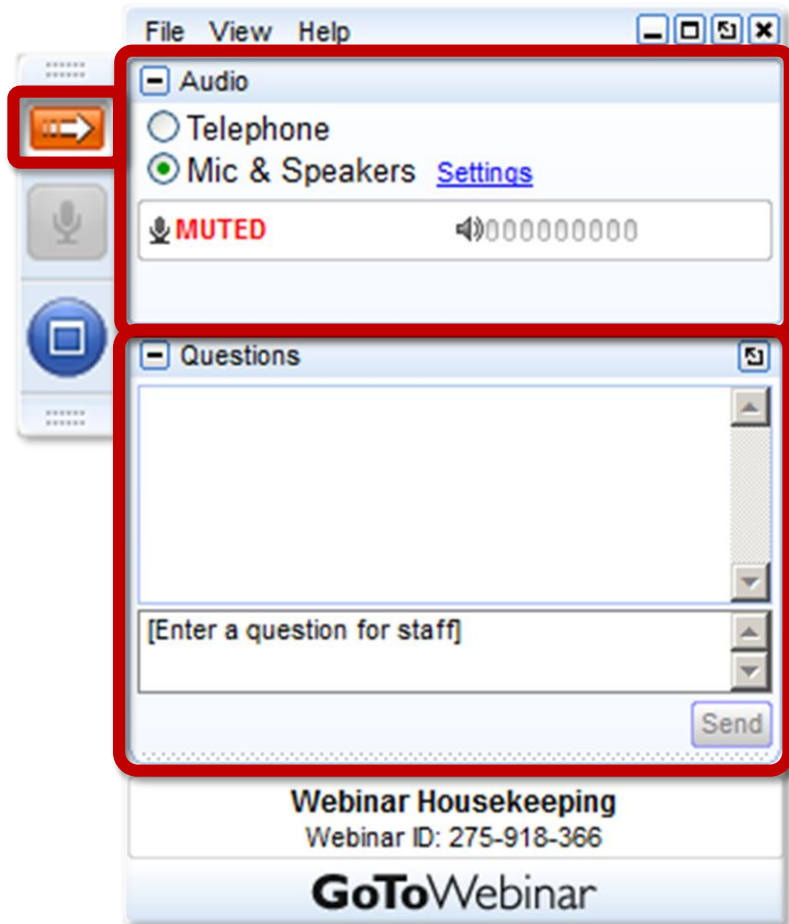


# MY HORSE IS CARB SENSITIVE.... ISN'T IT?



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PREMIUM WESTERN FORAGE®

Nutrition is the key to success”



## Your Participation

Open and close your control panel

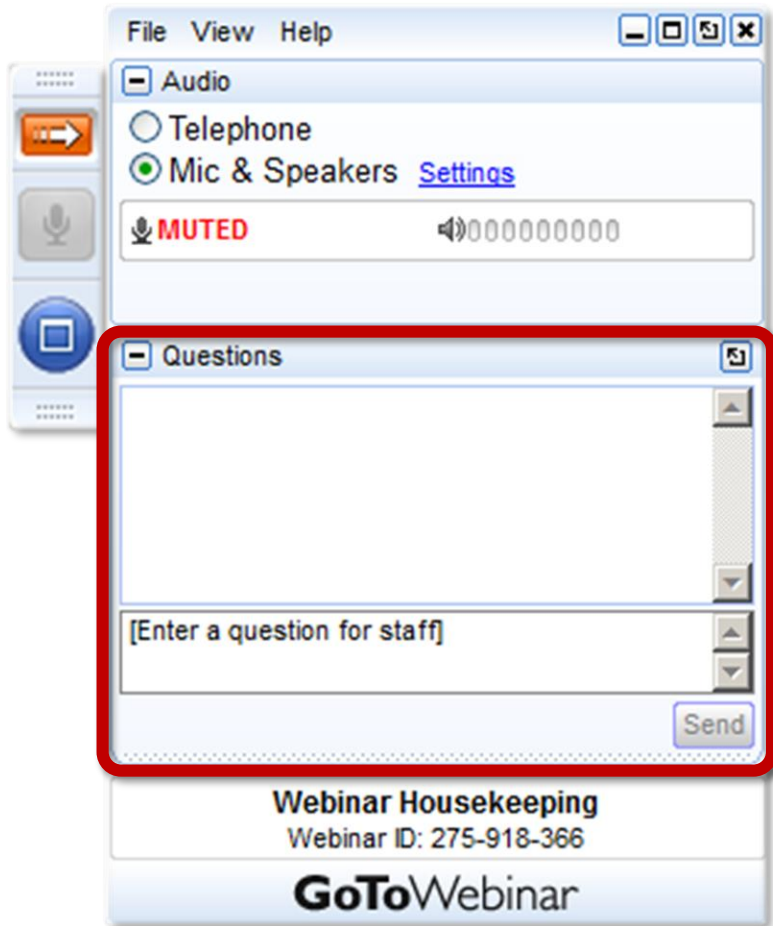
Join audio:

- 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 [kstarr@standleeforage.com](mailto:kstarr@standleeforage.com).

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

# My Horse is Carb Sensitive... Isn't it?

DR TANIA CUBITT  
PERFORMANCE HORSE NUTRITION



# OUTLINE

Nutrition is the key to success”



- Forage Carbohydrates
- Metabolic disorders
- Nutrient Content
- Management
- Questions



# FORAGE CARBOHYDRATES

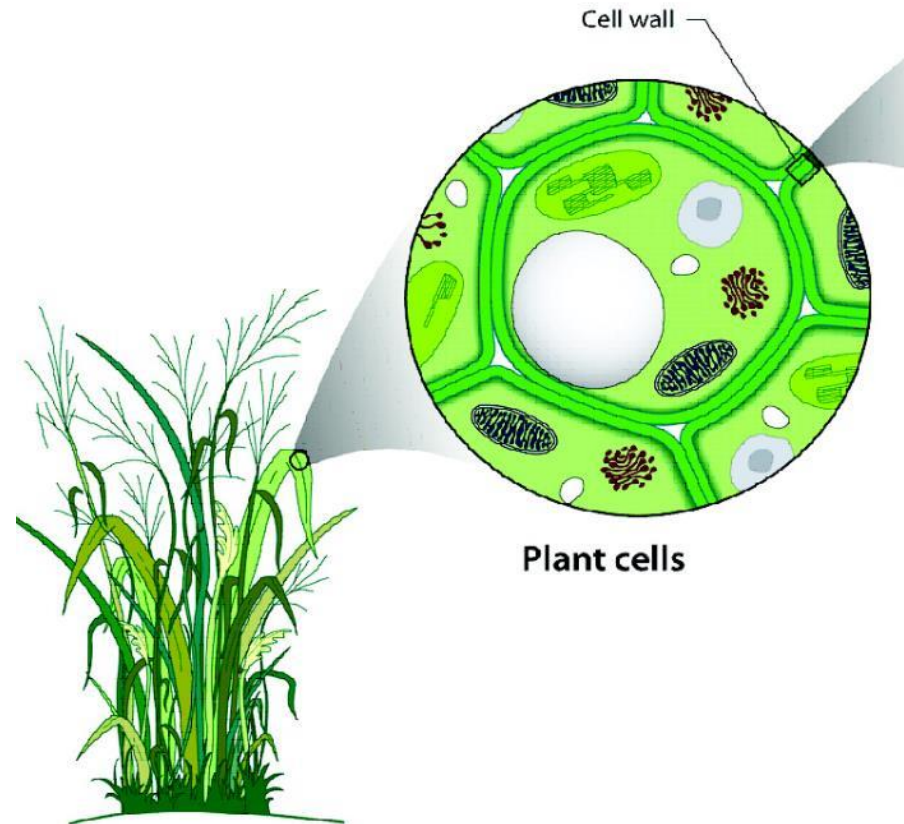


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# WHAT ARE CARBOHYDRATES?

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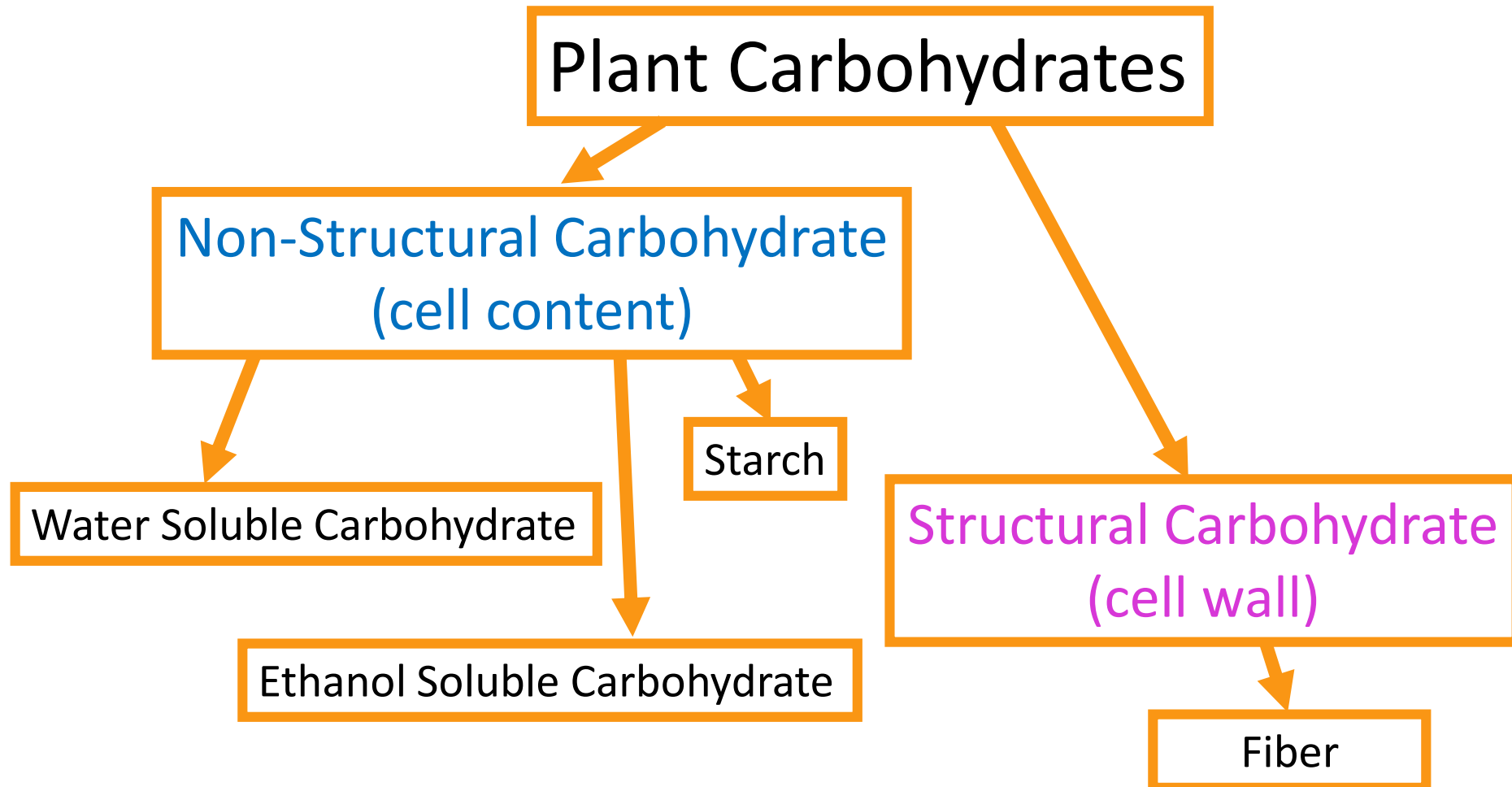
- Carbohydrates are important component of equine diets
- Major component of plant tissues
  - Comprise 70-85% DM of forages



# CARBOHYDRATE BREAKDOWN



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# CARBOHYDRATE BREAKDOWN



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**Water Soluble Carbohydrate  
“WSC”**

**Ethanol Soluble Carbohydrate  
“ESC”**

**Simple Sugars + Fructans**

**Simple Sugars**

**Non Structural Carbohydrate Calculation =  
WSC + Starch**



# NSC IN FORAGES AND FEEDS

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## Starches

Cereal Grains

Legumes



## Sugars and Fructan

Cool Season Grasses



# POLL QUESTION

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# METABOLIC DISORDERS



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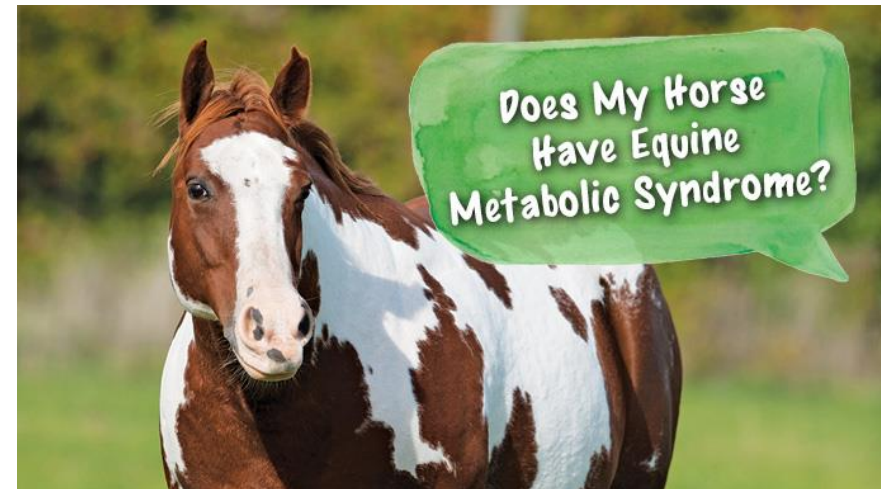
# METABOLIC DISORDERS



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Diseases associated with high intakes of nonstructural carbohydrates (NSC)

- Equine Metabolic Syndrome
  - Obesity
  - Insulin Resistance
  - Laminitis
- Equine Cushing’s Syndrome



# OBESITY...THE “EASY KEEPER”



Nutrition is the key to success”

Consuming  
more  
calories than  
they are  
burning

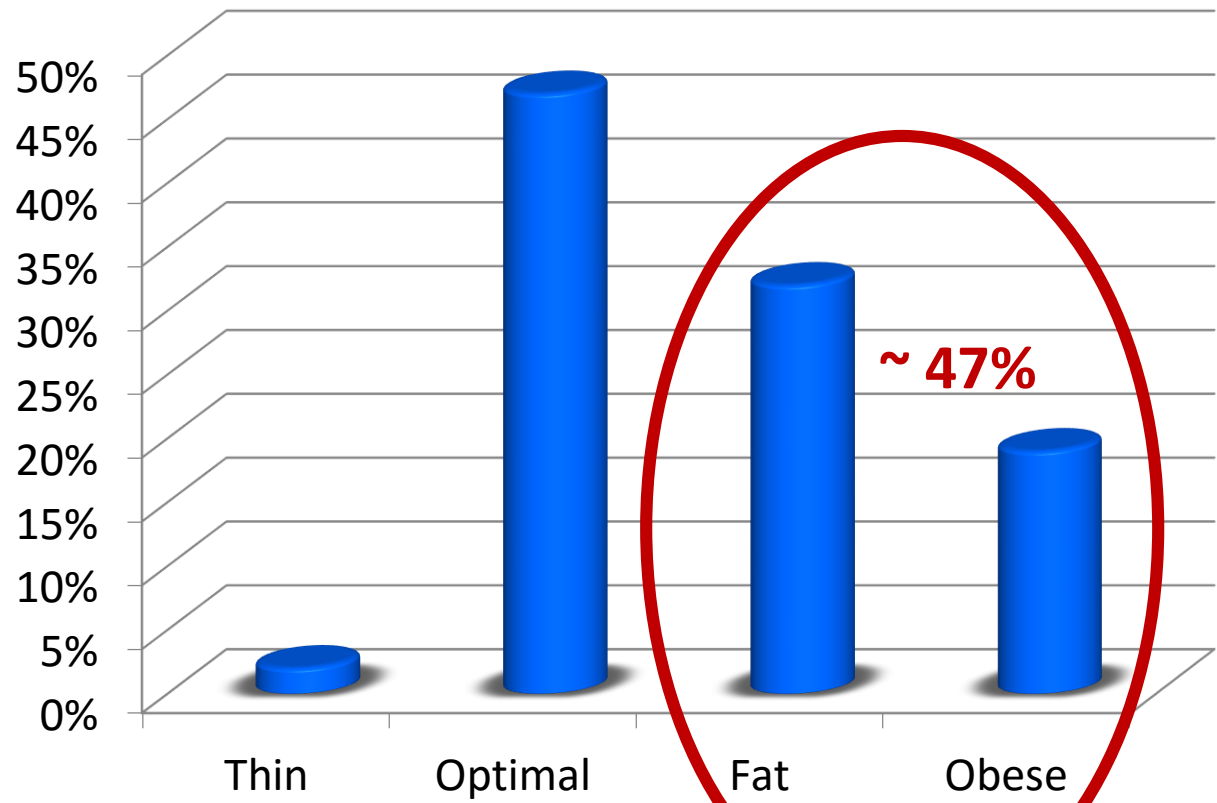


# PREVALENCE OF OBESITY



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Thatcher et al., 2007



# BODY CONDITION SCORING (BCS) SCALE 1 TO 9



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**< 4 underweight**



**4 ≤ BCS < 7 moderate**



**7 ≤ BCS < 8 overweight  
BCS ≥ 8 obese**



# CRESTY NECK SCORING

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- Does not consider fatness of the rest of the body
- Score of the amount of fat deposited along the ridge of the neck.



# CRESTY NECK SCORE (CNS) SCALE 0 TO 5

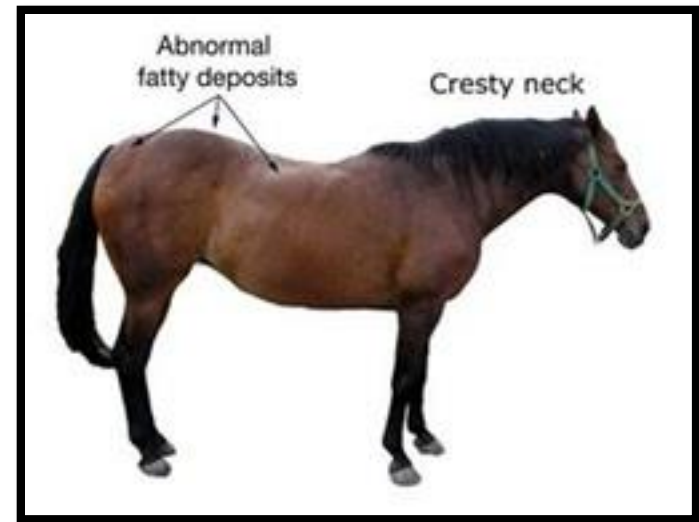
Nutrition is the key to success”



# INSULIN RESISTANCE

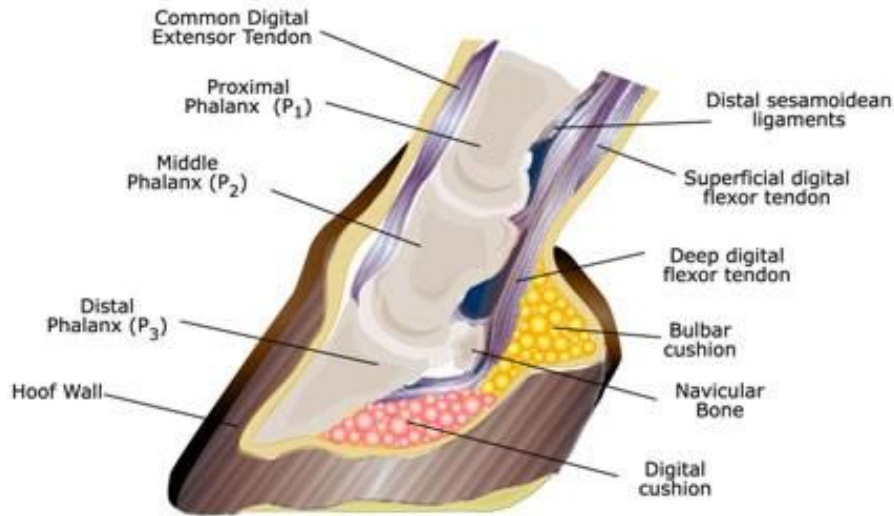
Nutrition is the key to success”

- Insulin = a hormone secreted by pancreas to control blood glucose
- Insulin resistance= tissues do not respond to insulin.
  - Obesity
  - Regional adiposity
  - Laminitis

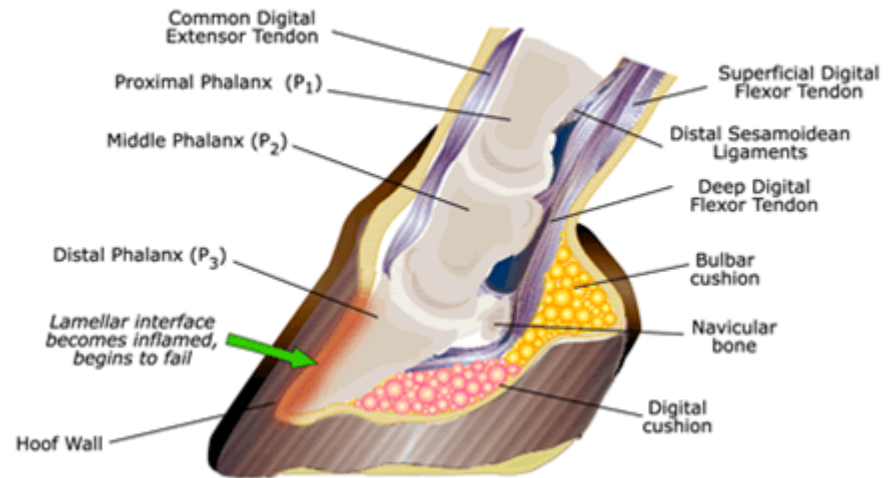


# LAMINITIS

## Normal Foot

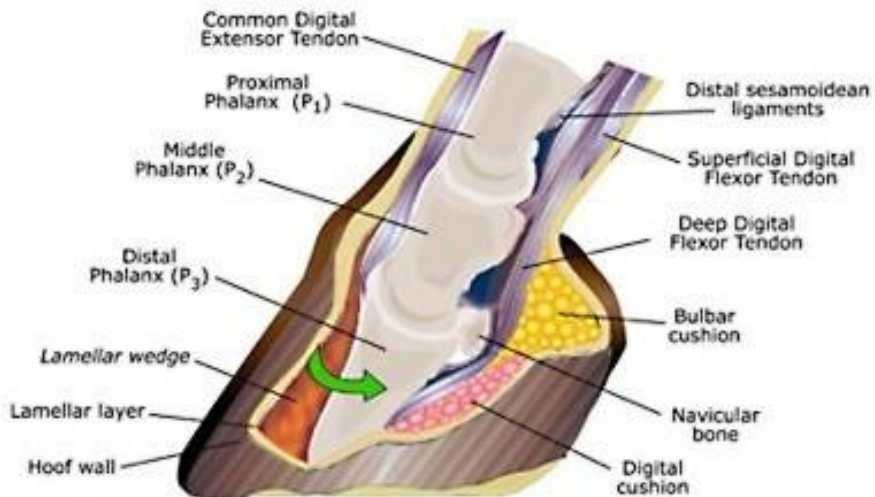


## Acute Phase



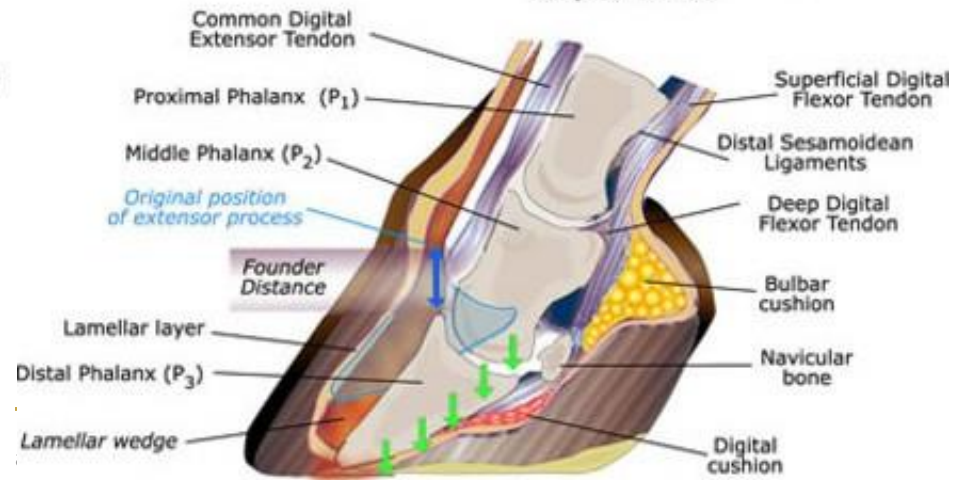
## Rotation

*Detached distal phalanx rotates and disrupts weight distribution*



## Sinking

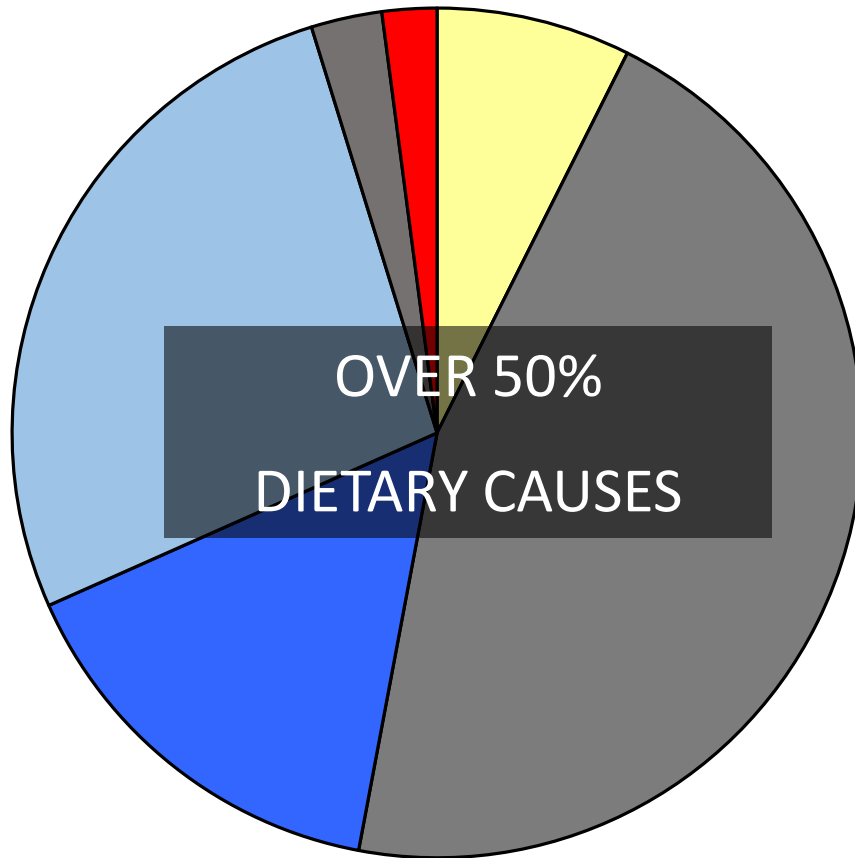
*Detached distal phalanx is forced downward under weight to eventually compress the sole*



# LAMINITIS



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- Grain Overload (7.4%)
- Lush Pasture (45.6)
- Unknown (15.4%)
- Other known (26.9%)
- Colic/Diarrhea (2.7%)
- Retained Placenta (2.1%)

# PITUITARY PARS INTERMEDIA DYSFUNCTION (PPID) “CUSHING’S SYNDROME”

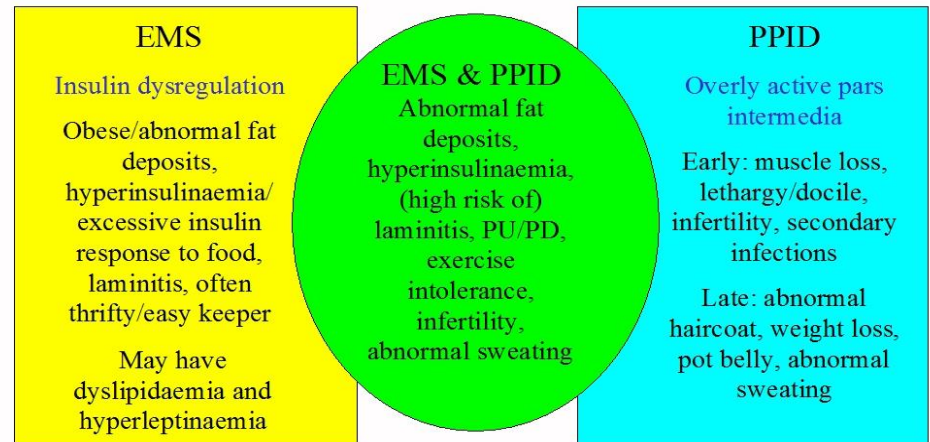
Nutrition is the key to success”



- Age, obesity and insulin resistance contribute to PPID
- Pituitary gland tumor or enlargement at the base of the brain
- Uncontrolled ACTH & cortisol production
- Can lead to insulin resistant (IR) & laminitis
- Long curly hair coat, increased drinking and urinating



A horse can have both EMS and PPID



# Poll Question

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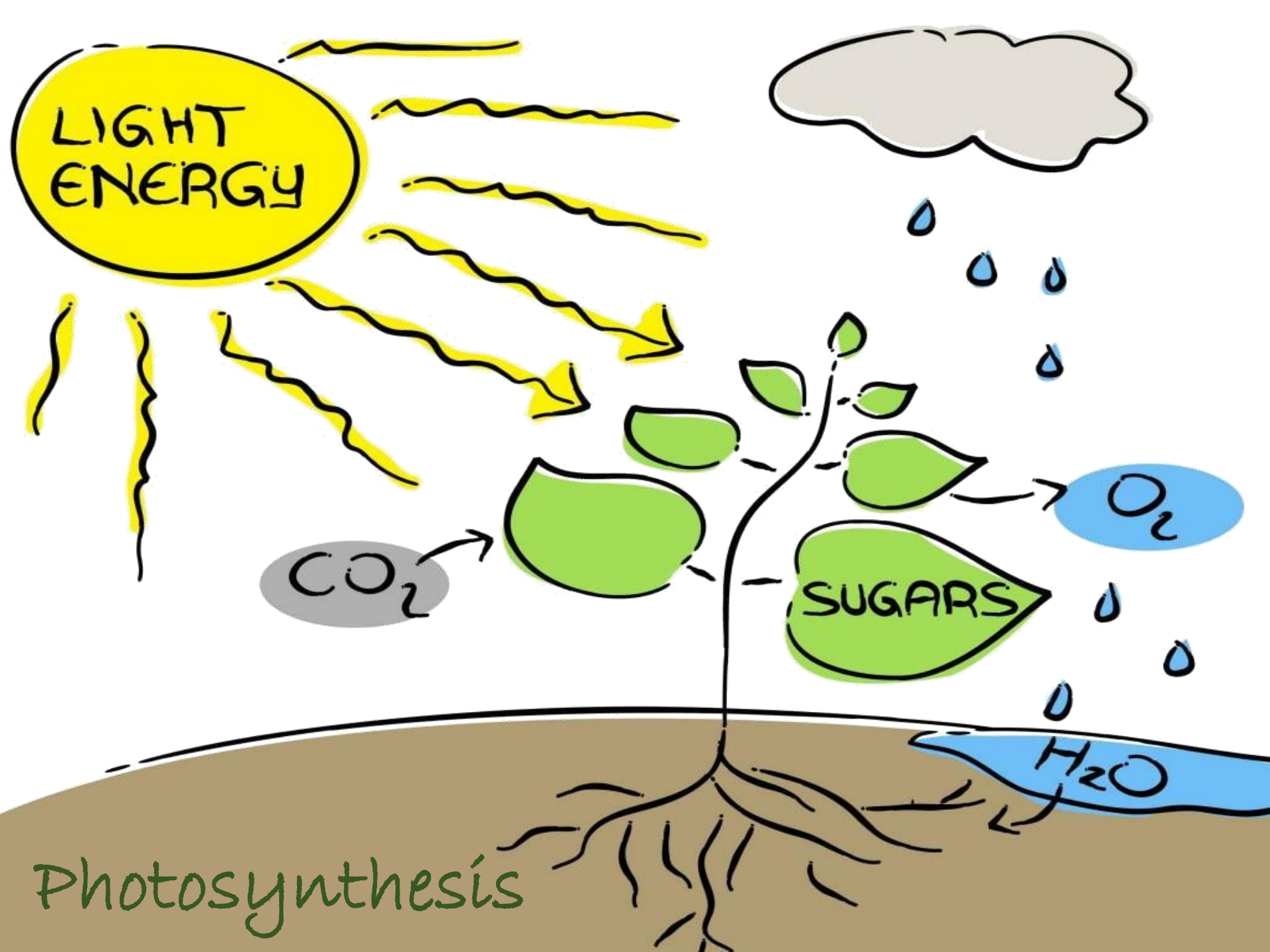


# PLANT GROWTH



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LIGHT ENERGY

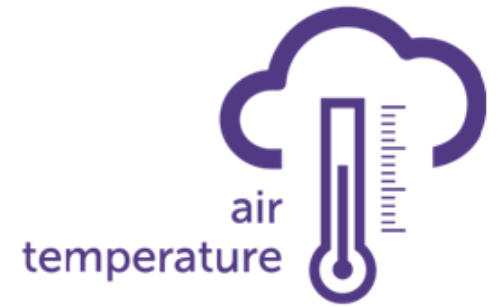
CO<sub>2</sub>

O<sub>2</sub>

SUGARS

H<sub>2</sub>O

Photosynthesis



# Plant Growth

Photosynthesis

+

Slow Growth

=



Sugar

Concentration

Photosynthesis

+

Fast Growth

=



Sugar

Concentration





Where growing forage is a science



# HAY PRODUCTION

Nutrition is the key to success”

- NSC content reflects amount when it was cut
- Cut in AM = lower NSC
- Forages respire & lose sugars after cut until moisture is < 40%
  - Fast dry, sunny = high NSC
  - Slow dry, humid = low NSC



# MANAGEMENT



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# HAY & PASTURE NSC

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Forage Type	Avg. NSC (% DM)	Low NCS (%DM)	High NSC (%DM)
Grass Hay	13.1	8.2	18.0
MMG Hay	12.5	8.4	16.7
Legume Hay	11.1	8.8	13.4
MML Hay	11.2	8.4	13.9
Grass Pasture	12.8	7.1	18.0
MMG Pasture	12.8	8.0	17.6

# REDUCING NSC IN HAY

Nutrition is the key to success”



- Soaking hay
  - Sugars and fructans are water soluble
  - Soak = lower NSC
  - Be aware of nutrient loss (???)
  - 30 min hot water
  - 60 min cold water
  - Poor out water





# REDUCING NSC IN HAY

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Hay	20 min	40 min	3 hr	16 hr
	% WSC loss	% WSC loss	% WSC loss	% WSC loss
1	4	15	22	24
2	4	5	6	16
3	3	7	11	14
4	3	12	15	40
5	8	26	43	44
6	9	12	21	46
7	2	2	6	9
8	2	5	12	19
9	7	8	18	54

# HOW TO HAVE YOUR OWN SAMPLES ANALYZED

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Equi-Analytical Laboratory / Dairy One

[www.equi-analytical.com](http://www.equi-analytical.com)

1-877-819-4110

“Test 644 **Carb Pack** - provides Ethanol Soluble Carbohydrates (ESC), Water Soluble Carbohydrates (WSC), and Starch analyses for owners solely concerned about carbohydrate levels and their effect on horse health. While informative, complete nutrient profiles are recommended for a better understanding of your horse's diet.

Price: \$27.00”



# GRAZING MANAGEMENT

Nutrition is the key to success”



- Manage turn out
  - Restricted grazing regimes
    - Avoid cold nights followed by sunny days
    - Early AM vs. afternoon
    - Overcast days best
    - Shaded pasture
    - Avoid stressed forages
    - Consider dry-lot when risks
      - Feed low NSC feed to meet nutrient requirements



# GRAZING MUZZLES

Nutrition is the key to success”



Reduce forage intake  
Allow for exercise



# Management Reduces Risk

- Decrease NSC Intake
- Select low NSC forages & Forage analysis
- Grazing management to avoid high NSC
- Low starch feeds (if calories needed)
- Ration balancer for easy keepers
  - protein, vitamins, minerals
- Exercise

# Questions



**PHN**  
PERFORMANCE HORSE NUTRITION



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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)

For more Nutritional White Papers, Standlee Forage Finder, Standlee Feed Calculator or our Dealer Locator:

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