

2013 Summer ICHO GAZETTE

International Curly Horse Organization

HC31 Box 102A, Williamsburg, NM 87942

SUMMER GAZETTE 2013

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www.ichocurlyhorses.org

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· Marianne Bornemark Region 8 mbornemark@gmail.com What a fantastic time had by all at the ICHO AGM held in Pagosa Springs, Colorado at Dr. and Mrs. Mitch Wilkinson's! After the rush greeting of Tangle and Paris, the Wilkinson's canine greeting committee, we began a whirlwind adventure in the San Juan mountains, meeting new ICHO friends, discussing Curlies and meeting the infamous Blackfish and his buddies. I would have loved to have bottled some of the pure mountain air and hot spring mineral water! More information and photos will be featured in our next gazette issue.

I would like to thank ICHO members for your continued loyal support. We are a scientific research based registry and there has been exciting new developments in the area of identifying the equine gait gene. ICHO gaited horses were included in the research data! The study results and article start on page 3 of this issue. Talk about exciting!! Nothing beats the dedicated research community, and solidifying the inheritance of traits, especially in our Curlies.

Lastly, some of you participated in a survey presented by

a group called the Unity Project. This was not done through ICHO, nor has ICHO officially discussed any merger or unity with other registries.

Sincerely, Joanie Henning, ICHO President and Angel Leggs, ICHO 1263-D.





2013 AGM Commemorative items are available at:

http://www.cafepress.com/ichoagm

GAZETTE AD DEADLINE

We now have a new Gazette ad deadline schedule for submitting ads as follows:

WINTER: Dec 15 SPRING: Mar 15 SUMMER: June 15 FALL: Sept 15

Ads that are received after the deadline will be run in the next following issue. Payments must also be made before the deadline. All ads and payment must be sent to the office.

Thanks!

ARTICLES- We are always looking for interesting articles for the Gazette. The article could be about training, health tips, an interesting story about a Curly or anything of interest horse related. Please send all articles to the office before the deadlines. Awaken the writer within you!



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ICHO now offers DNA testing for:		
Ancestral only TX A&M	\$25.00	
Parentage Only U of KY	\$30.00	
Gait Gene DMRT3 TAMU	.\$30.00	

To obtain a mailed copy of the Gazette, there is now a \$10.00 yearly fee. You can always view the Gazette online for free on our webpage— http://ichocurlyhorses.org in the Members Only section and print a copy for yourself.

CA- (Cerebellar Abiotrophy) VetGen..\$35.00

Lp color TX A&M

Gazette Ad Specials!

Stallion Station Ad- only \$10.00 per issue, \$40.00 for the year, color ad.

Business Card Ad- only \$10.00 per issue, \$40.00 for the year, color ad

All color Ads at Black and White Prices! All Gaz Color Ad fees reduced!!

Full Page Color \$40.00, 1/2 Pg Color \$20.00, 1/4 Pg Color \$10.00, Classified \$10.00

Submitting ads: *Pay for ads online on our webpage- http://ichocurlyhorses.org

All ads must be copy ready in word doc format or jpg, png. Since we have reduced our prices we need the ads in ready to print format. For photos png is preferred since it has the best resolution. We can no longer accept pdf format because it does not insert clearly for the Gazette editing process.

All Ads must be sent to the office with payment. Ads also appear on the ICHO webpage.

Thanks! office@curlyhorses.org

Gazette editor- Joan Henning

The 2013 International Curly Horse Organization Annual General Meeting went off without a hitch thanks to Cheryl and Mitch Wilkinson's superb organizational skills. There were expected guests, unexpected guests, activities and the obligatory shopping done by the ladies while the men napped on nearby benches.

Details and further pictures to follow in the Winter Gazette.



In this issue of the Gazette the focus is the Gaited Curly

with Curly Horse DMRT3 results posted at Gene Study table

The Gait Gene study was completed in Sweden by Niina Kangas. We now know a lot more about gaited Curlies and their gait genes. The full published/edited article can be seen at Nature

Also, find excerpts from one of Lee Ziegler's articles on Defining gaits, it is an oldie but a goodie. Hope you enjoy!

ICHO is also continuing the Gait Gene Study and offering testing here in US through TAMU. For more details visit our webpage- http://ichocurlyhorses.weebly.com/gait-gene-study.html LATEST NEWS! Sweden Lab is looking for more Curlies to test for Gait Gene, stay turned for more details **Continued on page 8**

The Curly Corner

Right—Jeff and Romeo nap in the Colorado sun. Jeff has allergies, with horses being severe triggers; however, he has no reaction to his Curly friends and has discovered a whole new dimension in friendship with his big Curly buddies.





Left-A bittersweet photo, as all three of the members are now deceased. Augie was a longtime Quarter Horse breeder and trainer until he discovered first Mustangs and then Curly Mustangs. Bit-O-Wy Spur (ICHO Reg # unknown) was a dream combination for Augie as he was Mustang, Curly and Buckskin-although he turned more bay as he aged. Yvonne enjoyed horses alongside Augie and this was one of the last pictures of these three. Augie and Yvonne used this a their Christmas card. Spur performed as a Cowboy Mounted Shooting horse both under saddle and pulling a buckboard.



Right—Trina and Jeff with their Curly boys, Romeo and Rowdy, at the 4th of July parade in Wellington, CO.

Left—Paul and Sidney pose with Ringo. Ringo is Paul's first horse after years of being a mule man. He loves Ringo's mischievous want-to-be-with-himall-the-time personality.



Genes Linked to Gaitedness in Horses

By Loretta L. Nielsen, Ph.D. (http://www.llnielsenmw.com)

In August 2012 the cover story for the science journal *Nature* was the discovery of the first gene conclusively linked to gaiting in horses.¹ As described in the publication, all horses can walk, trot, and canter/gallop, but some horses have the ability to perform extra gaits, such as the pace (moving the two legs on the same side of the body in unison). The genetic basis of 'gaitedness' in horses was explored in one of the oldest and most inbred horse breeds in the world, the Icelandic. Because Icelandics have many genes in common, it is easier to find genes that cause differences between horses in this breed than it would be in more genetically diverse horse breeds.

An international group of equine genomics experts spearheaded by Swedish scientists identified a link between a premature stop codon in the *DMRT3* gene (in other words a shorter-than-normal version of the DMRT3 protein is produced) and the ability to perform alternative gaits. This mutant gene was found to be permissive for 'gaitedness' in horses.^{1,2} This means, there's no guarantee a horse will be able to gait (pace, fox trot, running walk, etc.) when they carry this mutant gene, but it does appear to be a necessary condition for 'gaitedness' in the breeds studied so far.

In Icelandics,¹ the horses with 2 copies of the mutant *DMRT3* gene (homozygous, *A/A*) were 5-gaited, while most 4-gaited Icelandics were heterozygous (1 copy of the mutant *DMRT3* gene and 1 copy of the wild-type *DMRT3* gene, *C/A*). The authors concluded that *A/A* is required for pacing in this breed. Almost all horse DNA samples from the other gaited breeds studied had at least one copy of the mutant *DMRT3* gene (Kentucky mountain saddle horse, Missouri fox trotter, Paso Fino, Peruvian Paso, Rocky mountain horse, Tennessee walking horse). In contrast, none of the 8 non-gaited breeds carried *A*.

Continued on page 7



Mocha Baby Twist

ABC 3432 ICHO 1222-D DOB 2002 mare Labaccn 53809 sire- Kristofer Griffith mare- CVC Crimson Moon Damele/Krugler lines

Breed Group 1-WB 2-Eastern Europe

Breed Group 2- Non Arab Oriental

Breed Group 3- Quarter Horse

Mocha Baby Twist

owned by Joan Henning tested CC wild type. She carries no gait gene. -/- Mocha's ancestral DNA test results also shown.

Kids and Curlies

At HorseBuds Therapeutic Riding Center, Greeley, Colorado's only PATH International Center Member, seven Curly horses are used for equine assisted activities. The photo right is of a HorseBuddies Family Play Date. (L-R) Horse Leaders and Side Walkers are pictured with Josh (age 12) riding Coyote Run Chamois ICHO/NACHR #1410-D, a 13 year old mare; Simon (age 11) on an extreme curly gelding called Curly, age seven, registration pending; and Even (the birthday boy) age nine riding Covote Run Gypsy ICHO/NACHR #1404-D, an 11 year old mare.





"The kids have enjoyed riding, as Rowdy and Romeo are extremely patient and forgiving. R and R just enjoy being part of whatever we and the kids are doing. They are good boys, and the kids aren't too bad either!, says mom Trina"

In the photo right is Ani on Rowdy (L), Blake on Romeo (R) two Bit-O-Wy Curlies (ICHO reg pending). Jeff and Trina stand between.

HorseBuddies Family Play Dates: Teaching a horse to do tricks in response to a one syllable command can encourage a reluctant child to speak. "Smile" eventually leads to "Chamois Smile" and a big boost of confidence for the child! Left—Coyote Run Chamois ICHO/NACHR #1410-D, a 13 year old mare, smiles on command for Jack, age eight, and his mom.



Genes — cont. from page 5

Mouse studies¹ showed that the wild-type (full length) *DMRT3* gene controls development of the nervous system in the fetus in such a way as to produce coordinated limb movements. In contrast, mice born entirely without the *DMRT3* gene had normal muscle coordination and balance, but had alterations in how they used their legs to move.

In 2013, ICHO arranged to have a variety of DNA samples from Curlies tested by the Swedish research group.



Oh Boy

owned by Terry Schmidt tested homozygous AA +/+ for DMRT3 gait gene.

Early results have shown that all 6 of my curly Missouri fox trotters and one straight-coated offspring of a curly Missouri-fox trotter sire are homozygous for the mutant *DMRT3* gene (*A/A*). In contrast, Joan Henning's non-gaited Sporthorses are either heterozygous (*C/A*) or homozygous wild-type (*C/C*). The Swedish scientists have indicated that the majority of horses with *C/A* that they tested are non-gaited or somewhat gaited. It will be interesting to see how the rest of the ICHO horse samples sent to Sweden turn out. One thing to remember is that this gene discovery is probably only the tip of the iceberg. Certainly, Icelandic horses gait differently than Missouri fox trotters or Tennessee walkers do. Just look at the differences in conformation among all the different gaited breeds and it's clear there must be other genes controlling gaits besides this one. We don't know how important the *DMRT3* gene mutation is in the overall scheme of things, but it's still an exciting discovery and sheds light on an area we knew nothing about (genetically-speaking) before this discovery.

References

- Andersson LS, et al. Mutations in DMRT3 affect locomotion in horses and spinal circuit function in mice. Nature Vol. 488, August 2012, pp. 642-646. Free for downloading at http://www.nature.com/ nature/journal/v488/n7413/full/nature11399.html
- 2. Petersen JL, et al. Genome-wide analysis reveals selection for important traits in domestic horse breeds. PLOS Genetics Jan 2013 vol 9, issue 1. Free for downloading at http://www.plosgenetics.org

For readers with an ongoing interest in this topic, I recommend periodic searches of the scientific literature at PubMed (http://www.ncbi.nlm.nih.gov/pubmed/). PubMed is a public portal that allows anyone with an internet connection to search the medical/scientific literature in a (U.S.) national database called MedLine that's maintained by the National Library of Congress and the National Institutes of Health. It concentrates on human medical articles, but also captures many animal studies pertaining to human health subjects, like gene mapping projects.

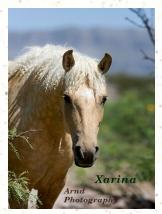
Gaited Study—Continued from page 3 SWEDEN GAIT GENE STUDY RESULTS



Frostfire's Xeque

Curly Jim & 3/4 MFT lines Tested heterozygous for DMRT3 -/+ one copy.

Xeque prefers to hard trot and only rarely showed a foxtrot up hill or in soft plowed ground. Yet he passed on his gait gene as both daughters gait.



Frostfire's Xeque's daughter, **Xarina**, tested homozygous for DMRT3 +/+.

Xarina got one copy of the gait gene from Xeque and one from her Peruvian Paso dam.

Xarina does a running walk/paso llano.

<u>Name</u>	Gaited lines	DMRT3 present CA, -/+	
Frostfire's Xeque	Curly Jim, MFT/Damele		
Xarina	Curly Jim, MFT, Peruvian Paso	AA +/+	
ZGC Diego	Curly Jim, MFT	AA +/+	
ZGC Sienna	Curly Jim, MFT	AA +/+	
ZGC Ysabel	Curly Jim	AA +/+	
ZGC First Lady	Curly Jim	AA +/+	
ZGC Cinnamon Ice	Curly Jim, MFT	AA +/+	
WDR Dragonsmoke	Curly Jim, MFT	AA +/+	
WDR Skydancer	Curly Jim, MFT	AA +/+	
Lilly's Moon Man	Mustang/Damele	CC -/-	
UBMB Angel Leggs	Other Curly bloodlines	CA -/+	
Mocha Baby Twist	Damele	CC -/-	
Renegait Curious Georgia	Curly Jim	CA -/+	
One Curly Drifter	Curly Jim	AA +/+	
HS Renegade's Eclipse	MFT- not a Curly	AA +/+	
Drifting Aurora	Curly Jim	AA +/+	
A Kurlee Dream	Damele	CC -/-	
BB Cinnamon	Mustang/Damele	CA -/+	
JT'S Courageous Comet	Curly Jim/MFT	AA +/+	
JT'S Smoky Spirit	Curly Jim/MFT	AA +/+	
Oh Boy	Curly Jim/ MFT	AA +/+	
Pizzaz Ringo	Curly Jim/ MFT	AA +/+	
DCC Me 'N My Shadow	Curly Jim/ MFT	AA +/+	
Hero's Chocolate Kiss	Curly Jim	AA +/+	
JT'S Lobodacious	Curly Jim/ MFT	AA +/+	
JT'S Colt .45 Peacemaker	Curly Jim/ MFT	AA +/+	
Daytona Dream RR	Curly Jim/ MFT	AA +/+	
D'Artagnan	Curly Jim/ MFT	AA +/+	
ZGC Durango	Curly Jim/ MFT	AA +/+	
DCC Justa Prince	Curly Jim/ MFT	AA +/+	
WWW Blue Eyed Jake	Curly Jim	AA +/+	

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Gaited Study—Continued from page 8

<u>Name</u>	Gaited lines	DMRT3 present	
HCR Faithful Velvet	Curly Jim/other Curly	CA -/+	
Renegait Royal Talisman	Curly Jim	AA +/+	
Stagcreek Lydiker	Curly Jim/Damele	AA +/+	
Tennessee Dream	Curly Jim	AA +/+	
Alaska Dream	Curly Jim	AA +/+	
Utah Dream	Curly Jim	AA +/+	
Wisconsin Dream	Curly Jim/Pony/mini	CA -/+	
Washington Dream	Curly Jim/pony/mini	CA -/+	
Kentucky Dream	Curly Jim	AA +/+	
Pennsylvania Dream Curly pony lines		CC -/-	
FC Justa Touch of Mist	Curly Jim	AA +/+	
LS Sassey Lady	Curly Jim/MFT/Damele	CC -/-	
Moonlight Sonata	Curly Jim	AA +/+	
Walker's Queen B	Curly Jim	AA +/+	
RCR Backfire	Curly Jim	AA +/+	
SS Pal's Amber Azela	Damele/other Curly	CC -/-	
RCR Pats Eleventh Hour	Curly Jim	AA +/+	
RCR Kaziah	Curly Jim	AA +/+	
DCC Strawberry Ice	Curly Jim	AA +/+	
Topazs Merry Dream Dancer	Damele/other Curly	CA -/+	
RTE Lord Tristan	Curly Jim	AA +/+	
RTE A Dust of Black Gold	Curly Jim	AA +/+	
Misty's Tansie	Curly Jim	AA +/+	
Annie's Rosebud T	Curly Jim	AA +/+	
Lovely Lady	Curly Jim	AA +/+	
RCR Lady Pansie	Curly Jim	AA +/+	
RTE Topazs Lunar Eclipse	Damele/TWH	CA -/+	
MO Charm	Curly Jim/ MFT	AA +/+	
MO Qui			
ZGC Dallas	Curly Jim/ MFT	AA +/+	

DMRT3 Results:

CC = no gait gene

CA = Heterozygous for Gait Gene

AA = Homozygous for Gait Gene

These Study results have shown that in Curlies, those that are known to gait and show gait are testing Homozygous for the gait gene, DMRT3.

Those that are heterozygous for the gait gene may or may not show any soft gait. It seems many heterozygous only horses gait occasionally or not at all.

Breeding heterozygous to heterozygous DMRT3 horses will give the offspring a 25% chance of being homozygous for DMRT3 gait gene and will show soft gaits.

In Curlies, being homozygous for DMRT3 does not seem to influence the type of gait performed, example lateral or diagonal. The homozygous horses perform many varieties of soft 4 beat gaits.

Thank you to all who participated in this study and a huge thank you to Niina Kangas for doing this for her master thesis study.

Excerpts from the article "How to Tell One Gate From Another" By Lee Ziegler

Defining Gaits

Gaits are usually defined by their footfall sequence, timing, support sequence and the shift in the center of gravity. There are many gaits theoretically and actually possible for horses, but the ones most likely to occur in gaited horses (in no particular order) are the: hard trot, fox trot, fox walk, running walk, ordinary walk, flat walk, stepping pace, hard pace, rack, saddle or step rack, canter, lope and

Gait Chart				
Walk - Trot 4 Beat slow speed square gait Gallop 4 beat fast speed	- Intermediate 4 beat- medium to fast speeds, includes all ambling/shuffle gaits. Foxtrot-diagonal Running Walk-square gait Rack- square gait with lateral pick up Stepping pace-lateral pick up Single Foot- rack	3 beat Medium fast speed	Pace 2 Beat slow to fast in speed lateral pick up and lateral set down	

gallop. Within each of these gaits there are some possible variations. For example, a true trot is defined as a diagonal gait in which the right hind and left front hit the ground at the same moment, followed by a moment of suspension when all four hooves are clear of the ground, followed by the simultaneous touch-down of the left hind and right front. However, in some horses that are very collected the hind hoof of the diagonal pair sets down before the front and in others that heavy on the forehand the front of the diagonal pair hits first. Sometimes the moment of suspension disappears and there may be a point in which three hooves are in contact with the ground. Since you can't see any of these variations without slow motion video, don't worry about them. All you need to know to ride effectively is which general gait a horse is doing not precisely how he is

doing it. Scientific gait analysis is not necessary for riding and enjoying your horse.

Diagonal Gaits

The fox trot/Trocha (for Paso Finos)/pasitrot (for Peruvians): In this diagonal gait, again diagonal pairs of hooves lift off and move forward together but this time the front will hit noticeably before the hind of the pair. To see this, again focus on the front foot, then include the diagonal hind in your field of vision. As the legs move forward together they will be just slightly out of time with one another and the front hoof will set down just before the hind slides into place. If you look at the hooves on the side of the



JT's Lobodacious a/k/a Bo (ICHO/NACHR No. 358-D). He's doing a fox trot

horse toward you, they will lift off and set down separately. The sound will be uneven, 1-2- - 3-4, with the beats closest together coming from the set down of the diagonal hooves. You may hear it as a ka-chunk, ka-chunk sound.



Paso Fino performing the "classic fino', a slow, isochronous lateral gait

The fox walk:

This is really just a slower version of the fox trot done with a slightly longer time interval between the set down of the front hoof and its diagonal hind. It looks and sounds like the fox trot with the same uneven 1-2--3-4 timing. It is much easier to see a front hoof hit before the diagonal hind in this gait than in the faster fox trot. Focus on the legs on the side toward you note that they are lifting and setting down independently then look at one front and its diagonal hind. They move forward together but the front hits significantly before the hind.

Continued on page 12



Woodke's Curly Horses

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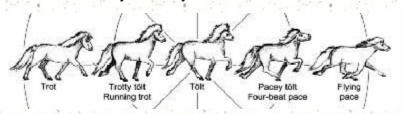
BIZ Card size

"How to Tell" ... cont from page 10

Lateral Gaits

The Pace:

In this most lateral gait, the lateral (same side) hooves lift off and set down at the same moment. (right hind, right front alternate with left hind, left front) To see this focus on the hooves on the side of the horse toward you and you will see them lift off and set down at the same time. The sound will be



a 1-2 beat like the hard trot but this time the sound will come from the set down of alternating lateral pairs of hooves.

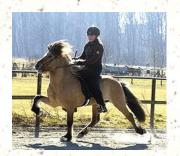
The stepping (broken) pace:

In a stepping or broken pace the lateral hooves no longer set down at the same time although they do appear to lift off the ground simultaneously. In this gait the hind hoof hits just before the front on the same side. To see this, look at the hind hoof on the side toward you then broaden your field of vision to include the front hoof on the same side. They will lift off together but the hind will set down before the front. The sound will e an uneven 1-2- - 3-4 similar in beat to the fox trot but this time the beats closest together will come from the set down of the lateral hooves. This gait is called a "sobreandando" in Peruvian horses and a "skeith-tolt" in Icelandics.

The "saddle" or stepped rack:

This gait is a modified stepping pace in which the lateral hooves are lifted at almost the same moment and set down separately. To see this, again focus on the lateral hooves notice that they seem to lift at the same moment but that there is a significant interval between the set down of the hind and fore. (because of the speed and action of the gait the set down of the hooves can be very difficult to see) The high action of the front legs delays the set down of the front hooves giving an even 1-2-3-4 beat to the gait. Unlike the true rack, in this gait there are always two and sometimes three hooves in contact with the ground. This gait is called a "paso corto" in Paso Fino horses, sometimes a "paso llano" in Peruvian horses and is often called a "single foot" in English.

The rack/tolt: (pictured right is an Icelandic Tolt from Wikipedia) A faster version of the "saddle", the rack looks virtually the same without slow motion video. The lateral hooves lift at the same time and set down separately. The beat is again and even 1-2-3-4. However, in the rack the horse is supported first by two then by one hoof at a time. He jumps forward between his transverse pairs of legs (both front, both hind) so that there is a moment when all his weight is supported by first one hind hoof then by one front hoof. This gait is very fast and hard to see without slow motion. It is called a "hreina tolt" in Icelandic horses, a "trippel" in Boerperds and a "largo" in Paso Finos.



How it Feels in the Saddle

Knowing the mechanics, sound and look of each gait doesn't do you much good once you are in the saddle. Unless you ride in a mirrored hall, with a good ground person or review your work constantly with a video recorder you will also need to know how each gait feels when you are riding it. Only when you know that what you feel isn't the "right" gait will you be able to start doing something to correct the "wrong" one. Here, ranging from rough to smooth, is the way the gaits feel under saddle.

How to Tell" ... cont from page 12

Trot:

I assume you know how this feels but in case you have forgotten a trot is a gait that can range from the relatively comfortable jog to the fast extended trot that will jar your teeth unless you have learned how to sit or post it. Motion in the trot is an up and down bounce as the horse jumps from one diagonal pair of legs to the other.

Pace:

This gait is as uncomfortable as any trot this time bouncing the rider from side to side as the horse



This Mangalarga Marchador is exhibiting a diagonal ambling gait

jolts from one lateral pair of legs to the other. It is not easy to sit but it can be posted if you are adventurous. (Icelandic horses do a flying pace called a "flug skeith" which is so fast that is no longer uncomfortable. This gait is not common in other breeds of gaited horses)

Stepping pace:

This gait gives a subtle side to side sway instead of the jolt of the true pace. This rocking motion can sometimes make people seasick but the gait is fairly smooth to ride.

Fox trot/troche/pasitrote:

This gait moves the rider front to back in the saddle with a definite "push-pull" motion. The hind quarters feel active moving up and down in a kind of "stutter step" and in some horses you can feel a pull from the shoulders in a rolling motion. There is never a sensation of side to side sway in this gait.

Fox walk:

This is a smoother version of the fox trot with less "push-pull" motion and a less well defined "stutter step". Again, there is no side to side motion in this gait and less "bounce" to the hind quarters than in the true fox trot.

Square Gaits:

The walk:

In a walk the hooves lift off and contact the ground at even, separate intervals. Look at the hooves on the side of the horse toward you. They lift separately, do not travel forwards at the same time and set down at separate intervals. The beat is and even 1-2-3-4.

The flat walk:

This is the same as an ordinary walk speeded up a little bit. The hooves lift and set down at distinct, even intervals. The beat is again 1-2-3-4.

The running walk/paso llano (In Peruvians):

A good running walk is the same a a flat walk again with more speed. The hooves on a side lift and set down separately in an even 1-2-3-4 beat. Often

what is called a running walk is a long stepping "saddle" rack. It is still an even four-beat gait but the legs on one side seem to move forward together and the hooves lift at the same time setting down separately. Focus on the hooves on one side of the horse to see the difference in the two gaits.



