

Traceability and the Real World Interactive Workshop

Information synthesized from the National Institute for Animal Agriculture's Workshop, "Traceability and the Real World Interactive Workshop" conducted April 12, 2018, in Denver, Colorado. Full presentations are available online at www.animalagriculture.org.

DISCLAIMER: The information provided in this White Paper is strictly the perspectives and opinions of individual speakers and discussions at the 2018 workshop, 'Traceability and the Real World Interactive Workshop.'

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Background

The workshop, “Traceability and the Real World Interactive Workshop” conducted April 12, 2018, in Denver, CO, was hosted by the National Institute of Animal Agriculture (NIAA). The conference brought together one hundred eighty eight (188) livestock industry professionals, and included producers, representatives of livestock markets, fairs, and shows, veterinarians, representatives of identification technology companies, and regulatory animal health officials. The workshop considered historical experiences with traceability in both the United States and Canada as well as diverse industry perspectives on traceability and data management. Those experiences and perspectives informed the diverse opinions represented among conference attendees during the review of the draft traceability proposal designed by the industry-driven Cattle Traceability Working Group. The ultimate goal was to consider all of the information presented in recommending both support and changes to the draft traceability proposal, and to determine action items and next steps.

Over the last decade, livestock traceability has been the focus of numerous discussions. In 2013, the Animal Disease Traceability (ADT) Rule became law. Four years after its implementation, the USDA undertook comprehensive assessment of the ADT program. In 2017, a group of industry professionals, supported by the NIAA, formed the Cattle Traceability Working Group to draft a practical approach to national traceability. This Workshop provided an opportunity for stakeholders to review and shape this practical approach and push the movement forward, looking to positive outcomes in the future as the US progresses towards national traceability.

The NIAA is a non-profit, membership-driven organization that unites and advances animal agriculture for the challenges facing animal agriculture industries (aquatic, beef, dairy, equine, goat, poultry, sheep and swine). NIAA is dedicated to furthering programs for the eradication of diseases that pose risk to the health of animals, wildlife and humans; promoting the efficient production of a safe and wholesome food supply for our nation and abroad; and promoting best practices in environmental stewardship and animal health and well-being.

The 2018 Traceability and the Real World Interactive Workshop was funded in part by Allflex, Agrident, American Angus Association, Bovine Veterinarian, Colorado Cattleman’s Association, Colorado Livestock Association, Dairy Herd Management, Datamars Inc., Drivers, Fort Supply Technologies, Global VetLINK, Henke-Sass, Wolf, IMI Global, 6666 Ranch, the USDA, Texas Cattle Feeders Association, Tracefirst, Virox Animal Health and Y-TEX Corporation.

Purpose and Design of the Workshop

The purpose of the workshop was to bring together livestock industry leaders and animal health officials to lead the traceability discussion and seek informed consensus to advance positive outcomes to this challenging issue. The objective was to provide a viable path to move forward with a national vision for traceability, with insight from our Canadian neighbors, United States animal health officials and industry; to identify potential solutions for data management and security; and ultimately to approach traceability through the lens of the producer. Workshop participants gained unique insight into the views and initiatives of the diverse segments of the industry, the opportunity to learn from the successes and failures of the Canadian traceability system, and a voice in the traceability development process, all of which will continue to enhance the advancement of identification and traceability.

Workshop Planning Committee Members

Mr. Glenn Fischer, Allflex USA, Inc.

Chelsea Good, J.D., Livestock Marketing Association

Mr. Ernie Birchmeier, Michigan Farm Bureau

Mr. Neil Hammerschmidt, USDA-APHIS-VS

Mr. Todd Low, Hawaii Department of Agriculture

Mr. Dave McElhaney, Allflex USA, Inc.

Dr. Lucas Pantaleon, Virox Animal Health

Workshop Topics and Speakers

(in order given at the conference)

Introduction and 'Call to Action', Mr. Glenn Fischer, President, Allflex USA, Inc.

Panel Discussion: A Historical Perspective from the United States and Canada, moderated by Mr. Glenn Fischer, President, Allflex USA, Inc.

A Glance Back – Lessons Learned That May Support Future Traceability Decisions, Mr. Neil Hammerschmidt, Former USDA Animal Traceability Program Manager

The Evolution of the National ID and Traceability Program in Canada, Ms. Julie Stitt, Livestock Industry Consultant

Cattle Traceability Working Group Update

Introduced by Cattle Traceability Working Group Members:

Mr. Glenn Fischer, President, Allflex USA, Inc.

Tony Forshey, DVM, State Veterinarian, Ohio Department of Agriculture

Nevil Speer, PhD, Vice President, U.S. Operations, AgriClear

Working Session: Action Items and Next Steps, moderated by Mr. Joe Leathers, General Manager, 6666 Ranch

Panel Discussion: Industry Perspective on Traceability, moderated by Mr. Glenn Fischer, Allflex USA, Inc.

Panelists:

Mr. Chuck Adami, President & CEO, Equity Cooperative Livestock Association

Mr. Jim Lovell, Cattle Procurement, Bartlett Cattle Company

Myriah Johnson, PhD, Agricultural Economics consultant, Noble Research Institute

Canadian Industry Perspective – Toward a Workable Cattle Tracking System, Mr. Ken Perlich, Perlich Brothers Auction Market, Ltd.

Data Management, A Regulatory, Industry, and Producer Panel, moderated by Ms. Kathryn Britton, Senior Director, Where Food Comes From

Panelists:

James Averill, DVM, State Veterinarian, Michigan Department of Agriculture

Mr. Roger Koberstein, Koberstein Farms

Mrs. Jill Wagner, Contract Manager, GlobalVetLINK

Wrap-up Keynote, Nevil Speer, PhD, Vice President, U.S Operations, AgriClear

Executive Summary

Traceability in the United States and Canada

Traceability discussions in the United States were initiated in 2002. The vision for a national traceability program has been introduced, debated, revised, and reintroduced several times. The initial mistake of designing a system that grew too large, too quickly was debated and the system was revised, with new versions of traceability offered. Scaling back and seeking industry input has allowed the discussion to move forward. Concerns throughout the process have remained the same: cost, confidentiality, liability, and speed of commerce. The U.S. has not yet attained traceability, but we are closing in on a solution.

Traceability in Canada was initiated by industry and was designed to be industry-led. Canada encountered stiff opposition from some sectors initially and took the approach of slowly phasing in all aspects of the traceability program. Official full system implementation was in 2002, with significant enhancement after BSE in 2003. The Canadian system is designed to be cost effective, flexible, secure, and allow for the inclusion of value-added initiatives. Canada continues to develop the system with an eye toward world markets, emerging technologies, and long-term animal health and food safety sustainability.

Update from the Cattle Traceability Working Group

This independent group of industry stakeholders is seeking a solution to traceability that is industry driven and flexible. The group supports a bookend structure, tagging cattle at farm or ranch of origin and retiring tags at the packing plant. They seek to enhance existing technology, improving electronic tagging options while supporting the infrastructure that's already in the market. Finally, they want to include value-added capabilities that will enhance current databases.

The draft system employs two databases, one for animal health officials and traceability, and another, protected by a firewall, providing value-added capability. Minimum data needed for traceability of 840 tag users is automatically entered into the system. 900 tag and non-tag users have the option to enter minimum traceability information and make it accessible either as real-time or time-independent data. The draft plan was presented and described in detail. Many workshop attendees expressed concern about the lack of real-time data, and the offer of a data entry choice to producers using non-840 tags.

The Cattle Traceability Working Group will bring the collected feedback and opinions of workshop attendees to their ongoing discussion, re-drafting the traceability plan to address workshop feedback. The working group acknowledges that there will be difficulty attaining full industry buy-in to any traceability plan. They reiterated their commitment to getting the process started, with the goal of publishing guidelines as a starting point.

US and Canadian Industry Perspective on Traceability

Representatives from the United States dairy industry, livestock markets, feedlots, and agriculture research discussed their perspectives on traceability. The dairy industry and the feedlot industry in

general support traceability. The dairy industry already uses EID extensively, so the move to traceability isn't as significant a change as it could be for other segments of the cattle industry. Large volumes of cattle move through the feedlot system, which relies heavily on beef export markets for the trade of those cattle. Feedlots can envision the catastrophic losses, especially in international markets, to a production system that does not include traceability. This concern for losses due to lack of traceability has led a segment of United States feedlots to the development independent domestic traceability system: the Texas Cattle Source Verification Service. The vision of this system is to attain the ability to quickly trace to contain disease incidents and increase access to export markets.

Livestock markets harbor more concerns about traceability than the dairy industry or the feedlot industry, fearing the burden of traceability logistics and costs will fall disproportionately to them. The Canadian Livestock Marketing Industry offers the experience and perspective of 15 years of national traceability. Canadian markets experienced hurdles as the national system was initiated and evolved, but ultimately they came to the view that traceability is necessary for disease management. While Canadian Livestock markets felt that they received an unfair share of the traceability burden initially, the system progressed and advanced to one where producers share the traceability burden more equitably.

Data Management Perspectives

Animal health officials, data industry representatives, and producers bring to the table very different perspectives on data management. Animal health officials are primarily interested in data management for animal disease traceability, and envision that management as standardized, accessible in real-time, and providing security to producers. Producers require data security, with assurances that their personal data will not be used in a manner that is ultimately detrimental to their business. The data industry response is to provide a solution to those needs. A distributed database such as Blockchain is a potential solution, providing the data access necessary for disease control by animal health officials, while simultaneously providing security for data controlled by producers.

One producer who has experienced significant business success implementing traceability at the farm level is Roger Koberstein of Koberstein Farms. He described the implementation of traceability through electronic identification and a data management system employed throughout his ranching organization. In the years since he initiated comprehensive traceability in his cattle herd, the benefits have been extensive, both economic and in consumer trust. These were achieved as a direct result of his institution of birth to slaughter traceability among his cattle.

Conclusion

The United States is making progress towards traceability. We are moving away from the hindrance of old technology and old attitudes, and toward an overall better system. There will be a cost, but the cost of not doing traceability, in terms of animal disease, loss of opportunity, and general vulnerability of the US agricultural sector, is much higher. As we move toward a national traceability system, producers are the only way to reach the critical mass needed to make traceability effective. Producers are beginning to understand the need for traceability, at least from an animal disease perspective, and are beginning

to cautiously accept the idea of electronic identification. The Cattle Traceability Working Group is moving toward a final draft of an industry-driven system. We will keep the momentum moving forward.

Presentation Highlights

Introduction and 'Call to Action'

Mr. Glenn Fischer, *President, Allflex USA, Inc.*

Animal Disease Traceability (ADT) is an issue which has generated controversy in the United States for more than a decade. Today we'll look at where the discussion started, how far we've come, and the lessons learned along the way. One lesson learned from Canada, and one the U.S. should take to heart, is that a coalition of industry drove the successful Canadian regulations. Traceability can be a hard sell, but it can be done. The United States can learn from our own and other countries' successes and build on those. This workshop is all about getting to a consensus point on ADT and finding a way to move forward.

Panel Discussion: A Historical Perspective from the United States and Canada

Moderated by Mr. Glenn Fischer, *President, Allflex USA, Inc.*

Panel: Ms. Julie Stitt, *Livestock Industry Consultant*; Dr. Neil Hammerschmidt, *Former USDA Animal Traceability Program Manager*

The Evolution of the National ID and Traceability Program in Canada

Ms. Julie Stitt, *Livestock Industry Consultant*

The Canadian Traceability System came about through government working together with industry stakeholders to come up with a simple solution. Canada began discussing national identification in 1997. There were two main reasons for this discussion. The Health of Animals Program, which had been in place and providing for cattle identification since 1920, ceased in 1985. By 1997 the level of identification had decreased to less than 50% of the national herd.¹ In addition to this decrease in overall cattle identification, disease issues emerging globally were causing fear in the industry. This decreased level of identification combined with significant concern for disease issues ultimately led the industry to bring the idea of a national identification program forward, with support from the Canadian government. Aside from protection against the spread of catastrophic animal disease, the Canadian traceability program addressed three issues: increasing consumer confidence in the safety and healthfulness of cattle products; ensuring market access to international markets and increasing overall exports; and remaining competitive in the marketplace, both against products from other species and against other countries that had begun to implement traceability programs.

The producer that came forward in 1997 was the chairman of the National Animal Health Committee, and presented the issue as one for which 'we need to do something to protect our industry!' The concept of national identification was endorsed at the Canadian Cattlemen's Association (CCA) in March 1997. A National Identification Workshop was held in 1997 and a consensus to move forward was

reached. A basic, simple business approach was approved unanimously at the August 1997 CCA Annual Meeting. Throughout this process, the Canadian Food Inspection Agency (CFIA) provided consensus and support.

In 1998, Canadian Cattle Identification Agency (CCIA) was incorporated. The CCIA was initiated as a small, industry-led not-for-profit agency whose main goal was to develop a basic infrastructure and educate the industry across Canada that a national cattle identification program was coming, why it was coming, and what it would entail. The structure of the CCIA included a board of directors representing commercial cattle, purebred cattle, feedlot cattle, auction markets, packing plants, veterinarians, dairy, and the province of Quebec. Government was included as an *ex officio* member.² Expert committees were formed to address technical, communications, import/export, and auction issues.

The Canadian beef strategy, put into place as a business plan and promoted by industry, was to develop and implement a credible and reliable individual identification traceback system for animal health and food safety in Canada. Official implementation was designed as a slow phase-in, both of the identification system and the enforcement penalties. The initial identification system release occurred in January 2000, with cattle to be tagged at the time they left the herd of origin. In July 2001, packing plants began to require and read identification. Through both of these phases, enforcement consisted exclusively of education with warnings of violations. Official full system implementation, from identification initiation at the herd of origin to retirement of identification at the packing plant, including monetary penalties for violation, began in July 2002.

There are five key components of the Canadian National Identification and Traceability System: the information system, legislation, standards, technology, and communications. The information system is designed simply, as a basic system with a high level of confidentiality and security. It began as a bookend system, encompassing all cattle in the system from herd of origin to packing plant. Tag numbers are allocated to approved manufacturers, who then produce and distribute those tags, issuing numbers to producers and recording those numbers in the database. Initial tag administration cost was 20 cents per tag. The database storing this data was built and is operated by industry and has a very high level of security. Government only has access to the database in the event of an animal health or food safety emergency.

Legislation and regulations were made possible through the existing authority granted in the Canadian Federal Health of Animals Act (Appendix). The industry worked closely with the CFIA to develop a national strategy for implementation of a national identification system, including compliance and enforcement. Although developed with industry, compliance and enforcement are primarily the responsibility of the CFIA.

Basic national and international standards for identification were not initially included as part of the strategy. However, to ensure the success and international recognition of the national identification system, these standards were subsequently incorporated into all aspects of the traceability system. The standards encompass premises identification, individual animal identification, identification devices, tag

distribution, data reporting, national audits, animal movement, zoning, and after the 2003 Bovine Spongiform Encephalopathy (BSE) case, age verification.

The technology of identification tags began with bar coded tags, because those tags are what producers would initially accept. However, bar codes did not provide a level of accuracy and readability necessary to reach the goal of greater than 95% industry compliance. In addition to the questionable efficacy of bar tags, there were 20 tag versions that were initially approved. Ultimately, the system moved to an electronic identification requirement. Necessary attributes of tags include retention, readability, and traceability, and all tag manufacturers seeking to become approved tag manufacturers were required to prove their tags met these attributes via laboratory, packing plant, and feedlot trials.

It cannot be overstated how important communication was during the phased-in implementation of the national identification and traceability system. The CCIA was initially formed to 'get the word out.' Newsletters and other information were continually distributed across Canada throughout the process. In the auction marts, 'train the trainer' sessions worked best at distributing accurate information.

In 2003, one BSE case affected both Canadian and United States cattle marketing systems. The CCIA was able to provide tracing assistance to the BSE investigation, providing a test of the new national traceability system, and highlighting needed improvements. Several enhancements were instituted after the resolution of the BSE case, providing further honing and improvement of the national identification and traceability system. One of the most important of these improvements was the transition to Radio Frequency Identification (RFID). As with the earlier aspects of the program, RFID was slowly phased into the system, with full implementation by September 2006.

Ten years into the Canadian system, there were many successes and many lessons learned. Industry initiation and leadership, with clear roles for industry and government and clear benefits demonstrated to the industry by the industry, were key to the success of the program. Identification, data security, and privacy, delivered in a cost-effective and user-friendly manner, all within a flexible system designed to not to disrupt commerce and to accommodate current as well as future demand, was also key. The timely introduction of a system test, in the form of BSE, was enough to push the system to greater than 95% participation. All of this has combined to create a proven system with international recognition and standards.

Some lessons learned along the way included a focus on standards, the clear need for electronic identification, and the facilitation of value-chain initiatives from the initial development of the system. Slow introduction will make the system more palatable to often resistant producers, leading to greater buy-in in the future. And finally, when developing a controversial system such as national identification, you will never keep everyone happy. At some point you just have to do it.

As Canada looks to the future, considerations for the evolving traceability system include working with partners around the world to develop international requirements for traceability, with the ultimate goal of enhancing consumer confidence and food safety. Technology must continue to evolve to keep pace with the speed of commerce. Traceability has the potential to provide for long term sustainability,

improve animal health emergency response capabilities, and harmonization of marketing systems throughout the world.

Discussion centered around logistics: tag cost; who is responsible for tagging and providing reading equipment; replacement tags; and tag retirement. Discussion with an emphasis on the importance of producer buy-in, as well as the politics with producer organizations and the government that can add to hindrance of that buy-in.

A Glance Back – Lessons Learned That May Support Future Traceability Decisions

Mr. Neil Hammerschmidt, *Former USDA Animal Traceability Program Manager*

The United States has covered a lot of ground since traceability discussions were initiated in 2002. The vision for a national traceability program has been introduced, debated, revised, and reintroduced at least four times. Concerns throughout this time have remained the same: cost, confidentiality, liability, and speed of commerce. We have compromised, and progressed. We are not at a complete solution yet, but we are progressing towards one. As the national debate has evolved, increasing numbers of producers are beginning to accept the idea that a traceability system is necessary, if not desirable. At the most recent ADT forum, hosted by NIAA and the United States Animal Health Association (USAHA) in September 2017, a group of forward-thinking producers formed the Cattle Traceability Working Group, a progressive, collaborative group representing diverse interested in the cattle industry, dedicated to putting together a workable traceability plan that addresses the concerns of producers.

In April 2002, the National Institute for Animal Agriculture (NIAA) organized the Food Animal Identification Task Force. This group prepared a ‘National Identification Work Plan’, which was then presented in July 2002 and the NIAA Identification Information Expo. In October 2002, this work plan was presented to the USAHA, with a request that the United States Department of Agriculture (USDA) use it as a work plan to establish a national identification program. In the Spring of 2003, a state-federal-industry working group was established by USDA to advance the work plan. 100 individuals from 70 organizations were involved in the effort, which culminated in the national identification development team and ultimately the U.S. Animal Identification Plan (USAIP). The USAIP was designed to address the three tenants of animal disease traceability: premises identification, animal identification, and animal movement tracking. The USAIP was a plan of great scope, including data and identification device standards, requirements for identification of all livestock with electronic identification (EID), and animal movement tracking. The goal of the USAIP was to achieve traceback in the event of disease by 48 hours.

The 2003 BSE case lent urgency to the implementation of an animal identification program, and the USDA expedited its implementation, incorporating USAIP standards and most processes. This version of the United States identification program was named the National Animal Identification System (NAIS). Under the NAIS, identification (ID) device standards were revised to be technology neutral – with no requirement for electronic identification (EID). The phase-in timeline was developed with initial implementation to begin in 2005 and full implementation of animal identification and tracking to occur by 2009. Key to the implementation of the NAIS was the development of Animal Tracking Databases

(ATDs) with a database designed to house and maintain animal movement information, with systematic federal and state government access only if there was a disease event. Numerous private ATDs were certified as compliant for providing traceability data under the arrangement. The NAIS became quite political and was ultimately discontinued before the portal access to the ATD was developed. NAIS was not well received by some sectors of the livestock industry or the general public, through a combination of legitimate concerns and rampant misinformation. In hindsight, this iteration of livestock disease traceability tried to get 'too big, too fast' and collapsed before it could be fully implemented.

In an effort to correct the mistakes of the past, the USDA conducted a series of listening sessions in 2009, to identify the reasons for resistance to a traceability program, and approach a solution that could be accepted by producers. In February of 2010 that approach was identified as the Animal Disease Traceability (ADT) Framework.

Key principles of the ADT framework are smaller in scope than the vision of the USAIP or the NAIS, but respond to the issues identified in the listening sessions while still addressing the needs for functional traceability. These principles include tracking interstate animal movement, administration by the states and tribal nations, use of lower cost technology (e.g. non-electronic tags), and transparency throughout the federal rulemaking process. The final rules were published in 2012, and became effective in March, 2013.³

ADT is a performance-based program, and Traceability Performance Measures (TPMs), measuring timely retrieval of complete and accurate information, were undertaken by government to assess and document progress. On the whole, these TPMs are successful, and the subsequent ADT assessment report indicates that framework objectives are being successfully achieved.⁴ Issues outside the framework do cause gaps: lack of a true bookend system, lack of identification to birth premises, lack of EID, and collection and retirement of ID at slaughter. These gaps should be addressed as ADT evolves.

Lessons learned through this 20 year process should be addressed and incorporated as we move forward. An all-encompassing system is not practical – we need to start small and target each specific industry, or risk losing support and buy-in if the system tries to grow too big, too fast. Flexibility is necessary, but with the caveats that too much flexibility increases confusion and accommodating every concern will lead to traceability gaps. Standardization among states is critical. There is a need to minimize data to only what is essential for traceability: location, event, and date. Finally, existing records such as electronic certificates of veterinary inspection (eCVIs) should be utilized, but with the realization that eCVIs are only part of the electronic equation.

Looking ahead, to advance traceability we need to continue to build on the successful ADT framework, ensure we address the gaps and major concerns, and always be mindful that traceability must occur at the speed of commerce. Tools available in this quest include the ADT assessment of TPMs³, feedback from 2017 public meetings, the USDA 14 point proposal report (drafted as an outcome of the public meetings)⁵, the National Cattlemen's Beef Association (NCBA)'s Feasibility Study⁶, and the Cattle Traceability Working Group, who will present their activities next.

Cattle Traceability Working Group Update

Introduced by Working Group Members:

Mr. Glenn Fischer, *President, Allflex USA, Inc.*

Tony Forshey, DVM, *State Veterinarian, Ohio Department of Agriculture*

Nevil Speer, PhD, *Vice President, U.S. Operations, AgriClear*

The Cattle Traceability Working Group was conceived at the Animal Disease Traceability Forum hosted by NIAA and USAHA on September 27-28, 2017. The purpose of this working group is to pivot from discussing shared history of animal disease traceability to determining next steps. Forty-five people were involved in the initiative, with the voice of the producer central to the group.

The Cattle Traceability Working Group is an industry-driven group that falls under the umbrella of NIAA, but exists as an independent, producer-led team. The group works by a collaborative process and has made significant progress toward a workable national traceability plan. The advances of the committee are still very much a work in progress, and discussion today will be returned to the working group and used to advance planning forward into the future. Dr. Tony Forshey noted that his participation in the working group has changed his mindset from ‘don’t tell me I have to tag my cattle’ to ‘traceability is a value-added product that can help my business.’ The goal is to change the mindsets of the majority of U.S. producers in a similar way.

Working Session: Action Items and Next Steps

Moderated by Mr. Joe Leathers, *General; Manager, 6666 Ranch*

The Cattle Traceability Working Group came into being in December 2017. This independent group of industry stakeholders is seeking a solution to ADT that is industry-driven and flexible. The group supports a bookend structure, tagging cattle at farm or ranch of origin and retiring tags at the packing plant. They envision a system which enhances existing technology, improving electronic tagging options while supporting the infrastructure that is already in place in the market. Finally, they want to accommodate the inclusion of value-added capabilities that will enhance current databases.

The discussion here centers around adult cattle, both beef and dairy, 18 months and older. Joe Leathers, with Dr. Andy Schwartz, Dr. T.R. Lansford, and Dr. Ross Wilson of the Texas Animal Health Commission, drafted a dual scenario simple system to visually depict the working group’s concept of animal disease traceability and the interaction between government and producers, animal disease traceability information and private information separated by a firewall. (Figure 1, Appendix 2).

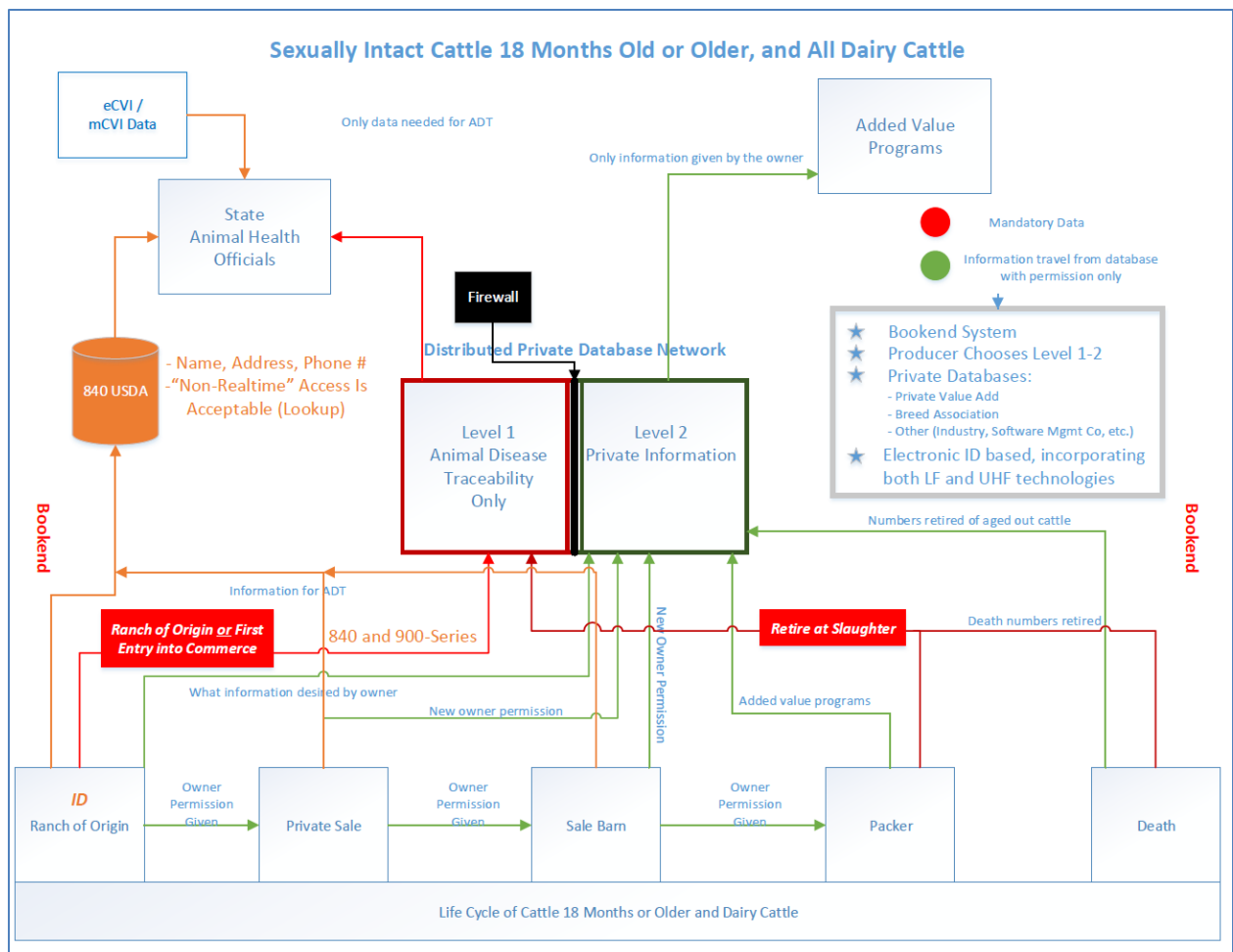


Figure 1. Animal Disease Traceability Schematic – Adult. Cattle Traceability Working Group⁶

This diagram is an initial concept and as such, is a work in progress. Discussion from today’s workshop will inform changes to be incorporated into the next draft.

The schematic depicted in this diagram is designed to provide flexibility and provide for disease traceability to government officials. Everything is a bookend approach. One significant problem that the schematic addresses is the reluctance of many producers to enter private information into a government database. The proposed solution is for 840 tag information to be entered into the system, and to give the ability to producers without 840 tags - often producers with 900 tags - to manually enter their disease traceability data into the level 1 database. The level 2 database is conceived for value-added capabilities, with information available only to the producer, to support and enhance their business.

If the bookend approach is to be accomplished, all traceability data must include information on the ranch of origin and at the packing house. However, many adult cows die at locations other than the packing house – this schematic needs to be updated with more information, such as the reasonable lifespan of a cow, addressing the ‘death’ bookend of the system.

Mandatory traceability data to be entered into the database includes name, address, and phone number of the producer, ranch of origin, and tag retirement information. There are three color codes to the diagram. Red is the mandatory traceability data that creates the bookend. Red data is entered into the system by the producer, the packer, or the recorder of cow death. Red data may be non-real-time access data. Orange data is entered via the 840 database. In order to get an 840 code, a producer must provide the tag supplier with a premises ID. Red and orange data are considered Level 1 information. Green data is private information, not accessible to state or federal officials, and denotes value-added capabilities. Green data is considered Level 2 information, and is maintained for, by, and at the control of producers.

Data in this system must be managed in a cost-effective manner and ensure privacy and confidentiality. The system must be flexible enough to include both private and public databases. Allowing producer control of data management ensures that producers control their own information and that their concerns are heard, which helps alleviate the perceived threat of traceability identification voiced by many in the industry. Additionally, private sector databases often provide more security for data protection, and private management of traceability data will allow for integration with current industry processes with little cost increase as well as the providing the capability to include value add-ons.

DISCUSSION

Dr. Andy Schwartz of the Texas Animal Health Commission noted that he likes the bookend system, but requested clarification regarding the fact that the diagram doesn't include private sales and sale barns as part of the bookend system. Joe Leathers offered that many ranches don't have the facilities to tag at the ranch of origin, thus the green lines represent alternative tagging sites for those cattle, which link back to the ranch of origin and thus to the primary bookend. Dr. Schwartz and Mr. Leathers touched on potential alternatives to facilitate the primary bookend of the system, including using veterinary records of 840 tags issued, or using recorded backtags temporarily as the system gets up and running.

Much of the discussion centered on the proposed allowance for producers to avoid 840 tags and enter their own traceability data into the Level 1 system. This data could be designated as non-real-time, at the choice of the producer. A significant portion of this data would be associated with 900 series tags, which are not tied to a premises ID. The reasoning offered by the members of the Cattle Traceability Working Group is that 900 tags, and the ability to enter non real-time data, are an entry into the traceability system for producers with fear due to misinformation and doubt. It removes the burden of registering a premises ID, a step that is a red flag to many producers. As an aside, many dairy producers would also like to maintain access to 900 series tags, which they use as a secondary ID for production purposes.

Dr. Paul McGraw, Wisconsin State Veterinarian, Dr. Susan Keller, North Dakota State Veterinarian, and Dr. Alex Turner, Colorado Traceability Veterinarian, voiced concern for the lack of real-time information from producer-entered data. Traceability requires real-time data, and without timeliness state animal

health officials are no better off than if the data were not entered in the system at all. There was general agreement from all state animal health officials in the room on this point. Ernie Birchmeier for the Michigan Farm Bureau also objected to the ability to enter non real-time data, as lack of timeliness prevents traceability at the speed of commerce, which slows the entire production system. Dr. Marvin Beeman of Littleton Equine voiced concern that data entered by producers would be siloed, thus unavailable for practical traceability use by animal health officials. Finally, Dr. Neil Hammerschmidt pointed out that this ability is being considered for producers in order to accommodate their fears and hesitations, however, too much accommodation loses what we're trying to accomplish.

In defense of 900 tags and producer-entered data, Glenn Fischer noted that real-time data would be subject to the Freedom of Information Act (FOIA), leaving producers vulnerable. However, many states have laws that protect producer data. Melody Benjamin of Nebraska Cattleman pointed out the need to give reluctant producers an alternative to 840 tags, to prevent them from 'planting their feet and refusing to move forward'.

These objectives led to a discussion of potential solutions. Ernie Birchmeier suggested picking a time to allow 900 tags to run out, which Deborah Wilson of BIXS supported. However, Dr. Paul McGraw pointed out that we already picked this time, and it was in 2015 - yet we are still dealing with 900 tags. Dr. McGraw offered the option of dropping the premises ID from the 840 tag data, as that identification is what most producers object to. Dr. Nick Striegel, Assistant Colorado State Veterinarian, offered that Colorado producers are required to have a Location ID (LID), and they have not resisted that sort of identification. This led Carry Sexton, ADT Coordinator for Massachusetts, to suggest offering a free 'intermediate' tag to producers that would provide information only to state, but not federal, animal health officials. Dr. Randy Munger noted that current traceability regulations do allow an intermediate tag.

At the conclusion of the 900 tag/non-real-time data discussion, Glen Fischer and Joe Leathers noted that the Cattle Traceability Working Group will revisit this aspect of their draft traceability plan to address these serious concerns. Glen Fischer offered that each of the relevant task groups will revisit the issue. The goal is to have a system that is more inclusive, with more access to producers, which can start as soon as possible. Those producers that don't have 840 tags need an alternative entry into the system. The Working Group will use today's input on this issue to rework the solution for how to arrive at that goal.

Finally, an additional discussion centered on database management. Deborah Wilson of BIXS pointed out that for any system to work, it must be easy to use, with the producer entering data into the system only once. Both Deborah and Dr. Julie Smith of the University of Vermont suggested the use of a distributed private database like Blockchain. The 900 series tag users typically already have their own database for production use, and a distributed private database would allow that production database to be directly tied into the traceability system. Renee Strickland of the Livestock Exporters Association asked if Canada could give the United States a tour of how their traceability database works? Dr. Nevil

Speer agreed that that is a good suggestion, and Glenn Fischer thought that Canada would be open to that suggestion.

In wrapping up, Joe Leathers confirmed with the conference attendees that in this discussion, they felt their voices were heard. The Cattle Traceability Working Group wants traceability to be of the industry, but even without full industry buy-in, we are going to get this started, and the working group will put guidelines out there as a starting point.

Panel Discussion: Industry Perspective on Traceability

Moderated by Mr. Glenn Fischer, *President, Allflex USA, Inc.*

Panel: Mr. Chuck Adami, *Equity Cooperative Livestock Association*; Mr. Jim Lovell, *Bartlett Cattle Company*, Dr. Myriah Johnson, *Noble Research Institute, LLC*

Market and Dairy Perspective

Mr. Chuck Adami, *Equity Cooperative Livestock Association*

Equity Cooperative Livestock Association is a member driven association that operates 14 markets in Wisconsin, Iowa, and Michigan, representing 29,000 farmer-ranchers⁷. Three of these markets operate close to state lines, thus have practical experience with traceability regulations. In 2017, these 14 markets handled 700,000 cattle, split evenly between feeder and replacement cattle. He believes that a traceability system, properly implemented, is necessary for disease control and increased market value. However the markets have several concerns. Foremost are concerns about the technology that is going to be required, and the cost that is going to be associated with the capital improvements necessary to accommodate traceability. Additional concerns include the burden of traceability, and the fear that extra burden will be placed on the markets. Finally, the markets feel that any traceability system must minimize inefficiencies and economic impacts in order to be viable and acceptable to the industry.

75% of the markets represented by Equity Cooperative Livestock Association are involved in the dairy or dairy cattle business. The dairy industry uses EID routinely, and most producers are interested in a robust traceability system. However, dairy producers are concerned about the cost of the system, and are concerned about regulations being incorporated that they would consider unreasonable, such as requiring EID for week old bull calves, or requiring EID for a cull cow that has spent her entire life on one farm and is now being phased out of production.

Feedlot Perspective

Mr. Jim Lovell, *Bartlett Cattle Company*

Feedyards are in the business of buying and selling cattle. United States feedyards commonly accommodate more than 4000 cattle and handle 11.7 million cattle annually, with 80% of fed cattle concentrated in the central United States.⁸ There are a tremendous number of cattle in commerce in every day. A small feedyard will process 1 or 2 loads of cattle daily, while a large feedyard may process hundreds of loads per week. These cattle represent a tremendous vulnerability: there are a lot of cattle moving, and currently, many of them are not traced.

The primary concern of feedlots with respect to traceability is how a disease outbreak would affect beef exports. The BSE case in December 2004 caused beef exports to 'drop off a cliff', and the markets took 8 to 12 years to recover. The speed to recover markets is one of the greatest potentials for improvement with traceability, providing the largest gain for feedlots instituting traceability. In addition to domestic investors, foreign investors and markets are asking for traceability, and traceability is an object of growing competition in world markets.

In response to this pressure, the Texas Cattle Industry has developed the Texas Cattle Source Verification Service. The goal of this service is fully functional voluntary Texas cattle source verification by January 1, 2020, with the ability to quickly trace cattle to contain incidents. The vision is that this ability will increase market creditability, and insulate the Texas markets from both domestic and international market reaction to disease incidents. There are many parameters of this system that align with the vision of traceability that we have been discussing here today: industry management, maintenance of data privacy, operation at the speed of commerce, use of EID as much as possible, and limited access by government. The system differs from a mandatory national traceability system in that participation is voluntary, with incentives created to increase participation and buy-in.

Agriculture Research Perspective

Dr. Myriah Johnson, *Noble Research Institute, LLC*

The Noble Research Institute is a non-profit agricultural research organization that collaborates with industry to execute research initiatives.⁹ One of their current pilot projects is the Integrity Beef Sustainability Pilot Project, which involves six industry partners: the Beef Marketing Group, a cooperative of feedyards which buys the cattle sourced through Nobel Research Institute and the Integrity Beef Ailance; slaughter establishment Tyson Foods; processor Golden State Foods, which buys carcass trim from Tyson Foods and incorporates project beef into hamburger patties; and retailer McDonald's, which sells the hamburgers and is funding the project. Traceability is a significant component of this pilot project, the goals of which include improvement of the sustainability of the beef production system and integration of all phases of the beef supply chain.

Throughout the project, cattle are tracked and indicators and metrics provided by the United States Roundtable for Sustainable Beef (USRSB) are measured and evaluated. Traceability is key to this project, and producers are rewarded for their voluntary participation with a \$75 per head premium, on average. All information is documented and shared with producers. The project provides cow-calf producers with feedlot and carcass performance data for their tracked cattle, allowing for more informed and thus improved management decisions, as well as providing information that may help solve bigger industry issues such as Bovine Viral Diarrhea (BVD). The beef industry benefits from increased market access as traceability and health data are more available throughout the supply chain; increased quality of beef product as management decisions based upon performance data improve beef quality; and increased efficiency when product quality improvement is enhanced as tracked data provides information on genetics, feed efficiency, and other important cattle health metrics.

There are many takeaways from this pilot project, but one of the most important is the message it sends to producers regarding traceability: traceability is a tool for increased business performance. This is a great selling point for traceability, and we need to get the message out.

Canadian Industry Perspective – Toward a Workable Cattle Tracking System

Mr. Ken Perlich, *Perlich Brothers Auction Market, Ltd.*

Perlich Brothers Auction Market is a large auction market located in Alberta, Canada.¹⁰ Alberta has long been a bastion of the cattle industry, with a history of large ranches, exportation to Europe, and early adoption of progressive irrigation practices. Currently, Alberta has two world-class packing facilities and a large feeding industry.

Consumers are increasingly interested in knowing where their beef is coming from, as a way to ensure healthfulness, among other things. Both government and the consumer are looking for a traceability system that can tell them where their beef product came from. This desire, combined with the BSE scare in 2003, initiated the discussion of traceability in 2003. Traceability made significant progress in Canada in the past 15 years, but has not been without snags and controversy along the way.

The markets in Alberta were initially promised that there would be no fines for untagged animals, but in fact, there were fines for everyone involved: the producer, the trucker, and the markets. The markets became a *de facto* tagging station to avoid these fines, and ultimately learned to charge a significant per head fee for every animal that comes into the market untagged. Animals arriving with tags incur no additional charges. This system helps with the fines by incentivizing producers to arrive at the market with the required tags, but cattle that come in already tagged are still taxed with condition loss as the animals wait for the tagging process in untagged animals.

A market pilot project was initiated in 2007, in order to assess feasibility of a read-in process. Six markets in Alberta participated, with another 10 participants across Canada. The system was arranged so that alley readers and wands were set up to read four cattle at a time, continuously moving through the read process. Cattle not read the first time were re-sent through the alley. There were several issues with the pilot project at Perlich Brothers, but ultimately Perlich found that there was a 76% read rate for cattle coming through the system. Cost to the markets of such a system depends on many factors: the design of the market, existing infrastructure, number of animals coming through the market, the availability and accessibility of existing traceability information such as brand manifests, and others. Different markets will find different costs to set up systems.

When you are building a workable traceability system, you first must define traceability. For Mr. Perlich, traceability is all about disease management. Market access is important, but an aspect of traceability that the private sector can address. To build a workable plan for the system, you must ensure that you keep in mind the producer, the consumer, and the animal, and work within industry

resources and standards to build the system. Resources to fund the system should be defined, and as they are, the perspective must be one of ‘public good’ instead of ‘public purse.’ Finally, rules and penalties must be established, through a combination of education and coercion.

The Canadian Livestock Marketing Industry experienced hurdles along the way to traceability, but ultimately came to the view that it is necessary for disease management. The Canadian Livestock markets felt like they got an unfair share of the traceability burden at first – but evolved to a system for producers to share that burden more equitably.

Data Management: A Regulatory, Industry and Producer Panel

Moderated by Ms. Kathryn Britton, *Senior Director, Where Food Comes From*

Panel: Dr. James Averill, *Michigan Department of Agriculture*, Mr. Roger Koberstein, *Koberstein Farms*, Mrs. Jill Wagner, *GlobalVetLINK*

Data Management: A Regulatory Perspective

Dr. James Averill, *Michigan Department of Agriculture*

The regulator’s ultimate goal is to protect, regulate, and promote animal health. This goal is accomplished via three core functions: monitoring reportable diseases, licensing, and animal disease traceability. The ability to serve at the speed of commerce is paramount to the practical execution of these core functions. In order to achieve traceability at the speed of commerce, data management must provide data in a useable and relevant manner; provide standardization for databases; and provide information protection to a level that delivers producer data security.

The state of Michigan has endured an outbreak of bovine tuberculosis since 1995. The benefits of this ongoing disease incident are twofold. Michigan has been able to require all cattle to have RFID when leaving a premises, and all tuberculosis program data from the outbreak has been uploaded into USAHerds, a state-operated database that communicates with federal databases. Michigan also has a privacy statute that exempts this animal and producer data from disclosure under FOIA, thus protecting the privacy of the producers’ data.

Data management is critical from a regulatory standpoint, as having accurate data available in the case of a disease outbreak is vitally important. This data provides not only for current needs, but also the health of future generations. In order to provide for timely access to data, the database must meet all parties’ needs, and provide for the security necessary to protect producer privacy. Regulators strive for data management that is standardized, accessible, and provides security to producers.

Databases: An Industry Perspective

Mrs. Jill Wagner, *GlobalVetLINK*

Facebook. Target. Health insurance databases. Credit card hacks. As databases around the world are breached and private information is illegally accessed, consumers are becoming more concerned of about how their information is being used. Hacking and privacy are at the heart of this concern.

However, even as concerns heighten, data stakeholders don't know how information moves throughout the system, and thus they mistrust all databases.

Data silos are one reaction, but siloed data has limited utility. Solutions exist in models such as Blockchain, which provides both privacy and access through a distributed system. However, distributed systems only work if all of the stakeholders participate. In developing a data management system, there are four main considerations for stakeholders: who has and needs access; legal considerations, including risk and FOIA; the standardization of shared information; and the ability to gain buy-in from stakeholders, such that participation is maximized.

Koberstein Farms: A Producer Perspective on Data Management

Mr. Roger Koberstein, *Koberstein Farms*

Koberstein Farms is a large ranching operation with production in both Colorado and Nebraska.¹¹ Koberstein farms has been using RFID for many years, initiated by a desire to know where every animal in both states was at any given time.

Koberstein Farms ranches offer full traceability from birth to plate. Data collected includes calf data, collected at tagging at about 60 days of age; feedlot or pasture data, as animals are scanned at the feed bunk; harvest data, returned from the processor; and restaurant and meat sale data. The farm has realized a multitude of benefits from full traceability. Economically, he has seen a 10% increase per year of demand for his beef since instituting full traceability. His customers find real satisfaction is being able to trace their beef from calfhood to plate. The ability to track genetics via traceability has made a significant difference in the improved genetics in his herds, and in more than a dozen restaurants in the Loveland and Longmont area, restaurants list Koberstein Farms on their menu as the source for the beef that they sell.

Traceability starts with the producer. It needs to be easy, with market incentive, not only to bring new producers into the system, but to keep them in it once they join. Tagging and education of 4-H animals and human participants is a great asset to keep tagging in front of the public. Finally, government must work with producers to educate them, bring them into the system, and keep them engaged.

Discussion with conference attendees addressed why Koberstein Farms decided to institute full traceability, which type of EID Koberstein Farms uses, premises ID registration, and standardization issues. Part of the reason for the move to full traceability was the need to comply with animal disease traceability regulations in two different states, and part was his experience working as a superintendent for the National Western Stock Show (NWSS) where every animal in attendance was tagged with EID. NWSS demonstrated the utility of tagging, particularly in animals that tested positive for drug residues, and working with state officials in both Colorado and Nebraska demonstrated how receptive the states were to working with the farm as it instituted a traceability system. He sees uses for both low frequency (LF) and ultra-high frequency (UHF) tags, ranging from existing LF infrastructure to the readability of UHF. There are benefits and pitfalls to both. Finally, Koberstein Farms uses only one particular tag, so have not experienced any issues with standardization

Wrap-up Keynote

Nevil Speer, PhD, *Vice President, U.S. Operations, AgriClear*

It's all about producers. That's what this workshop was today. We have a Cattle Traceability Working Group, organized and run by producers, and it's these producers that will take the discussion today and use it to craft a workable national traceability plan.

We need critical mass in order to make traceability effective - and producers are the only way to get there. A recent producer attitudes survey shows that opinions in the industry regarding traceability are starting to change. Sixty-five percent of cow-calf producers surveyed indicate cautious support for the idea of traceability.¹² We need to build on this, starting traceability with the cow-calf producer, at the ranch of origin.

New opportunities mandate new thinking. Brite tags have long been a hindrance, and we're beginning to move past it. The most recent ADT analysis indicated an increase in support of EID for cattle. 70% of producers are willing to consider EID.^{3,13} Brite tags are one hindrance to traceability at the speed of commerce, and the other is designing the data management system. We must build a system that is secure, easy to use, producer driven, and works at the speed of commerce. We have the ability and the knowledge.

As we move forward, there will be costs, but we must remember that there is an even higher cost to not doing traceability. In addition to lack of disease control, lack of traceability limits US access to export markets, which are increasingly requiring traceability in the course of business. US consumers want to know where their food comes from, and lack of traceability leads to lack of consumer confidence. Finally, in examining risk from natural or terrorist disruption, the current absence of traceability is a key vulnerability in the risk of United States agricultural sector.¹⁴

We have the ability, and we have the knowledge. Producers are moving toward cautious acceptance of both traceability and EID. We need to keep the momentum moving forward, and build the best system we can with the knowledge we have, and get national traceability started.

Appendices

Appendix 1: Canadian Health of Animals Act – Section 64. *Legislation providing for a national identification program.*

C.R.C., c. 296, 64 Regulations

(1) The Governor in Council may make regulations for the purpose of protecting human and animal health through the control or elimination of diseases and toxic substances and generally for carrying out the purposes and provisions of this Act, including regulations

(y) establishing and governing a national identification system for animals that provides for standards and means of identification;

Appendix 2: Cattle Traceability Working Group - Draft ADT Adult Cattle System Structure Proposal

April 6, 2018



Cattle Traceability Working Group

Bookend vs. Full Traceability

- The Cattle Traceability Working Group is an Independent working group of interested stakeholders not beholdng to any organization but interested in developing an industry-driven flexible solution to I.D. and traceability.
- Discussions by the CTWG Working Group to date have supported a Bookend structure for an I.D. and traceability system.
- We must walk before we run. A full traceability system may be achievable in the future, but there is strong opposition among producers today for full traceability.

- Beginning with enhancing the current Animal Disease Traceability system is prudent.
 - Improve the tagging technology from metal clip tags to approved low frequency or ultra-high frequency tags will significantly improve “speed of commerce” capabilities, supporting infrastructure is already evolving in the market, and it is the market that will determine if the dual technology approach continues to be preferred, or if one technology or the other proves to be more practical over time.
 - Adding value-added information sharing capabilities will create dual-purpose databases that are larger, operate more efficiently and reduce costs to producers and other users. Many such databases already exist in the private sector today.
 - 840 tags are currently required for interstate movement, however we must facilitate greater participation by including intrastate movement and the inclusion of 900 series tags.
 - Adding 900 series tags in the beginning will increase producer participation thus increasing traceability capabilities until the 900 series tags can be phased out. More than 10 million Low Frequency RFID tags were sold into the U.S. market in 2017 and more than 50% of them were non-840 tags.

Data management and structure

- Some stakeholders are concerned with cost, thus the emphasis on state-agency databases. Other stakeholders are concerned about privacy and confidentiality, thus the emphasis on private sector databases. This demands flexibility in database structure and management.
- Producers must be in control of their own choices and own data.
- Public sector databases
 - usually more susceptible to Freedom of Information Act requests from activist groups and others.
 - The CTWG Liability subgroup is researching this issue and will provide a report in early summer. ???
- Private sector databases
 - can usually provide more confidentiality to data protection but this is being researched.
 - usually more economically and operationally efficient
 - more capable of scaling up to serve more producers and data sharing needs than federal or state government agencies
 - Distributed Private Database Network system which creates databases capable of managing disease traceability information and private value-added information will reduce costs.

Speed of Commerce definition

- Several have been suggested....and continuing to work towards a more comprehensive definition of all segments is critical.

- “Provide a system that can be integrated with current industry practices with a minimum amount of economic and efficiency disruption, and, wherever possible, create valuable management efficiencies for the producers at each stakeholder level.
- “Allowing livestock to move through agriculture operations at the quickest speed possible, especially in livestock auction settings, where the pace of sale can affect value of animals.”
- Both of these and likely others (from other stakeholder segment perspectives) dictate that the fastest, most efficient and economically feasible methods to process cattle and collect accurate required ID information at ranches, dairies, markets, feeders and packers to meet current state and federal ADT regulations should be utilized.

Footnotes

¹ Kellar J.A. & Robinson R. (1998). *Re-identification of Canada’s national cattle herd*. Canadian Food Inspection Agency, Ottawa, Ontario, 7 pp.

² Canadian Cattle Identification Agency By-Laws, revised. (2016). *A by-law relating generally to the conduct of affairs of the Canadian Cattle Identification Agency*. Retrieved from http://www.canadaid.com/about_us/about_us.html on May 8, 2018.

³ 9 CFR Parts 71,77,78,and 86. *Traceability for Livestock Moving Interstate*. Retrieved from https://www.aphis.usda.gov/newsroom/2012/12/pdf/traceability_final_rule.pdf on May 8, 2018.

⁴ USDA-APHIS. (2017). *Animal Disease Traceability Assessment Report*. Retrieved from <https://www.aphis.usda.gov/traceability/downloads/adt-assessment.pdf> on May 8, 2018.

⁵ USDA-APHIS-VS. (2018). *Animal Disease Traceability: Summary of Program Reviews and Proposed Directions From State-Federal Working Group*. Retrieved from https://www.aphis.usda.gov/publications/animal_health/adt-summary-program-review.pdf on May 8, 2018.

⁶ World Perspectives, Inc. (2018). *Comprehensive Feasibility Study: U.S. Beef Cattle Identification and Traceability Systems - Evaluation of Opportunities, Obstacles and Incentives Across the U.S. Beef Industry Value Chain*. Retrieved from <http://www.beefusa.org/traceabilitystudy1.aspx> on May 8, 2018.

⁷ Equity Cooperative Livestock Sales Association: <http://www.equitycoop.com/>

⁸ Source – CattleFax: <http://www.cattlefax.com>

⁹ Nobel Research Institute: <https://www.noble.org/>

¹⁰ Perlich Brothers Auction Market: <https://perlich.auction/>

¹¹ Koberstein Farms: <http://www.kfangusllc.com/>

¹² World Perspectives, adapted. (2018). *Distribution of Cow/Calf Producer Attitudes – Beef Industry Traceability*.

¹³ World Perspectives, adapted. (2018). *Strength of Support/Opposition to Traceability Animal ID System: RFID/Electronic Tags*.

¹⁴ Knowles *et al.* (2005). *National Institute of Justice Research Report: Defining Law Enforcement's Role in Protecting American Agriculture from Agroterrorism*. Retrieved from <https://www.ncjrs.gov/pdffiles1/nij/grants/212280.pdf> on May 8, 2018.

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