

Canadian Beef Advisors – Industry Goals to 2030

Technology Goals

These goals are not presented in any particular order:

- Improvements in speed, reliability, accuracy, and cost-effectiveness of traceability solutions that advance both business and regulatory objectives
- Supporting functional information flow solutions to producers derived from a competitive service sector
- Invest in technological solutions that reduce costs, improve competitiveness and enable regulatory approvals and business functions that support trade and commerce
- Support innovation, research, refinement and commercialization of technologies throughout the supply chain that support economic viability and worker conditions
 - through connecting cattle industry domain expertise with cutting edge technological expertise
- Promote the acceptance of sustainable and safe beef production technologies by customers and regulators, in both domestic and international markets

Context

It is expected technology will evolve more rapidly over the coming decade than it has in the last 40 years. Advancements in technologies have the potential to disrupt and transform agriculture and agri-food value chains. This will make the coming years very interesting. One question is “how quickly can things happen?” Historically, animal agriculture has adopted new technologies at a slower pace than other sectors.

Technology is only one component of innovation and advancement within the overall agricultural system and tends to work in tandem with institutions, networks, and diversity in applications ([Walter et al 2017](#)). It is understood that technology must provide a return on investment (e.g. financial, time savings, process improvements, etc.) or it will not be adopted.¹ When aspects of technology, diversity of production systems, networking and institutions (i.e. markets and policies) are considered jointly, they have been described as “smart farming” ([Walter et al 2017](#)). Smart farming, also known as precision farming, has the potential to make farming more profitable and reduce the ecological footprint. Smart or precision ranching has a lot of potential to help achieve economic, environment and animal performance goals. Consequently, precision ranching is at the nexus of agricultural production and the environmental conversation ([Finger et al. 2019](#)).

There are hurdles to address as technology is adopted. One hurdle is having an outcome-based regulatory system that keeps up with these changes as they occur. In areas such as traceability and export digitization, entire generations of technology can be leaped to bring these systems into the 21st century and better serve an export-oriented industry at the speed of commerce, thus avoiding trade impediments and delays in product movement. Not only must the beef industry implement technology to stay competitive, but technology has the potential to support new products and investments that drive economic development. It should be recognized that technology frequently needs a dedicated operator and therefore does not always reduce labour needs. In fact, technology can increase labour demand for a different skill set and labor output towards the production of value-added products. While technology brings the potential of greater transparency of production systems, there is also the need to address acceptance of technological use in food production.

¹ Returns on Investment may occur in the medium and long-term

Guiding principles for industry investments and partnerships in digital technology are outlined in the [2020-24 National Beef Strategy](#) (page 22). The policy organizations will have greater detail around direction on the regulatory issues of specific topics.

How the goals could be achieved

The table below provides some examples of how the goals can be achieved. This is not a comprehensive list. All technology needs to start from solving an existing problem that is recognized as a problem versus having a technological solution in search of a problem to fix. Every technology needs a tangible benefit for the sector adopting it. As the cost of implementing technologies become more affordable, the cost:benefit needs to be tested and validated at a commercial scale.

Traceability	Technological solutions for Trade and Commerce	New processing technology to improve competitiveness
<ul style="list-style-type: none"> Transition to improved technology (e.g. improved tag retention, enhance read distances, read rates, Ultra High Frequency Tags) in order to meet traceability objectives at the speed of commerce Improve traceability technologies and automated ways of reporting (e.g. movement documents) including their approvals, standards, and regulations Facilitate the collection and dissemination of meaningful genetic evaluations to inform improvements within the national herd Transition to real-time information flow between all participants in the beef value chain (e.g. feedlots and packers on quality attributes and defects [see Beef Quality and Food Safety goals]) 	<ul style="list-style-type: none"> Addressing the lag of technological approvals, standard development, and regulations so that they can be utilized by industry <p>Expediate Export Digitization, including:</p> <ul style="list-style-type: none"> Container seals with digital readout Streamline lab and customs system for microbial testing Electronic certificates and acceptance of electronic signatures 	<ul style="list-style-type: none"> New products that generate customer interest in the beef category Incentives that encourage investment in technology to support new products/processes, enable value added and accelerate innovation Automation (e.g. robotics, artificial intelligence) to effectively utilize existing labour and improve working conditions (E.g. auto-steer, drone tractors, hydraulic vs. manual squeeze, etc.) Better in-plant beef tracking tools
Technological solutions for Improved Sustainability	Sensors and Rural Connectivity	Refinement and Acceptance of Technology
<ul style="list-style-type: none"> Improve point-of-care and refined animal diagnostics to improve animal health outcomes and understand disease movement Develop environmental technologies to improve outcomes (water, air and soil) for meat processors and feedlots Turn by-products into revenue streams to reduce waste 	<ul style="list-style-type: none"> Encourage telecommunication companies to continue to expand rural connectivity to allow industry to take advantage of technological solutions Continued focus on sensor development that have multiple uses (e.g. soil testing, remote animal management) contributing to performance, profitability and environmental outcomes 	<ul style="list-style-type: none"> Address regulatory, consumer, and trading partner acceptance of technological solutions (e.g. feed additives, sensors and drones, alternatives to antimicrobials (AMU), CRISPR/Gene editing technology)

FAQs

Q: How does private industry contribute to these goals?

A: There are multiple ways this can be done. Investments in start-ups, accelerator or incubators for agricultural technology support development of ideas and concepts. Public funding grants and partnerships that share investment in capital expenditures can speed-up the adoption of new technology within the industry. Partnering with research institutions to demonstrate technologies and/or complete trials/adaptation of technologies can increase awareness and provide return on investment numbers so that adopters better understand the risks and returns, ultimately increasing the success of those who adopt a new technology (e.g. early stage funding at the technology readiness level 1-4).

Q: Isn't traceability part of the CCIA mandate?

A: The Canadian Cattle Identification Agency (CCIA) has a mandate "To find solutions for all regulated parties to be compliant with traceability regulations". This includes addressing grass-roots issues with creative solutions. Research projects include new technologies used where no premises identifier was needed and used ghost readers to anonymize tracking data for privacy, data solutions for community pastures - sensors are advancing, new tech becoming available. There is a need to translate research into policy with synthesis of movement data (e.g. auto-data logger). Privacy and confidentiality need to be addressed (under CUSMA and other trade agreements). In addition, there is potential for EpiData to be used and reported differently.²

Q: Is there research needed to support the traceability objectives?

A: Yes, research is needed around: new tag technologies facilitating rapid reading, tag retention (limitations on approval process, standards); tag readers/wands (need to prepare for regulations); and automated ways of reporting. Research into what the data we can collect means and what insights can be generated from it using leading techniques (machine learning etc.). Reducing the reporting burden on industry where traceability data is 'pulled' to the database rather than having to be pushed from the ranch will provide accurate, and timely data while allowing industry to easily comply with reporting regulations.

Q: How does industry build acceptance of Technology?

A: There are several ways that industry could build acceptance. One option is to communicate practices such as right place, time, product, and dose that ensure the responsible use of animal health products (e.g. antimicrobials) while supporting animal welfare and/or associated environmental benefits (i.e. reduced feed requirements). Focus could be placed on changing the image of beef production that uses technology and innovation in a manner that is appropriate, conscious of animal welfare and environmental impacts.

For further information, go to: Beefstrategy.com

² EpiData is a group of applications used in combination for creating documented data structures and analysis of quantitative data; including documenting the quality of the data.