



Growing Forward

CANADIAN AGRICULTURE AND FOOD TRACEABILITY R&D STRATEGY

A Proposal for Action

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September 2009



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Canadian Agriculture and Food Traceability R&D Strategy

A Proposal for Action

Prepared for the Industry-Government Advisory Committee (IGAC) on traceability under the direction of the Traceability R&D Core Strategy Development Leadership Team

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Canadian Agriculture and Food Traceability R&D Strategy:

A Proposal for Action

INTRODUCTION

In June 2006, Federal/Provincial/Territorial Ministers of Agriculture committed to phasing in a National Agriculture and Food Traceability System (NAFTS), starting with livestock and poultry. An Industry-Government Advisory Committee on traceability (IGAC) was established to lead the development and implementation of a national traceability system for the livestock and poultry components of NAFTS. IGAC has taken the lead in developing traceability implementation plans for the four priority species of livestock (cattle, hogs, sheep and poultry). Other livestock sectors are now also working on implementation plans (e.g., cervid, equine). IGAC has also established national livestock traceability data standards and performance targets.

More recently in July 2009, Federal/Provincial/Territorial Ministers of Agriculture, with the exception of Saskatchewan, committed to move forward on a comprehensive national traceability system for livestock and poultry, which is critical for managing animal health and food safety issues, as well as expanding market access and driving efficiencies. They agreed that a mandatory comprehensive national system for livestock traceability will be in place by 2011 and that implementation will be supported by national funding and regulatory framework. Ministers committed to engage key industry groups on the timing of implementation for each species. The *Growing Forward* policy framework and *Agricultural Flexibility Fund* will provide support for key elements of the national system. Ministers also discussed the need for traceability for all sectors.

IGAC identified seven critical issues in the development of the livestock component of NAFTS. These include:

- i. Information Sharing – address privacy, confidentiality, and authorities to collect, keep and share information;
- ii. Cost Sharing – develop a practical cost-share model;
- iii. Communications – develop common and consistent messaging;
- iv. IT Guidance – comparable expectations of data service providers;
- v. Compliance and Audit – compliance thresholds supported by audit;
- vi. Voluntary-Mandatory – facilitate full reporting of core traceability information; and,
- vii. Research & Development – develop a national R&D strategy for agriculture and food traceability.

Project purpose and scope

This report focuses the 7th component, namely the development of a 2010-2015 Canadian Agriculture and Food Traceability Research and Development Strategy. A Traceability R&D Core Strategy Development Leadership Team has been created for the purpose of leading the development of a 2010-2015 Canadian Agriculture and Food Traceability Research and Development Strategy.¹ The scope of the strategy will be broader than Livestock and Poultry. The Traceability R&D Core Strategy Development Leadership Team provided oversight in the preparation of this report. The Team includes traceability technology users, researchers, service providers, funding agencies, extension officers and policy-makers. See Appendix A for a list of members.

The expected outcome of the implementation of such a strategy will include:

- i. Identify and communicate research priorities;
- ii. Communicate on-going projects and projects' findings;
- iii. Provide a forum where collaborative work between governments, producers' groups, service providers and the private sector is nurtured;
- iv. Facilitate and measure technology adoption; and,
- v. Provide for sustainable funding in support of research priorities.

The Strategy will serve as a *guiding document* to channel the complementary and collaborative interests of traceability technology users, researchers, service providers, funding agencies, extension officers and policy-makers. While the Strategy will provide longer-term direction, operational flexibility will be the domain of the Stakeholders. A strategic management system is ultimately needed to differentiate and address the required elements of planning, leadership, implementation, and change management geared at strengthening collaborative work.

The more detailed elements of the scope of the project as specified in the terms of reference for the Traceability R&D Core Strategy Development Leadership Team are outlined below:

- i. Consideration of strategy development, leadership, implementation, and *management. (*Strategy revitalization, problem-solving, status/progress monitoring, measurement, and reporting).
- ii. Future-orientated consideration of trends, critical issues, and drivers for trace R&D; both domestically and internationally.
- iii. Articulation of a compelling vision to 2015 including strategic outcomes, core beliefs/values translated into guiding principles, positioning.

¹ Traceability R&D Core Strategy Development Leadership Team of the Traceability Industry-Government Advisory Committee TERMS OF REFERENCE, July 2009

- iv. Identification of outcome measures of success (goals) to provide feedback on progress towards the vision. Predetermine the focus areas for measurement; high level outcome measures that transverse the strategic outcomes.
- v. Current state assessment – SWOT internal + external analyses.
- vi. Identification of core strategies to enable achievement of strategic objectives; bridge current state to vision.
- vii. Determination of a process including responsibility, for an annual review and update of the Strategy. The review should incorporate implications of emerging issues, problems, and changes in the environment; summary/compilation of progress and results.
- viii. Recommendations for on-going strategic management, progress and results reporting, information exchange and communication with key Stakeholders.
- ix. Process for identifying R&D priorities.
- x. Exploring sustainable investment opportunities.
- xi. Not included in the scope:
 - Identification of specific research and development priorities
 - Non agriculture and food sectors

This report was commissioned in July 2009 as a follow-up to the Trace R&D 2009 Conference and Workshop with the objective of developing an agriculture and food traceability R&D strategy document for consideration by IGAC at its Montreal meeting in early October 2009. Given the very tight timeframe for this report, not all of these elements could be explored in full detail.

Project procedures

This first draft of this report drew on information and suggestions gathered at the Trace R&D 2009 conference and workshop in June 2009, web searches and a literature review. This draft was being distributed in early August to the participants at Trace R&D 2009, and selected other stakeholders, for feedback and suggestions. The current draft takes into account written comments received from 17 respondents, plus a more detailed set of recommendations for next steps.

Organization of report

After a brief background on traceability and a vision for traceability in agriculture and food, the report examines the concept of an R&D strategy, and the current state of agriculture and food traceability R&D in Canada. The fifth section outlines the establishment of an R&D strategy, and a framework for implementing the strategy. The conclusions and recommendations are summarized in the last section.

BACKGROUND

What is agricultural and food traceability²

Although there are many different perspectives on traceability, for purposes of this report traceability is taken to mean the ability to follow an item, or a group of items, whether animal, plant, food product or ingredient, from one point in the supply chain to another, either backwards or forwards. From that basic concept, traceability definitions vary according to the objectives of those who want to trace items and the degree and type of assurance or reliability required. However, regardless of the concept, each traceability system requires three elements: a means of identification for the product or component (an identifier); product information in a retrievable form (i.e. what, where from, where to, when and how) and, a linkage between the identifier and the product information. (Canadian Traceability Handbook, September 2005). This can be simplified to three dimensions:

- i. Unique premise (or location) identification
- ii. Unique product identification
- iii. All movement records (between all premises along the product life cycle).

Although it is beyond the scope of this report to delve into the details and intricacies of agriculture and food traceability, it is important to note the key drivers behind the evolution of traceability. Eric Aubin, in his presentation to the Trace R&D 2009 Workshop³, summarized succinctly the objectives of agriculture and food traceability which have been approved through the IGAC process:

- i. Enhance the ability to manage an emergency resulting from a food safety issue, a disease outbreak or a natural disaster
- ii. Enhance industry's market access, provide added-value

Sanderson and Hobbs (2006) have broadly defined five roles for traceability (and quality verification) systems:

- i. Improved inventory and logistics management;
- ii. Improved management of food recalls in the event of a food safety problem;
- iii. Limiting the broader(public) impacts of food safety or herd health problems;
- iv. Strengthening due diligence and liability incentives; and,
- v. Demand-side incentives, including facilitating product differentiation strategies and providing stronger economic signals to producers

Sanderson and Hobbs go on to elaborate. For traceability systems to be effective and useful to the industry they must be functional, reliable and credible (Farm Foundation, 2006), as well as provide effective incentives to the appropriate supply chain members. Traceability systems need to be functional, meaning they must be workable in their application. Implementation must be

² See Appendix B for a more detailed commentary on the evolution of traceability in Canada.

³ Eric Aubin, Traceability R&D Strategic Workshop: Context, objectives, agenda

possible within the current industry structure otherwise changes need to occur if the program is to succeed. The program must be reliable. The outcomes of the program must be both accurate and consistent. Traceability programs must be credible with all stakeholders involved, including consumers. If the program is not designed such that it is credible with all parties it will be ineffective regardless of its functionality and reliability. Equally important, the system must provide tangible and appropriate incentives for compliance to all parties involved.

An interesting concept, entitled Full Value Traceability⁴, focuses on traceability for consumer product companies. Full Value Traceability differs from most current approaches to traceability in two ways:

- i. Many traceability activities today are driven by the food safety issue⁵. This focus on protection and risk mitigation creates a defensive traceability posture for many companies. While food safety is critically important, Full Value Traceability adopts a more strategic view of transparency and leverages the availability of information to empower products and brands to more credibly market functionality and responsibility claims.
- ii. Full Value Traceability also requires a more integrated approach to transparency that addresses the dynamics of today's complex physical and informational supply chains. It recognizes the value of engaging with a broad set of stakeholders and the need for integrated enabling solutions.

One of the challenges facing the implementation of traceability in the agriculture and food sector is still relatively little buy-in for traceability from industry. The OnTrace presentation⁶ at the Trace R&D 2009 conference summarized the issues well. These included:

- i. Consumers demand for food confidence is rising –Who pays?
- ii. Awareness & communication of cost-benefit is weak
- iii. Practical information is scattered and hard to access
- iv. Accessing reliable information & results of previous work is tough
 - Where do you go to research successes and lessons learned?
 - Who has already developed a solution that works and can be applied?
- v. Confusion still persists on the nature of traceability
 - Is it a tool? Is it just food safety?
 - Does it raise costs? Lower them?
 - Does it strengthen accountability? Increase liability?

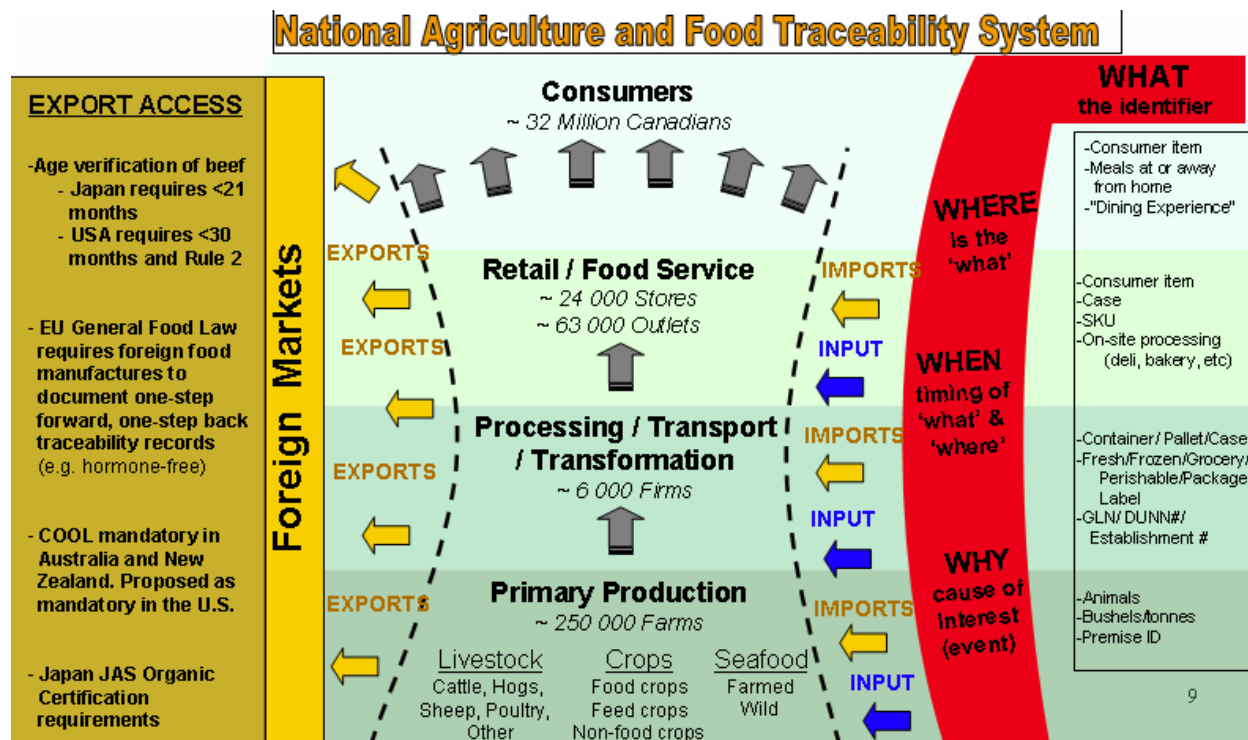
⁴ Guy Blissett, *Establishing Trust Through Traceability*, IBM Institute for Business Value 2007

⁵ It should be noted that almost all of the traceability systems in Canada have been developed to minimize the impact of animal disease outbreaks which are not necessarily a food safety issue.

⁶ **Bridging the Traceability R&D Gap: An Ontario Solution**, presentation to Trace R&D 2009 Conference June 2009

Traceability Vision and Value Proposition

A National Agriculture and Food Traceability System (NAFTS) needs to encompass 250,000 farms, 6,000 processors and transporters, 87,000 retail and food service outlets with imports and exports throughout. A NAFTS must clearly define the “what”, “where”, “when” and “why” of traceability. See Chart below.



Source: *Canada's National Agriculture and Food Traceability System: Strategic Management Plan*, draft, August 2008

From this, one can evolve a **vision** for agriculture and food traceability. For purposes of this report, the vision developed through the IGAC process is for

a secure National Agriculture and Food Traceability System to better serve citizens, industry and Government. The system will provide timely, accurate, and relevant information to enhance emergency management, market access, industry competitiveness, and consumer confidence.

An essential next step is to translate this vision into a **value proposition** for traceability to which stakeholders in the value chain can relate. This was succinctly summarized by Cargill's Len Penner at the Trace R&D conference in the form of three questions:

- Can it enhance our competitiveness?
- Can it create new markets?
- Can it enable us to hold our current market position and protect our brand?

Most livestock producers see traceability as reducing the economic impact of disease outbreaks, but the beef industry also sees the potential marketing advantages. An illustration of this is provided by the Canadian Beef & Cattle Market Development Council which developed an industry-wide, global brand strategy called the Canadian Beef Advantage (CBA)⁷. The main objectives of the CBA are to: expand and secure Canada's access into markets that will accept all beef cattle products, and clearly define Canadian beef and its advantages over competitors. The CBA value proposition for its global brand strategy (a form of traceability) includes:

- i. **Everyone can access information:** The ability for anyone on the CBA program to access information along the value chain and to capitalize on the advantages listed above will depend on the adoption of the industry's value proposition.
- ii. **Producer Benefits:** Defining production practices contributes to increasing the overall value of Canadian beef, creating a standard of excellence recognized by industry and consumers. Individual producer production practices will contribute to increasing the overall value of Canadian beef on all levels - domestic, national and international.
- iii. **Packing & Processor Benefits:** Packing plants will be able to promote the beef from animals on the program as age-verified, fully traceable back to the herd of origin and as having health records. Results in higher carcass values over time, as demand for beef from cattle on the CBA program increases domestically and internationally.
- iv. **Retailer Benefits:** The benefit to retailers, over time results in higher carcass values as consumer demand for beef from cattle on the CBA program increases domestically and internationally. As consumers demand more traceability in their food, offering the strong Canadian brand increases consumer demand and satisfaction even further.

Why an R&D Traceability Strategy for Agriculture and Food?

A cursory glance at the presentations at the Trace R&D 2009 Conference and Workshop would suggest that there is considerable traceability research activity already underway in Canada. A closer review, however, suggests that much of the focus is on short term issues and the development of technology. What is being done can be characterized as testing existing technologies under different conditions, and demonstrating to potential users how technologies can work. Dean Michael Trevan of the University of Manitoba's Faculty of Agricultural and Food Sciences, in his summation remarks after the first day of the Trace R&D 2009 Conference, stated rather succinctly that there appeared to be a lot of traceability technology in search of a problem to solve. In addition to technology development and testing, a major R&D effort should be focused on socio-economic studies relating to understanding the motivation for traceability implementation and how the costs and benefits should be apportioned along the value chain. This implies a longer term perspective and one that necessitates policy and regulatory analyses. Also, most R&D activities are focused on the livestock sector; this needs to be broadened to encompass other agricultural and food sectors.

⁷ Canadian Beef Advantage, <http://www.cattle.ca/global-brand-strategy-objectives/>

Other over-arching issues include: the establishment of standards based on science rather than political expediency, establishing procedures for information management (including confidentiality considerations and sharing) and exploring the establishment of international collaboration in agriculture and food traceability. Another important strategic issue is the establishment of procedures for assessment of traceability systems and related technology.

On the political front, the recent announcement by FPT Ministers of Agriculture that a mandatory comprehensive national system for livestock traceability will be in place by 2011 and that implementation will be supported by national funding and regulatory framework will require a high priority be placed on R&D activities that will underpin the implementation of this policy direction. These R&D activities should be undertaken by arms length organizations offering independent advice.

THE CONCEPT OF AN R&D STRATEGY FOR AGRICULTURE AND FOOD

Research Strategy versus Research Projects

A research strategy or strategic framework focuses on the process of identifying and communicating research needs and how these needs are to be met. It should include a strategic management system to differentiate and address the required elements of planning, leadership, implementation, and change management geared at strengthening collaborative work. Research and demonstration projects, on the other hand, focus on undertaking the research and demonstration itself. This report is concerned with **strategy** rather than specific **research projects**.

Framework for Science and Technology Strategy in Canada

Although not directly part of this report, it is useful to look at the framework for science and technology strategy at the national level and to give an example of a provincial strategy. See Appendix C for an outline of Canada's Science and Technology Strategy (2009), Agriculture and Agri-Food Canada's Science and Innovation Strategy (2006) and Alberta Agriculture Research Institute's Research and Development Framework.

CURRENT STATE OF AGRICULTURE AND FOOD TRACEABILITY R&D IN CANADA AND BEYOND ⁸

Trace R&D 2009 Conference and Workshop

The Trace R&D 2009 conference and workshop in early June 2009 in Winnipeg brought together more than 200 stakeholders from a diversity of backgrounds– users and providers of traceability systems, government, and academic researchers– with a view to forging a coordinated, targeted, and needs-driven Canadian Traceability Research & Development Strategy for the agriculture and food sectors. Workshop objectives were to:

- i. Identify and prioritize critical issues impacting both work in progress and prospective traceability research and development initiatives.
- ii. Articulate a compelling vision for a five-year Canadian Traceability Research & Development Strategy. The vision will encompass strategic outcomes and guiding principles that will channel investment of resources, effort and collaborative work across various fields of work.
- iii. Determine the next steps in supporting collaboration, information exchange, and further development of the Strategy.
- iv. Recognize work in progress, and build on information presented at the Conference (Day 1) and harvest common ideas for a Strategy that serves the complementary interests of industry, government and the research community.

A review of traceability R&D activities⁹ and related institutions lead to the following observations:

- i. Most Canadian agricultural faculties conduct some traceability studies, but these are mainly focused on socio - economic aspects. It is interesting to note that the University of Calgary's new faculty of veterinary Medicine and the Southern Alberta Institute of Technology's RFID lab are working with the Canadian Cattle Identification Agency on RFID tag technology.
- ii. Approximately 50 private companies involved in traceability R&D have been identified to provide services in Canada, a significant increase over the last years. Most of these companies sell products to identify and record the movement of livestock and data management software which attempt addressing producers' needs.
- iii. The process of identifying national research priorities in Canadian agriculture and food is less robust with the demise of the Canadian Agrifood Research Council (CARC) and its

⁸ This section draws upon the Trace R&D 2009 Workshop Background document prepared by the Workshop Planning Committee who drew upon material from **Concept Plan for Strategy Development: Canadian Traceability Research & Development Strategy, 2009 – 2015** which was developed by Cindy Bishop, a Process Consultant with Alberta Agriculture and Rural Development

⁹ For a review of traceability studies and projects, see Eric Aubin, *Traceability Of Livestock And Animal Products: Literature Review Of Studies Conducted In The Americas And The European Union*, 2007, and AAFC, *The Canadian Integrated Traceability Program: Summary of Pilot Projects*, 2008

Inventory of Canadian Agri-food Research (ICAR). The decline in resources for agricultural extension has made communication with stakeholders in the value chain even more challenging.

Dimensions of an R&D Strategy for Traceability

The Workshop Backgrounder document identified four different dimensions of an R&D strategy for traceability:

- i. Components of an agriculture and food R&D strategy;
- ii. Stakeholders;
- iii. Fields of study; and
- iv. Sectors.

Components of an agricultural and food traceability R&D strategy include:

- i. The identification and communication of needs;
- ii. The provision of R&D funding and policy support;
- iii. The availability of expertise and the identification of collaborative partners;
- iv. The assessment of findings and technologies developed; and,
- v. Knowledge transfer through the communication of results and the demonstration of technologies.

A national traceability R&D strategy will need to cover all of those phases because of their interconnectivity importance. A preliminary current state Strengths Weaknesses Opportunities Threats (SWOT) analysis was conducted in preparation for the Workshop. See Appendix D for this analysis.

Different **stakeholders** are involved in each of the above mentioned elements. Hence, the Strategy will need to be developed with an input from all of these stakeholders, including:

- i. The users of the technology;
- ii. The private sector which develops technologies;
- iii. The scientific community;
- iv. Policymakers;
- v. Funding agencies; and,
- vi. Communication and extension agents.

In considering the users of technology, it is important to recognize that there are those in the value chain that make use of the technology as well as related traceability information. This would include primary producers, processors, distributors and retailers. In addition, a very important category of users are Chief Veterinary Officers and Chief Medical Officers of Health. These are the people who need to use the information to control outbreaks of disease or food contamination.

Traceability R&D work being conducted is mainly technology related. However, the strategy should be broader and encompass, at a minimum, all of the following **fields of study**:

- i. Technologies and systems facilitating the identification and movement tracking of animals, food and agricultural products;
- ii. Market access, cost, benefit and risk mitigation analyses;
- iii. Sectors and critical points where traceability should be used;
- iv. Hurdles and solutions to traceability technology and system adoption;
- v. Consumer confidence and demand for traceability;
- vi. Traceability data and database management;
- vii. Traceability legal and policy analysis; and,
- viii. Systems facilitating the identification and characterization of premises.

Sectors: The direction provided by the FPT Ministers of Agriculture is the development of a National Agriculture and Food Traceability System, starting with livestock and poultry. Collaborative work between sectors would strongly benefit the development of traceability systems. The Strategy should therefore cover not only the livestock and poultry sectors, but also other agriculture and food sectors engaged in the development of traceability systems.

Critical issues faced in Canadian Traceability R&D

The Backgrounder document identified a number of strategic issues in traceability R&D. These included:

- i. Few research priorities identified and communicated;
- ii. Little information and technology transfer among sectors;
- iii. Little communications and extension conducted;
- iv. No national, long term vision; and,
- v. No national, coordinated approach leading to duplication

OnTrace, in its proposal for a National Traceability Science Cluster, also identified a number of challenges for Canadian traceability R&D. These include:

- i. Accessing ideas, research and accomplishments regarding traceability from elsewhere in the world in an efficient and affordable manner;
- ii. Assessing long-term policy and program needs for industry to successfully implement traceability solutions;
- iii. Translating research and other findings into practical cost effective traceability solutions (pre-commercialization) that can be used by Canada's agriculture and agri-food industry;
- iv. Communicating the availability of these tools, their use and their benefits; and
- v. Transferring outcomes and benefits of the work to the public domain.

In addition, workshop participants provided a long list of specific points; many of these fit under the issues and challenges listed above, while others were concerns relating to specific research needs or projects. Some of the suggestions for traceability research are summarized by fields of study in Appendix E.

International Traceability R&D Strategies

National governments are introducing regulations that provide record-keeping and labelling to support international agreements on food trade, such as WTO requirements. While it is generally not necessary for companies to implement a thorough traceability system, some governmental regulations are stricter than WTO minimum requirements. The European Union (EU) has been the first to put minimum traceability standards into law¹⁰. A review of literature and web sites revealed that there were a variety of traceability and traceability R&D activities in other jurisdictions, but very few specific research strategies. (See Appendix F).

GS1 (formerly EAN International) is a global organization dedicated to the design and implementation of standards and solutions to improve the efficiency and visibility of supply and demand chains globally and across sectors. It is governed by a management board composed of key leaders and drivers from multi-nationals, retailers, manufacturers and GS1 Member Organizations. Currently, there are over 104 Member Organisations with one member representing one country. The GS1 Traceability Standard defines business rules and minimum requirements when designing and implementing a traceability system. The GS1 standard uses the ISO 9000:2005 definition of traceability and extended it to include the concepts of “internal” and “external” traceability within the context of supply chain traceability.

Another example is the EU’s **PETER project** (Promoting European Traceability Excellence & Research) which is an international forum for focusing and disseminating the results of a €100 million investment traceability research conducted in the EU. For more details see <http://eu-peter.org/>The mandate for PETER ended earlier this year. Some of the core project parts of the PETER network included:

- i. **SEAFOODPlus**: To implement traceability from live fish to consumption and traceback any element from fork to farm.
- ii. **GTIS CAP**: Geo-Traceability Integrated Systems for the Common Agricultural Policy Project focused on legislation, geo-traceability management, definition of data standards, definition of geo-traceability indicators, and analysis of implementation.
- iii. **GeoTraceAgri**: Geographical Traceability in Agriculture, Agri-Environment good practices goal was to find the extent of geographic traceability of food in all stages of production/storage/distribution.

¹⁰ Source: Sununtar Setboonsarng, Jun Sakai, and Lucia Vancura, *Food Safety and ICT Traceability Systems: Lessons from Japan for Developing Countries*, No. 139, May 2009

ESTABLISHING AN AGRICULTURAL AND FOOD TRACEABILITY R&D STRATEGY

Considerable background work has been undertaken in Canada on traceability R&D and many insightful suggestions were made at the Trace R&D 2009 conference and workshop as to what an agriculture and food traceability R&D strategy might look like. In addition, the Alberta Agricultural Research Institute has spent considerable time and effort in developing a framework for research and investment in its agriculture and food sector. This section of the report attempts to meld the ideas from the various sources, and proposes a structure for managing a traceability R&D strategy for agriculture and food in Canada.

Guiding Principles for a traceability R&D strategy

Many attributes were identified by Workshop participants for guiding principles for a traceability R&D strategy. These are synthesized below. In addition, we reviewed strategic research frameworks for a number of agriculturally related organizations; the guiding principles developed by the Alberta Agriculture Research Institute were especially useful in the synthesis¹¹.

RECOMMENDATION 1: Guiding principles for a traceability R&D strategy should include:

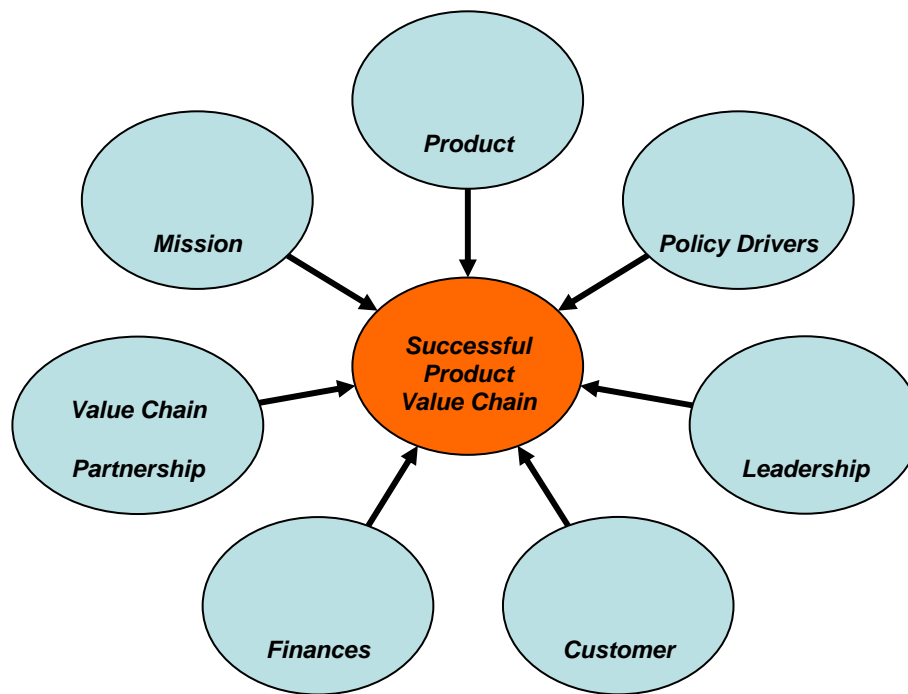
- i. Longer term needs driven national value chain approach***
- ii. Build research excellence with a collaborative spirit, global networks and links with entrepreneurial skills***
- iii. Build a critical mass of world-class scientific personnel in disciplines critical to achieving the vision for Canada's agricultural and food traceability system***
- iv. Support it with appropriate levels of sustainable research program funding***
- v. Ensure discoveries are supported with knowledge transfer, technology commercialization expertise and industry partnerships***
- vi. Fit with other IGAC priorities***

For a product value chain to be successful, it still must, first and foremost, meet the criteria of a successful business or operation. While standard business approaches to successful enterprises are useful, it is important to review additional criteria to ensure the uniqueness of product businesses and value chain approaches are examined as well. The chart below outlines seven important factors that contribute to the success of a product value chain¹²:

¹¹ Alberta's Agriculture Research and Innovation Strategic Framework 2003

¹² Allen Tyrchniewicz, et.al., *Development of Bioproduct Value Chains in the Canadian Economy: A Study of Value Creation, Value Capture and Business Models*, Report prepared for Industry Canada and Bioproducts Canada, July 2006

- i. Mission & Strategy
- ii. Value Chain Partnership
- iii. Leadership
- iv. Customer Focus
- v. Product Process
- vi. Financial
- vii. Policy Drivers



Vision for Agriculture and Food Traceability R&D

A vision for traceability R&D should logically follow from the vision for traceability. That vision was “-- *for a secure National Agriculture and Food Traceability System to better serve citizens, industry and Government. The system will provide timely, accurate, and relevant information to enhance emergency management, market access, industry competitiveness, and consumer confidence.*” Given the guiding principles mentioned above, and a review of comments made by Workshop participants, the draft vision statement presented at the Workshop seems to be generally appropriate for a strategic traceability R&D vision.

RECOMMENDATION 2: The vision for agriculture and food traceability R&D should be:

A coordinated, needs driven and sustainably funded R&D environment supporting the development and implementation of successful traceability systems in the Canadian agriculture and food sectors to 2015

Based on the background document prepared for the trace R&D 2009 conference and workshop, a conceptual framework of a stakeholder responsibility matrix for the components of an agriculture and food traceability R&D strategy is presented below. To make such a framework operational requires a strategic management system to differentiate and address the required elements of planning, leadership, implementation, and change management geared at strengthening collaborative work. Some of these elements are discussed below and a schematic framework is presented.

Stakeholder Responsibility Matrix for an Agriculture and Food R&D Strategy

Tasks	Users of traceability systems	Developers of traceability systems	Scientific community	Funding agencies	Knowledge transfer agents
1. Identification of and communication of R&D needs					
2. Availability of expertise and collaborative partners					
3. Provision of funding support					
4. Provision of policy support					
5. Assessment of research results and technologies					
6. Knowledge transfer					

A good example of such a process was the Alberta Agriculture Research Institute's (AARI) series of stakeholder consultations to establish a new strategic framework for agriculture research and innovation. One of the key results was the identification of critical components necessary to establish an effective R&D System. Stakeholders identified the following critical components as essential:

- i. Leadership, direction, and agreement on an R&D Strategic Framework.
- ii. Enhanced collaboration and partnerships throughout the R&D System.
- iii. Alignment of R&D System with industry goals and needs.
- iv. Advanced human resource capacity aligned with strategic direction and outcomes/priorities.
- v. Strategies and actions that address the needs of the full R&D System.

- vi. Increased public and private investment over the long-term.
- vii. Public/private mechanisms for action, i.e., networks, teams, organizations.
- viii. Public sector funding for priorities and private sector funding for commercialization.
- ix. Effective communication with other global knowledge providers relative to our strategic priorities.
- x. Accountability for goals, outputs and outcomes.

This framework creates a strategic approach for research ensuring that the research and innovation needs required to drive our agricultural industry's future are identified (inclusively by stakeholders) and are met through strategic investment portfolios and funding capacity. Starting with a shared strategic vision for a national traceability system, particularly around the science, technology, knowledge and innovation components, will enable the traceability system to achieve strategic growth targets and outcomes. Through a shared vision and collaborative leadership and governance model, stakeholders will be better able to capture the value of traceability R&D, and convert it into commercial products and knowledge utilization in the Canadian agriculture and food sector. Properly structured and managed, along with due diligence and accountability, the framework can ensure that efforts and resources are focused on priority areas, and will align and guide investment in the traceability R&D System. It will also address the human resources required for the industry and for R&D. This new framework can also serve as a focal point for public policy.

A National Traceability Research and Development Institute

Implementing an agriculture and food traceability R&D strategy in a framework that is inclusionary and collaborative will be a key success factor. Leadership for the management of such a framework will be critical, and must be inclusive and collaborative. Put directly, there does not appear to be an existing “champion” for traceability R&D research, especially of a longer term policy nature.

RECOMMENDATION 3: It is proposed that a National Traceability Research and Development Institute (NTRDI) be established to provide leadership for the management of a framework for implementing an agriculture and food traceability R&D strategy that is inclusionary and collaborative.

NTRDI would not have to be a new “bricks and mortar” institute¹³. Realistically, it would best fit at an academic institution with experience in managing interdisciplinary research and research networks, as well as expertise in food safety and business supply chain management. Academic institutions have credibility in research performance and management, have access to a broader range of research funding programs and provide the valuable by-product of training of graduate students.

¹³ It is too early to consider a “Centre of Excellence” for traceability research at this time since such a centre would pre-suppose the existence of an active research program with well-established researchers at a number of universities. Such a centre might be considered after five years.

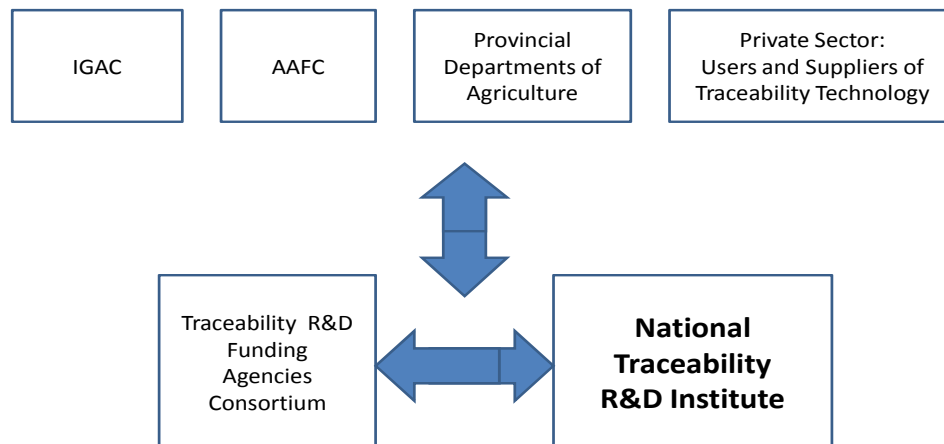
The NTRDI, in collaboration with its stakeholders, would set the strategic traceability research agenda, establish the strategic priorities and ensure that research investments are aligned with the strategic direction. This would be incorporated into a Traceability Business Plan which would be approved by the Board of NTRDI, and would serve as the benchmark for assessing progress and accountability.

NTRDI would require an on-going policy commitment from IGAC, AAFC, provincial departments of agriculture, and the private sector. NTRDI would be separate from IGAC in that NTRDI would focus specifically on research and development, while IGAC has a much broader responsibility for traceability in Canada. NTRDI would be governed by a Board drawn from members of IGAC and other groups identified in the National Traceability Strategic R & D Network schematic below.

RECOMMENDATION 4: NTRDI should work collaboratively with a Consortium of Traceability Research Funding Agencies to facilitate the attraction of long term government and private sector resources to support the strategic direction.

NTRDI would work with a Funding Consortium and other potential research funders to secure on-going adequate resources to fund the opportunities and priorities identified by the strategic networks. One of the greatest benefits the Funding Consortium would bring is the ability and opportunity to provide critical mass of financial resources in supporting NTRDI's strategic research and innovation priorities, while simultaneously honouring the specific mandates of each individual funder. Likely funding sources would include NSERC, SSHRC, AAFC's newly announced Canadian Agri-Science Cluster initiative, provincial funding programs, other *Growing Forward* funding programs and the private sector.

Schematic for a National Traceability Strategic R&D Network



RECOMMENDATION 5: An integral part of NTRDI would be a virtual Strategic Traceability Research Network (STRN).

The Strategic Traceability Research Network (STRN) would provide recommendations to NTRDI regarding the strategic direction and priorities, and would be responsible for identifying key research gaps, opportunities and priorities for traceability R&D. STRN would include working groups organized along fields of study, and would be part of the NTRDI. Establishing links with other research networks, such as the Consumer and Market Demand Network, would be encouraged. STRN and the working groups would include representatives from the full innovation continuum, from basic research through to technology transfer to the ultimate users of the knowledge, technology and/or products. Industry representatives along the value chain to the marketplace, and representatives from other sectors as necessary would be included.

RECOMMENDATION 6: STRN and the Working Groups would monitor R&D activities in other international jurisdictions, and maintain working relationships where appropriate.

RECOMMENDATION 7: The Strategic Research Network, the Funding Consortium, and NTRDI would work together to solicit high quality scientific project proposals aligned with strategic research priorities, and with Canada's technology transfer/innovation/commercialization capacity.

A robust scientific and industry peer review process stewarded by NTRDI would examine proposals and select those that reflect the priorities and strategic direction, at the same time focusing on specific outcomes. An underlying principle of the entire system is scientific excellence, which must guide decisions about outcome driven research priorities and ideas. Research performers, including Universities and Colleges, Federal and Provincial government researchers and private sector researchers, would focus their efforts on outcome driven research and scientific excellence. This focus on scientific excellence would help draw larger financial contributions to the strategic priorities from extra-provincial and industrial funders, as well as non-Canadian sources.

RECOMMENDATION 8: NTRDI would establish a traceability technology assessment mechanism to ensure that appropriate standards are established and followed.

Currently, CCIA and ATQ test some dimensions of new technology relating to traceability. The International Committee for Animal Recording has also set some standards. NTRDI would not have to do the testing, but it is important that national standards be established and monitored.

RECOMMENDATION 9: A key component to the NTRDI framework should be a series of virtual knowledge transfer networks.

These virtual knowledge networks could be subject-specific and membership would include appropriate researchers, technology users and providers, and extension and communications specialists. These networks would be especially important in communicating the assessment of

new technology relating to traceability systems, and would serve as an important link between the private sector and the research networks.

RECOMMENDATION 10: Under the collaborative structure outlined above, stakeholder consultation and input should continue to be an on-going priority for maintaining research strategy relevance.

Regular reviews (annual or biannual) by NTRDI of the roles, responsibilities, outputs and outcomes would use the Framework and System Business Plan as a basis for accountability. Baseline measurements, roadmap steps and regular status of achievement (SCORECARD) should be developed. In addition, NTRDI would ensure that research conferences and workshops similar to Trace R&D 2009 should occur on a regular basis.

Next Steps and Timelines

- Commitment in principle by IGAC to a traceability R&D strategy (as proposed in this report) at October 2009 meeting
- Establish an IGAC working group consisting of “champions” for traceability R&D who will assess the feasibility of establishing an NTRDI (including likely funding sources) and make implementation recommendations for the next meeting of IGAC.
- Convene a follow-up to Trace R&D 2009 in 2010
- If deemed feasible, establish the NTRDI and associated administrative/management structure by July 2010
- Initiate a more structured traceability research information management system, e.g., an e-newsletter on a monthly basis by the summer of 2010.

Measures of Success

- IGAC endorses this proposed strategy in principle
- A champion(s) for a traceability R&D strategy is identified
- Long term sources of funding, both public and private, would be identified
- NTRDI and its related components is established one year from now

SUMMARY OF RECOMMENDATIONS, NEXT STEPS AND CHALLENGES

Summary of Recommendations

RECOMMENDATION 1: *Guiding principles for a traceability R&D strategy should include:*

- i. *Longer term needs driven national value chain approach*
- ii. *Build research excellence with a collaborative spirit, global networks and links with entrepreneurial skills*
- iii. *Build a critical mass of world-class scientific personnel in disciplines critical to achieving the vision for Canada's agricultural and food traceability system*
- iv. *Support it with appropriate levels of sustainable research program funding*
- v. *Ensure discoveries are supported with knowledge transfer, technology commercialization expertise and industry partnerships*
- vi. *Fit with other IGAC priorities*

RECOMMENDATION 2: *The vision for agriculture and food traceability R&D should be:*

A coordinated, needs driven and sustainably funded R&D environment supporting the development and implementation of successful traceability systems in the Canadian agriculture and food sectors to 2015

RECOMMENDATION 3: *It is proposed that a National Traceability Research and Development Institute (NTRDI) be established to provide leadership for the management of a framework for implementing an agriculture and food traceability R&D strategy that is inclusionary and collaborative.*

RECOMMENDATION 4: *NTRDI should work collaboratively with a Consortium of Traceability Research Funding Agencies to facilitate the attraction of long term government and private sector resources to support the strategic direction.*

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RECOMMENDATION 6: *STRN and the Working Groups would monitor R&D activities in other international jurisdictions, and maintain working relationships where appropriate.*

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strategic research priorities, and with Canada's technology transfer/innovation/commercialization capacity.

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- IGAC endorses this proposed strategy in principle
- A champion(s) for a traceability R&D strategy is identified
- Long term sources of funding, both public and private, would be identified
- NTRDI and its related components is established one year from now

Summary of Challenges for a Traceability R&D Strategy

- Need a champion for traceability R&D
- Long term funding for traceability R&D
- Industry buy-in, particularly at the primary production level is weak
- Communication/awareness of traceability issues and benefits is weak
- Development of traceability policy and regulations is more politically driven than science driven

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APPENDIX A Traceability R&D Core Strategy Development Leadership Team Members

Team Member	Role On Project
Eric Aubin (CFIA) CHAIR	Provide perspective from policy
Nilos Korodimas (AAFC)	Secretariat
Bill Ballantyne (Maple Leaf Foods)	Provide perspective from users
Cindy Bishop (Alberta Agriculture and Rural Development)	Provide perspective from policy, strategy development
Christiane Deslauriers (AAFC)	Provide perspective from policy
Morteza Haghiri (Memorial University)	Provide perspective from research community
David Hall (University of Calgary)	Provide perspective from research community
Linda Marchand (Agri-traçabilité Québec)	Provide perspective from users and extension
David Moss (Livestock Identification Service)	Provide perspective from users
Kerry St. Cyr (Canadian Cattle Identification Agency)	Provide perspective from users
Ed Tyrchniewicz (University of Manitoba)	Consultant
Andrew Watt (Ontario Ministry of Agriculture, Food and Rural Affairs)	Provide perspective from funding agency
Susan Wilkinson (IBM)	Provide perspective from private sector
Karin Wittenberg (University of Manitoba)	Provide perspective from research community

APPENDIX B Evolution of agriculture and food traceability in Canada

(excerpted from *Towards a National Agriculture and Food Traceability System*, 2006)

Traceability is not new to agriculture. Tags, tattoos, brands and paper-based logbooks are all elements of traceability employed for many years by both industry and government for a wide variety of purposes. In general, systems were developed independently, involving databases designed to serve a single purpose. Effective results have been achieved, for example measurable genetic improvement or enhanced emergency management; however opportunities to gain efficiencies or to enable additional information uses have not always been identified or realized.

Efforts to co-ordinate livestock traceability initiatives in Canada began in 1990 with the creation of the National Advisory Board on Animal Identification, later transformed into the Livestock Identification Working Group. In 1998, the Canadian Cattle Identification Agency (CCIA) was created to co-ordinate the cattle sector's identification and traceability initiatives. While federal funding has supported the initiation of national systems and their enhancement, ongoing industry commitment provides for their daily maintenance and operation. In 2001, Québec became the first province to formalize its commitment to traceability with the creation of Agri-Traçabilité Québec (ATQ), a not-for-profit industry-government partnership mandated to lead provincial agricultural traceability initiatives and systems.

The creation of CCIA and ATQ demonstrated considerable foresight, by both Canadian industry and governments. At the time, key drivers influencing change were crises overseas as the U.K. and other EU countries were devastated by the economic, political and consumer confidence issues resulting from BSE, Foot and Mouth Disease and, in Belgium, dioxin contamination in livestock feed. The value of uniquely identified and readily traceable animals was made abundantly apparent – and failures in the system were visible to the entire world.

The value of mandatory systems in Canada also began to be understood. The federal government, under the authority of the Health of Animals Act, introduced regulations for national cattle and bison identification in 2001 and for sheep in 2004. Québec created a comprehensive regulatory framework for animal identification, premises identification and animal movement recording first for cattle (2002), followed by sheep (2004).

In 2003, the signing of the Agricultural Policy Framework (APF) signalled the importance federal and provincial governments placed on traceability and solidified program funding for national agriculture and food industry organizations to continue to advance traceability. In 2003, Can-Trace and in 2005, the Canadian Livestock Identification Agency (CLIA) were created; the first multi-sector or multi-commodity initiatives designed to lead the coordination and development of common national standards.

Industry continues to forge ahead, piloting identification devices; developing traceability strategies; initiating voluntary premises identification and movement recording systems; and identifying and responding to market opportunities. Individual agriculture and food chain

participants are recognizing the value of traceability. Facility level systems are gaining widespread adoption, particularly in the processing, distribution and retail sectors.

In 2005, the federal, provincial and territorial (FPT) governments formally recognized the unique opportunity to use traceability information systems for many applications, the benefits derived from traceability both for public and private good and the importance of a coordinated, industry-government approach by creating a FPT Traceability Task Team (TTT). Providing advice and recommendations to the FPT Policy Assistant Deputy Ministers (ADMs) for their consideration and endorsement prior to review and commitment from the FPT Deputy Ministers (DMs) and Ministers, the FPT TTT was charged with identifying government needs and articulating a vision for a National Agriculture and Food Traceability System, starting with livestock and poultry.

These concepts have been endorsed by FPT ministers and were supported in their June 2006 announcement: *“Recognizing industry’s leadership and foresight in building the foundation for livestock traceability, ministers committed to phasing-in an enhanced National Agriculture and Food Traceability System applicable to all livestock and poultry. They agreed to create an industry advisory group to work with officials to develop an implementation plan. Within the national framework, provinces/territories have agreed to lead the implementation process for multi-commodity premises identification, with a goal to have the infrastructure for animal and premises identification in place by December 2007.”*

APPENDIX C Framework for Science and Technology Strategy in Canada

Canada's Science and Technology (S&T) Strategy

The federal S&T Strategy, as outlined in *Mobilizing Science and Technology to Canada's Advantage: Progress Report 2009*, seeks to foster Canada's competitiveness through investments and activities in three key areas:

- i. Entrepreneurial Advantage;
- ii. Knowledge Advantage; and
- iii. People Advantage

It is founded on four core principles:

- i. Promoting world-class excellence;
- ii. Focusing on priorities;
- iii. Fostering partnerships; and
- iv. Enhancing accountability

Pierre Bilodeau of NSERC noted the critical role of the private sector in that an R&D strategy provides a basis for an appropriately balanced portfolio of R&D programs in alignment with the business strategy, and the proper identification and utilization of resources to effectively execute them. He went on to emphasize the importance of strategic alliances.

AAFC's Science and Innovation Strategy

Looking more specifically at Agriculture and Agri-Food Canada's Science and Innovation (S&I) Strategy (May 2006), the strategic goals are:

- i. Focusing our science and innovation investment – tightening the linkage between our science and innovation investment portfolio and national priorities;
- ii. Delivering world-class science and science management – enhancing our global reputation for science excellence;
- iii. Partnering for impact – addressing the need to catalyze a healthy, vibrant agriculture industry and rural economies; providing scientific knowledge to support public priorities and develop agri-based solutions for government and industry that address policy objectives in health care, environment, energy, biosecurity, food safety and quality, rural community development and international trade;
- iv. Extending integrated national science and innovation capacity to the bio-based economy – working with science partners to ensure that the Canadian agriculture and agri-food sector has access to the science capabilities needed to support sustainable profitability and growth in the 21st century;
- v. Accelerate the adoption and commercialization of scientific knowledge – Serve as catalyst for industry innovation results addressing the need to: delivering commercial

- impact for Canadian industry; preparing Canadian industry to receive the benefits of our S&I results;
- vi. Enhancing strong leadership and stewardship – addressing the need for continued consultations and strategic advice; and
- vii. Improve decision-making through science knowledge and advice – ensuring government, industry and public decision-making is informed by science and research results and implications. Develop effective science communications.

AAFC recently announced a number of funding initiatives under the Growing Forward Program, including the Canadian Agri-Science Clusters initiative. The initiative is intended to enable key industry-led agricultural organizations to mobilize a critical mass of scientific and technical resources to support innovation strategies for enhanced profitability and competitiveness of their sector. The Initiative will encourage the development and implementation of comprehensive applied agricultural science plans and technology transfer and commercialization strategies that address the priorities established by the industry. Each Canadian Agri-Science Cluster will address the challenges of technology, organization and knowledge management while developing new agri-products, practices and processes that will increase agri-industry opportunities for profitability and competitiveness.

Alberta Agriculture Research Institute's Research And Development Framework

Although any number of provincial strategic research frameworks could have been chosen, we chose Alberta's in that the process of arriving at a strategy and setting priorities is well established and is known to the author of this report. Alberta's Agriculture Strategic Research and Innovation Framework is comprised of six goals, which must be achieved with alignment across the research and development continuum and within the life sciences context. Specific strategies and outputs support achievement of these six goals. The six goals focus on alignment, communication, commercialization, investment, accountability and leadership, and human resources.

- i. **Goal 1:** Alberta's Agricultural Research and Innovation System is focused and guided by industry and public needs, Alberta's comparative advantage and market opportunities
- ii. **Goal 2:** Alberta's Agricultural Research and Innovation System has effective mechanisms to communicate internally and externally
- iii. **Goal 3:** Alberta's Agricultural Research and Innovation System delivers more products, practices and processes
- iv. **Goal 4:** Alberta's Agricultural Research and Innovation System attracts private and public investment
- v. **Goal 5:** Alberta's Agricultural Research and Innovation System is transparent and accountable
- vi. **Goal 6:** Alberta's human resource capacity supports R&D, commercialization and innovation activities

APPENDIX D Preliminary SWOT Analysis

The IGAC R&D working group conducted a current state assessment, including (a) a literature review; (b) a list of on-going projects in Canada, (c) a review of foreign and domestic funding programs; (d) the identification of domestic and international stakeholders (e.g. universities, research centres, private companies, industry groups, and governments), and (e) a list of research priorities identified by stakeholders. Through this process, the following strengths, weaknesses, opportunities and threats were identified for each of the R&D elements.

i. The identification and communication of needs

Strengths

- Identification of needs by the livestock and poultry sectors (through IGAC)

Weaknesses

- No research priorities identified for sectors other than livestock
- Priorities mainly addressing needs of a single commodity group
- Priorities not communicated

Opportunities

- The identification of needs shared by many stakeholders

Threats

- Further disconnect between users' needs and services provided
- R&D not providing effective support in the development and implementation of traceability systems.

ii. The provision of R&D funding and policy support

Strengths

- Traceability has been identified as a priority over the next five years (under Growing Forward)

Weaknesses

- No national or provincial R&D initiative announced under Growing Forward
- No national R&D vision
- No coordination between agencies providing funding for traceability R&D

Opportunities

- The alignment of the national traceability R&D strategy with Growing Forward

Threats

- R&D not providing effective support in the development and implementation of traceability systems.

iii. The availability of expertise and the identification of collaborative partners

Strengths

- Expertise available at the university and private sector levels

Weaknesses

- No forum to nurture joint projects between the private sector, industry groups, service providers and governments
- Little pure science conducted

Opportunities

- The enhancement of our R&D capacity with closer collaborative work with U.S. stakeholders - U.S. universities and private companies are highly engaged in traceability

Threats

- R&D not fully responding to needs
- R&D projects not using all resources available
- R&D projects not thinking “outside of the box”

iv. *The assessment of findings and technologies developed*

Strengths

- Technologies are tested for cost effectiveness through a sound process (e.g. via Canadian Cattle Identification Agency, Agri-Traçabilité Québec)

Weaknesses

- No accreditation of traceability technologies
- Few traceability studies peer-reviewed

Opportunities

- Build on work conducted by the International Committee for Animal Recording (ICAR)

Threats

- The development of a traceability infrastructure based on poor technology

v. *The potential transfer of knowledge into technology*

Strengths

Weaknesses

- Little long-term resources allocated for the development of technologies

Opportunities

- The development of technologies and expertise which can be offered to other countries

Threats

- Technologies developed outside Canada and not meeting our needs

vi. *The communication of results and the demonstration of technologies*

Strengths

- Traceability extension services provided in Quebec and Alberta
- Communications of traceability applications (e.g. through the new GS1 Canada Strategic Advisory Council’s Traceability sub-Committee)

Weaknesses

- R&D findings and technologies are mainly communicated to the sector which helped financing the projects
- Overall, less extension services provided
- Few or incomplete platform to inform about on-going projects
- Many projects are not published in scientific journals

Opportunities

Threats

- The duplication of work already conducted.

APPENDIX E Research Issues by Fields of Study

Workshop participants identified a wider variety of research issues in the Trace R&D 2009 workshop. Some of these are outlined below:

- i. Technologies and systems facilitating the identification and movement tracking of animals, food and agricultural products;
 - Integration between traceability information systems and ability to access information in a time sensitive manner
 - Technologies are field proven
 - Funds available for prototypes and pilot projects
- ii. Market access, cost, benefit and risk mitigation analyses;
 - Linkages with OIE and WTO
 - COOL, EU fishing, age verification – immediate needs
 - Tie traceability with certification bodies for value-added realization (eg. GM free, antibiotic free, organic etc.)
 - Need to be able to demonstrate cost-benefit ratios
- iii. Sectors and critical points where traceability should be used,
 - Co-ordination between sectors,
 - Linkages and info exchange between theory, policy and working food producers
 - Regular forums to bring together industry and researchers
 - Leadership at all levels required
- iv. Hurdles and solutions to traceability technology and system adoption,
 - Communications strategy
 - Who pays
 - Develop a system to quantify/qualify the issues, rank and order the issues and then coordinate the resources to address/resolve the issues
 - Practical examples and illustrating its importance in practical terms stakeholders can relate to.
 - Demonstrate benefits to business/farm/industry (eg. Inventory control) and incorporate into business practices similar to ISO and HACCP
- v. Consumer confidence and demand for traceability;
 - Communications strategy
 - Private sector needs different from public needs
 - Accountability
 - System of information sharing which promotes trust and transparency

- vi. Traceability data and database management;
 - Integration between traceability information systems and ability to access information in a time sensitive manner
 - Assessment of data sharing and data storage
 - Easy traceable database which includes value-added qualities that add value to producers and consumers
 - Data integrity
 - Web portal concept
- vii. Traceability legal and policy analysis;
 - Clear process to engage all stakeholders
 - Decouple traceability from food safety
 - Clear accountability legislation that is verifiable and enforceable
 - Clear roles for federal and provincial governments (national policy with provincial support)
 - Good governance model – strong institute staff with support from all levels of government and a diverse, senior level, involved board.
 - Strong pipeline of trained professionals (university courses)
 - Alignment of initiatives at a higher level – working together without duplication of effort and without competitive “non-disclosure”
- viii. Systems facilitating the identification and characterization of premises.
 - Don’t reinvent the wheel – use existing and proven systems from others

APPENDIX F International Traceability

To support international agreements on food trade, such as WTO requirements, national governments are introducing regulations that provide record-keeping and labelling. While it is generally not necessary for companies to implement a thorough traceability system, some governmental regulations are stricter than WTO minimum requirements. The European Union (EU) has been the first to put minimum traceability standards into law¹⁴.

GS1 (formerly EAN International) is a global organization dedicated to the design and implementation of standards and solutions to improve the efficiency and visibility of supply and demand chains globally and across sectors. It is governed by a management board composed of key leaders and drivers from multi-nationals, retailers, manufacturers and GS1 Member Organizations. Currently, there are over 104 Member Organisations with one member representing one country. The GS1 Traceability Standard defines business rules and minimum requirements when designing and implementing a traceability system. The GS1 standard uses the ISO 9000:2005 definition of traceability extended it to include the concepts of “internal” and “external” traceability within the context of supply chain traceability.

European Union

The EU General Food Law: requires traceability in all stages of the supply chain (farm-of-origin to retail sale) for all food, feed, food producing animals, and all ingredients incorporated into food including all domestic and imported food.

General Product Safety Directive (GPSD 2001/95/EEC): is a law for traceback of food products to point of production for all member states.

EU Traceability Framework: includes identification systems, labelling, and TRACES (TRAd e Control and Expert System) to jointly improve the quality, accuracy, availability and timeliness of the data for livestock and feed.

Promoting European Traceability Excellence & Research (PETER Project): is an international forum of the traceability research conducted in the EU. The core projects parts of the PETER network are:

- **SEAFOODPlus:** to implement traceability from live fish to consumption and traceback any element from fork to farm.
- **GTIS CAP:** Geo-Traceability Integrated Systems for the Common Agricultural Policy Project focused on legislation, geo-traceability management, definition of data standards, definition of geo-traceability indicators, and analysis of implementation.

¹⁴ Source: Sununtar Setboonsarng, Jun Sakai, and Lucia Vancura, *Food Safety and ICT Traceability Systems: Lessons from Japan for Developing Countries*, No. 139, May 2009

- **GeoTraceAgri:** Geographical Traceability in Agriculture, Agri-Environment good practices goal was to find the extent of geographic traceability of food in all stages of production/storage/distribution.
- **DNA-Track:** researched the traceability of DNA fragments throughout the food chain for soybean, maize, coffee, tea, potatoes, olives, and GMO detection in foods.
- **Oliv-TRACK:** develop traceability and verification systems for olive oil by combining genomic and metabolomic approaches.
- **ALCUEFOOD:** is a partnership between the EU and Latin American countries in food quality/safety research and development. Traceability is used to develop a permanent food quality and safety platform to facilitate information sharing. Four aspects of traceability include: legal, social economic, technology, and consumer.
- **FoodTrace:** The goal was to develop a “generic framework for traceability that can be applied to any food supply chain and accommodate the complexities of cross-supply chain interaction”. FoodTrace Plus currently focuses on traceability for small enterprises and at a low cost.
- **Co-Extra:** harmonization of co-existence of biotech and conventional crops and traceability systems in the food/feed chain and for GMO detection
- **TRACE:** 47-partner research institutions from Europe and China to develop complete traceability in the food chain and a ‘Good Traceability Practice’ guideline for the food industry.

P2P Project: co-founded by the European Community, is currently developing a unified way to collect traceability information. Pilot projects are being conducted in various sectors and businesses. The goal of the project is to allow companies to choose their traceability system that can best meet their business model, and allow authorities a unified approach to collecting the data via the Internet.

United States

Country of Origin Labelling (COOL): mandatory COOL for beef, pork, lamb, fish, shellfish, fresh fruit, vegetables and peanuts. Birthplace, rearing, slaughter, and pack location information is required, as well as records identifying sources and recipients of food transactions. Traceability records from at least port of entry are required for imported products.

Meat Inspection Act/ Poultry Inspection Act/ Egg Inspection Act: regulates meat and meat food products are unadulterated, wholesome, and properly marked/labelled/packaged. HACCP principles and traceability measures in case of a recall are required for meat and poultry.

Tracing and Recalling Agricultural Contamination Everywhere Act of 2009: amends the Federal Meat Inspection Act to direct the Secretary of Agriculture to establish a traceability system for all stages of manufacturing, processing, packaging, and distribution of food.

Perishable Agricultural Commodities Act (PACA, 1930): require traceable records of all pertinent information regarding transactions of perishable commodities to be kept for two years.

National Animal Identification System (NAIS) – is a voluntary State-Federal-Industry partnership program to “help producers and animal health officials respond quickly and effectively to animal health events”.

Australia

Australia New Zealand Food Standards Code: Requires all food businesses to be registered and implement HACCP principles, which includes traceability in the context of a recall.

Primary Production and Processing Standards: Are being developed by Food Standards Australia New Zealand (FSANZ) and will be adopted into State and Territory law once developed. The standards include a “one step forward, one step back’ approach to traceability, as well as the tracing of inputs.

Country of Origin Labelling (COOL, 2005): COOL labelling is mandatory for fish, fruits and vegetables, pork, and all food sold to catering establishments in catering packs.

Export Control Act & Orders (1982): Most food products and live animals destined for export require tracing systems and HACCP programs.

National Livestock Identification System (NLIS): Is a mandatory identification and tracing system that can trace individual cattle and sheep from farm of origin to slaughter facility. NLIS is a requirement for producers exporting to the EU.

Japan

Law Relating to Special BSE Countermeasures (2002): requires mandatory traceback of cattle from feedlot to packing plant.

Japanese Agricultural Standard Program (Production Information Disclosure JAS, 2003): certifies the traceability of domestic and imported beef and requires the same standards as the Law Relating to Special BSE Countermeasures as well as feed and pharmaceutical information.

Argentina’s National Sanitation Service (SENSA): requires all cattle producers to participate in the livestock producers’ identification system (CUIG). Cattle born before November 2006 (unless the cattle is older than 2 yrs) must be registered before being transported

Brazilian System of Identification and Certification of Origin of Bovine and Buffalo (2001): to participate in the voluntary system, premises must be registered in SISBOV and animals identified individually (animal ID standards are not developed)