PASTURE BASED NUTRITION FOR HORSES

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FORAGE IS THE FOUNDATION

- Horses are non-ruminant herbivores
- Forage based diet important for ALL classes of horses
- Digestive system designed to utilize fiber from forage via microbial fermentation in hindgut

WHY IS PASTURE IMPORTANT?

- Horses need 1.5% to 3% of their body weight in forage each day:
  - 17 to 33 lb/day for the average horse
  - Graze 14-18 hrs/day
  - Move 10 miles/day
The Foregut

- **Stomach**
  - Small
  - Little digestion
  - Continuous gastric acid secretion
- **Small Intestine**
  - Digestion and absorption of sugars, starch, protein, fat
  - Vitamin/mineral absorption

GASTRIC ULCERS IN HORSES

- Continuous secretion of gastric acid
  - Free choice forage: Stomach pH 4
  - Feed withheld: Stomach pH 1.6
- Withholding feed causes *gastric ulcers*
- Gastric Ulcers occur in at least 40% of horses, other studies show 90%
- Feed composition, meal size, management also affect incidence
- Pastures reduce incidence of ulcers

NORMAL EQUINE STOMACH

- **Non-glandular** (squamous) mucosa
- **Glandular** mucosa

Grade 0 Ulcer
- Small, single or multiple ulcers

Grade 1 Ulcer
- Large single or multiple ulcers

Grade 2 Ulcer
- Extensive surface ulcers with areas of deep digestion

Grade 3 Ulcer
- Extensive surface and/or deep digestion with areas of deep digestion

Courtesy of Dr. Mike Murray
THE HINDGUT

Cecum & Colon
- Houses millions of microbes that break down fiber
  (fermentation)
- Production of VFA's
- VFA's used for energy
- Synthesis of B-complex vitamins

TOTAL DIGESTIVE PROCESS TAKES 65 TO 75 HOURS

TYPES OF NUTRIENTS
- Water
- Carbohydrates
- Fats
- Protein
- Vitamins
- Minerals

PASTURE GRASS ALONE EXCEEDS MOST NUTRIENT REQUIREMENTS
Light Exercise (assuming intake at 2% BW)
**BENEFITS OF PASTURE**
- Provides optimal nutrition
- Reduces colic and digestive disorders
- Reduces gastric ulcers
- Reduces respiratory disease
- Increases bone mineral content in young growing horses
- Promotes normal healthy behavior
- Reduces costs

**MANAGEMENT PROBLEMS**
- Overstocking
- Overgrazing
- Manure management
- Mud management

**PROBLEM GRAZERS**
- Selective grazers = uneven grazing
- Biting top grazers = leaf removal
- Large & heavy = soil compaction & trampling
- Manure distribution = uneven grazing & parasites

**KEYS TO A HEALTHY PASTURE**
- What is purpose of pasture?
  - Exercise
  - Nutrition
  - Both?
- Size of usable acreage
- Stocking rate
- Pasture species selection
- Proper planting
- Soil testing
- Grazing management
- Turnout for exercise?
STOCKING RATES

- Depends on characteristics of your pasture
- Maintain at least 70% vegetative cover regardless of time of year
- 2 acres per horse minimum

HOW MUCH PASTURE?

<table>
<thead>
<tr>
<th>Turnout Time (d)</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 3 h</td>
<td>0.5</td>
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<tr>
<td>3-8 h</td>
<td>1</td>
</tr>
<tr>
<td>8-12 h</td>
<td>1.5</td>
</tr>
<tr>
<td>24 h</td>
<td>2</td>
</tr>
</tbody>
</table>

Stocking rates can be increased with elevated levels of management:
- Mowing
- Rotational grazing
- Irrigating
- Fertilizing
- Overseeding

FORAGE SPECIES SELECTION

- Several species make good horse pastures
- Cool Season
  - Tall Fescue*
  - Orchardgrass
  - Kentucky Bluegrass
- Warm Season
  - Bermudagrass
  - Crabgrass
- Legumes
  - Clover
  - Alfalfa

* Ky 31 Tall fescue is toxic to broodmares but perfectly safe for all other classes of horses

COOL SEASON VS WARM SEASON GRASSES

Seasonal Distribution
RENOVATE OR START OVER?

- Continue current management if:
  - 75% or more desirable plants
- Improve Management or overseed:
  - 40-75% desirable plants left
- Start over if:
  - Less than 40% desirable plants

HORSES SPOT GRAZE FAVORITE AREAS AND SELECTIVELY GRAZE FAVORITE SPECIES, AND ARE CAPABLE OF ELIMINATING PLANTS IF PASTURES ARE NOT MANAGED.

HORSES

TAKE HALF / LEAVE HALF

<table>
<thead>
<tr>
<th>Percent leaf volume removed</th>
<th>Percent root growth stopped</th>
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<tbody>
<tr>
<td>10%</td>
<td>0%</td>
</tr>
<tr>
<td>20%</td>
<td>0%</td>
</tr>
<tr>
<td>30%</td>
<td>0%</td>
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<tr>
<td>40%</td>
<td>0%</td>
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<tr>
<td>50%</td>
<td>2-4%</td>
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<tr>
<td>70%</td>
<td>78%</td>
</tr>
<tr>
<td>80%</td>
<td>100%</td>
</tr>
<tr>
<td>90%</td>
<td>100%</td>
</tr>
</tbody>
</table>

SERIOUS DAMAGE TO THE ROOT SYSTEM OF THE PLANT CAN OCCUR IF AS LITTLE AS 10 PERCENT ADDITIONAL PLANT LEAF VOLUME IS REMOVED.

Key point: REST the pastures
- Graze for a short time then allow forage to regrow
- Need to rotate between several fields
- Ideally, first field is ready to be grazed when horses are done on last field
- How many fields? How long between rotation? Depends!
  - Size of fields
  - Stocking density
  - Available forage

ROTATIONAL GRAZING FOR OPTIMAL PASTURE PRODUCTION
INTERNAL PADDock FENCING

- Temporary electric fencing works great!
- One-strand if separating paddocks only
- Avoid metal t-posts

CONSIDER THE SPECIES

- Cool season Grasses
  - Fast growth (May-June and Fall): 20-30 days
  - Summer/Winter: 30 to 40 days

- Warm Season Grasses
  - Early fast growth: 14-21 days
  - Normal growth conditions: 21-28 days
  - Slower growth: 35 to 45 days

GRAZING GUIDELINES

- Recovery time will depend on how short the forage was grazed, growing conditions, soil fertility etc.
- Separate paddocks by cool season and warm season if possible.

REST & RECOVER

- Remove at 3-4”
- Graze at 6 - 12” (cool season grasses)
**BENEFITS OF ROTATIONAL GRAZING**

- **For the Plants & Environment**
  - Increased forage production
  - Plants remain young & vegetative
  - Uniform grazing
  - Erosion reduced
  - NPS pollution reduced

- **For the Horse**
  - Improved nutrition
  - Exercise & grazing reduce risk for colic, bad behavior
  - Grazing increases mineral bone density in young horses
  - Decreases mud and erosion
  - Improve skin and hoof condition

**HEALTH CONSIDERATIONS FOR GRAZING**

- Pastures provide optimal nutrition for most horses
  - BUT...
  - Sometimes healthy pasture not healthy for all horses!
  - Metabolic Syndrome
    - Obesity
    - Insulin resistance
    - Laminitis/Founder

**BODY CONDITION SCORE (BCS)**

- Maintain Optimal BCS
- Score of overall body fatness
- Scale 1-9
- Average scores from six body regions
- Suggested scores
  - Athlete: 4-5
  - Maintenance: 5-6
  - Broodmare: ~6
**BODY CONDITION SCORING (BCS)**

Score of overall body fatness

- **< 4** underweight
- **4 ≤ BCS < 7** moderate
- **7 ≤ BCS < 8** overweight
- **BCS ≥ 8** obese

Henneke et al., 1983

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**CRESTY NECK SCORE (CNS) SCALE 0 TO 5**

Carter, 2009

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**PASTURE NSC (SUGAR) EFFECT ON GRAZING HORSES**

McIntosh et al., 2005

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**April NSC**

**May NSC**

McIntosh et al., 2005
EFFECTS OF GRAZING MANAGEMENT ON PLANT CARBOHYDRATES

McIntosh et al., 2013 & 2014

HEAVY USE AREAS OR DRY LOTS

- Mud Management
- High stocking rates
- Wet conditions
- Drought or slow forage growth
- Restrict grazing
  - Disease avoidance
  - Weight loss
- 300 ft² per horse

HEALTHY PASTURES MAKE HEALTHY HORSES

- Pastures provide optimal nutrition
- A good grazing system is healthy for horses & environment
- Grazing reduces feed/ labor costs

GRAZING MUZZLES

- DRY LOTS
- Reduce NSC intake
- Allow for exercise
- Turnout in early am
THANK YOU

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