THE UNIVERSITY OF ARIZONA
Race Track Industry Program

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MICROCHIPS

Sponsors:
Panel Session: American Quarter Horse Association

Moderator/Speaker:
Dan Fick, Executive Vice President and Executive Director The Jockey Club

Speakers:
Matt Iuliano, Vice President, Registry; The Jockey club
Andrea Mercer, Stud Book Manager; Weatherbys GSB, Ltd.
Kevin Owen, DVM, President; Electronic ID, Incorporated

MR. DAN FICK: Good afternoon. I certainly appreciate the opportunity to talk to you all about something that I've been involved with for a couple of years. Two years ago, if you would have said, "Can you put on presentation for an hour and fifteen minutes on microchips," I would have had to ask, what are we going to do for the other hour? More recently, this has become quite a topic, and a buzzword at a lot of racing commissions, breeding farms and some racetracks.

Your panel today provides a variety of experience and also comes from some different locations. They are going to tell you about microchips and their background, and how microchips are used in their various aspects of the industry.

Our order today, I am going to go first, and I am taking off my Jockey Club hat and I am going to speak as the co-chair of the American Horse Council Equine Species Working Group. I am going to talk to you about their place in a national animal identification system.

Next will be Dr. Kevin Owen, veterinarian from Fort Worth, Texas. He has been involved in this for about 20 years; he is the president of Electronic I.D. He is going to talk to you about the actual technology of microchips and what RFID in the future might look like.

Following Kevin is going to be Andrea Mercer, and she may have traveled the farthest, at least for our panel. Andrea is director of registration and keeper of the English Stud Book; she comes to us from the UK.

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Last, but certainly not least is Matt Iuliano; he and I work together at The Jockey Club. Matt is our vice president of registration services. He has an extensive background within the horse industry as a CSU grad with a master's degree. He also has his law degree from the University of Louisville. So we've got a lot of experience in this area, we have all been around horses all our lives.

We would like to ask that as we go through our presentations if you could hold your questions until the end, I think we will have plenty of time.

National Animal Identification System. USDA and state and federal health officials have been talking about national animal identification systems for over 20 years. The 2001 hoof and mouth outbreak in the United Kingdom, and every time that I look at these numbers they are staggering to me, 10 million animals, $13 billion economic loss to the agriculture industry in the UK. That really got everybody's attention over in this country and about two years later, a group of industry representatives, livestock industry representatives and animal health officials, issued the U.S. Animal Identification Plan, and it was called the USAIP for a while.

Shortly thereafter, you will remember the outbreak of Mad Cow Disease in Alberta and subsequently in Washington State that prompted Congress to propose six animal identification bills in the last session. The Senate passed a 'Sense of the Senate' that a national animal ID system should be implemented. I might add here that the USDA has the authority under existing law to start a national animal ID system, they do not have to have further legislation requirements, they are going to need funding, but they have mandate to do this.

They began implementing a national animal identification system in 2004, with premises identification, which I will explain here in just a second. They conducted 16 different listening sessions or forums around the country, listening to livestock owners and predominantly livestock producers. They found the overwhelming support was that, yes; this country does need a national animal identification system.

What is it? What they're proposing is to assign a seven-digit code to every premise for livestock or cattle. Then they want to attach a 15-character animal identification number to every livestock animal, and this includes horses, cattle, sheep, pigs, goats, deer and bison. Then the hard part, they want to track all the movements of these livestock through the reporting premises, so when an animal comes on your property, you have to tell the national database that this number came on this number on this date, those three pieces of information. They want to do this in order to establish 48-hour trace-back capabilities in case there is an outbreak of a contagious, deadly, foreign animal disease. This will give them the opportunity during the incubation period to determine which animals were commingled and where the quarantines have to implement to try and save an outbreak of this disease.

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Why are horses included? Well, obviously we have to protect our horses from an outbreak. These outbreaks can be cross-species, horses can get the same type of diseases that cows, sheep and pigs do, depending on the disease. Also, to protect human health since a number of these diseases are what's called zoological, West Nile Virus is a good example; both horses and humans can contract it.

To some extent, there is a threat of bio-terrorism. There is a disease called Glanders that was used in bio-terrorism in WWI, and up until a few years ago, the Soviet Union, before it split up, was stockpiling tons of Glanders for use in bio-terrorism.

Lost and displaced horses, most recent hurricanes that we saw in Louisiana and Florida, microchips were a great help in Louisiana, which has been microchipping horses for a number of years, in identifying and sending horses back to their rightful owners. We have to maintain a stable economic environment, if we have a severe outbreak and our horses are quarantined and we can't move them, we can't show them, we can't breed them, we can't race them. And also internationally, if we have an outbreak here, they wouldn't allow our horses to be exported to foreign countries; this would be a huge economic loss for major breeds in this country.

Last, we have to be a responsible member of the livestock industry. We keep telling Congress we want to be treated like livestock, we want to have the same tax breaks, the same research dollars, the same emergency relief funds; well, if you are going to be livestock, you need to act like livestock and be part of this entire program.

American Horse Council got involved at their 2003 convention; basically, we were told that if the horse industry doesn't take charge in developing a plan for horses, then the federal and state health officials will do it for them. We decided that we were going to do it ourselves. Our job is to develop recommendations on a national equine identification plan, we brought together 35 different organizations that are part of the American Horse Council, pretty much every organization in the American Horse Council was offered an opportunity to participate and we have a number of state and federal health officials working with us. Shortly after we were formed, we received the designation as the USDA Equine Species Working Group, so we are responsible for the program.

These are the areas that we looked at: horse identification technologies; what premises should be identified; and how do you track movement. You can just imagine the amount of movement that a horse goes through in its 20-year lifetime. We also looked at how to establish a communication to the owners and breeders of horses; very many people out in the industry don't know that this is coming. We want to, and there are grants available from the USDA to do pilot projects to test the identification methods that are selected, but also test your ability to automate the track. The breed registries are very concerned because some of the information obviously is part of their intellectual property in the pedigrees and the performance records of the horses, so they very much want to look at the possibility of having an equine database to store this information.

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We made recommendations to the USDA at the end of 2004; we said that the equine industry has to be in control, they have to be compatible internationally, we have to preserve our existing ID system, it's got to be voluntary to start and this program is voluntary right now for all species. We felt that the identification began with the veterinary health inspection, you have to get health papers to move that horse, and we are tracking movement. That should be at least the last point. If a horse has not been properly identified, then that is the point in time that it has to be identified.

It needs to be affordable; estimates are, talking to the AAEP, about $50 for the process, the chips can cost, depending on whether you are buying in bulk, up to $20, so you're looking at probably $70 to $75. Anybody that has had a pet chip lately, it probably cost you $50 to $75, so it's not overly expensive until you look at what the impact of that is to breeders of half a million horses across this country annually.

We determined, for the purpose of identification, microchips are probably the best method to satisfy everything that USDA was looking for. Probably transfers of ownerships are going to be required, ultimately by federal law, when this becomes mandatory, they are going to want to be able to track the ownership on these animals.

Horse identification, what we told them is that we do a better job than anybody in the livestock industry of identifying our horses or our livestock. We have the breed registration certificate, DNA/parentage verification, and all the other aspects of identifying an animal. The one thing that I want to emphasize here is that you can't just identify an animal by microchip or lip tattoo, you have to look at all of this. If you just read a number, you have to make sure it is a bay mare, otherwise you are going to find yourself in trouble, and we've seen that happen with lip tattoos in the past, where horses haven't been tattooed because horses can be very similar, obviously. So, the microchip is not a save-all, one-stop identification of horses.

The recommendation, and Kevin will talk a little bit more about what all this means, however, what we recommend using is the international ISO chip, it's a 15-character chip, so it's also compatible with the animal identification number, it's compatible internationally with what's called the Unique Equine Life Number, which Andrea may explain to you, they use that in England.

There has been a little bit of controversy out there about scanners that don't read both frequencies between the livestock chip and the pet chip. The scanners have to read all the chips, or you are going to think there is not a chip in there when there actually is. And Kevin is going to talk a little bit about some of the interesting options that you can have with the new technologies, one of which is bio-thermal.

We have to ask the question, what premises should be identified? It's a factor of the amount of horses that are going to be there and how much they are moving in

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and out and this is kind of the priority that we've established starting with the top and working our way down.

Basically, anyplace that an animal is located ultimately is going to have to receive premises ID. This program is up and going, all 50 states are fully operational. Over 133,000 premises have already been registered, and I challenge you all that are with a racetrack or with a fairground, a breeding farm, or two horses in your backyard to go online and try and register your premise, in doing so it will send you to the state veterinarian more than likely, and their offices, as those are the ones that do it. We are doing it online in Kentucky, and a number of other states are doing it. I would like to get the feedback as to how it's going.

What is the future focus of the Equine Species Working Group? We have got to expand on our understanding on the technology performance standards for microchips and other identification microchip readers that we might use. We have got to do some pilot projects. Currently, there are four pilot projects that have been funded by the USDA, one in Colorado, one in Florida, one in California and one in New Mexico, that involves horses.

In California they received funding to microchip 4,000 thoroughbreds in Southern California next year. New Mexico is going to start with quarter horse and thoroughbred 2-year-olds at Sunland Park right after the first of the year. So it is up and going through the state racing commissions at this point in time in two states. Kentucky has made a proposal to the USDA to do a program on also racehorses, breeding farms, and sale facilities.

Everything is starting to become clear, however, we are working with the federal government and they threw a monkey wrench in. This time it was the national cattleman. There is a lot of data here that is going to be available, data that is going to be valuable to livestock producers, to cattlemen's associations, to the pork industry, and there are some serious concerns about the USDA database having in their database, how many animals you have on a premise. That information will be accessible to the EPA and to the IRS, so the national cattlemen, in concert with the congressmen have proposed that this be a private database, that a consortium of the livestock industry run this. That is currently up for discussion, they have been required to get the cooperation from all species before they can move forward, by the USDA. So everything is kind of in limbo at this point in time as to where the database is going to be housed, but that should resolve sometime in the next six months, hopefully.

Here again, owner education is very important, we have a Web site through the American Horse Council that will give you all the information that you need or that we have available on equine ID in the international system. At the end of the program, I brought a bunch of information that has been provided both by the USDA and the American Horse Council. Here is the contact information, again, for the horse council.

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So, what is RFID, radio frequency identification device? Our next speaker is Dr. Kevin Owen from Electronic ID.

DR. KEVIN OWEN: Thank you Dan. I would like to thank you guys for allowing us this opportunity to try to get everyone a little bit more brought up to speed on what's going on in the world of RFID. How many of you folks have heard of microchips and scanners?

That's well over 60 percent, I would say.

Radio frequency is quite simple, as the name implies it is a radio frequency, which is the power source, i.e., the scanner that sends out a signal to a transponder that is encapsulated when you implant it in a bio-compatible place. That transponder is made up of metals, metallic antennas and a bar-coded number on that microchip. The microchip itself, with this particular technology, is passive, it is not active.

So, that is the end of my talk.

(Laughter)

The history of the RFID, it evolved with the discovery of radar back in 1934. It was used in WWII to identify British airplanes via ground radar or signals. Then it evolved into commercialization in surveillance tags and antitheft systems in the '50s and '60s. In the '70s the US Energy Department started using RFID to track nuclear materials and eventually it was used for many other things. Just to add to that, in about the mid-1980s, it began to be used in the animal world, mainly on trout and salmon.

So, what is RFID? They built it to use radio waves to transmit the unique identity of an object, thing, or person, it is wireless. It requires two basic outlets, a reader and a microchip, again with this particular technology, the reader is the power source the chip is passive; therefore the chip actually has a life expectancy of infinity.

The two different basic types of RFID are passive, like we were talking about, or active. The active tags, of course, require an energy source. Passive is cheap, active is more expensive.

Of course, passive, again, has an unlimited life expectancy, whereas the active has a very pronounced life expectancy. The tags are characterized as low, high, ultra-high or microwave frequency. At this point in time we are using in the livestock industry 134 kHz, which would fall into the low category. The higher the frequency the longer the distance of read range and the faster read response. However, the higher the frequency, you have more trouble with interference, i.e., metallic objects.

Not all the frequencies work the same for industrial application. The established world recognizes ISO standards, which maximized the effectiveness and minimized confusion. When I say ISO standards, I am referring to the International Standards

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Organization. The International Standards Organization, they dictate to the manufacturers a particular set of numbers that are going to be issued to that manufacturer and then from that manufacturer into any particular governmental agency. For example, in the U.S., I think that we are looking at 840 as the USA country code. Each country will have a code, the first three numbers that will automatically identify where that animal was at at the time it was implanted.

Here we are just talking about the different applications of RFID, product labeling, animal identification, baggage identification, keyless system assessment, identification and tracking of assets and payment systems.

The benefits of RFID technology, it does not require a line-of-sight like barcodes, it withstands harsh environments, its upgradeable technology. The technology of RFID is changing almost, well, as we speak. RFID technology easily integrates with software packages, automated data collection and storage, thus minimizing human error factors.

Some of the issues, RFID tags stay affixed to the product and continue to work. Often RFID tags can be read without the knowledge of the owner. This is mostly a consumer concern or issue.

Here we are looking again, as Dan mentioned, at the ISO 11784 and 11785, it just talks about the different radio frequencies that are allowed for identification in RFID for livestock identification.

Here are just a few examples. Now, these are external tags that are used mainly in the food-producing livestock identification. This just talks about the two different types of technologies used currently in the passive RFID. We have the full duplex and the half duplex; this just talks about the speed and how the signal is sent out to the chip.

These are the different types of transponders used, again, with cattle. Again, you see the external tag, the injectable transponder that can be put in, and right now the USDA will recommend or allow placement in the hoof, the umbilical region, and the base of the ear, there is also the rumen bolus. As we talked about earlier, as far as read range goes, it is going to depend on the strength of the chip or the kilohertz of the chip, and the size of the chip and of course the size of the reader. The advantage that you have in livestock is that we can use a bolus transponder that is about four inches long, whereas the horse, we use an 11mm or 12mm transponder, which is about the size of an uncooked grain of rice.

On putting the microchip in the horse there is only one USDA site, and that is in the nuchal ligament area, half way between the ears and the withers, it is approximately an inch or so beneath where the mane hair starts to grow out. We developed that site in conjunction with the USDA, FDA, FSIS, etc.; we needed to find a site that would not cause harm to the animal at the time of implantation, at that particular anatomical site allowed us that. We also wanted an anatomical site

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that we could implant on day one of a foals life, so therefore we settled upon this area and that is internationally accepted.

What kind of read distance can you expect? This, of course, depends on the power available of the reader and on the size of the tag and the characteristics of the antenna. Each of those types of sizes of transponders makes a difference, again, on the read range.

RFID implants are a more permanent means of identification, protected inside the tissue of the animal. It is difficult to remove, it is a tamper evident product, and can potentially tell us if a problem exists biologically. For example, the most recent one was an increase in temperature, or monitoring body temperature. This is just a graph showing the bio-thermal chip, and why do you take an animals temperature? Well, that is very evident of course; you want rapid diagnosis or sensing of an animal's wellbeing. False low readings may lead to greater morbidity and mortality rates, and a false high reading may lead to expensive unnecessary diagnostics and treatments.

The causes of some of the rectal readings, again, for the people who have been around horses, you know what I'm talking about here, the anatomy and physiology of the rectum, possibility of the fecal bowls, or action of the rectum, depth of the colon, etc. And body temperature, and this is just some stuff; I'm not going to dig really deep.

Again, the main thing that I want to make you guys aware of today is that the technology with RFID is improving on a daily basis, and one of the things right now at this point in time is the bio-thermal chip which not only gives you the animals unique identification, but also it's body temperature.

MR. FICK: Thanks Kevin, I'm sure that we will have a few questions for you when we get done.

Are we ready for the next PowerPoint? Next, as I said, is Andrea Mercer, the keeper of the stud book and she is here to talk to you about a program that Weatherby's has been doing in England with the microchipping of thoroughbreds.

MS. ANDREA MERCER: First thing, I would like to thank Dan for getting me the opportunity to attend this very important conference. My end today is really just to share with you our experiences in Great Britain and Ireland, with the use and application of microchips and how we find them.

First thing, I would like to just give you a little bit of background on the general stud book. The stud book, as some of you may know, is the mother stud book in many ways, it was first published in 1791, so we've been responsible for recording horses for a while, over 200 years. The initial volume one of the stud book contained 350 foundation mares, but naturally, things have changed a lot since then, and the last volume, which was volume 44, actually contained approximately

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33,000 mares. Currently, in Great Britain and Ireland we produce an average of 17,000 foals per annum.

In terms of being a stud book, we do everything very similar here to the function performed by U.S. Stud Book, we record all stallion coverings, all the broodmare returns, we also conduct parentage testing, both in the basis of blood type back up until 2001 and in 2001 we then changed to DNA. We also record and verify all of the markings and also the microchip details. We also issue all of the passports for all the animals within the stud book. Our purpose really, is to ensure accurate identification of all of the animals contained within our stud book, and of course the integrity of all that detail.

I am here specifically today to speak about microchipping. So really, the question is, why did we decide to microchip?

What was really asked from us from the British Horse Racing Board and Horse Racing Ireland. The two racing authorities in Great Britain and Ireland were hoping to achieve an improved level of integrity, and naturally by default also improve identification of animals.

The reason for choosing microchips is it is a very, very quick process. It only takes a few seconds to read a microchip. It is very easy to read, you don't require any special training either in handling horses or in using a microchip reader.

The microchip, as Kevin has already indicated, has a very long life, well in excess of the expected life and duration of an equine. And as some of you may know, we have a very good publication following racing in Britain, called the Racing Post, and naturally neither the British Horse Racing Board, nor Ireland wish to have any exciting headlines, so they are hoping this will reduce those

So, the first thing that we did before actually embarking on a microchip program was we completed a trial, and the trial results were really interesting. The first thing we find is that it is a steep learning curve. One of the key issues was the animals that were being microchipped at the time of implantation. The animals need to be well handled, so they needed to be well-used to being handled and also well restrained. That doesn't mean that they needed to be clamped down, but they need to be held and be comfortable and happy in that environment.

We proved to ourselves that the equipment did indeed work, and that was very important because you always need to satisfy yourself that something is going to be as good as it is portrayed to be. We also proved that horses could successfully have the microchip read much later. And therefore, on the basis of this trial, which was conducted in 1998, it became mandatory for all Great Britain and Ireland born foals to be microchipped from 1999 onwards.

In terms of our choice of microchip, again, this has already been highlighted, we went on using the ISO Standard 11784 and 11785, the internationally recognized

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microchip that can be read by any ISO reader. These were provided to us by Destron Fearing, and they also supply us with the reader that we utilize.

I just included this picture -- as Kevin has already highlighted, there is already an internationally accepted site for the implantation of microchips on the neck, about halfway down, and very close to the nuchal ligament, it is very easy to access. The good point with the equine microchips is, unlike some small animal microchips, equine microchips do not float, they do not move around the body. It is one thing to try and find a floating microchip when you are dealing with a small poodle or a little cat, but when you have 500kg of racing-fit horse it is a slightly different thing, so you need to be very confident as to where that microchip is likely to be located.

Microchips did cause some changes to our passports. From 1999 on, foals had on their passports a barcode, which highlighted the microchip number, which they had been implanted with. This appears in their passport twice and I will show you that in a second.

As Dan mentioned, in Europe there has been a unique equine life number introduced, and prior to this being introduced we had already began using the microchip number to form part of our life number. Therefore, our systems are set up to generate that number. The one exception to this when there is a mistake and a non-Weatherby's chip is inserted, because naturally they will not fit with our systems, and so we must manually create a life number.

This is just a front cover of our passport, you can see a barcode and the microchip number beneath it, and above that, if you can read it, it will say the passport and life number which is taken from part of the microchip.

The next slide is just a little bit of a close-up of the passport. And then inside, where the markings are located, again, in the bottom right hand corner, you will see the same barcode and microchip number so that you can see from the outside of the passport that the animal has been microchipped and also when you go to check the markings, the microchip is there and handy for verification.

So in terms of distribution and cost, because of the BHB and Horse Racing Ireland, they really were spearheading this activity, they actually pay for all of the microchips that are utilized within the thoroughbred industry. We at Weatherby's order and collate these microchips, we then issue them free of charge to all veterinary surgeons that we know who do thoroughbred practice throughout the UK. The breeders actually pay the vets to complete the implantation, this must be carried on at the same time as they are taking the marking and withdrawing the blood sample for DNA/parentage verification. It is very important that all three steps are carried out at the one stage to ensure that there is no chance for any mishap. When a vet accidentally uses a chip in a non-Weatherby's animal, they will be charged for that chip, and that is a cost, plus administration fee.

We designed some software to make sure that we could actually monitor where every chip was. Firstly, whenever we received chips in from Destron, we will record

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the fact that they have come to our premises, and that they are now in stock. This provides us with a stock control system, we know exactly how many chips we have in our premises and also located with the veterinary surgeons, but yet not implanted. When the markings come back with the microchip details, our software also checks that the DNA and markings do refer to the same microchip number, and again, this is just a double-checking mechanism.

We also link the microchip both to the individual animal to which it is being implanted and because we know which microchips we sent to which veterinary practices, we can also link that microchip number to a particular vet practice.

One of the benefits to having one of these details is of course whenever the animals are due to travel to a racecourses or attending sales, we can actually use this information to send the data to the racecourses or to the sales companies so that they can confirm that the animals that are on their premises are indeed meant to be there, because again, they will have a list of microchip numbers against which to check the markings.

There were a few practical problems. The vets have had an issue of hoarding the chips. We advise the veterinary surgeons of how many chips we have sent them, how many we are aware of being implanted, and therefore the residual balance that they have left, and we encourage them to carry as minimal stock as possible because it becomes quite costly if they are keeping lots of them in a warehouse or somewhere else.

We did have some vets trying to use small animal readers with which to try and read the equine chip, and this is not suitable. Pet ID chips are generally just under the skin where as the equine microchips are implanted quite deep into the neck, so small animal readers would have some difficulty getting the signal.

We also had some occurrences of people using non-ISO readers, but with all three of these issues, it is really just an educational matter. We have very rare incidences of any of these. These problems were seen in our early stages; an education program ensured that everyone understood microchips and how they worked.

Also, on some occasions non-Weatherby's microchips were used and implanted in Weatherby's animals. Again, with education, we have very few incidents of this.

Also, implantation technique, we had some vets who appeared to be able to do this process very smoothly and have no problems at all. There were a few that needed practice, but again, over the years, it's not something that we have had any more issues with.

So, just to put it in context, if I can give you some statistics, as of the end of September this year, we have microchipped 124,000 horses. Of those we have had 522 incidents of double microchipping. We have had 134 adverse reactions; once these reactions were allowed to settle, they would then re-implant with no problems. So we do record each instance so that we have complete statistics. In

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the early days, we had the majority of non-Weatherby's microchips being used, to date there have been 494. Both with this instance and double microchipping, it doesn't really cause us a problem, we simply put in a proper chip, ensure that it is fully operable and then it is recorded in the passport so that it is always there, so none of these have actually produced significant issues for us.

We have had about 1,003 chips that have proven to be unreadable, and I would like to break this down just a little bit further by saying that there is a difference between unreadable and not actually being in the horse. We did, after some research, understand that sometimes when the veterinary surgeon thinks that they have implanted the microchip into the neck, they actually haven't, it's dropped off the end of the implantation method or whatever. Now, good practice dictates that when the surgeon implants the microchip they should automatically scan the site to ensure that it is there and it is operational.

Again, with good training, these numbers are reducing all the time. That is not to say that there is not a few microchips that do occasionally either cease reading or read intermittently, but it is a very low proportion. As you can see, all in all, in terms of problems, true problems, we have had less than one percent.

So, in terms of the future, well, Kevin has already touched on a few things, but as far as we are concerned, our animals, all foals born in Great Britain and Ireland that are currently six years old an younger are microchipped, so that will be all 7-year-olds by the turn of the year.

Thermal chips, we actually conducted a trial on thermal chips in 2003, and we inserted them in horses that were in training with trainers who we knew routinely did take body temperatures, the results were incredibly favorable. Not only did it move the process of taking the body temperature from being a two-person process with some degree of difficulty with some horses to being a very simple, quick and easy process which can be carried out by one handler. The results were very good; the comparisons between the rectal temperatures and the actual thermal chip were excellent, in fact in many ways the thermal chip reacted quicker in our trial.

Again, this has already been mentioned, is the opportunity to progress towards longer distance readers. We see a particular benefit to this with animals going to the racetrack or working out or going to the sales yards. When the horses arrive, there will be a sheet of numbers for the horses that are expected to be there, when the animal walks under a large archway, their microchip will be read, if they are expected to be there, that's fine, they will pass through; if for any reason their microchip number is not expected to be there on that day then a notification will be made and that animal can be prevented from either being raced or going through the sales easily.

So just in summary, we feel that microchips support the industry's need for integrity, and certainly we have found that to be the case in Great Britain and Ireland. Microchips are very quick and easy to read. We have had a low incident

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rate of problems. As far as we are concerned, they have certainly proved themselves to be an excellent secondary means of identification.

Thank you very much for your time.

(Applause)

MR. FICK: At The Jockey Club, we have been looking at microchips for a number of years, and over the past 18 months, we have had the different family of companies at the Jockey Club looking at research, what's going on around the world, what's available and also looking at the potentialities and Matt Iuliano, our vice president of registration services is going to talk to you about some of the conclusions that we have come up with and what are future looks like so far.

MR. MATT IULIANO: Thank you Dan, good afternoon everyone. Before I dive into the topic of microchips and identification of thoroughbreds, I would like to take a moment for a brief overview of the family of companies that comprise The Jockey Club. Later in the presentation when I discuss the various business initiatives under development involving microchips we will have this roadmap to place company names and faces to initiatives. The more detailed description of our organization can always be found in our fact book and on our Web site at jockeyclub.com.

For over a century The Jockey Club as an organization has been dedicated to the improvement of thoroughbred breeding and racing. As the breed registry of thoroughbreds in the U.S and Canada and Puerto Rico, our principal responsibility is to maintain the highest integrity in the American Stud Book. The Jockey Club Information System provides information and technology to the industry through its three divisions: services, cataloging and software sales and consulting. Its flagship products include horse-managing software and equineline.com. And as you all know, Equibase companies have a general partnership between The Jockey Club and Thoroughbred Racing Associations of North America, formed to provide a uniform industry-owned database of racing information and statistics for thoroughbred racetracks. The Jockey Club Technology Services provides the technology and related infrastructure to support The Jockey Club family of companies. Now, TJCTS not only supports the day-to-day operations of all the business units but also provides software design and consulting services for the industry at large, including both national and international clients. InCompass Solutions provides software applications and systems to racetracks by leveraging the power of a comprehensive centralized database of racing and pedigree information. InCompass' Racetrack Operation System or RTO for short, supports the activities of racing offices of most North American racetracks. And finally, our two charitable foundations include the Grayson Jockey Club Research Foundation and The Jockey Club Foundation.

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So, with that as a backdrop I would like to turn our attention to the topic of microchips and the stud book. As keeper of the American Stud Book, our mission in the registry is to ensure the integrity of the information that it contains. This year we undertook a comprehensive analysis of microchips with the objective to assess

their potential to enhance the identification of thoroughbreds during registration process. Before I jump to the end of the analysis, I need to spend just a few moments on the beginning or on the situation analysis to give you an idea of the scope of business in the registry.

Each year we record approximately 64,000 breedings, resulting in 41,000 live foals, producing 37,200 registrations. Approximately 80 percent of this activity is distributed over one million of the three and half million square miles comprising the U.S. When Canada and Puerto Rico are included, since we include those thoroughbreds in the American Stud Book as well, we find a market of customers disbursed over nearly seven and half million square miles. Our registration processes were designed to maximize the integrity of information reported to us in light of this enormous geographic diversity of our customers. At its core, we rely on information submitted by the customer to complete most of the registration process.

Application forms certified accurate and truthful by the customer are used to record the foaling and breeder information. Photographs and physical descriptions are used to describe the color and markings of the horse. And finally, mane or tail samples submitted directly to the lab by the customer are used to authenticate the pedigree.

In 2001, there was a transition from blood typing to DNA typing using hair samples. The registration process could now be completed entirely by personnel with really just basic equine husbandry skills.

So, to analyze the utility of microchips, we looked first at the areas of registration process where identification issues may have delayed registration. Now the typical year, and we will use 2004 as a good example, the laboratory reported to us a total of 597 foals that were initially excluded as offspring of their reported sire and/or their dam. Of these, we are still working on 58 of them, which means that the balance of those has been resolved through corrections in the reporting process, but 58 are still in process and still considered active.

Now, these exclusions may be due to a number of reasons including misreporting of sires or dams, or the misidentification of the foal, or any combination of those three events.

Now, isolating only the potential identification problems involving either the mare or the foal, of these 58 active exclusions, 49 of them could be the result of a misidentification. Most often these are the cases where the hair of a foal thought to be foal (a) was mistakenly obtained from foal (b) instead. Assuming the microchip is correctly inserted, and as Andrea pointed out, at the correct time, with the collection of the DNA sample and while taking the markings, a microchip may have assisted us in the identification and resolution of these exclusions.

So what do all these numbers tell us? At most, microchips may have assisted us in resolving one tenth of one percent of the annual foal crop that is reported as

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genetically excluded possibly due to the misidentification during the registration process. Or conversely, misidentification of and re-registration does not appear to be an issue for the under 99.9 percent of the foal crop.

In the end when we weigh the magnitude of the potential problems and the potential benefits of microchipping as an enhancement to the identification of thoroughbreds during registration and the potential cost of microchipping, including the logistical considerations of deployment to customers in the U.S., Canada and Puerto Rico, we concluded that at this time, there were not sufficient tangible improvements to the identification of thoroughbreds during registration to make microchips a requirement for registration.

Now, having said all that, we have a longstanding policy of encouraging our customers to report to us whenever the markings reported on a certificate do not agree with the horse or whenever anything new happens to the horse, which may alter its identification.

For example, if the horse acquires an identification characteristic, which distinguishes it, such as a scar or brand, we want our customers to return the certificate of registration to us so that we can update the markings to include any additional identifying characteristics that the horse may have acquired during its life. To that end, we are modifying our systems to allow customer to report implantation of a microchip to The Jockey Club. After the first of the year, customers electing to microchip their thoroughbred can report that number to us via interactive registration on our Web site.

Additionally, we will provide some limited look-up capabilities behind a secured log-in, where the name, selected pedigree and basic identification information can be obtained after the entry of a microchip number, which is contained in our database.

InCompass and Jockey Club Information Systems are modifying selected applications as well to permit search and query capabilities based upon a microchip number or to record and display a microchip number on horses in within a farm or trainer programs.

So in summary, although we could not identify sufficient benefits to justify the added cost to make microchip be a requirement to registration, we believe identification is fundamental to the stud book and as such we are modifying our systems to enable the reporting, storage and retrieval of this information for thoroughbreds.

Thank You.

(Applause)

MR. FICK: We would be happy to take any questions at this time.

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A VOICE: There has been talk the last few years about using microchips to chart racing, the charts that are used in the Daily Racing Form; are these the chips that will do that or does another chip have to be implanted to do that?

MR. FICK: Well, as we have talked, the read ranges on these chips aren't far enough to be able to chart the horses as they go around the racetrack. That is a much larger RFID tag that is, I believe, an active tag that is sending out a signal in some cases. The Jockey Club, through Equibase, is looking at four or five different technologies that are in the process of developing RFID systems that will chart the running of the horse, the X, Y factor. Unfortunately, we cannot put a microchip in the nose of the horse and chart the races, at least not at this point in time. It is all a factor, as Kevin said, of how much copper wire you can put on that chip as far as how far it will bounce back the response you get from the reader and you sure can't put much, at least at this point in time, on a grain of rice. With the device that Kevin talked about that you put in cattle, you have a much larger antenna, the copper wire, you can literally have a truck drive down the road and pass the reader or antenna and it will tell you what cattle just went by. So the technology is there we just have to get a larger chip somehow.

Dr. Jensen?

DR. RON JENSEN: This question is for Ms. Mercer, I'm wondering has the Horse Racing Board in Britain or in Ireland utilized microchips as a tracking device when an individual horse goes from location to location?

MS. MERCER: No they haven't. To date, the microchips have purely been used as a secondary means of identification, there has been no form of tracking in terms of the location as Dan has already considered here. In terms of national equine database, quite similar to the thoughts that you have here in America and Canada, within Europe there is a strong movement towards having a national equine database, in fact, the UK government actually formed a national equine database for the UK last year, so animals within the UK are now officially recognized within that database. A lot of the concerns that I heard raised earlier in the presentations about security of that data and how it might be used from an IRS point of view were also discussed in the UK, and the agreement that was reached was that the UK government will require specific information about horses and the keepers of those horses. They don't necessarily want to know exactly, pinpoint where the horse is, but should there be an outbreak of an infectious disease they do want to be able to immediately contact every horse owner within a particular location and advise them that there is a risk and that they may need to curtail their movements or whatever additional activities the government suggests. To date, microchips do not take any part in that whatsoever. Microchips are recorded on the national equine database but they are not actively used to track movement from far to farm and location to location.

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A VOICE: Does anyone on the panel see microchips replacing lip tattoos any time in the future?

MR. FICK: As we talked earlier, microchips would not be the end all say all, you are still going to have to have the other identifications. You may need to be able to identify the animal and not have a reader, and so the lip tattoo will work. At this point in time we think that they are a beautiful cross-check, but we don't envision lip tattoos going away.

A VOICE: Would it be possible to use chips in the identification of horses for morning workouts?

MR. FICK: Yes. As horse's come on, through the gap, whoever is working the gap could go ahead and read the microchip in the horse. That information could be transferred up to the clocker's stand. It would be much easier than flipping a lip tattoo sometimes.

A VOICE: Couple of questions. First, as the program is being established do they envision veterinarian essentially functioning as the gatekeeper on this program? Will it require a veterinarian to apply and verify application of these microchips, and if that is the case?

MR. FICK: Kevin, do you want to answer that?

DR. OWEN: I don't necessarily think that across the board that would be the case, I think there is a strong possibility that in some of the registries, stud books, etcetera, the technicians that they already have in place will be recruited for that.

MR. FICK: How about in the UK?

MS. MERCER: Certainly within both Britain and Ireland, it is mandatory that a qualified veterinary surgeon inserts the microchip. However, there is no onus on the veterinary surgeon to be held accountable for the identification of that animal, that is still our job, the stud book's job, and the microchip doesn't just identify an animal in isolation, it only forms one significant but small part of our process.

I think the strength of microchipping in Great Britain and Ireland, and it's use as a secondary identification, the strength comes from all the other procedures the taking of markings, the DNA, all of these pieces of the jigsaw contribute to a very robust form of identification, one that does not require a vet to be comfortable for that.

MR. FICK: Any other questions?

A VOICE: Are there any plans to find out the registration certificate for race identification purposes -- will microchips become the primary source of identification for racing?

MS. MERCER: In terms of identification, be it racing or breeding, no. At the moment, we are very, very happy with our primary means of identification, they don't fade, they don't stop reading, they don't have any malfunctions. The beauty

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of the microchip is that is it is a secondary level of identification, it's quick, it's easy. Our trials and experiences have shown it to be robust, but no, at the moment we have no intentions to make microchips the primary means of identification.

A VOICE: What is the procedure when a microchipped horse dies?

MS. MERCER: In terms of what we require in Great Britain and Ireland, death of any registered thoroughbred is reported back to us. The UK government, with the introduction of the National Equine Database, also requires us to notify with the death of any animal. Any animals that go to slaughter, the abattoirs by law have to require the passport for that animal before its slaughter, they also have to return that to us and file a report to the UK. So the reason is to ensure that animal that dies, if we are notified, which it is supposed to be, we then feed that information into National Equine Database and it is there and recorded.

MR. FICK: As a point of clarification, there is some thought out there that because it is a chip you can store lots of information on the microchip, the horse's health papers, registration, information, not on a chip that is the size of what is in the horse. Plus, you don't have the power to send that much information back, but it's very simple in that you could have your scanner hard-wired through a cable to a tablet PC, scan the horse, and if you've got the horses records stored in that PC or if it's a wireless, you can automatically connect to The Jockey Club database, so you could scan that horse and get the horse's health records, the horse's identification, the horse's race records.

A VOICE: When you were first applying this in the UK, was there any thought as to which horses should be microchipped, making it a requirement for older horses?

MS. MERCER: At the time when it was introduced, no, the decision was made that we would draw a line in the sand and move forward, in terms of the animals that would be microchipped. We are coming under a small degree of pressure because the French authorities have now decided to make microchipping mandatory in any equine competing. So we are currently advising all of our trainers that if they wish to run horses in France, we recommend that they actively get one of our vets to microchip the horse with a Weatherby's microchip prior to traveling to France. But no, we have no intention, at the moment, to make it retroactive, however, we did have some low-key discussions recently about the possibility of making that a consideration.

At the moment, well, by the first of January, all 7-year-olds and younger will be microchipped, so it's really our national hunt horses, which would be still actively competing much beyond that age. So, it may well happen retrospectively.

A VOICE: For the American Jockey Club, if you decide to make this a requirement, would it be retroactive?

MR. FICK: Not since we decided that at this point in time it doesn't increase our effectiveness with the identification of a horse at registration.

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What we need to see, which is what they have seen in a number of other countries across the world, is the industry start using microchips at the breeding farms, at the racetracks, at the barn. If you see that impetus building, so we are not starting from scratch out there, then I think that we would look at the possibility of maybe that. However, we are still a ways away from that.

A VOICE: Can microchips be duplicated?

MS. MERCER: If I could just answer initially on the microchips that we utilize, the microchips we use, they are a specific number set to us. Yes, if someone wanted to go out through a very extreme exercise and create a duplicate, they could. The one thing that they couldn't do is, within all of our microchips, we have a secondary indicator on there, which no one is aware of, and no one knows what it is. So, even if we did find a microchip which had exactly the same number as one of our horses, as soon as we would read it with our readers, we would know if it was a Weatherby's microchip or not. So as far as we are concerned, duplication for us is not an issue.

A VOICE: That being said, since they can be duplicated, does the British Racing Board or racing in the UK utilize DNA testing as we do here? In other words, the DNA testing could work as a back-up here, for us in this country, is that the same case in Europe?

MS. MERCER: Absolutely. All of the horses, since 1986, we have been verifying the blood type and that moved to DNA in 2001. As I stressed earlier, the microchip is not the sole identifier, so even if a horse is presented in front of a Jockey Club vet at a racecourse, unless the passport markings were good in the first instance, only then would they go to read the microchip. If that then verified, then in theory, they should be fine. However, if the Jockey Club vet has any question at all in his or her mind, then it will there and then take a blood sample, it will become a racecourse query, it will come into our systems. So within 24 hours we would know if that horse was a problem horse or not.

So I really can't stress enough that we cannot use microchips in isolation; it is all part and parcel of a larger picture, certainly in Britain and Ireland.

A VOICE: Wasn't there a problem with two horses shipped to Australia and identification?

MS. MERCER: Yes, a really interesting case in that one of the horses was microchipped and the second horse was not, he was an older horse, a 1997 horse, so we are quite confident that had both horses been microchipped, and had both horses gone through the correct procedures, this instance wouldn't have happened. I am grateful to my team that they picked it up literally the day that we received the application. So, had the microchip been in both instances, I am quite sure that it would never have gone as far as it did, but unfortunately, the horse that did travel to Australia was an older horse, pre-microchipping days, and therefore was

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nothing against which to measure it. When the vet tried to read the microchip, he assumed the microchip had ceased reading, naturally, there should have been a more active stance taken on that because the reason it wasn't reading was because there was no microchip there.

A VOICE: Can you talk about any cases in which a horse has rejected an implant?

MS. MERCER: You mean in cases were the animal rejected the microchip? Is that correct?

A VOICE: Yes.

MS. MERCER: Basically, all we did was were there was an adverse reaction, the implantation site was left to heal, just by the standard healing process, and once the animal was comfortable again, in a slightly different site, the chip was re-implanted. We have really had no problems.

Sometimes it is just a case of a little bit of dirt, or something gets trapped in the needle, etcetera, you can get a slim risk. However, the adverse reactions are decreasing year on year. I think as our vets become more skilled in the use of the implantation methods, then we're naturally getting fewer and fewer problems, and to date there really have been very few anyway. A natural healing process will correct that

MR. FICK: I might add, just to remind everybody, we have a number of handouts from the USDA and American Horse Council on all aspects of ID, including white paper on microchips and another white paper on the different diseases that are cross species.

Also, when we get done, we have a reader and a bio-thermal chip that Kevin is going to demonstrate, if anyone would like to come up and see how they work and try it out.

There is also a demonstration available in our conference room right outside, it shows the different screens that we have developed, the California Horse Racing Board, to help them track the horses that they are going to be microchipping next year.

Any other questions?

Well, I appreciate your attention. Thank you.

(Applause)

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