

# ***National Animal Identification System (NAIS)***

## ***Pilot Projects/Field Trials Report***

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# Basis of Pilot Projects/Field Trials

- ❖ Industry-State-Federal partnership
- ❖ Developed in applied situations to demonstrate feasibility and document performance of proposed animal ID systems
- ❖ Intended to obtain unbiased experience by state animal health officials with selected technologies and products in selected environments



# What the Pilot Projects/Field Trials Were Not!

- ❖ Comparison of products and systems; rather, they were an evaluation of products and systems in varied environments
- ❖ Hard science



# General Description of Program

- ❖ Funding available in late Fall, 2004 for 12-month period
- ❖ 16 States, 1 Tribe participated; CO, FL, KY, MN, MT, WY, CA, ID, KS, ND, OK, PA, SD, TX, NM, AZ, Ft. Belknap
- ❖ Extensions requested for some of the projects; final reports forthcoming
- ❖ All projects/trials coordinated by State/Tribal Animal Health Officials



# General Description of Program

- ❖ All projects involved LF RFID
- ❖ Species involved included beef cattle, dairy cattle, swine, sheep, goats, white-tailed deer, equine, bison, elk



# General Description of Program

- ❖ Livestock industries involved included beef cow-calf, dairy, dairy calf growers, beef feedlots, farrow-to-finish swine, sheep flocks, sheep feedlots, captive cervids, bison cow-calf, ram test stations, replacement beef heifer confined development, cull cows, cull sows and boars, recreational horses



# General Description of Program

- ❖ Production system industries represented included livestock markets (12); harvest facilities (7); and order buyers (1)
- ❖ Companies involved included Y-Text, Digital Angel, Allflex, Farnam, eMerge Interactive, Global Vet Link, AgInfoLink, IMI Global, Beef Industry Exchange, Premier, GAM, Ranger ID



# Executive Summary Highlights

(Common to all 17 projects)

- ❖ Every operation is unique and will likely require some degree of customization when using LF RFID
  - ❖ Best results are obtained when one fully understands the limitations of a selected environment for incorporating a chosen animal ID technology



# Executive Summary Highlights

(Common to all 17 projects)

- ❖ Every operation is unique and will likely require some degree of customization when using LF RFID
  - ❖ Understand the limitations of a chosen technology, including cost
  - ❖ And optimally match environment with technology



# Executive Summary Highlights

(Common to all 17 projects)

- ❖ Choosing an animal ID product/system may best be determined by the availability of service
  - ❖ Particularly in market situations, where speed of commerce is important, the need for timely technical assistance, both hardware and software, is critical



# Executive Summary Highlights

(Common to all 17 projects)

- ❖ LF RFID is not designed to overcome human error
- ❖ Knowing what works and what doesn't work isn't always the issue; must be able to understand why a system does not work



# Executive Summary Highlights

(Common to all 17 projects)

- ❖ A real value of the pilot project/field trial component of NAIS is identifying individuals to contact for unbiased experience with a particular product or system
- ❖ <http://animalid.aphis.usda.gov/nais> and click on State/Tribe Projects; click June, 2006 report



# Human Aspects of LF RFID

- ❖ Tag placement within the ear of cattle was the single most important variable affecting read rate
  - ❖ There was a 40% reduction in read rates attributable to tag placement within the ear (KY)



# Human Aspects of LF RFID

- ❖ Tag placement within the ear of cattle was the single most important variable affecting read rate
  - ❖ Tags too close to base of ear - ↑ loss rates
  - ❖ Tags on top of ear - ↓ read rates
  - ❖ Best results when placed in mid-third of ear
- ❖ Conclusion: Follow Manufacturer's Recommendation for Tag Placement



# Human Aspects of LF RFID

- ❖ When ranch calves were moved to backgrounding facilities, 79% had their tags removed upon arrival (ND)
- ❖ When the same calves left the backgrounding facilities, another 18% of tags were removed at the feedlot upon arrival (ND)



## Human Aspects of LF RFID

- ❖ In tracking 5,170 calves used in study, and based upon current management practices and access to brand inspection data, it took over 5 months of time to track all calves (ND)
- ❖ In using LF RFID, 0% read rates are achieved when users forget to turn on equipment (KS)



## 2004 NAIS Program Innovation

- ❖ Cattle transport in contributing to NAIS evaluated (KS)
- ❖ Developed proof of concept regarding placement of LF RFID readers mounted on trucks for entry and exit recording can work
- ❖ From 99 loads of cattle, found 134 errors, most of which were attributed to human error



## Observations of Interest

- ❖ 96% accuracy exists with current market backtag system while on the premises (KY)
- ❖ Biometrics such as DNA can be 100% effective for validating animal ID (CO)



## Observations of Interest

- ❖ LF RFID in a 15,000 swine herd can add value to management with accurate, within 24-hour recording, and maintaining barn inventories (MN)
- ❖ Comparing use of AIN versus GIN within herd – data forthcoming (MN)



## Observations of Interest

- ❖ LF RFID used in cattle program disease response effort, as compared to official USDA metal ear tag, resulted in increased efficiency due to less time involved in reading the tags, accuracy of data, and much improved human and animal safety (MN)



## Observations of Interest

- ❖ Tagging 1,604 lambs, followed to harvest, found 1% tag loss due to improper tagging; tag loss subsequent to initial tagging of  $< 0.25\%$ ; and read rate  $>99.75\%$  using wand reader (MT)
- ❖ Using wand reader, 139 rams with LF RFID scanned in 50 minutes with 100% accuracy (WY)



## Observations of Interest

- ❖ 668 beef cows tagged with LF RFID devices; 229 d period; 99.8% read rate; 99.8% retention; all wand readers (MT)
- ❖ 1,856 beef cows; 193 d period; 99.9% read rate; 99.8 % retention (MT)



## Observations of Interest

- ❖ Over 50,000 dairy animals (all ages) from 210 herds tagged with LF RFID tags (PA)
  - ❖ Facilitated more effective use of data
  - ❖ Retention rate was  $> 95\%$
  - ❖ Readability – only 11 of 50,000 tags unreadable



## Observations of Interest

- ❖ Unsuccessful attempts to utilize LF RFID in markets were usually due to some type of interference or to defective equipment (SD)
- ❖ All readers required on-site trouble shooting by company representative(SD)



## Observations of Interest

- ❖ Each auction market was unique and required some level of customization based upon facilities, cattle flow, available electrical power supply, available internet access, and presence of other interfering “noise” (SD)



## Observations of Interest

- ❖ Read rates improved as sale barn personnel became more familiar with the scanning equipment and when care was taken to move cattle calmly through the reading alley in single file (SD)



## Observations of Interest

- ❖ Over 34,000 LF RFID ID'ed calves were run through 3 different livestock markets evaluating multiple tags and reader systems; data forthcoming (TX)



## Observations of Interest

- ❖ Approximately 15% of producers reported to have and use internet access and e:mail (KY)
- ❖ Worst orientation distance for hand-held read rate was most useful in making decisions on alley widths (KY)



# What's Coming for Next Year?

- ❖ 12 competitively funded pilot projects/field trials
- ❖ Involve beef, dairy, sheep, goats, swine, and Mexican imported steers



# What's Coming for Next Year?

- ❖ Evaluating LF, HF, VHF, and UWB RFID, metal ear tags, retinal imaging DNA, nose prints, and visual tags



# What's Coming for Next Year?

## ❖ Projects of note

- ❖ NAIS economic cost-benefit study (CA)
- ❖ Harvest, rendering facilities study (CO)
- ❖ Alternative technologies (TN, OH, CRS)
- ❖ ID validation study with imported animals (NM)
- ❖ Focused livestock market study (KS)



**Thank You!**