

Animal Disease Traceability



WORKBOOK

“Slow Burn”

An Endemic Disease Trace Story

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Introduction

Welcome to Animal Disease Traceability (ADT).

Animal disease traceability, or knowing where diseased and at-risk animals are, where they have been, and when, is important to ensuring a rapid response when animal disease events take place. Although animal disease traceability does not prevent disease, an efficient and accurate traceability system reduces the number of animals and response time involved in a disease investigation; which, in turn, reduces the economic impact on owners and affected communities.

This tutorial is designed to share insight into one of the important activities of animal disease traceability.

“Slow Burn:” an Endemic Disease Trace Story is a realistic, but entirely simulated animal disease trace story. The names and locations, the markets, the plants, the farms, and the events are all fictitious. The people you will meet are real. This story has a simple plot, however, it is not all that goes on during a trace; it is one leg of a trace.

Watch for the complexities that will arise and the points where this trace, if real, might branch off. Find the gaps and potential failure points ...

At the end, we will share “take homes” --- what is it that stands out to successfully trace animals.

Objectives

Learning Objectives:

The process of tracing animals in disease investigations is challenging.

- Our main objective in telling this story is to **share knowledge and experience** with you, our stakeholders and producers and colleagues all across the country.
- To do this, we are going **to take you on a virtual disease trace**. You are going to meet some people, hear their stories and their conversations with one another; you will follow them along as they do what they do, and, you are going to see some of the documentation they look at as they do the trace.
- We are going to **talk about the different kinds of resources** – what sorts of things you need to do a trace.
- As we go through this virtual trace, we will have some **“teaching moments”** --- some times to pause and discuss some key components of a successful trace and hear your thoughts and ideas.
- Your assignment is to **look for the gaps and potential failure points**. Where in this scenario are there potential failure points; what things might fail --- be it tags, be it records, be it whatever it takes to find those cattle.

Scenario

“Slow Burn” – Endemic Disease Trace Story

This trace story focuses on the procedures for initiating an animal disease trace due to a detection of bovine tuberculosis at a slaughter facility.

The story will focus on the information required to initiate and complete a trace, including the different types of animal identification, movement certificates, and databases.

This is a story – it is realistic, but entirely simulated! The disease trace and events described are realistic based on TB traces conducted by USDA and States. The names and locations, the market, the plant, the farm and the story events and people are fictitious.

On Monday, February 25th, information is received by USDA APHIS Veterinary Services about a consignment of 32 head of mixed breed commercial beef cattle that Wylie Springload delivered tot High Plains Packing Company in Greeley, Colorado on February 14th for slaughter. The consignment was assigned lot number 19/105 and held for slaughter on February 15th. Four cows in the consignment, identified by ear tags 840003012665328, 48ABC8746, 74ABC7445, 73ABC2189 and back tags 48KS1111, 48KS1112, 48KS1113 and 48KS1114, were found to have extensive lesions consistent with bovine tuberculosis. The cattle were also identified by plastic ear tags, 914, 1223, 1414 and 12114. The plastic tags did not carry any additional inscription.

Samples of affected tissue were submitted to the National Veterinary Services Laboratories (NVSL) and the carcasses were condemned due to extensive and systemic disease. On February 19th, NVSL reported a diagnosis of Mycobacteriosis compatible, which was followed by a positive TB test report of *M. tuberculosis* complex on February 23rd. ***NVSL transmitted the report to the Area Veterinarian In Charge (AVIC) in Colorado who shares this information with the State Veterinarian in Colorado.***

Key Issues:

- ***Four head of cull cows presented at slaughter are positive for Bovine Tuberculosis.***
- ***The four head of cattle need to be traced to the farm of origin as part of an epidemiologic investigation of all cattle purchased and sold by the farm.***

The Colorado Animal Identification Coordinator (AIC) visits the High Plains Packing facility on February 25th:

The goal of the AIC is to confirm that these are the correct cattle and that the person who delivered them to the slaughter plant is the correct source.

Information received from the Colorado AIC documented that there was good correlation at High Plains Packing between the cattle identification with lesions and the facility records. The cattle were definitively identified as being delivered by Wylie Springload. The Colorado AIC is also able to confirm that Wylie Springload had purchased the cattle on or about February 8th from the West Kansas Livestock market.

The Kansas Animal Health Technician (AHT) visits the West Kansas Livestock Market to confirm the purchase of the cattle and identify the seller:

The goal of the AHT is to confirm the buyer and the seller of the four bovine TB lesioned cattle.

Through the West Kansas Livestock market records, the AHT is able match the backtags to cattle consigned by Acme Cattle Company, the seller of the four head of cattle of interest sold on February 8th.

The AHT is also able to confirm that the four head of cattle of interest were included in the 32 head of cattle purchased that day by Wylie Springload.

Review of additional market records confirms the seller as Acme Cattle Company, located in Dry Creek, Oklahoma.

Market records also confirm Wylie Springload as the purchaser, with the intent to deliver the cattle to High Plains Packing Company for slaughter.

- **The investigations conducted by the AIC and AHT are critical to ensure that the infected cattle are correctly matched to the animal identification reflected in the records at slaughter plant and the market.**
- **Records are critical to trace and find the source of disease animals, as well as to assure that uninvolved livestock premises are not needlessly quarantined and subjected to testing.**

The State Veterinarian in Colorado contacts the State Veterinarian in Oklahoma to share the information gathered about this trace involving the bovine TB lesioned animals originating from the farm in Dry Creek, Oklahoma.

The State Veterinarian in Oklahoma assigns a state field veterinary medical officer (VMO) to visit the farm:

The primary goal of the VMO on this visit is to confirm Acme Cattle Company as the seller and determine if this is the farm of origin of the four bovine TB lesioned cattle – were they born on this farm or were they purchased?


On the initial visit with Acme Cattle Company in Dry Creek, Oklahoma, the VMO confirms that Acme Cattle Company, a 400 head cow/calf operation, did indeed consign the cattle in question for sale at the West Kansas Livestock market on February 8th.

The VMO works with the owner of Acme Cattle Company to:

- Gather more specific information on the four cattle of interest – what we call their “life history.”
- Review farm records and gather information on animal movements. Of interest are movements of cattle onto and off of the farm that occurred while the four bovine TB lesioned cattle resided on this premises.
- Discuss the need to quarantine TB-susceptible livestock on the farm.
- Discuss TB testing of the herd.
- Assess working conditions and supplies needed to conduct the testing.

- **Animal movements are of particular interest in animal disease tracing. It is important to assess the possible commingling and potential exposure to other livestock that may be located on other premises.**
- **Timeliness of identifying movements of infected and exposed animals and assessing premises involved in these movements is critical to preventing further spread of disease.**

While reviewing the Acme Cattle Company farm records, the VMO notes the following animal movements of interest for 2018/2019:

|  | | | | |
|---|--|------------------------------|-------------------|-----|
| TB trace: Records check – Acme Cattle Company | | | | |
| Date | Sales/ Purchases | Location | Official ID | CVI |
| 02/08/2019 | Sold 32 cull cows | West Kansas Livestock | <i>Case trace</i> | |
| 08/10/2018 | Purchased 40 bred replacement heifers | Video Auction from SD Ranch | trace-in | |
| 09/2018 | Sold 160 5-6 month old steers, and 170 5-6 month old heifers | Instate Livestock Market | trace-out | |
| 04/15/2018 | Purchased 3 year old and 5 year old herd bulls | Private Treaty from TX Ranch | trace-in | |

“Trace-ins” are movements of animals onto the premises.

“Trace-outs” are movements of animals off of the premises.

- There is a trace-in of cattle from a ranch in South Dakota. This information will be shared with colleagues in South Dakota so they can trace those cattle. Could that ranch be the source of infection? Could that ranch have purchased some or all of these cattle from one or multiple sources?
- There is a trace-out of cattle from Acme Cattle Company – cattle they sold at an instate market. These cattle need to be traced and information shared with colleagues in any states in which the cattle may have resided. Assessments need to be made to determine if any potentially exposed or possibly infected cattle are on any premises in those states.
- There is another trace-in of bulls from a ranch in Texas. We know Texas has been dealing with some TB infected herds for some time now. Could the ranch in Texas be the source of infection?

With just these three additional trace-in and trace-out movements, how many more producers may be impacted by this trace? Now ponder that same question if we had little or no ID to trace. Would we have a happy ending?

Discussion Questions

Take Homes:

What thoughts, ideas, and concerns came to mind as you road along on this trace?

Questions to think about:

- What are the most critical components of a successful trace?
- What factors might have made this trace fail?
- Where did you see an interaction of people, papers, and databases?

What are your “take homes” from this virtual trace story?

The following are the thoughts, ideas, concerns, and opinions expressed by participants during the 2019 NIAA ADT Workshop in Des Moines, Iowa on April 11th, 2019:

1. No ID on cattle: *“May not seem a likely situation given interstate movement regulations and marketing practices, however it does happen. South Dakota is involved in a real trace with 99 potential herds having to be tested for TB because they received a TB trace with no ID on it. Oklahoma had a case for which they ended up testing upwards of 15 herds because the cattle didn’t have good ID to collect at the slaughter plant. Bottom line – It still happens.”*
2. Impact to producers and producer cooperation: *“Specifically, those producers that would not have been affected in this trace if there was a decent trace to start with. The industry as a whole and individual producers are put at undue potential risk because someone else has a problem and there is lack of information to do a good trace. Electronic ID and this traceability program that we are working extremely hard to try to come up with and implement is actually an insurance policy. The point is, how many traces wouldn’t have to be done and how many individual producers wouldn’t have been affected if there was good trace information?”*
3. Diversion from the slaughter channel and/or violation of slaughter channel rules: *“The cattle were supposed to go directly to slaughter, but in this story, they didn’t. Animals moving on a direct-to-slaughter form such as was used in this story, are supposed to go direct to slaughter. When you have animals that enter the slaughter channel, they are not supposed to be diverted. They should go directly to slaughter and should be slaughtered within 3 days. Where were these cattle for those days in between? Were they off-loaded and commingled with other cattle not in the slaughter channel? Could these TB infected cattle have exposed other cattle that went out to other premises? We need to find out where the TB infected cattle traveled between the market and the slaughter plant.”*

In 2018, South Dakota became involved in a real trace with 99 herds having to be quarantined and tested for TB because the animal initiating the TB trace had no ID on it!

4. Importance of market records: *“What if these TB infected cattle had not been sold through a market? Without the market records in this story, it would have been harder to trace these TB infected cattle.”*
5. What about possible commingling with cattle at the market? *“That needs to be evaluated and could result in many many more animals needing to be traced.”*
6. The success of a trace depends on the availability and the ability to communicate of all those people in the chain of the trace: *“Is there a way to intermediate this and the person from USDA or the State initially investigating the trace could determine that point of origin and immediately get to the farm or ranch or origin? If we can immediately get to the farm of origin of the TB infected cattle, we can jump forward and try to find out where they went. The purpose of a disease trace is not just to find diseased cattle, but to find everything that is exposed. Every contact could be a potential infected animal. Finding all the intermediate steps in a trace is critical.”*
7. *“Records are a critical component.”*
8. *“We still have people involved in tracing by paper records.”*
9. *“Backtags are still being used a lot. Backtags may fall off.”*
10. Contact with producers: *“Contact with farms involved in a trace needs to be by State or federal animal health officials in the same state, not by a federal animal health official in the state where the animals were slaughtered and hence the trace started from. States have best knowledge of the producers in their state, so contact by the appropriate State official is how things work best. That’s important in a successful trace.”*
11. Working relationships: *“How well the people involved in conducting a trace work together is critical to a successful trace. It’s the local people that are best at doing the trace to premises in their state. The State and Federal people in a state hopefully work well together and work well and seamlessly together with their counterparts in other states to make the trace happen.”*
12. *“State Veterinarians are integral to successful traces.”*
13. Use of databases, entering ID data accurately into the databases, and sharing pertinent trace information between databases: *“The quicker we can find an ID and movement events associated with it, the quicker we can get to the correct locations and the fewer producers there will be unnecessarily impacted. The inter-combined network of databases with ID information facilitates tracing. It’s the people and partnerships that make it all work.”*
14. Lack of resources to enter ID data into a database: *“If you don’t have the people resources to keep up with entering ID data timely, you may not have the data you need for your trace when you need it. Using electronic ID and electronic databases and streamlining processes benefits us all. The more electronic communication of accurate information, the less shoe-leather involved in the trace; and a lesser impact on available (or not) resources.”*

Appendices:

A. Slaughter TB Trace Success Rates

Slaughter TB Trace Success Rate

| | Total cases by identification type | Successful Trace | Traced Indirectly | Unable to trace |
|----------------------------------|------------------------------------|------------------|-------------------|-----------------|
| Unofficial Identification | 12 | 9 | 1 | 2 |
| No Identification | 14 | 5 | 5 | 4 |
| Official Identification | 12 | 12 | 0 | 0 |
| Total | 38 | 26 | 6 | 6 |

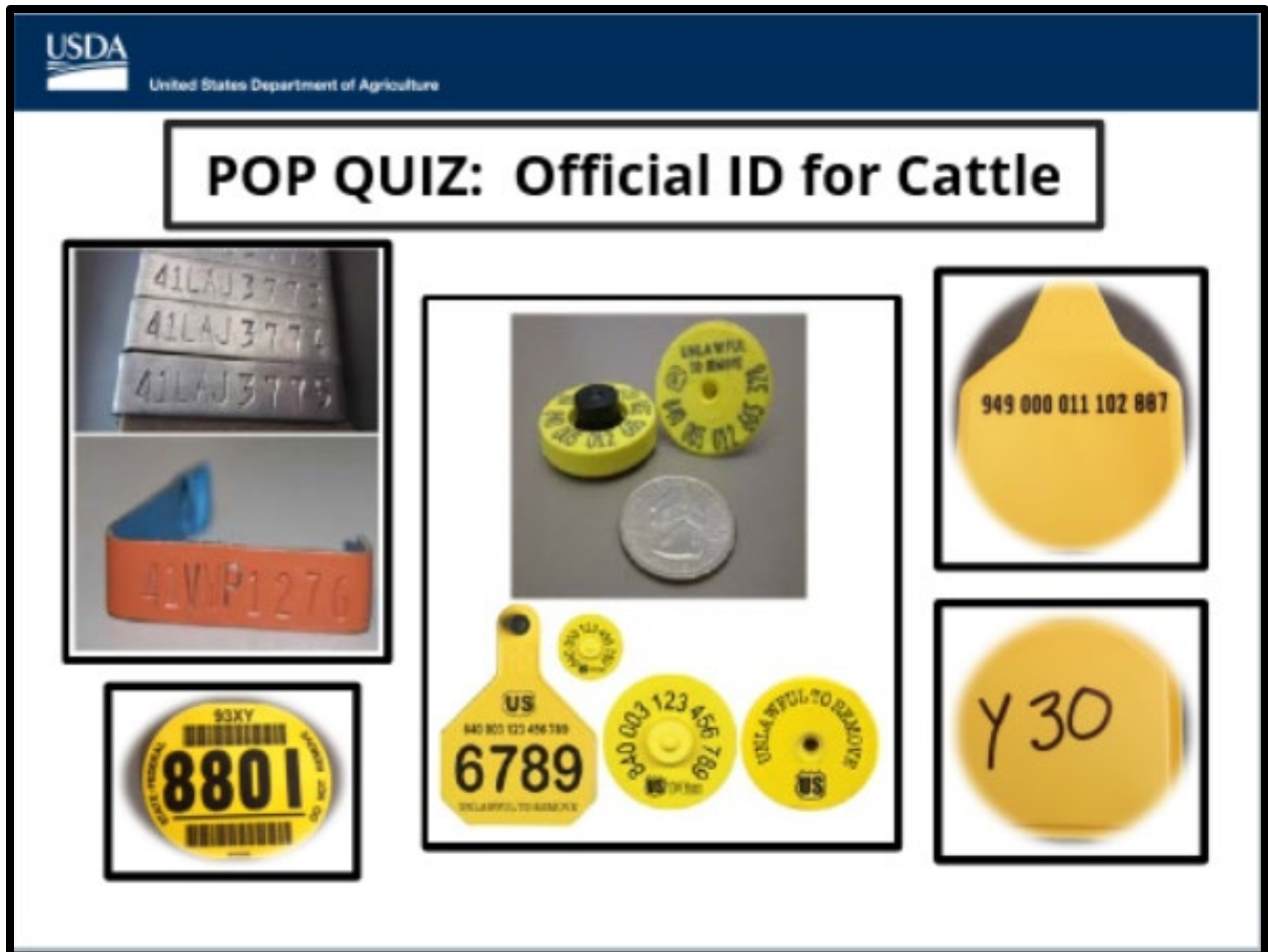
This Table depicts some data obtained from our Emergency Management Response System (EMRS) database on TB traces. You can see on this chart that there were 38 slaughter TB traces during a 3-year time period (2013 to 2016).

Of those 38 traces, the traces that had official identification, depicted in the bottom row, were all traced successfully and traced pretty quickly.

The top row depicts traces that had identification, but not necessarily official identification. Most of those traces were traceable, with a lot of hours and a lot of hard work by a lot of people, but they were traceable; all but 2 of them. So what does that mean? These are NVSL confirmed lesioned animals. Those 2 animals were not traced back to their source herds and presumably, those herds could still be out there unless found by other means along the way.

The middle row depicts traces that had no identification. There were 14 slaughter cattle traces that had no ID on them. We were not able to trace 4 out of these 14 traces. Only 5 of these 14 cases with no ID resulted in successful traces. The other 5 were traced indirectly, meaning that due to some really good work by some hard working people who were able to associate these cattle with other animals slaughtered on the same day and same time, we were able to find the source herds despite not having any ID.

B. Official Identification (ID) for Cattle



Here's a Pop Quiz for you ...

- What makes a tag or device an official ID?

- Which tags and devices can be used as official ID for cattle?

Official ID for Cattle:

There are a number of different types of tags and devices used to identify cattle.

3 major criteria must be met before a tag or device can be approved as official ID.

The tag or device must:



- 1) Bear the official U.S. shield;
- 2) Be a unique number; and
- 3) Be tamper evident with high retention.

Let's quickly review the types of tags and devices. Pictured here are:

- "Brite" or silver metal eartags and orange Brucellosis vaccination eartags are currently used as official ID. The tags pictured here are visual only and may be difficult to read and transcribe the numbers accurately. They may be in a database, but all numbers must be accurately entered manually. These tags use the National Uniform Eartagging System (NUES), a numbering system for the official identification of individual animals in the United States that provides a nationally unique identification number for each animal. The first two numbers on the tag are the numbers assigned to a specific State.
- Official "840" tags are used as official ID and are recorded in a database somewhere. Most are RFID tags (radio frequency identification) and can be read electronically and records can be accessed, collected, and moved electronically (i.e. when used on an eCVI).
- Backtags are NOT Official ID, but can be used for cattle moving directly to slaughter.
- "900 series tags" are NOT Official ID. Original distribution location may not be accessible and no records are required when these tags are shared or further distributed.
- And the yellow "Y30" tag, found on a black steer. Remember the criteria for official ID? ... *Need we say more?!*



C. Initial Trace Data

What are the specific pieces of information needed to conduct a successful trace?

Hint – There are six pieces of information we initially look for.

The 6 pieces of information we initially look for are:

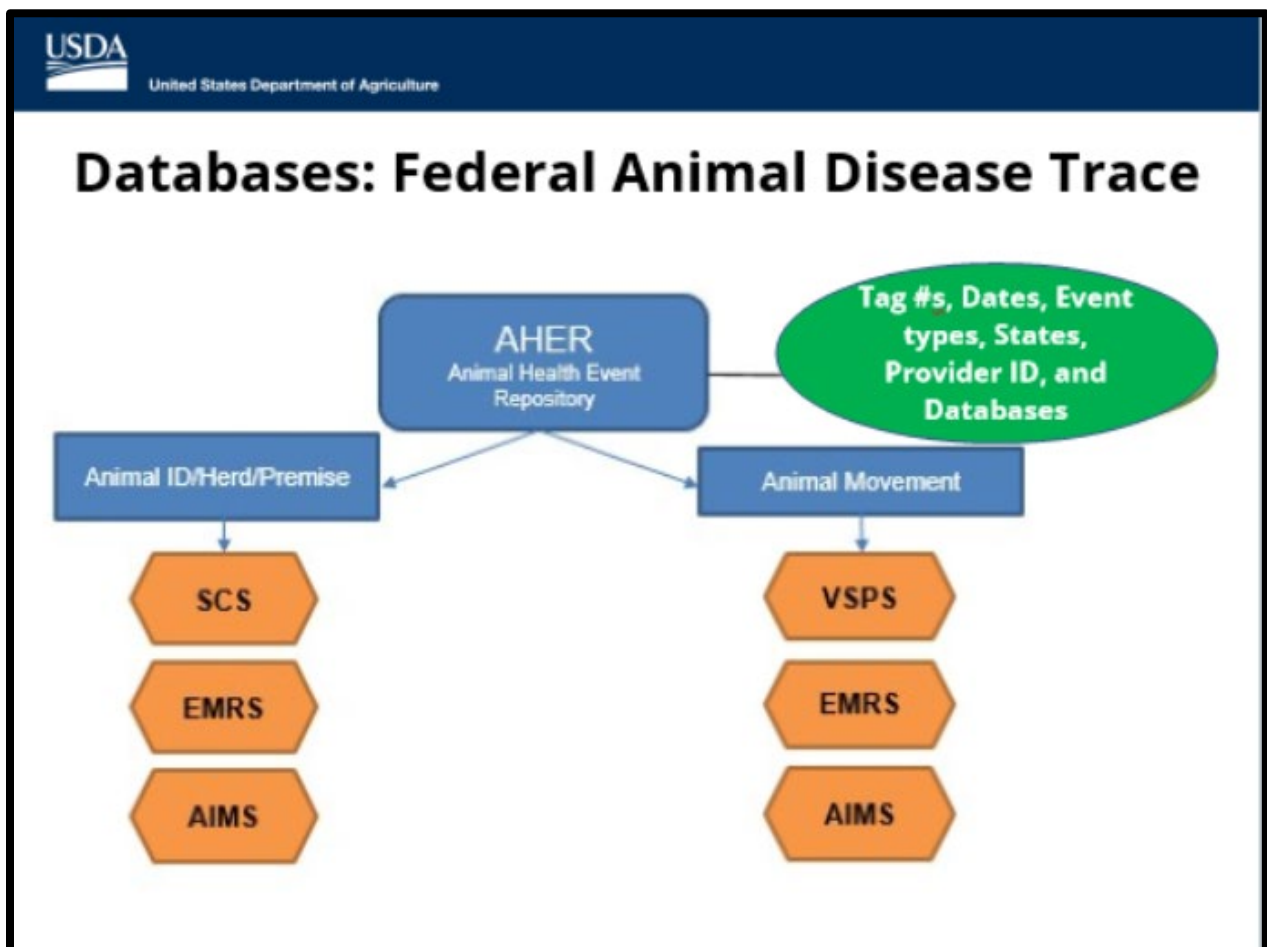
1. **ID tag and device numbers**
2. **Dates**
3. **Event types (i.e. movements or testing)**
4. **State**
5. **Provider ID, and**
6. **Databases in which to look for this information**

D. Databases

Key to successful traceability is timely retrieval of complete and accurate information.

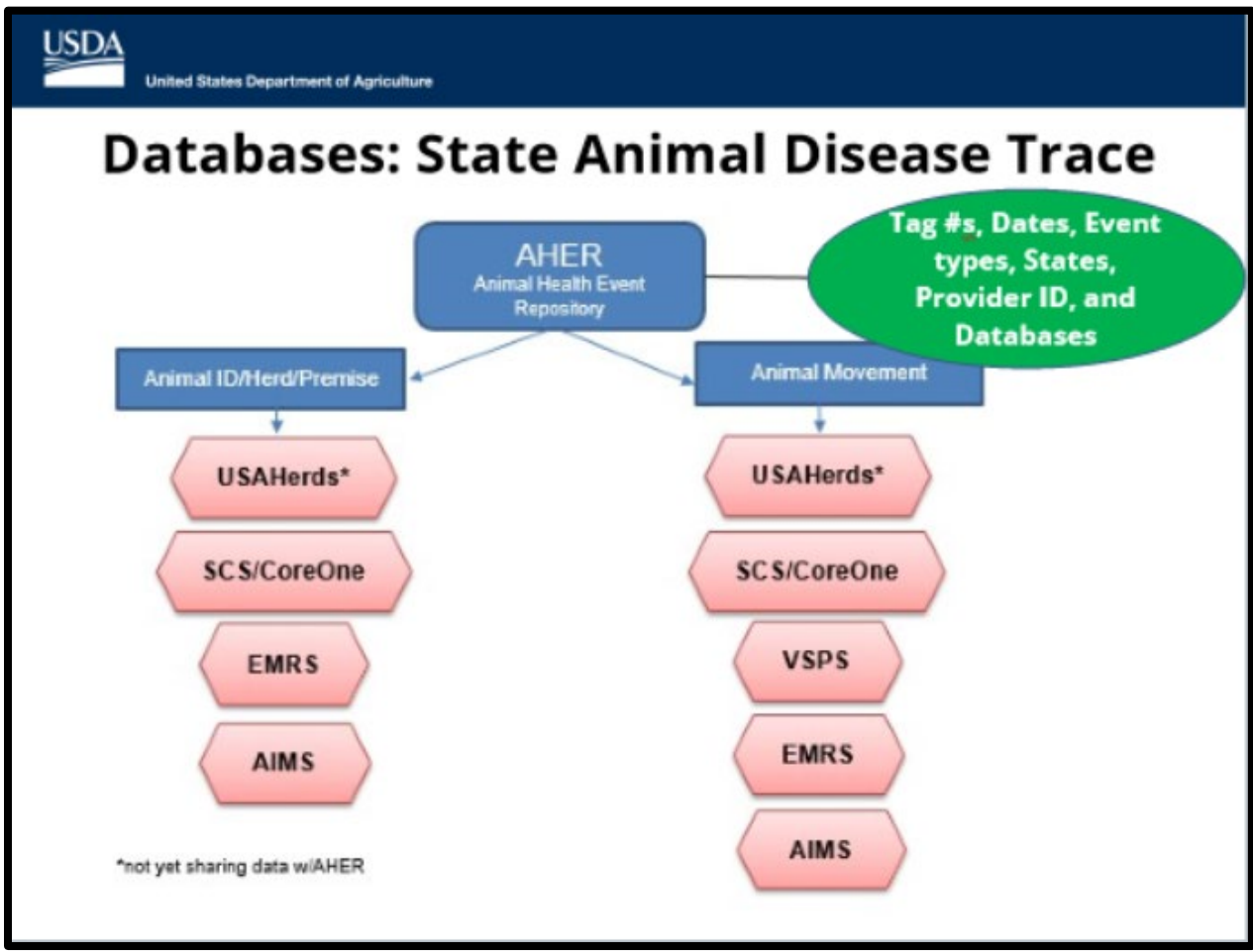
Depicted below are some of the federal databases that collect data that might be used in tracing.

- A trace search may begin in the Animal Health Event Repository, otherwise known as AHER. There are 6 data elements are of interest. AHER directs you to which database(s) these elements have been “sighted.”
- The individual animal ID is one of the 6 elements and may be “sighted” in the Surveillance Collaboration Services (SCS) database, the Emergency Management Response System (EMRS) database, or the Animal Identification Management System (AIMS) database (which contains tag allocation information only).
- Animal movement data is another element of value and may be “sighted” in Veterinary Services Process Streamlining (VSPS), EMRS, or AIMS (containing animal sightings only).



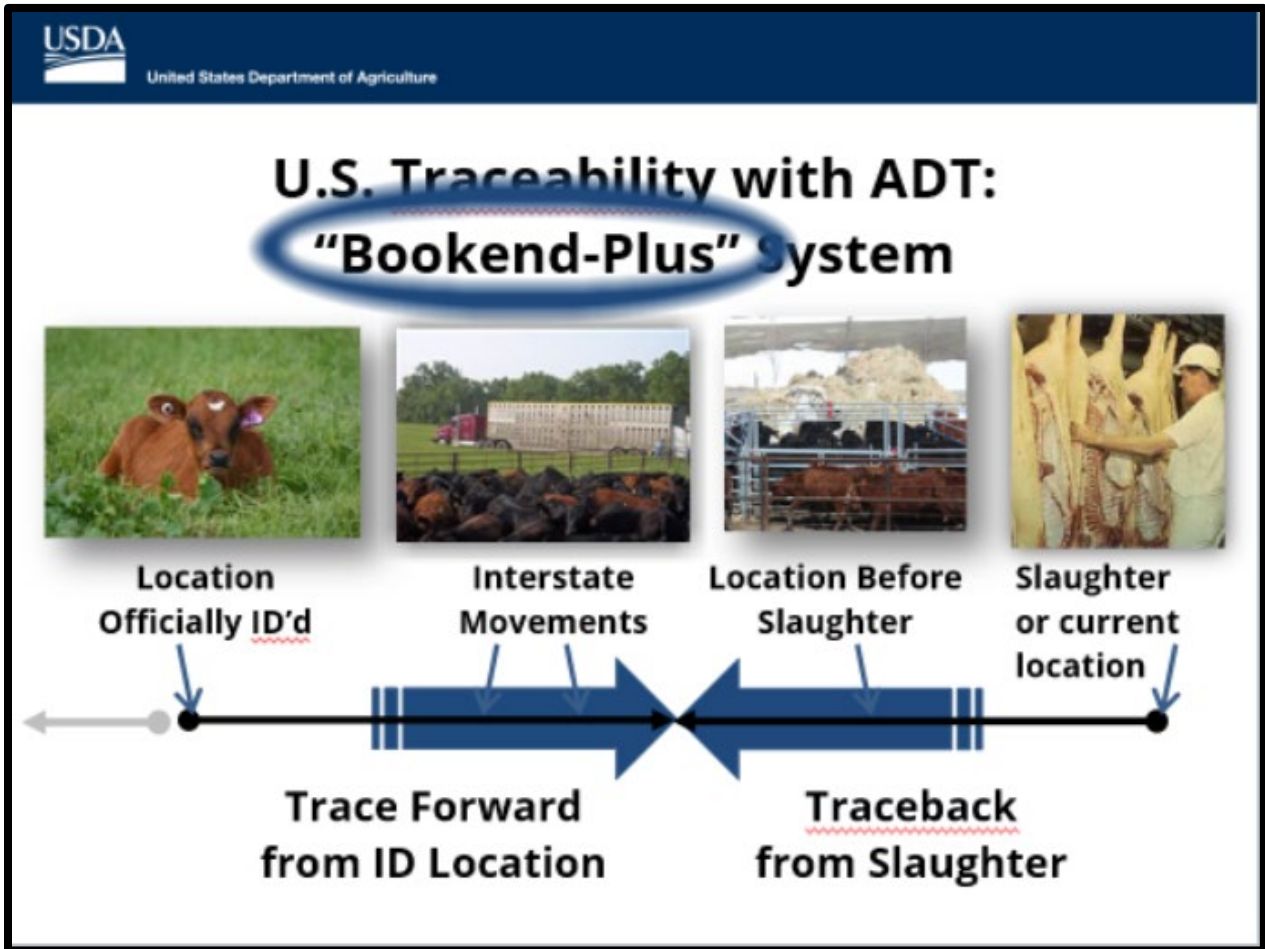
Some States and Industry organizations have their own databases that collect data that might be used in tracing.

- A trace can begin in AHER for States as well. Remember, in a trace, you want to find those 6 data elements of interest. AHER may quickly direct you to which databases contain that information. Or, States may start directly in an appropriate database of their own.
- Animal ID may be found in databases such as USAHerds, SCS/Core One, EMRS, or AIMS (tag allocation only).
- Animal movement information may be found in databases such as USAHerds, SCS/Core One, VSPS, EMRS or AIMS (animal sightings only).



E. “Bookend-Plus” System

In an animal disease trace, it is important to assess the movement of animals throughout the entirety of their life. Depicted here is a “Bookend-Plus” system which includes a traceback from slaughter or a trace forward from the ID location. Ideally, in a full traceability system, we would be able to follow animals from when they first leave the farm, all the way through to when they were slaughtered.



Thank you for your interest in Animal Disease Traceability.

If you would like more information on the Animal Disease Traceability Program, please visit our web site at <https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/traceability>.

You can also email us at traceability@aphis.usda.gov.

Additionally, you are encouraged to contact your [State Animal Health Official](#) for more information pertaining to your State's traceability activities and requirements.

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