Using RFID to Advance Traceability

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Overview

- Official IDs for Cattle
  - Visual / data entry
  - RFID (LF, UHF)
- Advances in other industries
- Imported animals
- Other countries
- Tag retirement
Official ID Options for Cattle

• Visual Only
  – NUES, Brucellosis Vaccination, 840

• RFID
  – LF & UHF
    ○ 840
    • NUES
Visual Only ID

• Low-cost to Produce
• Identifies the State where applied

• Manually recording of the ID
  – Animals restrained
  – Increased stress, chance of injury, shrink (costs to producer)
  – Reading / Communication / transcription errors
  – Recording twice to get into electronic format (searchable)
  – $ Data entry - Error rates (1% / keystroke)
ID Recording Errors

• Mobile applications
  – Assist with proper ID format

• Tracing wrong animal – correct animal never followed

• Animal traced to wrong herd
  – Testing and quarantine of herds not associated
  – Unnecessary culling
    o Producer, State / Federal Government, Taxpayers

• Open ended traces – animals never found
RFID - Cattle

ID is captured electronically – no data entry errors
Information easily shared or reused – requires Infrastructure

- Low Frequency
  - 134.2 kHz

- Ultra High Frequency
  - 902-928 MHz
LF RFID

- **Less Expensive (currently)**
  - HDX = $2.37/tag (CattleTags.com)
  - FDX = $2.04/tag (CattleTags.com)

- **Existing Infrastructure**
  - Est. 9 -12 million tags annually
  - 1000+ readers sold

- **ISO Standards**
  - ISO 11784 & 11785

- **Read range 12”-18”**
  - Animals restrained/single file
  - Only read one at a time
UHF RFID

• More Expensive (currently)
  – UHF = $3.22/tag (Fort-Supply.com)

• Read range – Handheld/Fixed (8’-16’)

• Ability to read many tags at once
  – No need to move in single file or restrain individually

• Reduced stress, shrink and chance of injury since animals do not need to be restrained - may offset tag costs

• Additional user memory

• Limited Infrastructure/market penetration
UHF RFID

• APHIS conducted UHF pilot projects (2014-2015)
• No International Standards
  – USDA Interim Tag Data Standard 2016 (840/NUES)
• ISO WG creating international standard for encoding IDs
• Canada, Brazil, Denmark, Germany, New Zealand & Scotland
  • Showing interest in UHF
• Dual frequency tags 2015 (Scotland)
• US manufacturers investigating UHF backtags
Possible Need for Single RFID Format

• Questionable if both LF and UHF could be supported

• Infrastructure costs increase (readers / antennas)
  – Would need to have equipment to read both types

• Could a dual frequency tag/readers bridge gap?

• Need Industry led group to lead discussion / decision
Why Adopt RFID?

• Need to collect IDs accurately & at the necessary speed
  – “Speed of Commerce”
  – Traceability does not need to interfere with business
  – Need to retire official IDs
  – Other countries have already “invented the wheel”
    ○ Use lessons learned and what works from others

• Examples of electronic solutions other industries have used
Speed of Commerce - Retail

- Grocery / Department Stores
  - Use of automated checkout
    - Prices (accuracy)
    - Speed
    - Inventory control

- Manual entry
  (Visual Only)

- Single item scan - Barcodes
  (LF RFID)

- No Cashier or line - read items on the go
  (UHF RFID)
Moving People and Vehicles

• Toll roads
  – Transition
    o Cash
    o Electronic

Single file slow down for read at toll booth (LF – RFID)

No Toll booths no stopping or slowing (UHF-RFID)

Stop and Pay – (Visual Only)
Trucking Industry

- Weigh in Motion
- PrePass®
Other Industries

- Examples embraced technology
- Invested in the infrastructure
- Capture the information electronically
- Became more efficient (Save time and money)
- Continuously looking for ways to improve efficiencies and throughput
RFID Enables Traceability

- Imports
- Other countries
- Tag retirement
Imports – MX (Chihuahua)

• Roping steers identified with LF RFID
  – Desire to use RFID for feeders moving to the US
    o Speed / efficiencies during inspections
    o Ability to follow animals – carcass data
  – US gains efficiencies at border/safety
    o Data available to States
  – Electronic recording of all animals entering US
Imports – MX (Chihuahua)

• Conducting additional pilot projects
  – Electronic data transfer from MX to US
  – Uploading individual IDs into VS databases
  – Providing electronic information to States
Imports - Canada

• All Canadian imports have LF RFID
  – US not currently receiving tag data electronically

• July 1, 2010
  All cattle must be tagged with an approved Canadian Cattle Identification Agency (CCIA) radio frequency identification (RFID) tag prior to moving from their current location or leaving their farm of origin (unless going to an approved tagging site).
Imports - Canada

• Pilot project Feeders
  – Potentially not require unloading
  – Electronic data exchange
  – Use of QR codes
    o All animals in load
    o Or animals on import paperwork but not on vehicle
  – Share data with States
Data Sharing Alternative - Canada

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<th>QR Code</th>
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124000215596714 124000213950605 124000221218048 124000213424274 124000213950628
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124000213951033 124000213627804 124000218998876 124000215291100
Traceability in Other Countries

- Canada – LF RFID required – Looking at UHF
- Mexico – wanting to move to LF RFID for exports to US
- New Zealand – RFID required
- Australia – RFID required
Tag Retirement

• ADT Assessment
  – Tag retirement is a gap

• Many comments received on tag retirement and how this is considered a vital piece of ADT:
  – “Need to know what animals are no longer in the population”
  – “Government responsibility”
Tag Retirement – ADT Assessment

“The termination or retirement of official identification numbers at slaughter would GREATLY INCREASE TRACING EFFICIENCY as it would document which animals have been removed from the population.”

“While the TERMINATION OF VISUAL-ONLY TAGS IS NOT CURRENTLY FEASIBLE*, it could be systematically achieved at slaughter plants when RFID technology and infrastructure are established.”

*Pilot project conducted by APHIS to investigate the cost of NUES tag retirement - $1/tag
RFID Advances Traceability

- Speed
- Accuracy
  - No manual data entry
- Potentially saves money (data entry/retrieval - States)
  - $ used to build infrastructure?
- Existing Standards
  - ISO 11784 & 11785 (LF)
  - USDA interim standard / ISO for UHF in animals under development
- Millions sold and applied in the US annually
  - Provides initial bookend/Imports
- Need Infrastructure not just tags
  - Readers/software
  - Searchable databases
  - Data Exchange

Insurance policy against ID transcription errors
THANK YOU!!