Chico Equestrian Association

www.chicoequestrianassociation.org May/June 2015

President's Message

I hope everyone is enjoying the nice spring weather with your equine friend(s). Our club sponsored a desensitization clinic on April 12, and we had a great turnout. Thank you, Deni Whiting, Jeff Crawford and Ute Wirth for the excellent help and instruction that you provided at this clinic. We hope to do another desensitization clinic in the fall.

Please join us for the Cowboy Dressage Clinic on May 17. The clinicians are Nonny Largent and our own CEA member, Wyatt Paxton. This is a great opportunity to learn about this popular and growing sport. See "CEA Events" just below for more details.

Our April general meeting was very well attended. Joe Maxwell , a custom saddle maker and fitter from Cottonwood, lectured on the proper fit of western saddles, and allowed members to bring their own horses and saddles for a fitting. On May 12, Tamara Yates, an equine massage therapist, talked about the horse skeleton and painted a skeletal and muscle diagram on a live horse. The next meeting will take place at the Book Family Farm in Durham on June 9. Nattie Book will do a horse-driving demonstration for us. It should be lots of fun.

-Lorie Brooks, CEA President

CEA Events

Sunday, May 17; 9:00 AM to 4:00 PM
Cowboy Dressage clinic with Nonny Largent and Wyatt Paxton. There is currently space for one more rider; the cost is $100. Call Wyatt at 530-784-8000 to reserve your slot. Auditors are welcome; the cost is $20.00 for members, $30.00 for non-members, and free for 18 and under. At the CEA arena in Upper Bidwell Park.

CEA Officers & Board

CEA Officers
President: Lorie Brooks
Vice President: Jan Sneed
Secretary: Donna Mathis
Treasurer: Kathleen McFarren

Board Members
Jeff Crawford (Webmaster)
Sue Holt
Skip Oberdorf
Wyatt Paxton
Deni Whiting
Bryan Wickham
Kathleen Woodard

Gate combo - For Members Only
CEA members get the gate combo in their newsletter

CEA Meetings

Tuesday, June 9
6:00 - General Meeting. Nattie Book will provide a driving demonstration. At the Book Family Farm, 144 Heavy Horse Lane in Durham. More details to following—watch for an e-mail.

7:00 - Board Meeting. Everyone is welcome at the board meetings! But only officers and board members may vote on CEA business.

July: NO MEETING
August: Tuesday, August 11

Local Events

May 16
CSHA Reg. #2 Sanctioned CSHA Trial Trial
Location: Black Butte Lake Grizzly Flats Call Chris Enos 530-865-8471 or Email: kcenous@sbcglobal.net Check out the website www.trailtrials.com to download the entry form and get more information. Divisions: Novice, Intermediate & Advance, by age category. Come have some fun and enjoy the day.

May 16
Gold Country Trails Council Poker Ride
Location: beautiful Skillman Horse Camp in the Tahoe National Forest, just above Nevada City. Go to website to get entries, information: goldcountrytrailscouncil.org Click on 2015 POKER RIDE box on the right hand side. Or, you can email the GCTC Poker Ride Manager, Linda@Mtnequestrian.com

May 30
CSHA Reg. #2 Sanctioned CSHA Trial Trial
Location: Murphy Ranch, Capay Valley, 18 miles west of Woodland. Buckles to be given in the 3 divisions to riders with lowest overall points for all 3 rides. Dates for Rides 2 & 3: July 25-26 at Dru Barner Equestrian Camp located in El Dorado National Forest. Call Erin Vannucci 530-796-3266 or email bluedogeb@aol.com Check out the website www.trailtrials.com to download the entry form and get more information. Divisions: Novice, Intermediate & Advance, by age category. Come have some fun and enjoy the day.

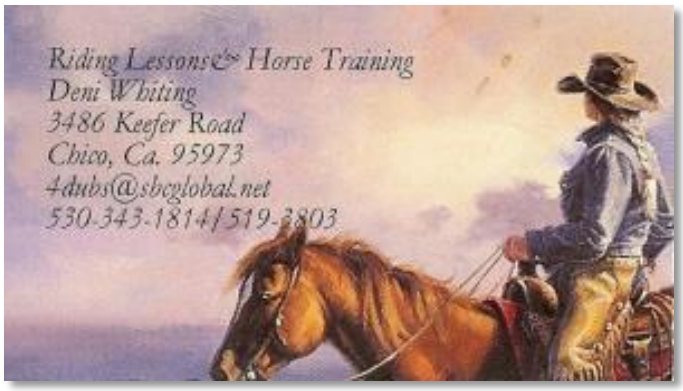
May 30 – 31
Rolling Hills Equestrian Center Reining Clinic
All levels welcome. See flyer on this site under Event Flyers. Contact Eric Laporte (919) 901-9403 or email laperic@gmail.com. Visit http://rollinghillscasino.com/meetings/equestrian-center/

June 5-7
Western States Horse Expo
At Cal Expo in Sacramento. Visit http://horsexpo.com/

June 5-7
Butte County Sheriff's Posse Bandit Chase
http://www.buttecountysheriffsposse.com/

October 10
Lope for Hope
Sponsored by the Desperate Horsewives of Biggs. Location: Saddle Dam in Oroville. This is a Breast Cancer Awareness trail ride. More information to follow.

CEA Member Business Cards



PICTURE <u>YOUR</u> BUSINESS CARD HERE!

If you have an equine-related business and are a current member of CEA, please send us a high-resolution copy of your business card. We'll post it in the next CEA newsletter and also on our website.

E-mail your business card to Kathleen at skmcfarren@comcast.net.

How Your Horse Got His Color (And Why You Should Care)

By Lindsay J. Westley
April 28, 2015

A horse's coat color genetics are important not just for aesthetic reasons or breed registry; they can also have serious health implications.

As a kid trotting around the 4-H show ring, I was convinced that judges favored my best friend's horse—a flashy dapple-gray Thoroughbred with black legs and a dark mane and tail—over my undistinguished (but much-loved) liver chestnut. The fact that my friend rode well and that gorgeous "Penny" was also a great mover with picture-perfect jumping form probably had something to do with their success, but that didn't stop me from wishing and hoping that my family's soon-to-foal mare, a coppery-red chestnut, would drop a stunning steely gray baby with black points.

Well, it didn't happen. Out popped a colt with (surprise!) a coppery-red coat matching that of his sire and dam. In hindsight, the odds were stacked against me, as breeding a chestnut to another chestnut will inevitably yield more of the same. (And if it doesn't, it's time to do a paternity test!) But that's one of the few givens in the world of equine coat colors, an equation that's only solved by digging deep into the genes that make up equine DNA.

Equine Coat Color Genetics

All equine coat colors and patterns stem from three basic coat colors: red, black, and bay. Two genes control how these colors are expressed. The Extension (or E) locus gene determines whether black pigment will be expressed somewhere in the coat, and the Agouti (or A) locus gene defines where the black will be expressed. All bay and black horses have at least one copy of the E allele. And because the A gene determines the black's location, it's the determining factor of whether a horse is black all over or just has black points (legs, tail, mane). The chestnut color, on the other hand, is a recessive trait, so horses must have two alleles for it to show up (e/e). All other coat colors are variations on these three colors.

Color is More Than Skin-Deep

If you're not particular about the color of horse you ride, you might not have spent much time thinking about coat color genetics. But understanding how a horse inherits a particular coat color is essential if you're planning to breed. Beauty isn't just skin-deep in horses; it can mean the difference between health and sickness—sometimes even determining whether a new foal can survive. That's because the gene mutations responsible for producing specific color patterns can also cause some serious health problems.

While that might be reason enough to test your horse's DNA for certain mutations, it's also quite handy to know what colors your sire and dam carry if you intend to register your foal with a breed association that requires a specific coat color (the Appaloosa Horse Club, the American Paint Horse Association, or the Palomino Horse Breeders of America, for example), or one that prohibits white markings of a certain size on the body, such as the Rocky Mountain Horse Association or the Friesian Horse Association of North America.

Mapping the Equine Genome

Breeding for a specific color used to be more like a dice game than a lab report. Scientists could run some tests, but accurately predicting coat color involved a complicated series of blood-type evaluations. That all changed in 1997, when a group of international scientists started working together to create a genetic map of the horse. The Horse Genome Project collaborators sequenced the equine genome (or genetic material/DNA) in 2007—an immediate boon for scientists and veterinarians who could now more easily use genetic information to understand common hereditary diseases. The completion of the Horse Genome Project also made it infinitely easier for equine geneticists to predict coat colors and avoid those combinations that have serious health implications, says Kathryn Graves, PhD, director of the Animal Genetic Testing and Research Laboratory at the University of Kentucky, in Lexington.

Today's coat color tests only cost, on average, $25-40 and simply require taping a small bunch of your horse's mane or tail hairs to a piece of paper and shipping them off to a licensed lab.

Mutations: The Good, the Bad, and the Ugly

A mutation is a permanent change in a gene's DNA sequence that occurs during cell division. Both a sire and dam can pass hereditary mutations to their offspring. In domestic animals such as horses, breeders have, over time, selected for coat color-related mutations because they produced unusual or desirable patterns. This has caused many mutations to eventually became fixed in the population, says Graves. Prehistoric horses were primarily dark colors prior to domestication, as evidenced by genetic tests German researchers performed on ancient horse remains (Ludwig 2009).

From an aesthetic perspective, it's important for breeders to have a basic understanding of the coat color genes and what they do. Scientists defined the major coat-color genes and their associated mutations years ago, but the molecular data that became available starting in the 1990s helped geneticists like Cecilia Penedo, PhD, of the University of California, Davis, Veterinary Genetics Laboratory, identify mutation variations much more readily. The completion of the equine genome made it even easier.

Now Penedo's specialty is the cream and pearl dilution—a mutation that dilutes a base coat color (which can be either black, bay, or chestnut) into a variety of different colors, such as cremello, buckskin, or perlino. And, like most equine geneticists, she also keeps a close eye on the mutations that cause white coat patterning or white spotting.

In many disciplines it's highly favorable (or, in the case of color breeds, required) to produce a horse with flashy white markings or spots. But, Penedo cautions, it's also risky. That's because the mutation that produces the white patches found in the main frame overo patterns (white patches centered in the body and neck and framed by colored areas) is the same mutation that produces the deadly overo lethal white syndrome (OLWS).

Heterozygosity (one copy of the mutated form of the gene and one normal copy) for the OLWS mutation produces an attractive white spotting pattern in breeds such as Paints, Quarter Horses, Thoroughbreds, and Tennessee Walking Horses—basically, a foal with striking markings born

without incident. A horse that inherits two copies of the mutant gene, however, is born completely white and possesses the major developmental defects that define OLWS.

“These are major genes that are affected,” says Penedo. “They’re involved with cell development and the proliferation and migration of cells through embryonic development—they don’t simply determine coat color.”

More specifically, foals born with OLWS lack the ability to pass food through the gut and excrete waste, causing them to become impacted and die within a few days. Most are euthanized at birth. Because of the fatal consequences now definitively associated with breeding two overo-pattern horses, most owners of horses that clearly carry the overo gene test their stock before breeding.

Genetic testing remains important, however, for breeders of all colors with Paint or stock horse ancestry, because the American Paint Horse Association notes there are records of two apparently nonspotted parents producing frame overos. Testing has revealed that these horses are actually frame overos whose body color is so dark it overpowers any spots.

“Horses can appear a solid color with minimal white markings and can still carry the overo gene,” Graves says. “And a lot of Paint horses have mixed patterns that may mask the more obvious markings of an overo.”

On the flip side, Graves says, it is important to know the parents’ genotypes before you assume a white foal is has OLWS. Not all pure-white foals are overo; healthy white foals might actually be sabino-patterned. While sabino is a subclass of overo, it doesn’t carry the mutation responsible for OLWS.

Other Problem-Causing Colors

Overo lethal white syndrome is the only known fatal disease associated with a coat color gene mutation, but that doesn’t mean other coat types don’t also cause problems.

The same genes that cause Appaloosas’ distinctive spotted coat pattern, the LP (leopard complex) mutation, can cause adverse effects in these horses. Appaloosas that have two copies of the dominant form of LP are commonly afflicted with congenital (present at birth) stationary night blindness (CSNB). This inherited disorder makes it difficult or even impossible for the horse to see in the dark. Many Appaloosa owners might not even realize their horse is affected but, if they do, they can make simple equine management changes to accommodate the problem. The bigger issue, notes Penedo, is that breeders continue to produce primarily white Appaloosas, which are associated with the LP mutation. “Sure, you can change the way horses are handled and trained to accommodate for night blindness, but there are some consequences associated with it,” she says.

A similar problem is associated with the silver gene: It produces a very attractive color dilution on black-based horses (such as the Rocky Mountain Horse’s chocolatey coat and flaxen mane and tail), but two copies of the silver mutation gene result in multiple congenital ocular defects that impair vision.

“Take into account the function and marketability of your horse as a whole - because (when you breed) you may not get the color you want!”

DR. KATHRYN GRAVES

While these health effects are widely known (and tested for), many geneticists conjecture there are other white-spotted mutations that cause mares to resorb or abort fetuses. But because there’s currently a limited field of genetic tests, it’s nearly impossible to draw definitive conclusions.

Coats of Many Colors (And a Few Surprises, Too)

The ability to define mutations and the genes associated with specific coat colors through relatively inexpensive genetic testing has greatly reduced the number of surprises born. In Graves’ laboratory at the University of Kentucky, the most popular test is for tobiano spotting. Horses that are homozygous for tobiano will always produce spotted foals, regardless of their mate; this is desirable if you are breeding for spots. Other owners want to know what color they need to breed their horse to in order to achieve, say, a blue roan or a cream dilution color. “There are a couple of tricky inheritance things that take people by surprise sometimes,” Graves says. “For example, if you breed a palomino to a black horse, hoping to get palomino or buckskin, you need to know that black can mask the cream. Alternatively, you might have a black horse that throws palominos—and that can be quite a surprise!”

Similarly, breeding a bay to a chestnut can result in a jet-black horse, thanks to the way the two genes interact. Another variable color is gray, as horses are typically born dark, then get progressively lighter. Graves recalls a gray Quarter Horse stallion in Kentucky that sired quite a few palominos and buckskins, because his gray color masked the fact that he was actually a palomino. “People weren’t too happy when he was throwing cream, as that wasn’t nearly so desirable in the hunter-under-saddle classes they were breeding for,” Graves says. “You need to get an idea of the colors that are in a horse’s pedigree, because they may very well pop up.” Color preference certainly varies among the disciplines, but Penedo and Graves both emphasize the importance of breeding for healthy animals first, with priorities such as color falling second. They also caution that, while genetic testing has greatly improved the accuracy of color prediction, there is still an element of genetic variability (remember Thunderhead, sorrel Flicka’s throwback white colt?).

“Even if you produce a horse that isn’t a fancy color, consider what his value will be if he has good conformation, as compared to a flashy horse that has conformation problems,” Graves says. “Take into account the function and marketability of your horse as a whole—because you may not get the color you want!”

Lindsay J. Westley

Lindsay J. Westley is a freelance writer based in Burlington, Vt. She grew up riding hunters, worked as a wrangler in Montana, and spent two years as a professional polo groom. She rides between deadlines when she can find a horse.