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# Grazing News



Iowa State University  
Department of Animal Science  
Equine Science Newsletter & Updates  
2011

May

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Below is new and updated information from Iowa State University Equine Science. If you have questions or comments about this message or the content listed herein, please contact me.  
Peggy M. Auwerda, PhD  
Iowa State University  
Extension Horse Specialist  
E-mail: [peggy@iastate.edu](mailto:peggy@iastate.edu)  
Phone: 515-294-5260



## Upcoming Events

- [High Risk Pregnancy - May 3rd](#)
- [Cyclone Horse Judging Camp - June 16th - 18th](#)
- [Horse Judging Team Coach/Advisor Clinic - June 16th](#)
- [4-H Round-UP - June 28th - 30th](#)
- [Iowa State Fair 4-H Horse Show - Aug. 8th-11th](#)
- [Management of the Equine Environment - Oct. 1st](#)



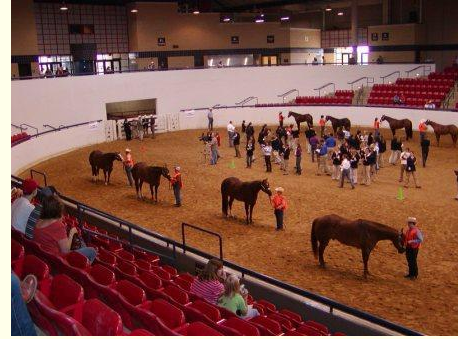
Cyclone Horse Judging Camp

**WHAT:** A 3 DAY CAMP FOR YOUTH INTERESTED IN HORSES AND HORSE JUDGING. YOUTH WILL RECEIVE INSTRUCTION IN JUDGING BOTH CONFORMATION AND PERFORMANCE CLASSES. IN ADDITION, EACH INDIVIDUAL WILL HAVE THE OPPORTUNITY TO HAVE BOTH GROUP AND INDIVIDUAL INSTRUCTION AND FEEDBACK ON ORAL REASONS.

**WHEN:**  
JUNE 16-18, 2011

**WHERE:**  
IOWA STATE UNIVERSITY CAMPUS

**WHO:**  
YOUTH AGES 12 TO 18 YEARS INTERESTED IN HORSES, JUDGING, MEETING OTHER YOUTH AND HAVING FUN!  
CAMP FEES WILL INCLUDE ON-CAMPUS HOUSING, FOOD, INSTRUCTION AND EVENING FUN!



**REGISTER BY MAY 15, 2011!**

For questions: Contact Nikki, [nikkif@iastate.edu](mailto:nikkif@iastate.edu)  
or 515-294-3996

[Judging Camp Forms](#)

## HORSE JUDGING TEAM COACH/ADVISOR CLINIC

JUNE 16, 2011 at Iowa State University  
Check-in at 8:30am - Start at 9am

Coaches clinic for youth/4-H/FFA adult advisors, volunteers and coaches. Focus will be directed to Western and English events along with how to coach students to give oral reasons. ISU past and present horse judging team members will give example sets of written and oral reasons



### Schedule

OPENING REMARKS, INTRODUCTIONS AND GATHERING QUESTIONS FROM PARTICIPANTS TO BE

ADDRESSED DURING THE DAY

GIVING YOUR STUDENTS THE TOOLS THEY NEED

UNDERSTANDING EVENT RULES - HUNTER UNDER SADDLE AND EQUITATION

UNDERSTANDING EVENT RULES - WESTERN PLEASURE AND HORSEMANSHIP

EXAMPLE CLASSES

LUNCH

SCORING ORAL REASONS

EXERCISES IN TERMINOLOGY

WRITTEN REASONS - GIVING FEEDBACK

LISTENING TO ORAL REASONS - HOW TO LISTEN/WHAT TO LISTEN FOR

PRACTICE LISTENING AND GIVING FEEDBACK

OPEN DISCUSSION/QUESTION AND ANSWER SESSION

LOOKING INTO THE SCORED CLASSES: REINING, WESTERN RIDING, TRAIL

PROGRAM EVALUATION AND FINAL COMMENTS

**SPEAKERS TO INCLUDE:**

NIKKI FERWERDA, ISU HORSE JUDGING TEAM COACH  
PAST/PRESENT ISU HORSE JUDGING TEAM MEMBERS  
ISU JUDGING TEAM FINISHED 4TH IN ORAL REASONS AT THE 2009 APHA SPRING SWEEPSTAKES AND  
HAD INDIVIDUALS PLACING IN THE TOP TEN IN EACH DIVISION: HALTER, PERFORMANCE AND REASONS AT THE CONGRESS, QH WORLD SHOW, AND ARABIAN NATIONALS

[Registration Form](#)

## Horse Owners Seminar Series

ISU College of Veterinary Medicine

The Lloyd  
Veterinary  
Medical  
Center  
Iowa State  
University  
presents ...

# 2010-2011 Horse Owners Seminar Series

**May 3**  
**High-Risk Pregnancy  
in the Mare**  
Dr. Bruce Christensen

**September 6**  
**Wound Healing in Horses**  
Dr. Alexandra Tracey

**November 1**  
**Equine Muscle Diseases**  
Dr. Beatrice Sponseller

**February 7**  
**Common Equine  
Emergencies**  
Dr. Joan Howard

Sponsored by  
 **Nutrena**

**IOWA STATE UNIVERSITY**  
College of Veterinary Medicine

**Cost:** Free  
**When:** 7:30 to 8:30 p.m.  
**Where:** Alumni Room  
College of Veterinary  
Medicine  
Iowa State University  
Light Refreshments  
will be provided

**Directions available**  
**online:** [www.vetmed.iastate.edu/vmc](http://www.vetmed.iastate.edu/vmc)  
Click on "Map & Directions"  
**phone:** 515-294-1500

## Strangles

**Definition** Strangles is an infectious, transmissible, world-wide disease of horses, donkeys and mules. Its widespread distribution is favored by its highly contagious mode of spread and a mobile horse population. The causative agent is *Streptococcus equi* subspecies *equi* (*S. equi* var. *equi*), a bacteria.

**Source of Infection** Strangles is transmitted by ingesting or inhaling the bacteria. Usually this results from direct contact with infected animals or through shared feed and water containers. In fact, *S. equi* will survive for several weeks in water troughs but dies quickly in soil and on pasture. Contaminated tack, halters, clippers, brushes, hoses, nose wipe clothes, sponges are all sources of infection. Paddocks and barn facilities used by infected horses

should be regarded as contaminated for ~2 mo. after resolution of an outbreak.

### Clinical Findings

1. Early Stage of Infection: The incubation period is 3-14 days. Initial symptoms include a fever (103-106°F), stops eating, stops drinking, clear nasal discharge (gets thicker and creamy as the disease progresses) & swelling of the lymph nodes between the jaws and around the throatlatch. The swollen lymph nodes can cause difficulty swallowing, noise during inspiration and an extended head and neck.
2. Lymph Node Abscesses: Abscesses may develop in the swollen lymph nodes 7-10 days after initial signs are observed. As the abscesses mature, they will rupture and drain thick, cheesy material. Note that the draining pus from these abscesses contains high numbers of infectious bacteria and anyone caring for the sick animals should take every precaution to avoid contaminating other areas with bacteria
3. Complications: A condition known as "bastard strangles" can occur in about 20% of all cases. This results when abscesses form throughout the body, with the most common in the lungs, liver, spleen, kidneys and brain. Horses with bastard strangles will require antibiotic therapy for an extended period of time (four to six weeks), and may require additional medical therapy, such as anti-inflammatory medications or intravenous fluids.



**Vaccination** Most horses will develop immunity to strangles after infection, with that immunity lasting at least five years. Some may contract the disease a second or even third time. Several strangles vaccines are available, with products being given either intramuscularly or intranasally. Vaccination will not guarantee prevention of the disease, but it may lessen severity and duration, and does seem to be effective in helping control outbreaks.

### Prevention/Control

- Isolate affected horses immediately
- Any equipment, including all brushes, buckets and tack that have come in contact with an affected horse should be disinfected thoroughly. *Streptococcus equi* is sensitive to most disinfectants as long as label directions are followed and the product is used appropriately.
- Feed should be handled and stored correctly.
- Water containers should be examined regularly for functionality and cleanliness (containers should be cleaned of all organic debris, including manure, bedding, feed)
- Flies can transmit infection mechanically; therefore, efforts should be made to control the fly population during an outbreak.
- Trailers should be cleaned and thoroughly disinfected.
- Caregivers should deal with affected horses last.
- Workers should wash and sanitize their hands thoroughly and change their clothing and boots before leaving the isolation area. Other precautions include using disposable plastic boots and wearing rubber glove
- Animals typically recover in approximately three weeks; however, bacterial shedding can occur for months. Ideally, recovering horses should be tested by a veterinarian and return three negative cultures before being returned to the herd.
- The exact length of time that strangles can survive in the environment varies widely. A general recommendation is that pastures and turnout areas that housed infected animals should be left open for at least 30 days

## Eating Frustration in Stabled Horses

by Marie Harris  
Senior, Animal Science

Horses are very complex animals. They can show a variety of behaviors based on environment

and management techniques. When stabled, frustration and stress increase to become stereotypic behaviors. Eating frustration is one common factor that needs to be addressed in horses that are stabled long term. If it isn't properly handled, frustration can lead to life-long stereotypic behaviors that can become permanent habits.

Stereotypic behavior is intentional, repetitive behavior that has no apparent purpose or function. (Auwerda, AnS 415) Most develop when horses are socially isolated, or don't get enough exercise or grazing time, like when they are stabled. Some examples are cribbing, pacing, weaving, stall walking, pawing, and self-mutilation. According to the ASPCA, "Frustration and stress are the two factors most likely to produce stereotypies in horses." (ASPCA, 2011) In pastures, horses spend approximately sixteen hours eating, but when stabled, they only spend about three hours eating. This leads to more down time in which the horses become frustrated and supplement with behavior changes.

When stabled, horses are restricted from their natural behaviors. In the short run this leads to frustration and stress, but in the long run this leads to more serious stereotypic behaviors that can develop if not properly confronted by the owner. When behavior is restricted, horses often turn to food. When a horse changes its appetite behavior, it is often a sign of frustration. Frustration occurs because a horse's needs or desires are unfulfilled. (Lewis, 2005) There are feeding methods that may help or hinder a horse's frustration when stabled.

A study was conducted to observe different feeding methods on eating frustration in thoroughbreds. There were 8 horses, ranging from two to six years old. (Table 1) They were turned out for four hours per day and fed a pelleted concentrate and oat mixture with alfalfa cut hay and long timothy hay. They changed the timothy hay as necessary and outlined in the study. The five alternative methods observed were: cut the hay, delay the feeding time, increase the feeding frequency, increase the feeding locations, and increase the hay varieties.

Table 1. Animals Used in the Present Study

Table 1. Animals used in the present study								
Horse	Sex	Age (years)	Treatment <sup>†</sup>					Stability observation <sup>‡</sup>
			1	2	3	4	5	
A	F	5	○	○	○	○	○	x
B	M	2	○	○	○	○	○	○
C	M	2	○	○	○	○	○	○
D	M	2	○	○	○	x	○	○
E	M	6	○	○	x	○	x	x
F	M	4	x	x	○	○	x	x
G	M	3	x	x	○	x	○	x
H	M	3	x	x	○	x	○	x

(Ninomiya, Kusunose, Sato, Terada, and Sugawara, 2004)

Researchers cut the timothy hay to observe if a shorter length increased or decreased frustration. The hay was cut into 5 centimeter long pieces for easy consumption. They discovered the time spent eating hay decreased. This is because the shorter pieces do not take as long to chew and digest. Since less time was spent eating, the horses supplemented that time with other behaviors. The horses turned to eating their straw bedding and spent more time resting during the day. Since horses are designed to spend most of the day eating, this causes major frustration demonstrated by the bedding eating and more time spent sleeping rather than doing something productive. (Table 2) As seen by the study, stabled horses can easily become frustrated, leading to possible stereotypic behaviors. It has been shown, and seems logical, that delaying the feeding time and cutting the hay are not efficient ways to decrease frustration and may actually have the opposite effect. If there is a horse that must be stabled for long periods or shows signs of frustrations and stress, it is worth it to try one or more of the following alternative feeding methods: increase the feeding frequency in a day, increase the feeding locations around the stall, and increase the hay varieties fed. As more studies are conducted, these methods may

become more popular in the equine industry. None of these options will harm a horse, so it could be worth the trial and error to see if they have an effect on any frustrated, stabled horse.

The research team next looked at the delay of the feeding time. They delayed the normal feeding time by one hour to observe the frustration effects on the horses. The observations showed the horses actually spent more time eating hay, and they were more motivated to eat the hay rather than bedding. This was all positive, but bedding investigation time increased after the food was consumed. With the delay of the feeding time, the horses were worked into a frustrated manor of searching for food. They ate the hay, but wanted more once they were finished since the anticipation and wait time were so drawn out. (Table 2)

Next, the researchers studied the increase of feeding frequency on the horses. They administered timothy hay twice a day instead of once. The horses' eating time increased since they were eating over a length of time instead of all in one sitting. This seemed to improve quality of life because it stimulated more normal, active behaviors. Feeding more than once a day is closer to the feeding behaviors they would develop in the wild or in a pasture setting. None of the other behaviors changed from the normal routine observed. The ASPCA also mentions a study showing the effects of eating more than two meals per day. The results were that oral stereotypies (cribbing, wind sucking, etc) decreased in horses that were fed more often. (ASPCA, 2011) This can be a great tool in management of stabled horses. (Table 2)

The horses were further tested by being fed their hay in three different locations around the stall. The time spent investigating their bedding decreased since they had to forage around their stall for more hay. They were kept occupied for longer and weren't as likely to be looking for other things to do. Horses on pasture or in the wild will continually walk while they eat, so this also touches on that natural behavior. This method can really decrease the incidence of stereotypic behaviors. (Table 2)

The final test was using different hay varieties in a single feeding to decrease the level of frustration. Timothy, orchard grass, and alfalfa hay were all mixed prior to feeding. This method forced the horses to sort and select their food while eating. The time spent eating hay increased, while resting time decreased since they spent more time foraging through the meal. The horses chose alfalfa first, then timothy, and finally orchard grass. The researchers thought they ate in a less frustrated manner while sorting through the varieties, so this could be another alternative to stimulate activity in a stabled horse. (Table 2)

Table 2. Comparison between the control and the treatment of each behavioral category for 2 hrs after hay feeding

Treatment	Behavior	Control	Treatment	Paired t-test
* Wilcoxon signed rank test. Figure is a mean ( $\pm$ SE) total duration (minutes) in each behavior for 2 h.				
Cutting hay	Hay eating	86.0 $\pm$ 4.1	65.4 $\pm$ 6.5	$P < 0.05$
	Bedding eating	0.0 $\pm$ 0.0	4.4 $\pm$ 3.0	$P = 0.07^2$
	Resting	14.4 $\pm$ 3.9	36.2 $\pm$ 10.4	$P = 0.06$
Delaying feeding time	Hay eating	61.4 $\pm$ 4.4	78.2 $\pm$ 4.1	$P = 0.08$
	Bedding investigation	6.0 $\pm$ 2.0	12.8 $\pm$ 2.2	$P < 0.01$
Increasing the feeding frequency	Hay eating	77.3 $\pm$ 5.5	80.9 $\pm$ 6.1	$P = 0.06$
	Bedding investigation	8.6 $\pm$ 2.7	6.4 $\pm$ 2.1	$P = 0.09$
Increasing the hay varieties	Hay eating	81.8 $\pm$ 2.8	90.7 $\pm$ 4.7	$P = 0.08$
	Resting	16.3 $\pm$ 4.0	6.3 $\pm$ 2.3	$P = 0.05$

(Ninomiya, Kusunose, Sato, Terada, and Sugawara, 2004)

As seen by the study, stabled horses can easily become frustrated, leading to possible stereotypic

behaviors. It has been shown, and seems logical, that delaying the feeding time and cutting the hay are not efficient ways to decrease frustration and may actually have the opposite effect. If there is a horse that must be stabled for long periods or shows signs of frustrations and stress, it is worth it to try one or more of the following alternative feeding methods: increase the feeding frequency in a day, increase the feeding locations around the stall, and increase the hay varieties fed. As more studies are conducted, these methods may become more popular in the equine industry. None of these options will harm a horse, so it could be worth the trial and error to see if they have an effect on any frustrated, stabled horse.

## Bibliography

1. Ninomiya, Shigeru, Ryo Kusunose, Shusuke Sato, Misao Terada, and Kazuo Sugawara. "Effects of Feeding Methods on Eating Frustration in Stabled Horses." *Journal of Animal Science* 75.5 (2004): 465- 69. *Wiley Online Library*. 8 Sept. 2004. Web. 21 Mar. 2011. <http://onlinelibrary.wiley.com.proxy.lib.iastate.edu:2048/doi/10.1111/j.1740-0929.2004.00214.x/full> .
2. "Compulsive Behavior in Horses." <http://www.aspcabehavior.org/articles/133/Compulsive-Behavior-in-Horses.aspx> ASPCA. 2011. Web. 21 Mar. 2011..
3. Lewis, Lon D. *Feeding and Care of the Horse*. 2nd ed. Ames: Blackwell, 2005. *Google Books*. Web. 31 Mar. 2011. [http://books.google.com/booksid=m4VM9\\_SKJMC&pg=PA370&lpg=PA370&dq=stable+frustrati+in+horses&source=bl&ots=xHMvkHl\\_ER&sig=jmUZr9AhXQI016JsMAPv2C9XrV4&hl=en&ei=aUmVTbHXF7SG0QH8PD8Cw&sa=X&oi=book\\_result&ct=result&resnum=1&ved=0CBUQ6AEwAA#v=onepage&q=stable%20frustration%20in%20horses&f=false](http://books.google.com/booksid=m4VM9_SKJMC&pg=PA370&lpg=PA370&dq=stable+frustrati+in+horses&source=bl&ots=xHMvkHl_ER&sig=jmUZr9AhXQI016JsMAPv2C9XrV4&hl=en&ei=aUmVTbHXF7SG0QH8PD8Cw&sa=X&oi=book_result&ct=result&resnum=1&ved=0CBUQ6AEwAA#v=onepage&q=stable%20frustration%20in%20horses&f=false) .
4. Auwerda, Peggy. "Horse Behavior and Management." AnS 415. Ames. 25 Mar. 2011. Lecture.

## Glucosamine

by Jenna Dixon  
Senior, Animal Science

### Introduction

Joint disease, in particular osteoarthritis, is a major cause of lameness and debilitation for humans and animals alike. Patients with osteoarthritis suffer from breaks in the collagen network and loss of proteoglycans. Because there is no cure for this disease, treatment is aimed at decreasing pain and inflammation and slowing the progression of the disease. Radiographic evidence suggests that glucosamine sulfate and chondroitin sulfate may slow joint degeneration in patients with osteoarthritis<sup>5</sup>. Glucosamine is an amino monosaccharide that is the precursor of the disaccharide units of glucosaminoglycans (GAGs), such as hyaluronan and keratin sulfate, which are components of articular cartilage. Glucosamine is a small, water-soluble molecule with a pKa that favors its intestinal absorption and intracellular transportation. It is naturally produced in the body and is involved in the cartilage matrix and synovial fluid. Most glucosamine in the body is in the form of glucosamine-6-phosphate. It is often used in the treatment of degenerative joint disease and supplemented for joint health and to increase cartilage formation in dogs, cats, horses, and even humans with joint problems. Glucosamine is produced commercially by the hydrolysis of crustacean exoskeletons or, less commonly, by fermentation of a grain such as corn or wheat. It is commercially available in three forms: glucosamine hydrochloride, glucosamine sulfate or sulfate salt, and N-acetyl-D-glucosamine<sup>1</sup>.

### Biochemical Mode of Action

The exact mechanism of glucosamine is unknown. Absorption is carrier mediated, utilizing a glucose transporter, whereas absorption of N-acetylglucosamine occurs via diffusion<sup>1</sup>. Quantitative aspects of glucosamine absorption have been debated. However, early methods of detection revealed nearly 90% absorption after oral administration, via glucose transporters, incorporation into plasma proteins, and biotransformation in the liver<sup>1</sup>. In all species tested, glucosamine was rapidly distributed into tissues, with a tropism for articular cartilage indicated by levels of radioactivity in cartilage that exceed those in plasma<sup>1</sup>.

In tissue, glucosamine is an essential component of proteoglycans which make up the cartilage between

joints (see Figure 1). In articular cartilage, glucosamine exists as a monosaccharide that makes up disaccharide GAGs, ultimately building a proteoglycan. This cartilage consists of a matrix of collagen fibers stuffed with proteoglycans. These proteoglycans trap water into the matrix of cartilage, providing it with the deformable resilience that is necessary for its function<sup>4</sup>. In vitro addition of glucosamine to chondrocyte cultures increases aggrecan synthesis, the most predominant proteoglycan<sup>4</sup>. It is possible that glucosamine causes an anti-inflammatory effect, which may explain its supposed pain-relieving ability in patients with osteoarthritis. In vitro studies indicate that glucosamine stimulates proteoglycan synthesis and possesses mild anti-inflammatory properties.

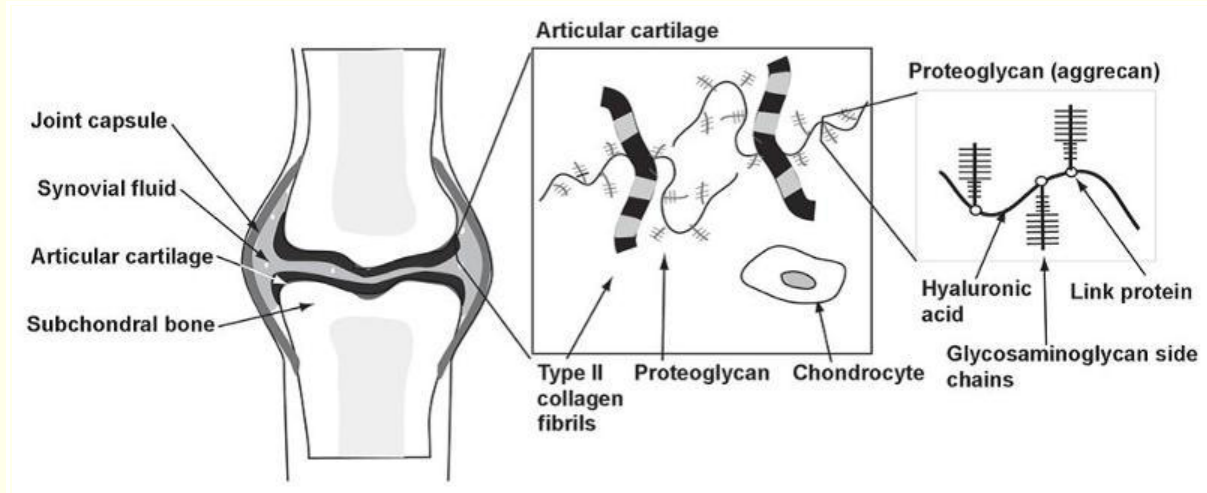


Figure 1-Illustrations of synovial joint structure, articular cartilage components, and the extracellular matrix of articular cartilage. Articular cartilage has sparse cells (chondrocytes) that synthesize the extracellular matrix in which they are embedded. The extracellular matrix is predominantly composed of proteoglycans and type II collagen arranged in fibrils. Proteoglycans are composed of a central protein core to which various glycosaminoglycan side chains are attached via a link protein region. Aggrecan is the largest and most predominant proteoglycan in articular cartilage and has side chains of chondroitin sulfate and keratan sulfate.<sup>1</sup> Source:

<http://avmajournals.avma.org.proxy.lib.iastate.edu:2048/doi/pdf/10.2460/javma.2005.226.1079>.

Glucosamine may act as a substrate for repair by either stimulating proteoglycan synthesis via chondrocytes or inhibiting proteoglycan degradation. One in vitro effect is a reduction in proteoglycan degradation through inhibition of the synthesis and activity of degradation enzymes and inflammatory mediators. When an exogenous form of glucosamine is available, the rate-limiting steps in the hexosamine biosynthetic pathway are bypassed (see Figure 2) which may be a possible mechanism of stimulating proteoglycan synthesis. Exogenous glucosamine is preferentially used in the synthesis of GAGs when cells are cultured without glucose<sup>1</sup>. The incorporation of glucosamine supports its use as a source of cartilage matrix components; however, this mode of action has been debated. In vitro glucosamine influences the expression or activity of many mediators of osteoarthritis. The form of glucosamine may influence its activity, with glucosamine hydrochloride and glucosamine sulfate appearing to inhibit cartilage degeneration more consistently than N-acetylglucosamine in vitro<sup>1</sup>. The effect of glucosamine may be attributed to increased intracellular GAG precursors, N-acetylglucosamine, and galactosamine or to an influence on other steps in GAG synthesis such as posttranslational modification. Recent research also suggests that the actions of glucosamine may extend beyond the provision of components for articular cartilage. Current research shows that glucosamine is involved in the cartilage matrix to produce a beneficial effect on proteoglycans, but researchers are still trying to determine the precise mechanism of action.

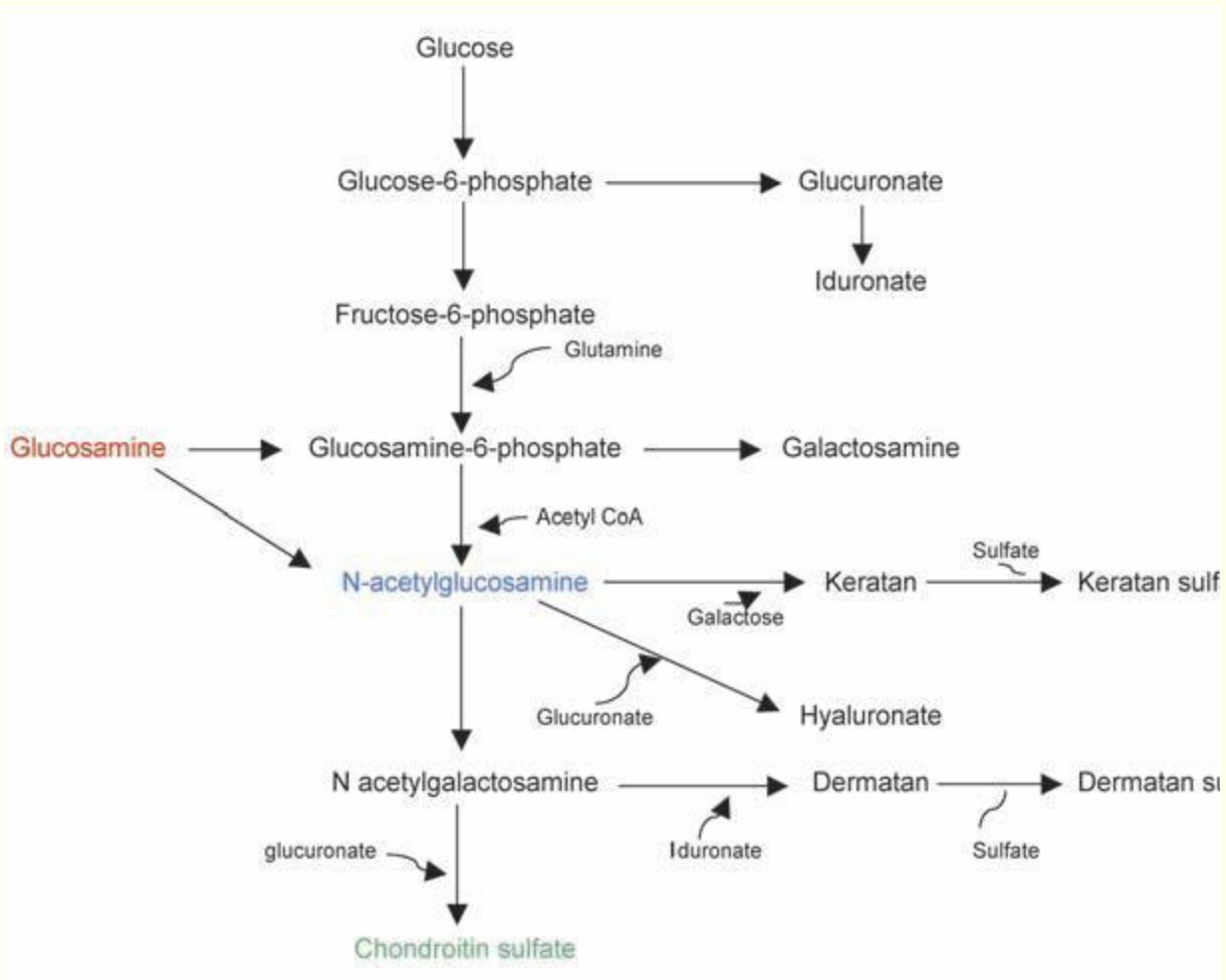


Figure 2-Illustration of the hexosamine synthetic pathway depicting synthesis of glucosamine and its derivatives, including glycosaminoglycans such as chondroitin sulfate, keratan sulfate, and hyaluronate (hyaluronic acid). Exogenous glucosamine is phosphorylated to glucose-6-phosphate, bypassing rate-limiting steps in the pathway. Exogenous N-acetylglucosamine can directly enter the pathway as a substrate for glycosaminoglycan synthesis<sup>1</sup>. Source: <http://avmajournals.avma.org.proxy.lib.iastate.edu:2048/doi/pdf/10.2460/javma.2005.226.1079>.

## Dosage

The exact dosage of glucosamine necessary for dogs, cats, horses, and even humans remains unclear. Presently recommended amounts for oral doses is roughly 22 mg/kg for glucosamine hydrochloride<sup>2</sup>. Recent research has developed techniques to determine plasma concentrations achievable after oral administration in rats and dogs<sup>1</sup>. Results of single-dose pharmacokinetics of glucosamine performed by use of those methods support its absorption, with lower oral bioavailability in horses than in dogs. In horses, doses at presently recommended concentrations result in undetectable plasma concentrations, necessitating the use of doses approximately 5 to 10 times greater, but multiple-dose pharmacokinetics remain to be determined. Application of newer methods will help in clarifying the concentrations achieved in plasma, synovial fluid, and perhaps cartilage after oral administration and may prove indispensable in modifying present oral dosing protocols<sup>1</sup>.

## Benefits and Potential Issues

Glucosamine has definitely shown its benefit of slowing the progression of osteoarthritis in multiple species. However, glucosamine is classified as a food additive or nutraceutical and thereby not regulated by the US Food and Drug Administration. Although the exact dosage necessary to achieve desired results is still unclear,

glucosamine is being used to treat dogs, cats, horses, and humans with joint problems all across the globe. Many studies have demonstrated that glucosamine is a safe, nontoxic product and that adverse effects are rare, however, veterinarians have expressed concern that glucosamine supplementation may cause diabetes mellitus. A reason for this concern is that glucosamine can be used to induce insulin resistance in skeletal muscle of normoglycemic rats. One study has shown that short-term (ie, 21 days) administration of an oral glucosamine-chondroitin sulfate supplement does not adversely affect glycemic control in healthy dogs<sup>6</sup>. However, further research is needed to determine if long-term glucosamine supplementation will cause diabetes mellitus in dogs or in other species.

Products currently marketed as oral supplements for equine joints have also had their quality questioned. Poor product quality has been reported for a variety of human and veterinary compounds, including glucosamine, after a particular study found that only 2 out of 14 commercial over-the-counter glucosamine sulfate products for human use actually contained the amount of product on the label. Products with lower levels of glucosamine are unlikely to be effective and are an unnecessary expense to the owner. Low levels in oral supplements for joints are especially important in the horse where bioavailability is very low. One study that evaluated equine glucosamine supplements showed 9 of 23 products contained less glucosamine than claimed by the manufacturer<sup>7</sup>. This variability in the quality of commercial glucosamine supplements for horses combined with the discrepancy in dosing recommendations makes it difficult for horse owners and veterinarians to select and provide the proper amount of supplement. Better quality control along with more research on the appropriate dosages of glucosamine is needed for consumers to have confidence in all available products.

As the supplementation of glucosamine continues to gain popularity, studies to further explain the direct mechanism of action and pharmacokinetics are needed. These compounds have promise in terms of protection of articular cartilage and relief provision of clinical signs of osteoarthritis. Furthermore, the use of these compounds may reduce the requirement for other anti-inflammatory drugs and analgesics. Glucosamine may become a mainstay of preventative maintenance programs that provide support for aging animals and may aid in extending competitive careers of athletes, particularly horses. The duration of the effect of glucosamine supplementation and the potential benefit of slowing the progression of osteoarthritis or preventing its onset remain unclear, which warrants further investigation of the nutraceutical's effects.

## References

<sup>1</sup>Neil, K.M., et al. "The role of glucosamine and chondroitin sulfate in treatment for and prevention of osteoarthritis in animals." *JAVMA*, Vol 226, No. 7, April 1,

2005.<http://avmajournals.avma.org.proxy.lib.iastate.edu:2048/doi/pdf/10.2460/javma.2005.226.1079>.

<sup>2</sup>Oke, S.L. "Indications and contraindications for the use of orally administered joint health products in dogs and cats." *JAVMA*, Vol 234, No. 11, June 1,

2009.<http://avmajournals.avma.org.proxy.lib.iastate.edu:2048/doi/pdf/10.2460/javma.234.11.1393-dosing>.

<sup>3</sup>Largo, A.S., et al. Glucosamine inhibits IL-1 $\beta$ -induced NF $\kappa$ B activation in human osteoarthritic chondrocytes." *Osteoarthritis Cartilage* 2003;11:290-298.

<sup>4</sup>Kirkham, S.G., and R.K. Samarasinghe. "Review article: Glucosamine." *Journal of Orthopaedic Surgery* 2009; 17(1): 72-6.<http://www.josonline.org/pdf/v17i1p72.pdf>.

<sup>5</sup>FDA. "Synopsis of Petitions regarding glucosamine." 2010.

[http://www.fda.gov/ohrms/dockets/ac/04/briefing/4045b1\\_04\\_Summary%20GCSOA%20FAC.htm](http://www.fda.gov/ohrms/dockets/ac/04/briefing/4045b1_04_Summary%20GCSOA%20FAC.htm).

<sup>6</sup>Lenox, C.E., K.F. Lunn. "Effects of glucosamine-chondroitin sulfate supplementation on serum fructosamine concentration in healthy dogs." *Journal of the American Veterinary Medical Association*. Jan 2010, Vol. 236, No. 2, Pages 183-186: 183-186.

<sup>7</sup>Oke, S., et al. "Evaluation of glucosamine levels in commercial equine oral supplements for joints." *Equine vet. J.* (2006) 38 (1) 93-95.

[2011 Iowa Horse Judges Directory](#)

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## Horseback Riding Program 2011

Iowa Quarter Horse Association offers Horseback Riding Program

Want to receive recognition for your time in the saddle or the cart - but not necessarily at a show or jackpot? The Iowa Quarter Horse Association has the answer!

IQHA offers a Horseback Riding Program to recognize and reward people for the time they spend with their horses in non-competitive activities.

Modeled after AQHA's successful Recreational Riding Program, the IQHA program asks riders to log the number of hours they spend on such activities as trail rides, lessons, parades, training, and other non-competitive avenues. Horses and ponies of all breeds, and riders of all ages and experience levels, are welcome.

At the end of the year, hours are tabulated, and the top riders in the various divisions (Adult/Youth, Quarter Horse/Other Breeds) receive year-end awards. In addition, hours accumulate every consecutive year that a participant is registered with the program, and Lifetime Benchmarks are recognized at various hour levels. In order to participate in the Iowa Horseback Riding Program, participants must be IQHA or IQHYA (Youth) members, and pay a small program enrollment fee per division. There is no limit to the number of horses that a rider can accumulate hours on.

This is the fourth year for the program. Earlier this year, IQHA honored the top riders from 2010 at its Awards Banquet. Award recipients participated in the same year-end awards program as show competitors, earning such prizes as sheets, headstalls, and personalized halters.

Official rules, registration forms, and hourly log sheets are available on the IQHA website: <http://www.iowaquarterhorse.com/RidingProgram.html>

If you would like more information, please contact Holly Wilson, Horseback Riding Program Chair, at (515) 460-4463, or by e-mail at [hwilson@newportlabs.com](mailto:hwilson@newportlabs.com)

## ACTHA Trail Challenge

Several equestrian trails in Iowa are under threat of being closed due to funding cuts. That's why Iowa Trail Riders Association is hosting an ACTHA trail challenge on May 7th at Brushy Creek State Park. Proceeds from this ride will be used to support equestrian trails in Iowa.

An ACTHA trail challenge is a 2-3 hour pleasure ride with 6 judges trail obstacles along the way. It is a fun, supportive atmosphere with tons of prizes up for grabs. Ribbons and prizes awarded to 1st-6th place for Open, Pleasure and Junior Divisions, jackpots, drawings and door prizes. No one will go away empty-handed. Also - the **first 5 Juniors (age 7-15) to register will pay no ride fee** (regularly \$25). They do, however, need to be ACTHA members in order to ride (memberships start at \$35). All the ride details are at [www.ACTHA.us](http://www.ACTHA.us) - Go to Rides tab and click on View Rides & Locations, then scroll down to the May 7 Mother's Day ITRA ctc ride and click on it.

Also, I still have a few spots open for obstacle judges. If someone is interested in volunteering to judge a trail obstacle, please have them email me at [HorseHugR@aol.com](mailto:HorseHugR@aol.com) Judges are not required to be ACTHA or ITRA members, but must be 18 yrs or older and know what to look for in good trail horsemanship. There is an online tutorial to instruct judges on how to score the contestants and there will be a judges' briefing the morning of the ride.

Please let me know if you have any questions!  
Susan Andersen  
ACTHA Affiliate, Ride Manager  
[www.ACTHA.us](http://www.ACTHA.us)

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