

Equine Stress, Research & Education

2020 ESRE Committee Meeting
Chair: Lori Conway
Vice Chair: Chris Culbreth
AHA Staff: Stan Morey

Equine
Stress!



It's not
always so
obvious!

AGENDA

- 1.) Roll call. Type your name in the chat. You can raise your hand to talk in the participants area.
- 2.) What is ESRE?
 - This committee is committed to staying abreast of all things educational for the health and well-being of our horses and researching ways to reduce and eliminate stress from our horses. The Facebook page: AHA-ESRE is updated routinely with Educational and Informative information. This is a private group, so you must ask to join and you will be added.
- 3.) Shoeing
- 4.) Rescue & Rehoming of Arabians. We need to work together to reduce the number of Arabians that end up in the pipeline. ESRE should spearhead a list of qualified people and facilities to contact if you know someone that needs assistance before their horses end up in the kill pen. Debbie Fuentes is available if you have any questions for her.
- 5.) PAST ACT & AHA's Stance - Stan Morey
- 6.) Arabian Horse Foundation - Update - Beth Minnich
- 7.) Any other business?

How to Make Your Horse's Life **Less Stressful**

- Maintain a consistent daily routine
- Create a healthy diet and feeding schedule
- Increase pasture time
- Adjust exercise schedules
- Monitor social interactions
- Take care when traveling
- Perform preventative care





Heavy Pads being used that are made with Polymer Tungsten rubber. It is flexible, absorbs concussion and it can be cut with a pair of scissors. It does not X-ray and is ILLEGAL.



No Sho Pads

Polymer Tungsten (also known as Tungsten-filled Polymer) is a composition of various resins and Tungsten powder which are mixed together through special metallurgical technology. The resins can be ABS (acrylonitrile butadiene styrene), PP (polypropylene), PBT (polybutylene terephthalate), PA (polyamide), PU (polyurethane), and TPE (thermoplastic elastomer), etc. It's an ideal substitute of lead for radiation protection.

Properties of our polymer tungsten

-High density: $\geq 11.34 \text{ g/cm}^3$

-Perfect radiation shielding performance: Tungsten has comparable radiation shielding ability as lead but is much healthier than lead. To date, many manufacturers, especially those in medical industry, are trying to replace lead radiation shielding products with Polymer Tungsten products.

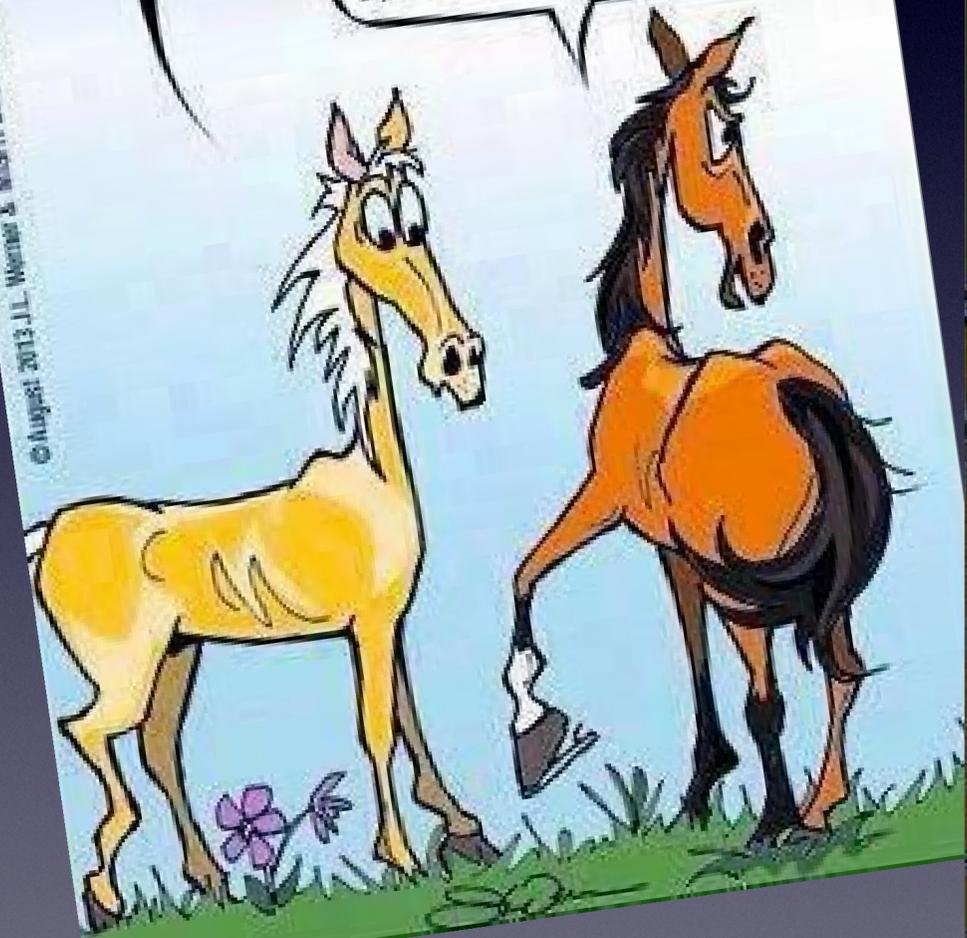
-Good flexibility and excellent workability: The Polymer Tungsten sheets can be cut or holed with household scissors and formed into shapes with various curved surfaces. **-Healthy and environmentally friendly:** The Polymer Tungsten is made of non-toxic & recyclable materials and produces no pollution to the environment.

Application of our polymer tungsten

- X-ray inspection device for industrial and medical use
- Radiation shielding and radiation-protective equipment
- Consumer-use products such as raw material for vibration suppression, weight, acoustic (audio) isolation, etc. because of characteristics of enabling 3-dimensional forming
- X-ray shielding material and substitute for lead fiber mat in nuclear reactor piping systems
- Medical radiation collimator

You've almost got that shoe off. What are you waiting for?

The farrier. He hasn't left yet...



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IT LOOKS TOO BIG TO EAT...

WE COULD TEAR IT INTO SMALLER PIECES FIRST...

IT'S GOT TENTACLES!!! PULL IT INTO YOUR STALL AND PEE ON IT!!!



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JL Werner

CLEARLY THE RIGHT FRONT

HE'S OFF BEHIND

IT'S LEFT FRONT

ACTUALLY, I'M FINE...



IF YOU STARE AT A HORSE LONG ENOUGH, YOU CAN MAKE IT LAME IN ANY LEG YOU WANT.

© August 2018 J.L. Werner / Misfit Designs for EQUUS

Shoeing our Arabians

5. Pads.

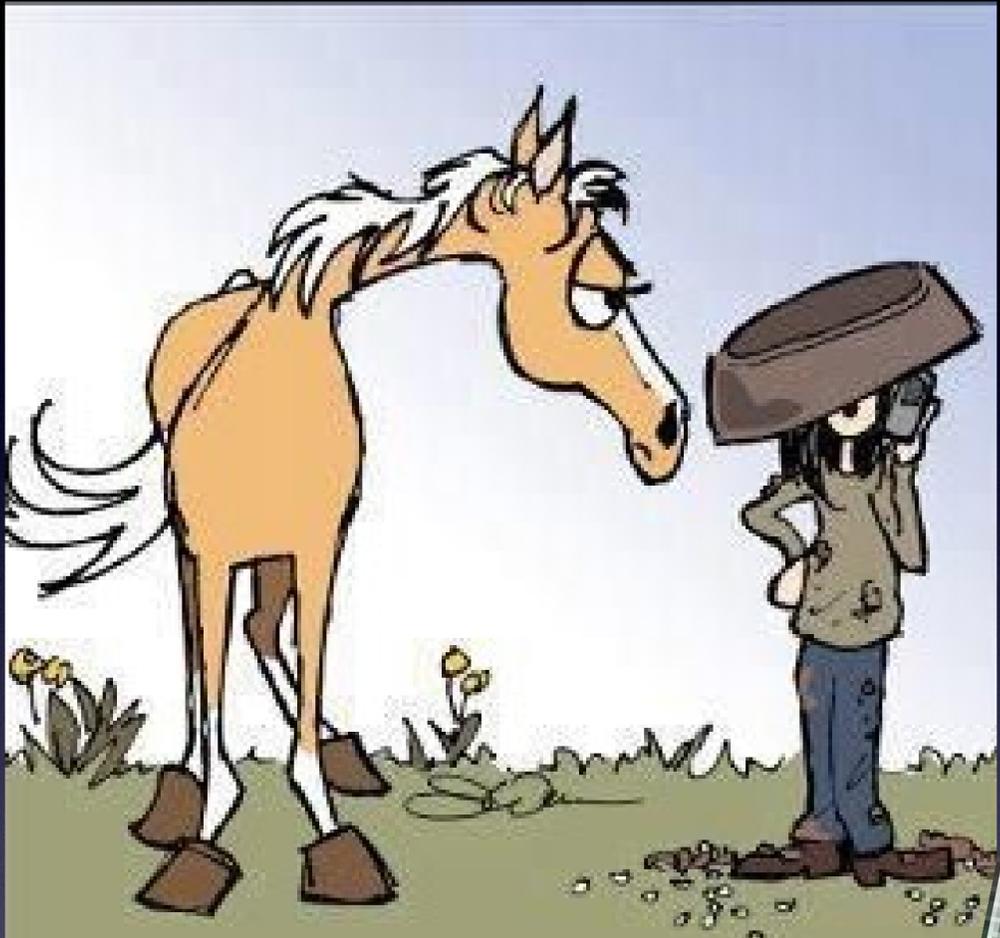
a. The use of pad(s) (either full or partial, including rim) made of rubber, leather or plastic, is allowed.

b. The introduction of a foreign material within, attached to, or between the pad(s), between the pad and the shoe, between the pad and hoof or in conjunction with the pad or shoe (other than accepted packing material such as oakum, pine tar, silicone, foam rubber etc.) designed to add additional weight or enhance action is strictly prohibited.

c. Material with anti-concussive qualities (such as rubber, silicone, latex, etc.) may be used between the pad and hoof for additional support, provided such material does not extend beyond the inner rim (edge) of the shoe.

6. At the discretion of a judge or a steward officiating at a licensed Arabian competition, or Arabian classes in any Federation licensed competition, or at the request of the Show Committee (See GR1201 License - Operation of Competition) inspection of shoes, pad(s) and/or hoof length may be required.

1. Inspection shall include measuring the shoe, measurement of hoof length, and in the case of the presence of a pad, inspection of the pad(s).
2. **Inspection may include but is not limited to, visual, X-Ray, metal scan, or manual separation of pads.**
3. Shoes and pads, if present, cast after entering or before exiting the arena in any class, not exempt from shoeing regulations, shall be inspected as described above by a licensed steward or judge officiating at the competition.
4. Any trainer, exhibitor and/or agent of a horse subject to the inspection each may request to be present and heard while said inspection is being performed by said licensed official(s).
5. Prior to any disqualification and/or other penalties imposed on a horse at a competition, the inspecting officials shall make reasonable efforts to notify and have present, the owner(s) and trainer(s) of said horse, or agent(s) at the inspection.
6. The inspecting officials shall take possession of any shoe, and/or pad(s) and measure the shoe with an accurate gauge and inspect pad(s). Measurement of hoof length shall be made in accordance with AR106.4 Method of Measuring Toe and Shoe.
7. **In the event that the inspecting officials find a violation of the shoe measurement, hoof length and/or pad(s) rules the horse shall be disqualified for the remainder of the competition, and the owner shall be required to forfeit all prize money, sweepstakes and trophies, entry fees, ribbons, and points won at said competition by said horse.**
8. **Additionally, any forbidden foreign material found within, attached to, or between the pad and the shoe, between the pad and hoof, or in conjunction with the pad or shoe is in violation of AR106.5b. The steward shall report the alleged rule violation to the Federation. The Trainer and/or Owner may be subject to disciplinary action. BOD 8/18/20 Effective 9/1/20**
 1. In the event the Hearing Committee determines a violation has occurred, the trainer, owner and/or their agents each shall be subject to any and all penalties imposed by the Hearing Committee at its discretion pursuant to Chapter 7, including suspensions, fines, and the revocation and redistribution of winnings. Notice or notices of which shall be published on the Federation's website. The suggested penalty is a minimum of 30 days and a maximum of one year suspension. Subsequent violations of this rule by any individuals/entities shall be subject to such greater penalties as determined at the discretion of the Hearing Committee. *BOD 8/18/20 Effective 9/1/20*



"AS A MATTER OF FACT, HE DID NOTICE THAT I HID THE MEDS IN HIS FEED."



Rescue & Re-Homing our Arabians

- The ESRE-AHA Facebook page could have a list of reliable people and places that people could contact in every state for assistance.
- Does anyone have any interest in getting involved in this project?
- Debbie Fuentes, is available to answer any questions you may have for her.
- www.slideshare.net/trufflemedia/ms-debbie-fuentes-arabian-horse-association-perspective-equine-identification





Shown Here:

Passed House (07/25/2019)

U.S. Senator Joseph D. Tydings Memorial Prevent All Soring Tactics Act of 2019 or the PAST Act

This bill addresses the practice of soring horses. The soring of horses includes various actions taken on horses' limbs to produce higher gaits that may cause pain, distress, inflammation, or lameness.

Specifically, the bill expands soring regulation and enforcement at horse shows, exhibitions, sales, and auctions, including by establishing a new system for inspecting horses for soring.

The Department of Agriculture (USDA) must license, train, assign, and oversee persons for hire by the management of horse shows, exhibitions, sales, or auctions to detect and diagnose sore horses. A license may not be issued to a person with conflicts of interest, and USDA must give preference to veterinarians. USDA may revoke a license for unsatisfactory performance.

In addition, the bill increases penalties for violations. USDA may disqualify (1) violators from specified activities related to horse shows, exhibitions, sales, and auctions; and (2) a horse that is sore from being shown or exhibited.



The Arabian Horse Foundation Research Program
Dedicated to Improving the Health of Arabian Horses

<https://thearabianhorsefoundation.org>

Research Advisory Panel Members:

Beth Minnich, Chair

Ray Cerniga, DVM

Lori Conway

Tim Fleck, DVM

Ty Wallis, DVM

Commercially Available Genetic Tests (2020)*	Mode of Inheritance
Androgen Insensitivity Syndrome (AIS)	X-linked recessive
<u>Cerebellar Abiotrophy (CA)</u>	<u>Autosomal Recessive</u>
Congenital Stationary Night Blindness (CSNB) [2 different forms]	Autosomal Incomplete Dominant Autosomal Recessive
Distichiasis	Autosomal Recessive / Incomplete Penetrance
Dwarfism	Autosomal Recessive
Equine Familial Isolated Hypoparathyroidism (EFIH)	Autosomal Recessive
Foal Immunodeficiency Syndrome (FIS)	Autosomal Recessive
Glycogen Branching Enzyme Deficiency (GBED)	Autosomal Recessive
Hereditary Equine Regional Dermal Asthenia (HERDA)	Autosomal Recessive
Hoof Wall Separation Disease (HWSD)	Autosomal Recessive
Hydrocephalus	Autosomal Recessive
Hyperkalemic Periodic Paralysis Disease (HYPP)	Autosomal Incomplete Dominant
Immune-Mediated Myositis (IMM)	Autosomal Dominant / Variable Penetrance
Junctional Epidermolysis Bullosa (JEB1 / JEB2)	Autosomal Recessive
<u>Lavender Foal Syndrome (LFS)</u>	<u>Autosomal Recessive</u>
Lethal White Overo (LWO)	Autosomal Recessive
Malignant Hyperthermia (MH)	Autosomal Dominant
Multiple Congenital Ocular Anomalies (MCOA)	Autosomal Incomplete Dominant
Myotonia	Autosomal Recessive
Naked Foal Syndrome (NFS)	Autosomal Recessive
<u>Occipitoatlantoaxial Malformation (OAAM1)</u>	<u>Autosomal Recessive</u>
Ocular Squamous Cell Carcinoma (SCC)	Autosomal Recessive / Incomplete Penetrance
Polysaccharide Storage Myopathy - Type 1 (PSSM1)	Autosomal Incomplete Dominant
<u>Severe Combined Immunodeficiency (SCID)</u>	<u>Autosomal Recessive</u>
Skeletal Atavism	Autosomal Recessive
Warmblood Fragile Foal Syndrome (WFFS)	Autosomal Recessive

*list does not include all tests currently offered

U.S. Labs Offering Arabian Panel Testing

(SCID, CA, LFS, OAAM)

- UC Davis Veterinary Genetics Laboratory** - <https://vgl.ucdavis.edu/>
- VetGen - <https://www.vetgen.com/>
- Animal Genetics - <https://www.animalgenetics.us/>
- Etalon Diagnostics - <https://www.etalondx.com/>

**also offering pre-implantation genetic diagnosis (PGD) - to screen embryos for genetic traits prior to implantation



- The Arabian Horse Foundation is the charitable arm of the Arabian Horse Association
- The Foundation has a Board of Directors separate from AHA and is financially supported solely through donations
- Research arm added in 2007 to support projects directed at improving equine health, with a focus on issues of particular interest to the Arabian breed
- Program has provided \$75,000 in funding for a variety of projects, including collaborations with top veterinary research programs
- When program was initiated, SCID was the only genetic test available for Arabians. Since then, the Foundation has been involved with studies that have resulted in the development of direct DNA tests for CA and LFS.
- The Foundation has also funded studies investigating the genetic basis of JIE, OAAM, Equine Metabolic Syndrome (EMS), and equine melanoma
- The Foundation is also interested in becoming involved in research projects related to performance horse medicine

How You Can Help!

Whether it's a little or a lot – every donation matters!

- Tax-deductible donations can be made when joining or renewing with AHA
- Donations can also be made online with PayPal or credit/debit card at the Foundation's website - thearabianhorsefoundation.org
- Or by sending a check to the Foundation's Treasurer at
 - 1024 K Street, Lincoln, NE, 68508
- Donors can designate their funds specifically for the research program
- Designate the Arabian Horse Foundation as charity of choice through Amazon at Amazon Smile, and a portion of purchase amount will go to the Foundation



Juvenile Idiopathic Epilepsy (JIE) Research

Dr. Samantha Brooks (University of FL-Gainesville)

- Data from this study suggests JIE is not a single gene; which may explain the wide range of severity exhibited by foals with this condition
- There is a publication in the works – but it is clear this is going to take time to sort through and figure out
- DNA samples sought from horses previously diagnosed with JIE, as well as horses that have had JIE offspring
- Contact the Brooks Equine Genetics Lab for more information: phone (352) 273-8080 / equinegenetics@ifas.ufl.edu

Occipitoatlantoaxial Malformation (OAAM)

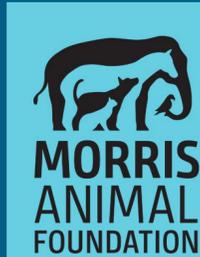
Dr. Carrie Finno (University of CA- Davis) - cjfinno@ucdavis.edu

- The Foundation has provided project funding aimed at determining additional mutations associated with other forms of OAAM
- Current work on this project includes whole-genome sequencing from two Arabians and one Arabian/Appaloosa cross that were affected with OAAM but did not have the OAAM1 mutation
- 5 potential mutations have been identified either in all 3 foals or in the two full Arabian foals
- One of these mutations is an insertion on chromosome 2 that is found only in the affected Arabian foals. This mutation is currently being validated.
- The long-term goal of this project is to have genetic tests for additional variants of OAAM (i.e. OAAM1, OAAM2, etc.)

Molly E. McCue, DVM, PhD, DACVIM-LAIM
University of Minnesota



Appraising Commercially Available Genetic Tests for Equine Muscle Diseases



- With the increasing recognition of the importance of genetic disease in horses, and the development of new technologies such as whole genome sequencing, there is an increased commercial interest in the rapid development and marketing of genetic tests for horses.
- While whole genome sequencing can pinpoint genetic variations associated with specific disease risk, it also can identify many dozens of genetic alleles (gene variations) with predicted effects that may or may not actually cause disease.
- Researchers will closely scrutinize currently marketed genetic tests for type 2 polysaccharide storage myopathy (PSSM2), myofibrillar myopathy (MFM) and recurrent exertional rhabdomyolysis (RER).
- This new information will ensure the validity of available screening tests and help veterinarians and horse owners make informed health decisions for horses with muscle diseases.



GENERAL ARTICLE | Open Access

Commercial genetic testing for type 2 polysaccharide storage myopathy and myofibrillar myopathy does not correspond to a histopathological diagnosis

Stephanie J. Valberg , Carrie J. Finno, Marisa L. Henry, Melissa Schott, Deborah Velez-Irizarry, Sichong Peng, Erica C. McKenzie, Jessica L. Petersen

First published: 08 September 2020 | <https://doi.org/10.1111/evj.13345>

Commercial genetic tests for type 2 polysaccharide storage myopathy (PSSM2) and myofibrillar myopathy (MFM) have not been validated by peer-review, and formal regulation of veterinary genetic testing is lacking.

Objectives

- To compare genotype and allele frequencies of commercial test variants P2, P3a, P3b, P4 between Warmblood (WB) and Arabian (AR) horses diagnosed with PSSM2/MFM by muscle histopathology, and phenotyped breed-matched controls.
- To quantify variant frequency in public repositories of ancient and modern horse breeds.

Results

- There was no significant association between any P locus and a histopathological diagnosis of PSSM2/MFM, and no difference between control and myopathic horses in total loci with alternative alleles, or total alternate alleles when PSSM2/MFM was considered combined or separately as PSSM2 or MFM.

Conclusions

- Because of the lack of significant association between a histopathological diagnosis of PSSM2 or MFM and the commercial genetic test variants P2, P3 and P4 in WB and AR, we cannot recommend the use of these variant genotypes for selection and breeding, prepurchase examination or diagnosis of a myopathy.

Ocular Squamous Cell Carcinoma

Squamous cell carcinoma (SCC) is the second most common type of tumor in the horse and the most frequent tumor of the horse's eye

Dr. Rebecca Bellone (UC Davis)

- Studying the genetic risk for ocular squamous cell carcinoma in Arabian horses
- Study is seeking samples from horses who have been clinically confirmed to have ocular SCC
- Contact: research@vgl.ucdavis.edu

Degenerative Suspensory Ligament Disease (DSL/D)



Left: A dropped fetlock and a thickened suspensory is evident in a horse affected with DSL/D.

Photo from University of Wisconsin School of Veterinary Medicine website

- A systemic connective tissue disorder
- Abnormal accumulation of proteoglycans in connective tissues, particularly in tendons and ligaments, leads to progressive and debilitating lameness and pain
- DSL/D is being recognized more frequently
- Affects more than tendons and ligaments; including the cardiovascular system and sclera of the eye
- General understanding of DSL/D genetics in horses is limited
- No strong candidate genes have been identified to date

DSLSD Research

Comparative Orthopaedic Research Laboratory

DSLSD Information Page

Genetics of degenerative suspensory ligament disease in the horse

Sabrina Brounts DVM, MS, PhD
Diplomate ACVS/ECVS, Diplomate ACVSMR
Clinical Professor of Large Animal Surgery

Peter Muir BVSc, PhD, Diplomate ACVS, ECVS, FRCVS
Melita Grunow Family Professor of Companion Animal Health

Comparative Genetics Research Laboratory, University of Wisconsin-Madison, School of
Veterinary Medicine, 2015 Linden Drive, Madison, WI 53706

sabrina.brounts@wisc.edu, peter.muir@wisc.edu

Genetics of Rabicano

Dr. Rebecca Bellone (UC Davis)

Rabicano is a white spotting phenotype that includes white around the tail head, also known as coon tail, and roaning or ticking in the flanks

- The study is seeking registered Arabian horses with and without the phenotype
- Contact: research@vgl.ucdavis.edu

equinegenetics@ifas.ufl.edu

Brooks Equine Genetics

Face Shape

Brooks Equine Genetics Lab is working to identify genetic components contributing to equine face shape. This fascinating trait varies greatly across breeds, and is an important component in our selection of valuable individuals

Why Do This Study?

- 1) Face shape in domesticated animals is a good model for skeletal development that can teach us about biology and help to better understand problems with skull shape in human disease.
- 2) Understanding the genetic basis for face shape will allow breeders to select for desirable variations more effectively, improving the value of their future foal crops.

The study will first analyze and quantify morphological differences of horse face shapes to scientifically define this trait, then use genomic tools to discover markers responsible for variations in this facial morphology trait.

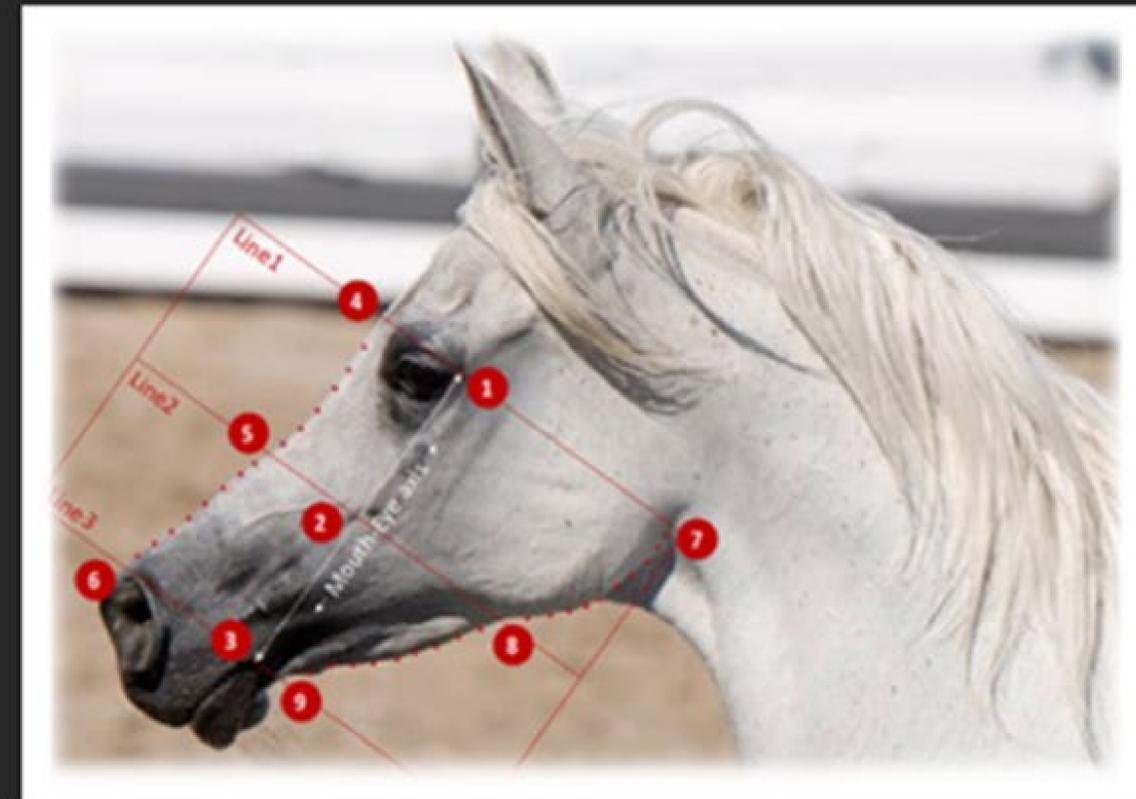


Figure: Example image of face photo with morphometric markers

% SCID Carriers Tested at VetGen



Total samples tested:
VetGen – 13,001

% CA Carriers Tested at UC Davis VGL

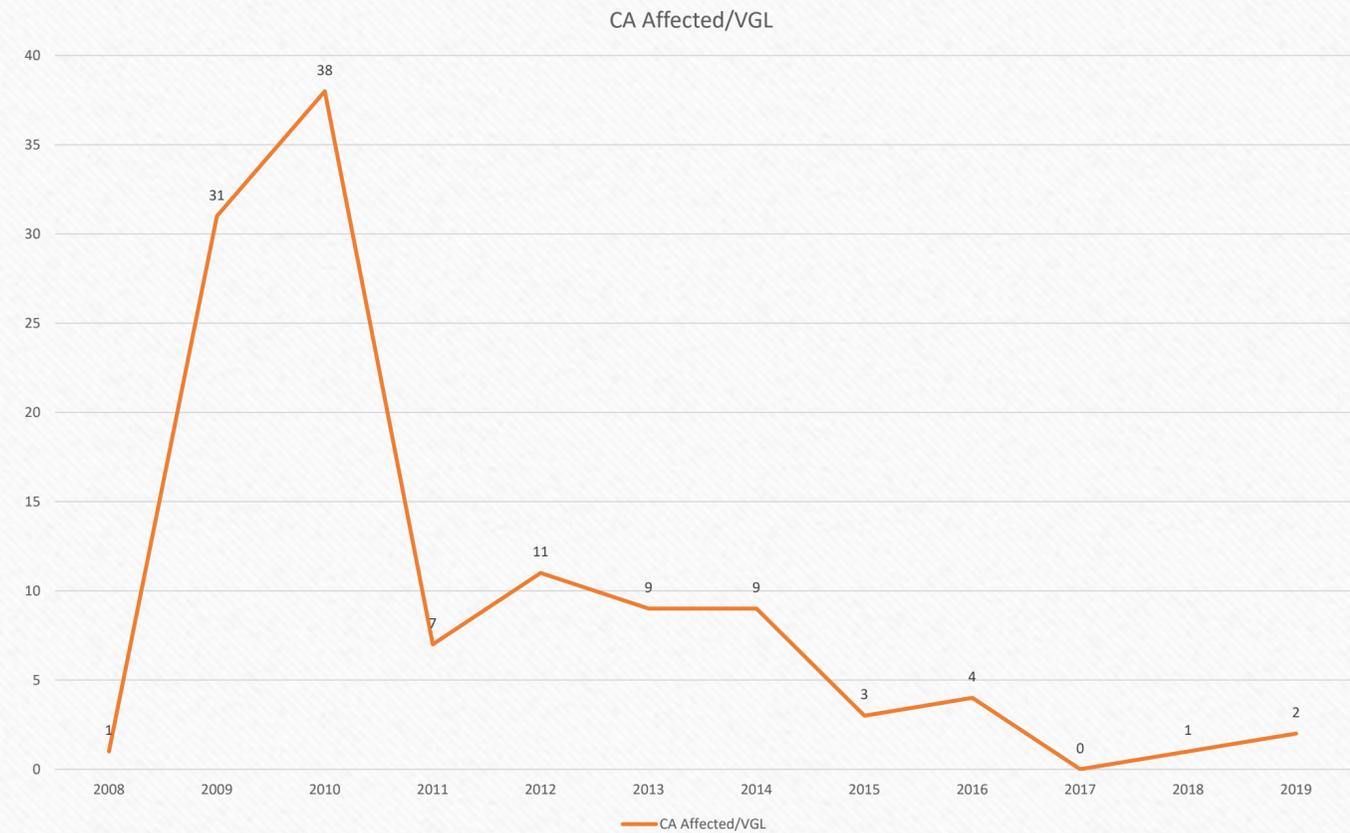
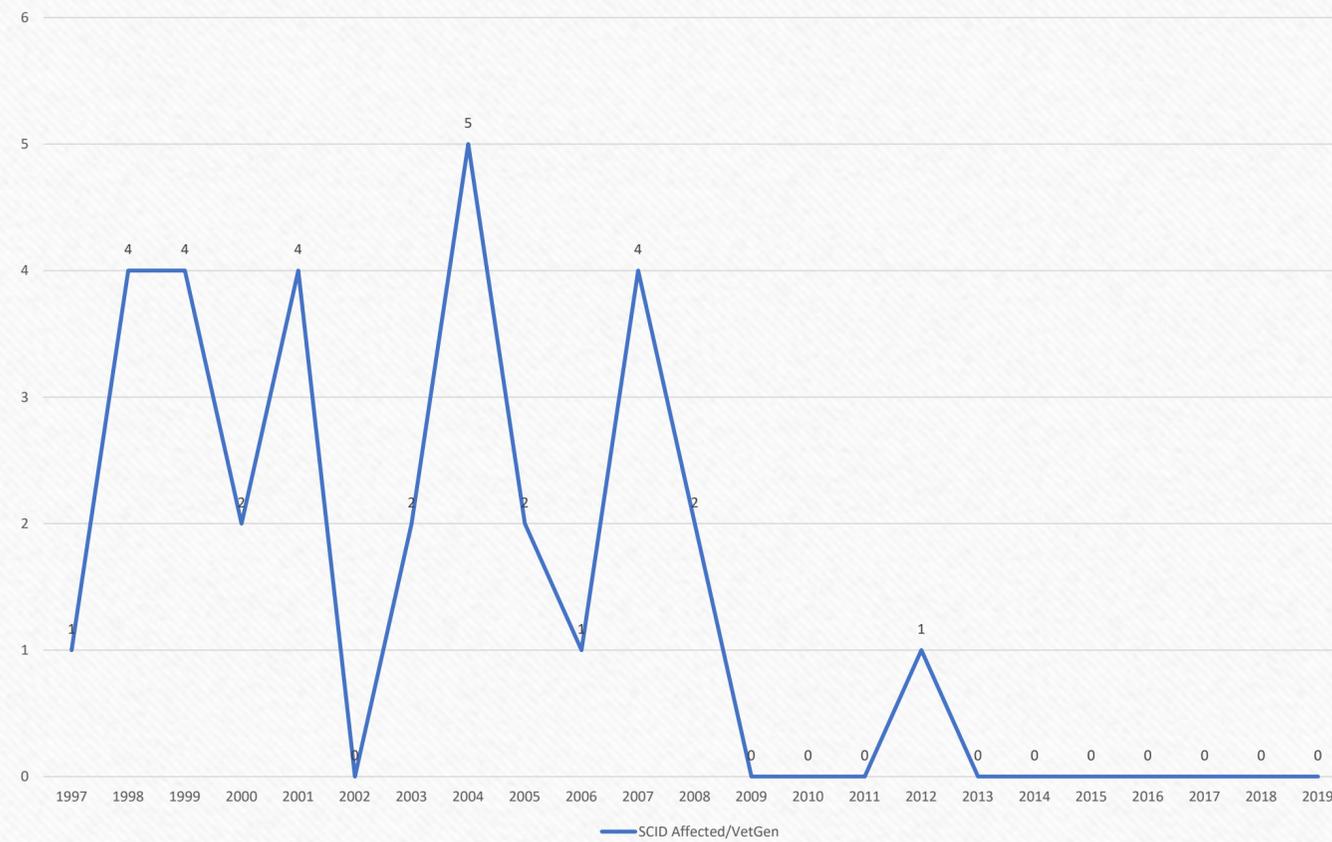


Total samples tested:
UC Davis VGL – 12,236

Carriers CA and LFS		
Year		N/CA - L/N
	2012	6
	2013	1
	2014	4
	2015	8
	2016	4
	2017	2
	2018	1
	2019	0
Grand Total		26
Carriers CA and SCID		
Year		N/CA - D/N
	2017	2
	2018	5
	2019	1
Grand Total		8

**Double Carriers
Tested at UC Davis**

Affected Foals Tested at VetGen or UC Davis VGL



The Big Picture

- Goal of testing - identify carriers, not automatically eliminate them from breeding
- Goal of breeding - avoid tragedy, while still being able to produce quality and maintain genetic diversity
- With continued education and open discussion, this can be accomplished
- The Arabian horse deserves nothing less!

The Future of Equine Research

- What does the Arabian horse community want to get from equine science in the next 20 years?
 - Genetic disorder and other health related research
 - Performance horse medicine
 - Reproductive physiology
 - Genetic diversity, etc.
- How are we going to get it?
- Federal funding for agriculture in general likes to neglect the horse and it is getting worse
- The horse industry needs lobbying power with the USDA, and some financial muscle. Otherwise, research and innovation in all areas of equine science is going to dry up.
- The Arabian horse community needs to engage. But how???? Suggestions welcome!



**Thank you to our donors and the owners who participate in studies.
Without you, genetic testing advancements wouldn't be possible!**

Dedicated to Improving the Health of Arabian Horses

<https://thearabianhorsefoundation.org>

No matter how
stressed you are,
remember how
Blessed
you are.

