

GOAT NUTRITION

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NUTRIENTS

- Carbohydrates
- Fats (Fatty Acids)
- Minerals
- Proteins (Amino Acids)
- Vitamins
- Water

STRUCTURAL CARBOHYDRATES

- Referred to as “Fiber”
- Made up of the forage portion of a diet
- In a complete pelleted diet, additional fiber sources may be the hulls of grains
- A goat itself cannot digest structural fiber carbohydrate like it can sugars and starches
- Digestible fiber is fermented by the microbes in the goat’s rumen volatile fatty acids (VFA’s), which are then absorbed
- VFA’s are a main source of energy for the goat

NON-STRUCTURAL CARBOHYDRATES

- Starches, Sugar Starches (grain) and sugars are also key energy sources for the goat
- Both starches and sugars can be digested two ways:
 - like fiber, they can be fermented into VFA's in the rumen
 - they can flow through the rumen and be digested by enzymes in the small intestine
- When digested in the small intestine, they quickly convert to glucose, which can be used immediately or stored in the muscles as glycogen
- Both glucose and VFA's provide the energy needed for growth

FATS (FATTY ACIDS)

- Fats are excellent sources of energy
- Fats contain more than twice the calories per pound than either carbohydrates or protein
- Adding fat to the diet allows the goat to ingest more calories in a smaller quantity of feed
- Ruminants like goats have a limited ability to utilize fat
- Fat tends to be an expensive source of energy
- Goats typically are not fed high-fat diets
- Fats are important in maximizing hair quality

MACROMINERALS

- Involved in the formation of structural components in the body, muscular contraction and energy transfer
- Some minerals are also integral parts of amino acids, vitamins and hormones
- Levels of major minerals (macrominerals) are critical, especially for young, growing animals
- Calcium and phosphorus are two macrominerals of great importance
- Goats require calcium and phosphorus in relatively large amounts for bone growth and maintenance
- Growing kids especially need adequate amounts of calcium and phosphorus as they are still experiencing active skeletal growth and development

MACROMINERALS

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Important

- Excess phosphorus or an imbalance in the calcium: phosphorus ratio can increase the potential for urinary calculi
- Goat diets should contain twice as much calcium as phosphorus
Other important macrominerals include sodium, chloride, potassium, magnesium and sulfur
- Sodium and salt will help stimulate water consumption, which helps reduce the formation of urinary stones
- Magnesium and sulfur levels are usually adequate in typical diets fed to goats

TRACE MINERALS

- Required in small amounts by the goat
- Essential trace minerals include cobalt, copper, iodine, iron, manganese, selenium and zinc
- Deficiencies and/or imbalances of trace minerals may cause decreased growth rate, lowered resistance to disease, lack of stamina and reduced reproductive rate
- Copper is of particular interest
- Goats have a higher requirement for copper than do sheep, but require less copper than cattle
- To ensure the proper balance of copper and other minerals, a goat-specific mineral should always be fed when a mineral is offered

PROTEINS (AMINO ACIDS)

- Proteins are composed of amino acids
- Amino acids are the building blocks for muscle, organs, hair and a key component of milk
- Ruminants like goats can obtain their protein from two sources
 - Dietary amino acids that the goat consumes
 - Microbial protein that is produced from carbohydrate fermentation in the rumen
- Microbial protein is usually the main source of protein and amino acids that the goat will digest and absorb

VITAMINS

- Micro-nutrient required by the goat in small amounts to help utilize nutrients for growth, maintenance, reproduction and performance
- The goat is able to synthesize many of the needed vitamins from ruminal microorganisms, including vitamin K and the B-complex vitamins
- Divided into two general categories: fat-soluble vitamins (A, D, E and K) and water-soluble vitamins (B-complex)
- High quality pasture and forages are rich sources of vitamins
- Mature forage and forage that has been stored for an extended time lose a lot of vitamin activity
- Vitamin supplementation of mature or stored forages is often necessary

VITAMIN A

- Vitamin A requirements of goats can sometimes be met by carotene
 - carotene is found in all fresh green forages
 - the carotene content of forages decreases with time, even if hay is stored properly
 - a significant amount of carotene will be broken down after as little as six months
- To ensure an adequate body supply of vitamin A, a goat feed or supplement should be fed

VITAMIN D

- Goats exposed to sunlight receive a significant amount of vitamin D
- To ensure that dietary needs are met, goat feeds and supplements should be fortified with vitamin D₃

VITAMIN E

- Key component in the antioxidant system
 - helps maintain various tissue functions
 - supports immune response
- Fresh forages are very high in vitamin E
- Dried forages like hay rapidly lose their vitamin E activity
- Goat feeds and supplements should be fortified with vitamin E

B-COMPLEX VITAMINS

- B-complex vitamins are all synthesized by microbes during the ruminal fermentation of carbohydrates
- Supplementation of the B-complex vitamins is not necessary in a goat diet

WATER

- Goats will survive a long time without food, but just a few days without water would be fatal
- Goats need to drink a lot of water, at least four times their intake of dry food
- A safe general recommendation is to provide goats with all the clean water that they will drink (ad libitum intake)
- Insufficient water intake will reduce feed intake
- Lactating goats also need to consume more water when they are producing in milk
- A lactating goat will consume 2-3 pounds of water for every pound of milk produced

WATER

- To encourage water intake, be sure goats have a constant source of clean, fresh water
- Make sure that it is accessible at all times to all goats in the herd (this may mean having more than one watering station)
- Have the water tested if you suspect problems; the water should be free of organic contaminants, minerals, salt, heavy metals, and stray voltage
- Water should never be frozen or fouled with feed, dirt, or manure
- Goats are finicky; they will drink enough to live, but if you wouldn't drink their water, chances are they are not drinking as much of it as they should be
- Increased water intake can help reduce the potential for urinary calculi
- Increased water consumption will help flush excess minerals out of the kidneys, preventing stones from forming

REFERENCE



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