

Goat Nutrition

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Ruminants

- Cattle
- Sheep
- Goats
- Deer

Ruminants

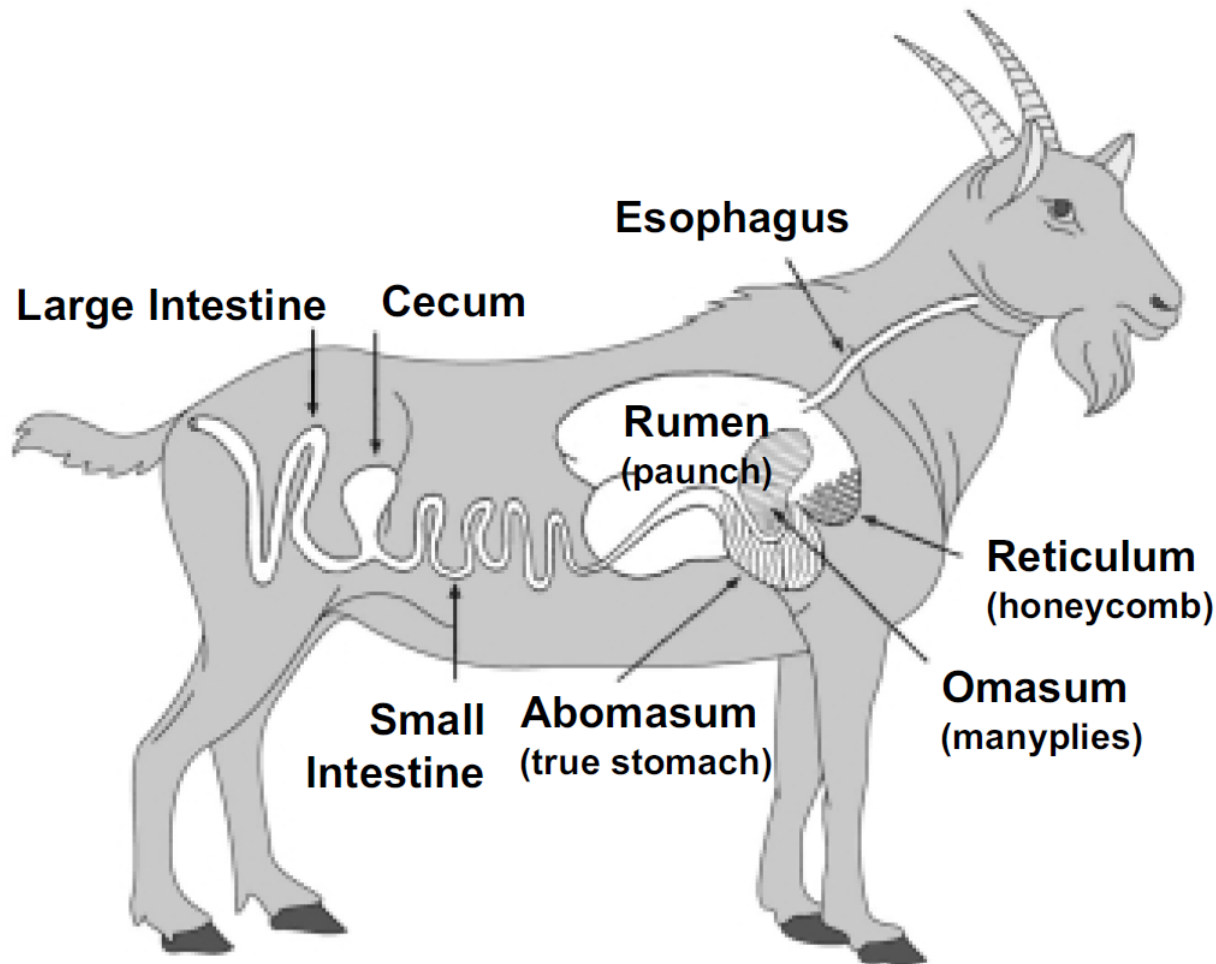
- 2.8 billion domesticated ruminants
 - Cattle, sheep, deer, elk, bison
- Pregastric fermentation
 - Ability to chew cud at frequent intervals distinguishes true ruminant from other foregut fermenters
 - Kangaroo, colobine monkey are not true ruminants



Ruminant Digestive System

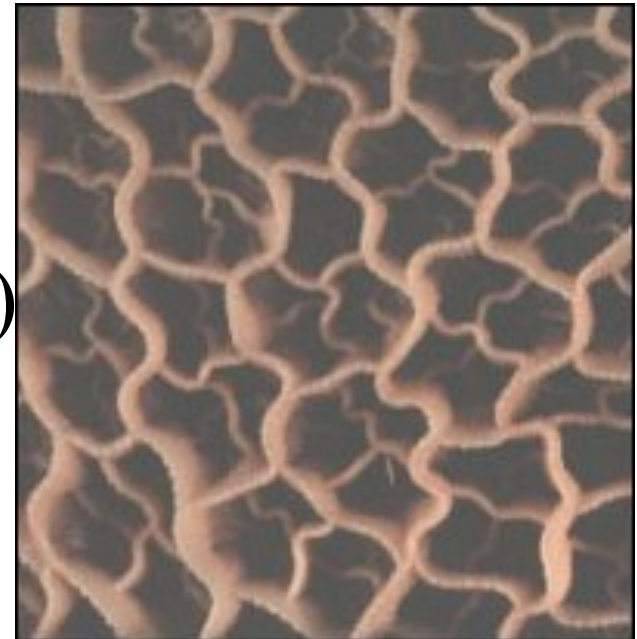
- Four compartment stomach
 - Reticulum
 - Rumen
 - Omasum
 - Abomasum

Ruminant Digestive System



Reticulum

- ❑ Located at the base of the esophagus
- ❑ Honeycomb lining
 - No secretions
- ❑ Formation of food bolus
- ❑ Regurgitation initiated here
- ❑ Collects hardware (nails, wire)



Reticulum

- ❑ Since ruminant animals do not “chew” their food when it is taken in, at times foreign material like rocks, nails, small pieces of wire, can be swallowed.
- ❑ While the animal is “chewing its cud” foreign particles that are heavy are allowed to “sink” in the reticulum, preventing many foreign particles from entering the rest of the digestive system.
- ❑ Once foreign material enters the reticulum, it stays there for the life of the animal.

Reticulum

- If enough of this foreign material remains in the reticulum, it may cause damage and infection of the reticulum (hardware disease).



Rumen

- Digestion and fermentation vat
 - Sheep: 5 – 10 gallons depending on size of the animal
 - Goats: 3 – 6 gallons
 - No secretions
- Contains anaerobic microbes (25-50 billion bacteria/mL fluid)
 - Also protozoa, fungi
 - Produce VFA, protein
- Papillae lining
 - Increase surface area
- Absorption of VFA
 - Passive diffusion



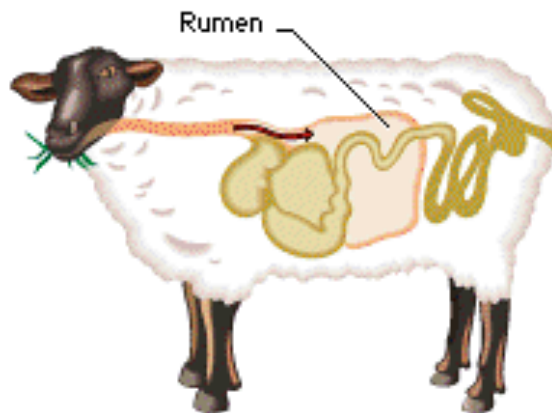
Rumen

- The largest segment of the ruminant stomach
- Fermentation
 - Volatile fatty acids (VFA)
 - Gases
 - Carbon dioxide (CO₂)
 - Methane (CH₄)
- Gases are removed by the process of eructation (belching)

Rumen

- Ruminantion helps the breakdown of feeds, particularly roughage, into smaller particles to facilitate fermentation
 - Ruminantion or chewing the cud is a characteristic of all ruminants
- A bolus of rumen digesta is formed by muscles at the base of esophagus, regurgitated, and chewed

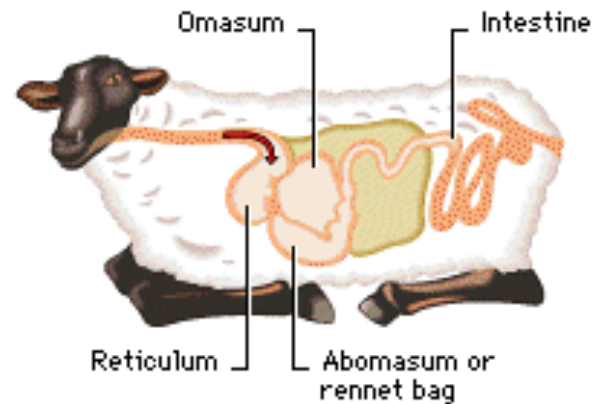
Ruminant Digestive System



Grazing

Plant material is chewed a little before being swallowed.

Part-digested food is stored in the rumen where it is broken down into cud by bacterial action.



Ruminating

Cud is regurgitated and chewed again while the ruminant is lying down.

Food swallowed for the second time bypasses the rumen.

Food is finally processed by acids and digestive enzymes in the other stomach chambers.

Capacity of Digestive Tracts

<u>Compartment</u>	<u>Capacity</u>
Stomach	
Reticulum	1.5-2.0 qt.
Rumen	5.0-10.0 gal.
Omasum5-1.0 qt.
Abomasum	2.0-3.0 gal.
Small Intestine	2.0-2.5 gal, (80 ft)
Large Intestine	1.5-2.0 qt.

Nutrients

- Water:
 - Always supply fresh and clean water
 - A 110 lbs goat should drink around 1-3 gallons of water (depending on weather conditions and diet)



Nutrients

- Carbohydrates
 - Main source of dietary energy
 - Corn is the most common feedstuff added to ruminant diets
 - Goats do not adapt to high grain diets like cattle
 - Acidosis, founder, urinary calculi and etc
 - So, gradually increase grain levels and maintain a minimum of 12% crude fiber or around half of the diet as grass, hay or roughage



Nutrients

□ Fats

- Very high in energy
- May be added to increase energy content
- Some people add vegetable oil as a top dress to improve the coat of the animal

Nutrients

□ Protein

- Very important during the growing phase
 - Muscle development
- Ruminant animals are capable of producing all essential amino acids by microbial fermentation (microbial protein)

Nutrients

- Vitamins and Minerals
 - Most complete feeds have the correct amount of vitamins and minerals.
 - Normally are fed in very small amounts
 - Vitamins:
 - A, D, E, and K
 - Minerals:
 - Macro – Calcium, Phosphorus, Sodium, Potassium, etc
 - Micro – Iron, copper, zinc, selenium, etc

Internal Parasites

- ❑ Newly purchased goats should be drenched immediately for internal parasites and a second drenching 3 weeks later
- ❑ Internal parasites are a big problem in goats
- ❑ To make sure the dewormer or drench you use is the correct one contact your veterinarian for assistance



Other Health related issues

- ❑ Enterotoxemia – vaccine
- ❑ Urinary calculi – 2:1 Calcium:phosphorus
- ❑ Coccidiosis – Medicated feed with a coccidiostat
- ❑ Ringworm
- ❑ Pinkeye



Factors Affecting Nutrient Requirements

- Productivity
 - Maintenance and activity level
 - Pregnancy
 - Lactation
 - Growth
- Biotype
 - Meat, dairy or fiber
 - Purebred or crossbred?



Other Factors

- Weight
- Maturity
- Sex
- BCS
- Goals
 - Market
 - Breeding
 - Showing
 - Pet



Important points to consider

- Colostrum needed first hour after birth (passive immunity)
- Higher requirement last third of pregnancy
- Higher protein requirement during growth and for larger animals

Feeding your goat

- Feed a complete feed
 - You may start with a starter ration when you first get your goat
 - Then you may gradually shift to a grower ration
- Always have free choice hay
 - Good grass hay and/or alfalfa can be used
- **Be careful to not over feed grain/concentrate to your goat**



Feeding your goat

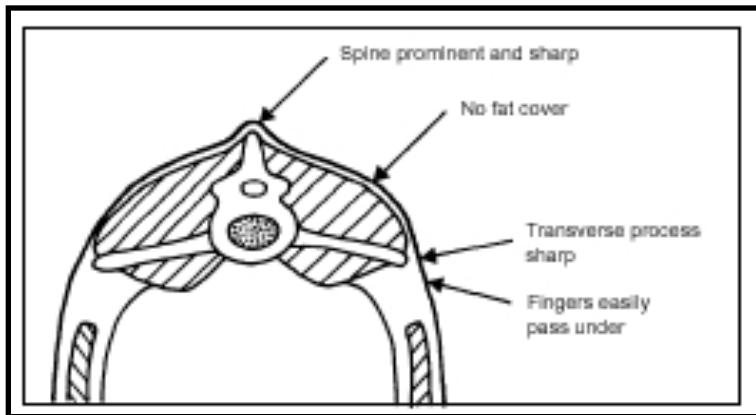
- Feeding too much grain can cause digestive disorders such as acidosis and bloat
- Goats will normally gain between $\frac{1}{4}$ to $\frac{1}{2}$ lbs per day
 - So make sure you weigh your goat frequently

Feeding your goat

- How much protein?
 - Prior to weaning should feed them a 18% protein
 - Weanlings – 16% protein
 - Growing to finishing – 14% protein
- Should feed around 1 – 1.5% of BW concentrate and 0.5 – 1 % of BW of forage
 - Forage has be fed free choice and make sure they are consuming at least 0.5 % of their BW

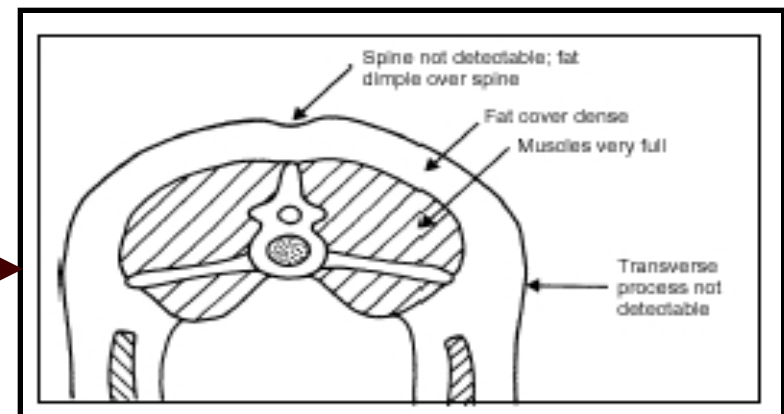
BCS

- Body condition scoring for goats is on a scale of 1 to 5. With 1 being very thin and 5 being obese. (Spahr, 2009)

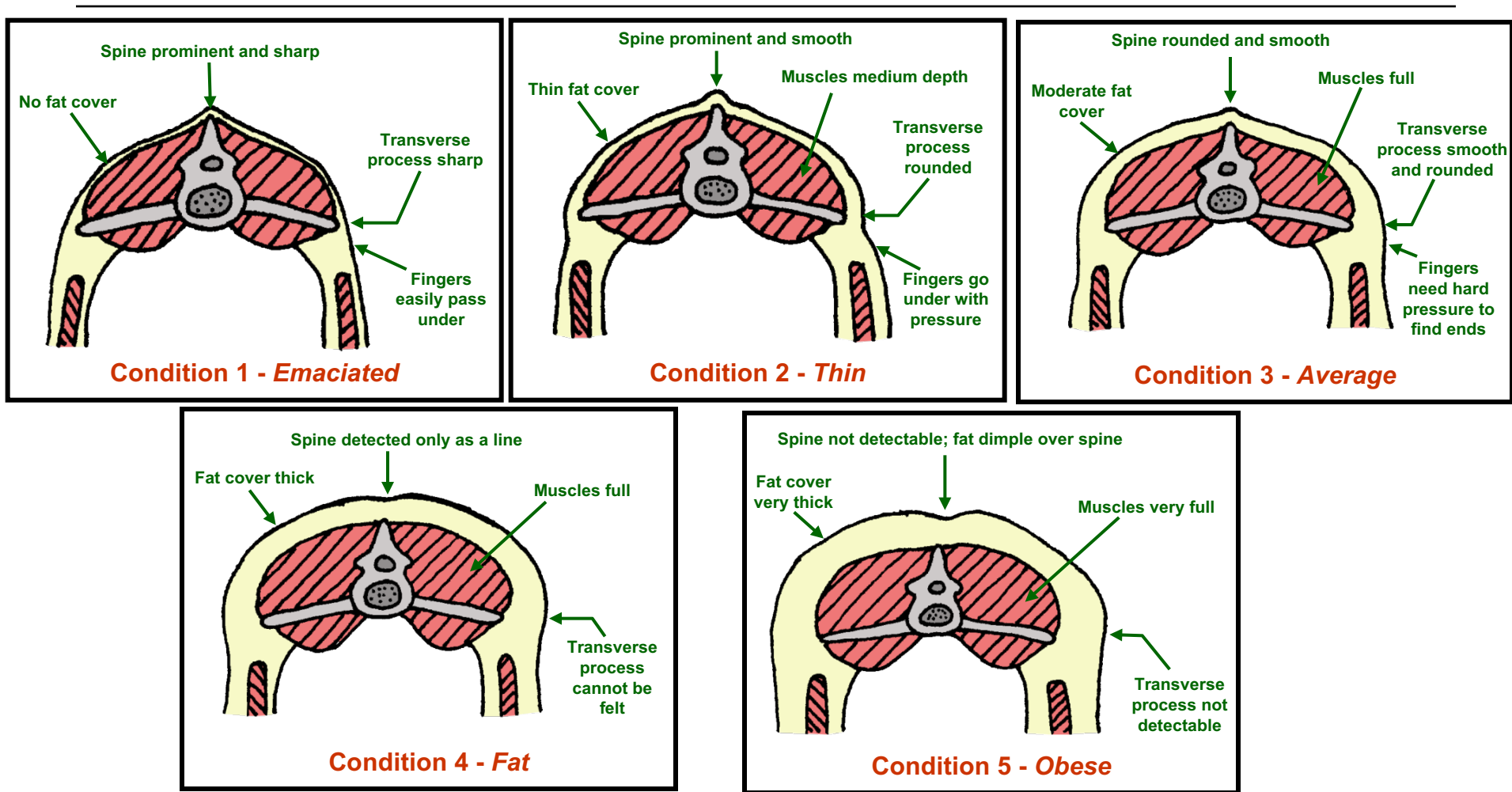


← BCS 1

BCS 5 →



BCS



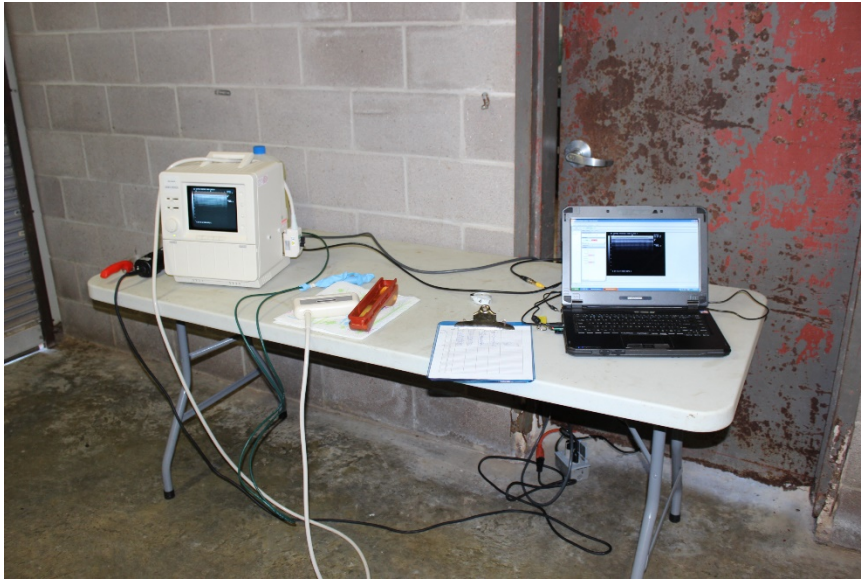
Adapted from "Body Condition Scoring of Sheep" by J.M. Thompson and H. Meyer (Oregon State University)

BCS





RTU



RTU



Adding Value to Goat Meat



Adding Value do Goat Meat



Adding Value do Goat Meat



Adding Value do Goat Meat



Adding Value do Goat Meat



Questions

