

DRAFT

**Executive Summary
For the
Agriculture and Food
Strategic
Research & Development
Plan
For
Alberta
(2002 – 2008 and Beyond)**

Vision: "The Agricultural R&D System is innovative, collaborative, focused, and stimulates sustainable growth and development."

October 16, 2002



EXECUTIVE SUMMARY

Preamble

Agriculture is a critical component of the Alberta life sciences economy. Alberta has developed one of the most productive agricultural economies in the world based on 2001 farm cash receipts totaling \$8.3 billion and utilizing more than 51 million acres of land for crop and livestock production. In addition, Alberta accounts for approximately 22 percent of Canadian agricultural production. At the end of 2001, there were 59,500 persons employed in Primary agriculture.

On the value-adding side, the agri-food processing sector is Alberta's largest manufacturing sector, accounting for \$9.9 billion in value of shipments in 2001. The sector generated 23.3 percent of all manufactured goods, ahead of the next largest sectors of petroleum and coal products (17.5 percent) and chemical products (16.3 percent). The sector employs 23,000 people and consists of over 500 firms located throughout the province. With the breadth and depth of Alberta's primary and value-adding agriculture and food sector, coupled with strong energy, forestry, petroleum, health, and chemical sectors, the prospects for agriculture and food and life science research, development, and commercialization opportunities are potentially limitless.

During the last several years, considerable attention has been dedicated to reviewing the agricultural research and development, and commercialization (R&D) system in Alberta. As a result of these reviews, it is clear that there are several key issues that need to be addressed in the R&D system. They include: the need for innovation, clear direction and focus, and the need for a system to be well funded, effective, accountable, and efficient.

To address these issues in the current system, this Provincial Agricultural R&D Strategic Plan was developed. The creation of this Plan involved numerous stakeholders from around the province, including research funders, research performers, industry players, and government officials. The Plan includes:

- Strategic R&D priorities with specific outcomes and measures.
- Strategies and actions to develop a system that works together to achieve a shared vision and values collaboration and alignment.
- An implementation plan to address the R&D priorities outlining strategies, actions, outputs, and resources.
- A proposed governance model for the R&D system.

VISION FOR THE R&D SYSTEM

"The Alberta Agriculture and food R&D System is innovative, collaborative, market focused, and stimulates sustainable growth and development."

Purpose

The Plan for the R&D system is designed as an implementation strategy to help achieve the growth goals set out by the Agriculture and Food Growth Strategy. In addition, the Plan is linked to the Alberta Science and Research Authority's (ASRA's) Integrated Life Sciences Strategy for Alberta, the plans of other research institutions and organizations, universities and colleges, and other government departments including federal government departments.

The Strategic Plan has evolved through an open, collaborative, and multi-stakeholder consultation process involving numerous stakeholders, province-wide. The plan is intended to leverage and provide focus and direction for new R&D resources entering the system and supplement the \$135 million in research dollars already funding the system.

Strategic Research Networks

New strategic research priorities set out in the plan have evolved through a Strategic Research Network (SRN) process. The SRNs were formed to link industry needs and economic opportunities to good science for the growth and sustainability of the agriculture and food industry. In addition to supporting these goals of growth and sustainability, the SRNs support continued excellence in food safety, improved environmental stewardship, and strengthened rural communities. Strategic Research Networks represent the research continuum, from basic research to technology transfer and innovation. Networks connected the “dots” in the research continuum by identifying long-term strategic focus to research investments and partnerships in Alberta. As of May 2002, three research networks were identified:

- Value adding and Agri-Health
- Bio-Based Products
- Sustainable Production

The purpose of the SRNs is to:

- Lead/catalyze the definition and review of strategic direction within each network.
- Define outcomes, measures, and priorities.
- Reflect Stakeholder input and market needs.
- Act as a point of contact/communication.
- Advocate for a collaborative R&D system.

Based on the work of the SRNs, the following table identifies recommended investments, focus and priority areas, and potential growth outcomes for new funds flowing into Alberta's agricultural R&D system.

Alberta Priorities – Summary of Strategic Technologies and Products

Strategic Research Focus	Priority Areas	Growth Targets To 2015
Agri-Health and Value-Added Research \$126 Million Over 5 Years	<ol style="list-style-type: none"> 1) Food Ingredient and Fermentation Products 2) Value Enhanced Meats and Meat Products 3) Health, Wellness, and Performance Products 	<ul style="list-style-type: none"> • \$4 Billion in Crop Extracts • \$5 Billion in Processed Meats • \$2 Billion in Health Products
Bio-Products Research \$133.5 Million Over 5 Years	<ol style="list-style-type: none"> 1) Bio-Materials Products 2) Bio-Energy Technologies and Products 3) Bio-Industrial Chemical Technologies and Products 	<ul style="list-style-type: none"> • \$1 Billion in Bio-Materials • \$1 Billion in Bio-Energy • \$1 Billion in Bio-Chemicals
Sustainable Production Research Supporting Profitable Sustainable Production \$ 5 Million Over 5 Years	<ol style="list-style-type: none"> 1) Sustainable Production Systems for Specific Traits in Crops and Livestock 2) Nutrient Efficient Systems in Crop and Livestock Production 3) Microbial Management Systems 	<ul style="list-style-type: none"> • \$11 Billion in Beef and Boxed Beef Products • \$2.7 Billion in Pork and Fresh, Chilled, Frozen, and Case-Ready Meats
Investments in Infrastructure \$34 Million	<ol style="list-style-type: none"> 1) Build on Current Infrastructure Resources 2) Fill Infrastructure Gaps 3) Infrastructure for All Priority Areas 	
Due Diligence, Market Research, Regulatory \$5 Million		
Total New Investment \$298.5 Million Over 5 Years \$59.7 Million Annually		

Strategic Business and Implementation Plan

The Strategic and Implementation plans were developed by an 11-member team (the R&D Strategy Team) comprised of research funders, research performers, and industry players with input from a variety of stakeholders. The R&D Strategy Team integrated its input on strategic direction and implementation activities with the priorities set out by the Strategic Research Networks into one solid plan for Alberta's R&D system. New resources dedicated to agricultural R&D in Alberta will be directly linked to this plan.

During the R&D strategy team's discussions, a number of principles were suggested to guide Alberta's agricultural R&D system performance and a number of critical components were identified for an effective agriculture and food R&D system in the province. Principles, critical components, and governance for an R&D system were recorded as follows:

- 1) Guiding Principles – market driven; focused on fostering research, development, and commercialization; encourages collaboration; optimizes use of Alberta's resources; builds on Alberta's strengths and comparative advantages; and, encourages collaboration.
- 2) Critical Components of an Effective R&D System – the system is well governed and directed; system participants collaborate and partner; the R&D system is aligned with industry goals and consumer needs; human resources are aligned with the strategic direction; there are public and private mechanisms for action; the system is funded by

public and private investors; and, mechanism to monitor and renew the system are in place.

- 3) Governance – sets strategic direction; ensure implementation is aligned with strategic direction; act as advisory board; comprised of judicious individuals; unbiased decision making; receives R&D investment dollars; enhanced AARI structure; supported by three strategic research networks, an industry advisory group, and a performer network.

The tables that follow identify the broad strategic direction for Alberta’s R&D system. Table 1 highlights the system’s goals, outcomes, strategies, and resources. Table 2 unveils the implementation plan for the R&D system including strategies, actions, commitments, priorities, and timelines for action.

Policy and Regulatory Environment

A number of common policy and regulatory themes were identified requiring immediate focus and attention to ensure that the Alberta’s agricultural R&D system, its priorities, implementation, and ultimately its success will be connected to. The common policy issues were identified as follows:

- Initiatives favoring venture creation and economic development in value-added processing of crops and livestock products.
- Capacity development for market research and competitive intelligence, and industrial R&D and innovation by small-to-medium scale enterprises.
- Development of intellectual property strategies that favor technology transfer and commercialization activities by Alberta firms.
- Strengthening of industrial R&D and experimental development capacity in industry.
- Scientific collaborations that cross science and engineering disciplines and industry.
- Private investment by venture capital, national and international firms.
- Institutional collaboration policies amongst Alberta R&D performers.

Discovering Our Future

The Agriculture and Food Strategic Research and Development Business Plan for Alberta will be implemented in the New Year with support and endorsement from all stakeholders. A majority of Alberta’s R&D stakeholders have been directly involved in shaping the action initiatives for this plan. The completion of this plan signals the beginning of a new era of collaborative discovery, creation, problem-solving, prioritization, innovation, and renewal in Alberta’s agriculture and food, and life sciences industries.

Table 1 - Strategic Plan

Goal	Strategies	Outcomes	Resources
<p>Goal 1 – Alignment: Alberta’s R&D System is Focused and Guided By Industry and Public Needs, Alberta’s Comparative Advantage, and Market Opportunities</p>	<p>Strategy 1. Develop a competitive intelligence (CI) center for the R&D system province-wide.</p> <p>Strategy 2. Have a process in place to establish and renew priorities for the R&D system. Actions:</p> <p>Strategy 3. Ensure R&D resource allocations support due diligence processes.</p>	<p>O1: R&D priorities are aligned to industry and public needs.</p> <p>O2: Strategic priorities provide clear direction for building resources, capacity, and investment.</p>	
<p>Goal 2 - Communication: Agriculture and Food R&D Communication Excellence</p>	<p>Strategy 1. Increase awareness of the Agricultural R&D system research successes and activities.</p> <p>Strategy 2. Create mechanisms to build industry and science partnerships/alliances for investment, communication, and efficiency.</p>	<p>O1: R&D system participants are well informed and aware.</p> <p>O2: More informed public, stakeholders, shareholders, research performers, and investors.</p> <p>O3: Engaged and knowledgeable stakeholders.</p> <p>O4: Enhanced public trust in R&D.</p>	
<p>Goal 3 - Commercialization: An Agricultural Innovation System That Delivers More Products, Practices, and Processes</p>	<p>Strategy 1. An aggressive commercialization sector delivers technologies from within Alberta and beyond.</p> <p>Strategy 2. Improve access to capital for pre-commercialization and early development R&D activities.</p>	<p>O1: The R&D system collaborates or aligns to produce more impactful commercial endeavors.</p> <p>O2: Commercial partners actively seeking benefit from Alberta’s research performing capacity.</p> <p>O3: More opportunities are seized, new products and processes are developed at a faster pace.</p> <p>O4: R&D is a larger economic engine for the Alberta economy.</p>	
<p>Goal 4 – Accountability and Leadership: Alberta’s R&D System is Transparent and Accountable</p>	<p>Strategy 1. Establish a leadership model that meets the needs of the R&D system.</p> <p>Strategy 2. Facilitate the development of collaborative partnerships that maximize efficiency and effectiveness.</p>	<p>O1: Stakeholders support a leadership framework resulting in increased system productivity, efficiency, and investment.</p> <p>O2: System focused on priorities and identified outcomes for investment.</p> <p>O3: Collaboration and partnerships create new and enabling capacity.</p>	
<p>Goal 5 – Human Resources: Alberta’s Human Resource Capacity Supports R&D and Commercialization Activities</p>	<p>Strategy 1. Align HR capacity with strategic priorities and future agricultural R&D needs.</p> <p>Strategy 2. Attract and retain scientific and business capacity in key strategic areas.</p>	<p>O1: Human resources aligned with strategic priorities and future needs.</p> <p>O2: New R&D personnel attracted to Alberta.</p> <p>O3: Additional highly qualified personnel (scientists, technicians, commercialization, and innovation staff) are working in the Alberta R&D system by 2005, e.g., 300.</p>	
<p>Goal 6 - Investment: The Provincial R&D System Attracts Private and Public Investment</p>	<p>Strategy 1. Build high quality scientific investment opportunities.</p> <p>Strategy 2. Align infrastructure capacity with strategic priorities and future R&D needs.</p> <p>Strategy 3. Improve Alberta’s Ability to access key federal resources.</p> <p>Strategy 4. Increase commercial investment in Alberta new products, practices, and processes.</p>	<p>O1: New companies formed each year.</p> <p>O2: Increase in start-up companies.</p> <p>O3: Alberta’s R&D system will attract (\$40 million) in extra-provincial private and public investment each year.</p>	

Table 2 – Implementation Plan

Strategies	Actions	Commitments (Who)	Priority/Timelines
<p>Goal 1 – Alignment</p> <p>Strategy 1. Develop a competitive intelligence (CI) center for the R&D system province-wide.</p> <p>Strategy 2. Have a process in place to establish and renew priorities for the R&D system. Actions:</p> <p>Strategy 3. Ensure R&D resource allocations support due diligence processes.</p>	<p>Actions:</p> <ul style="list-style-type: none"> • Develop an R&D Intranet knowledge management (KM) site to strengthen the R&D system’s efficiency and capability in harvesting, storing, managing, and sharing information. • Develop a skills database for you by Alberta’s R&D system participants. • Provide CI and KM training opportunities to R&D system participants, <p>Actions:</p> <ul style="list-style-type: none"> • Implement an ongoing system for collecting information and knowledge concerning Alberta’s comparative advantage, market, and public needs to be utilized in the R&D system decision-making process. • Build a mechanism to annually review and set priorities through a transparent and inclusive process. <p>Actions:</p> <ul style="list-style-type: none"> • Develop due diligence processes that support sound funding and resource decisions that are consistent with the strategic plan. • Develop and expand the R&D funders round table. • Develop an R&D research performers round table. • Align the R&D system with the Alberta’s technology transfer/innovation/commercialization capacity. 		
<p>Goal 2 – Communication</p> <p>Strategy 1. Increase awareness of the Agricultural R&D system research successes and activities.</p> <p>Strategy 2. Create mechanisms to build industry and science partnerships/alliances for investment, communication, and efficiency.</p>	<p>Actions:</p> <ul style="list-style-type: none"> • Regularly (quarterly) publish Alberta R&D success stories using a variety of communication methods. • Showcase Alberta R&D locally, nationally, and internationally. • Recognize and meaningfully reward research excellence. • Annual stakeholder bear pit sessions to share success, share emerging priorities, and identify gaps. Develop public relations plan including media relations. <p>Actions:</p> <ul style="list-style-type: none"> • Facilitate think tanks for all stakeholders in the R&D system to encourage innovative thinking and identify technology and market opportunities and possibilities. • Conduct research conferences and discussion forums to showcase research, development, and commercialization successes. 		
<p>Goal 3 – Commercialization</p> <p>Strategy 1. An aggressive commercialization sector delivers technologies from within Alberta and beyond.</p> <p>Strategy 2. Improve access to capital for pre-commercialization and early development R&D activities.</p>	<p>Actions:</p> <ul style="list-style-type: none"> • Utilize competitive intelligence to “harvest the world” for technology opportunities. • Review research already undertaken in Alberta to determine commercialization potential. • A collaborative feasibility process is implemented that includes industry partners. • Provide opportunities for global networking among scientists and technology specialists. <p>Actions:</p> <ul style="list-style-type: none"> • Develop angel investor networks. • Link pre-commercialization/early development activities to actions under goal 6. 		
<p>Goal 4 – Accountability and Leadership</p> <p>Strategy 1. Establish a leadership model that meets the needs of the R&D system.</p>	<p>Actions:</p> <ul style="list-style-type: none"> • Develop a suitable governance model for Alberta’s R&D system. • Design an accountability system with clear agreed upon measures that are regularly updated and monitored and design due diligence processes that support sound funding and resource decisions. • Build and facilitate partnered funding mechanisms that support the funding consortium and aligns system with the strategic priorities. • An annual review of the Strategic Business Plan is conducted that engages all system stakeholders in the discussion. • ASRA to establish a clear and uniform policy for Intellectual Property management across Alberta’s R&D system. 		

<p>Strategy 2. Facilitate the development of collaborative partnerships that maximize efficiency and effectiveness.</p>	<p>Actions:</p> <ul style="list-style-type: none"> • Develop new reward and recognition systems that encourage collaboration, partnerships, and networking. • Develop and engage R&D stakeholders in a networking/leadership program.
<p>Goal 5 – Human Resources</p> <p>Strategy 1. Align HR capacity with strategic priorities and future agricultural R&D needs.</p> <p>Strategy 2. Attract and retain scientific and business capacity in key strategic areas.</p>	<p>Actions:</p> <ul style="list-style-type: none"> • Conduct a needs assessment on human resource requirements and determine where there are gaps in system (align with strategic priorities). • Actively fill HR gaps in Alberta’s R&D system in alignment with strategic priorities. • Assess human resource requirements on a biannual basis. <p>Actions:</p> <ul style="list-style-type: none"> • Design innovative recruitment programs to attract new personnel including scientists, technologists, etc. to Alberta. • Create an infrastructure package, operational, and human support along with new research chairs in key strategic areas. • Provide opportunities for secondment in outside jurisdictions across the R&D system (inter-institutional, funders, performers, stakeholders, research/technology/commercialization specialists). • Implement training programs to address key research, technology, and industrial competencies. • Implement programs for leadership, networking, commercialization, innovation, and team building competencies. • Increase funding opportunities for training in technology transfer and commercialization activities. • Establish attractive IP policies for researchers.
<p>Goal 6 – Investment</p> <p>Strategy 1. Build high quality scientific investment opportunities.</p> <p>Strategy 2. Align infrastructure capacity with strategic priorities and future R&D needs.</p> <p>Strategy 3. Improve Alberta’s Ability to access key federal resources.</p> <p>Strategy 4. Increase commercial investment in Alberta new products, practices, and processes.</p>	<p>Actions:</p> <ul style="list-style-type: none"> • Funders and research performers work together to create high quality scientific program submissions aligned with strategic priorities. • Proposals are examined through a robust scientific and industry peer review process. • Engage industry in priority setting to ensure submissions meet industry and public needs and reflects profitability focus. • Develop mechanisms to assess return on investment (i.e., whole cost accounting). • Provide ongoing monitoring and analysis of Alberta’s R&D competitiveness in investment attraction relative to other jurisdictions (i.e., CI functions). • Develop competitive incentives for investment and commercialization, e.g., research tax credits, flow-through shares. • Address public policy issues, e.g., endowment fund, intellectual property and regulatory barriers. • Assist researchers and small businesses in identifying and attracting industry funding and support. <p>Actions:</p> <ul style="list-style-type: none"> • Carry out gap analysis of current infrastructure and prioritize direction. • Optimize use of present resources. • Create new business incubators and locate close to R&D facilities. • Create analytical and business capacities within incubator facilities. <p>Actions:</p> <ul style="list-style-type: none"> • Focus resources in accessing NSERC, NRC, AAFC, and CFI funding. • Partner with Bio-Products Canada on specific bio-products research opportunities. • Establish and MOU with AAFC’s new Bio-products and Bioprocesses Research Program. <p>Actions:</p> <ul style="list-style-type: none"> • Showcase Alberta’s R&D performing capacity to potential commercialization partners. • Link commercialization priorities and opportunities with research priorities. • Resolve receptor capacity issues.