examine the relationship between diet and behaviour in laying hens
- 7.2 Understand how managing layer rations can successfully reduce ammonia levels in barns to:
 - Mitigate emissions from poultry barns,
 - Improve egg quality,
 - Positively impact welfare of poultry and personnel working in the area and
 - Improve productivity.
- 7.3 Using feed formulations improve feed efficiency 10% over the next 5 years.

***Nutrition – Specific Project**

Initiate research to evaluate feed relating to hen behaviour to determine the degree of feather pecking with different rations. Complete within two-years.

Theme 8. Human Resource Needs

Theme Outcome: The Ontario Egg Industry is the agricultural career of choice

Theme Objective: An optimal number of appropriately skilled people available for all positions in the egg industry supply chain

Potential Areas of Investigation:

- 8.1 Develop producer employer training programs to enable producers to get value from and give value to employees.
- 8.2 Identify and develop specific training programs for industry service roles which will bring efficiencies and profitability to the sector.

Theme 9. Genetics

Theme Outcome: Industry is utilizing emerging gene technologies for management and productivity gains

Theme Objective: Producers are able to manage the new genetics as they are developed by the suppliers.

Potential Areas of Investigation:

- 9.1 Productivity and value
 - Extend the life of the bird and produce higher-quality eggs at the end of the cycle
 - Investigate the potential to develop a commercially acceptable hen that will lay more than one egg per day
 - Develop an egg with superior interior quality and the nutrient enhanced nutrient value to meet market needs
 - Utilize genomics to select lines with improved shell quality

9.2 Health and welfare

- Develop birds with improved behaviour that don't require beak trimming
- Work to select a bird that is better adapted to new housing systems

Theme 10. Environment

Theme Outcome: A measurable reduction in the environmental footprint of the egg industry in Ontario.

Theme Objective: To reduce the environmental impact of egg production in Ontario

Potential Areas of Investigation:

10.1 Research to elucidate those areas where management strategies can be introduced into the Ontario egg industry to reduce carbon footprint on a year on year basis.

10.2 Identify historical 'bench-markable' parameters. Benchmark current productivity against historical results and develop targets for reductions in environmental impact i.e. using 50% less land for the same production.

10.3 Understand water use in the industry and undertake research into why it is used the way it is and how it can be more efficiently utilized.

10.4 develop mechanisms to improve water quality in and around layer farms - less phosphorus and nitrogen released to the water system.

Theme 11. Poultry Health

Theme Outcome: A more robust bird and improved management and housing systems has decreased industry reliance on veterinary medical intervention.

Theme Objective: Poultry health is maintained throughout the production cycle with measurably reduced use of medical intervention.

Potential Areas of Investigation:

11.1 Research on different housing systems to find those that are optimal for hens' health

11.2 Research to identify and develop new, effective vaccines

11.3 Develop "Flock Health Systems" that keep birds healthy over entire production cycle.





Ontario Turkey Sector

Theme 1. Turkey Welfare

Theme Outcome: By 2020 welfare concerns will be eliminated.

Theme objective: To engage the entire value chain in developing best practices for ensuring that a high standard of turkey welfare is maintained from hatchery to slaughter plant.

Potential areas of investigation:

- 1.1 Review transportation and develop better mechanisms, protocols and systems for live turkey transport
- 1.2 Research the economic impact of losses/downgrading due to substandard welfare management along the entire value chain
- 1.3 Work towards a better understanding of the causes and management of leg problems and breast blisters
- 1.4 Undertake research to develop genetic solutions to the problem of leg problems
- 1.5 Develop improved litter management systems to alleviate problems with breast blisters
- 1.6 Review potential mechanisms (possible education campaign) to improve the public perception of culling/euthanasia

Theme 2. Turkey Health

Theme Outcome: By measures such as outturn at processing and veterinary survey, Ontario turkeys are considered healthier in 2020 than in 2014

Theme objective: To measurably reduce the use of antibiotics in the Ontario turkey industry while maintaining the overall health status of the provincial commercial flock.

Potential areas of investigation:

- 2.1 Reducing the need for antibiotics:
 - Develop systems that help reduce the use of antibiotics in the industry (commercial scale trials of probiotics for example)
 - Continue to seek probiotic solutions to common health problems
 - Seek to identify antibiotics specific to poultry production that do not impact the human population
 - Develop education programs (barn management) aimed at reducing reliance on medication
- 2.2 Management interventions:
 - Work with hatcheries to prevent disease early in the life of poults
 - Investigate if there is any correlation between underperforming poults and specific batches coming from the hatchery (early vs late).
 - Understand the cause of and eliminate yolk sac infection
 - Continue to investigate 'smarter' ways to implement biosecurity on turkey farms
- 2.3 Genetic Solutions
 - Use genetics to create poults that are more robust, have better livability and are less susceptible to disease
 - Investigate genetic solutions to eliminate roundheart (Spontaneous Turkey Cardiomyopathy - STC) related to young poults and growth rate
 - Investigate why some poults flip and work to determine if this problem is genetically linked

Theme 3. Turkey Production

Theme Outcome: More precise feed formulations and accurate feeding systems are driving turkey productivity improvements.

Theme objective: Develop feed ingredients and create feeding systems that more closely meet the needs of the turkey at every stage of growth.

Potential areas of investigation:

- 3.1 Genetic research to produce better feed conversions and the consequent shorter growth cycles
- 3.2 Feeding trials to ascertain more precise needs of the turkey throughout its growing phases – research ways to reduce feed and water intake without compromising productivity.
- 3.3 Research potential new/alternative feed ingredients and reduce processing costs
 - Use genetic tools to manipulate/modify feedstuffs to reduce processing costs
 - Develop tools to accurately determine quality of fed ingredients
 - Undertake research to ascertain nutrient losses during processing
- 3.4 Examine ways to improve water quality to best meet birds needs
- 3.5 Create feed formulations to reduce ammonia emissions and nutrient losses to manure (this is work that can be undertaken across the poultry sectors)
- 3.6 Collaborate with breeders to identify semen sex chromosome to create more toms (right ratio)
- 3.7 Develop education information on management techniques to help producers manage:
 - Cannibalism
 - Picking
 - Litter
 - Arthritis

Theme 4. Product Quality

Theme Outcome: The nutritional attributes of turkey are well understood and messaging to customers and consumers is reflecting this.

Theme objective: Manage all aspects of production, transport, processing and marketing to ensure that the nutritional attributes of turkey meat are retained in the product.

Potential areas of investigation:

- 4.1 Identify the key components of the true nutritional attributes of turkey meat
- 4.2 Seek to gather evidence from around the world to demonstrate that turkey meat has specific, unique nutritional attributes.





Ontario Broiler Hatching Egg & Chick Sector

Theme: Production

Theme Outcome: Sustainable returns on investment are being achieved through the application of new technologies and management practices along the hatching egg sector value chain.

Theme objective: The hatching egg industry has the tools and the knowledge to be able to make objective production management decisions that drive productivity and profit.

Potential areas of investigation:

- 1.1 Investigate the use of alternative, cheaper, more effective feeds and feed ingredients.
- 1.2 Identify where energy efficiencies and consequent cost savings can be made and quantify the savings (direct and indirect). Develop a simple education message.
- 1.3 Research to elucidate the major causal agents of reduced hatchability, substandard chick quality and livability.
- 1.4 Because the genetics of broiler chickens have been manipulated to meet a market demand for meat production not fertile egg production, investigation of the following production areas is required:
 - Management of fertility rates – develop practical mechanisms to determine where the fertility problem lies (within the males or females)
 - Managing the emerging incubation problems related to accelerated embryo development - systematically investigate specific changes in metabolism in the embryo in new strains
 - Understanding metabolic disorders in the developing chicks associated with changing genetics
 - Feeding systems that manage body weight and growth in a welfare friendly manner.
 - Managing the increased nutritional requirements for optimizing production



Ontario Chicken Industry

As we consider the role of research, development and education (RDE) in our business, the relevant issues for us are strategy, performance, management and governance.

CFO has a strong commitment to applied research, development and education (RDE) as a means to achieve our CFO and Ontario industry business vision. High quality, value-added, business – implementable RDE can drive and support Ontario growth, competitiveness and sustainability.

Accordingly, CFO will champion and support RDE with supporting marketing/communications to promote industry outcomes.

CFO's RDE Strategy 2013

“To enhance the profitable and sustainable production and marketing of high quality, safe and healthful Ontario chicken for domestic and export markets by guiding, directing and investing in the generation, adaption and application of innovation; science, engineering and technology; knowledge and education”

CFO will support research directions and specific initiatives that reflect the needs of Ontario industry, as expressed in five core pillars:

1. profitable growth- *initiatives that support Ontario's growth objectives and improve business opportunities*
2. productivity- *initiatives that improve the efficiency and profitability of stakeholders*
3. competitiveness- *initiatives that strengthen existing and/or build new Ontario competitive advantages*
4. sustainable resource management- *initiatives that enable the industry to continue to provide high quality, safe and healthful chicken to consumers*
5. policy and regulatory development- *initiatives that support the development and implementation of efficient and effective policies, regulations and regulatory frameworks to meet the objectives of the CFO and Ontario Industry Strategic Plans*

Our RDE investment priorities will focus and concentrate investment funds towards activities which have the highest potential impact for targeted Ontario outcomes.

Of critical importance is the commercialization potential of RDE investments (practical, implementable, fast-to-market) thereby achieving positive business impacts within a reasonable time frame, i.e. preference for shorter term (one to two years) paybacks.

Our investment priority, wherever possible, is to support Ontario-based resources wherever possible to encourage, build and sustain Ontario human resources capabilities and technical infrastructure. We recognize that, over time, this may represent an Ontario competitive advantage.

In addition, wherever feasible, CFO will align its RDE priorities with Ontario Government priorities. This requires proactive consultation and collaboration initiatives.

Our strategy also recognizes the significant role that **private commercial RDE** (Canadian and International organizations) contributes to the Ontario chicken industry across a broad range of industry domains including feed, breeding, pharmaceuticals, production technology and equipment, etc. For the most part, these business organizations very effectively offer their distinctive value propositions directly to their customers. It would not be fiscally responsible for CFO to duplicate these initiatives. However, Ontario should have disciplined processes for monitoring, assessing, accessing and sharing of relevant private RDE outcomes.

CFO's RDE Strategy continued,

Our strategy also recognizes the significant opportunity for **academic RDE** (Canadian and International educational institutions) to contribute to the Ontario chicken industry. It would not be fiscally responsible for Ontario to duplicate these initiatives. However, Ontario should have disciplined processes for monitoring, assessing, accessing, adapting and transferring appropriate academic RDE science, processes and technologies for the benefit of the Ontario industry.

Our strategy also recognizes the role, responsibility and significant synergistic opportunity of the **Canadian Poultry Research Council-led national poultry RDE program**. The program and

resources of the national initiative are under development in the areas of research, education and technology transfer.

Again, it would not be fiscally responsible for Ontario to duplicate CPRC national initiatives. However, given Ontario's market size, business infrastructure and scale, its leadership position within the Canadian system and RDE strategy goals, Ontario should champion and collaboratively support national RDE priorities and initiatives. This will require accountability to targeted outcomes, an operating plan and appropriate resources.

RDE Performance: Ideas into Action

Our goal is to develop RDE proposals and other projects to accomplish the objectives and priorities established in the RDE strategy.

CFO recognizes two types of research projects to accomplish the objectives and priorities identified in the RDE mission,

- **“Direct research projects”** to address specific industry needs, as per the RDE mission core pillars and priorities

The project deliverable is a complete report of the research results, together with an account of how the results will be transferred into practice

- **“Adaptive research projects”** to develop existing completed research into practical applications

The project deliverable is a practical product or application based on research evidence that will be used to enhance the growth, competitiveness and sustainability of the industry as well as a report outlining the important lessons learned in the development process

RDE Priorities: Focus and Concentration

To facilitate focus and concentration on targeted research outcomes, **a segmentation approach will be utilized to direct Ontario and National initiatives** as follows,

1) Ontario business and RDE priorities,

- supply management system effectiveness, efficiency and sustainability
- profitably accessing existing and growth markets to build chicken consumption
- achieving value-chain operating effectiveness and efficiency with an emphasis on-farm production and at the farm-processor interface
- identifying and capturing feed and nutrition productivity
- encouraging worker safety and health
- facilitating farmer-member and processor collaboration

2) National business and RDE priorities,

- enhancing food safety
- enhancing food supply chain security
- proactive risk management, particularly poultry welfare and poultry health
- antimicrobials
- more effective traceability
- environmental sustainability
- WTO and bi-lateral trade
- economic adulteration and import control practices

We recognize the crucial role of ongoing, focused **consultations and collaborations** amongst value chain stakeholders in the generation of RDE priorities, projects and activities that arise from industry needs reflecting important trends, opportunities and issues; and in the transformation of knowledge produced by research into useful applications.

Our principle value chain stakeholder groups include CFO farmer-members, Ontario primary processors/slaughterhouses, Ontario value-added food manufacturers, CFO employee-associates and colleagues, and government. We will continue to refine and develop information sharing, collaboration and communication processes that enhance stakeholder understanding and adoption of value-added RDE.