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CANADIAN
CATTLE
IDENTIFICATION
AGENCY

# THE STORY OF TAGS



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Many people rely on tags as part of their daily business but are unaware of the detailed research, testing and systems required of tags in Canada. This document is presented to give a better understanding of the origins of tags and how this all came to be a national program with global ties.

The word "tag" will be used when referring to animal identification indicators in this document. You may see them more commonly listed as tag/indicator in other literature on the subject.

This document was created by the Canadian Cattle Identification Agency (CCIA), an industry-initiated and led, not-for-profit organization incorporated to establish a national livestock identification program to support efficient trace back and containment of serious animal health and food safety concerns in the Canadian livestock industry.

**COVER PHOTO CREDITS**

*Bison photo courtesy of Staden Farms*

*Cervid photo courtesy of Ian Thorleifson*

*Sheep photo courtesy of the Canadian Sheep Federation*

**1998 | NATIONAL ID PROGRAM**

The national program needed accuracy and speed when identifying livestock, in order to be considered practical.

# HISTORY OF TAGS IN CANADA

The first iteration of the National Identification (ID) program was initiated by CCIA in 1998 for cattle and bison. This included the creation of a multi-species, national information database, managed by CCIA. The program was voluntary and relied on machine-readable visual ear tags which were printed with a unique barcode.

Tagging with official tags began at the cow-calf level but this was only a portion of the entire herd. It would take more than a year for identified animals to move through the system. In an effort to get more animals registered in the national database an additional tag was soon developed for feedlot cattle. A low cost, one-piece, feedlot tag in multiple colours, marked with a unique number was developed. The number was translated into a barcode to allow the tag to be machine-readable.

The barcode technology proved difficult to use in the real world. Dirt on the tags caused barcode-reader errors as the technology required line-of-sight of the barcode to be read. The national program needed accuracy and speed when identifying livestock. A technology that could be read through the dirt and muck was essential to the success of the program.

In 2003, a technological advancement was adopted that would change the identification program in Canada. Radio-frequency identification (RFID) tags were introduced, allowing for more accurate readability without the

requirement of line-of-sight. Tags could be covered in dirt or hair and were still readable with 100% accuracy.

The new RFID tags were the technological solution the program needed, but they came with a higher cost. In 2004, the federal government offered a subsidy to encourage producers to move to RFID, which was called the 'set-aside' program. The program would allow government to subsidize the initial tagging of all calves in the system so that producers were not unfairly burdened at the program start-up. Barcode tags were still in use but finally phased out by 2010.

CCIA instituted a testing program to ensure that any tag entering the system met the global standard for animal identification and that tags met a minimum level of performance. The Technical Advisory Committee (TAC) worked with industry and following the International Organization for Standardization (ISO) to create basic performance requirements for RFID tags. A testing standards document was developed. A local engineering laboratory was contracted to help develop procedures and apparatus to test tags for CCIA.

In 2010, it was determined that a more comprehensive, national testing program was required that included transparent and internationally accepted testing procedures and a testing laboratory with international credentials that would be respected by government, industry and manufacturers.

**RFID | RADIO-FREQUENCY IDENTIFICATION**

RFID would change the identification program in Canada.

# LF/UHF

Tags in Canada started with a simple barcode on a plastic tag. The barcode was a unique number according to the system following International Organization for Standardization (ISO), Standard 11784 and ISO 3166.

As a member of ISO, and an international partner it became increasingly important to keep and maintain the ISO numbering system. The global standard used for animal identification is ISO Standard 11784 and ISO 11785 and this standard uses low-frequency (LF) technology and part of a platform that includes electronic (RFID) tags for livestock. All can be read and interpreted by the same reader because they all are manufactured to the same standard.

Discussion regarding the move to a different technology which uses Ultra High Frequency (UHF) has been going on for over 10 years.

Some of the potential advantages of a UHF technology based system would include a longer read range, anti-collision capability (the ability to read many tags in a group) and lower costs.

Currently there is no standard or numbering scheme available for livestock within this technology platform. UHF has international standards for use in supply chains, however, they were not designed for use in livestock.

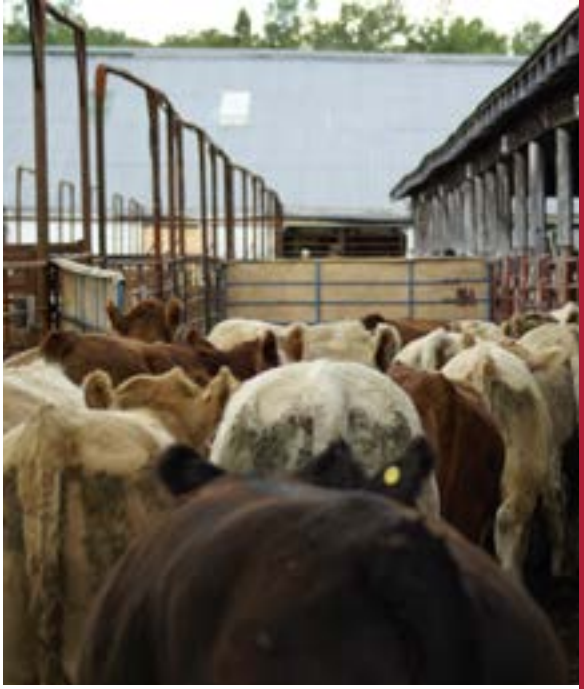
**ISO's | REGULATED BY GOVERNMENT**
The global standard for animal identification is low-frequency (LF).

Moving to UHF technology platform would be a formidable undertaking for the industry. There is no real way to transition from LF technology. It will need to pivot to the new platform if deemed appropriate. Our current ISO standards keeps our tags compatible with other systems anywhere in the world. Having a standard to abide by, companies can make one product that works anywhere.

It would be a massive overhaul to transfer industry from the current low-frequency technology to UHF. It is not simply just a software update, but a hardware change and a whole new set of infrastructures. This transition would come with a cost to the industry, to upgrade tags and tag accessories and a cost to subsidize these changes and to facilitate the transition.

UHF technology has both benefits and challenges. In feed-lots and auction markets; the increased read range and the ability to point an antenna at a group of animals and read the whole group in one simple action could be seen as beneficial.

CCIA currently has a research project underway looking at UHF technology and the costs and benefits of a technology shift to a different platform.



**UHF | TECHNOLOGY BENEFITS**

Increased read range and the ability to point an antenna and read the whole group in one simple action.

# DISTRIBUTION/SELLING

The tag program began with a small number of companies that had the capability to make products suitable for use in the system. Each manufacturer had their own distributor. The tag program was launched through commercial distribution via farm and ranch retail stores to reach the most producers in the shortest amount of time. Farm and ranch retailers played a pivotal role with the launch of the program.

In 2010, CCIA in conjunction with a large consulting firm did an analysis of the tag/animal data and determined changes were required as to how tag data was collected to improve the integrity of system. As a result, the supply chain was optimized by moving to a single distributor. CCIA simplified the system to be manufacturer-distributor-producer, which lowered the overall cost of tags across the country and provided better selection of approved tags to all producers. With a more efficient distribution model, the average cost of tags was reduced and the integrity of the tag/animal data improved. All approved tags and accessories


**CCIA | ONE DISTRIBUTOR**

We use a "less hands in the pie" approach, and a more efficient distribution model.

are available from the CCIA webstore, as well as select licenced, farm and ranch retailers and participating veterinary clinics across Canada. The CCIA webstore is competitive with retail outlets, and tags within the various brands are the same price anywhere in Canada. The web-store gives producers the choice of all approved brands of tags and accessories.

CCIA conducts annual tag testing for performance and conformance of all approved tags to ensure tags meet minimum specifications to which they were approved. CCIA monitors results so that tags meet the criteria for minimal performance standards. In 2019, two approved tags that were tested, failed to meet the conformance standard. As a result, one company resolved the problem and one company was removed.

**tags.canadaid.ca**


**CCIA | NOT-FOR-PROFIT**
All approved tags are available from our webstore and available across Canada.

# THE APPROVAL PROCESS

The tag approval process is transparent and thorough. All tags used in the National program must be tested and then approved by the Minister of Agriculture and are required to meet a strict conformance and performance criteria.

All testing is based upon a technical document targeted toward conformance and performance of tags, known as the National Testing Framework. The document was created by the National Identification and Methodology Advisory Committee (NIDMAC), a joint government/ industry advisory group, and outlines in detail the technical requirements necessary for successful submission, testing and approval of tags for use in Canada.

The Framework details the laboratory test parameters and the field testing criteria necessary for approval. The field test is at least a one year retention test on live cattle and bison, the results need to meet the Framework Standard with 99% retention of all tags on test over one year, with a 95% confidence level. Field trial duration vary with species.

All tags are required to be certified by the International Committee on Animal Recording (ICAR) and tested by CCIA in an ICAR approved testing facility. Currently, there is only one lab that meets criteria to test indicators against the Framework standards, and that lab is in Germany.

**TAGS | TESTED BY ICAR APPROVED LABS**

Currently, there is only one lab that meets criteria to test tags at -35 C and that lab is in Germany.

Laboratory tests include stress tests at various temperatures to ensure tags work in the colder environs in Canada, including measuring the force it takes to couple tags and pull tags apart. Tests also measure other factors such as the minimum distance it takes to read a tag. This entire process helps stop under performing products from entering the system and allows CCIA to determine the minimum quality that is needed. CCIA tests all tag types, and all approved tags go through a yearly testing procedure to ensure they still meet all criteria. As a responsible administrator, CCIA ensures indicators meet the criteria of the National ID program.

By working directly with manufacturers, CCIA can request changes or modifications to products in order to meet the required standards. CCIA receives in-depth reports back from the testing laboratory with results and recommendations rated against the NIDMAC framework. After lab testing, field trials are initiated. CCIA works closely with farmers and ranchers, finding herds that can provide access to the test tags for the required period of time.

Finally, when the Minister of Agriculture approves the tag, it goes onto an approved tag list which is a public document.

**CCIA | RESPONSIBLE ADMINISTRATOR**

It's our job as a responsible administrator to make sure tags meet the criteria of the National ID program.

# THE FUTURE

Tags have undergone improvements since the program began and technology may well change for the better in the future. As a responsible administrator, CCIA is technology neutral and is open to any and all technology solutions that can benefit the system at a lower cost.

UHF technology is one such solution. There is a lot of interest around this technology and it may benefit some more than others. A cost-benefit analysis will be done to determine where the value is with this potential pivot in technology.

Huge technological strides have been made with concepts like facial recognition and artificial intelligence which could be beneficial for animal identification. This technology may one day be transferred to animals and animal ID systems and entirely change our current methods. Maybe there will no longer be a need for a perfect animal ID system in the future.

Tags themselves don't change much. They are cost effective and they work. The element that will inevitably change with tags is the technology.

**CCIA | TECHNOLOGY NEUTRAL**

CCIA is about the data rather than the device used to collect the data.

*Photos courtesy of our member organizations and directors.*

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CANADIAN CATTLE IDENTIFICATION AGENCY

CCIA (Canadian Cattle Identification Agency) is led by a board of directors representing 16 livestock organizations across Canada, including: livestock producers, auction markets, livestock dealers, feedlots, veterinarians and processors and is the responsible administrator of the animal identification program and traceability initiatives for beef and dairy cattle, bison, sheep and pending regulation, cervids and goats in Canada (with exception of Quebec where CCIA only administers bison and goats.)

**KNOW | CLTS DATABASE**

clts.canadaid.ca

Login to your CLTS account via your home computer or MOBO app; input your premises ID number and update your account information.

**LEARN | CLTS RESOURCE CENTRE**

support.canadaid.ca

An online information and learning source on how to use the Canadian Livestock Tracking System (CLTS).

**USE | TRACEABILITY TECHNOLOGY**

support.canadaid.ca/clts-mobo/

Download the CLTS MOBO phone app from your favorite app store and put the CLTS database in your hand.

To learn more about how we are working towards traceability together:

canadaid.ca | info@canadaid.ca | 1-877-909-2333