Giraffe Nutrition Guide

BACKGROUND [1]
Giraffes have been described as “browsers,” “folivores”, and “concentrate selectors.” Unlike grazing (grass-eating) herbivores, which consume relatively uniform feeds, wild giraffe choose their diet from an assortment of foods that are very different in nutritive content.

Trees and shrubs generally comprise the bulk of the natural diet (in some cases > 93%), with limited vine and herb consumption. Grass intake is either non-existent or negligible; grass is apparently “eaten by accident when enmeshed with other food”.

It also has been suggested that long-stemmed hays may be an inappropriate physically effective fiber source for captive giraffe. Because of their physical shape, long-stemmed hays linger in the rumen. Long hay strands form a mat that distends the rumen, causing a feeling of satiation and decreasing intake.

Grains and pellets require little time to consume and little chewing. While wild giraffe appear to spend approximately half their time feeding, six captive giraffe fed a grain/alfalfa hay diet spent only 12% of time feeding.

Recommended protein concentrations for giraffe have typically been 16 to 20% of the diet. Zoo diets for giraffe and other browsing animals are typically based on alfalfa hay and herbivore pellets. This diet easily meets and can even surpass the previously recommended requirements for crude protein. Alfalfa hay typically contains more protein than grass hays, depending on hay maturity and cutting stage. Herbivore pellets also tend to be alfalfa-based and contribute significantly to the total concentration of crude protein intake.

There is no indication that starch is a necessary dietary component and no more than 10% starch (DMB) should be included in the total diet of captive giraffe. Diets containing less than 5% starch are encouraged. High concentrations of simple sugars also can result in ruminal acidosis; therefore, care must be taken to also limit these in the diet.

The committee concluded that captive giraffe are currently being fed diets too high in starch, simple sugars, and protein. It is believed that the high concentrations of these nutrients may be leading to or exacerbating many of the health issues currently diagnosed in captive giraffe. By lowering the concentrations of simple sugars, starch, and protein and increasing the concentration of fiber in giraffe diets, zoos should be able to minimize the number of health problems associated with unhealthy rumens. By creating a healthy ruminal environment, issues with diarrhea also should be resolved. Feeding a lower protein diet also will help cut feeding costs because the quantity of higher priced, higher protein hays fed will be decreased.

Browse is recommended for giraffe when available. Access to browse will not be a problem until it limits trace mineral and vitamin intake from the commercially manufactured feed. Only browse that has been approved for use with giraffe should be fed.

NAG recommends 65% alfalfa hay and 35% supplement (equaling to 2% of giraffe body weight). Actual average is closer to 25% alfalfa hay and 75% supplement (equaling to 1.39% body weight).

Some Plant Suggestion for Zoo Giraffe Browse:
**DIET FORMULATIONS [1]**

The typical zoo giraffe diet of pelleted feed, with an acid detergent fiber (ADF) concentration of 16%, fed with alfalfa hay will not meet the proposed recommended feeding specifications. Table 1 lists average nutrient specifications for grass and legume hays, ADF-16 formula pellets, and a typical zoo giraffe diet consisting of 50% alfalfa and 50% ADF-16 pellets (DMB). The new recommendations are listed under Total Diet Target for comparison. The current zoo diet is too low in ADF and vitamin D and too high in protein, starch, calcium, and phosphorus with copper being slightly over the suggested concentration.

Table 1. Average nutrient composition (Dry Matter Basis) of hays, pellets, and a typical zoo diet compared to the new total diet recommendations.

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Alfalfa Hay</th>
<th>Grass Hay</th>
<th>Acid Detergent Fib Pellets</th>
<th>Zoo Diet</th>
<th>Total Diet Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADF (%)</td>
<td>31.2</td>
<td>39.5</td>
<td>17.2</td>
<td>24.2</td>
<td>&gt; 25-30</td>
</tr>
<tr>
<td>Fat (%)</td>
<td>2.1</td>
<td>2.6</td>
<td>3.6</td>
<td>2.9</td>
<td>2-5</td>
</tr>
<tr>
<td>Crude</td>
<td>20.2</td>
<td>10.6</td>
<td>19.0</td>
<td>19.6</td>
<td>10-14</td>
</tr>
<tr>
<td>Starch</td>
<td>2.5</td>
<td>1.2</td>
<td>30.0_d</td>
<td>16.3</td>
<td>&lt; 10</td>
</tr>
<tr>
<td>Calcium</td>
<td>1.5</td>
<td>0.6</td>
<td>0.9</td>
<td>0.9</td>
<td>0.65-1.0</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>0.3</td>
<td>0.2</td>
<td>0.8</td>
<td>0.8</td>
<td>0.35-0.5</td>
</tr>
<tr>
<td>Magnesium</td>
<td>0.3</td>
<td>0.2</td>
<td>0.3</td>
<td>0.3</td>
<td>min 0.3</td>
</tr>
<tr>
<td>Copper</td>
<td>22.2</td>
<td></td>
<td></td>
<td>22.2</td>
<td>10-15</td>
</tr>
</tbody>
</table>
Other mineral concentrations to follow those established for domestic ruminants
Free choice access to salt block

- Typical zoo diet: average alfalfa (listed) and ADF-16 pellets consumed in a 50:50 ratio.
- “hay, all samples”, Nutrient Requirements of Beef Cattle, 1996.
- Griffin, personal communication, 2005.
- Vitamin concentrations not given due to variability among hays; calculations are made with the assumption that no vitamins come from the hay.
- Vitamin D amount added.


EXAMPLE DIETS [1]
Listed below are diet examples for a 1,000-kg animal that consumes approximately 12 kg dry feed/day based on a prediction of 1.2% of his body weight as intake.

- Diet A: 25% alfalfa hay (3 kg) and 75% manufactured feed (9 kg).
- Diet B: 50% alfalfa hay (6 kg) and 50% manufactured feed (6 kg).
- Diet C: 35% alfalfa hay (4.2 kg) and 65% manufactured feed (7.8 kg).
- Diet D: 25% mixed grass hay (3 kg) and 75% manufactured feed (9 kg).
- Diet E: 25% mixed grass hay (3 kg), 25% alfalfa hay (3 kg) and 50% manufactured feed (6 kg).

NAG recommends 65% alfalfa hay and 35% supplement (equaling to 2% of giraffe body weight). Actual average is closer to 25% alfalfa hay and 75% supplement (equaling to 1.39% body weight).

HOW MUCH TO FEED
The total daily dry matter intake by free-ranging giraffe has been estimated as 1.6% of body weight in males and 2.1% of body weight in females.
Based on captive studies, it is predicted that an adult giraffe will consume approximately 1.2% of its body weight in dry food each day, but this may vary slightly from animal to animal. Giraffe that are incurring greater energy demands, such as those exposed to colder climates, that are pregnant, or lactating, should continue to receive the same nutrient concentrations, but may consume more feed than the predicted 1.2% of body weight.

WHEN TO FEED
Feeding is the most time-consuming activity of wild giraffe, taking up as much as 53% of daylight hours. Giraffe feed at all hours of the day and night with morning and evening reported as peak feeding times. During observations in Nairobi, approximately 75% of visible giraffe were feeding in the morning, 50% at noon, and 90% in the evening.
It is recommended that ruminant animals be offered at least two separate meals of the manufactured feed daily with hay available at all times. Increasing the number of meals offered will minimize the starch and sugar loads entering the rumen at one time and, in
turn, lower the incidence of rapid microbial fermentation in the rumen. If an animal consumes an entire day’s ration of pelleted feed at one time, the ruminal microbes that use (ferment) sugars, starch, and easily degraded protein have the potential to quickly ferment the nutrients, rapidly produce large concentrations of short-chain fatty acids, and multiply exponentially, all of which lead to problems with ruminal acidosis.

HOW TO ENCOURAGE NATURAL BEHAVIORS [1]
Enrichment items are sometimes thought of as food offered in addition to an animal’s “normal diet”. Changing this concept is important. ALL food an animal is offered should be considered as part of the “total diet” and analyzed as such. Enrichment items (not including browse) should be no more than 5% of the total diet on an as-fed (fresh or moisture included) basis.

RELIABLE PROTEIN PRODUCTS
21001 N. Tatum Blvd. / Suite 1630 - 620
Phoenix, AZ 85050 - 4206 - U.S.A.
Phone: (480) 361-3940 / FAX: (480) 393-8660
Email: info@zoofood.com

GIRAFFE - FARE
BALANCED DIET FOR GIRAFFES, OKAPI And Other Herbivorous Animals
Soybean Meal, Dehydrated Alfalfa, Ground Corn, Wheat Bran, Ground Oats, Ground Milo, Ground Barley, Wheat Germ, Wheat Flour, Linseed Oil, Dicalcium Phosphate, Calcium Carbonate, Salt, Anise Oil, Cane Molasses, Carotene, Magnesium Sulfate, Irradiated Dried Yeast (D-2), Vitamin A Supplement, Vitamin E Supplement, Riboflavin, Ascorbic Acid, Sulfur, Manganese Sulfate, Niacin, Sodium Selenite, Choline Chloride, Pyridoxine Hydrochloride, Folic Acid, Calcium Pantothenate, Copper Oxide, Iron Oxide, Menadione Sodium Bisulfite, Magnesium Oxide, Vitamin B-12 Supplement, Zinc Oxide, EDDI, Ethoxyquin (preservative), D- activated Animal Sterol(D-3), Thiamine Mononitrate.

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Min. Value</th>
<th>Max. Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude Protein</td>
<td>21.00%</td>
<td></td>
</tr>
<tr>
<td>Crude Fat</td>
<td>3.00 %</td>
<td></td>
</tr>
<tr>
<td>Crude Fiber</td>
<td>8.00 %</td>
<td></td>
</tr>
<tr>
<td>Moisture</td>
<td>10.00%</td>
<td></td>
</tr>
<tr>
<td>Ash</td>
<td>10.00%</td>
<td></td>
</tr>
<tr>
<td>Calcium (CA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phosphorous (P)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selenium (SE)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

GIRAFFE - FARE
is a pelleted diet in a 1/2 inch (13 mm) diameter
Packed in multi-walled 50 pound bags GIRAFFE - FARE should be fed free choice as the sole-ration.
Acacia, Alfalfa or Hay may be offered to relieve boredom.
Giraffe Diet & Feeding
Diet
Browsers: leaves and young shoots. Also eat seeds and pods.
Up to 100 species of plants recorded for the giraffe's diet. But, bulk of diet usually made up of only a few species of trees and woody bushes. *Acacia* spp. are favored in all locations. Additional species are different depending on location, and include the following genera: *Combretum, Commiphora, Terminalia, Harrisonia, Pterocarpus, Cassia, Lonchocarpus, Grewia*.
Rainy season: eat mostly deciduous species. Dry season: eat mostly evergreen species. Consume 34 - 75 kg (75 - 165 lbs) of browse per day.
Foraging
Able to feed at a height unreachable by all other browsers except for the elephant. This often creates a pruned browse line along the undersides of trees at a height of about 4.3 - 5.5 m (14-18 feet).
Long, prehensile, sticky tongue enables a giraffe to feed on hard to reach leaves. Small, thickened papillae of the tongue and lips protect against thorns. Elongated occipital condyles (where the skull attaches to the neck) enable a giraffe to extend its head to a completely vertical angle, increasing its reach while browsing. Because males are so much taller than females, they will browse in a higher region of a tree, thereby reducing competition for food.
Digestion
Very little chewing when leaves first eaten. As seen in other ruminants, leaves are quickly swallowed, partially digested, and then regurgitated so that they may be chewed more thoroughly at a later time (= "chewing cud"). Can chew cud at any time of the day.
Four chambered stomach highly efficient, with numerous, long papillae on the surface, which greatly increases the surface area for nutrient absorption, (largest surface area of any ruminant).
Water
During the wet season, obtain most or all water from the leaves (and dew) that are consumed.
During the dry season, drink at least every three days, up to 38 liters (10 gallons) at a time. Must kneel on forelegs or spread them wide to reach water while drinking. The same is true for Okapi, suggesting that this trait evolved before the giraffe's neck elongated.

Somali Giraffe Diet
Almost all of the Somali Giraffes feed on leaves, twigs, and bark from trees just like all other species. However, they have occasionally been documented consuming the remains of antelope and other animals that have been killed by predators in the wild. This is a very puzzling fact that investigators are still trying to understand. In the areas where this has taken place, there are ample vegetarian food sources around for them to consume.
The acacia makes up most of the diet for these giraffes. Other animals can’t consume them due to the thorns on them. Yet all giraffes have very thick lips and tongues so they can consume them without any problems at all. They will eat up to 75 pounds of food a day and spend many hours a day eating. During the very dry season they may consume nothing but pine needles for survival. They don’t need to drink very much water but often consume some of it every three to four days. In the wet season they can go weeks without water due to so much being in the food they consume.

Masai Giraffe Diet and Feeding Habits
Most of the hours in a day are spent on feeding for the Masai Giraffes. They are grazers and can spend from 16 to 20 hours every single day out there eating or looking for food. Thankfully, these animals only need to sleep short time in a span of 24 hours. They often do so in 10 minute increments. They have a diverse diet that is completely made up of vegetation forms. This includes twigs, seasonal fruits, flowers, and Acacia leaves. Many of the trees where they get leaves contain thorns but their bodies are designed to handle that. They have a thick tongue and lips that allow them to reach around the thorns.
It is interesting to watch them feed from the high up trees. The males will feed from the very top branches with the females at the lower branches. These giraffes live in an area where their food has more water in it than others. That means they can actually go for several days without water

Lowry park
Feeds mainly on Acacia and Combretum trees. Eats over 100 different plants including flowers, vines, and herbs depending on availability. Needs 75 lbs. of vegetation per day. Drinks every 2 or 3 days. Goes for weeks without water. Can drink 10 gallons at one time. Spends 16-20 hours a day feeding.
FOOD:
Their long necks help giraffes eat leaves from tall trees, typically acacia trees. If they need to, giraffes can go for several days without water. Instead of drinking, giraffes stay hydrated by the moisture from

Feeding Schedule for a Giraffes
Giraffes eat throughout the day, instead of in scheduled meals. Giraffes are most easily recognizable for their long necks, and that height gives them a distinct advantage when they’re looking for food. Because of the way they eat and the amount of food that animals this size require, giraffes’ feeding schedule dominates their day-to-day activities. In fact, a giraffe spends a majority of his waking life either eating or looking for food.

Time Commitment
A giraffe’s feeding schedule is relatively consistent -- that is, he's consistently eating. Giraffes eat as much as 75 pounds of food every day, most of which consists of leaves, so they spend a considerable amount of time chowing down. They're grazers, so they eat
throughout the day rather than in large meals. A giraffe may spend as much as three-fourths of his waking hours finding food and eating, which he intersperses throughout the day.

What They Eat
Giraffes use their long necks to reach the tasty leaves atop tall trees that other animals often can't access. A staple of the giraffe's diet is the acacia leaf, which grows on thorny trees that are too treacherous for animals that don't share the giraffe's distinct evolutionary advantages. And because the acacia leaf is rich in moisture, the giraffe rarely has to stop for a water break -- he gets most of his hydration from the plant, saving himself the trouble of awkwardly bending down to drink from a pool.

Grabbing Their Food
Because the acacia tree is so thorny, a giraffe relies on more than his long neck to safely snag a bite to eat. His tongue can grow up to 2 feet long, and he uses it to reach into the tree and grab a mouthful of leaves. Any stray thorns that get picked up along with the leaves are safely coated in a thick gob of saliva, which allows the giraffe to swallow them without hurting himself. The giraffe is known for his black tongue -- according to zoologists at the San Diego Zoo, this coloration may protect it from being sunburned while the giraffe spends his whole day sticking it out to grab food.

Chewing the Cud
Even when the giraffe isn't actively looking for or grabbing leaves, he's often eating in one way or another. Part of his eating process is swallowing leaves, at which point they form a gooey ball in his stomach that travels back up his throat and into his mouth. He may spend hours chewing on a single lump of this semi-solid paste, called cud, before swallowing again to finish digesting.

Eating in Captivity
In captivity, a giraffe's feeding schedule typically mimics what it would be in the wild -- that is, he makes his own. To accommodate his instincts to eat continually throughout the day, zoos provide food sources around the clock. These food sources are generally designed to replicate food sources from the wild, like the acacia tree. Acacia leaves may be attached to tall, tree-like structures from which the giraffe can eat them. Depending on the zoo and the giraffe in question, he may enjoy special treats on occasion, like carrots and specially formulated biscuits.

Zoo Diet
A giraffe's tongue can be extended up to 45 centimetres and is a dark, almost black colour. This colour is a natural sun protection. Giraffes use this tongue to reach high into trees to obtain leaves and also use their long, muscular upper lip to rip leaves from branches. The effectiveness of this lip means that the giraffes have no upper front teeth.

In the wild giraffe's diet comprises of leaves, shoots, flowers, seedpods, fruits, vines and some herbs. An average of 16-20 hours per day are spent feeding, with up to 60kg of fresh browse consumed. The long, prehensile, muscular tongue, thick, gluey saliva, and special upper palate shape enable the giraffe to process thorny foods.

Adelaide Zoo
At Adelaide Zoo, our giraffes feed on the many branches and baskets of hay that are hung
from the trees and buildings. Their food is winched up high to encourage natural feeding behaviour. The branches are usually from rubber trees, but may include ficus, ash and poplar. The giraffes are also provided with challenging feeders full of lucerne, which requires them to use their tongue to get the food out.

They love carrots and are also given molasses on pellets as a treat, and also fed high protein pellets to ensure their diet is complete. Both giraffes have a good relationship with the keepers and can be hand fed.

Two automatic water feeders are mounted on the walls of the Giraffe house at around 1.3 metres. In the wild giraffe will drink water if it is available but can go weeks without it, relying instead on the morning dew and the water content of their food.

National Geographic
Diet
Giraffes are herbivores, which means they eat only plants. Their long necks allow them to reach leaves, buds and branches high up in mimosa and acacia trees. They can eat hundreds of pounds of leaves per week, according to National Geographic. Though these animals eat a lot, giraffes can go without drinking for weeks at a time. They get most of their moisture from the vegetation they eat.

Oakland Zoo
DIET:
Highly selective browsers feeding primarily on a variety of Acacia and Combretum species. Over a hundred species may be eaten, depending on what is seasonally available. Although mostly leaves and shoots are taken, giraffe also eat flowers, vines and herbs. Giraffe have also been seen to eat weaver-bird nests with young inside, and may chew on bones, perhaps to gain additional minerals. An average of 16-20 hours per day are spent feeding and up to 140 lbs of fresh browse are taken. Thorns do not seem to be a deterrent to feeding; the long, prehensile, muscular tongue (which can be extended up to 18 inches), thick, gluey saliva, and special upper palate shape enable the giraffe to process thorny foods. They are ruminants with a 4-chambered stomach.

ZooAtlanta
Giraffe Feeding
Feed the giraffes from the Twiga Terrace! Stand eye-to-eye with Earth’s tallest living land mammals, and hand-feed them part of their regular diet.
$3 per guest; availability may be subject to change due to weather, animal needs or daily capacity.
Giraffe feeding is available daily from 11 a.m. – 1 p.m. and 2 – 3:30 p.m. Times and availability may be subject to change due to weather, animal needs or daily capacity. What will I be feeding the giraffes?
Guests will be feeding the giraffes romaine lettuce, a regular part of their diet.
$3 for two pieces of romaine lettuce, which must be purchased from the Giraffe Guide stationed at Twiga Terrace.
Sacramento Zoo
Giraffe Encounter
Get up-close-and-personal at the Tall Wonders giraffe viewing deck!
$3 per person. You will receive two pieces of giraffe food (a small tree branch called “browse”) and be admitted into the supervised encounter area on the Tall Wonders giraffe viewing deck.
What is the giraffe food?
We feed our giraffes branches from acacia, elm and other trees that grow right here at the Sacramento Zoo (branches on which animals feed are referred to as browse). Many zoos use biscuits for encounters, but our giraffes prefer browse.

Rothchild’s Giraffe
Diet: Giraffes are browsing ungulates, feeding almost exclusively on the new shoots of shrubs and trees. Acacia trees are by far their favourite food source, the leaves being stripped from their thorny branches with the assistance of the giraffe’s long prehensile tongue and lips.

Giraffe - The Facts
How much do giraffe eat in a day? What does their diet consist of?
Giraffe are browsers and select mainly leaves and buds on trees and shrubs. Herbs, climbers and vines are also eaten, likewise flowers and fruit are preferred when in season. The proportion of grass in the diet is very low. Acacia leaves and shoots form the bulk of the giraffe’s diet in most areas.
Giraffe use their extremely dexterous and long tongue, as well as the ridged roof of their mouth to help feed on a variety of leaves and shoots – all dependant on the plants defences.
Evidence shows that giraffe adapt their diet to the species available in the specific region they find themselves, as well as adapting intake depending on the seasons and the plant’s growth stage; for example in some parts of South and East Africa, giraffe often feed on deciduous trees, shrubs and vines during the wet season, and on evergreen species, near streams and rivers, during the dry season.
Males are capable of feeding on vegetation at higher levels than females do, although both can stretch their head and neck near vertical to access preferred forage. Scientists have found that the diet of adult females is nutritionally richer than that of males who consume significantly higher proportions of fibre and lignin. Giraffe appear sensitive to their own nutritional needs, for example, in Niger nursing females seem to avoid high levels of tannins in leaves even though it means giving up higher quality forage.

Regardless of their size, giraffe are not as destructive as elephants when feeding, indeed one scientist, Robyn Pellew who studied giraffe in the Serengeti, demonstrated that when giraffe are not too numerous, their impact can actually stimulate shoot production in Acacia species, which soon declined when the browsing stimulus was withdrawn. There are, however, also some natural plant protection methods at work which ensure over-browsing does not happen, for example carnivorous ants that are symbiotic with some Acacia species reduce the amount of time that giraffe can spend browsing on any one plant. On a positive mutual note, giraffe can actively benefit some of their food sources:
Acacia seed consumption by giraffe favours seed dispersal into non-shaded habitats and enhances the potential for seed germination through the beneficial effects of its digestive processes. Giraffe are also thought to play a role in pollination. Feeding takes up most of the giraffe’s day - up to 75% at certain times of the year. Time spent browsing often increases markedly during the dry season compared with the rainy season as good quality browsing is harder to find and the giraffe often have to travel further to satisfy their nutritional needs. Giraffe are also active at night, but feed significantly more during moonlit nights and ruminate more during dark nights.

To eat, a giraffe takes a branch in its mouth and tears off the leaves by pulling its head away. Like a cow, giraffes lack upper front teeth and instead have a “dental pad,” a lump of tough tissue against which the lower incisors pinch their food as they eat.

In zoos, giraffes are fed mostly on herbivore pellets, which provide them with a well balanced diet. They are also given acacia branches as a more natural type of food.

How much do giraffes eat?
Typically a giraffe will eat about 30 kg (~66 lbs) of food a day (a large one may eat up to 34 kg), but can survive on as little as 15 kg. Nowak (1999, vol. 2, p. 1086) says that in giraffes the “Shoulder height is 2,500-3,700mm [8-12 feet] and weight is 550-1,930 kg [1213-4255 lb], the average adult weigh being 800 kg [1764 lbs] (Dagg 1971).” Based on these figures, a giraffe eats about four percent of its body weight daily.

Giraffes sleep far less than most mammals and spend nearly all of their time eating (16-20 hours a day). They are ruminants and spend most of their time chewing their cud whenever they are not eating.

How much do giraffes drink?
The water requirements of a giraffe, which are extremely sparing, are similar to those of a camel. They can go for weeks or even months without any water at all. On average, though, a giraffe drinks about 7.5 liters (~2 gallons) of water a week.

What do giraffes eat in the wild? Acacia nilotica, a favorite giraffe food. Note the large thorns.

In the wild, giraffes primarily eat the leaves and twigs of acacia, mimosa, and wild apricot trees (also various trees and shrubs in the genera Commiphora and Terminalia). Still, their diet does extend well beyond the more commonly eaten plants just mentioned. They even eat some fruit. And they also show individual food preferences. Mostly giraffes eat plants they can easily reach. They do, however, eat some grass. But to eat short grass close to the ground, these huge animals have to either bend at the knee or splay their front legs wide apart and to the front, as in the picture at right. Because they are browsers, giraffes eat mainly leaves and buds of shrubs and small trees that are easily in reach, although they will also eat herbs and vines, as well as fruits and flowers. They typically live on the savanna, but eat very little grass, perhaps because it doesn’t suit their taste, but more likely because it’s hard for them to eat anything that grows so low to the ground. Moreover, giraffes are especially vulnerable to lion predation when ground-feeding or drinking.
A giraffe's tough mouth and its great height allow it to reach and eat foods most other animals can't. Giraffes have a long prehensile tongue, and both the tongue and lips are virtually unaffected by thorny branches that most herbivores would not be able to utilize as food. They strip leaves from limbs, even very prickly ones, like those of the acacia (see picture above), by enclosing a portion of the branch within the mouth and pulling the head back. The impervious lips and tongue rip the leaves away.

http://www.zutrition.com/giraffe-nutritional-disorders/

Giraffes have been described as “browsers,” “folivores”, and “concentrate selectors.” Unlike grazing (grass-eating) herbivores, which consume relatively uniform feeds, wild giraffe choose their diet from an assortment of foods that are very different in nutritive content.

Giraffes are ruminants. The primary difference between a ruminant and non-ruminant (called monogastrics) is that ruminants have a four-compartment stomach. The four parts of the stomach are rumen, reticulum, omasum, and abomasum. In the first two chambers, the rumen and the reticulum, the food is mixed with saliva and separates into layers of solid and liquid material. Solids clump together to form the cud or bolus. The cud is then regurgitated and chewed to completely mix it with saliva and to break down the particle size. Fiber, especially cellulose and hemi-cellulose, is primarily broken down into the three volatile fatty acids (VFAs), acetic acid, propanoic acid and beta-hydroxybutyric acid, in these chambers by microbes (mostly bacteria as well as some protozoa, fungi and yeast). Protein and non-structural carbohydrate (pectin, sugars, starches) are also fermented.

NUTRITIONAL DISEASE

Captive giraffe have a specific set of maladies that may be related to basic nutritional inadequacies.

Peracute mortality syndrome (pms) (Fowler, 1978; Fowler and Boever 1986; Junge and Bradley, 1993) chronic wasting (Flach, 1997; Ball et al., 2002) energy malnutrition (Ball et al., 2002)

Pica (a pattern of eating non-food materials, such as dirt or paper)

Mortality related to cold stress (Clauss et al., 1999),

Pancreatic disease (Lechowski et al., 1991)

Urolithiasis (Wolfe et al., 2000; Wolfe, 2003)

Neonatal health concerns (Miller et al., 1999)

Intestinal parasitism

Hoof disease

Pelleted feeds with high starch and protein content and low physically effective fiber coupled with low overall feed intake by captive giraffe may contribute substantially to these problems

Peracute mortality syndrome (pms) has been seen worldwide in captive giraffe and has been defined as the sudden death of giraffe with a history of a stressor. Typical post-mortem findings include serous atrophy of fat and some degree of pancreatic degeneration.
Nutritional imbalances and pathology in the rumen can decrease the production and absorption of short-chain fatty acids, resulting in energy deficient states. Energy deficiency may become particularly crucial during periods of increased energy demands such as pregnancy and lactation. Dystocia (abnormal of difficult birth) is uncommon and may be due to fetal maternal disparity; however, cases can be seen in dams of poor nutritional status that become exhausted and even show hypoglycemia during parturition (Murray, personal communication). Maternal neglect and failure to produce adequate milk and/or colostrum are other common problems in giraffe and can be readily explained by a negative energy balance in a dam and/or an associated mastitis or irritation to the mammary gland by a calf attempting to nurse.

A diet high in pelleted feeds and inadequate fiber led to abnormal papillae development, decreased absorptive surface area, and decreased mucosal short-chain fatty acid transport capability in growing cattle. In giraffe, the same dietary factors are likely to lead to a poorly developed rumen that differs significantly from one exposed to browse and high starch, low fiber feeds.

Necropsy evaluations of giraffe revealed that wild-caught animals had better developed papillae and less pathology than captive-born animals.

Consumption of feeds high in starch and low in fiber can be a cause of ruminal acidosis in domestic ruminants, affecting intake, feed digestibility, milk production, hoof health, and overall animal health. Identifying a common denominator for these problems is one of the cornerstones of medical diagnostic investigations. A central hypothesis is that dietary induced rumenitis and resulting changes in physiology are fundamental to the disease syndromes seen in captive giraffe.

As noted below in the comments, Dr. Laurie Gage points out the following: While perhaps not a classic nutritional disorder in giraffes, it may be worth mentioning that feeding giraffes grass hay that has a high silica content could result in unnatural tooth wear, leading to problems over time.

Disorders in rumen digestion (particularly rapid production of short-chain fatty acids, lactic acid, ammonia, and gases) can result in:
- Ulceration of the forestomach
- Hypertonic rumen digesta
- Systemic acidosis and dehydration
- Bloat (high intraruminal pressure that can cause cardiovascular collapse and death)
- Neurological damage
- Impaired immune function
- Metabolic abnormalities (i.e. reduced ion transport, impaired gluconeogenesis, blunted synthesis of nitric oxide and hepatic ureagenesis)

Giraffe Nutrition Research at University of Central Florida and Disney’s Animal Kingdom
- See more at: http://www.zutrition.com/giraffe-nutritional-disorders/#sthash.l7MKWzTi.dpuf