Feeding the Mare and Foal

Martin W. Adams, PhD, PAS
The Equine Diet
Forage is the Foundation

- Forage should be primary component
  - Provides daily nutrient requirements
  - Maintains integrity of GI tract
  - Minimizes vices

- How much forage?
  - Minimum 1% of body weight per day
  - Mature horse can consume up to 2.5% BW/day
  - Good quality important, > 8% crude protein, < 40% ADF and < 60% NDF
Feeding the Bred Mare

- Consider 3 different stages:
  - First 2/3 of pregnancy or first 8 months
  - Last 2/3 of pregnancy or last 3 months
  - Lactation or Post Foaling

- First 8 months can be fed maintenance diet with min. 8% crude protein hay and EquiMin Horse Mineral Block
Nutritional Management of the Brood Mare

- Feed to maintain body condition score of 5.5 to 6.0 for optimum conception rate
- Total dietary needs for 3-year old 1100-lb mare are < 8% protein, 16.7 Mcal DE, 0.45% calcium, 0.35% phosphorus and 800 IU vitamin E
- Good quality pasture or hay will provide most requirements
- Provide mineral/vitamin supplement or supplement pellet or concentrate depending on hay quality and amount to maintain body condition
- Always provide extra mineral/vitamin supplement to pregnant mares
EquiMin Horse Mineral

- Mineral and vitamin supplement
- 25-lb Block
- 25-lb Pail
- Provides all major and trace minerals including salt
- Added yeast culture, organic trace minerals and biotin
## Maintenance Diet for Mature Pregnant Mare

<table>
<thead>
<tr>
<th>Type of Forage</th>
<th>Concentrate (lb/day)</th>
<th>Forage (lb/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legume or Excellent Quality Grass Hay</td>
<td>0(^2)</td>
<td>16-18</td>
</tr>
<tr>
<td>Average Quality Grass Hay</td>
<td>1-3(^3)</td>
<td>13-16</td>
</tr>
</tbody>
</table>

\(^1\)First 8 months of pregnancy and feed to maintain BCS of 5.5 to 6.

\(^2\)EquiMin Horse Mineral Block.

\(^3\)Triple Crown 30% Supplement (hay < 8% crude protein) or Legends Mare & Foal or Triple Crown Growth (hay > 8% crude protein).
Proper BCS for a Brood Mare
Score: 5 (Moderate)

- Back level
- Ribs cannot be visually distinguished, but can be easily felt.
- Fat around tail-head beginning to feel spongy.
- Withers appear rounded over spinous processes.
- Shoulders and neck blend smoothly into body.
Proper BCS for a Brood Mare
Score: 6 (Moderate to Fleshy)

- May have slight crease down back.
- Fat over ribs feels soft and spongy.
- Fat around tail head feels soft.
- Fat beginning to deposit along sides of withers, behind shoulders and along the sides of the neck.
Feeding the Late Bred Mare

- For last 3 months of pregnancy:
  - Fetus grows at one pound per day - 2/3 of growth occurs in last 3 months
  - Increased requirements for protein, energy, minerals and vitamins
  - Feed to maintain body condition score of 5.5 to 6.0
Feeding the Lactating Mare

- First 3 months of lactation:
  - Milk production peaks at 3% of body weight daily
  - Energy needs are doubled compared to maintenance
  - Increased requirements for energy, protein, minerals and vitamins
Broodmare Nutrient Needs

Peak lactation = 30-35 lbs. milk/day

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protein</td>
<td>120%</td>
</tr>
<tr>
<td>Energy</td>
<td>70%</td>
</tr>
<tr>
<td>Calcium</td>
<td>180%</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>160%</td>
</tr>
</tbody>
</table>
## Approximate Daily Grain Amounts Needed for Broodmares Fed Hay Free-Choice

<table>
<thead>
<tr>
<th></th>
<th>1100 lb BW Avg. Hay</th>
<th>1100 lb BW Good Hay</th>
<th>1300 lb BW Avg. Hay</th>
<th>1300 lb BW Good Hay</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pregnant (first 8 mos.)</strong></td>
<td>3¹</td>
<td>0²</td>
<td>4³</td>
<td>0²</td>
</tr>
<tr>
<td><strong>Pregnant (last 3 mos.)</strong></td>
<td>7⁴</td>
<td>5³</td>
<td>8⁴</td>
<td>5³</td>
</tr>
<tr>
<td><strong>Lactation (first 3 mos.)</strong></td>
<td>14⁴</td>
<td>12⁴</td>
<td>16⁴</td>
<td>14⁴</td>
</tr>
<tr>
<td><strong>Lactation (last 3 mos.)</strong></td>
<td>9⁴</td>
<td>6³</td>
<td>10⁴</td>
<td>6³</td>
</tr>
</tbody>
</table>

¹If feeding 3 lbs or less daily use Triple Crown 30% Supplement.
²EquiMin Horse Mineral Block.
³Legends Grow & Perform or Triple Crown Growth.
⁴Legends Mare & Foal or Triple Crown Growth.
Legends Mare & Foal

- 16% protein, 6% fat & 12% fiber
- 0.85% lysine
- 19 nutrient guarantees
- Organic selenium, zinc, copper & manganese
- Yeast culture, biotin & beet pulp
- Low starch & sugar content
- Textured and pelleted formulas
- Feed with grass, mixed and legume forages
Triple Crown Growth

- 14% protein
- 0.8% lysine
- 10% fat
- 17% fiber
- Beet pulp based
- Low carbohydrate level for prevention of DOD
- Recommended for weanlings, yearlings and broodmares
Fescue and the Broodmare

- Toxic factor from fungus in fescue hay and pasture can cause:
  - Abortions
  - Prolonged gestation
  - Still births
  - Thickened placenta
  - Agalactia (lack of milk)
Managing Fescue and the Broodmare

- Remove from fescue hay and pasture 60-90 days before foaling
- If bag has not developed within 14 days of expected foaling date, consult veterinarian about use of domperidone
- Have alternate source of colostrum and milk available for foal
- Horse Gestation Period
  - Light Horse Breeds: 340-342 days
  - Draft & Warmblood Breeds: 330-340 days
  - Colts 2 days longer than fillies
Feeding the Growing Horse

- Greatest nutrient requirements of any horse class
- Diet fortified with minerals, vitamins, fat, amino acids and other additives for rapid growth rate, proper muscle and bone development, and optimal immune system function for good health
- Nursing foals need 16% protein feed or 14% protein feed with added lysine
- Select feed and forage to provide weanlings with 14% protein diet and yearlings with 12% protein diet
- Consider a feed with controlled carbohydrate content for prevention of developmental orthopedic disease (DOD)
As a yearling…

- 60% of mature weight
- 90% of mature height
- 95% of bone growth
Digestibility of Protein

• Foregut digestion of protein yields amino acids – absorbed in small intestine
• Hindgut digestion of protein results in ammonia and microbial protein – not absorbed in large intestine
• The amino acid pool is influenced by the foregut digestion of protein into amino acids

The horse is sensitive to protein quality (amino acid profile)
## Protein Quality or Essential Amino Acid Profiles

Yearlings fed three diets:

- **A** – control (11.4% CP)
- **B** – lysine supplemented (11.6% CP)
- **C** – lysine/threonine supplemented (11.5% CP)

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP intake, g/d</td>
<td>920</td>
<td>960</td>
<td>980</td>
</tr>
<tr>
<td>Lysine intake, g/d</td>
<td>37</td>
<td>47</td>
<td>49</td>
</tr>
<tr>
<td>Threonine intake, g/d</td>
<td>33</td>
<td>34</td>
<td>40</td>
</tr>
<tr>
<td>ADG, kg/d</td>
<td>0.57</td>
<td>0.64</td>
<td>0.67</td>
</tr>
<tr>
<td>Girth gain, total</td>
<td>9.7</td>
<td>10.1</td>
<td>11.3</td>
</tr>
</tbody>
</table>

Graham et al., 1994
Colostrum for the Foal

- Needed for first two days of life
- Antibodies are proteins that are absorbed into blood from GI tract
- Absorption greatest within 12 hours
- Optimum IgG Concentration: >800 mg/dl
- Frozen - can be stored frozen for 2 years (milk from mare 6-12 hours after foaling)
- Synthetic colostrum and bovine colostrum can be used in an emergency
Feeding the Orphan Foal

- Premature separation from mare due to death or rejection
- Colostrum needed to provide antibodies for immunity against diseases
- Vet can check IgG level in foal’s blood
- If no colostrum by 3rd day, vet can supply IgG with IV plasma
Sources of Foal Milk

- Nurse mare
  - Draft breed typically used
- Milk replacer
  - mare’s milk composition (24% protein, 16% fat on dry matter basis)
  - Bucket feeding - foals must be trained
  - Bottle feeding - more labor required
Mare’s Match Foal Milk Replacer

- 24% protein & 16% fat
- Same composition as mare’s milk
- All milk protein
- Research-proven to provide similar growth as nursed foals
Mare’s Match Foal Pellets

- 26% protein & 10% fat
- All milk protein
- For early weaning of orphan & nursed foals
- Can be used as creep feed or as supplement to creep feed
Foal Creep Feeding Guidelines

- Start creep feed at 1 month of age
- Feed 1 lb/month of age for first 3 months
  - 150 lbs at 2 months - feed 1.5 lbs/day
  - 300 lbs at 3 months - feed 3 lbs/day
- Feed 1.5% BW until weaning
  - 400 lbs at 4 months - feed 6 lbs/day
  - 500 lbs at 6 months - feed 7.5 lbs/day
Before Weaning Foals

- Deworm before weaning
- Check with your veterinarian and perform any required vaccinations prior to weaning if possible
- Don’t add halter breaking, hoof trimming or castration during the weaning process
Weaning Foals

- Separate mare and foal physically but allow them to see each other or pair weaned foals
- Reduce mare’s feed for 3-5 days before weaning foal to reduce mastitis
- Foal needs to be consuming 2 lbs/day of milk pellets or 4 lbs/day of creep feed
Body Weight Estimates at Various Ages for Light Breed Horses of Different Mature Weights

<table>
<thead>
<tr>
<th>Age (months)</th>
<th>Mature Weight 900 lbs.</th>
<th>Mature Weight 1100 lbs.</th>
<th>Mature Weight 1300 lbs.</th>
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<tbody>
<tr>
<td>2</td>
<td>230</td>
<td>290</td>
<td>330</td>
</tr>
<tr>
<td>4</td>
<td>325</td>
<td>400</td>
<td>465</td>
</tr>
<tr>
<td>6</td>
<td>415</td>
<td>510</td>
<td>585</td>
</tr>
<tr>
<td>8</td>
<td>485</td>
<td>600</td>
<td>700</td>
</tr>
<tr>
<td>10</td>
<td>545</td>
<td>680</td>
<td>790</td>
</tr>
<tr>
<td>12</td>
<td>600</td>
<td>740</td>
<td>850</td>
</tr>
<tr>
<td>14</td>
<td>640</td>
<td>790</td>
<td>900</td>
</tr>
<tr>
<td>16</td>
<td>680</td>
<td>840</td>
<td>950</td>
</tr>
<tr>
<td>18</td>
<td>710</td>
<td>880</td>
<td>1000</td>
</tr>
</tbody>
</table>
Dietary Protein Requirements (%) of Growing Horses

- Weanling: 14%
- Yearling: 12%
- Long Yearling: 10%
- Two-Year Old: 10%
Developmental Orthopedic Disease

- Osteochondrosis – OCD (chips, cysts, cracks in hock, fetlock or stifle)
- Physitis (bumps, swelling in knees or fetlocks)
- Cervical Vertebral Malformation or Wobblers
- Flexural limb deformities of coffin, carpus or fetlock joints (contracted tendons)
- Angular limb deformities (open knees, enlarged fetlocks)
Causes of DOD in Growing Horses

- Genetic predisposition
- Poor broodmare nutrition in the last trimester
- Excessive milk production by mare
- Lack of trace minerals in diet
- Excessive calories in the diet
- Lack of exercise for young foals
- Forced exercise for older foals
- Improper calcium to phosphorus level
Some DOD is normal...

- Younger horses may self-repair
  - Hocks: up to 5 months of age
  - Stifles: up to 8 months of age
- Yearlings & older may need treatment
- Severe: veterinary attention advised
- Mild problems:
  - Limit turnout
  - Keep hooves trimmed to correct
Treatment and Prevention of DOD in Growing Horses

- Pre-Weaning Problem - wean early to slow rate of gain
- Post-Weaning Problem - decrease grain feeding rate by 33% (reduces digestible energy intake by 25%) for six weeks
- Make sure diet is balanced for protein, vitamins and minerals, supplement pellet may be needed if intake is reduced
- Avoid excessive feeding of alfalfa hay and limit pasture grazing time (too many calories)
- Select feed low in soluble carbohydrates and feed to maintain moderate instead of rapid growth rate
- Provide abundant free exercise or controlled forced exercise program (more than hand-walking only)
Feeding Examples to Restrict Growth Rate due to Physitis

- **Weanling** - 371 lbs (4 months old) - Mature BW: 1100 lbs
  - 4 lbs/day Legends Mare & Foal or Triple Crown Growth
  - 6 lbs/day grass hay
  - No pasture or turnout
  - Feed for 6 weeks until physitis is gone and gradually increase grain and hay to normal growth rate (1.8 lbs/day)

- **Yearling** – 707 lbs (12 months old) – Mature BW: 1100 lbs
  - 5 lbs/day Legends Grow & Perform or Triple Crown Growth
  - 10 lbs/day grass hay
  - No pasture or turnout
  - Feed for 6 weeks until physitis is gone and gradually increase grain and hay to normal growth rate (1 lb/day)
Legends Grow & Perform

- 14% protein, 6% fat and 12% fiber
- 0.65% lysine
- 19 nutrient guarantees
- Organic selenium, zinc, copper and manganese
- Yeast culture, biotin & beet pulp
- Low starch & sugar content
- Textured & pelleted formulas
- Feed with legume, mixed and grass forages
Bone Growth and Exercise

- Repetitive loading of bone (training) and the related strain contributes to remodeling and reshaping in young horses (Nunamaker et al., 1990)
- Hiney et al. (2002) showed an advantage in bone density and strength in yearlings which had been “pre-conditioned” on a treadmill prior to going into race training
- Weanlings trained in a show jumping environment showed a positive effect in hind limb muscle development (Reitbroek et al., 2007)
Heavy breeds (Drafts, Warmbloods)

Mid-sized breeds (QHs, TBs)

Light-sized breeds (Arabians, Morgans)

Pony breeds (Welsh, POA, Hackneys)

Mark an "X" at the appropriate weight-age intersection every time you weigh your horse. You should see a pattern that falls into one of the categories above.
Feed Minis, Ponies, Warm Bloods and Draft Breeds Differently than Light Horse Breeds

- Feeding charts for miniature horses and ponies are available
- Growing warm blood and draft breeds: Feed concentrate at 1 lb/month of age until 6 months, then 0.75% of body weight until two years of age
Follow Proper Management Practices

- Feed by weight and not by volume
- Make gradual adjustments to feed and hay changes
- Provide consistent feeding times
- Feed at least twice daily if amount exceeds 0.5% of body weight (5 lbs/1,000-lb BW, 2.5 lbs/500-lb BW)
- Feed horses individually and not in groups
Follow Proper Management Practices

- Routine deworming, vaccinations and dental care
- Provide daily exercise
- Keep feed and water containers clean
- Keep manure picked up and properly composted or spread on pastures not containing horses
- Inspect horses daily
Features and Benefits of Legends and Triple Crown Horse Feeds

- Guaranteed biotin → Improved hair and hoof growth
- Guaranteed lysine, threonine, methionine → Optimum growth, milk yield and muscle development
- Yeast culture → Improved hair coat, higher milk yield, increased foal growth and greater bone density
- High fat (6% and 10%) → Increased milk yield, lower feeding rate, improved hair coat and hoof condition
- Fixed-ingredient formulas → Consistent consumption and less colic risk
- Organic trace minerals → Increased absorption allows better metabolic function for less health and DOD problems in growing horses
- Analyzed soluble carbohydrate levels → Unbiased selection of feeds low in soluble carbohydrates to reduce colic risk and DOD problems
Foals For Love Photo Contest!

- Pretty soon, mares across our territory are going to start foaling...which means it’s time for the Southern States Foals For Love Contest!
- Between now and April 10th, submit photos of your 2011 foals to equussource@sscoop.com for a chance to win 10 bags of Legends Horse Feed.
- Please include the foal’s name, sire, dam, breed and birth date with the photo.
Feeding horses can be scary!

But Southern States can help! Come to our websites at SouthernStates.com or EquuSSource.com for information about horse feeds and contact us if you have a question about feeding your horse.

Thanks for your attention!