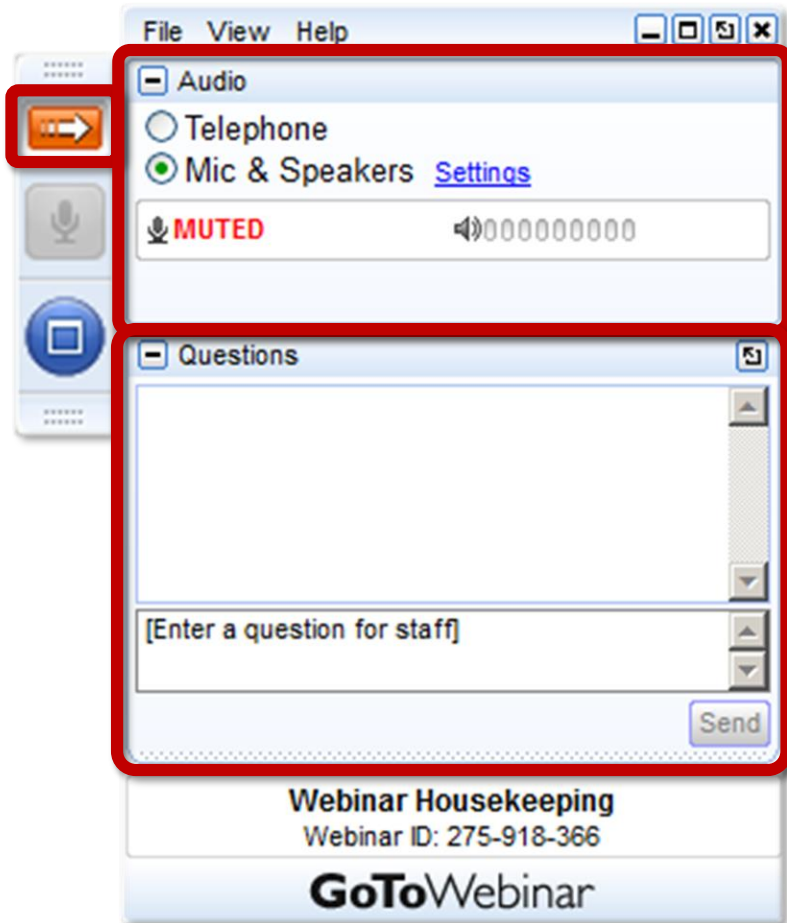


# Gastric Ulcers in Horses – What Causes Them and Proper Management



“Nutrition is the key to success”



## Your Participation

Open and close your control panel

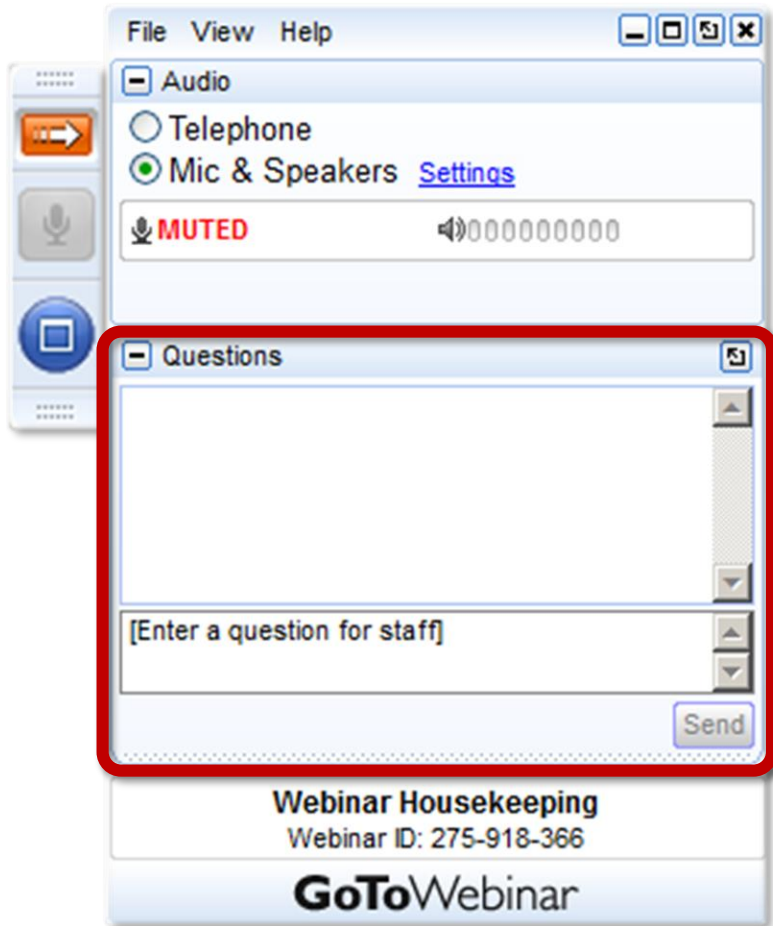
Join audio:

- Choose **Mic & Speakers** to use VoIP
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Submit questions and comments via the Questions panel

**Note:** Today's presentation is being recorded and will be provided within 48 hours.

“Nutrition is the key to success”



## Your Participation

- Please continue to submit your text questions and comments using the Questions panel

For more information, please contact [kstarr@standleeforage.com](mailto:kstarr@standleeforage.com).

**Note:** Today's presentation is being recorded and will be provided within 48 hours.

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## What You Need To Know About Gastric Ulcers

### What is the Prevalence of Gastric Ulcers in Horses?



- 93% of race horses
- 58% of show horses
- 25-50% of foals

### What Causes Gastric Ulcers?



- High grain, low forage diets
- Meal feeding
- Long periods of fasting

### Clinical Signs of Gastric Ulcers



- Loss of appetite
- Weight loss
- Poor body condition
- Irritability and attitude change
- Abdominal discomfort
- Decreased performance

### Diagnosing of Gastric Ulcers



- Consult your veterinarian
- Fast for minimum of 12 hours
- Water withheld for 4 hours
- Gastric endoscopy

### Treatment



- Acid pump inhibitors, i.e. Omeprazole
- Maintain stomach pH of greater than 4
- Management adjustments to reduce ulcer opportunity

### Prevention & Management



- Feed forage frequently or offer free choice pasture to stimulate saliva production
- Add alfalfa forage to diet as calcium is known to reduce acidity
- Avoid exercising horse on empty stomach
- Be cautious with anti-inflammatory drug use
- Limit stressful situations
- Reduce amount of concentrates fed

References:

Winkler, J. et al. "Evaluation of the prevalence of gastric ulcers in horses." *Am J Vet Res*. 2003; 64(11):1440-1442. [www.ncbi.nlm.nih.gov/pubmed/14995907](http://www.ncbi.nlm.nih.gov/pubmed/14995907)  
 Hargrett-Bean, J. (2005). "Stomach ulcers in horses." *Equine Veterinary Science*, Volume 35, Issue 1, 12-14.  
 Andrews, Frank. (2010). "Stomach ulcers in horses." *Equine Management*, Volume 35, Issue 1, 12-14.

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# Gastric Ulcers in Horses – What Causes Them and Proper Management

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TANIA CUBITT, PH.D.  
PERFORMANCE HORSE  
NUTRITION



DR. HOYT CHERAMIE,  
DVM, MS, DACVS  
Boehringer Ingelheim



# OUTLINE

“Nutrition is the key to success”

- Digestive Function
- Gastric Ulcers
- Medical Management
- Supportive/Preventative Management
- Forage Management
- Questions



# Digestive Function



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# DIGESTIVE FUNCTION - EVOLUTION

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## NATURAL DIET

- Fiber-based
- Wide variety of forages
- Nibbler – small amounts
- 12-18hrs grazing
- Moving while eating
- Herd
- Eating from ground
  - Natural drainage of the respiratory tract
  - Increases chewing time
  - Prevents muscular tension in the neck & back
  - Maintains teeth alignment



## MODERN DIET

- Cereal grain based
- Rapid intake
- Increased acidity of GI tract
- Frustration due to confinement
- Lack of socialization
- Exercise level
- Fed at chest height or higher



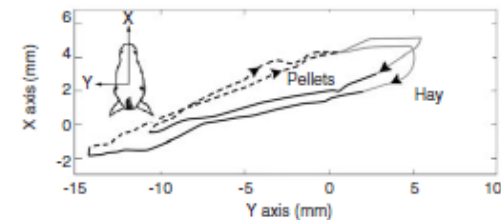
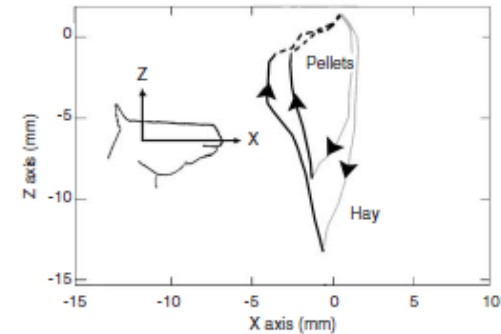
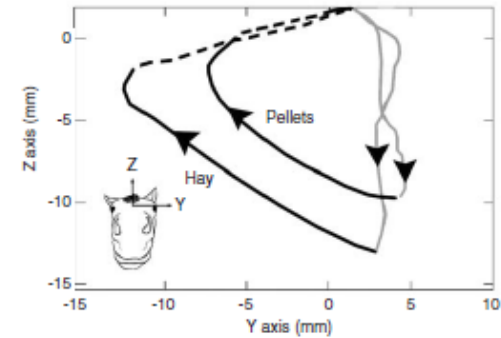
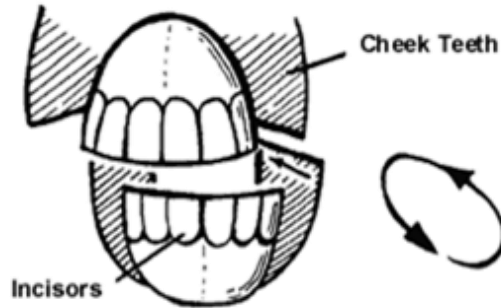


# DIGESTIVE FUNCTION - TEETH

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- Horses chew approx. 60,000 times a day when grazing
- 1000lb horse
- 1.5% BW hay; 15lbs = 25,500 chews
- 6lbs grain = 2,550 chews + 25,500 (hay) = 28,050 chews
- 12lbs grain = 5,100 chews + 25,500 (hay) = 30,600 chews

*Bonin et al., Comparison of mandibular motion in horses chewing hay and pellets. Equine vet. J. (2007) 39 (3) 258-262*

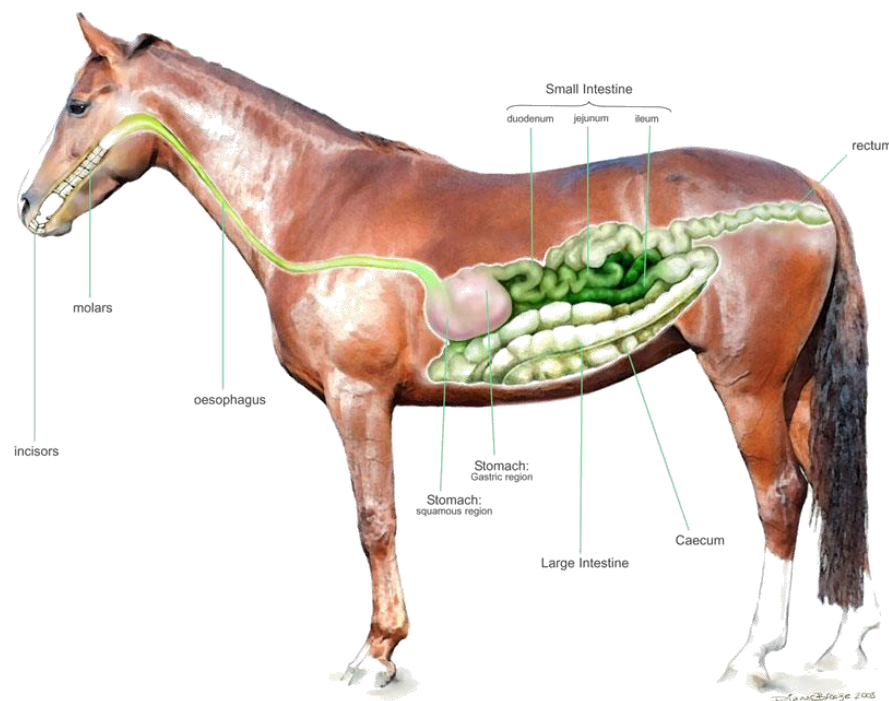


# SALIVA IS A BUFFER

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Saliva helps buffer stomach acid – the more time chewing the more saliva is produced

Ingredient	Chew or Jaw Sweep
2lb of oats (on ground)	1000 times
2lb of hay (on ground)	2000 times
2lb of oats (chest height)	350-500 times

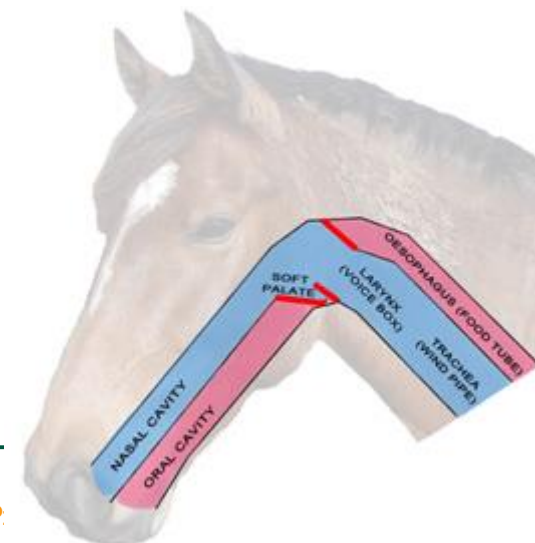
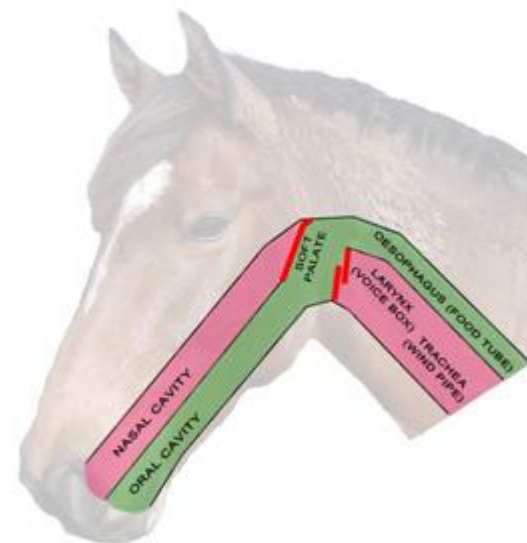


Ad libitum grazing = 60,000 chews per day

# DIGESTIVE FUNCTION - ESOPHAGUS

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- Mastication - Hay will have absorbed about four x its weight in saliva & oats will absorb their own weight
- Choke
  - Obstruction within esophagus
  - Fast eaters
  - Not chewing feed
- Satiety can influence ingestion and chewing behavior
  - More voracious ingestion with less thorough mastication is observed in animals that are fed restrictively (Luginbuhl et al., 1989)
- Increased fecal particle size with reduced feeding level was reported in horses (Clauss et al., 2014)
  - Hastier ingestion with less thorough mastication in hungry animals



# Poll Question

“Nutrition is the key to success”

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# Gastric Ulcers



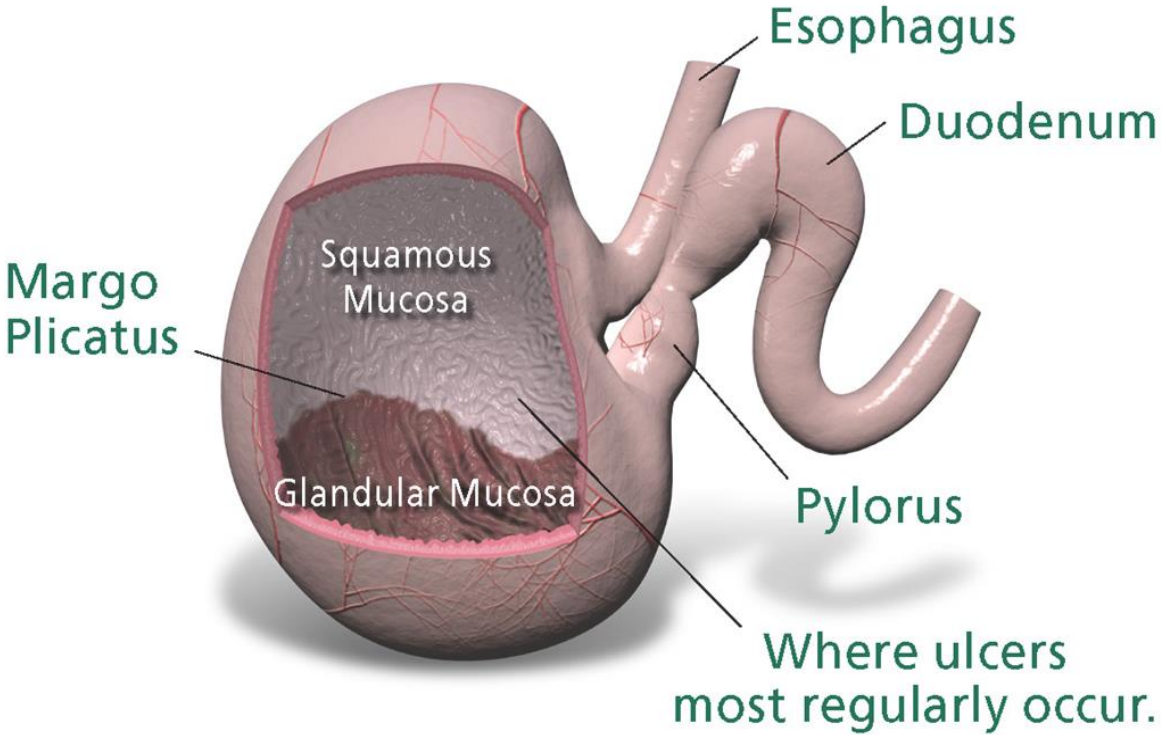
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# WHAT IS EGUS?

## Equine Gastric Ulcer Syndrome

- Squamous Disease
  - Very similar to GERD (Gastric Esophageal Reflux Disease) in humans
  - Heartburn to esophageal erosions
- Glandular Disease - ??
  
- Related to what people do with their horses

# EQUINE STOMACH ANATOMY



# EQUINE GASTRIC ULCER SYNDROME (EGUS)

- A horse's stomach can produce up to 16 gallons of acidic fluid every day<sup>1</sup>
- In a natural grazing situation, a steady flow of acid is necessary for digestion
- Today, many horses are not constantly grazing. With the added stresses of training and traveling, excess acid can easily build up and cause EGUS

1. Kitchen DL, Merritt AM, Burrow JA. Histamine-induced gastric acid secretion in horses. *AJVR* 1998;59(10):1303-1306.



# CAUSES OF EGUS

Leading stress factors that may cause EGUS include,  
but are not limited to:

- Competition<sup>1</sup>
- Training<sup>1</sup>
- Travel<sup>1</sup>
- Lay-up due to sickness or injury<sup>2</sup>
- Weekend shows or events<sup>3</sup>
- Limited turnout or grazing<sup>2</sup>
- Changes in routine<sup>4</sup>
- Trailing<sup>1</sup>
- Confinement<sup>3</sup>

1. ULCERGARD product label.

2. Murray MJ. Disorders of the Stomach. In: Smith BP, ed. *Large Animal Internal Medicine*. St. Louis; CV Mosby, 1990;710-717.

3. McClure SR, Carithers DS, Gross SJ, Murray MJ. Gastric ulcer development in horses in a simulated show or training environment. *J Am Vet Med Assoc* 2005;227(5):775-777.

4. Equine Gastric Ulcer Council. Recommendations for the diagnosis and treatment of equine gastric ulcer syndrome (EGUS). *Equine Vet Educ* 1999;11:262-272.

# PATHOGENESIS OF EGUS

## Risk Factor #1: Eating and Feeding Patterns

- Episodic feeding: feeding 1X, 2X or 3X/ day<sup>1</sup>
- Withdrawal of feed prior to work or competition
- Diet selection: Grain & concentrate vs. hay/grass<sup>1</sup>
- Limited or no turnout/grazing<sup>1</sup>
- Changes in feeding routines, particularly traveling<sup>2</sup>



1.Luthersson N, Nielsen KH, Harris P, Parkin TDH, Risk factors associated with equine gastric ulcer syndrome (EGUS) in 201 horses in Denmark, *Equine Veterinary Journal*, 2009;41(7) 625-630

2.Equine Gastric Ulcer Council. Recommendations for the diagnosis and treatment of equine gastric ulcer syndrome (EGUS). *Equine Vet Educ* 1999;11:262-272.

# PATHOGENESIS OF EGUS

## Risk Factor #2: STRESS

- Physical stress
  - Training/competition<sup>1</sup>
  - Illness/lay up
  - Painful disorders/Lameness
  - Surgery



1. Pedersen SK, Cribb AE, Windeyer MC, Read EK, French D, Banse HE, Risk factors for equine glandular and squamous disease in showjumping warmbloods, Equine Veterinary Journal, 0(2018)1-5

# PATHOGENESIS OF EGUS

## Risk Factor #2: STRESS

- Behavioral stress
  - Transport
  - Stall confinement
  - Unfamiliar environment
  - Changes in routine
  - Social regrouping
  - Some physical stresses



# SIGNS OF GASTRIC ULCERS<sup>1</sup>



- Weight loss
- Reduced appetite
- Poor hair coat
- Recurrent colic
- Attitude changes
- Poor performance

<sup>1</sup>.Sykes BW, Hewetson M, Hepburn RJ, Luthersson N, Tamazali Y, European College of Equine Internal Medicine Consensus Statement – Equine Gastric Ulcer Syndrome in Adult Horses, J Vet Internal Medicine, 2015, 1288-1299

# Medical Management



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# GASTROGARD® (OMEPRAZOLE) BY MERIAL

- Only FDA approved product to treat equine gastric ulcers
- Healed or reduced severity of gastric ulcers in 99% of treated horses
- One daily dose per syringe for horses weighing up to 1,250 lbs
- For use in foals > 4 weeks of age, horses and breeding stallions
- Well accepted cinnamon-flavored paste



GASTROGARD product label

# PREVENTION – THE NEXT STEP

## How do we help to prevent EGUS?

### Management Practices:

- Removal / reduction of ulcerogenic factors<sup>1</sup>
- Turnout
- Feeding changes to more appropriate feedstuffs<sup>1</sup>
- Continuous access to roughage<sup>1</sup>
- Alfalfa hay<sup>1</sup>
- Pharmaceuticals (During high stress, ulcerogenic situations)<sup>1</sup>
- Nutraceuticals/Supplements<sup>1</sup>
  - Continuously?
  - Research?

1.Sykes BW, Hewetson M, Hepburn RJ, Luthersson N, Tamazali Y, European College of Equine Internal Medicine Consensus Statement – Equine Gastric Ulcer Syndrome in Adult Horses, J Vet Internal Medicine, 2015, 1288-1299



# ULCERGARD® (OMEPRAZOLE) BY MERIAL

Same patented oral formulation as GASTROGARD

- Cinnamon flavored paste
- 4 daily doses per syringe for a 1200 lb horse
- Marked in 4 dose increments
- Labeled for use in horses 6 months of age and older



ULCERGARD product label

# “TIMED PREVENTION”

## UlcerGard® once a day

- 4 doses per tube (up to 1250 lbs)
- Prior to and during stressful situations (start 48 hrs prior to event)
- Traveling, changing facilities, trailering
- Training/**competition**
- Stall Confinement
- Social regrouping/weaning
- Hospitalization

# IMPORTANT SAFETY INFORMATION:

*Federal (USA) law restricts GASTROGARD to use by or on the order of a licensed veterinarian. GASTROGARD is indicated for the treatment and prevention of recurrence of gastric ulcers in horses and foals 4 weeks and older. In an efficacy trial, no adverse reactions were observed. Safety of use in pregnant or lactating mares has not been determined. Keep this and all drugs out of the reach of children. In case of ingestion, contact a physician.*

*ULCERGARD can be used in horses that weigh at least 600 lbs. Safety in pregnant mares has not been determined. Not for use in humans. Keep this and all medications out of the reach of children. In case of ingestion, contact a physician.*

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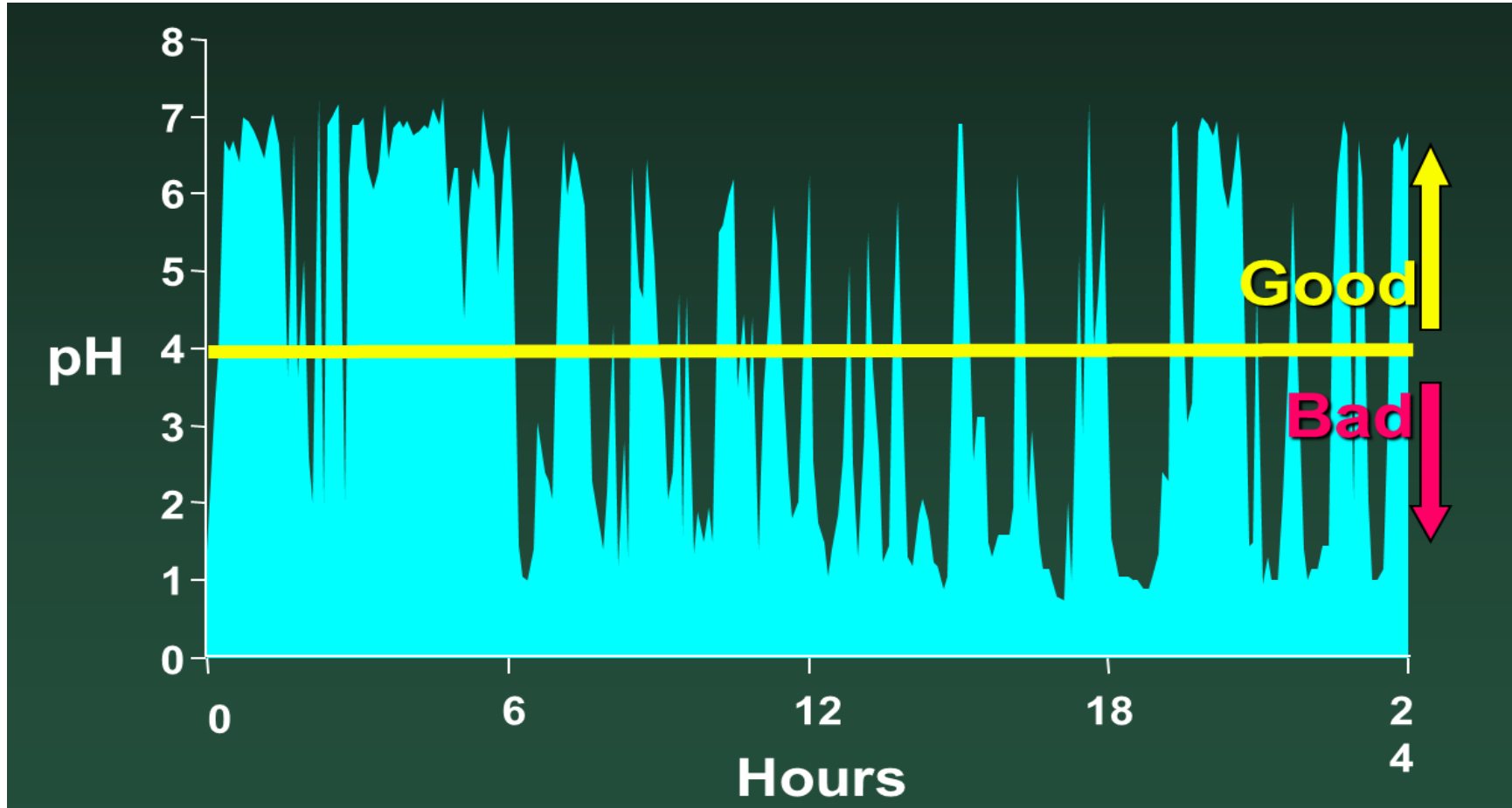
# Supportive/Preventative Management



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# 24-HR STOMACH ACID: FREE CHOICE GRASS HAY

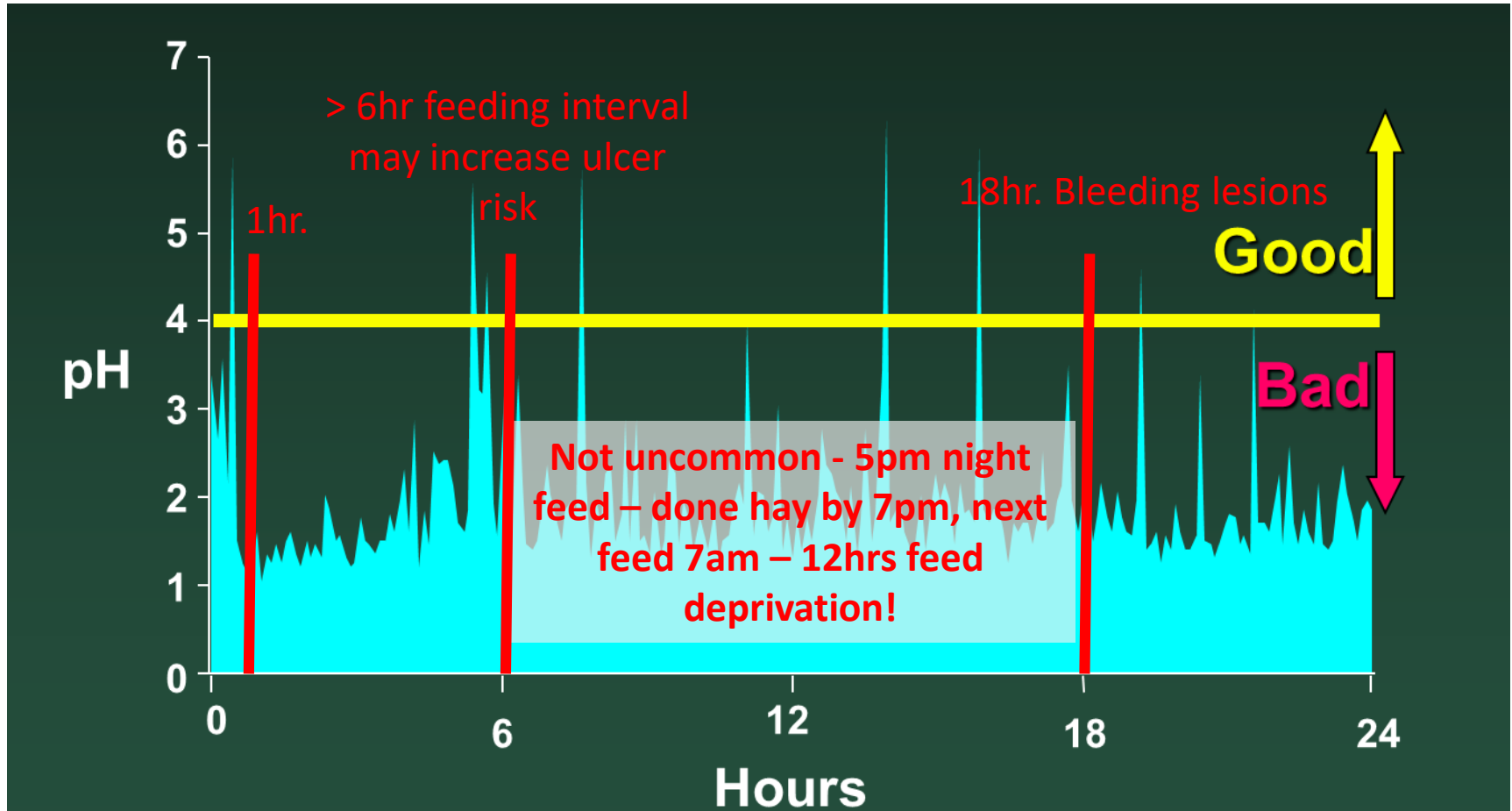
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Murray & Schusser, EVJ, 1993; Murray et al., EVJ, 1996; Luthersson et al., 2009

# 24-HR STOMACH ACID: NO FEED

"Nutrition is the key to success"



Murray & Schusser, EVJ, 1993; Murray et al., EVJ, 1996; Luthersson et al., 2009

# Poll Question

“Nutrition is the key to success”

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# ALFALFA

“Nutrition is the key to success”

- Alfalfa Hay
- Research Texas A&M University, USA, (Lybbert et al., 2007)
- Alfalfa was a natural buffer to acidity in the stomach (Calcium)
- Feeding Alfalfa was more effective at reducing the incidence of gastric ulcers than Bermuda grass hay
- Preferably provide alfalfa at regular 5 – 6 hour intervals (Nadeau 2000)
- Saliva production that results from chewing also serves to buffer stomach acid and stomach contents for horses that have free choice access to forage throughout the day





# Forage Management



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# FORAGE AMOUNT

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- Absolute minimum = 1% of B.W.  
1000 lb horse = 10 lbs forage (DM)
- Weight Loss = 1.2% of B.W. 1000 lb horse = 12 lbs forage (DM)
- Recommended minimum = 1.5% of B.W. 1000 lb horse = 15 lbs forage (DM)
- Normal forage intake = 1.8 to 2.5% of B.W. (DM)
- Maximum intake = 3 to 3.5% of B.W. (DM)



# FORAGE MANAGEMENT: HAY

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- Important to mimic grazing behavior
- **Hay** – Extend meal time



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**Small Extra Slow Feed Hay Net**



**Extra Slow Feed Hay Net**



**Slow Feed Hay Net**



**Everlast Slow Feed Hay Net**



**Super Slow Feed Hay Net**



Reference: <https://www.sstack.com/product/extra-large-hay-net/>

# GRAZING MUZZLES

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- Slow forage intake
- Allow for exercise



# Management Reduces Risk

- Medical treatment
- Decrease high sugar grains in favor of higher fat and fiber feeds
- Alfalfa
- Mimic grazing behavior



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# Questions



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# Thank you for joining us!

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