

# Introduction to Horse Digestion



**Standlee**  
PREMIUM WESTERN FORAGE®

**PHN**  
PERFORMANCE HORSE NUTRITION

# NUTRITIONAL RESOURCES



“Nutrition is the key to success”

[standleeforage.com](http://standleeforage.com)

The navigation menu is a dark green vertical sidebar on the left side of the website. It features the Standlee logo at the top, followed by a list of menu items: HOME, PRODUCTS, NUTRITION (with a minus sign), COUPONS, BLOG, COMPANY, RESOURCES, INTERNATIONAL, and CUSTOMER SERVICE (all with plus signs). Under the NUTRITION section, there are sub-links: Why Premium Western Forage, Nutrition Overview, Forage Finder, Feed Calculator, Feeding Instructions, and Nutritional Resources. At the bottom of the menu, there is a 'Find Us Online' section with icons for Facebook, Twitter, Pinterest, and Instagram.

## NUTRITIONAL RESOURCES

Standlee Premium Western Forage® creates and maintains a wealth of nutritional resources to help you maintain the nutrition of your horses. You can find those resources here.

## Nutritional Webinars

### UPCOMING WEBINARS

**Introduction to Horse Digestion** - Wednesday, April 29, 2020 - 5:30 PM MST (6:30 PM CST)

With many schools going online, and events, such as 4-H, FFA and Pony Club meetings, being canceled or delayed, we want to offer a fun learning experience for our youth!

We invite 4-H, FFA and Pony Club members, along with their leaders, advisors and parents to join us in learning about the basics of horse digestion and forage. Dr. Tania Cubitt, Doctor of Philosophy in Equine Nutrition and Reproduction, is an engaging speaker who will walk us through this interactive presentation. We'll also have question and answer time at the end with Dr. Cubitt, so get your horse nutrition questions ready!

REGISTER NOW

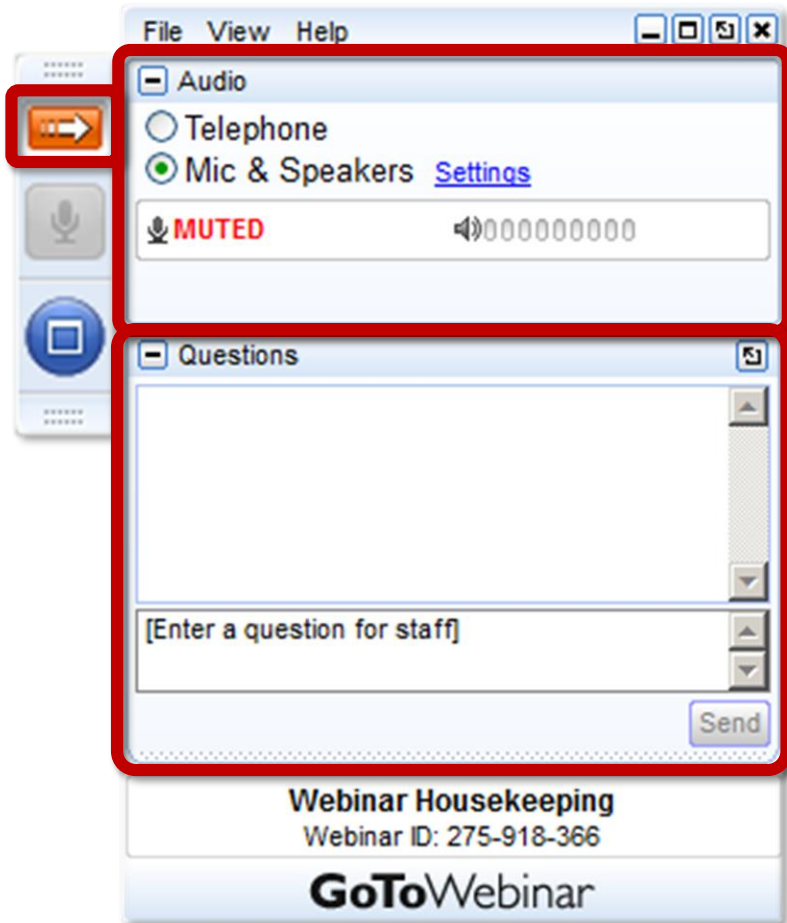
DOWNLOAD WORKSHEET

### RECORDED WEBINARS

▶ A Window into Your Horse's Digestive System: How It Works & How It Can Fail ([Watch Video Recording Now](#))



“Nutrition is the key to success”



## Your Participation

Open and close your control panel

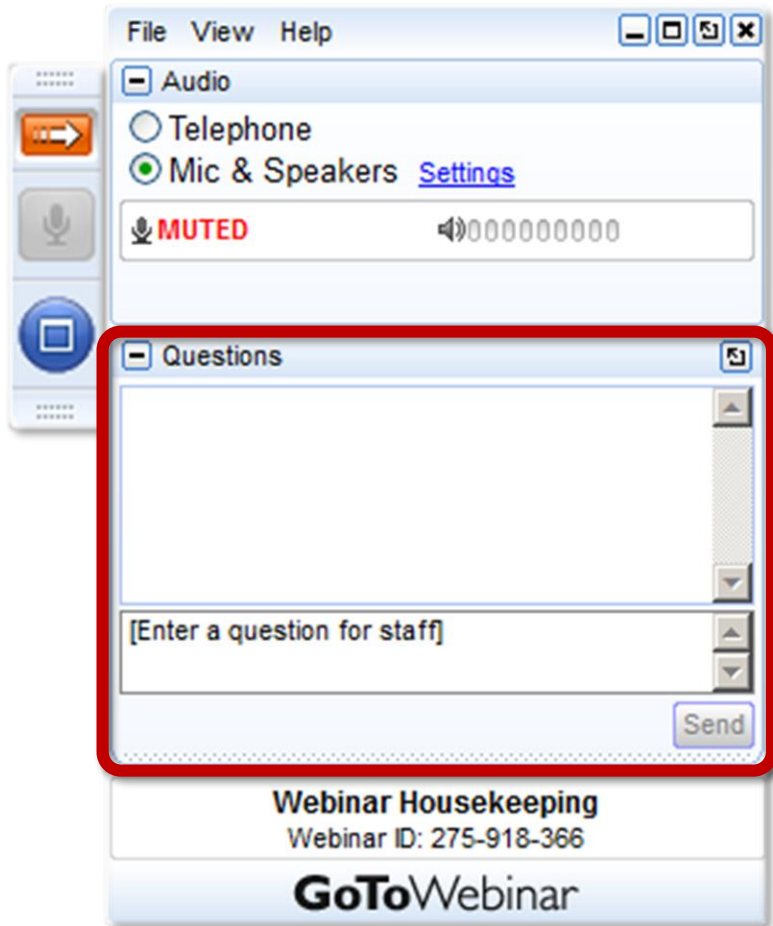
Join audio:

- Choose **Mic & Speakers** to use VoIP
- Choose **Telephone** and dial using the information provided

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 [training@standleeforage.com](mailto:training@standleeforage.com).

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# Introduction to Horse Digestion

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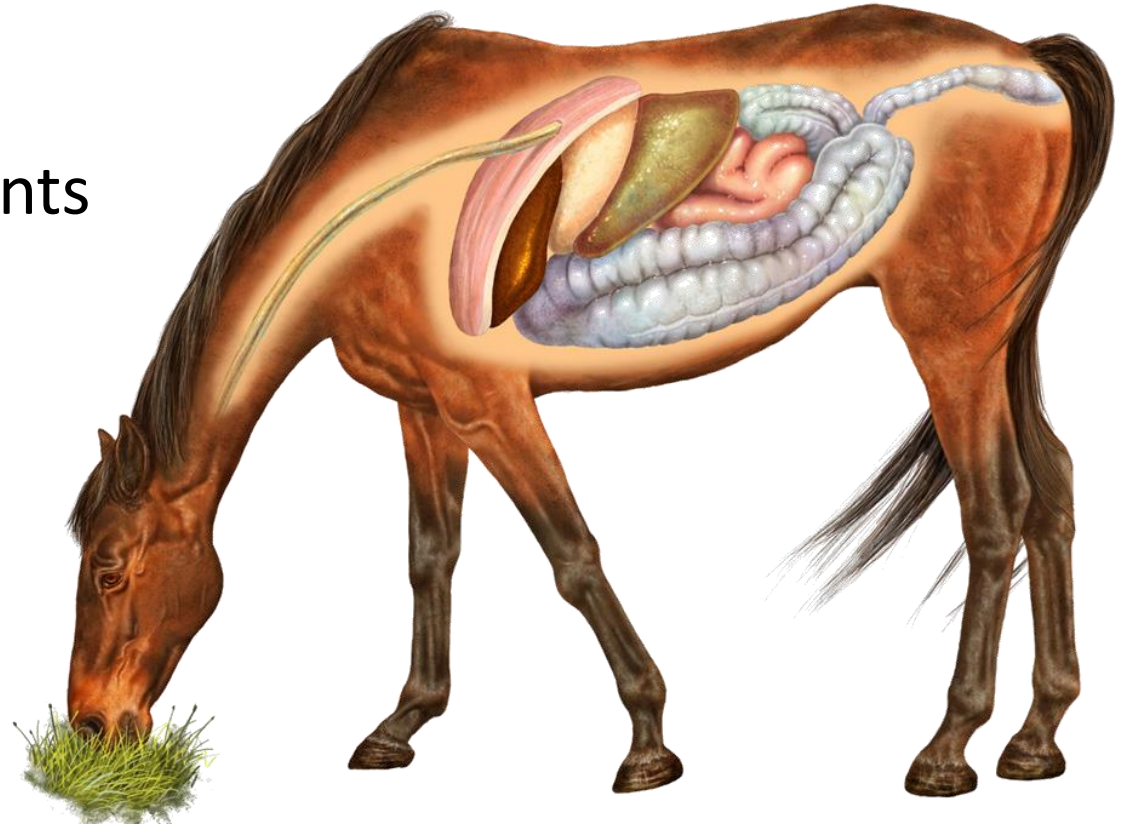
DR. TANIA CUBITT  
PERFORMANCE HORSE NUTRITION



# OUTLINE

“Nutrition is the key to success”

- Equine Evolution
- Digestive Function
- Forage Requirements
- Questions



# Equine Evolution



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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

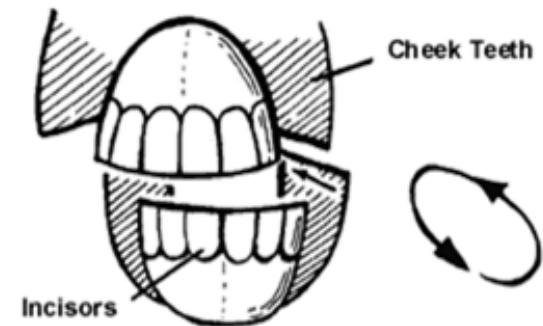
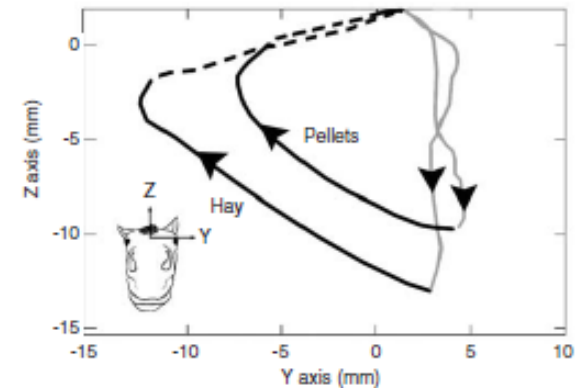


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# TEETH

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- Horses chew approximately 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

# ESOPHAGUS

“Nutrition is the key to success”

- Chewing
  - Hay will have absorbed about four times its weight in saliva. Oats will absorb their own weight.
- Choke
  - Obstruction within esophagus
  - Fast eaters
  - Not chewing feed
- Hungry horses eat faster



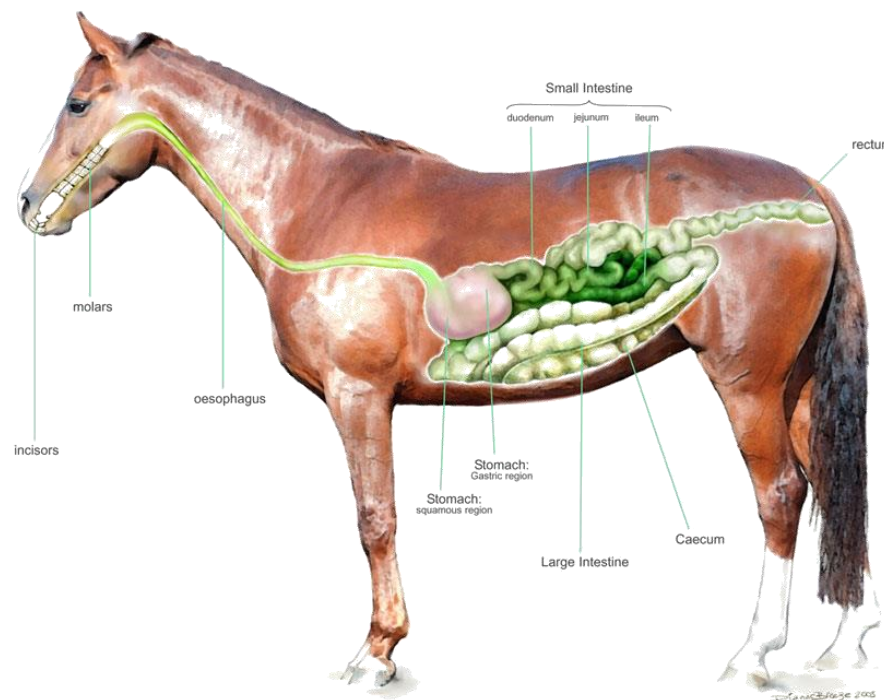


# SALIVA IS A BUFFER

“Nutrition is the key to success”

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

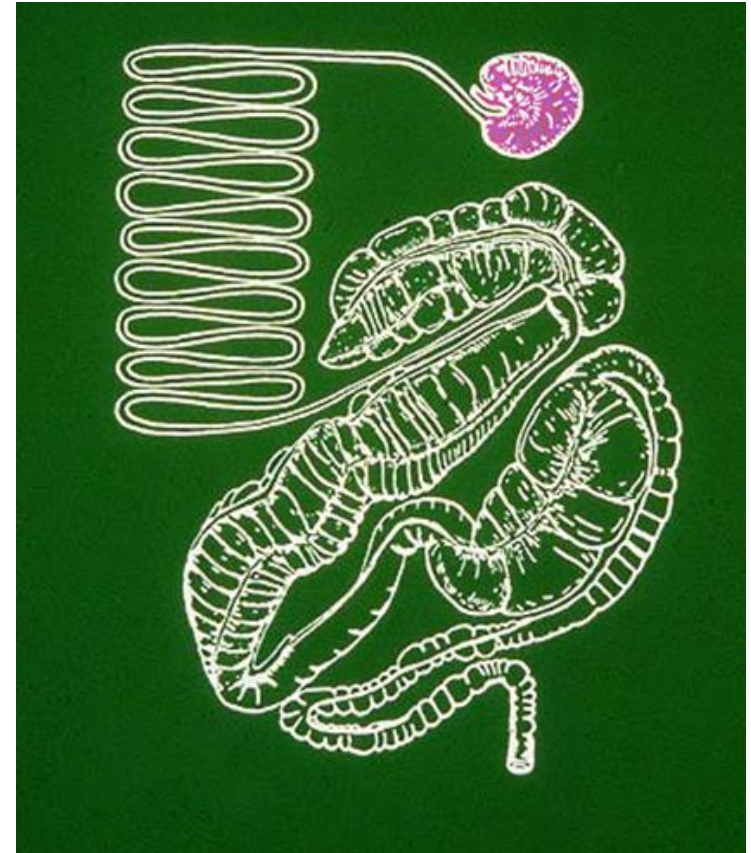


Ad libitum grazing = 60,000 chews per day

# STOMACH

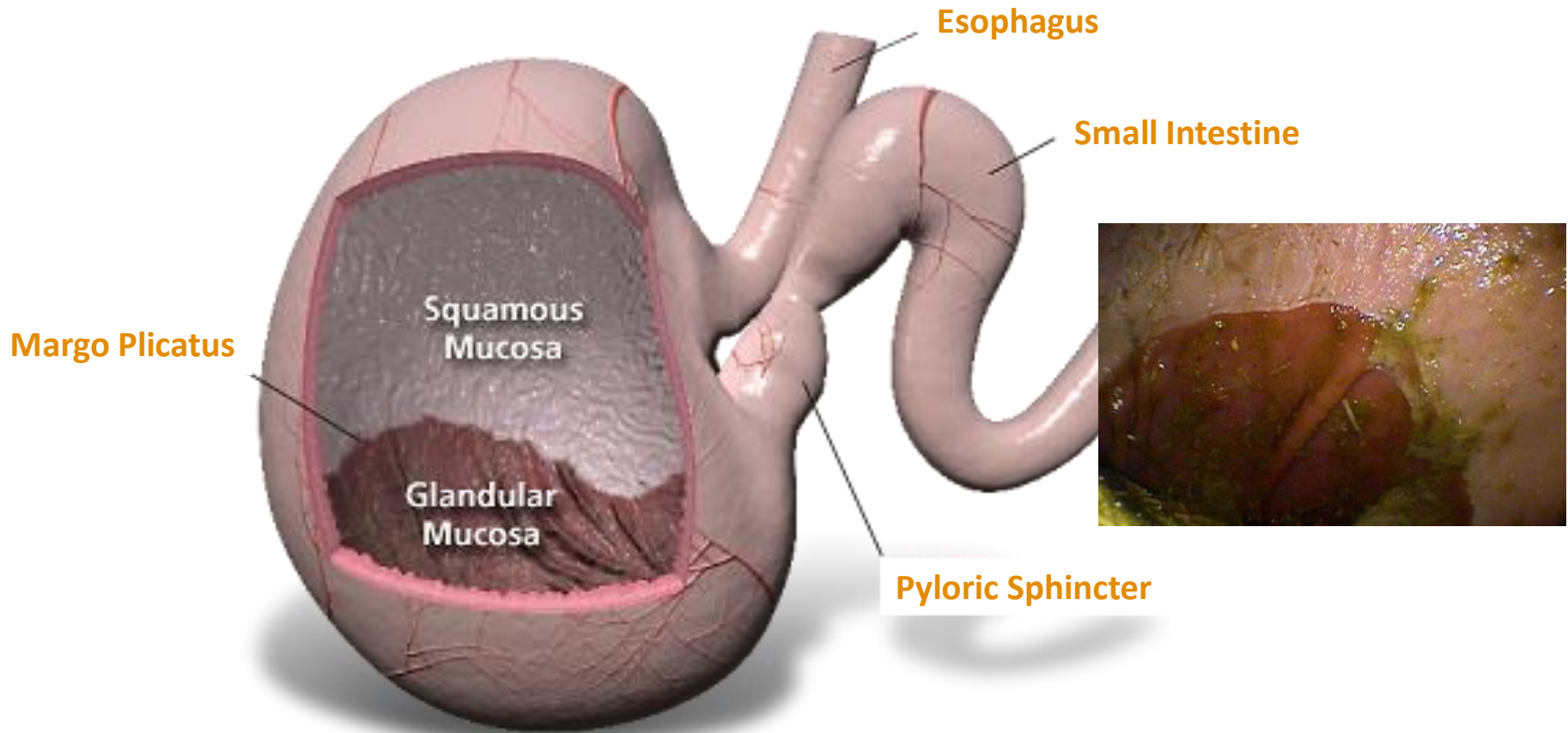
“Nutrition is the key to success”

- One small compartment
- 9% of capacity
- Dictates meal size
- 17hrs per day
- Acid, pepsin
- Protein digestion
- Meal size
  - No more than 3-4lbs



# DIGESTIVE FUNCTION - STOMACH

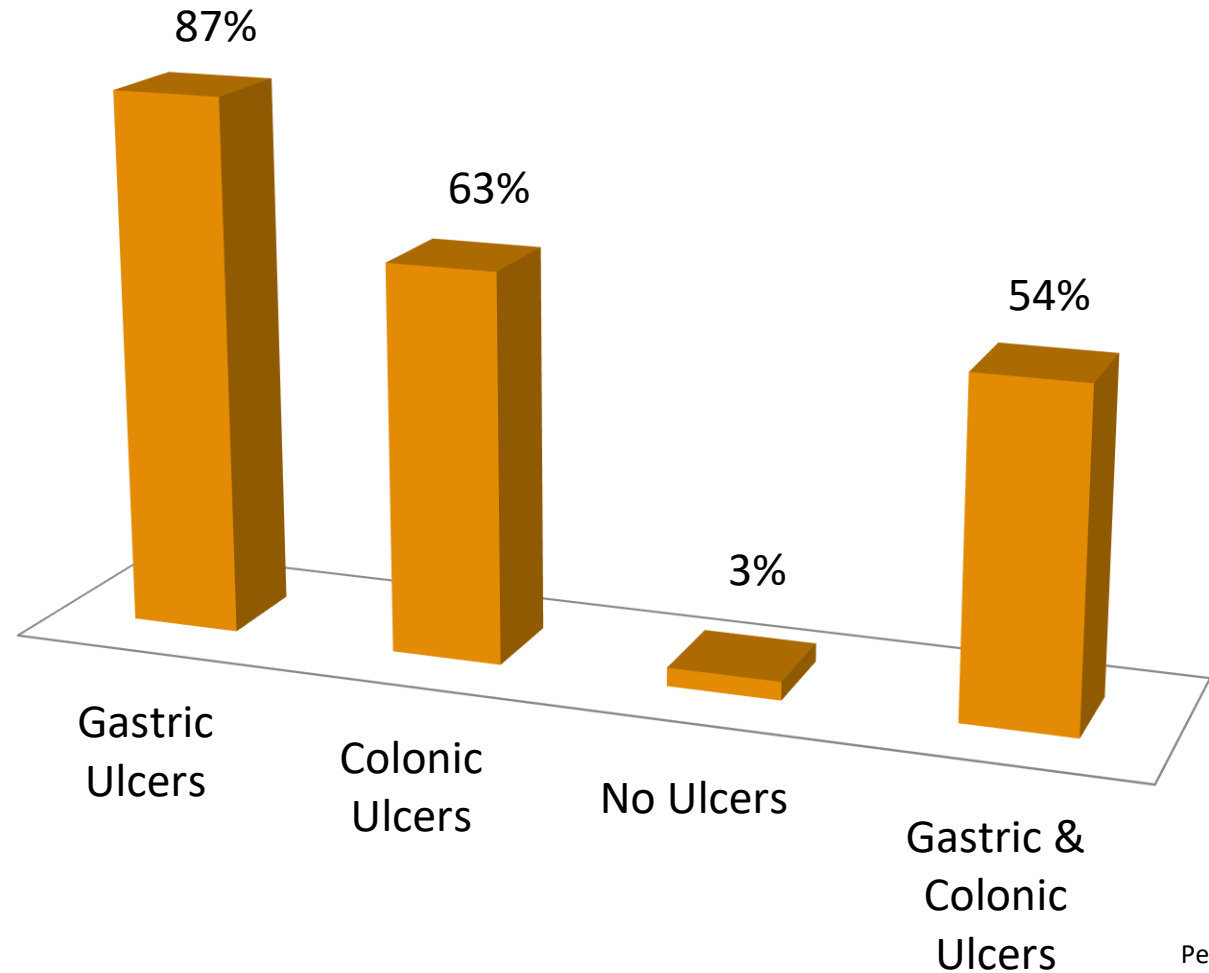
“Nutrition is the key to success”





# ULCERS – PERFORMANCE HORSES

“Nutrition is the key to success”



Pellegrini, 2005

# CAUSES OF GASTRIC ULCERS

“Nutrition is the key to success”

- Fasting
- Meal feeding
- High grain diet
- Low roughage diet
- Stress
  - Transport
  - Stabling
  - Intense exercise
- Long term use of nonsteroidal anti-inflammatory drugs (NSAID's)



# SOLUTIONS - ALFALFA

“Nutrition is the key to success”

- Alfalfa hay
- Alfalfa was a natural buffer to acidity in the stomach (Calcium)
- Frequent meals
- Constant access to hay or pasture
- 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





**What State Are You From?**

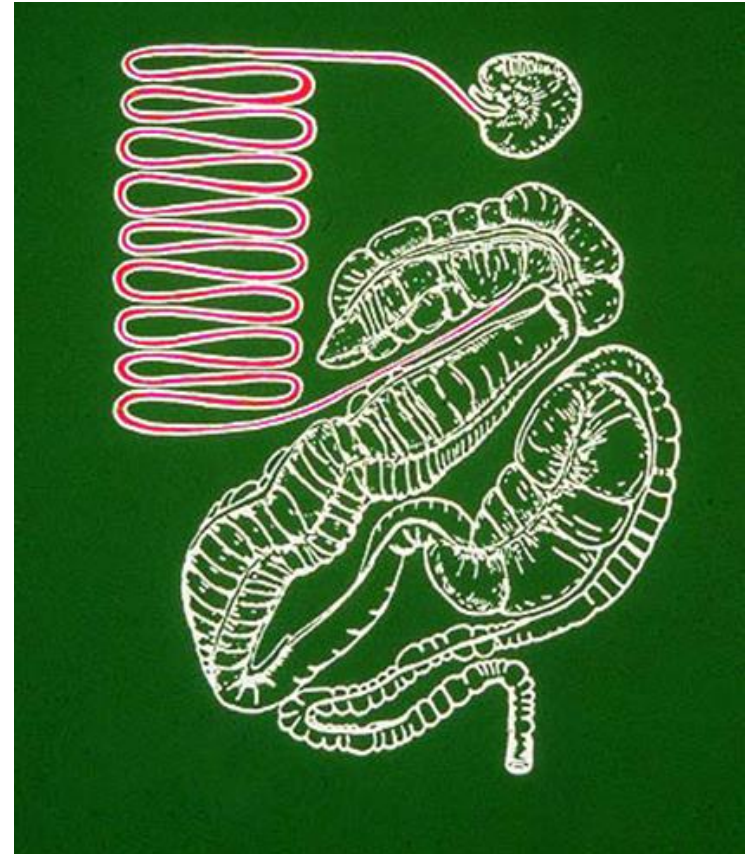


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# SMALL INTESTINE

“Nutrition is the key to success”

- 25% capacity
- 70ft
- 3-4 inches diameter
- 10-12 gal
- 30-40 mins to 3-4 hrs
- Enzymatic digestion
  - CHO
  - Protein
  - Fat
  - Minerals
  - Vitamins

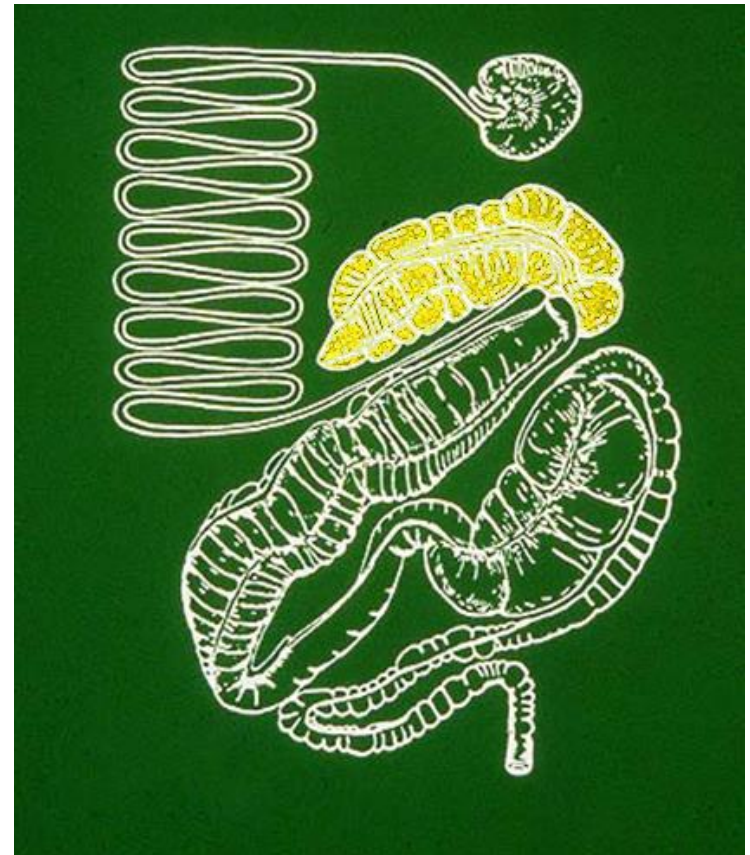




# CECUM

“Nutrition is the key to success”

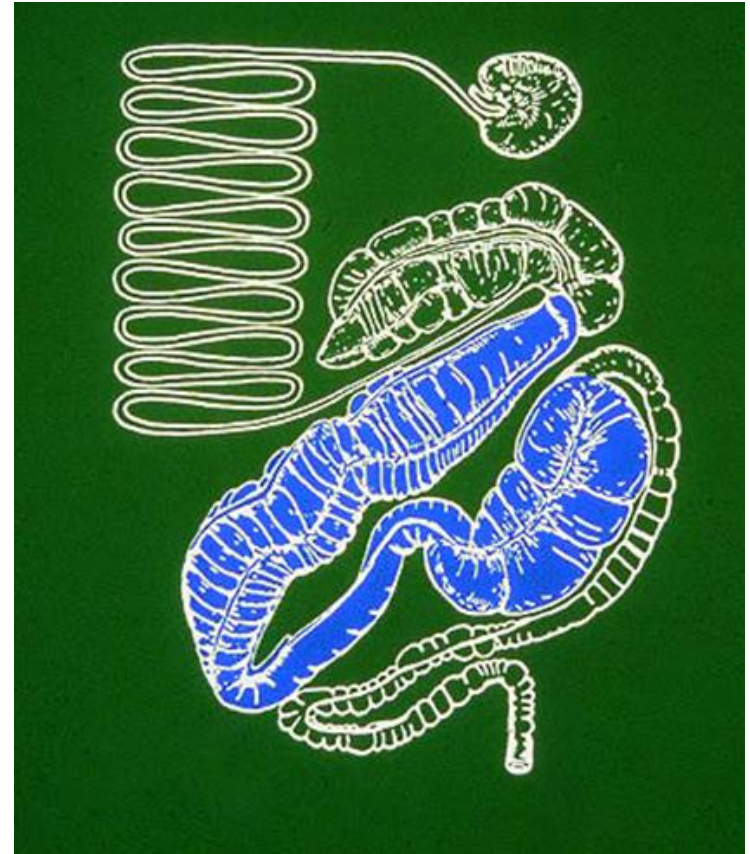
- Cecum
  - 4 ft
  - 9-12 inches diameter
  - 7-8 gal
  - Entrance and exit at the top
  - 7 hrs rate of passage
- Enlargement to promote fermentation



# LARGE COLON

“Nutrition is the key to success”

- 10-12ft
- 8-10 inches diameter
- 15-23 gallons
- Pouches can easily become twisted and fill with gas
- 35 -65 hours rate of passage





# ULCERS – COLONIC

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- Right Dorsal Colitis (RDC)
- Less frequent but more severe than gastric ulcers
- Symptoms
  - Intermittent colic
  - Lethargy
  - Anorexia
  - Fever
  - Diarrhea
  - Dehydration
  - Ventral edema
  - Changes in blood work
    - Mild anemia
    - Toxic changes in white blood cells
    - High number of white blood cells
    - Low blood proteins
    - High inflammatory proteins
    - Low calcium

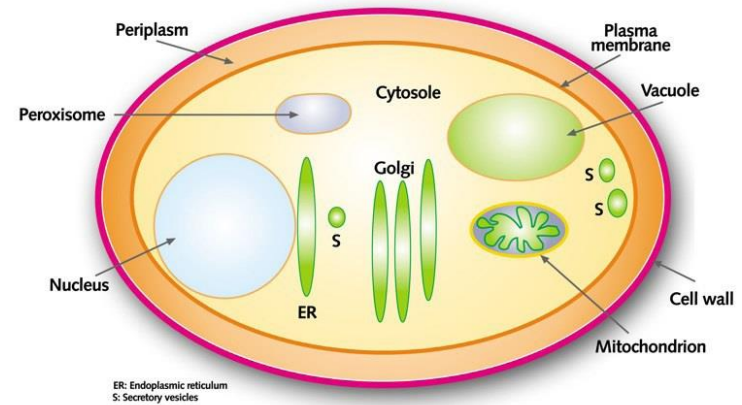


# ULCERS - COLONIC

“Nutrition is the key to success”

- Pelleted/cubed forage
  - Long stem hay can be abrasive
- Graze small amounts of fresh grass (10 to 15 minute intervals four to six times daily)
- Yeast culture may help with, stabilize hindgut pH
- Omega 3 (DHA) to decrease inflammation

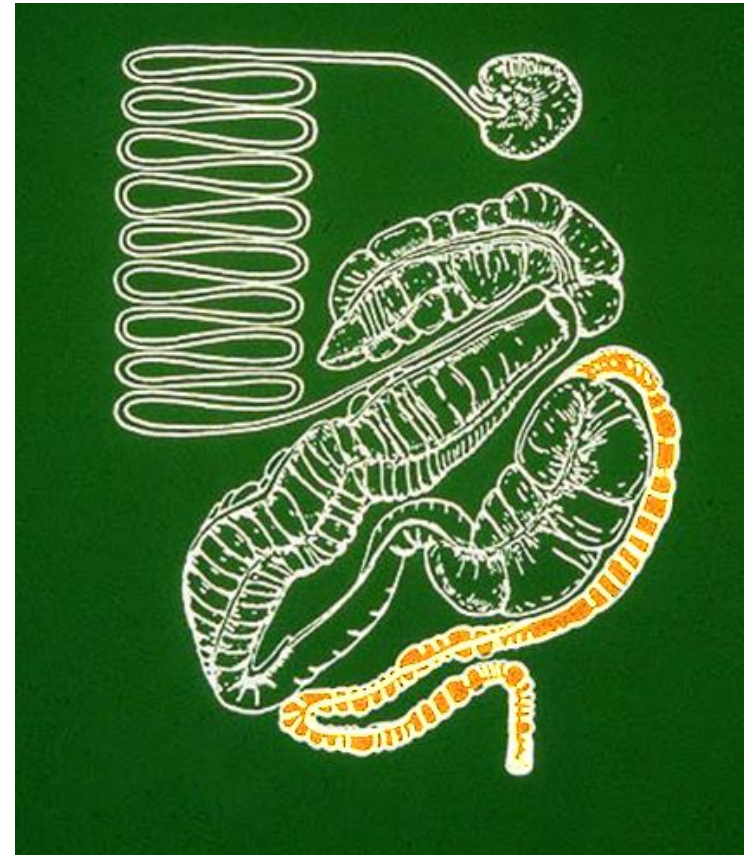
**The Yeast Cell**



# SMALL COLON

“Nutrition is the key to success”

- 10-12ft
- 3-4 inches diameter
- 5 gallons
- Reclaim excess moisture and return it to the body
- Form fecal balls





# Forage Requirements



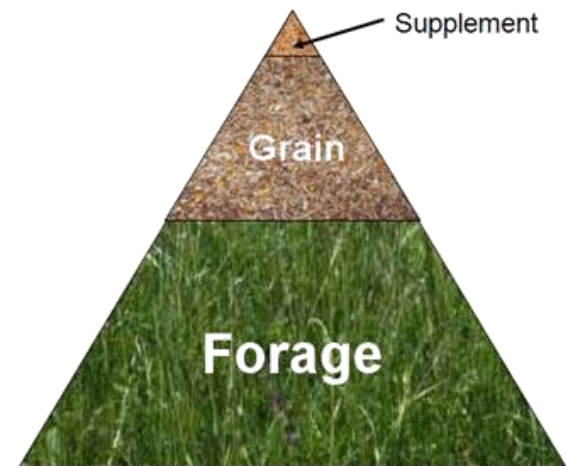
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# WHAT ELSE DOES MY HORSE NEED

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- **Absolute Minimum** = 1% of BW  
1000 lb horse = 10 lbs forage – as dry matter (DM)
- **Weight Loss** = 1.2% of BW 1000 lb horse = 12 lbs forage (DM)
- **Recommended Minimum** = 1.5% of BW 1000 lb horse = 15 lbs forage (DM)
- **Normal Forage Intake** = 1.5 to 2.5% of BW (DM)
- **Maximum Intake** = 3 to 3.5% of BW (DM)



Feed Pyramid for Equine

# WHAT ELSE DOES MY HORSE NEED

“Nutrition is the key to success”

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- Water - very important
- Cool weather 10-12 gallons



- Hot weather 20 – 25 gallons



# SUMMARY

“Nutrition is the key to success”

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- Teeth are the first part of digestive system
- Small stomach
  - Small meals
  - Acid
- Small intestine
  - Enzymes
- Hindgut
  - Bacteria
  - Fiber digesters
  - Don't make rapid feeding changes
- Water is essential

# Q & A Session



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# Thank you for joining us!

**For follow-up questions, please contact our customer relations:**

1-800-398-0819

[customerservice@standleeforage.com](mailto:customerservice@standleeforage.com)

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