Goat Nutrition

Earl H. Ward
NE Area Livestock Specialist
Anatomy of Digestive Tract
Anatomy of Feed Tag

**Name of feed, Class of Animal, and Purpose**

**Active Drugs**

**Guaranteed Analysis – minimum not exact**

**Ingredient List – by ingredient or group of ingredients**

**Feeding Directions**

**Any warnings**

Not Shown

Manufacture's name and contact
Nutrient Requirements

- Water
- Energy
- Protein
- Fats
- Minerals
- Vitamins

Most Important
Water

- Cheapest nutrient to supply
- Mature goats will consume between $\frac{3}{4}$ and $1 \frac{1}{2}$ gallons per day
- As temperatures rise above 70°, water intake will increase substantially
- Water intake dictates feed intake
% vs lbs

- We talk in percentages, but animals require **pounds** of nutrients not percentages
# Nutrient Requirements

## Nutrient Requirements of meat goats


### Nutrient Requirements for mature non-dairy does (lb per day)

<table>
<thead>
<tr>
<th>Stage of Production</th>
<th>BW, lb</th>
<th>DMI, lb</th>
<th>% BW</th>
<th>TDN, lb</th>
<th>CP, lb</th>
<th>Ca, lb</th>
<th>P, lb</th>
<th>Ca:P</th>
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### Breeding

<table>
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<tr>
<th>Stage of Production</th>
<th>BW, lb</th>
<th>DMI, lb</th>
<th>% BW</th>
<th>TDN, lb</th>
<th>CP, lb</th>
<th>Ca, lb</th>
<th>P, lb</th>
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### Late gestation

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<th>TDN, lb</th>
<th>CP, lb</th>
<th>Ca, lb</th>
<th>P, lb</th>
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### Early lactation

<table>
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<th>DMI, lb</th>
<th>% BW</th>
<th>TDN, lb</th>
<th>CP, lb</th>
<th>Ca, lb</th>
<th>P, lb</th>
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**ABBREVIATIONS**

- BW = Body weight
- DMI = Dry matter intake
- TDN = Total digestible nutrients
- CP = Crude protein
- Ca = Calcium
- P = Phosphorus
- Ca:P = Calcium to phosphorus ratio

**NOTES**

- CP = 6.8%
- TDN = 53%

- CP = 10.9%
- TDN = 53%

- CP = 12.2%
- TDN = 53%
Seasonal Doe CP Requirements

Kidding

% CP

Forage

Protein

J F M A M J J A S O N D
Seasonal Doe TDN Requirements

Forage TDN:

Kidding:

% TDN

J    F    M    A    M    J    J    A    S    O    N    D

50  52  54  56  58  60  62  64  66  68  70
Factors Influencing Requirements

- Weight
- Maturity
- Sex
- Body Condition

- Goals
  - Market
  - Breeding
  - Showing
  - Pet
Important Points

• The highest energy requirement time for a doe is late pregnancy
  – Different than with a ewe and cow
• Watch feed intake carefully with pregnant does
• DON’T let does get too fat
Grazing Animals Diets

% of Diet

Livestock Species

Bison Horses Cattle Sheep Goats Deer

Grass Forb Browse
Goats are Browsers
Grazing Preference

- **Desirable**
  - Multiflora rose
  - Briars
  - Ironweed
  - Ragweed
  - Lambsquarter
  - Sericea lespedeza
  - Annual lespedezas
  - Honeysuckle
  - Spiny amaranth
  - pigweed
  - Privet
  - Kudzu
  - Buckbush
  - Curly dock
  - Winter annuals

- **Intermediate**
  - bermuda
  - Chickweed
  - Thistle
  - Burdock
  - Tree of heaven
  - White clover
  - Buttercup
  - Japanese grass

- **Undesirable**
  - Horse nettle
  - Black nightshade
  - Perilla mint
  - Poison hemlock
## Preference = Nutrition

<table>
<thead>
<tr>
<th>Browse type</th>
<th>Crude protein</th>
<th>Neutral detergent fiber</th>
<th>Calcium</th>
<th>Phosphorous</th>
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<td><em>Multiflora rose</em></td>
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<td>1.21</td>
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<td><em>Brambles</em></td>
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<td>16.7</td>
<td>43.1</td>
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</table>
Early to Mid-Gestation

- Placental development occurs first 30 to 90 days of pregnancy.

- Underdeveloped placentas result in low birth weights, regardless of late gestation nutrition.

- 21 days of severe underfeeding or 80 days of moderate underfeeding can affect placental development.

- Do not overfeed or underfeed; aim to have does with a body condition score of 3 to 3.5.

⇒ Nutrient requirements are only slightly above maintenance.
Late Gestation

• Proper feeding and management during late gestation is crucial to a successful kidding season.

• During the last 4 to 6 weeks of gestation:
  – 70 percent of fetal growth is occurring.
  – The doe’s mammary system is developing.
  – The doe’s rumen capacity is decreasing.
Late Gestation

- Energy is required in the largest quantity.
- Energy is the nutrient most likely to be deficient.
- Protein requirements are not significantly higher.
- Calcium requirements virtually double during late pregnancy.
- Selenium and vitamin E are also critical nutrients during late gestation.
Late Gestation

- Level of nutrition depends upon the size (weight) and age of does and the number of fetuses she is carrying.

- To meet the energy needs of pregnant does, you usually need to feed some grain.

- If forage quality is low, you may also need to supplement protein and/or calcium in the diet.
Late Gestation

Extra Nutrition is Needed

• To support fetal growth.

• To support mammary tissue development.

• To prevent pregnancy toxemia (ketosis) and milk fever.

• To ensure the birth of strong, healthy, kids of moderate birth weight.
Controlling Acidosis

Acidosis occurs when ruminants eat too much feed that contains high levels of starch.

Could be grains or grain by-products

Rate of Fermentation

FASTER
Dry Rolled Wheat
Steam Rolled Barley
Dry Rolled Barley
Whole Barley
Steam Flaked Corn
Steam Flaked Sorghum
Dry Rolled Corn
Dry Whole Corn
Dry Rolled Sorghum

SLOWER
Do NOT Over Feed Does

Even the thin ones!

WHY?

– Fat does are more prone to pregnancy toxemia.

– Fat does experience more kidding difficulties (dystocia).

– Fat does are more likely to prolapse.

– Large fetuses can cause dystocia.

– Fat is expensive to put on.
Do NOT Under Feed Does
Even the fat ones!

• Inadequate nutrition can result in:
  – Pregnancy toxemia (ketosis)
  – Small and weak kids.
  – Higher kid mortality
  – Reduced quality and quantity of colostrum.
  – Poor milk production.
Feeding During Lactation

- Does nutritional requirements are still high for first 6 to 8 weeks of lactation.

- Energy and protein requirements increase by 30 and 60 percent, respectively above maintenance.

- Should have body reserves (fat) for optimum performance.

- Inadequate energy intake increases protein need.
Feeding During Lactation

- Ideally, does should be separated into production groups for feeding.

- General rule of thumb is one lb. of grain per kid or access to better pasture (quality and quantity).

- A loss of weight and body condition is acceptable (and expected).

- Yearlings should be fed and managed separately until they wean their first set of kids.
Feeding During Lactation

• **Singles**
  – Lowest nutritional requirements.

• **Twins**
  – Produce 20 to 40 percent more milk than ewes nursing singles.
  – A doe nursing twin lambs growing at 0.66 lbs. per day is as productive as a dairy cow producing 66 lbs. of milk/day.

• **Triplets**
  – Full feed?
    May need to limit forage intake.
  – Hard for a doe to raise triplets on pasture without supplementation.
  – Does nursing triplets is equivalent to a high producing dairy cow.

General rule of thumb is 1 lb. of grain per kid.
Growing Kid Nutrition

• For the first several weeks of life, all a kid needs for nourishment is its mother's milk.

• Kids will start to nibble on solid food soon after birth.

• 74% of the doe’s milk is supplied in the first 8 weeks of lactation.

• A doe's milk production peaks between 3 and 5 weeks of lactation.

• By the time kids are 4 to 6 weeks old, they may be obtaining as much as 50 percent of their nutrient intake from sources other than their mother's milk.
Creep Feeding

• A means of providing extra nutrients (usually grain) to nursing kids – puts on extra pounds.

• Beneficial to kids managed in an intensive system in which early weaning is practiced.

• Advantageous in flocks that have a lot of multiple births or flocks where milk production is limited.

• It is more efficient to feed the kids directly than to feed the doe to produce more milk.

• Is of less value for kids that will be developed on pasture.

• May not be cost-effective in all situations.
Weaning
removing the milk diet

• Weaning age varies from less than 30 days to 6 or 7 months of age (natural weaning).

• Usually 60 to 120 days.

• Causes stress to kids (nutritional) and doe (mastitis).
Weaning: Kids

• Leave kids in familiar surroundings.
• Leave kids in same group.
• Leave kids on same diet.
• Vaccinate for overeating disease prior to weaning.
• Treat for coccidiosis prior to weaning.
• Maintain fence line contact with doe to minimize weaning stress(?).
Feed Related Problems

Pregnancy toxemia (ketosis)

- Inadequate intake of energy during late gestation.
- Fat breakdown produces toxic ketone bodies.
- Treat with propylene glycol or IV glucose (or c-section).

Milk fever (hypocalcemia)

- Low blood calcium caused by not enough or too much calcium in diet.
- Treat with oral, sub-Q, or IV calcium solution.

Similar symptoms
Feed Related Problems

Urinary Calculi ~ “Water Belly”

Phosphorus “stones” getting lodged in the urinary tract

High levels of P

Imbalance Ca:P ratio
Feed Related Problems

Urinary Calculi ~ “Water Belly”  
**PREVENTION**

Make sure the feed ration has at least a 2:1 Ca:P ratio

Add 10-15 lbs of Ammonium Chloride per ton of feed
Feed Related Problems

Coccidiosis

PREVENTION
HOW TO USE THE MEAT GOAT RATION EVALUATOR 2011 SPREADSHEET

1. Fill out the feed inventory with the feedstuffs you plan to feed your goats. You can replace the feeds listed with your own feeds and values.

2. Go to the Nutrient Requirements worksheet [TAB] and find the class of goat you want to evaluate a ration for.
   The nutrient requirements in the tables are from the National Research Council's Nutrient Requirements of Small Ruminants, published in 2007.

3. Copy the goat's TDN, CP, Ca, and P requirements to the Windows clipboard. Nutrient requirements are in the BRIGHT YELLOW cells.
   To copy, highlight the cells you want to copy with the mouse, then hold down the CTRL key and press the C key (or right click the mouse and click COPY).

4. Go to the Worksheet [TAB] and find the same class of goat.

5. Paste the TDN, CP, Ca, and P requirements that you copied to the clipboard to the same location (BRIGHT YELLOW cells) on the Worksheet.
   To paste, highlight where you want to copy the information to with the mouse, then hold down the CTRL key and press the V key (or right click the mouse and click PASTE).

www.sheepandgoat.com
Pearson Square

Assumptions: 176 lbs Late Gestation twins (DMI = 2.9%) = 5.10 lbs
Requirements: CP = 0.56 lbs TDN = 2.71 lbs $80/ton Native Hay
$440/ton SBM

Crude Protein

44
SBM

5

5/38 = 13.2 % SBM

6
Native Hay

33

33/38 = 86.8 % Hay

5.10 lbs x 13.2% = 0.67 lbs ÷ 90% DM = 0.75 lbs SBM
5.10 lbs x 86.8% = 4.43 lbs ÷ 89% DM = 5.00 lbs Hay

Cost = $0.37/hd/d
Pearson Square

Assumptions: 176 lbs Late Gestation twins (DMI = 2.9%) = 5.10 lbs
Requirements: CP= 0.56 lbs  TDN = 2.71 lbs  $80/ton Native Hay
                $240/ton Alfalfa

Alfalfa Hay

17

SBM

5

5/11 = 45.5% Alfalfa

6

Native Hay

6/11 = 54.5% Hay

11

5.10 lbs x 45.5% = 2.32 lbs ÷ 89% DM = 2.6 lbs Alfalfa
5.10 lbs x 86.8% = 2.78 lbs ÷ 89% DM = 3.1 lbs Hay

Cost = $0.44/hd/d
Goat Nutrition

Questions?

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