

Alabama BSE Investigation

Final Epidemiology Report

May 2, 2006



Background

On February 27, 2006, an Alabama cattle producer contacted his herd veterinarian and reported that he owned a cow that was down and unable to rise. He had last seen the cow approximately three days prior and had not noted any abnormalities at that time. Upon examination the veterinarian found the cow in right lateral recumbency with her feet pointing uphill. The cow was unable to rise after being rolled onto her sternum. The differential diagnoses at the time of the visit included hypocalcemia (milk fever) and hypomagnesemia (grass tetany). Grass tetany is a common cause of downer cows in Alabama during this time of the year. Intravenous and oral mineral supplements were administered with minimal clinical improvement. After treatment, the cow displayed tremors of the head and neck and was still unable to rise.

On the following day, February 28, the cow remained in lateral recumbency and she was euthanized and the obex removed to test for bovine spongiform encephalopathy (BSE). The attending veterinarian who removed the obex is accredited by the United States Department of Agriculture (USDA) and has received training in the collection procedure. At that time, the attending veterinarian determined that she was approximately 10-years-old based on dentition. The index premises owner buried the cow on his premises.

The obex was placed on ice and transported to the veterinarian's clinic and stored in a freezer. On March 7, a State Animal Health Technician with the State Veterinarian's office picked up the sample and transported it to a branch of the Alabama Veterinary Diagnostic Laboratory. The sample was registered, prepared, and then shipped to the Georgia Veterinary Medical Diagnostic Lab (GVMDL) in Athens, GA, on March 9.

The GVMDL received the sample on March 10 and ran the one-well and two-well enzyme-linked immunosorbent assay (ELISA) on brain homogenates from the sample. Test results were inconclusive. That same day the GVMDL forwarded the remaining tissue to the National Veterinary Services Laboratory (NVSL) for further testing. Upon receipt of the sample on March 11, NVSL confirmed an inconclusive result based on the ELISA test, which was made public the same day in a national press release.

Parts of the inconclusive brainstem sample were transferred to the Agricultural Research Service (ARS) at NVSL for further testing. ARS performed a World Organization for Animal Health (OIE) scrapie-associated fibrils (SAF)-enriched Western Blot analysis for the presence of PrP^{BSE}, and Hybrid Western Blot analysis using mAbs 6H4 and P4 antibodies. On March 13, ARS reported the positive results to APHIS.

On March 15, NVSL completed immunohistochemical testing on the tissues, confirming the second native case of BSE in the United States. A press release was issued on the same day announcing the findings.

The goals of the epidemiologic investigation are to locate at-risk cows.

At-risk cows are:

- The index case;

- The two most recent progeny of a (female) index cow;
- Birth cohorts of the index case that were born and raised on the same farm (herd of origin) one year before and one year after the index cow was born.

Methods

The process of tracing the animals of interest was based on interviews with current and previous owners, stockyard sales records, phenotype, age, stage of pregnancy, and genetic matching.

Epidemiology Investigation of Index Herd: Farm A

The index case was a deep red, crossbred beef cow estimated to be approximately 10-years-old based on dentition. On March 16, 2006, USDA personnel exhumed the carcass of the index case, sent the head to NVSL and transported under seal the remainder of the carcass to the Alabama State Diagnostic Laboratory (ASDL). The investigators confirmed the carcass to be that of a red beef cow. The body and facial area did not contain any white markings. No identification devices were found on the cow, including any evidence of brands, tattoos, or ear tags. Additionally, on March 29, NVSL examined the head of the carcass to confirm the lack of a tag and the lack of evidence (holes or scarring) of previous tags in the ear.

The age of the index cow was estimated by examination of the dentition as 10-years-old by the accredited veterinarian. Regulatory personnel examined the dentition of the exhumed carcass and concurred with the estimate. The teeth in the head of the carcass were short with elongated necks with some incisors missing. This is consistent with the dentition of other cattle from Alabama with a known age of 10 or more years.

Genetic tests were conducted at NVSL to match the NVSL-generated homogenate of the obex, the homogenate of obex from the Georgia lab, brain material from the cow head (collected by NVSL), and ear material from the cow head (also collected by NVSL). On March 23, the results for these tests indicated they all originated from the same source and confirmed that that carcass exhumed on March 16 was the index case.

Disposal of the Index Case

Following exhumation on March 16, the carcass was broken down and Federal personnel transported the head (stored on ice) to NVSL. The remainder of the carcass was placed in hazardous materials barrels and transported under seal to ASDL by Federal and State personnel.

The carcass is currently being held under seal in a secure cooler at the ASDL, pending final disposal. The head remains frozen at NVSL.

Cleaning and disinfection of the site was completed following removal of the carcass.

At-Risk Progeny of the Index Case

2005 calf:

The index cow gave birth to a black bull calf around February or March 2005. The calf was born on the index premises. The owner took the calf to a stockyard sale in July 2005. The owner reported that the animal died at the stockyard prior to sale and the carcass disposed of in a sanitary landfill. An interview of the stockyard manager confirmed memory of that owner having a calf die at the stockyard. Stockyard records confirmed delivery of material to the landfill on that day. This trace thread is closed.

2006 calf:

At the time of death, the index cow had at her side a 2- to 3-week old red Charolais cross female calf born in February 2006. This calf was present on the premises when the investigation began. On March 16, this calf was indemnified using Animal and Plant Health Inspection Service (APHIS) funds and transported to NVSL where it is currently held in APHIS custody. ARS is developing a research protocol to study this calf.

Results obtained on April 6 of a DNA analysis comparing a blood sample from the calf to tissues from the index case confirmed that this animal was the calf of the index cow. This trace thread is closed.

These two calves constitute the last two calves born to the index cow prior diagnosis of BSE.

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Trace Back Investigation

Investigation of Index herd (Farm A):

The most recent owner (Farm A) purchased the index case at a stockyard in December 2004. The stockyard sheet for that day describes Farm A buying a single animal that matches the appearance of the index case. This cow was red, back tag #57, with short-solid mouth (indicating worn incisors) and 7 months pregnant, weighing 990 lb. The owner confirmed this purchased cow is the index cow.

Based on the color/breed, age, and pregnancy status of the index case, the following criteria were used to trace the index case to its herd of origin:

1. Coat color - Only cattle described as red in color were traced as potential leads to the herd of origin. All other colors, including red with white described on the face (such as red, white-faced or red, mottled-faced, and breeds that are not red in color, such as Charolais), were excluded from further investigation. This is because the index case was solid red with no white on the head and any red cow

with recorded facial coloring would not be compatible in appearance with the index cow.

2. Age - Only cattle known or suspected to have been born before March 1998 (i.e., greater than 8 years of age at the time of death of the index case) were traced as potential leads to the herd of origin. To estimate the lower limits of age, cattle sold at a stockyard and identified as being 18 months of age by mouthing (the date they shed their deciduous medial incisors) will be considered to be at least two years of age on the date of sale. This takes into account that the exact age of shedding of medial incisors varies slightly among cattle and erring on the older side of the estimate of the cattle's age will more likely increase the number of animals traced.
3. Other factors - Other factors considered in determining whether or not to pursue an animal as possibly being the index case include the recorded weight at sale, stage of pregnancy, and ages of calves. The value of these factors depends on the information obtained from interviews, sales records and other evidence used to trace the index case.

Investigation of Previous Farms/Owners

Investigation of Farm B

Background: Stockyard records identified the prior owner of the index cow as Farm B. The cow was one of 26 animals sold as part of a dispersal of the herd of Farm B in December 2004.

Investigation: All 26 animals had been purchased between July 2004 and November 2004. The owner of Farm B was deceased by the time the index case was detected. Interview of the widow of Farm B confirmed that, due to health issues, the owner of Farm B had sold all his cattle in early 2004 then began to re-establish a herd during late 2004 before again selling out in December 2004.

Results: Stockyard records of all 26 cattle purchased by Farm B were evaluated to determine where the index cow came from. Four animals could not be ruled out as having been the index cow based on color, age, and stage of pregnancy at the time of sale. Each animal belongs to a different owner. Two additional red cows were purchased by Farm B but were too young and at the wrong stage of pregnancy at the time of sale to qualify as the index case and were excluded from further tracing.

Investigation of Farm C

Background: The owner of Farm C sold a red cow with calf at its side at a stockyard on August 8, 2004, weight 1,220 lbs (total for pair). These animals were later purchased by Farm B. This animal is consistent with the weight, age, and stage of pregnancy of the index case at that time.

Investigation: Farm C purchased the animal in question as a yearling or bred heifer in 1997 along with two half siblings from Farm G. Of the three animals purchased, one remains on Farm C, another died several months prior to the investigation and is buried on the premises, and the third is the possible index cow being traced. The three cows were all sired by the same bull. Additionally, the possible index cow, if on Farm C, would have given birth in this herd and there would likely be calves present.

On March 25, blood samples were collected from all animals on Farm C between the ages of 18 months and 8 years of age, including the known half-sibling, in order to determine if any of the animals were compatible with being first generation progeny of the index case. In addition, the known half-sibling was evaluated for genetic linkage to the index case. Samples were submitted to NVSL for DNA analysis in order to determine genetic linkages.

Results: Results received on March 6 indicated that none of the animals tested qualified as offspring or siblings of the index cow. The animal identified by the owner of Farm C as possibly related to the index cow did not genetically match the index case.

No animals remained on Farm C that would qualify for additional testing. Farm C was excluded as a source of the index case, and the suspected half-sibling did not qualify as related. This trace thread is closed.

Farm G stated that the cow traced to his herd had a bangle tag, although there was no evidence of a tag or prior presence of a tag in the index cow's ear at the time of death. This trace thread is closed.

Investigation of Farm D

Background: The owner of Farm D sold a red cow on September 11, 2004, full mouth, 5 months pregnant, 1,015 lbs. This animal is consistent with the weight, age, and stage of pregnancy of the index case at that time.

Investigation: Farm D is a cattle dealer. He buys and sells many cattle each year. According to records, at two stockyards with which Farm D does business, he purchased 35 red cows from 23 different premises (Farms M – II) that were consistent with the index case according to age and weight between 2000 (the earliest date of availability of records) and September 11, 2004, (the date he was reported as having sold the cow being traced). This owner's typical business practice is to purchase young cows (less than 3 years of age) that are not pregnant or recently bred, breed them, hold them until near calving, and then resell them as bred cows and cow calf pairs. He does not typically keep cows for more than a year. He does not retain calves from any of the cattle (with the exception of a single Braham cow). He is certain that the cow was not born on his premises. Because of the transient nature of cattle within this herd, and lack of suspected first generation offspring, no DNA analysis was performed on animals in Farm D.

Farm D purchased a red cow from Farm M on March 17, 2004, as part of a cow and calf pair through a local stockyard. Farm M is a registered Red Angus breeder. All cattle are

tattooed and tagged as part of the registry process. Farm M had a few recipient cattle that were sold at approximately the same time that the animal being traced through Farm D would have been sold. All of the recipient cattle were Holsteins and were excluded based on phenotype. Because all qualifying animals on this farm are identified by both tattoo and ear tag as a requirement of registration, the farm could not have been the source of the index cow. This trace thread is closed.

Farm N consigned a cow and calf pair to Farm D on January 8, 2003, at a local stockyard. The weight of the pair at purchase was 1,140 lbs. Farm N consists of approximately 25 cows, primarily Charolais cross and black Angus cross. Farm N's current herd was established in 1996. According to records kept at Farm N, the cow sold to Farm D produced bull calves in 1997, 1999, and 2001 and heifers in 1998, and 2000. Because this cow was small for the herd, none of her heifers were retained in this herd. The cow was listed as a red Angus-type cow that was purchased through a stockyard in 1997. The sale records for the stockyard were destroyed in a fire and therefore unavailable. Since the cow was not born in this herd, and no offspring or other related animals remained in the herd, there are no eligible animals remaining on this farm for genetic testing. This trace thread is closed.

Farm O consigned a red cow to the stockyard on December 14, 2002, as a 5-month pregnant cow, weighing 1,060 lb, which was purchased later by Farm D. Farm O had purchased 118 head in early 2002, calved them out, and rebred them before selling the calves and the bred cows later that year. None of these animals remains on the farm and no calves were retained. The owner of Farm O purchased the cattle through four to five stockyards or other sources. The traced cow was not born in this herd and no animals remain on the farm that qualify for genetic testing. This trace thread is closed.

Farm P consigned two red cows to the stockyard on August 10, 2002. Farm P purchased these two cattle from Farm JJ in 2000 as part of a group of 38 heifers. There are no cattle remaining on Farm P at this time; therefore, no animals are available for genetic testing for comparison with the index cow. This trace thread is closed.

The cattle present on Farm JJ were dispersed in 2001 and a new owner began operating from the same property. The new owner did not recall the exact cattle in question but was very certain that any cattle sold from Farm JJ (under either owner) would have had ear tags in place, and if sold before the 2001 dispersal, would have been branded on the right hip. Because the index cow had no evidence of having ever been tagged or branded, this farm can be excluded as a source of the index cow. This trace thread is closed.

Farm Q sold five red cows at a stockyard on April 17, 2002, that were later purchased by Farm D. All five of these animals, according to the owner, were red Angus-type cows, between 6-and 10-years of age and sold with a calf at their side. The owner had purchased these five cows as part of a group of cattle from Farm KK. Farm Q does not keep replacement heifers. There are no eligible animals remaining on Farm Q for genetic testing and this trace thread is closed.

All five of the animals traced back from Farm Q were purchased from Farm KK as part of an unknown number of red Angus-type cows sold to Farm Q. Farm KK currently consists of a beef cow/calf operation with approximately 300 brood cows. The herd is a mixed breed beef herd that was acquired over a period of several years by purchasing cattle at local stockyards. The owner of Farm KK had a herd with another animal consisting of approximately 60 head of mixed breed cattle in 1998 to 1999 that had been purchased and sold out entirely to the local stockyard in either 1999 or 2000. However, he could not find any records for that sale and all stockyard records were destroyed in a fire during 2000. The owner of Farm KK stated he had not sold any cattle privately to Farm Q and did not know who purchased the cattle at the stockyard.

Subsequent to the 1999/2000 dispersal, Farm KK began buying cattle again and sold all its animals in 2004. The current herd consists of brood cows that have been purchased at local stockyards since the 2004 dispersal. These cattle are not known to be related to any previously owned cattle. There are no animals remaining on Farm KK that would be appropriate for genetic testing. This trace thread is closed.

Farm R consigned a red cow to the stockyard March 6, 2002. The owner of Farm R does not remember the specific cow, but has a registered Beefmaster herd and a commercial herd and does not retain commercial heifers as replacements. He purchases replacement animals to enter the commercial herd from three different stockyards. No animals are present on the farm that would be eligible for genetic testing. This trace thread is closed.

Farm S sold a red cow and calf pair to Farm D through the stockyard on March 27, 2002. Farm S sold all his cattle a year ago and has purchased new cattle. None of the original herd remains on the farm. He said he purchased the traced cow from a neighbor. He bought the neighbor's entire herd at the time and took the traced cow directly to the stockyard. The neighbor's farm does not have any cattle remaining. No animals remain on either farm that would qualify for genetic testing. This trace thread is closed.

Farm T consigned a red cow to the stockyard on January 9, 2002. This cow was later purchased by Farm D. All cattle on Farm T were sold in 2003. The owner of Farm T stated that he purchased three older red cows at the same stockyard in 1999 or 2000 and sold them back in 2002 or 2003. He thinks the cows had tags in their ears but is not sure. Additionally, no animals remain on the farm that would be appropriate for genetic testing. This trace thread is closed.

Three red pairs were consigned to the stockyard from Farm U on three different dates in 2001. These cows were later purchased by Farm D. The owner of Farm U has been out of the cow business since 2001. He has no memory of these cows or any other particular cattle. He stated that he would have tagged his brood cows, which is inconsistent with the lack of evidence of tagging in the index cow. There are no animals on this farm for genetic testing and this trace thread is closed.

Farm V consigned two red cows to the stockyard on January 12, 2000, that were later purchased by Farm D. The owner of Farm V purchased a group of cows in 1998 from

the stockyard to keep on some land that he had purchased. Farm V sold all of the cows in 2000. He currently has only roping steers. No eligible animals remain on this farm for genetic testing. All stockyard records prior to 2000 were destroyed in a fire, so tracing this cow further back is not possible. This trace thread has been closed.

Two red cows were consigned to the stockyard on October 13, 2001, from Farm W, one of which was purchased by Farm D. There are approximately 50 cows of various breeds currently located on Farm W. The owner of Farm W has maintained a cow herd since 1973 and does not maintain identification on his cattle. The owner of Farm W does not recall details about the animal being traced through his farm; however, farm records indicated that the animal would likely have been one of two red cows purchased from a stockyard on May 1, 2001. Although the owner of Farm W typically retains heifers, the calves from both of these cows were sold on October 10, 2001, according to the stockyard's records. No animals remain on this farm for genetic testing. Records collected from the stockyard indicate that the purchase weight for these traced animals was 580 and 650 lbs, both of which fall below the minimum weight defined in the SOP for investigation. These cows are excluded as the index cow based on their weights at the time of sale. This trace thread is closed.

Farm X consigned two red cows to a stockyard on January 17, 2001, that were later purchased by farm D. The daughter-in-law of the owner of Farm X stated that all the cattle in the herd as of 2001 were sold in 2004 after the owner's death. Subsequently, the owner's son did purchase some additional cattle (unrelated to the traced animals) but these animals have also been sold. There are currently no animals remaining on the farm. No eligible animals remain on this farm for genetic testing and there are no records for purchases or sale of animals; therefore, this trace thread is closed.

A red cow and calf pair was consigned by Farm Y to the stockyard on March 11, 2001. This pair was later purchased by Farm D. Farm Y buys and sells cattle regularly and had no specific recollection of the traced cow, but when presented with stockyard records he felt reasonably sure that the animal in question was a horned Limousin cow sold with a calf at her side. He stated that all his cattle were tagged, either at the time of purchase, or by him after bringing them to his farm. Farm Y sold out all cattle during 2004 but has since begun accumulating cattle again. The index cow did not have horns and there was no evidence of dehorning or tagging. In addition, no eligible animals remain in the herd for genetic testing. This trace thread is closed.

Farm Z consigned three red cow and calf pairs to the stockyard on June 6, 2001. These animals were later purchased by Farm D. The owner of Farm Z has land (owned and rented) in many locations and occasionally runs cattle on some of this land. He reported that his practice was to buy entire herds and sell the complete herd a few months later. He sold all of his cattle accumulated from the mid-1990s during May or June of 2001 and was without cattle until later in the year when he began restocking. He has since bought and sold groups of cattle several times but keeps no records himself. There are no eligible animals remaining for genetic testing. This trace thread is closed.

Farm AA consigned a red cow to the stockyard on September 19, 2001. This cow was later purchased by Farm D. The traced cow was lotted-in the day before the sale and had been purchased through another stockyard earlier in the week. Sales records show the weight of the cow as 1,140 lb at the time of purchase at the previous stockyard sale, which exceeds the upper weight established for tracing in the SOP. This cow is excluded from further tracing. This trace thread is closed.

A red cow and calf pair was consigned to the stockyard by a dairy, identified as Farm BB, on November 10, 2001. This cow was later purchased by Farm D. Farm BB is comprised of a milking Holstein dairy with about 300 milking animals. The owners of Farm BB also have approximately 400 mixed breed beef cattle maintained as a cow/calf operation. Farm BB does not retain any heifers as replacements for either the dairy operation or the beef operation. They buy all their replacement cows for the dairy and buy beef cattle to raise a calf then resell the cow with a calf within a 12-to 18-month time period. When asked about records of purchased cattle, one of the owners stated that he could not locate any records prior to 2002.

Farm BB utilized the services of a cattle dealer to purchase cattle at various stockyards in the region. Some of the cattle might have had ear tags prior to purchase but the owners did not put in their own ear tags when the cattle were bought.

The current herd at Farm BB is comprised of various breeds of beef cattle, but they would not be the same cattle that were present in 2001, since all cows at the premises are sold within a 12- to 18-month period (with calves) after purchase. Therefore, this trace thread is closed.

Farm CC consigned a red cow to the stockyard on December 8, 2001. This cow was later purchased by Farm D. Farm CC has no cattle at this time. The owner of Farm CC has no records of cattle that he has owned and no memory of the particular animal being traced. There are no animals on the farm eligible for genetic testing. This trace thread is closed.

Farm DD consigned a red cow to the stockyard on December 12, 2001 that was later purchased by Farm D. The owner of Farm DD has no records of his cattle operation. He currently owns three cows, one bull, and two calves. All are black and none has identification. Additionally, the owner has stated that he has never owned any cows more than two years. No animals currently on the farm were present at the time the traced cow was sold and no offspring were retained from that time. There are no eligible animals remaining on this farm for genetic testing. This trace thread is closed.

Farm EE consigned a red cow to the stockyard on March 3, 2000. This cow was later purchased by Farm D. All cattle on Farm EE were sold two or three years ago. No records of sales or purchases were kept. No animals remain on this farm for genetic testing. This trace thread is closed.

Farm FF consigned a red cow to the stockyard on June 21, 2000. This cow was later purchased by Farm D. Farm FF has not kept cattle since the herd was dispersed

approximately three years ago. The owner of Farm FF has no knowledge or records of the cow in question other than that the cow would have been purchased through the same stockyard where it was sold. Purchase records prior to 2000 for this stockyard were destroyed in a fire. There are no eligible animals on the farm for genetic testing and this trace thread is closed.

Farm GG consigned a red cow to the stockyard on June 21, 2000. This cow was later purchased by Farm D. The owner of Farm GG runs a feeding operation and normally purchases 350 to 450 lb steers and heifers for feeding out. He generally has fewer than 700 head at any one time. Farm GG reported selling the entire cow herd between late 2000 and early 2001. He has no recollection or records of the traced animal. Most of his cows at that time were purchased either through the stockyard or by private. He did not keep offspring of his cattle. No eligible animals remain on the farm for genetic testing. This trace thread is closed.

Farm HH consigned two red cows to the stockyard on September 20, 2000. These cows were later purchased by Farm D. All cattle on Farm HH were sold at that time as part of a herd dispersal and none remaining on the farm are eligible for genetic testing. This trace thread is closed.

Farm II consigned a red cow and calf pair to the stockyard on October 11, 2000. This cow was later purchased by Farm D. Farm II's owner currently has 100 to 150 cows. He formerly had Beefmaster cattle but now has a herd of mixed crossbred cattle. He normally buys cows through the stockyard or from private individuals. After he brings them to his farm, he evaluates them by close examination. If he decides to keep the animal he tags it. Those that he decides not to retain are sold at the stockyard the next week. If any animal was sold from his farm without an ear tag, it would have been one of these that he resold immediately. On review of his records, the owner believes that the cow sold at the stockyard on October 11, 2000, was one that was purchased through the same stockyard on April 3, 2000. That cow was tagged on his farm with a green bangle tag #6. There was no tag in the index cow's ear, nor was there evidence of either a hole or scar. This cow is excluded as the index cow based on the known presence of an ear tag. This trace thread is closed.

Results: In all, 25 farms were investigated as suppliers of cows that could have supplied the index cow to Farm D. All of these farms were excluded as the herd of origin of the Index Case. Therefore the trace back from Farm D is closed.

Investigation into Farm E

Background: Farm E sold a red cow on August 11, 2004, 2 months pregnant, weighing 790 lbs. This cow was later purchased by Farm B. This animal is consistent with the weight, age, and stage of pregnancy of the index case at that time.

Investigation: Farm E purchased two cows on January 17, 2000, that matched the color, approximate age, and stage of pregnancy of the index case. These cows had been purchased from Farm K and Farm L.

Farm K sold an 18-month old red heifer through a stockyard that was later purchased by Farm E. The cow in question had been tested for brucellosis at the stockyard and an official brucellosis ear tag was placed in its ear. The cow was at the minimum age for tracing at the time of sale. Because all cattle on Farm K were dispersed in 2003 and no animals remain on the farm and because the index case had not been ear tagged. This traced is closed.

Farm L consigned an 18-month old red cow to a stockyard on January 17, 2000, that was later purchased by Farm E. The cow in question had been tested for brucellosis at the stockyard and an official brucellosis ear tag was placed in its ear. The cow was also at the minimum age for tracing at the time of sale. There was only one animal present on Farm L from January 2000 at the time of the investigation in 2006. Because the cow being traced did not calve in this herd there were no animals eligible for genetic testing. This trace thread is closed.

Farm E indicated that he may have kept some calves from red cows. DNA testing was conducted in Herd E to determine whether offspring of the index case were present. On March 31 blood samples were collected from all cattle that qualified by age as possible progeny of the cow being traced in order to determine if they could be genetically linked to the index case. Results received on April 8 indicated that no animals qualify as first generation offspring or full siblings of the index case. This trace thread is closed.

Results: Because both animals sold to Farm E had been identified with ear tags, and because either no animals were present or no animals were eligible for genetic matching on the farms supplying Farm L neither of these animals could have been the index case. The trace thread from Farm E is closed.

Investigation into Farm F

Background: Farm F sold a red cow with a calf on September 1, 2004, no age or pregnancy status available, weight 890 lbs. This cow was purchased by Farm B. This animal is consistent with the color and weight of the index case at that time.

Investigation: The stockyard records indicated that this cow had a Charolais Cross bred steer at its side, which was sold for slaughter.

The owner of farm F had purchased the cow from Farm H through the stockyard. The cow was sold as lot #87 on April 9, 2003. Farm H identified the cow as having come from two possible sources, one of which was a purchased animal that was confirmed to be a Beefmaster breed, light red in color, and branded. This cow was excluded as the index case. The other possible animal might have been raised in the herd. If it had been raised in his herd it was possible that one animal that qualified as first generation progeny would still be presenting the herd. On March 29, blood samples were collected from all animals 18 months of age or older on Farm H. Results received on April 6 indicated that none of the animals qualified as offspring of the index case, including the one animal identified by the owner as the offspring of the cow being traced. This trace thread is closed.

The owner of Farm F also purchased another red cow from Farm I on the same day as determined by stockyard records. No animals remain on the premises of Farm I to be genetically compared to the index case. This trace thread is closed.

Results: Farm F did not retain any calves from his cows so no animals were eligible for genetic comparison. This trace thread is closed.

Summary:

Despite a thorough investigation of two farms that were known to contain the index cow, and 35 other farms that might have supplied the index cow to the farms where the index case was known to have resided, the investigators were unable to locate the herd of origin. The index case did not have unique or permanent identification, plus, the size and color of the cow being traced is very common in the Southern United States. Due to the unremarkable appearance of solid red cows, it is not easy for owners to remember individual animals. In the Southern United States, it is common business practice to buy breeding age cows and keep them for several years while they produce calves. Most calves produced are sold the year they are born, whereas breeding cows are sold when there is a lapse in breeding, which can occur multiple times in cows' lives. For all of these reasons, USDA was unable to locate the herd of origin.

