



Alberta Dairy Industry

Research and Development
Strategic Planning Session
August 3 & 4, 2004



Workshop Summary



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Introduction

On August 3 and 4, 2004, forty-seven representatives of the Alberta and Canadian dairy research community, veterinarians, dairy producers and processors and various support agencies convened in a two day strategic planning event.

The goal of the workshop was to create a stronger research and development system by developing:

- Clearly identified, industry-driven research and development priorities
- Guiding principles for implementing the research and development strategies
- Collaboratively managed processes for developing and implementing the research and development strategies

The workshop purpose was introduced with a presentation by Bruce Beattie, Chair of the Research Committee for Alberta Milk (see attached Power Point presentation).



The Workshop Process

A. Research and Development Priorities

Research and development priorities for the industry were developed by exploring a range of factors that affect the dairy industry and the research and development processes. The raw data of the reflection questions is appended to this summary.

B. Research and Development Principles

Guiding principles reflect the purpose and guide the actions and decisions of an organization. When an organization adopts guiding principles, they are used as a sieve for all decisions, and decisions are assessed as to how well they *genuinely* reflect all or some of the principles.

The participants worked together to develop guiding principles by responding to the following question:

“To ensure the industry has/is building capacity to meet current and emerging needs, R&D for the dairy industry should focus on, address, align with, demonstrate that, or lead to...”

C. Process for Developing and Implementing a Research and Development Strategic Plan

The Agriculture Funding Consortium presented the concept and process that has been used in Alberta for the last three years to provide a one-window approach to funding agricultural research and development.

Workshop participants, and specifically Alberta Milk, were asked to consider the Funding Consortium model as a mechanism for aligning funding for the identified Dairy R&D priorities, and for building stronger partnerships.

Workshop Results

A. Guiding Principles for Research and Development in the Alberta Dairy Industry

The vision, mission and values were used as a foundation for the guiding principles discussion.

Alberta Milk Vision

"A growing, profitable and consumer focused dairy industry"

Alberta Milk Mission

"We promote the viability and sustainability of the Alberta Dairy Industry through programs, policies and services."

Alberta Milk Values

"Alberta Milk values open communication, innovation, knowledge, competence, ethical practice, mutual respect and recognition. These values guide our daily actions and activities to deliver the vision and mission of Alberta Milk."



Guiding Principles:

- Principles reflect our purpose and guide actions and decisions as we move towards our vision.
- Question: To **ensure the industry has/is building capacity to meet current and emerging needs**, R&D for the dairy industry should focus on, address, align with, demonstrate that, or lead to:

Results:

Research and development for the Alberta Dairy Industry is driven by the overarching purpose of ensuring sustainability and profitability of the industry.

Each of the following principles represents an important aspect of supporting a robust and effective research and development system for the dairy industry which includes producers, processors, further processors and consumers:

Alberta Dairy Research and Development Principles

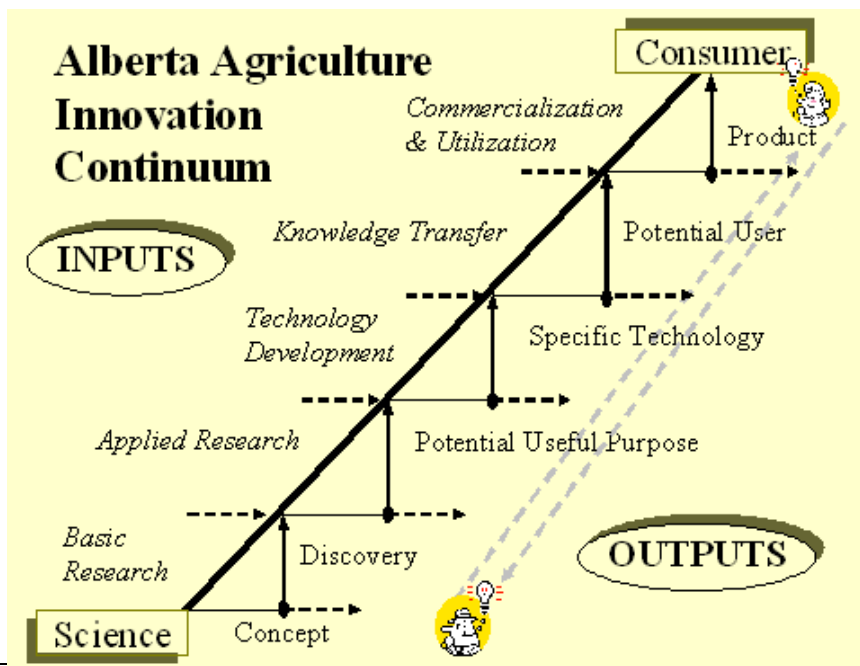
- *Strategically Collaborative R&D:* Multi-disciplinary efforts provide benefit for the Alberta and Western Canadian dairy industry through coordinated and strategic alignment processes and accessing provincial, national and international R&D resources.
- *A Balanced Approach:* Strategic investment along the R&D continuum, with a range of short and long term research and development initiatives, is another key component to strategic R&D.
- *Proactive and Responsive R&D:* R&D initiatives respond to stakeholder needs and/or Canadian and global issues and challenges.
- *Goal Oriented R&D:* R&D initiatives have identified measurable outcomes that fulfill the purpose of the R&D strategy.
- *Knowledge Transfer in R&D:* Research and development initiatives include processes for ongoing and effective knowledge transfer amongst appropriate stakeholders.
- *Scientific Excellence in R&D:* R&D initiatives clearly demonstrate excellence in research standards and the advancement of knowledge.

Discussion:

A Balanced Approach to Research and Development

The principles listed above reflect not only the results from the group exercise, but also recurring themes from various discussions in the workshop.

For example, the key message from the question of what needs to be improved in the Alberta Dairy R&D system was the need for improved collaboration, cooperation and



communication between stakeholders.

As an adjunct to this theme, ***the need for more effective and efficient knowledge transfer was perhaps the strongest message in the workshop.***

A discussion that permeated most of the conversations was about ***the concern of providing for discovery research as well as applied research and development.*** The principles address this concern through the “Balanced Approach” principle, while also including a principle on “Goal Oriented Research”.

The guiding principles will benefit the industry if they are used in the decision-making and evaluation process, recognizing that the assessment should be made upon *how well* the strategy, project, or program aligns with some or all of these principles.

B. Research and Development Priorities for the Alberta Dairy Industry

Results:

The following nine research priorities represent the results of a group ranking process (each participant was provided with five votes to determine the priorities from R&D issues identified by participants). Again the results reflect both the ranking process and the discussion themes of the workshop. Each of the top five R&D priorities was supported by a large majority of the participants (over 20 votes), with priorities six and seven receiving nearly 50% support. Priorities eight and nine received support of approximately 25% of the participants.

The comments under each priority were provided by workshop participants

1. Increase the longevity of lactating dairy cows

- Target: one year increase in productivity (longevity)
- A balanced approach (basic to applied) research program
- A multi-disciplinary research program
 - Genomics
 - Reproduction
 - Locomotion—genetics, pasturing impact, barn floor surface, foot care
 - Housing and cow comfort—barn design, alley, mat and stall design
 - Management practices—reduce involuntary culling, identify and reduce those practices that have negative impact on cow longevity from birth or pre-birth to culling time
 - Nutrition
 - Animal welfare
 - Transition cow
 - Mining milk
- Restoring healthy cows
 - What influences are limiting longevity and challenging reproduction? What production practices must be changed to increase longevity and increase lifetime production?

2. Improving cow nutrient utilization and efficiency

- A multi-faceted, long term project
- Nutritional requirements of the cow
- Nutritional evaluation of feedstuffs—new methods of testing, interaction between feedstuffs and forages, better predictability of D.M.I. based on requirements of the cow and the nutritional value of the feed, impact of production levels, cow health, longevity, and economics
- Application of the concept of net feed efficiency to identify efficient animals
- Nutrient output utilization/management—forage and grain
- Reduction of negative nutrient balances in early lactation
- Environmental sustainability—reducing nutrient excretion into the environment

3. Milk components and new product development

- Need to match milk component production/synthesis to marketplace demand
- Need an understanding of control of milk component synthesis plus ability to mine milk for its components—fat, proteins lactose, vitamins, minerals
- Need to develop products containing high levels of solids non-fat (SNF)
- Mining milk components—health, wellness and functional properties/benefits contained in milk components (What comes after CLA?)
- Identify the health benefits of drinking milk through long term testing

4. Improving reproductive efficiency

- Enhancing the reproductive performance of western Canadian dairy herds
- Develop a research program aimed at reduced culling due to infertility and other reproductive disorders
- Nutritional management of reproduction
- New tools for improved estrus detection
- Genetic selection for fertility-related traits
- Records-based evaluation of reproductive trends (whole herd)
- Reproductive fitness: alternate techniques to hormone injection for heat detection
- Interaction between diet and reproductive efficiency—long term applied research program
- Nutrition
- Genetics
- Management practices

5. Health and wellness benefits of milk and milk products

- Research to identify the health benefits of drinking milk
- Tests on humans identifying the long term effects
- Maintain and strengthen the image of milk as pure, wholesome and safe
- Educate consumers with good knowledge

6. Optimization of regionally grown feedstuffs

- Recognition that this must be regional research as no one else will do it

- Forage typical for Western Canada
- Barley grain processing
- Need to tailor it to dairy cow needs, animal health, etc

7. Production diseases

- Issue: disease prevention and recognition (at the cellular level) (metabolic)
- Holistic approach to animal health
- Identification of markers for early detection of specific diseases
- Mastitis:
 - Control: prevent, control and eliminate disease—monitoring disease epidemiology, knowledge transfer)
 - Contagious versus environmental, vaccination, dry cow therapy, milking technique
- Johne's disease transmission—need international collaboration –genetic, milk production and eradication
- Hands-on, ongoing program for producers to learn about and utilize technology as it progresses

8. Zoonotics

- Disease control program
- Technology transfer (control)
- Testing protocols
- Consumer awareness

9. Better farm economic decision tools

- An ongoing research project with benchmarks developed
- How to manage capital
- Farm transfer
- Operating costs

Discussion:

These research and development priorities coupled with the guiding principles provide a consistent representation of the workshop conversations. For example, when participants were asked about where R&D capacity needed to be strengthened and the outcomes that would be achieved, they responded that the desired outcomes would be:

- Market expansion and growth
- Maintain or increase total milk market and perhaps add value
- Facilitate new product development and adoption
- More flexibility to adapt to changes in demand by ingredient users
- Increased capacity for nutrient management in the dairy animal would increase economic benefit and decrease impacts
- Tie human health information to dairy R&D
- Cow longevity: decrease cost of production and increase cow longevity
- Higher pregnancy rates

- Ration formulation and prediction of milk yield
- Learn from experience about preparedness and animal welfare
- Meet future societal expectations
- Urban compatibility and sustainability
- Increase consumer confidence
- More efficient use of current infrastructure and financial effectiveness
- Broader application of the research and final outcomes
- Better application of genetics research
- More efficient use of resources/data/knowledge
- Increase use of new technology
- Increase future scientific capacity and technology transfer capacity

While inherent in the research and development priorities, two themes are perhaps understated:

- The challenge of environmental expectations and sustainability in light of increasing consumer scrutiny
- The impact of WTO policies on competitiveness in the industry

C. The Funding Process (see attached Power Point presentation)

Eight Federal and Provincial funding organizations cooperate in an annual R&D funding process by committing to the specific operational practices:

- Autonomous organizations with independent decision-making abilities
- Rotation of responsibilities
- Shared operational expenses
- Coordinated activities and processes
- Shared accountability

The fundamental components of the research and development funding process used by the Alberta Agriculture Funding Consortium are using shared processes:

- Joint call for proposals
- Shared list of priorities for funding
- One-window application process
- Shared due diligence and review process
- Joint funding
- Coordinated contracting and reporting

To obtain the following results:

- Increased investment in agricultural R&D
- Improved coordination of agricultural R&D
- Improved due diligence processes to select high quality, industry relevant initiatives
- Focused research initiatives in priority areas aligned with industry goals
- A model for collaboration and integration

The Funding Consortium hosted this planning event to present the consortium model and to invite Alberta Milk to participate in this one window approach funding process. They also will use the data from the workshop in reviewing dairy R&D proposals received in their call for proposals.

The development of more strategic applications that focus on priority Research and Development needs is a primary goal of the Funding Consortium Concept. Collaboratively targeting resources with those that fund R&D initiatives is a primary function of the Funding Consortium. To that end, the Consortium recommends an annual review of the priorities to ensure that it is responding to industry needs in targeting its R&D investments.

Appendix A: Results of Poster Session Questions

The following section contains the direct transcription of the poster session in which participants responded to the focussing questions. The responses are verbatim and in no specific order.

1. Based on our discussion last night, are there key areas in which Dairy R&D has inadequate capacity to serve the industry?

- Need more focus and sharing of data/knowledge within the Canadian Research and Development community
- Cross commodity communication
- Increased collaboration
- More ingredient based product development (nutraceuticals)
- Higher emphasis on research in reproductive management
- Production disease research
 - Immunology research for disease prevention
- Genomics, proteomics—genetics
- Level 3 research lab—BSE research
- Lactation physiology/milk component synthesis
- Better nutritional values of feed ingredients in the Western Canada picture (grains, forages)
- Better research on early embryonic death—reproduction physiologist
- Consumer safety issues
- Animal health/longevity/reproductive health
- Capacity in new product development

2. Where specifically does capacity in Alberta Dairy R&D need to be strengthened? Why? (Explain how it would make a difference and why it needs to be done in Alberta)

Increased R&D capacity in	To achieve	Specifics
Innovation	Market expansion and growth	New product development Health and wellness research
Health and wellness research	Broader application of the research and final outcomes tying human health information to dairy R&D	Mining human health information data (bio-informatics)
Genomics	Cow longevity	Gene markers for heritable traits
Reproduction	Higher pregnancy rates	Nutritional management of reproduction—utilization of grasses Electronic aids

		Reduced early embryonic deaths
Animal welfare	Meeting future societal expectations	New courses at the U of A, U of L Research linkages with UBC group Proactive AW audit
Feedstuff evaluation	Ration formulation and prediction of milk yield	Improve estimates for energy in forages (quality control in labs)
Animal health and human diseases	Learning from experience about preparedness and animal welfare	Production diseases Zoonotic research
Applied animal breeding	Better application of genetics research	Population genetics
Environmental sustainability	Urban compatibility and sustainability	Preserving water quality and soil fertility
	Increased capacity for nutrient management in the dairy animal would increase economic benefit and decrease impacts	Overfeeding of protein
Heifer management	Decreased cost of production and increased cow longevity	Feeding management Animal welfare and health
Antibiotic residues	Consumer confidence	Dry cow—impacts of dry period 30 vs. 60 days Uniformity in testing protocol
Value-added new products	Maintain or increase total milk market and perhaps add value	Expand diversity of products for consumers
Infrastructure	More efficient use of current infrastructure and financial effectiveness	Collaborative efforts re equipment and dairy herds
Increase data use from the industry	More efficient use of resources/data/knowledge	Sharing data— animal/management information Collaborative efforts
HR	Increase future scientific capacity and technology transfer capacity	Student training
HR	Increase use of new technology	Increase producer training
Milk component research	More flexibility to adapt to changes in demand by ingredient users	Dairy components
HR	Facilitate new product development and adoption	Processor training

3. What challenges currently face the industry?	How specifically can/would research and development help?
▪ BSE and consumer perception	▪ Detection techniques
▪ Transition period (dry cow)	▪ Knowledge of feeding practices to decrease metabolic diseases
▪ Knowledge transfer and application	▪ Economic benefits
▪ Milk components are not responding to changing demands in market place	▪ R&D can provide technical knowledge to help response
▪ Longevity of cows and animal welfare	▪ Animal health and well-being (multi-disciplinary)
▪ Balancing reproduction with high efficiency	▪ Identifying important factors—cause and effects
▪ Johne's and other diseases	▪ Solve the problem
▪ Formulation of diets in regards to possible ban on animal protein sources	▪ New economical local protein sources (bypass)
▪ Expected loosening of trade tariffs—increased competition from imports	▪ Improve production efficiency ▪ Product innovation—lost effectiveness and efficiency reformulation
▪ Retaining market share	▪ Developing “healthy” products
▪ Genetic level of Western Canadian cows is behind national average	▪ Better knowledge transfer to encourage use of better sires ▪ Confirmation of traits
▪ Production disease and poor reproductive efficiency	▪ Increase cow longevity and profitability
▪ Slaughter/market capacity for dairy industry	▪ Find markets for dairy beef
▪ Environmental issues	▪ Improve public perception
▪ Disposal of dead cows (culls and downers)	▪ Practical and economical techniques for disposal
▪ Mineral balancing	▪ On-farm research
▪ Maximizing productive performance with high production	▪ Increase pregnancy rate and profitability

4. What is coming up the road that you think will be an issue for the industry?	What capacity do we need in Dairy R&D to be able to meet these challenges?
Increased emphasis on dairy farm waste management (reduction of nutrient excretion)	Team approach: agricultural engineer, soil scientist, nutritionists and hydro-geologists
Cow/human health diseases—Zoonotic Looking at the effect on human health of Johne's disease	Identification of transmission route Collaboration/veterinarian input
Animal health and welfare	
Milk/dairy role in the human diet	National approach
Environmental challenges	Technology transfer to use existing knowledge
Product development	Component research
Challenge to supply management (WTO)	Economics of an internationally competitive industry
Increased competition from imported food products	Food product development research—develop less costly processing/further processing techniques Competitively priced MPC
Foreign animal diseases	In vivo testing
Quality assurance	Auditing program
Use of antibiotics in dairy production	
Use of pharmaceuticals for reproductive management of dairy cattle	Alternate methods
Surprise challenges/crises	Access to emergency funds to meet challenges (e.g. cull cow/ BSE)
Use of plantibodies for animal health to replace antibiotics	Collaboration between plant and animal scientists (researchers)
Air quality	Health studies of surrounding areas of farms
Labelling from Health Canada for new dairy products	
Use of milk for non-traditional purposes—pharmaceutical development, textile production	

5. What specific R&D needs to be done for the industry to be successful and sustainable? (specific research, not general categories)

- Production diseases
- Fertility disorders
- Whole farm economic analysis
- Impact of BSE
- Benefits to human nutrition of whole milk
- Whole industry economic analysis—feedback loop from consumer to processor to farmer
- Understanding the competition
- Understanding milk component synthesis
- Increase efficiency of the dairy cow (reproduction and milk production)
- Efficient nutrient capture in milk
- Lessen or reduce manure/nutrient excretion
- Cow comfort, animal welfare/behaviour—building design
- New product development
- Genomics, proteomics and bioinformatics
- Transition cow management
- Technology transfer for benefit of the food processing sectors
- Cow longevity (relationship between production practices and reproductive fitness)
- Laminitis, lameness
- Alternate/new forages, grains for improved efficiency leading to reduced metabolic disorders and increased longevity
- Learn how to make feed better suit animal needs and environmental sustainability
- Forage preservation
- Managing the impact of government policies on the industry

6. What issues affect the whole agricultural industry? (Who do you need to be working with?)

- Sustainability
- Policies (parading as health issues)
- Trade issues
- Environmental issues, especially water quality and quantity and greenhouse gases
- Animal welfare and health
- Food safety and human health
- Respect for the complexity of agricultural production
- Recruitment of dairy farmers—e.g. workers or passing the farm to the next generation
- Zoonotic diseases—capacity for survival (financially), knowledge-based problem solving (CFIA) scientific community—animal and human
- Consumer demands/food processors and the economic impact of these demands
- Antibiotic resistance (issue for the entire livestock industry)
- Public perception—lack of good knowledge on the health and wellness benefits
- Media
- Education—not just kids

- Government/industry collaboration and communication
- Agriculture commodity pricing—fair to farmers

7. What do we know about *emerging consumer needs* or trends that could affect our R&D priorities?

- Perception of safety and health
- Desire for convenience—providing convenient foods
- Animal welfare concerns (e.g. re factory farms)
- Traceability of products
- Labelling and health claims—clearly stated
- Functional foods and nutraceuticals
- Finding ways to increase fluid milk consumption
- Demand for low fat/high protein products
- Environmental concerns (farm size and density—factory farm)
- Genetically modified organisms
- Biodiversity
- There are changing market demands and competing markets (soy or vegetarianism)
- Expanding consumer demand for organic products
- The consumer perception of animal fat
- Limited consumer knowledge/understanding of product
 - Don't appreciate the low carbohydrate/high protein benefits of many dairy products
 - Weight loss benefits
- Concern about use of antibiotics and hormones
- Consumer demand changes faster than the industry can respond—trends/issues can arise “overnight”

8. Is there something that needs to change in how R&D is done in Alberta?

Benefit or outcome to be achieved	Change
<ul style="list-style-type: none"> ▪ Less fragmentation, better resource utilization, researchers would be working with the whole industry and building on strengths ▪ More efficient use of research funds ▪ Increased R&D synergy across value chain 	<ul style="list-style-type: none"> ▪ More coordination/cooperation and team building in research and development (e.g. IFASA) between provinces and organizations and internationally ▪ Communication for knowledge transfer ▪ More funding for quality post-doctoral researchers to increase capacity ▪ Better coordination between university, private research (like DRTC) and AAFRD with private industry

	<ul style="list-style-type: none"> ▪ Cooperation between dairy farmers, service people, researchers, consumers, industry and funders to determine research and development priorities
	<ul style="list-style-type: none"> ▪ More coordination between production and processing R&D
	<ul style="list-style-type: none"> ▪ More funds for R&D

9. What do funders need to do to better support effective R&D in Alberta?

- Increase investment
- Earmark funds specifically for knowledge/technology transfer
- Consolidate funding agencies—work together, but don't amalgamate
- Understand the potential that R&D can offer to the development of the industry
- Shorter (two page) preproposal
- Two-way communication between funders and researchers
- Better communication between the funders and dairy producers
- Increase funds for discovery research
- Long term commitment for research programs
- When a project is declined, the funding agency should explain why and what should be done to improve the application
- Unbiased program evaluation
- Streamline application process
- Availability of money right away
- Encourage and accept graduate student programs
- Understand clearly what is needed for the benefit of the industry in R&D

10. What do producers need to do to better support effective R&D in Alberta?

- Communicate needs to researchers
- Increase knowledge of current research—reading research outcomes and making a commitment to evaluate research outcomes
- Invest more in R&D for product development (consumer driven)
- Review process to streamline research proposal and provide a timely response
- Two-way extension meetings
- Communicate the payback (cost-benefit) and its derivatization to producers
- Need to feel more connected or have more ownership of research projects
- Promote on-farm research/demonstration
- Develop a feedback system between dairy producers and funders
- Increase involvement in producer knowledge transfer (meetings)
- Lobby for additional R&D funds
- Direct some promotional funds to research

11. What do processors need to do to better support effective R&D in Alberta?

- Strengthen communication between producers and processors to build community in support of R&D funding
- Demonstrate commitment through investment
- Work with producers/researchers—tell us what they want
- Be willing to develop and market new products
- Incentives to develop new products or penalties for not developing them
- Take more risks by bringing new products to market
- Support Western Canadian research
- Participate in the development of a research network with dairy producers and processors
- Attend meetings—participate and communicate

12. What do researchers need to do to better support effective R&D in Alberta?

- More effective technology/knowledge transfer to industry stakeholders
- Communication and better understanding of needs of dairy industry
- Communicate with funders
- Keep current with reality
- Promote more collaborative networks between institutions
- More multi-disciplinary research (e.g. physiology, behaviour, genomics, nutrition human-animal)
- Be more innovative
- Apply up-to-date research technology
- Researchers should be able to focus purely on research and delegate other responsibilities (applications, administering grants, dissemination/transfer) - there was disagreement with this statement
- Increase graduate student and post-doctoral training opportunities
- Identify producer priorities and be visionary
- Present research in a user-friendly manner to make it easily applicable
- Demonstrate economic impact
- Listen