

# White Paper

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## Equine Forum: Advancing ID, Technology and Electronic Health Records

Information synthesized from January 17-18, 2017 forum in Denver, CO: “Equine Forum: Advancing ID, Technology and Electronic Health Records”

*DISCLAIMER: The information in this White Paper is strictly the perspectives and opinions of individual speakers and results of discussions at the 2017 Equine Forum: Advancing ID, Technology and Electronic Health Records.*

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## **BACKGROUND**

The *Equine Identification Forum, “Advancing Identification, Technology and Electronic Health Records”*, conducted January 17-18, 2017, in Denver, CO, was the second equine industry forum hosted by the National Institute of Animal Agriculture (NIAA) and the U.S. Animal Health Association (USAHA). The forum brought together one-hundred and six (106) equine industry professionals, to include equine organization leaders, veterinarians, representatives of equine identification technology companies, and regulatory animal health officials, to gain a better understanding of equine identification and traceability. The goal was to obtain industry thoughts on the need for a national equine identification program, the ideal method of equine identification, the concept of centralized database versus various industry databases and use of search tool for equine microchips, and recommendations for advancing equine traceability and electronic health records.

Over the last decade, equine identification methods have been the focus of numerous discussions. However, lack of consensus on methodologies and unification among the industry has hindered advancement of equine identification and traceability. In recent years, an unprecedented number of equine disease issues in the US required involvement of animal health officials. The recent disease incidents highlight the challenges associated with the ability to identify and trace infected and exposed horses. Additionally, the diversity and segmentation of the equine industry led to challenges as regulatory officials made numerous unsuccessful attempts to confirm equine identification. Protecting the future of the equine industry will require use of advanced equine identification and traceability technologies and the ability to electronically capture health documents, such as health certificates and Coggins tests.

During, the 2016 Equine Forum, equine industry leaders agreed that it was time to act on equine identification and traceability and requested a subsequent forum to bring stakeholders together to take action on the issue of equine identification and traceability. The NIAA and USAHA tasked a planning committee of subject-matter experts to plan the 2017 Equine ID Forum.

The NIAA is a non-profit, membership-driven organization that unites and advances animal agriculture for the challenges facing animal agriculture industries (aquatic, beef, dairy, equine, goat, poultry, sheep and swine). NIAA is dedicated to furthering programs for the eradication of diseases that pose risk to the health of animals, wildlife and humans; promoting the efficient production of a safe and wholesome food supply for our nation and abroad; and promoting best practices in environmental stewardship and animal health and well-being.

The USAHA is a forum for communication and coordination among State and Federal governments, universities, industry, and other concerned groups to consider issues of animal health and disease control, animal welfare, food safety and public health. It is a clearinghouse for new information and methods, which may be incorporated into laws, regulations, policy and programs. It develops solutions of animal health-related issues based on science, new information and methods, public policy, risk/benefit analysis, and the ability to develop a consensus for changing laws, regulations, policies and programs.

The 2017 *Equine Identification Forum* was funded in part by the USDA, Zoetis, AKC ReUnite, Boehringer Ingelheim, Destron Fearing, Electronic Vet, Merck Animal Health, Computer Aid Inc., Datamars, Global VetLINK, Microchip ID Equine, and the Arabian Horse Association.

## **PURPOSE AND DESIGN OF THE FORUM**

The purpose of the forum was to bring together equine industry leaders and animal health officials to specifically discuss equine identification, traceability and electronic equine health records. The objective was to provide details on the latest equine identification technology and recent challenges in equine traceability, and to identify potential solutions for advancing equine identification and traceability. In addition to subject-matter expert presentations, the forum held break-out discussion groups to discuss traceability and microchip data storage options. Forum participants gained unique insight into the views and initiatives of the various segments of the industry, which will enhance future collaborations for advancement of identification and traceability.

### Forum Planning Committee Co-Chairmen

Dr. Katie Flynn, California Department of Food and Agriculture  
Dr. Carl C. Heckendorf, Colorado Department of Agriculture

### Forum Planning Committee Members

Dr. Bill Brown, Kansas Department of Agriculture  
Dr. Ellen Buck, USDA-APHIS-VS  
Dr. Rory Carolan, USDA-APHIS-VS  
Dr. Joe Fisch, Florida Department of Agriculture and Consumer Services  
Dr. Marta Luz LaColla, Allflex USA Inc.  
Dr. Tom Lenz, Zoetis Animal Health  
Mr. Kevin Maher, VetMeasure, LLC  
Dr. Kenton Morgan, Zoetis Animal Health  
Dr. Lucas Pantaleon, Ogena Solutions  
Dr. Angela Pelzel-McCluskey, USDA-APHIS-VS  
Dr. Grant Rezabek, Oklahoma Animal Disease Diagnostic Laboratory  
Mr. Ben Richey, United States Animal Health Association  
Dr. Peter Timoney, Gluck Equine Research Center  
Ms. Jill Wagner, GlobalVetLINK  
Mr. Cliff Williamson, American Horse Council

**FORUM TOPICS AND SPEAKERS**  
**(in order given at the forum)**

*Welcome and Introductions*, Dr. Katie Flynn, Equine Staff Veterinarian, Animal Health Branch, California Department of Food and Agriculture, Sacramento, CA

*Why Equine Identification and Traceability*, Summer Stoffel, CEO, Equicore, Broken Arrow, OK

*Private Practitioner Perspective*, Dr. James Morehead, President, Equine Medical Associates, PSC, Lexington, KY

*Equine Owner Perspective*, Dr. Glenn Blodgett, Horse Division Manager, Four Sixes Ranch/Burnett Ranches, Guthrie, TX

*USHJA and USEF Perspective*, Ms. Mary Babick, President, United States Hunter Jumper Association, Director, United States Equestrian Foundation, Freehold, NJ

*AQHA Perspective*, Mr. Craig Huffhines, Executive Vice President, American Quarter Horse Association, Amarillo, TX

*Arabian Horse Association Perspective*, Mrs. Debbie Fuentes, Registrar and Senior Director of Registry/Member Services, Arabian Horse Association, Aurora, CO

*Jockey Club Perspective*, Mr. Matt Iuliano, Executive Vice President/Executive Director, The Jockey Club, Lexington, KY

*Horse Identification – Past, Present, and Future*, Dr. Katie Flynn, Equine Staff Veterinarian, Animal Health Branch, California Department of Food and Agriculture, Sacramento, CA

*Regulatory Perspective on Individual Equine Identification*, Dr. Angela Pelzel-McCluskey, Equine Epidemiologist, USDA, APHIS, VS, Fort Collins, CO

*Regulatory Perspective on Individual Equine Identification*, Dr. Carl Heckendorf, Colorado Department of Agriculture, Broomfield, CO

*Regulatory Perspective on Individual Equine Identification*, Dr. Diane Stacey, Assistant State Veterinarian, Louisiana Department of Agriculture and Forestry, Baton Rouge, LA

*Equine Microchips 101*, Dr. Marta Luz LaColla, Afflex USA Inc., Dallas, TX

*Electronic Records – Owner Benefits of Linking Electronic ID*, Mr. Craig Huffhines, Executive Vice President, American Quarter Horse Association, Amarillo, TX

*Traceability of Equine – Health Perspective*, Dr. Carl Heckendorf, Colorado Department of Agriculture, Broomfield, CO

*Traceability of Equine Microchips*, Dr. Angela Pelzel-McCluskey, Equine Epidemiologist, USDA, APHIS, VS, Fort Collins, CO

*Database Management in Small Animals*, Mr. Kenneth Klaus, General Manager, HomeAgain, Merck Animal Health, Madison, NJ

*AAHA Model – A Microchip Search Tool*, Ms. Katherine Wessels, Senior Manager of Communications, American Animal Hospital Association, Lakewood, CO

*Overview of Electronic Health Certification Systems Passports and Certificates of Veterinary Inspection*, Dr. Alex Turner, Traceability Veterinarian, Colorado Department of Agriculture, Broomfield, CO

*Advancing Equine Identification and Traceability: Next Steps*, Dr. Katie Flynn, Equine Staff Veterinarian, Animal Health Branch, California Department of Food and Agriculture, Sacramento, CA

## EXECUTIVE SUMMARY

Subject-matter expert presentations on identification and traceability resulted in robust dialogue and exchange of information. The forum highlighted and brought forth the following issues:

1. Current equine identification and traceability measures are inadequate. Advancing equine identification and traceability will require new methodologies, enhanced communications, and collaboration.
2. Advancing equine identification must be industry-driven with limited government involvement. Equine enthusiasts trust local industry leaders, their trainers, and their mentors; the personal connection is important. The value-added benefits of improved equine identification will drive adaptation.
3. Reasons to promote the use of unique, permanent, unalterable identification include that it provides verifiable identification of exposed or infected horses in a disease incident and verifiable animal identification reuniting horses with owners after theft or a natural disaster.
4. Advances in equine microchip technology make microchips an ideal industry choice for unique, permanent, individual identification of horses. Ultimately, the goal is to get microchips in horses. However, the industry should ensure that microchips meet the minimum standards of ISO 11784/11785 and be ICAR-certified (International Committee for Animal Recording). The international integration of equine identification technologies is critical to the industry due to the ever-increasing global market.
5. Science has disproven myths of microchips. Science has demonstrated that a properly implanted microchip may result in mild, transient soreness and localized inflammation, which resolve in three (3) days or less. Currently available microchips on the market remain in the site of implantation and can only be surgically removed under anesthesia leaving a visible scar.
6. The biothermal microchip has tremendous benefit as a temperature surveillance tool for the industry. The ability to rapidly scan multiple horses during a disease outbreak could ensure stress-free temperature monitoring at intervals for easy detection of elevations in temperatures and prompt isolation of horses demonstrating fever.
7. One deterrent to use of microchips is the cost of the microchip. Opposition to microchip use may be raised by those engaged in fraudulent business practices. Industry initiatives, such as chip-a-thon events, can decrease overall cost and will encourage participation.
8. The success in traceability of horses, during natural disaster, disease outbreaks or incidents of theft, are currently stymied by multiple data “silos” of equine microchip numbers, a lack of data sharing, and a lack of a centralized microchip database or microchip search mechanism. The American Animal Hospital Association (AAHA) has the Pet Microchip Lookup tool that is a solution for small animal microchip searching. This microchip lookup tool directs users to the microchip manufacturer which has additional information on the animal with the chip. This technology and system would be extremely useful for the equine industry and should be given consideration.
9. The Jockey Club had 66% of the 23,000 2016 foals voluntarily microchipped by owners associated with an option to request a microchip when obtaining foal registration



materials. Learning from historical efforts, advancing equine identification should focus on voluntary participation and not regulatory requirements.

10. The future of equine identification relies on ensuring convenience and leveraging microchip value. The key for disease traceability will be to ensure recording of microchips on electronic records and not recorded on paper-based documents as this will eliminate the benefits of speed of information retrieval.

## **PRESENTATION HIGHLIGHTS**

### **PERSPECTIVES ON EQUINE IDENTIFICATION AND TRACEABILITY**

#### *WHY EQUINE IDENTIFICATION AND TRACEABILITY*

Speaker: Summer Stoffel, CEO, Equicore

Equine identification and traceability are core fundamentals for every facet of the equine industry. Identification is defined as the verifiable evidence of a horse's identity. Traceability is defined as the ability to use positive identification to track a horse in all areas of its life from birth to death. There are multiple perspectives on equine identification and traceability based upon one's involvement in the various facets of the industry<sup>1</sup>.

The importance of traceability varies depending upon the perspective on an individual or entity. Industry growth is important to all equine stakeholders. Accurate, verifiable and permanent identification of horses and a traceability system assures transparency and fair play in the equestrian sports. Verifying horse identification to ensure that the rules of a competition such as age or class restrictions for the horse competing are being met, promotes sports integrity which ultimately leads to consumer confidence and growth of the equine industry. Implementing proper traceability in the industry would assist in biosecurity and disease control efforts specifically enabling the governing bodies to rapidly identify horses that may have been exposed to an infected horse at an event. Additionally, horse welfare is of utmost importance to the industry, and proper identification and traceability of horses enables authorities to hold horse owners accountable in cases of neglect and cruelty. In cases of a natural disaster or theft, properly identified animals can be promptly reunited with their owners when found. Implementation of a proper equine identification and traceability system would assist with fraud prevention in the sale of horses. Overall there are many benefits to increasing equine traceability and those individuals partaking in unfair and unlawful practices are the ones most opposed to advancing the current systems.

Currently, there are multiple methods of equine identification and traceability in use in the equine industry in the United States. These methods include official identification documents such as breed papers/passports; horse identification documents or the Federation Equestre Internationale (FEI) passports; unique individual identification systems, such as the Universal Equine Life Number (UELN) Assignments; breed or industry brands/tattoos; DNA typing; microchipping; and iris scanning. Registration documentation is a strong method in use for competing and breed registered horses. Registration documentation contains a registration

number, breed papers, breed passport, horse identification document (HID), and potentially an FEI passport. However, the majority of horses in the US are unregistered, recreational horses.

Organizations that register horses, such as breed registries, have their own independent system of identification, which can make information sharing difficult. The Universal Equine Life Number (UELN) is a project of common language between horse registering organizations. A UELN is a unique identification numbers issued to horses by breed and sports organizations. The goal of this method is the registration of all horses in a uniform method so all networks and databases can easily work together internationally. As stated on their website (<http://www.ueln.net/>), “The UELN system is suitable for the registration of both registered equidae and equidae for breeding and production and allows computerized networks to be brought in gradually to ensure that the animal’s identity can continue to be verified.” The UELN system has been agreed upon worldwide by the major horse-breeding and competition organizations.

The UELN is a 15-digit number that contains the original country of recording, the organization performing the registration, and the unique identification number of the horse. The first three digits of the number code are the county of origin code (i.e., USA = 840). These numbers will never change, even if the horse moves to a different country. The second set of three digits are the industry database issuing the registration number (i.e., AQHA = 006). The final nine digits are the registration number of the original horse. If the registration number is less than nine digits, then the remaining numbers of digits are assigned zeros preceding the registration number. The system was developed in a manner so that all horses, including those already recorded with a registry, can still receive a unique UELN. The UELN is a number assigned to the horse and associated records.

Multiple breed registries use DNA testing to verify parentage, eligibility for inclusion into a studbook, performance traits, and genetic disorders. Current DNA testing evaluates microsatellites of DNA which identify parentage and not the individual identity of the horse. DNA alone does not provide positive horse identification for traceability purposes.

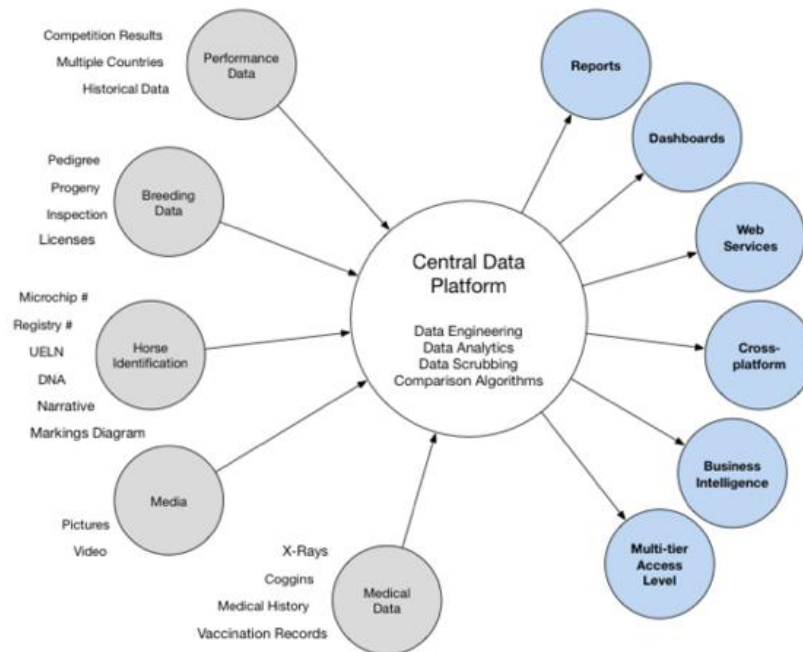
Historically, various microchips have been in use to identify horses. Before implementation of microchip standards, older technology and microchips, such as the 125 kHz microchips with 9-digit numeric or 10-digit alphanumeric codes, were used. Today, the international standards for acceptable microchips are:

- ISO 11784/11785 compliant
- 15-digit numeric, no letters format
- 134.2 kHz frequency

The first digits of the microchip number provide information on the source of the microchip. A first digit of “9” indicates a manufacturer’s code. The “9” plus the two following numbers will identify the company that manufactured the microchip. The benefit to this method is the ability to trace to the microchip manufacturer. The main concern with these microchips is that if an animal is found with this microchip, there is no indication of the country to contact for animal

information. If the first digit of the microchip number is other than a "9", then it is the three-digit country code where the animal was chipped (i.e., USA = 840, Germany = 276, Belgium = 056, etc.). These country codes align with UELN country codes. There are multiple roadblocks to implementing an efficient form of equine traceability. First, most horses in the United States are unregistered, recreational animals for which there is no need to meet an identification requirement. Second, there is not a centralized data platform since equine identification data is currently held in multiple equine industry data systems known as data silos. These data silos do not "speak to each other" or share the information held within them, thereby preventing essential connections being made. In addition, the data in each silo is not visible to anyone outside each individual organization. In the current systems, accuracy of data is questionable since there is a lack of supporting documentation or illegible, handwritten paper documents are received, which results in inaccurate data entry. Third, verification of current visual identification methods such as brands or tattoos, is challenging due to the difficulty to accurately read and record. Ultimately, the use of microchips and microchip scanner technology could eliminate these roadblocks.

One roadblock, which must be overcome to ensure a functional traceability system, is the current structure of data silos or identification data repository system. Unique pieces of equine identification and traceability data are held in data silos by various equine industry entities such as breed organizations, regulatory bodies, veterinary organizations, sports federations, and microchip manufacturers. Currently in the United States, there is no central platform where these silos convene to share information. In Europe, the World Breeding Federation of Sport Horses has a Microchip Look Up Tool (HUB) used to increase communication between data silos in the European equine industry. It was designed for one to be able to search the HUB for the microchip number to obtain the contact information for the databases with possible matches.



This method has proved difficult to implement and unsuccessful for European registries up to this point.

The future of equine traceability is a system that would locate a horse microchip number and provide the appropriate information for the user at a certain level. Levels of access would require certain credentials from users. This design would be known as a central data “platform”, not a database. A database houses all of the information in one central location, but a “platform” networks and aggregates data from multiple databases. The above figure depicts separate databases, which could potentially be screened by the central platform, and would then feed out information that is needed. Future discussions are necessary to identify what information should remain confidential and what information to provide. For instance, current discussions in Europe focus on whether equine X-rays should be private or public knowledge.

In summary, there are a few key points of focus when implementing an equine traceability program. The data platform does not own the data, the platform is merely the machine used to provide reporting, analytics, and verification. To be efficient and successful, equine identification standards must be easily implemented across the different industry segments without impact on the industry. Estimates are that 75% of horses in the US are imported from other countries. There is an increased need for international traceability due to the ever-increasing and frequent global movement of horses so international integration of the system is vital to a US system. Ultimately, the future of equine identification and traceability is the streamlining of data aggregation, not excessive data creation in silos. The welfare of the horse in this process is of utmost importance.

Moving forward in the process of advancing equine identification and traceability, it is important to focus on the main benefits of equine identification and traceability. The ultimate goal is to enhance the welfare of the horse with streamlined equine identification for seamless national and international traceability. Advances in equine identification will enhance the ability to verify identity and ownership of horses in cases of theft or natural disasters, will promote a higher level of biosecurity and enable faster response times to a potential disease outbreak. Additionally, identification and traceability will increase consumer confidence, support equine sport integrity, and promote overall growth of the equine industry from multiple perspectives.

#### *PRIVATE PRACTITIONER PERSPECTIVE*

By Dr. Jim Morehead, Equine Medical Associates, PSC

Private practitioners and the American Association of Equine Practitioners (AAEP), previously worked on the issue of equine identification. An Equine Species Working Group (ESWG) was formed at the time the United States Department of Agriculture had proposed a mandatory National Animal Identification System (NAIS). The working group, comprised of individuals from multiple facets of the equine industry, was charged to develop an equine identification system. At the time, it quickly became apparent that many in the industry did not see the world through the same eyes as veterinarians. As the working group tried to develop some methodology for the USDA, several roadblocks were faced by some segments of the

industry. The working group realized that there were going to be multiple roadblocks when developing an identification system but that these shouldn't discourage the group.<sup>2</sup>

The equine veterinary data silo contains a great deal of client-confidential information. The veterinary community is concerned about how much information is put in the data silo and what information should follow that horse for the rest its life. The public believes that the veterinarians want to gather up all their information and put it in a place with government access so the government can monitor everything about the client. There are concerns to address when exploring ways to advance equine identification,

Equine movement is unique and not comparable to other livestock movements. The Equine Species Working Group (ESWG) proposed to USDA a voluntary equine identification system using microchips to identify the horse, a premise identification system, and requirement for horse movement records when crossing state lines. Positive identification of the horse would be necessary for issue of a Coggins test report or a health certificate.

The horse industry continues to challenge the need for an equine identification system. The industry proffers that use of brands, lip tattoos, whorls, cowlicks, etc. for identification is longstanding and without problems, so they do not see the need for the microchip. The idea of black government helicopters following and monitoring movements is also of concern of the public. Owners have concerns about giving the government access to their private information (equine medical records, ownership, travel, etc.). Horse owners will move or hide horses at a moment's notice to protect them and remove them from a situation or threat.

The American Association of Equine Practitioners (AAEP) does not currently have a formal position statement on equine microchips. AAEP acknowledges that there are many methods of identifying a horse however, if the industry moves forward with microchip identification, AAEP will support the industry. The AAEP recognizes the benefits of permanent equine identification and understands the benefits of a standardized acceptable form of identification. However, it is important to keep an open mind on the many different available forms of identification and advancement may come along at any time. Next year there might be something better.

The American Veterinary Medical Association (AVMA) recently released a position statement on animal identification including wording for microchips on horses and realizes that equine organizations increasingly want animals microchipped. The ESWG recommends that veterinarians apply microchips, but many people believe that anyone can apply a microchip.

The future of equine identification and traceability is going to be based upon many things. Cost of microchips is a big factor. In addition to cost, another significant issue is the determination of who would maintain the database. The USDA General Accounting Office estimates that a mandatory equine identification system would cost \$200-300 million a year to maintain. The more information entered in the system, the more it is going to cost and the less people will trust the system. Therefore, it can be argued that it is better to keep separate silos of information and at the time of an emergency, there can be communication between the silos.

## *EQUINE OWNER PERSPECTIVE*

By Dr. Glenn Blodgett, Four Sixes Ranch

The historic Four Sixes Ranch, established in the 1800s, has had a long-established need for equine identification. For many years, brands were used along with markings for identification. Historically, every horse is branded with four (4) brands: a Four Sixes brand, a mare line brand on the shoulder or jaw with a specific number, a year brand on one buttock and a sire brand on the other buttock. This branding tradition is a symbol for the ranch and to those animals in the industry from the ranch and will continue. Over the years, a problem was recognized since some foals look identical. With roughly 1000 horses on the property and turnover of personnel, there was a recognized need for good identification. Out of necessity, the ranch was driven to use electronic identification with microchips<sup>3</sup>. The ranch also obtains digital photographs of all foals.

The ranch utilizes a DataMars implanted microchip (Slim Chip) with a 15-digit number. The microchip is used in conjunction with brands, whorls, and photographs. Within 48 hours of birth, every foal is microchipped. Microchipping is done automatically even for foals of other owned horses born on the ranch. The ranch reports microchip numbers on AQHA foal registration forms. The facility uses Wise Option™ software for records and breeding management. This program uses a microchip number and animal name to identify the animal.

From a horse owner's perspective, microchips offer a very efficient and accurate means of identification for the horse. When applying a microchip, especially for older horses, it is important to always check the horse to make sure that the horse has not already been chipped. It appears that many breed registries are recognizing and using microchips as a means for equine identification which presents numerous benefits throughout the equine industry.

## *USHJA AND USEF PERSPECTIVE*

By Ms. Mary Babick, President, United States Hunter Jumper Association

The United States Equestrian Federation (USEF) is the national governing body for Olympic-level and FEI sport horses (80,000 members). It has twenty-nine (29) recognized breed and discipline organizations. The United States Hunter Jumper Association (USHJA) is the largest organization recognized by the USEF (44,000 members and 208,000 horses registered) and oversees the hunter and jumper sport except for the Olympic and FEI-level. Approximately 60% of the USHJA horses are imported from other countries and are microchipped due to European ID requirements.

The idea of advancing horse identification was started when the USEF formed an ID Task Force with representatives from different breed and discipline organizations. It was clear there was not going to be agreement among the different groups on a system for implementation.

Ultimately, USHJA formed an ID group of their own, and in 2013 tried to implement a rule change that failed miserably.<sup>4</sup>

With the rule failure behind them, the group reconvened to create a map of the entire project and identified every potential problem they might encounter since there were many misconceptions circulating in the industry. Identified misconceptions included the notion of government surveillance with black helicopters, microchips causing cancer and other diseases, and that microchips could be easily removed. To counteract these concerns, the USHJA went to an outside organization to have an outside entity (Summer Stoffel) introduce the ID rule concept to the association. A proposal was made for a gradual roll-out of the rule over several years. The decision for a gradual roll-out was influenced by the division and resistance in the association. Horse owners at the top of the sport had no objection since many of their horses are from Europe and are already microchipped or they are FEI competitors whose horses are required to be microchipped. The horse owners at the bottom of the sport had no objection because they want to ensure that each horse competing is verified to be the horse the owner claims them to be. Horse owners in the middle of the sport offered the greatest resistance.

Implementation of the ID rule change will start with the 2018 competition year beginning December 1, 2017. In 2018, the rule requires microchips for horses participating in the USHJA points programs. In the 2019 competition year, the rule requires full compliance with all horses requiring a microchip to compete in USHJA competitions. The success of the USHJA ID rule implementation demonstrates the importance of straightforward education, proper use of media, and engagement of people outside the industry to speak on your behalf.

Consumer confidence was the biggest element in promoting microchipping as the form of identification since age verification and horse competition records have become more important and sport integrity has become critically important. Specifically, verification of a microchip enables an owner to know that the bay gelding they purchased is the bay gelding in their possession, and the microchip number ties the horse to its competition records and breeding records, if applicable. Once the horse is microchipped and the data is in the system, all of the information will follow it no matter where the horse goes. Microchipping will prevent owners and trainers from creating a “new identity” for a horse if the horse does not meet their planned expectations. Ultimately, this information will also tie to international records so owners can truly have an entire record of their horse. Equine shippers and insurance companies are delighted with the microchip rule as it ensures the ability for accurate identification of the horse. In short, integrity of the sport has become critically important.

The plan is to use microchipping for several key initiatives: 1) at the time of animal measurement since many animals look the same and are often misrepresented. Microchipping will enable verification of animal identification and accuracy; 2) drug testing to verify animal identification ensuing sample collection from the correct horse; 3) for member-to-member protests; and 4) for eligibility-based competitions (i.e., championships) which generally applies to age and performance records to ensure that the horse competing is the horse it is supposed to be. USHJA, through work with Equicore, LLC will also be able to look at the history of the horse to ensure eligibility.

There are multiple challenges for wider adoption of microchipping by USEF. Some member organizations and associations are happy with the current identification methods in use and do not want to implement microchipping. There is a recognized “shadow economy”, which involves a group of unrecognized shows with no regulation, therefore competitors do not have a level playing field. Price variation for microchipping is a reason for some to avoid regulations and rules. Additionally, if a microchip type is mandated in the future (for example, by regulation), it would present a problem for owners of horses identified with a different kind of microchip. Consideration must be given to any future requirements that may be made. People have concerns that ISO-compliant microchips are what are being recognized now, however question whether better technology may become available in the future and wonder whether states may require some other means of identification. People will be very angry if they are compliant with one set of rules and are then non-compliant when the rules change. In this situation people will use this as another reason to avoid competition and regulations.

Moving forward it is important to keep in mind that for member compliance things need to be easy and clear. Other considerations should be given to the cost of supplying the microchip readers to competition managers, drug testers, stewards, etc. Additionally, the current methodologies of data silos are a problem and need to change.

The overall goal of microchipping is to shine the light on a sport that has a lot of problems and needs to improve. Data sharing for advancement of the sport is viewed as positive by some and with great opposition by others. We are in favor of a centralized database. USHJA has decided that big data is a great way to move forward, however, USEF is not at all happy about sharing data and does not want to share their data with everyone. When you are buying a horse will you know all of the performance history of the animal? Universal Equine Numbers may be in the future.

#### *AQHA PERSPECTIVE*

Mr. Craig Huffhines, Executive Vice President, American Quarter Horse Association

The American Quarter Horse Foundation (AQHA) has 250,000 members and an estimated 2.4 million horses registered. We know that the words “compulsory and mandated regulation” will not work to implement microchipping with some AQHA members. We believe that it is the responsibility of the individual breed organizations to mandate microchipping. The main purpose of organizations is to protect, track, and identify equine progeny and their lineage for selection and performance purposes. We need to reposition the value of microchipping to protect and track the valuable equine assets. The AQHA is looking for information from this forum on how to take current information and the value of microchipping back to present it to members and group organizations. There are leveraging points for managing the big data of the industry and converting this into a value and content package for the memberships. If it becomes a value and not a burden to the members, the AQHA believes that unveiling the value of microchipping to the members will help to push the idea of microchipping forward. The AQHA wants to know the hurdles that they will be facing and how to address them. Also, once AQHA



gets this data, they want to be able to manage it. AQHA is going to use the pathways that have been lined out by other breed organizations in implementing microchipping<sup>5</sup>.

#### *ARABIAN HORSE ASSOCIATION PERSPECTIVE*

Mrs. Debbie Fuentes, Registrar and Senior Director of Registry/Member Services, Arabian Horse Association

Through the years, the Arabian Horse Association (AHA), established in 1908, has changed its means of identification. Historically, recorded markings of horses were written on the backs of registration certificates. From 1972-1989, the method of identification was freeze branding done by a field services team of four representatives that traveled across the US to freeze brand horses. The brand was an Alpha-Angle freeze mark; upright A for purebreds and laying down A for half-Arabs. The field representatives also did breeder visits, import inspections, and random parentage testing to confirm identity, not parentage. In 1976 breeding stallions were required to have their blood type on a permanent record. In 1991, the organization went to parentage verification with the 1991 foal crop. This was done through blood typing at the time of registration, which was very expensive and is rarely used now, since people use DNA testing. In 2001, there was a switch to parentage verification with DNA testing which is proven to be more accurate and efficient. In 2002, all new Arabians were required to have DNA verification of Parentage.<sup>6</sup>

Parentage verification through DNA testing is the strongest identification method used in the organization. It is required for every Purebred Arabian registration, and, in certain circumstances, for Half-Arabian registration. It is also required for participation in select Half-Arabian classes at National Shows. It is also used for identity issues and in theft cases. In 2012, the AHA began random DNA testing at the National Show for an identification comparison to the type of record, which confirms the horse being shown is the same horse that was registered. This has been very effective. DNA testing is also done for Champions and Reserve Champions in random classes, typically in money earning classes. The downside to DNA testing is that it takes up to a week to get results.

There are also small numbers of racing Arabians, primarily in the Middle East, that have a unique certificate of registration. They receive a lip tattoo just like thoroughbreds and their cowlicks and markings are extensively described.

Two years ago the AHA started issuing export passport documents for horses as part of Arabian World. The passports, modeled after the European Union passport, has the full pedigree, foaling date, gender, markings, the animal's vaccination and medical history, and microchip number (if applicable). Arabians cannot be registered internationally, and horses can only be registered in their original country. Arabians cannot leave the United States and be registered in another country unless they go through AHA and receive an export certificate,

which includes the DNA profile, blood type pedigree and covering certificate. Export certificates are in high demand. The export certificate is sent directly to the importing country's registry. To date, China does not have a registry.

Microchips are not as popular in the United States as they are in Europe and the Middle East. If a horse is microchipped, it is recorded on their official documents. Some of the identification challenges the AHA encounters are with searches for the identification of horses that may have been separated from the Certificate of Registration. This occurs through multiple transfers of horse ownership. Presently, the only way to reunite the horse with its papers is through comparing DNA testing results, but even with 240,000 DNA profiles on record, there is a less than 10% success rate. The abolishment of horse slaughter has caused an increase in the number of unregistered and undocumented horses in circulation. Upcoming requirements for horses that race abroad include microchipping and confirmation of identity with a second DNA test as a result of some races having extremely high-dollar purses. Another challenge is how the organization will capture the microchip data for horses that are competing in various disciplines requiring microchips (i.e., endurance).

Moving forward, the AHA recognizes the value of microchipping. Though not currently required by AHA, microchip information is still documented and recorded. Microchipping is heavily in use in Europe and the Middle East and to date there is a very small demand in the United States. Microchip data is a valuable resource and currently there is no global database.

#### *THE JOCKEY CLUB PERSPECTIVE*

Mr. Matt Juliano, Executive Vice President/Executive Director, The Jockey Club

In 2008, the Jockey Club offered microchips for sale. The Jockey Club is now in the process of implementing a two-phase program to require microchipping of all Thoroughbreds for registration. With Phase One, beginning with the foals born in 2016, it was optional to request a free microchip on a Live Foal Report; the microchip was then mailed with the genetic sampling kit and registration kit. The breeder then certified the implantation of the chip and reported the microchip number with the registration paperwork sent back to the Jockey Club. Two-thirds of the 2016 foal crop were voluntarily microchipped. With Phase Two, all foal registration kits contain a microchip and microchipping of foals became mandatory for foals born in 2017. Breeders must certify implantation and report the microchip number to the registry. The microchip must be ISO 11784 and 11785 compliant and readable at 134.2 kHz. In the event of microchip failure, corrected certificates will be pursued. Many farms already implemented microchips use for inventory control. In Canada microchips are implanted in the nose while in the US microchips are implanted in the nuchal ligament. The Jockey Club is currently exploring alternate reading platforms for different types of microchip scanners such as Bluetooth linked readers<sup>7</sup>.

Microchips are considered another identification tool and are recorded on the official foal registration. Other identifiers, such as DNA/parentage verification, age (teeth), sex, coat color, markings, cowlicks, night eyes, scars, brands, and tattoos, are still of value. The Jockey Club

believes that the microchip number may be the key to pulling up additional information on the animal.

There has been little pushback during implementation of the rule. One issue raised was the need to call out a veterinarian to implant the microchip once received. There is a cost savings element to send the microchip out early, ideally in time for the neonatal exam, which gets the veterinarian back involved in the registration process. Ideally, the Jockey Club would like to see the recording of all forms of identification (photographs, genetic sample and microchip) occur at the same time, but this is not always practical. Identification errors do occur, however, coordinating all identification activities will reduce errors. Even with errors the strongest weight is placed in the DNA profile.

Getting various groups to all agree is a challenge. Currently, all racing organizations have a centralized database system, called World Hub, which collects past performance records from Thoroughbred racetracks the world over and also information on horse imports and exports. The Jockey Club has applied the same idea to microchips and want a centralized database to store information with control of data taken out of the system.

Use of 840 microchips was experimented and resistance was encountered from breeders that did not want to register their premises. Given transition to acceptance of other microchips with a manufacturing code, resistance decreased. This group should contemplate a model in which essential elements of identification that can be tracked to the original source are entered into a central database and the information is used for specific purposes. Data sharing agreements are essential to facilitate communication. Their use avoids regulations through contracts.

Regarding thermal microchips, research at Texas A&M found that weather or sunshine affected microchip temperature readings; ambient temperature made a difference in temperature recordings. Thermal microchips, if they work, are a good idea, though in the 46° range, they are not reliable. The sport horse federation does not think that biothermal microchips should be forced on entities since the technology is still changing. The South African and Japanese Jockey Clubs initially required the biothermal microchips, but have since withdrawn the requirement for biothermal microchips since they are not reliable. These entities now require just the numerical microchip.

#### *PANEL DISCUSSION: FUTURE OF EQUINE IDENTIFICATION AND TRACEABILITY*

- How are you going to ensure compliance of microchipping at USHJA events?
  - **Mary Babick:** Microchips will be scanned when performing drug testing, taking measurements, during protests, or for eligibility championships. Stewards are concerned they will have too much to do, however, stair-stepping implementation is the best method to accomplish this.
- What is the need for and benefits of a national equine ID plan in the US?

- **Craig Huffhines:** Respective organizations will be the driving force and once that is established there are going to be databases to address the health side and the microchip will just become the key to unlock this information. Our hope is through the different systems the link will occur and the unregistered can tap into that.
- **Glenn Blodgett:** Breed organizations are a step in the direction of identification. The key is to determine the value to the owners and breeders and go from there.
  - **Audience:** What is the value?
    - **Glenn Blodgett:** To identify horses that are difficult to identify. Once I started using microchips, it made sense to continue to use it in a broader spectrum with horses and cattle. Once the cattle were identified, inventory management, age tracking, etc., became much easier. Being able to track performance throughout a horse's life enhances the value of the horse.
- **Debbie Fuentes:** Without a national database, it's hard for the person with the horse to know where to go especially the owners who compete in multiple disciplines.
- **Mary Babick:** If people knew the convenience factor of getting their horse's records all in one place they would transition easier. It is also "green" and paperless. We need to find a balance between compliance and convenience.
- **Matt Iuliano:** It provides extra care for the horse. Microchips are a permanent identification and can help to identify horses in cases of neglect. From the standpoint of repurposing these animals to other careers, their new lives typically start at a rescue and with a microchip there is always a permanent connection to who they are and their history.
- From an animal health perspective, especially when there is disease surveillance requirement which requires the recording of the animal's temperature at least two times per day, what is the value of the bio-thermal microchip?
  - **James Morehead:** In a trial study the temperatures were very dependent upon the environment and ambient temperature were sensitive to direct sunlight. Maybe they could be used as a relative measurement or in a stable environment though can be highly variable.
  - **Glenn Blodgett:** They could be a good idea if they worked. The devices currently available are not reliable.
  - **Mary Babick:** I support the idea though they cannot force the technology on the people that have already become compliant with the original chip. We cannot continue to change the requirements as technology improves.
  - **Matt Iuliano:** The South African and other stud books have tried to use it but did not have satisfactory results. They have since changed their requirement for thermal microchip use.
- Can all your programs succeed with a unique 15-digit number or is there a need for a standardized code? Do you need a country code?
  - **Mary Babick:** Any would be fine because we link the code to the registry in the system.
  - **Matt Iuliano:** I echo Mary's thought. As long as there is faith in the uniqueness of the number, data is data.

- Although the 15-digit code is the goal, most agree that not every horse is going to have that. Currently, official ID is a physical description of the horse (name, age, breed, color, markings, etc.). If we were to up-the-bar for official ID, but not as far as microchips, what are the options and how does that tie into a database? Most agree 3 digital photos are better than the original form of identification. Are we willing to accept these photos and assigning them a 15-digit ID as identification? What do you think if we can't get everyone on a microchip what are other options, if any, to tie to a database?
  - **James Morehead:** Any form of ID is better than what we had, regardless if it is a picture, tattoo, brand, etc., but we struggle with database people as to how it will be searched. I caution that we don't dismiss the microchip and that any form of uniform ID is better than a mismatch of all the other options.
  - **Craig Huffhines:** The fallback from cattle industry is that nobody was interested in centralized database. We took it back to methodology to manage traceability. In the absence of a unique identifier, who is the keeper of the data? Who manages it? And it leads to the same problem we have now.
  - **Mary Babick:** USHJA goes through this process of photo ID and age verification of horses that don't have papers. The owners think that is should be the responsibility of the vet, and that they should be the ones to verify. Microchips are the best option still. Iris scanning, for example, is much more difficult to manage.
  - **Glenn Blodgett:** Global VetLINK is a system used by veterinarians. I am unsure of the percentage of veterinarians using it to write health certificates and Coggins test, but in that system, there are digital photographs and microchips. In the future, I can see that being used as the main system.
- What are some reasons people don't want microchipping (besides black helicopter) and how do you address these issues?
  - **Mary Babick:** It is too expensive, so we started doing "chip-a-thons" by local veterinarians on a voluntary basis at a price-point. Also, "ship-and-chip", or during scheduled visits such as Coggins test. Veterinarians need to offer it at a lower cost.
  - **James Morehead:** It takes veterinary action. The best way to address this is to reach out to others and there should be veterinarians willing to help, though it may take more scheduling.
  - **Debbie Fuentes:** Some horses never leave the farm, and the owners need to be informed that it would be helpful in natural disasters or health issues.
- Many people want to know why they should do this and how do you get the message out?
  - **Mary Babick:** Town halls and a network of volunteers. Stress the benefits, not the negatives. Also, instill a bit of fear, such as in natural disasters.
  - **Matt Iuliano:** From a breed registry perspective, one of the easiest ways to do this is to make it a condition of registration. Secondly, these chips will continue to come down in price due to technology improvements and increasing value in the chip. A few years ago we decided to give them away and encouraged owners to call the veterinarians to ensure correct application. We could develop a series of short courses at major breeding areas throughout the country educating the consumers on the technology. You need to get the chips in the hands of the professionals early. There is a great deal of trust in the industry and you must rely on the veterinarians and clients to do it right away and potentially as part of the initial neonatal exam.

- Disease traceability is going to require the entire population and it is going to be difficult to relay the information to the individuals.
- Is there enough information out there that is accessible to the horse owner?
    - **Craig Huffhines:** No, and they aren't seeking the information. Information is available but not being sought out. It is not an easy practice unless you are doing it extensively. It is going to have to sell the benefits to get even the serious equine member to engage in it. We can leverage social media to get the information out there.
    - **Mary Babick:** The USHJA produced a lot of educational materials and would welcome the opportunity to share. It is important to share these materials through social media.
  - What are the challenges you see with complying with a national required identification program if it were to be required?
    - **Mary Babick:** Some things are non-negotiable as far as the amount information that is required. There will be a lot of confusion if the standards get too strong. As well as requiring different levels of access so that people feel their information is secure.
    - **Glenn Blodgett:** I feel it is better to approach it from the standpoint of demonstrating participation before you try to shove things down their throat. People don't like the term "mandatory."
    - **Debbie Fuentes:** The national requirement was the part that scared everyone as they have faith in their individual organization as opposed to the national level. There is a stigma that is hard to overcome. It is important to continue to stress the positives and affordability.
    - **Comment from Audience:** At a state level we have noticed and are discouraged by the manufacturing brand tags 985/935. If we try to trace them, for the most part, it is a dead end and we have a poor success rate, and as such, it is very discouraging.
    - **Comment from Audience:** People are more likely to trust the people they work with locally making the voluntary aspect extremely important. It is also important to identify positives and story-telling from large operations. We need to start in the local silo that is more comfortable. I think the natural disaster angle is extremely strong. I think people will be receptive starting small and don't overreach.
  - **Audience:** Are there any other personal stories you share with members to get the point across?
    - **Mary Babick:** I asked one of the past USHJA directors to give me all her horse's information so I could research it. I found out that she ended up buying a dressage horse instead of a jumper which impacted its performance ability. At the USEF Horse of the Year Awards, I was sitting next to the vice president and she said that she has registry papers on four chestnut mares. She did not really know which is which and she said microchipping would be helpful even if her breed registry does not embrace it. The USHJA also found out that "nationalize" is a bad word and people will automatically fight you.
    - **Matt Iuliano:** Our experience is still young and you need to continue to sell the value. The data delivery that is possible is the best representation. Microchips are going to open that up. We give a lot of data for free at the moment. When you are looking at health-related issues and governmental regulations, the difficulty is going

- to be individual privacy issues and concerns and intellectual property. Data has value that is recognized and people are going to resist giving that up. There has to be a mechanism eliminating that barrier. Making it (microchipping) a condition of registration, condition of a show, condition of a race track, etc. eliminates the barrier versus saying it is the right thing to do.
- What I'm hearing is that starting out with a national mandate will end up in failure. AQHA, USHJA and Jockey Club have a different methodology to get the point across. What is the possibility of all of the associations coming together to agree on how to present that information to the industry?
    - **Mary Babick:** I wrote a letter to every affiliate and asked for their interest level in joining in this effort. Eventing and dressage have not responded. Others feel very strongly that they already have horse ID, therefore, they are not interested.
    - **Craig Huffhines:** We are on the front end of this. One thing we do well is collect data and information from shows and competitions. We identify ways to make that more efficient. We are going to need help from AAEP. How do we get the health information record into the system and is that system in a place where we can access it? Coggins test, vaccinations, etc. are going to be important for shows in some format where we can access it and view it.
  - As microchips are being used now, in the future, how do you see it being utilized on the track?
    - **Matt Iuliano:** Identification of horses at the race track falls under the TRPB (Thoroughbred Racing Protective Bureau), which is under the TRA (Thoroughbred Racing Association). Currently, we survey the identification rules in thirty-two (32) states. Most have provisions in the rules on electronic devices. We always start with the regulations and they are in place. From acceptance as a breed registry condition, there are so many advantages throughout the lifetime of the horse. We didn't try to replace anything that goes on at the racetrack. The data attached to the microchip can be served to the customers, and microchip scanners are being distributed to TRBB administrators. Education needs to continue and the initiative needs to continue to push forward. Thus far not much resistance has been met with the lip tattoo. As for how it (microchipping) gets implemented at the racetrack, all we can say is things are all in place and it will be up to individual states to make the decision when to jump.
    - **Glenn Blodgett:** Tattoos are extremely hard to read and not very legible compared to microchips which are very readable. There is more integrity with the microchip. AQHA receives tattoo revenues from the Quarter Horse tattoos at the track. That would be a loss of revenue initially, though the microchip will be a supplement to the tattoo, and may ultimately replace it.
    - **Comment from Audience:** About 30% of the time you can't read the tattoos so this is a good place to start. Animal Identifiers are worried about losing their jobs which I don't think is the intent.
    - **Craig Huffhines:** With out-of-competition drug testing, getting a precise identifier on that horse is critical because the horse is away from the track. Racing Quarter Horses may benefit the most and adapt the quickest to microchip technology. Many breeders are already institutionalizing chips in their protocols.

- **Comment from Audience:** It is such a common-sense situation that breed people have recognized. Would it be beneficial to employ a public relations person on how to get to the industry? If there was a system accessible to the people who need it I think they would use it in abundance. As a health--welfare person, I think chipping is the absolute best way to go.
- **Comment from Audience:** I agree with the comment about having a public relations person and coming up with an idea for the solution. Sometimes having a person outside of the entire scenario and looking at the different organizations to determine how to implement the message and frame the problems is beneficial.
- **Comment from Audience:** The cost to store the data would be roughly \$7,000 per year for two million horses with three photos and to store and host that same data would be about \$16,000 per year.
- **Comment from Audience:** I think there is a commonality in all this related to technology. I drive 45 miles to work each day and 75% of people are on their phones. That is common technology. There should be an app that can read the chip and pull up the information and pictures on the horse.
  - **Glenn Blodgett:** At Texas A&M there is a group working on that exact technology. They have a health certificate out now and are working towards chute or stall side identification that would link to that health certification.

## **EQUINE IDENTIFICATION TECHNOLOGY AND ELECTRONIC HEALTH RECORDS**

### *HORSE IDENTIFICATION – PAST, PRESENT, AND FUTURE*

By Dr. Katie Flynn, Equine Staff Veterinarian, California Department of Food and Agriculture

The need for identification of horses spans back to the 1800s when branding cattle and horses became commonplace for tracing these animals back to specific ranches or owners. In the 1950s the federal government required identification of animals being transported to different states and mandated that cattle be tagged to indicate they were currently vaccinated against Bovine Brucellosis. In the 1980s, the United States Animal Health Association(USAHA) stressed that animals be individually identified for ease of ownership identification, identification in an emergency, and disease outbreak control<sup>8</sup>.

Today there are numerous reasons to identify individual horses including instances of theft, individualized treatments, emergency management, health certifications, veterinary care, traceability, and performance record keeping. Overall consumer confidence is the primary reason that unique horse identification is so important. Consumers want to be assured that the horse in question is indeed the horse they intend it to be.

There are many methods of equine identification each with its own unique advantages and disadvantages. Popular identification techniques include physical descriptions, photographs, lip tattoos, brands, DNA tests, iris scans, and microchips.

One of the most common means of equine identification is a physical description of the horse. The description incorporates the horse's age, breed, sex, coat color, and markings,



whorls, scars, and chestnuts. One disadvantage of a physical description as a unique identifier is the fact that these features may be subjective and differ depending on who is describing the horse. Many times written descriptions are not very detailed and can lead to ambiguity. Also, many horses look alike in which case their written physical descriptions would not be sufficient in telling the individuals apart. For instance, a physical description of a solid black Friesian mare is very common for the breed, and would not identify a specific horse.

Another method currently used to identify horses is branding with either a hot iron or freeze brand technique. The hot iron brand was first used by the Egyptians and is the oldest form of physical identification, and it is an invasive procedure that produces a third-degree skin burn. Freeze branding utilizes an extremely cold iron chilled with liquid nitrogen or dry ice which is applied to the horse to damage the pigment-producing hair cells follicles so that the hair grows back white or not at all. Theoretically freeze branding is less damaging to the hide and more visible than the hot iron brand. Some advantages to branding are that branding is relatively inexpensive and a brand is difficult to alter. However, this technique comes with a few disadvantages including pain, stress, and inherent safety issues associated with the procedure. Brands are also sometimes unsightly and difficult to read, and occasionally are used to identify an owner or registry, not an individual horse.

Since the late 1800s horse owners used lip tattooing as a means of identifying horses. This method was adopted by the Jockey Club in the early 1900s to eliminate cheating. The tattoo is applied inside the upper lip on the horse. In Thoroughbreds and Standardbreds, the tattoo consists of a letter followed by a series of numbers to identify the animal. Some advantages of lip tattooing are that lip tattoos are permanent and difficult to alter. They can also be linked to the horse's registration making it easier to identify the animal. However, the lip tattooing procedure is invasive and has the potential to spread diseases, such as equine infectious anemia and equine piroplasmiasis. As the horse ages, the lip tattoo can fade and become difficult to read. There is also a potential that a lip tattoo can be altered so that they are completely illegible.

A newer noninvasive technology in equine identification, iris scanning was developed in 2000 by Japanese researchers. An infrared camera is used to map the unique pattern of the iris of the eye which is then translated into an alphanumeric code. This code then serves as the horse's identification number. This technology is beneficial since it is highly accurate, noninvasive, and has a low probability of being altered, except with damage to the eye. Unfortunately, the technology is expensive and therefore, is limited access to reading equipment.

DNA typing is another commonly used way of identifying horses. It is frequently used by breed registries for parentage verification of foals. The DNA of each horse contains a unique genetic code that can be measured by gel electrophoresis and computer analysis. Hair samples are collected from the horse for DNA testing. The advantages of DNA as an identification technique are accuracy and limited invasiveness. It is also difficult to alter the results. However, DNA testing is expensive if being done without a breed registry, and involves extensive logistics during sample processing.

It has been proposed that microchipping could be the future of equine identification. As will be discussed in detail throughout this forum, identification through microchipping is highly accurate, dependable, and convenient, with minimal risk of altering identification or disease transmission during implantation. The microchips and readers are expensive, however, and the administration techniques can be considered invasive.

In reviewing the most common equine identification techniques there is no perfect system. However, the importance of the unique identification of horses is clear, and industry members agree that some sort of reliable method is needed to ensure a horse's identity.

## *REGULATORY PERSPECTIVE ON INDIVIDUAL EQUINE IDENTIFICATION*

*DR. ANGELA PELZEL-MCCLUSKEY*

The USDA-APHIS currently employs one (1) equine epidemiologist who is responsible for equine infectious disease management at a national level. Overall, the goal of the veterinary services at USDA-APHIS is to protect the national herd. Infectious disease management is a vital component of this effort. The majority of USDA rules deal with importation of horses from other countries. The common diseases of concern include Equine Infectious Anemia (EIA), Equine Piroplasmiasis (EP), Equine Vesicular Stomatitis (VS), and Contagious Equine Metritis (CEM)<sup>9</sup>. Big government is really small in horse-health issues. Other government agencies involved in horse issues are the DEA and FBI. Equine industry leaders are partners in dealing with disease issues.

In general, the goal of USDA-APHIS is to track down and isolate sources of equine disease outbreaks. Tracebacks are a challenge. To accomplish this they focus on the individual identity of horses to figure out who the horse is and where they have been to identify the source of the infection outbreak and establish control. The longer it takes to identify, quarantine and treat horses, the greater the chance for disease spread. Industry data is used every day in disease tracebacks. The investigation looks at the life of the horse and the people who had a role in the horse's life. By identifying the source USDA can determine the number of horses involved and recommend management practices at the source to mitigate further infection.

Registration data is often very useful in an investigation and the horse may have lost its identity over the years. The most common permanent equine identification used by regulators is the lip tattoo, and about 20-30% of the time the lip tattoo can be linked to the registered name of the horse. With either the registered name or lip tattoo number, regulators can contact breed registries to obtain more information about that animal. However, there is often a lack of permanent identification for the animal which makes it increasingly difficult to identify the horse and ultimately the source of disease outbreaks. Additionally, over the past year many altered lip tattoos were seen during investigations.

To more easily identify animals in question, USDA-APHIS regulators support the use of microchips in horses. This would provide them with a better chance of identifying disease

outbreaks and infected horses. It is their belief that the government should not be involved in storing the database of microchip information. However, the government would need to know where to go to access the information during a disease investigation. Currently microchip manufacturers can provide information on who they distributed a microchip to, but then the regulators hit a dead end. The information should be collected and stored by the industry and connected by a network of communication. Entry of the microchip number into an online system to be able to access information on who registered the microchip would be ideal. Equine microchip databases should be with the industry and stay with the industry. This is a partnership, where there is a comfort level for data sharing. Regulators want the industry partners to have confidence in our use of data in an infectious disease situation, when regulators are working for you to control disease.

*DR. CARL HECKENDORF*

Currently, Colorado utilizes three forms of equine identification documentation, namely the Certificate of Veterinary Inspection (CVI), VS 10-11 (Coggins test) and brand certificates. The CVI includes pertinent information about the equine individual including permanent identification, horse description with age, breed, sex, and color, registration name and number, and other identification information, such as lip tattoo number. The Coggins test is arguably one of the most informative forms of equine identification documentation, but not all states require them. Brands are not individual animal identification, rather they are an ownership identification method. In Colorado, brand inspections are required at change of ownership and before travel outside of the state or more than 75 miles. Brand inspections are limited in that they are not commonly enforced, and the brand need not be unique to each individual horse<sup>10</sup>.

During a disease traceback, Colorado also makes an effort to track equine movement around the state by reviewing the CVI, Coggins, individuals shipping logs and show venues entry and exit records. Although this information is helpful, these investigative efforts are faulted in that many show venues and individuals only document horses who are actively involved with the show and do not include other horses in attendance.

To sway more equine owners to adopt the act of microchipping their horses, Colorado has chosen to capitalize on the emergency management benefits that come with microchipping. Colorado is subject to natural disasters, such as wildfires, and many horses become lost or are turned loose in these instances. When horses are found, owners are faced with the challenge of locating their animals and proving ownership of their horses. Colorado offers horse identification cards that contain the horses name, microchip number, photo, and owner name so that the lost horses can be returned once they verify correct information on the card. As an added incentive, these cards also contain a smart chip that can store health records and horse show information if desired. This helps to streamline not only the emergency management of horses and also equine travel in general.

We need to agree to use 840 microchips, to have the microchip information on the CVIs and have a centralized microchip database. We would be in good shape utilizing all three items.

We are waiting to see how the industry feels about this as the time is right and we must keep going on with the effort.

*DR. DIANE STACY*

The Louisiana Department of Agriculture & Forestry (LDAF) implemented a unique Equine Infectious Anemia (EIA) Program in the early 1970s with the advent of EIA AGID testing. We wanted to make sure that positive horses were permanently identified. Some highlights of this program include guidelines that a horse must test negative for EIA within 12 months of entering the state, within 12 months of an event, and within 6 months of change of ownership. Also, a negative test must be proven annually for all horses in the state. Every positive case of EIA is consigned to euthanasia, and all horses within 200 yards of the infected horse must be subsequently tested<sup>11</sup>.

One major change to the program came in 1994 when Louisiana began requiring a means of animal identification to ensure that horses being tested for EIA were correctly identified. This amendment stated that permanent equine identification include either a microchip, lip tattoo, or hot/freeze brand. Since instituting these permanent identification requirements, positive EIA cases have drastically declined (less than 10 cases/yr). Several years ago, horses were turned loose by owners who no longer wanted them. These horses were eventually captured and tested for EIA; a spike in EIA cases was seen.

Louisiana had reasons for requiring permanent identification of equines. Other livestock programs require animal identification, written identification and description of horses is often insufficient and inconsistent. In addition, poor descriptions without identified marking caused abuses of the program and legal problems, for better traceability in disease outbreak cases, for theft deterrent and easier identification of stolen horses, and for reunification of lost and rescued horses in natural disasters.

To encourage the use of microchips as the desired form of permanent identification, the Louisiana Department of Agriculture and Forestry provided microchips to accredited veterinarians free of charge and offered microchip readers for sale at a reduced price. They also offered microchip services at local equine events (chip-a-thons) for a small fee. All microchips were recorded in a searchable database maintained by LDAF.

The LDAF's EIA database is an in-house document imaging system in which the negative EIA tests are manually scanned in; there are searchable fields catalogued by owner name, zip code, and horse permanent identification number (microchip number, lip tattoo number, or brand). The system allows a search of the EIA history of the horse which is medical information. This information is state record and is therefore subject to disclosure. Although this system is very beneficial to the department, it is a dated technology requiring manual data input and can lead to complications in data access.

Despite the program's resounding success, there were some early drawbacks with the integration of microchipping. Originally, LDAF used 9-digit microchip readers which were problematic with the introduction of 15-digit code chips. Veterinarians had to update their readers. Also, not all states accepted microchips as a form of identification which led to problems when traveling. The horse racing industry was slow to accept the practice of microchipping claiming that the microchip affected performance. The racing industry was granted a waiver to the microchipping requirement until the permanent tattoo was applied. This exemption was discontinued in 2017.

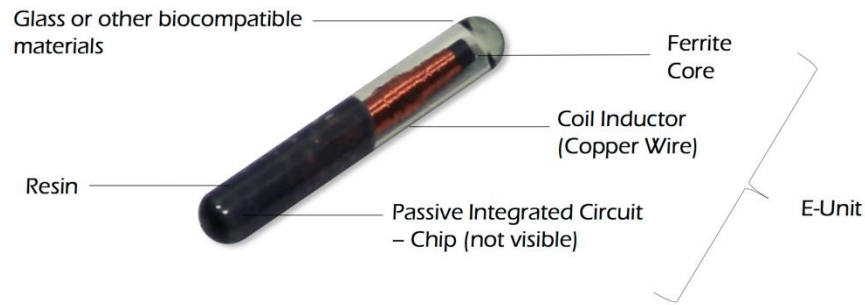
Today, the state is keeping up with microchip technology and has eliminated any reader incompatibility issues. Current difficulties that the state of Louisiana is facing include continuing to work with an outdated and labor intensive database, and dealing with the speculation of possible mandate for 840 microchips. Currently, the state allows several types of chips, including the 900 series chips. The database developer is no longer with the agency, therefore, there is no IT support of the database at this time. Louisiana is evaluating the cost-benefit for moving to a new database.

### *EQUINE MICROCHIPS 101*

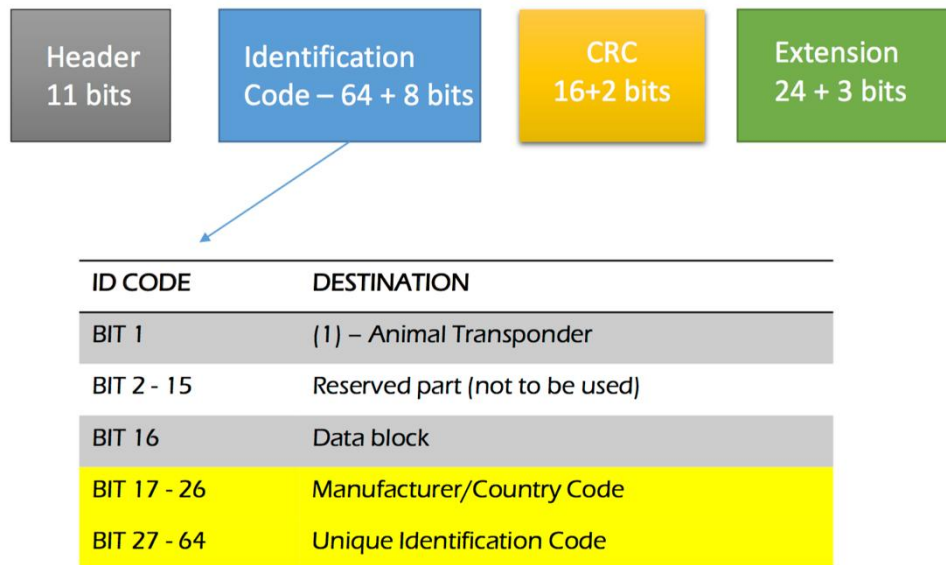
Dr. Marta Luz LaColla, Veterinarian, Afflex USA Inc

Equine microchips are Radio Frequency Identification Devices (RFID) that are not active until stimulated by a microchip reader. The microchip reader transmits a low frequency radio wave that activates the microchip. The microchip then responds with a radio frequency signal that is detected by the reader. This radio frequency is then translated into information by the reader. This two-way communication is classified as Full Duplex (FDX) communication which is different from the Half Duplex (HDX), a one-way communication that is found commonly in cattle ID tags. The radio frequencies utilized by the microchips in horses are low frequency, between 120-140 kHz. This contrasts with RFID frequencies used on some livestock tags that are ultra-high frequency at about 1 GHz.

Microchips used in horses come in various sizes and materials but share a common appearance. The structure of the microchip includes the E-Unit, or "intelligent" portion of the microchip that consists of a passive integrated circuit, a coil inductor, and a Ferrite core. This component transmits the radio frequency signal which is received and read by a microchip reader. The E-Unit is housed within resin and a biocompatible material such as glass or polypropylene. Most of the microchips used in the horse range in length from 8-13 mm and width of 1.4-2.1 mm. The microchips are typically administered using a 12 to 15-gauge needle, depending on the specifications of the microchip. A detailed view of a standard equine microchip is included below<sup>12</sup>.



To assure quality in manufacturing of microchips, the International Organization for Standardization (ISO) and the International Committee for Animal Recording (ICAR) developed a set of standards for microchips to be used in animals. To be marketed as an ICAR/ISO compliant microchip, it must meet ISO Standards 11784 and 11785. ISO 11784 references the microchip’s unique numeric 15-digit code, while ISO 11785 specifies how the transponder activates and transmits information. The unique code structure consists of a header that is used to assist the reader in finding the microchip, an identification code, that includes the unique 15-digit code for the individual animal, and a series of cyclic checks followed by an extension portion that can include other microchip features, such as biothermal data or data storage. This code structure is illustrated below.



The identification code contains the manufacturer or country code (3-digits) followed by a unique identification code (12-digits). This results in a 15-digit code that will be relayed to the reader and is used for the unique horse microchip number. Each country has a country code, which is 840 in the US. If the microchip is not correlated with a specific country code, a manufacturing code beginning with 9 is used. The 900 code is a designated shared code, and 999 is used for research or special use. Shared 900 manufacturing code standards are not encouraged for use in horses since they do not associate with a specific country or distributor.

The 12-digit identification code is guaranteed to be unique in ISO-certified chips and can therefore be verified as a unique identification code for the horse it is assigned. ICAR compliance also requires that microchips can be read by any ISO reader at 134.2 kHz ensuring that information is standardized and universal. To manufacture ISO standardized microchips, manufacturers must comply with the ICAR Certification of Conformance. This requires that they test the microchips at an ICAR-approved testing center and have signed the Code of Conduct to respect ISO regulations. It is important to note that not all microchip manufacturers are ICAR-certified, and not required to meet ISO standards, therefore, their conformance with ISO Standards 11784 and 11785 was not tested at an ICAR approved and accredited test center. Additionally, ICAR will not be able to support the uniqueness of the ID code embedded in the microchip.

According to a 2015 USDA Baseline Reference of Equine Health and Management in the US Survey that was conducted in twenty-eight (28) states and included 71.6% of the equine population, only 3.4% of equine operations containing 1.6% of the equine population use microchips as an identification method. Although this population is small today, large equine organizations are beginning to propose using microchips as a popular form of permanent equine identification. With the growing use of microchips in horses, there are many decisions to be made regarding standardization of the practice.

One topic up for debate is the use of country coded or manufacturing coded microchips. The use of an 840-coded microchip (country coded) would provide some assistance in equine traceability, since these microchips can be traced to the United States. These microchips require implantation with USDA devices that are ICAR-certified. They clearly define the country of origin and require a premise ID to be submitted at time of implantation. Although the premise ID requirement is very beneficial from a traceability standpoint, the concept acquired some pushback in the equine industry since many horse owners are reluctant to share personal information such as their physical address. There may be a way to work around this by assigning a breed registry or racetrack as the assigned premise eliminating the request for the horse owner's address. The use of microchips assigned with a manufacturing code beginning with a "9" does not require a premise ID. These microchips trace back to a specific manufacturer instead of the premise where it was administered. Therefore, the equine industry would be required to hold microchip registration data for each microchip. The use of a 900-shared code is not encouraged since it does not have a traceable prefix, and is shared between manufacturers and distributors. ICAR can identify the manufacturer of the chip, but traceability is limited since the microchip cannot be traced to a distributor, country, or premise.

Given the permanence of microchips once implanted into a horse, correct implantation technique is important. Currently, guidelines for microchip implantation are intended for administration by veterinarians or in accordance with state laws. In most cases, sedation is not required if adequate time is spent with the horse. It is important to scan the horse first to identify if a microchip has already been implanted. A universal reader should be used that can identify various frequencies, and the user should be familiar with the reading zone of the reader. The horse should be scanned all along its neck from poll to withers in a parallel and perpendicular

motion. If no microchip is detected, the technician can move forward with the microchip administration. Correct microchip administration technique is outlined as follows:

1. Scan the horse thoroughly to ensure that horse has not been previously microchipped.
2. Scan microchip inside packaging to ensure correct code.
3. Identify correct placement in the nuchal ligament on the left side of the neck, halfway between the poll and withers, and about 1.5 – 2 inches below the mane line.
4. Aseptically prepare implantation site.
5. Remove administration needle from packaging and remove needle cap with bevel facing up
6. Insert needle perpendicularly to the horse as an intramuscular injection
7. Once completely inserted, depress plunger and remove the needle
8. Scan the horse again to ensure correct microchip placement

Some minor health concerns are possible following microchip administration including pain or inflammation at the implantation site and migration of the microchip. These health factors have been investigated in several research projects. In 2007, Gerber et. al. investigated the inflammatory and pain response associated with microchip administration. Skin temperature, swelling area, and pressure threshold were measured for two (2) weeks following implantation of a microchip. Results of the study indicated swelling and sensitivity were apparent for up to three (3) days following microchip implantation<sup>13</sup>. Another study by Gerber et. al. investigated migration probabilities of microchips at 1, 2, 4, and 6 months after implantation. Radiographs measuring the distance between the most cranial point of the fourth cervical vertebrae and the microchip indicated that the microchips did not migrate<sup>13</sup>. A similar study by Stein et. al. investigated the incidence of microchip migration in horses, donkeys, and mules over a four-year period. There was no evidence of microchip migration at the conclusion of the study<sup>14</sup>. Therefore, investigations indicate that microchip administration yields minor pain and inflammation at the injection site and microchip migration should be very minimal following the correct implantation in a horse.

An additional feature available in some microchips is temperature-sensing technology. These biothermal microchips are ISO 11784 and 11785 compliant identification devices can also report an animal's temperature whenever the device is scanned. The original technology yielded inconsistent results so it was recalibrated to improve accuracy. The current technology is calibrated to an ideal temperature of 38°C to give more consistent readings. A study by Langer and Feitz evaluated the reliability of microchip temperature readings when measured every 30 seconds. Results indicated that the accuracy was within 0.07 +/- 0.12°C<sup>15</sup>. Similar studies performed in foals and performance horses yielded similar results. Readings very accurately followed trends of temperature changes like other methods. The biothermal chips can be scanned frequently with ease and is a valuable option as a monitoring tool for equine health. Since the biothermal chips can be scanned frequently with ease it is a valuable option as a monitoring tool for equine health.

The following questions were posed to Marta Luz LaColla following her presentation:



- What is the reading distance for the chip?
  - It varies from as far as 10 cm to almost touching the chip though it depends on the quality of chips and readers.
- Do you see the chip technology moving towards RFID tags used in cattle where the tag can be read through a chute?
  - We could though a larger microchip with a larger antenna would be needed.
- There are rumors that after being implanted the ID number can be altered. Is that true?
  - In the case of data or advanced chips if ICAR-certified, it will not happen, but it is possible in others. In the ICAR- certified chip, the ID portion of the microchip is locked.

*PANEL DISCUSSION: FUTURE OF MICROCHIPPING IN THE UNITED STATES*

- If it was decided to mandate 840 chips, what would be the recommendation for horses with other types of chips? Should we double chip them?
  - **Carl Heckendorf:** Do not double chip the horse. It's important to have the national databases of both US and other countries. Grandfather in the existing chip instead.
- From the horse industry perspective, what are the advantages and disadvantages of the 840 chip?
  - **Angela Pelzel-McCluskey:** Any unique 15-digit number works if it is clear who has the information. It does not need to be an 840 chip.
  - **Carl Heckendorf:** If we didn't have the country of origin code, it will be harder to find mistakes. The equine industry should follow the cattle industry and implement the 840 chip.
- Do you think one of the problems is the merging of the IT industry with the equine industry? Will the industry be able to bring in data specialists who understand how to manipulate the data? Is the advancement of technology a challenge in this scenario?
  - **Angela Pelzel-McCluskey:** State and federal entities have a very hard time keeping up with technology. It is very difficult to get funding and upgrades. The industry is in a better situation to be able to stay current more so than the state/federal departments
  - **Diane Stacy:** Our database is not going away. We can no longer print the brand book because of the technology. We would need to evaluate the cost benefit ratio if we were to consider expanding. We will probably never upgrade due to the cost. Our database is invaluable during emergency scenarios, however, we would be willing to upgrade if the proper funding was provided
  - **Carl Heckendorf:** Research needs to be done on private companies, because there are a lot of underqualified people for the job. Government "plugs along" although it may not be as efficient, so it may be an advantage.
- Unless it's a mandatory requirement backyard horses will not be microchipped. So what is your strategy on getting compliance for backyard horses?
  - **Angela Pelzel-McCluskey:** This will be a slow process but aim to make it so that microchipping is required to do things in the industry. For example, you need a

chip if you want to take your horse to a show. It will eventually become a standard and accepted process. You as industry leaders are the initiators to improve the industry.

- **Carl Heckendorf:** I agree. Not every backyard horse needs to be chipped. The focus should be on those who travel.
- **Diane Stacy:** If Louisiana can mandate it, then any state should be able to. At first there was pushback but now it's common place and accepted.
- What is your position on integrating databases with law and fire authority databases?
  - **Angela Pelzel-McCluskey:** I think it's a great idea. There's nothing that prohibits using some information that's already there.
- What are you doing at the state level for data storage?
  - **From Audience:** USAHerds is a database management system that we use in Colorado. It is managed as state data. In an emergency it would be harder to find information quickly. We can follow traveling animals and their health certificate fairly easily with CVIs.
  - **From Audience:** Core One or SCS are inputting every Coggins test and that can be made easier with chipping. It is easy to find the history of herds with just scanning chips. One problem is that tribal grounds have become dumping grounds for unwanted horses. Microchipping can identify and distinguish unwanted versus tribe horses.
- How do you regulate the horses that don't travel in Louisiana?
  - **Diane Stacy:** We used to send people out door to door. We held chip-a-thons where horses congregate to try to catch everyone. Every horse must be tested before they are sold.
- Do you still see it as success if you don't have 100% compliance?
  - **Diane Stacy:** Absolutely. We are still looking for our untested population. We round up feral "trespass" horses, get them tested and microchipped, and turn them over to rescue groups.
  - **Angela Pelzel-McCluskey:** Data needs are small and we only need a minimum amount of data to be a success. We don't need 100% compliance, but over time this will improve and participation will improve.
- What level of compliance is "success"?
  - **From Audience:** Compliance success is 100% for USHJA,
  - **From Audience:** Success is not the same as progress so interim goals are important.
  - **From Audience:** One measurement of success would be the ability to find an individual that the microchip was issued to and that isn't the case right now.
- Who should insert the microchip? And who should be allowed to report that chip?
  - **Diane Stacy:** In Louisiana, the Board of Veterinary Medicine says it is to be performed by a veterinarian or a technician under the supervision of a veterinarian for small animals for sure. It is believed large animals are the same.
  - **Angela Pelzel-McCluskey:** We generally follow the Code of Veterinary Conduct for each state. We could possibly implement official identifiers or microchip applicators.

- **Marta LaColla:** The veterinarian administers the chip in New York. That is not the case in Texas and California. However, it should be at least under the supervision of veterinarian or after training from a veterinarian.
- **From Audience:** By legal definitions in the state, it may be different for “owned animals” or “under the care of”. Importance is not so much who inserts it, but that it is correctly registered.
- **Angela Pelzel-McCluskey:** That’s the problem today, incomplete or incorrect registrations of chips that leads to dead ends in searches. The most important part is that the information gets where it needs to go.
- **Carl Heckendorf:** That’s why the 840 tags are important. It is a start.
- What about the individual registration databases that are out there today? Is there a network between them?
  - **Angela Pelzel-McCluskey:** The databases out there currently do not interact and are difficult to update, search, etc. There is a way to start to track this information but it is difficult to find the person/database that houses that information.
  - **From Audience:** It appears that there are two delineations: providing each horse with an ID and what to do with that information. Should each plan be addressed individually to figure out the overall goal?
  - **From Audience:** Often, multiple organizations have the chip information. The difficult part is that the records are not updated. It is important to have cross verification. The technology to network is out there, but it will take effort.

*ELECTRONIC HEALTH RECORDS – OWNER BENEFITS OF LINKING ELECTRONIC ID*  
Mr. Craig Huffhines, Executive Vice President, American Quarter Horse Association

There is a large amount of involvement in the Quarter Horse industry with an estimated 818,000 Quarter Horse owners involved in everything from jumping, racing, rodeo, and barrel racing. The Quarter Horse has a strong presence in every part of the equine industry. The American Quarter Horse Association (AQHA) is very interested in both tracking and celebrating the records of these horses in various disciplines<sup>16</sup>.

About 12% of AQHA registrations are tied to the Quarter Horse racing industry. This amounts to \$45,947,068 gross sales from 3,241 yearlings sold each year for the purpose of racing. On the race track, there are 14,787 Quarter Horse starters annually, racing in a total of 61,677 starts. This brings a total purse of \$127,140,633 and a total betting handle of \$297,533,160. Therefore, racing Quarter Horses contribute a significant amount to the value of the Quarter Horse breed.

Performance horses also largely contribute to the AQHA industry with the top thirteen (13) AQHA performance horse sales grossing \$26,860,750, with an average sale price of \$17,185. There are also 2,860 annual shows and events tied to the performance horse industry drawing 952,986 show entries. Given that these horses, along with Quarter Horses in other showing disciplines, are the animals that travel and congregate the most, they are the most

susceptible to an equine disease outbreak. These horses should be the focus of the microchipping effort to significantly impact disease outbreak management.

For example, the 2011 NCHA Western National Championship EHV-1 outbreak in Ogden, Utah had a tremendous impact on the performance horse industry. The outbreak impacted nineteen (19) states, resulting in 2106 primary, secondary, and tertiary exposures, and thirteen (13) horses euthanized. Ultimately, the outbreak came at a large cost with 5800 state and federal hours dedicated to the investigation and an estimated \$1.5-2.5 million in cancelled show revenue loss. The true economic impact remains unknown, but effective equine disease outbreak management is critical in these show and event industries. This need is also apparent when considering the regularity of other reported disease outbreaks. The Equine Disease Communication Center (EDCC) reported 267 disease outbreaks in 2016, listing as follows:

- West Nile Virus: 113 cases in 24 states
- Eastern Equine Encephalitis: 76 cases in 11 states
- Strangles: 23 cases in 1 state
- Equine Herpes Virus: 22 cases in 15 states
- Equine Infectious Anemia: 10 cases in 6 states
- Rabies: 4 cases
- Equine Influenza: 2 cases

With these cases, horse owners acknowledge the inherent risk of disease transmission at shows and events, but believe that it is the job of the show and industry officials to make decisions related to controlling biosecurity at these events.

When considering the integration of microchipping in the equine industry, it is important to consider the ways in which other industries utilize similar technologies. For example, many supply chains utilize RFID technology to create traceability of product within the industry. A similar technique could be applied to increase the traceability of movement of horses within the US, leading to better control of disease outbreaks.

One example of traceability for safety reasons comes from the food industry. Consumers expect that their food will be safe and, in the event of a contamination or problem, traceability efforts are in place to track the problem to the source of the product. This boosts consumer confidence that their food will be safe to consume. Large retail stores, such as Macy's are implementing RFID technology to improve the traceability of their products. Within the near future, Macy's will ensure that 100% of their products are implemented with an RFID tag to aid in inventory and distribution control, sales tracking, and theft recording. This technology is also useful for tracking individuals' at large events such as races and conventions. With each attendee wearing an RFID tag, it is possible to track attendance, finish times, and consumer traffic flow. Similarly, libraries are using this technology for books on loan, and large casinos and hotels use RFID chips to track laundry and return it to specific employees.

When considering how to incorporate these technologies into the equine industry, it is important to consider how to best link all the information together. There is the potential to link

horse identity, show records, health certificates, travel itinerary, etcetera, but the challenge will be deciding who will handle this information and who will have access to it. Ultimately, the industry knows that this technology can be helpful, but they are unsure where or how. Industry leaders need to present consumers with the options and benefits to gain consumer confidence. As Steve Jobs says, “People don’t know what they want until you show it to them.”

## **EQUINE TRACEABILITY**

### *TRACEABILITY OF EQUINE – HEALTH PERSPECTIVE*

Dr. Carl Heckendorf, Veterinarian, Colorado Department of Agriculture

Microchipping horses is important to enable the traceability of horses and diseases. Currently, the Colorado Department of Agriculture is dealing with multiple diseases from a regulatory standpoint. These diseases include: Equine Infectious Anemia (EIA), Equine Herpesvirus Myeloencephalopathy (EHM), Contagious Equine Metritis (CEM), Piroplasmiasis, and Equine Viral Arteritis (EVA). If horses have microchips, their movement and other horses that they may have come into contact with, can easily be identified. A website that is very useful to track information on disease outbreaks is known as the Equine Disease Communication Center<sup>17</sup>.

Microchips are also important from an emergency preparedness standpoint. This is one of the biggest issues in states that have issues with wildfires or hurricanes. Overall the Departments of Agriculture desperately needs a strong form of identification. In the case of a wildfire, horses are rounded up and usually sent to the local fairgrounds. These grounds can house anywhere from 200-400 horses. Inspectors then go through and identify all the physical markings of all the horses but without a microchip, this information can be very variable and potentially not reliable enough to identify an individual’s horse. If a horse has a microchip, then there is no debate over who that horse is and who it belongs to.

Eight years ago, the department tested a system using a smart card that was tied to each horse individually. This smart card contained a picture of the horse and a chip that could be inserted into a computer. In association with that card, the horse had a microchip and through that information one could pull up everything about that individual horse. They put on a chipping event that charged \$10 per horse for chipping to occur. This program was a success and showed the true value in implementing a microchip requirement for horses to be identified.

Microchips would also be extremely helpful to track the movement of an individual horse. Currently the only movement documentation that is available are a Certificate of Veterinary Inspection (CVI), which is poorly enforced at borders, Coggins test paperwork, shipping logs, and venue entry/exit logs. This data can be scattered. If each was associated with a microchip, it would be a lot easier to trace the movement of that animal. The main challenges with traceability are the lack of documentation, illegible documentation, limited electronic documentation, and the lack of requirements for documentation at equine events.

Moving forward, the best solution is to determine a permanent method for individual identification. This can be a tattoo, a unique brand, or a microchip. This permanent identification needs to be required for a Coggins test and CVI. There also needs to be a centralized database where all this information is located so it can be easily accessible when needed.

### *TRACEABILITY OF EQUINE MICROCHIPS*

Dr. Angela Pelzel-McCluskey, Equine Epidemiologist, USDA, APHIS, VS,

There are multiple different people and scenarios that are using microchips for traceability purposes. Professionals that trace disease outbreaks rely heavily on microchip data, and states that have chips tied to EIA programs use microchips on a regular basis. When a horse is lost, stolen, or found, microchips are usually the only form of true identification and can be the only link between that horse and its owners. Sometimes border control comes across horses that are strays or being smuggled into the country and it is their responsibility to try to trace who that horse belongs to regarding the actual owner and the country of residence. For a traceback to be considered successful, contact has to be made with an entity that has information about that horse that is connected through its microchip. The key is how long it takes to get to that main entity. The following are several case studies with varying levels of success or failure even with the presence of a microchip<sup>18</sup>.

In case study number one, a load of ten (10) horses were intercepted while being smuggled into Texas from Mexico. All of the horses tested positive for equine piroplasmiasis and were in poor condition. The breed of the horse was also unidentifiable. All were found to contain microchips. The microchips had 982 and 985 prefixes and that led to the manufacturer name and contact phone number. The manufacturer provided the name and contact phone number for the distributor that was in Europe. After contacting the distributor, it was found that the microchips were sold to ANCCE, which is a breed registry for Spanish PEs (Pura Raza Espanola). While trying to contact the breed registry, the website revealed an online microchip lookup tool. Each of the animals were then found online with information from their pedigrees and history. This was a successful traceback. This ultimately led to the identification of a large smuggling ring that focused on illegal importation of Spanish PEs from Spain. These horses are brought by boat to Mexico and are then transferred through Texas and ultimately end up in California. More horses were then found in California and also tested positive for equine piroplasmiasis. The overall time of this trace back was four (4) days.

The next case study was a stray horse that was intercepted at the Mexican border. It tested negative for all diseases of interest. It had a microchip and there was an attempt to identify ownership. Using the microchip number the manufacturer was contacted to determine the distributor. The problem occurred when contacting the distributor. First, the distributor asked what size the chip was, which obviously was not able to be determined, because it was in a live horse. The distributor then claimed that that microchip number was supposed to be in a fish. It was then determined that the microchip was so old that it was in a database that was located on an old IBM computer that only one person in the company knew how to use. When that

database was finally researched, there were no records found for that number. This was an unsuccessful traceback that occurred even when a microchip was present and it took two (2) weeks to reach that dead end.

The third case study was a cluster of seventeen (17) equine piroplasmosis bushtrack Quarter Horse racehorses in Tennessee. All of the horses had lip tattoos, and a few of them had microchips. They had all lost their registered AQHA names and papers. The fastest method of trace back was lip tattoos. From the lip tattoos that could be read, AQHA was contacted and identification was complete in 1 - 3 hours. The problem was that some horses' lip tattoos were intentionally altered to change the identity of the horse. Then the microchips were scanned and the manufacturers were contacted. For one of the horses, the manufacturer sold the microchip to a veterinary supply company. The veterinary supply company had gone out of business and was bought by another company. Ultimately there were no records of the old supply company to be able to track this microchip number. They also found out that the new company doesn't keep records of who they sell the microchips to. This resulted in a dead end for this microchip and any future microchip that goes through this veterinary supply company. This dead end took three (3) days. For another horse in that group, they contacted the manufacturer and then the distributor. The distributor sold it to a veterinary practice. The veterinary practice keeps only paper records so they agreed to look through their records for that microchip number. This was in a state with microchips required for an EIA program. The state was contacted and there was no record of that microchip number and it was noted that the veterinarian had a history of not sending in his paperwork. The veterinarian stated he could not find any records with that microchip number. Overall, this resulted in a dead end and took one (1) week to reach the dead end. The idea of sticking a microchip in a horse and not having a way to search for that microchip is very problematic.

Overall, there are multiple parties responsible for keeping records in the life of an equine microchip. If there is a failure to keep or transfer these records at any single point in the life of the microchip, it will result in a dead end. The most accurate results and most successful cases have come from a breed organization being responsible and maintaining the microchip records. Even though having to go back to the manufacturer for information and tracing step-by-step can be successful, it is very time consuming and the industry and personnel would benefit from having an easier microchip search tool that could provide the contact information for the final entity that retains the data on that microchip.

The final case study presented is an ongoing case study that is due to the lack of a microchip. A six-year-old Thoroughbred brown/bay mare that was a polo mare presented with a group of horses from Mexico at the Mexico-United States border for entry into the United States. She tested high positive for glanders. She had no clinical signs but was having a cross-reaction to the glanders test. The issue was that on the Mexican side, the owners and handlers insisted that she was a US-origin mare returning to the US. They even presented the health certificate that she supposedly had to move from California in August 2016. There were twenty-two (22) horses on that health certificate, but none of them matched the markings of that mare indicating that she was not on that load. Currently, there is a debate with the Mexican government as to where this horse originated from. The problem is, as of right now, we do not know which load,

if any, she was in. There is a lip tattoo and a registered name for her. She was born in the United States in 2010, but beyond that there is no information as to where she has been and what she has been doing. In the end, it is not extremely important because this mare does not clinically have glanders, but if this was a more extreme case, it could be detrimental. It is resulting in two countries pointing fingers at each other and arguing about who should actually be concerned about a possible glanders outbreak. This scenario is more detrimental to the equine industry than anything. If there are issues with a traceback on imports/exports, it may negatively impact your ability to import/export horses to/from that country. If we had a microchip in this horse and it had been included in the export documentation, there would no longer be an issue. If there was an ability to search the export documentation, it would not have mattered that they did not have the correct health certificate. We could have searched her history and found her. If we do not find a way to address these short falls, it is going to end up costing the industry more money.

The following questions resulted from this presentation:

- Have you given these types of presentations to the industry and grass root owners to show the value of this? I think this type of presentation could be very powerful.
  - **Angela Pelzel-McCluskey:** You are the guinea pigs for this. The United States Animal Health Association has seen this. I am going to continue to write this stuff down and have been told to try to publish this information to relay it to the public. I am hoping to continue to try to do these presentations and give the information to journals to present to help get rid of the misconceptions and show the minimal information that is needed on these microchips.
  - **Katie Flynn:** A lot of times industry just asks for presentations on how many were infected versus how we did our job. Most folks don't think it is all that difficult to trace a horse. And we don't know how to "sell" the challenges of our jobs when it comes to traceability. We need your help. It goes back to the fact that we are government officials and people don't typically want to hear from us but would be willing to hear it from you, the people they trust.
- **Comment from Audience:** The one place I think people most care about the individual horse is at the time they are born and bred. By focusing some of our efforts to promote ID at the time the horse is born and bred, it is going to have more stickiness. Once these horses get older it becomes harder. I think that's where people have the most at stake in making sure the horse has more ID. It is an investment into the horse's welfare.
- **Comment from Audience:** Angela, you mentioned that some cases have microchips, those all are registered somewhere. Right?
  - **Angela Pelzel-McCluskey:** Yes, but where they are registered is the challenge as to where to look. If we don't go to 840 tags, we really need that microchip lookup tool.
  - **Comment from Audience:** If it is 840, it should be in USDA, right?
    - **Angela Pelzel-McCluskey:** Supposedly, but it is a matter of going back and forth. Change of ownership and movement of the animal are not being recorded.
    - People want to know the history of their horse, so a lookup tool would be beneficial to everyone including owners. Rescue organizations really want to



know the backgrounds of the individual horses to help their welfare moving forward.

- If permanent IDs of these animals are not being recorded properly, the industry does not have control over the USDA's system, especially at the Mexican border. Who needs to be approached to respond? Is it purely a technology issue or a cultural issue? Other species don't have this problem.
  - **Angela Pelzel-McCluskey:** A lot of species don't go back and forth in their movements like horses. We have been told that because we do not have a US requirement or a system set up in the US, thus we cannot require that from other countries. If we set up a system in the US, then they can't use that as an excuse, especially at southern US borders. Adding a microchip requirement on the US side is really going to help. Currently, the only requirement for microchips are for horses going to slaughter in Mexico. That's backwards. I think the problem is a history of not recording horses at the border properly. I think it is changing for import/export. There is an attempt to be better at recording. Our exports also have a lot of complaints because of lack of traceability from our end. There should be no question about filling in the permanent ID on the export, and then from the federal side, it is our responsibility to make that searchable.
- The USEF Horse Recording Department managing director says that for traceability, they can go back for fifteen (15) years with a microchip repository. USHJA: 60% of horses are imported from Europe, can her (Summer Stoffel) database help with merging databases?
  - **Summer Stoffel:** We are currently in the process of merging databases with European databases. It would be possible to track them back to Europe potentially.

## MICROCHIP DATA STORAGE SYSTEMS

### *DATABASE MANAGEMENT IN SMALL ANIMALS*

Mr. Kenneth Klaus, General Manager, HomeAgain, Merck Animal Health

From a small animal standpoint, the number one cause of death for pets is getting lost. One third of pets get lost every year which amounts to 8-10 million animals. Without identification, only 10% of these pets return home. Therefore, only 20% of dogs and 2% of cats are reunited with their owners after being lost. As a result 4 million lost pets must be euthanized if they are not reunited with their owners or adopted<sup>19</sup>. The top eight reasons that pets become lost are that they:

- Slip out of their collar
- Become frightened during storms or fireworks and flee
- Separate from owners during natural disasters
- Find an escape through open doors or windows
- Chase after wildlife
- Become separated during travel
- Are stolen

One way to ensure that pets have a better chance of being reunited with their owners is to ensure the animal is microchipped and that the microchip is registered with a database such as HomeAgain. Microchips serve as a form of permanent identification of pets which is a better option than collars and tags since these may fall off and prove ineffective. However, only 10% of pets are microchipped, and only 50% of those microchips are registered to a database. HomeAgain Pet Recovery is attempting to improve the success rate of pet recovery. Today, they are the US's leading lost pet recovery service. They have reunited over 1 million pets with their owners and have over 10 million registered microchipped pets in their database. This amounts to over 14,000 successful pet recoveries each month. HomeAgain's pet recovery process begins when pet owners microchip their pets. The microchip is then registered with owner information. When the pet goes missing, a recovery network is mobilized, and when a veterinarian or rescue site recovers the pet, they scan its microchip, and the owner is notified and reunited with their pet.

HomeAgain uses a biocompatible, 134 kHz, ISO-compliant microchip with a 15-digit numeric code. The microchip comes in two sizes and can be administered using either a 15-gauge or 12 gauge needle. In the US, these microchips are most commonly inserted in the mid-scapular region of the animal. Occasionally, pets will have a microchip implanted in the side of the neck, so it is important to scan both locations when searching for a microchip.

HomeAgain partners with the American Animal Hospital Association (AAHA) to offer online courses and microchip lookup tools to veterinary clinics and animal rescue centers. A clinic's participation in the program includes enrollment in a free microchip replenishment program and the AVImark veterinary practice management system. They also provide a plethora of services to pet owners who register their pet with HomeAgain. Customers receive access to the Lost Pet Recovery Network, 24/7 Lost Pet Specialists, a 24/7 Emergency Medical Hotline, Rapid Lost Pet Alert System, and travel assistance for lost pets.

HomeAgain stresses the importance of enrolling and maintaining microchipped pets in their database. An unregistered microchip does very little to help reunite lost pets so it is vital that contact information be linked to the pet's microchip. HomeAgain offers several enrollment options including automatic enrollment through AVImark, online enrollment, or paper enrollment. Once enrolled, it is important to keep the pet owner's contact information updated in the event of a phone number change, new email address, or relocation to a new address.

#### *AAHA MODEL – A MICROCHIP SEARCH TOOL*

Ms. Katherine Wessels, Senior Manager of Communications, American Animal Hospital Association

The American Animal Hospital Association (AAHA) was created in 1993 and serves as a companion animal veterinary hospital accreditation service. Currently, 3,600 hospitals are accredited through AAHA. Animal hospitals are evaluated every three (3) years based on a set of standards of accreditation that evolves benchmarks of excellence and both mandatory and optional standards<sup>20</sup>.

In addition to their accreditation services, AAHA also hosts the AAHA Universal Pet Microchip Lookup Tool. This tool was created in 2009 as a collaboration between AAHA and Schering Plough after identifying a need for a universal hub of microchip registry information. Prior to the Lookup Tool there was very little collaboration between microchip companies, making it difficult to identify registration information for individual microchips. It was not feasible to create a single registry for all microchips so an online software search tool was created by Schering Plough to identify where a microchip was registered and manufactured. AAHA agreed to serve as a neutral third party responsible for hosting the tool.

The AAHA Universal Pet Microchip Lookup Tool allows users to enter a microchip number and receive information on where a chip is registered and manufactured. With this information, the user can then contact the registry and/or manufacturer directly to obtain more information. This tool is commonly used by veterinarians, animal shelters, and humane organizations. For a microchip registry to be a participating pet recovery service on the search tool, they are required to adhere to specific requirements identified in a signed agreement. Once accepted, their registry will be included in the search tool database.

The following questions were posed to Katherine Wessels following her presentation:

- **Comment from Audience:** We can see the link between our silos of registries being synonymous with the different manufactures that are included in the AAHA. So, this can be a comparable model for the breed registries.
- Do you have records of how often registration is updated by new owners in change of ownership?
  - The transfer of ownership process is close to 10-20,000 from shelters and rescues. We have proof of new ownership and close regulation of acknowledgement of change of ownership.
- Given that manufacturing registration is voluntary, have the breed specific registries joined in?
  - Not at this time.
- When the program was developed, how was it funded and what was the starting point?
  - It was started at no charge, because it was created for all competitors to compete in. Once it was developed and AAHA took it over, there was a slow and gradual buy in.
- Can other animals be registered?
  - Yes, we have about 10,000 horses in the system.
- This is a database that pulls from other databases?
  - No, it is more of a web service that searches other databases.
- If it could be replicated in the horse industry, what resources need to be implemented by a national resource, such as AAEP?
  - The resources are mainly maintenance at this point. We have one IT person and a person that handles marketing and new enrollment. The IT side would be the greatest need.

- Can you expand on the 2008 creation and how you brought people together? What was the incentive to join?
  - The point was to get acceptance that microchipping was a standard of care. There were companies making chips, but it was difficult for vets to buy in without certain regulations, such as a database, standard microchip, and standard frequency. It was a bit of a slow buy in.
- Who pays for the chips and what is the annual subscription?
  - No one pays for the chip. You pay for the registration of them. The subscription is not mandatory though is encouraged.
- Why did you go with a search tool?
  - That was the best option at the time.
- Where would the data go if the company in charge of it decided to disband or stop hosting?
  - For a business that size, there would be protocols in place to see if someone wants to buy it or they would be responsible for managing it for the rest of its life. That would be more difficult for smaller businesses.
- **Comment from Audience:** There is a need to learn who the microchip was put in for, so there needs to be a way to find the origin. Who do we need to go to for that information? There is information in USAHerds which is separated by states, however, they do not communicate with other states. There should be a way to develop a citing ability to figure out the origin of the information as a starting point.
- **Comment from Audience:** It is important to decide what information is relevant, who collects it and who is able to access it.
- **Comment from Audience:** What is the big problem? Some say it is regulation that needs mandating. Another problem is privacy levels. The issue is getting owners to want to give this information out.
- **Comment from Audience:** If you called AHA and asked the name and number of a horse owner, we would give that to you because we encourage commerce. We do not consider that a violation of an owner's rights.
- Earlier we discussed the need for health records assigned to a microchip. Has this effort been applied to dogs?
  - We started this early but there's no standardization of records, difficulty of accessing information, and little demand for the information by the consumer. This is still evolving.
- It looks like you market to vets. How many owners apply their own chips?
  - From our perspective, you need a vet license to sell, administer, and register microchips.

## **ADVANCING IDENTIFICATION AND EQUINE HEALTH**

### *SUMMARY OF DISCUSSION GROUPS*

#### *FUTURE OF TRACEABILITY - MICROCHIPS*

##### **1. What type of microchip should be used in horses in the United States?**

###### **a. Types for consideration include:**

- i. 840 USDA official approved microchip series**
- ii. 900 series manufacturing code series**

###### **• Discussion Points:**

- Pro chips though 900 and 999 chips as they can be duplicated and they are not a unique number.
- There is pushback on the 840 chips because if the premises ID is associated with that horse, it is associated with that horse for its entire life.
- There is no need to have an ID with a premise/country code on it.
- If an 840 chip is required, it is just adding more burden on the industry.
- Just get the chips in the horses – who cares what type it is as long as we can read them.
- Is it just identification or do we need to worry about traceability?
- Start with just getting chips in horses. The rest will follow
- Need to show the benefits of the biothermal chips - it shows trends and that's important! These have huge advantages from a disease prevention standpoint. As you can more quickly isolate a horse with an elevated fever at the track or at a show. This can be enough to prevent the next Ogden event.

##### **2. What should be the requirements for recording the microchip implantation?**

- **General Consensus:** The veterinarian using the chip should be required to record the implantation for the welfare of the horse.

###### **a. If 840 microchips are not utilized, where should initial chip be registered (the chip manufacturer, the breed registry, the veterinarian records, etc.)?**

###### **• Discussion:**

- There are many places implanting chips but they do not register those chips.
- There needs to be standards on both chip requirements and chip registration otherwise there will be a huge mess.

###### **b. Who should be responsible for the registration of the microchip (the veterinarian, the owner, the agent)?**

- **Discussion:**
  - The veterinarian and whomever has the electronic capability without transcribing.
  - If it is required to go onto a Coggins test or a health certificate, then it is definitely the veterinarian's responsibility.
  - The initiating entity (breed organizations) should also be responsible for registration of the information.
  - Everyone involved should register the microchip in order to create redundancy.
  - Need mechanism to make it easier for horse owner and veterinarian to register chip (i.e., on a smart phone or tablet).

### **3. What is the potential regulatory purpose for use of microchips?**

- **Discussion:**
  - For traceability we need to require electronic records with some sort of official ID whatever that is.
  - Industry should lead the way first. Regulations and requirements should only be after industry paves the way.
  - Regulations, compliance and enforcement should not be terms used when discussing microchips.

#### **a. What steps should be taken for initiating regulatory requirements for microchips (i.e., microchip numbers required on EIA forms and CVIs)?**

- **Discussion:**
  - It could be required on Coggins test and health certificates because then it could be tied back to registration.
  - The microchip could also act as the positive ID on the certificates.
  - The goal should be for promoting electronic forms not just electronic identification. A 15-digit code written on paper defeats the purposes of electronic data capture.
  - No action should be taken to make it mandatory.

#### **b. What are the challenges which need to be overcome?**

#### **c. From the perspective of a private practitioner, what user friendly ways can be used to incorporate the 15-digit microchip number onto regulatory documentation?**

- **Discussion:**
  - Scan it and then it automatically populates via electronic documentation.
  - If there are a group of people who are not computer literate, then the redundancy as previously mentioned avoids this problem.
  - Needs to be ease of use and user friendly.

### **4. How can reader technology be more user-friendly and available to the industry?**

- **Discussion:**
    - It is already done and completely universal for some things.
    - There needs to be more information out to the industry.
    - There needs to better trained end users.
- a. How can the industry ensure these tools are available?**
- **Discussion:**
    - Most feel the technology is already available and there is nothing to develop. However, many don't know what's out there and available
    - More education and outreach is needed on what is out there.
    - Individual organizations may want to develop their own apps.
    - Currently the industry is working on connecting the readers directly to the database and there are groups working on being able to scan from phones and iPads.
    - Those working on projects need to educate the rest of the industry. Lessons learned need to be shared.

**5. How do we get microchips into more horses?**

- **Discussion:**
  - Make it easy to do.
  - Marketing is of critical importance - get the message out frequently.
  - The industry needs to create some sort of value for the recreational horses (i.e., natural disaster) or have it tied to the Coggins test.
  - Need to sell the story – find and share all the success stories.
  - Chip-a -thons at events and vet clinics can prove to be very successful.
  - Create Incentives for microchips such as tax breaks, insurance incentives, identification cards for the horses.
  - Getting veterinary buy-in for the need for more horses to be microchipped is critical.
  - There is a need for a PR firm to handle getting the message out. There is a need for more public outreach. There must be a plan dispel the myths.
  - There is a need for an industry working group to research ways of getting more horses chipped and develop a plan for the US that all industry groups can utilize.

*MICROCHIP DATA STORAGE*

**1. Is a centralized database or microchip search tool necessary for equine microchips in the United States?**

- **Discussion:**
  - Yes, there should be multiple databases possibly held by individual organizations with one common search tool.

- Multiple databases can house the information necessary for the organization.
- A search tool is the critical component for regulatory folks. We just need to know who to contact rather than calling every manufacturer.
- Ideally, a microchip search tool can reach into the breed registries, the discipline registries, and manufacturers to provide multiple access with the most recent information.
- To have a microchip search tool and the ability to update contact information for a microchip on one site would be ideal.
- Let the groups have their own databases. Groups can control their own data.
- Owners will be happier if the entity they trust houses their data. Keeping it as local as possible would be the best solution.

**2. Should the microchip data storage system be a private or public endeavor?**

- **Discussion:**

- Data storage should be a private endeavor.
- Each private entity should maintain its own database system.
- The microchip search tool should also be hosted by an independent entity, like the AAHA look-up tool.

**3. What are the desired functions of a microchip data storage system?**

- **Discussion:**

- The search tool would only give animal identification and a link to database contact information.
- There would need to be a minimum level of information on each horse in the database to be determined by the industry.
- Industry working group should discuss needs of such system in detail before it is finalized.

**4. How do we handle confidentiality to make the system work?**

**a. What are the necessary parameters for confidentiality?**

- **Discussion:**

- The microchip lookup tool is a good way to control movement of information and protect confidentiality.
- The lookup tool would give contact information of the organization that holds the horse information and each silo would be responsible for controlling their own confidentiality.
- There could also be potential for different levels of information access for public, veterinary, and regulatory bodies.
- Credentialing system to allow people access to the data would be beneficial. Standards could be set by industry working group.

**5. Who should be provided access to the system and how?**

**a. What information should be accessible?**



- **Discussion:**
  - There should be different levels of information access for public, veterinarians, and regulatory bodies.
  - The individual organizations would control who and what information they will release.
  - Horse owners should have the option to potentially opt in or out on allowing access to certain optional information.

**6. How can a microchip data storage system be funded?**

- a. **What are the mechanisms to obtain funding for this project?**
- b. **Who should be designated as responsible for securing funding?**

- **Discussion:**
  - The first thing that needs to be determined is how much it will cost.
  - One option could be adding a Check Off Fee on Coggins tests that goes toward funding this project.
  - If organizations are responsible for managing their own database, they would each individually be responsible for securing funding.
  - Another option may be appointing AAEP or American Horse Council where the infrastructure for acquiring this funding already exists.
  - A working group should be established to determine costs and explore funding options.

**7. What are the steps forward today for a microchip data storage plan?**

- a. **Who is responsible?**
- b. **What are the action items?**
- c. **What is the deliverable timeline?**

- **Discussion:**
  - The most important part of the endeavor is getting microchips into horses.
  - Education and outreach are essential, and the incentives of microchipping should be forefront.
  - Next, it needs to be established who will house the microchip information, what information will be included, and who will have access to it.
  - This requires work between all equine organizations and surveying of horse owner interests and demands.

*OVERVIEW OF ELECTRONIC HEALTH CERTIFICATION SYSTEMS PASSPORTS AND CERTIFICATES OF VETERINARY INSPECTION*

Dr. Alex Turner, Traceability Veterinarian, Colorado Department of Agriculture

The Colorado Department of Agriculture receives an average of 50,000 - 55,000 Certificates of Veterinary Inspection (CVI) a year. These CVIs are issued for small animals, cattle, and horses, predominantly for import and export from the state. Given the large number of CVIs issued each year, there is high demand for convenient and reliable electronic CVI options. Given the various electronic CVI versions, it is important to consider what each group

involved is seeking from this electronic certificate. From a regulatory official standpoint, it is important that the data be easily imported, exported, and searchable via a database system. Ideally, the data would allow automatic import to minimize data entry mistakes. From the view of a veterinarian, it is best that the CVI be convenient, intuitive, and cost effective. Some methods of increasing convenience are insuring that the format be compatible with available technology and have an option to submit the form directly to the State Veterinarian Office. Horse owners have a different opinion of CVIs, and therefore different goals for an electronic version. Most often, owners only request CVIs because “it’s the law,” but they do find it convenient when they can access these records electronically via smartphone or tablet<sup>21</sup>.

Ultimately, the industry requires a faster and more convenient means of generating and recording CVIs. Although there is not a unified system in place that will solve every problem, veterinarians must find a solution that works best for them. Electronic CVIs help decrease the time and labor required to comply with state regulations. And a reliable online database, such as USAHerds, is important for ease of traceability and disease outbreak response.

There are multiple electronic CVI options available each with their own unique set of advantages and disadvantages. The system preferred by the Colorado Department of Agriculture is called mCVI. The advantages of this software are that it is compatible with any Android or Apple mobile device, it doesn’t require a data connection, it is able to import contacts and official animal ID numbers, it can automatically deliver forms to the State, and it is free to use. It is also convenient for regulators since the data from the forms can be directly imported into a database, such as USAHerds. Some disadvantages include difficulty printing forms without a data connection, a steep learning curve for some animal ID entry features, and the technology is limited to smartphones and tablets which some veterinarians may not own.

Another electronic option available is an editable pdf file named the eCVI. This program features advantages in that it is easy to use and runs on any computer with Adobe Acrobat Reader. It also allows pre-filled templates for repeat clients and is free to use. State regulators are able to upload the data directly to USAHerds. Some downsides to this program are that it still requires veterinarians to email the pdf to the State and it is not compatible with mobile devices.

Veterinary Services Process Streamlining (VSPS) is another electronic CVI application available to veterinarians and is supplied by the USDA. This program eliminates the need to submit a separate form to the State, and allows users to store client information and generate EIA forms. The program requires an internet connection and is free to use. Some disadvantages to VSPS are that it is time consuming in its setup and for ID verification and approval process. Additionally, it has a steep learning curve and the completed forms do not include an electronic signature.

Health Link provides veterinarians with a software program called Global VetLINK. This program can be used to complete both CVIs and EIA forms, and can be used on any device with internet access. Client information is stored in the database and forms need not be sent to the State. Also, clients can access their own forms through the website, which eliminates the

need to send electronic versions to them. However, veterinarians pay a fee per CVI and EIA, and consistent internet access is required.

There are several services that are more popular in the livestock market that can be used for equine CVIs. The first, SmartICVI by New Planet Technologies, is a web based system that uses an app for Android or Apple devices and a web-portal for use with a laptop. The mobile app can be used without internet connection, and data can be imported directly into USAHerds. The program does require veterinarians to pay a fee per month. Another program called Fort Supply Technologies is an option for electronic CVIs. A CVI is built from information received from the animal's microchip and the information can be integrated into sale barn software and USAHerds database.

Equine Passports are another tool available to supplement the CVI. There are a few versions of passports available in different regions of the US. These passports alleviate the need for multiple CVIs and most are good for six (6) months. A negative EIA test is still required within the previous 12 months. The Northwestern states, namely WA, OR, and ID, implemented a passport agreement that is also honored by CA and MT. This passport requires horse owners to provide an itinerary to the State, however, many states have observed low compliance in this area. The Southern States Passport is available in fifteen (15) states, AL, AR, FL, GA, KY, LA, MS, NY, NC, OK, SC, TN, TX, VA, and WV. This passport goes by several names including the Equine Interstate Event Permit, the Equine Event Extension, and the Equine Interstate Passport Card. A six-month equine passport is currently under review for eleven (11) Western States. There are questions about whether this will increase or decrease the amount of equine movement the health officials will need to know about. There is also debate on how passports will be enforced and who will be responsible for submitting itineraries for horse movement.

The following questions were posed to Alex Turner following his presentation:

- **Comment from Audience:** Florida started the passport program because of political pressure from GA and AL. If there is any sign your horse is sick and you didn't notify the veterinarian, then you will never qualify for this 6-month CVI again. The passport requires you to file that you are going somewhere and if you don't file an itinerary, then you cannot renew.
- **Comment from Audience:** In Kansas we have had the passport and we are eliminating them. It doesn't give us good visibility of animal movement and believe a disease would move more easily. We are also required to submit an itinerary and only received one itinerary report last year. Since people aren't keeping up their end, we will not continue to offer it.
- **Does a CVI tie to the ID card that Carl Heckendorf talked about?**
  - Not currently. If the horse is chipped and registered, the vet enters the information.
- **Comment from Audience:** On the southern passport the owners can log into Global Vetlink and log itineraries. They must log one itinerary in order to renew for a new passport. In the western region you need a new passport for every movement. If nobody is going to check and enforce the itinerary, then no one is going to do it.

- **Comment from Audience:** On the western states proposed extended equine CVI, we look at it as a hybrid between the CVI and passport. It only requires one veterinarian inspection. The veterinarian counsels the client on sick versus a healthy horse, identification, and how to take temperature. It is an initial document with a 6-month Coggins test, animal ID, owner information and is all sent to the owner. They still cannot go anywhere without logging in and adding the origin and destination. The document is converted into the same data standard as all health certificates approved by USAHA. It is convenient since you can log in as you are driving and continue to show movements. The system does not issue a permit without asking if the horse has shown any sickness in the past 7 days or has horse been exposed to other horses in the past 7 days.

### *ADVANCING EQUINE IDENTIFICATION AND TRACEABILITY: NEXT STEPS*

In summary, it is believed the time for advancing equine identification and traceability is now as the industry is heading in that direction. Industry is in a position to take charge and lead as it is the overwhelming consensus that the government should not lead the charge. The identification technology and the software to manage the data of microchips is available and ready for use by the industry. It is time for microchips to be implanted in horses as a means of identification. However, the challenges of the type of microchips and how to get horses microchipped are on the forefront.

The agreed upon goal is for horses to be microchipped and that chip be recorded in a searchable system to ensure traceability. The type of microchip is ultimately an individual or organizational decision. If an entity chooses to go with an 840 chip with a premise ID, then the manufacturer should ship to an entity with a premise ID and that is how it would get reported. If it is a veterinarian, then they are supposed to report that microchip, animal, and premise ID to an animal identification management system<sup>22</sup>.

The following opinions were garnered from forum participants and should be used to direct the working group and industry organizations for moving forward:

- Should we pursue mandating microchips on a veterinary inspection this year?
  - **General Consensus:** No
- Should we pursue mandating microchips on Coggins this year?
  - **General Consensus:** No
- Should we pursue considering mandating microchips on a veterinary inspection in the next 2-5 years?
  - **General Consensus:** Yes
- Should we pursue considering mandating microchips on Coggins in the next 2-5 years?
  - **General Consensus:** Yes
- **Statement:** Let industry start on the voluntary path without requirements and then re-evaluate the need for requirements. In the future, work with the working group on mandating microchips on veterinary inspections and/or Coggins.

- Do you support the use of an 840 tag only as a primary microchip?
  - **General Consensus:** No
- Do you support the use of an ISO chip ICAR-certified only as a primary microchip?
  - **General Consensus:** No
- Do you support the use of an ISO chip ICAR-certified or 840 chip as a primary microchip?
  - **General Consensus:** Yes
- **Statement:** Consensus for developing a strategic action plan for equine identification and traceability.

As the Jockey Club has demonstrated, a voluntary system can work to achieve the goal of microchipping. If it is convenient to microchip and register a horse, then there will be a stronger acceptance of the program. Additionally, decreasing the cost of the microchip would encourage more participation. In order to advance equine identification and traceability, the equine industry groups need to work together to develop a plan for moving forward. Eventually, equine identification and traceability will be common practice with the use of microchips and elimination of paper records. It is the goal of the industry working group formed from this forum to determine the plan for moving forward.

## **NEXT STEPS**

While the forum brought together equine industry professionals, equine identification and traceability companies, veterinarians and regulatory animal health officials to gain a better understanding of equine identification and traceability efforts, the current status requires further dialogue and cooperative efforts to advance the mission. The newly-formed industry working group will provide the leadership and establish a platform to collaborate and ensure advancement.

The group consensus includes the following broad objectives:

1. Microchips in horses
2. Microchip data into a database (also ensure updates to contact information)
3. Microchips searchable and accessible

Highlighted below are the potential areas for future exploration in the advancing of equine identification and traceability.

1. Development of a National Equine Identification Plan, which outlines goals, objectives, timelines.
2. Development of Microchip Search system that meets the needs of the equine industry.
3. Surveys to obtain industry and regulatory officials to identify gaps and needs related to equine identification and traceability. Industry survey to determine what data or information they are willing and able to share. Regulatory Official survey to determine what data they need and how they would like to access it.
4. Set goals and targets for horse identification and determine strategies for meeting these goals. Explore the idea of chip-a-thons and other incentive programs to get participation.

5. Define and demonstrate value: Identify owner benefits and value-added services associated with the microchip. Wallet cards for horse identification information. Develop incentives for the right behavior. Identify owner motivators. Collaborate with allied industries to link benefits such as insurance companies or identify potential tax deductions available.
6. Identify collaboration opportunities with equine practitioners. Identify added benefits for practitioner, such as links to electronic record keeping.
7. Outreach and educational strategy development to educate industry on the subjects of identification, traceability and electronic health records. Share the story and the facts. Identify the channels of outreach.

## FOOTNOTES

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<sup>1</sup> Stoffel, Summer. “Why Equine Identification and Traceability.” National Institute for Animal Agriculture Equine Forum: Advancing ID, Technology and Electronic Health Records, Denver, CO, 17 January 2017.

<sup>2</sup> Morehead, James. “Private Practitioner Perspective.” National Institute for Animal Agriculture Equine Forum: Advancing ID, Technology and Electronic Health Records, Denver, Colo., 17 January 2017.

<sup>3</sup> Blodgett, Glenn. “Equine Owner Perspective.” National Institute for Animal Agriculture Equine Forum: Advancing ID, Technology and Electronic Health Records, Denver, Colo., 17 January 2017.

<sup>4</sup> Babick, Mary. “USHJA and USEF Perspective.” National Institute for Animal Agriculture Equine Forum: Advancing ID, Technology and Electronic Health Records, Denver, Colo., 17 January 2017.

<sup>5</sup> Huffhines, Craig. “AQHA Perspective.” National Institute for Animal Agriculture Equine Forum: Advancing ID, Technology and Electronic Health Records, Denver, Colo., 17 January 2017.

<sup>6</sup> Fuentes, Debbie. “Arabian Horse Association Perspective.” National Institute for Animal Agriculture Equine Forum: Advancing ID, Technology and Electronic Health Records, Denver, Colo., 17 January 2017.

<sup>7</sup> Iuliano, Matt. “The Jockey Club Perspective.” National Institute for Animal Agriculture Equine Forum: Advancing ID, Technology and Electronic Health Records, Denver, Colo., 17 January 2017.

<sup>8</sup> Flynn, Katie. “Horse Identification – Past, Present, and Future.” National Institute for Animal Agriculture Equine Forum: Advancing ID, Technology and Electronic Health Records, Denver, Colo., 17 January 2017.

<sup>9</sup> Pelzel-McCluskey, Angela. “Regulatory Perspective on Individual Equine Identification.” National Institute for Animal Agriculture Equine Forum: Advancing ID, Technology and Electronic Health Records, Denver, Colo., 17 January 2017.

<sup>10</sup> Heckendorf, Carl. “Regulatory Perspective on Individual Equine Identification.” National Institute for Animal Agriculture Equine Forum: Advancing ID, Technology and Electronic Health Records, Denver, Colo., 17 January 2017.

<sup>11</sup> Stacy, Diane. “Regulatory Perspective on Individual Equine Identification.” National Institute for Animal Agriculture Equine Forum: Advancing ID, Technology and Electronic Health Records, Denver, Colo., 17 January 2017.

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<sup>12</sup> LaColla, Marta. “Equine Microchips 101.” National Institute for Animal Agriculture Equine Forum: Advancing ID, Technology and Electronic Health Records, Denver, Colo., 17 January 2017.

<sup>13</sup> Gerber, M.I. et al – Health factors associated with microchip insertion in horses. *Journal of Equine Veterinary Science* 32 (2012) 177-182.

<sup>14</sup> Stein FJ, Geller SC, Carter JC. Evaluation of microchip migration in horses, donkeys and mules. *J Am Vet Med Assoc*: 2003;223:1316-9.

<sup>15</sup> Langer F, Fietz J. Ways to measure body temperature in the field. *J Therm Biol* 2014;42:46–51.

<sup>16</sup> Huffhines, Craig. “Electronic Health Records – Owner Benefits of Linking Electronic ID.” National Institute for Animal Agriculture Equine Forum: Advancing ID, Technology and Electronic Health Records, Denver, Colo., 17 January 2017.

<sup>17</sup> Heckendorf, Carl. “Traceability of Equine – Health Perspective.” National Institute for Animal Agriculture Equine Forum: Advancing ID, Technology and Electronic Health Records, Denver, Colo., 18 January 2017.

<sup>18</sup> Pelzel-McCluskey, Angela. “Traceability of Equine Microchips.” National Institute for Animal Agriculture Equine Forum: Advancing ID, Technology and Electronic Health Records, Denver, Colo., 18 January 2017.

<sup>19</sup> Klaus, Kenneth. “Database Management in Small Animals.” National Institute for Animal Agriculture Equine Forum: Advancing ID, Technology and Electronic Health Records, Denver, Colo., 18 January 2017.

<sup>20</sup> Wessels, Katherine. “AAHA Model – A Microchip Search Tool.” National Institute for Animal Agriculture Equine Forum: Advancing ID, Technology and Electronic Health Records, Denver, Colo., 18 January 2017.

<sup>21</sup> Turner, Alex. “Overview of Electronic Health Certification Systems Passports and Certificates of Veterinary Inspection.” National Institute for Animal Agriculture Equine Forum: Advancing ID, Technology and Electronic Health Records, Denver, Colo., 18 January 2017.

<sup>22</sup> Flynn, Katie. “Advancing Equine Identification and Traceability: Next Steps.” National Institute for Animal Agriculture Equine Forum: Advancing ID, Technology and Electronic Health Records, Denver, Colo., 18 January 2017.



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