



PREVENTING PASTURE- ASSOCIATED LAMINITIS: RESEARCH UPDATE

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Picturesque backdrop to horse and hunt country



Grazing behavior

- Small frequent meals
 - 14-17 hours/day
 - Travel 10 miles/day
- Meet most nutritional needs
 - 1.5% - 3% BW in forage/day (17-33 lb DM/day)
 - Exercise/metabolism dependent



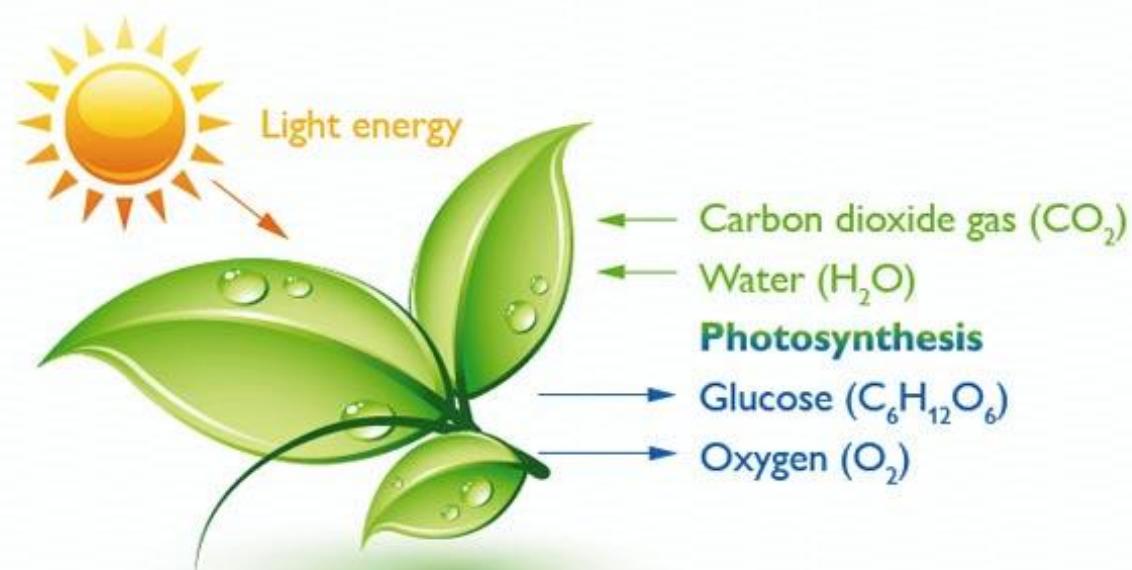
Benefits of a pasture-based diet

- Optimum nutrition
 - Gut motility and bacterial populations
- Promotes exercise and normal healthy behavior
- Reduces gastric ulcers
- Reduces respiratory disease
- Reduced labor costs
- 70% of horses in Virginia



Nonstructural carbohydrates

- Starch
- Water soluble carbohydrates (WSC)
 - Fructan
 - Simple sugars
- Photosynthesis
- Respiration
 - Growth and reproduction
 - Excess of plant needs → stored



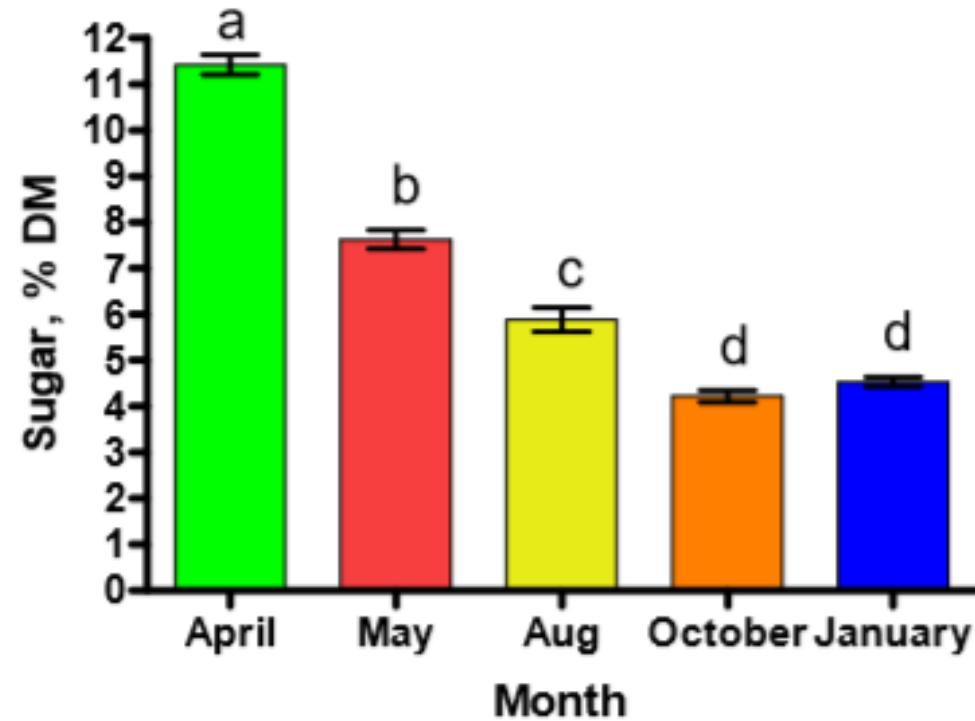
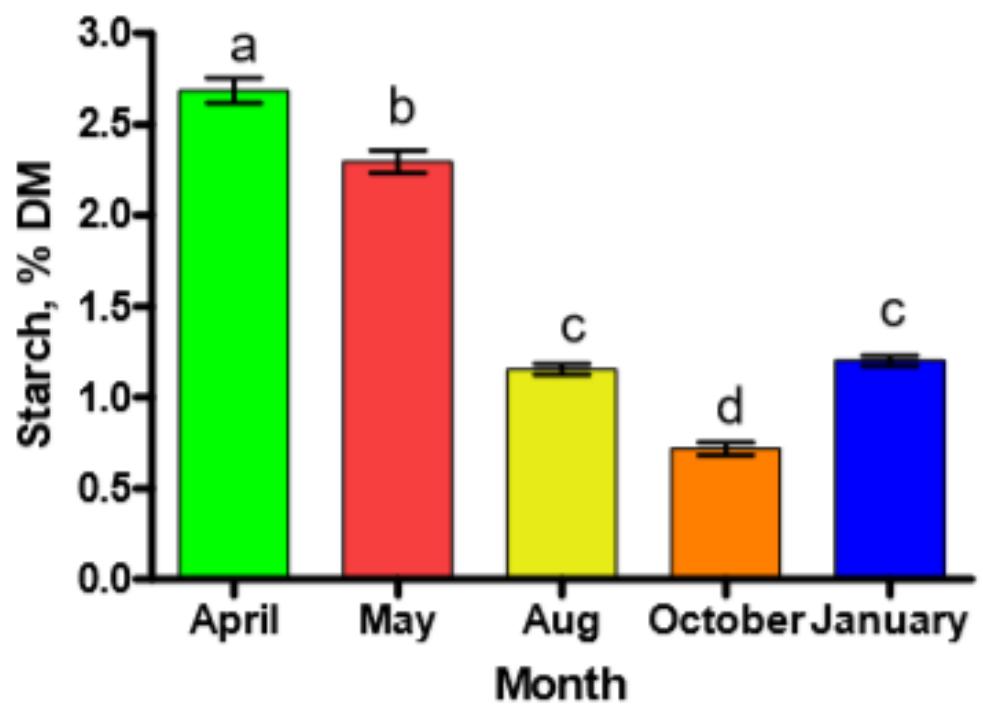
THINGS TO CONSIDER

Fluctuating NSC content

- Season
- Time of day
- Weather conditions

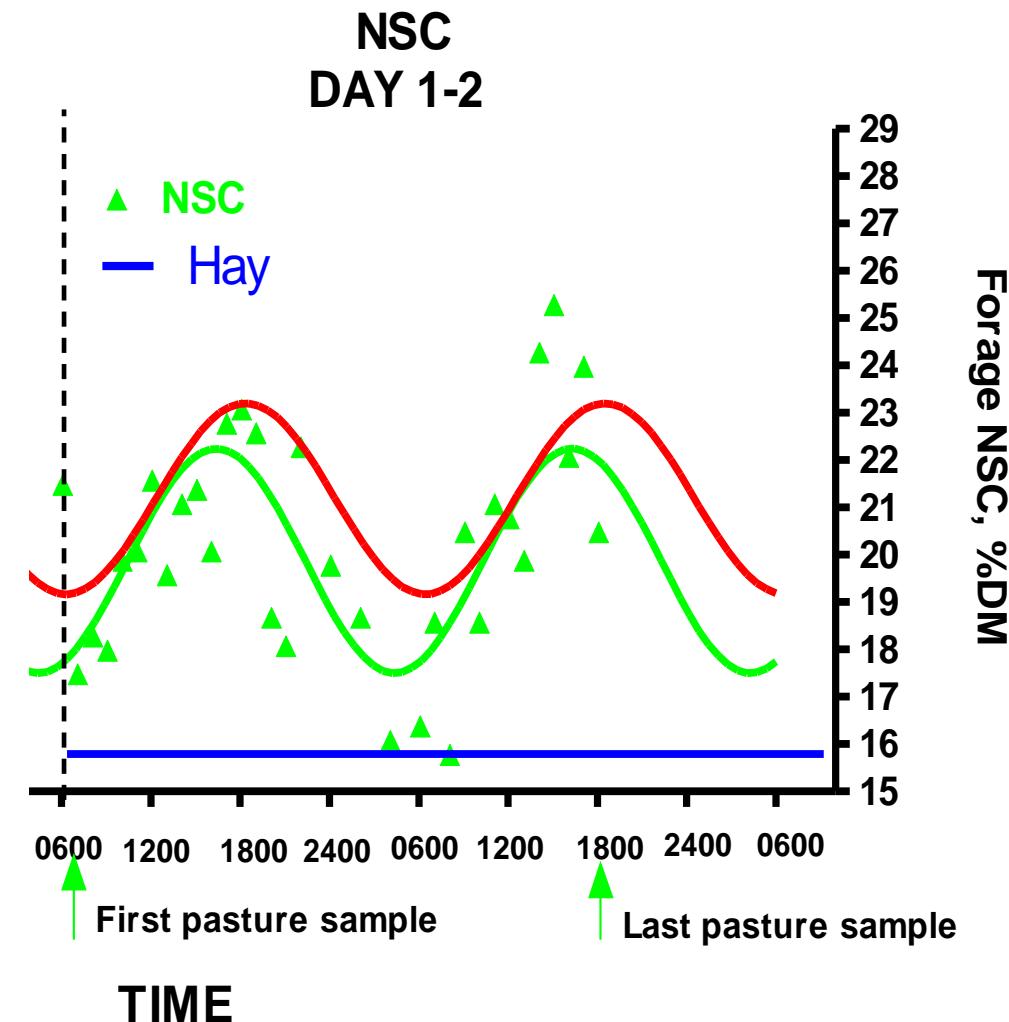


Seasonal fluctuations



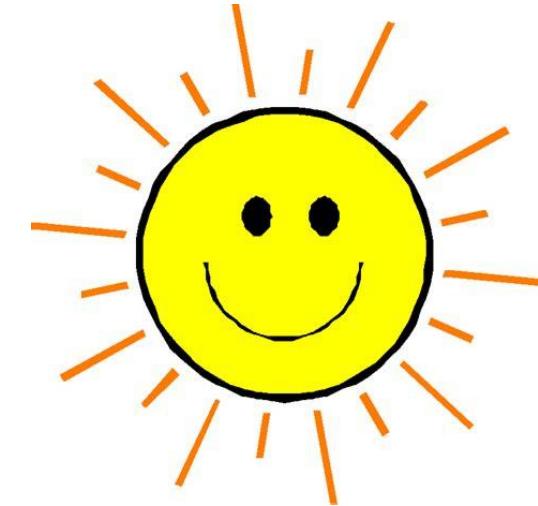
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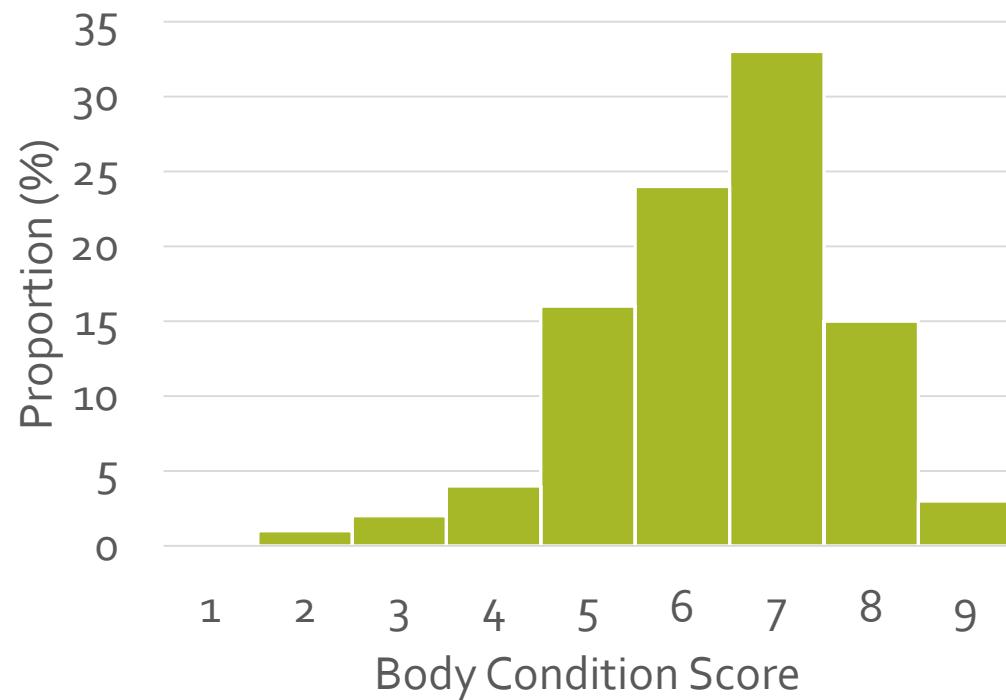
Fluctuating NSC content

- Season
- Time of day
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When is forage too ideal?

- Obesity
 - 51% in Virginia

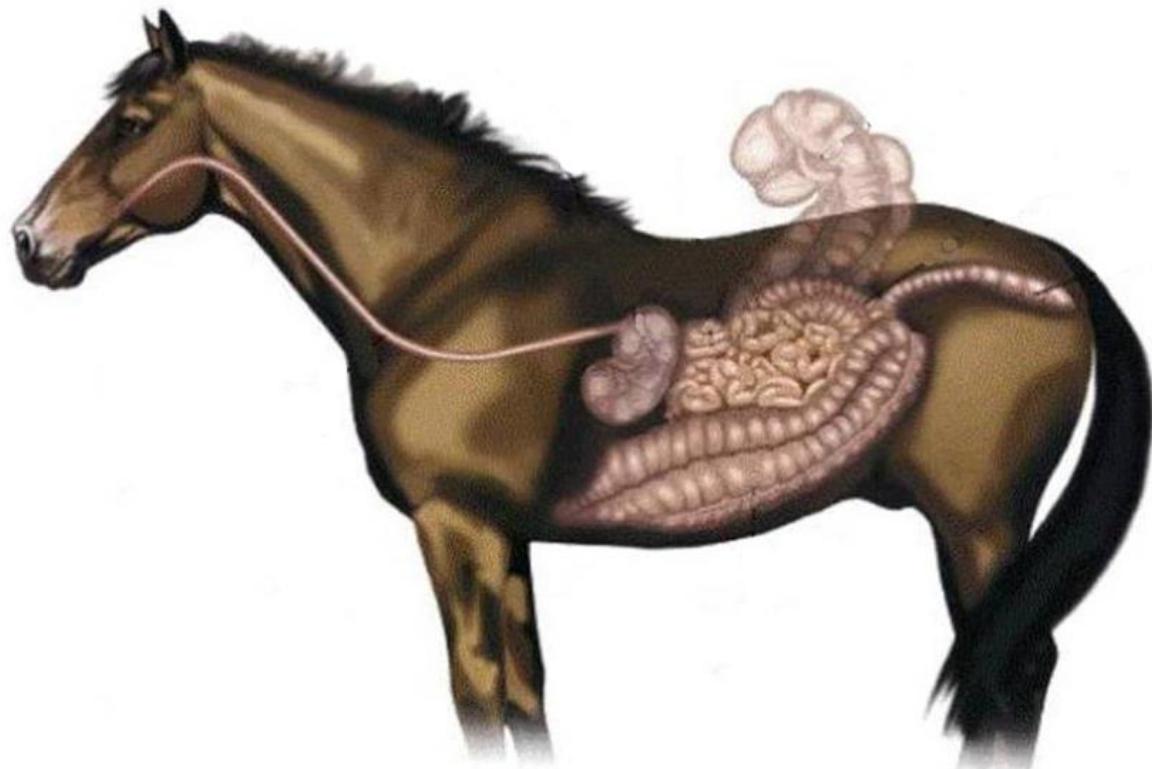


- Metabolic dysfunction

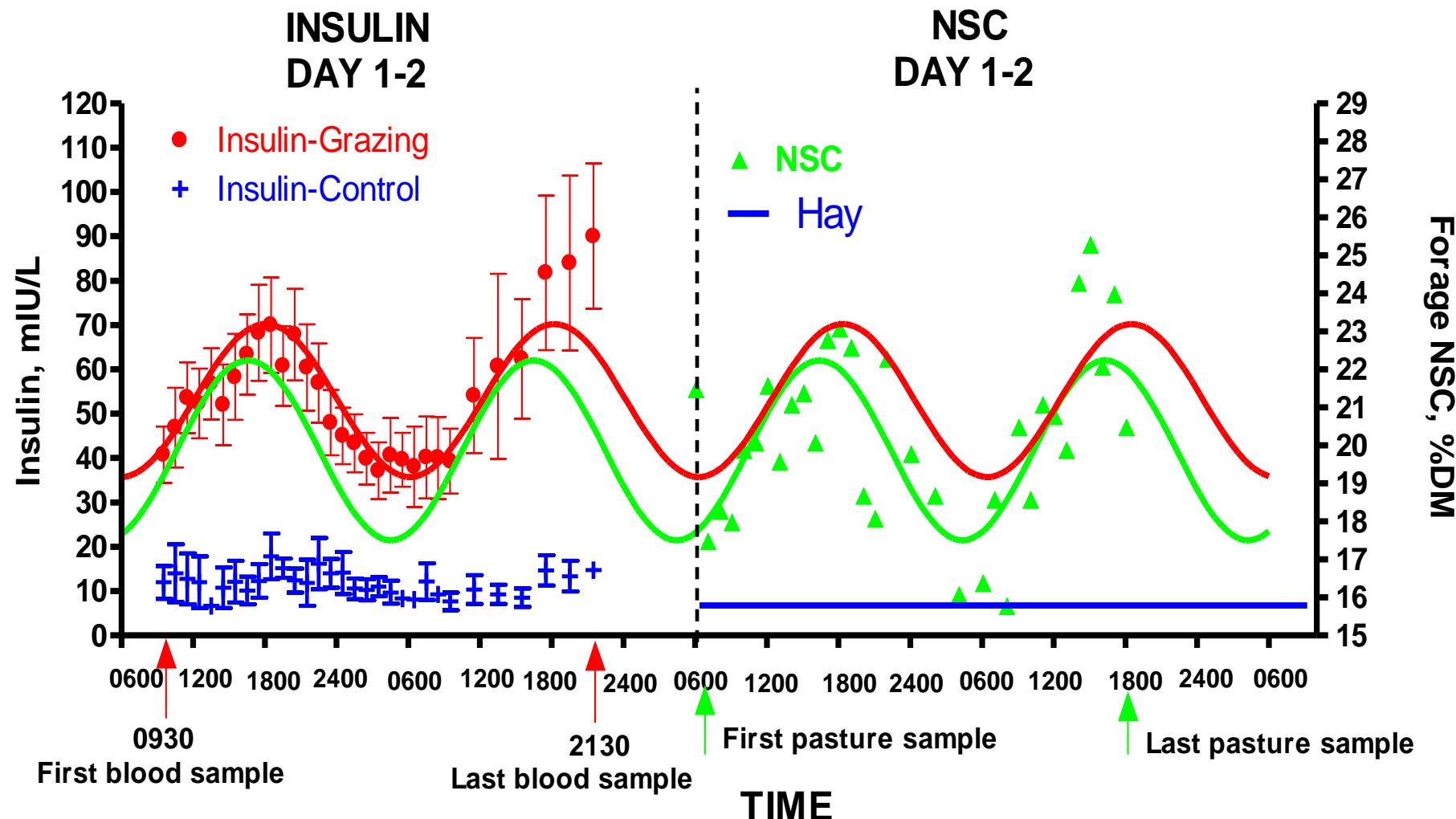


Starch digestion

- Rapid hindgut fermentation
- Inflammation
- Colic
- Pasture-associated laminitis



Limited data



Our seasonal grazing study

- Virginia Tech Middleburg Agricultural Research and Extension Center
- 21 acre cool season pasture
 - Tall Fescue
 - Bluegrass
- 12 mares
 - Warmbloods and Thoroughbreds
- October 2016 to October 2017



Weekly sample collection

Starch

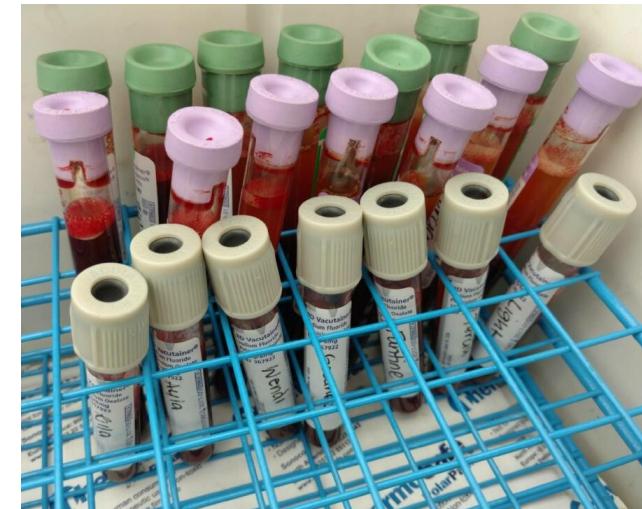
Water Soluble
Carbohydrates (WSC)

Nonstructural
Carbohydrates (NSC)



Weekly sample collection

- Blood
 - Glucose
 - Insulin
 - L-lactate
- Fecal
 - pH
 - D-Lactate
 - Volatile fatty acids
 - Microbial populations



Unpublished data has been removed from presentation

Avoidance strategies

- Reducing NSC intake
 - Time of day
 - Time of year
 - Environmental conditions
 - Cloud cover
 - Frost
 - Sunlight



Avoidance strategies

- Reducing NSC intake
 - Grazing muzzle
 - Spring – 77% DMI
 - Summer – 77% DMI
 - Autumn – 83% DMI
 - Reduce turnout time
 - Dry lot



Issues with avoidance

- Grazing muzzles
 - Cost, behavior/rubbing, labor intensive
- Reducing turnout time
 - Ponies consumed total DMI in 3 hours
- Dry lot
 - \$\$, maintenance, hay



Improved management strategies

- Better understanding of seasonal NSC fluctuations
 - Metabolic and digestive response grazing horses
- Avoidance strategies
 - Gastrointestinal disturbance, colic
 - Inflammation
 - Pasture-associated laminitis



Photo credit: Patricia McQueen

Questions?

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