

What's on the Menu?

NUTRITION PROGRAM FUELS ANIMAL HEALTH

Day	Breakfast	Lunch	Dinner	Snacks
MON	Apples	Apples	Apples	Apples
TUES	Apples	Apples	Apples	Apples
WED	Apples	Apples	Apples	Apples
THU	Apples	Apples	Apples	Apples
FRI	Apples	Apples	Apples	Apples
SAT	Apples	Apples	Apples	Apples
SUN	Apples	Apples	Apples	Apples

Remember that card has which fruits for Rocky need to be pitted

at SM ART

Day	Breakfast	Lunch	Dinner	Snacks
MON	Apples	Apples	Apples	Apples
TUES	Apples	Apples	Apples	Apples
WED	Apples	Apples	Apples	Apples
THU	Apples	Apples	Apples	Apples
FRI	Apples	Apples	Apples	Apples
SAT	Apples	Apples	Apples	Apples
SUN	Apples	Apples	Apples	Apples

MOLE-RATS

Day	S&P	Starchy	Fruit	Veg
D	2			
N	246	70	25	105
B	42	112	42	42
E	39	126	36	54

Day	Food	Notes
Sunday	Wh. Pot. Apple	Mix
Monday	Pear	Ca
Tuesday	Turnip	Mix
Wednesday	Wh. Pot. Pear	Ca
Thursday	Apple	Ca
Friday	Pear	Mix
Saturday	Turnip Apple	Mix

Day	Food	Weight
MON	500g	23g
TUE	Mix	23g
WED	Probiotic	117g
THUR	Banana	177g
FRI	500g	117g
SAT	Banana	212g
SUN	Mix	140g

* Lemurs can not have citrus

→ **Supp. Millipede Diet (make only once)**

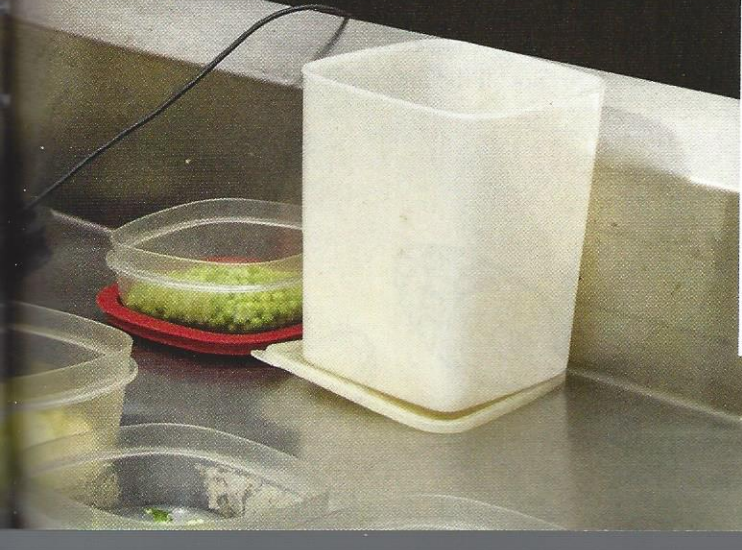
6/ Sweet Pot
12/ Cucumbers
6/ Marion LE
6/ SpAmix

Nutrition is the cornerstone of good health. For our whole lives, starting with the moment we're conceived, ingesting the appropriate items to keep our physical selves working properly is one of our primary instinctual directives. Everyone knows that proper nutrition plays a key role in disease prevention, but it's also the driving mechanism for reproduction, growth, and metabolism.

All living things have several characteristics in common, and one of those is to find food. But the methods that animals in the wild use are clearly different than ours. They don't have the luxury of a quick drive to the grocery store, so they have to seek out sustenance in a vigorous way. For them, the daily search for food—whether that food grows from a branch or flees quickly on four feet—is an act that rolls exercise and nutrition into one healthy behavior.

In a zoo or aquarium, the animals can look for food only in a limited sense. It's the job of any institution's nutrition department to formulate diets that are not only as nutritious as possible but that also motivate animals to feed in a manner that's natural to their species. At Brookfield Zoo, we employ dedicated staff who design and construct devices that encourage the animals to forage for food according to their natural behaviors. These staff coordinate with our Nutrition Department to make sure that food items that are appropriate for each species work in the devices they create. This is one way that the Nutrition Department ties in holistically with our experts on enrichment for the animals, providing suitable physical and mental stimulation in the animals' daily lives.

Wendy Cimino, a specialist in the Nutrition Department, prepares diets for the naked mole-rats.



Nutrition departments are becoming ever more skilled at implementing methods for keeping the animals healthy and stimulated through food resources. But here at Brookfield Zoo, our nutrition staff are undertaking research that has experts at other zoos and aquariums looking at this area of animal management in a new way.

African painted dogs feed on an elk leg hung from a zip line, which encourages pack cooperation and enforces social structure.

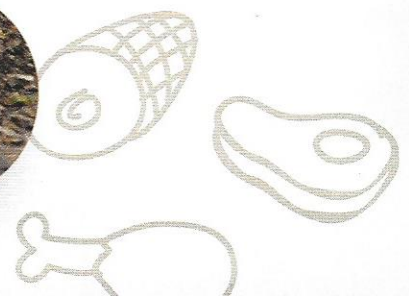
VARIED VITTLES

Because life in the wild is not one-stop shopping, animals are adept at eating a variety of foods that help them maintain a healthy balance of nutrients—whatever is available and appropriate to their species in that moment of hunting or browsing. Offering that variety to animals in professionally managed situations is one topic that we're studying extensively.

In many cases, the strategy to variety in food types is seasonality. In the wild, animals eat what's available during any particular season. (Even in rain forests, which are not seasonal, different fruits are available depending on the time of year.) For herbivores, seasonality aids in reproduction, as the micronutrients that plants take up from the soil vary throughout the year, and certain micronutrients are better for the development of young animals.

Our challenge is in providing the correct micronutrients at the corresponding time of year. It's a slow process, but we are talking to the companies that provide formulated, preprocessed feeds for zoo animals to nudge them toward different diets throughout the year. Other zoos are interested in the results of these efforts. At the same time, we are looking at reducing our use of these formulated, preprocessed feeds by reaching out to new suppliers of more exotic fruits and vegetables that are closer in nutritional value to what animals eat in the wild. Domestic produce is nothing like wild produce in terms of most nutrients, and the goal of our research is to glean what this means in different sources of food.

Prey items for carnivores offer the same type of variability that plants do for herbivores. Diverse parts of a prey item offer different nutritional value. But as it does with herbivores, the time factor comes into play. It's not always enough to just throw a whole prey item to a group of carnivores. Based on our research, we know that carnivores such as wolves and African painted dogs go through a gorge/fast cycle, when they feast on prey for a few days, then don't eat at all. While we do give our carnivores fresh meat, it's not all the time for that very reason.





Left: Specialist Joel Woodruff vacuum seals fresh browse in bags to be frozen over winter.

Far left: Fresh browse is important for browsers such as black rhinos. This behavior keeps their teeth clean.

BRANCHING INTO NEW TERRITORY

One of our most successful initiatives has been what we call our browse program. “Browse” is the word for twigs, leaves, and branches from trees and bushes, and it is one of the most important diet items for a great many animals, which at Brookfield Zoo include giraffes, okapi, rhinos, gerenuks, hyraxes, camels, addax, primates, reindeer, and grizzly bears. Browse is a healthy source of natural fiber.

A number of years ago, the animals were receiving browse once a week. In

2011, however, we began a relationship with ComEd through which the utility company delivers to us browse cut from around transmission towers throughout Chicagoland. (Browse from transmission corridors is generally free from pesticides and traffic exhaust, and the Society’s director of nutrition, Dr. Jennifer Watts, approves all tree species for animal consumption.) During the summer, a ComEd team dedicated to this specific purpose cuts browse on Mondays and Thursdays and transports it, fresh, to the zoo the following morning.

Because ComEd doesn’t need to clear transmission corridors in the colder months, we began buying browse in winter about three years ago. But there’s a cost associated with that, and the abundance of browse we receive during summer seemed to go to waste. We decided to test and develop a strategy unique in the zoo industry: vacuum seal the summertime browse and freeze it over the winter, thawing a bit at a time for the animals. The drawback is that this program *is*

unique in the industry. There’s no manual on how to seal, freeze, and thaw browse without it spoiling—in fact, we are one of the first zoos in a temperate climate to initiate a program like this—so now we’re undertaking this new area of research.

Previously, we had tried freezing browse in plastic garbage bags, but they take up too much space and only willow maintained leaf integrity. We reached out to a company willing to custom make vacuum seal bags to fit the size we need and, beginning last fall, used the bags to package browse from maple, mulberry, willow, and honey locust trees for the winter. As always, our intention is to provide as many varieties of plant species for the animals as possible. We spent this past summer analyzing the browse for its nutritional content to gauge the success of this program. Preliminarily, the animals seemed to love their winter treats.

One long-term area of research for our browse program is determining how significantly the winter browse improves the animals’ health. It takes many years to study data like these, but we have seen short-term improvements, such as

dental health. (A few years ago, a visiting animal dentist declared that our rhinos' teeth were in better health than those of rhinos in other zoos, thanks to the fact that the rhinos could chew on branches.)

EXTRA HELPINGS OF SCIENCE

Like all of our endeavors, the browse program is based on research and science. And there's a lot of research to do. Out of the more than 230 institutions accredited by the Association of Zoos and Aquariums in North America, only 17 of them—including Brookfield Zoo—have professional nutritionists on staff. (A nutritionist needs a graduate degree in animal science or biology to run a zoo program.) Promising areas of research add much work on top of the regular duties of finding suitable diets for the animals. That's why we're just starting to train the next generation of nutritionists, accepting interns from university programs, with a graduate program on the horizon. We also plan to soon reactivate our nutrition lab to examine elements of animal diets that are not currently studied but are still vital to the animals' health.

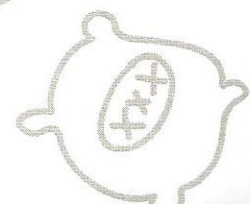
The lab comes from a tradition of excellence in this area. Brookfield Zoo was one of the first North American zoos with a dedicated program headed by a nutritionist with an advanced degree. In 1987, the Society's


Dr. Sue Crissey organized the Nutrition Department here. She also created the Zoo Nutrition Network, assisting other zoos with diet assessments. Her residency program accepted many graduate students, and




Top: Senior marine mammal care specialist Beth Miller gives Tapeko Dolphin a whole mullet.

Below: For a tamandua, a cricket is a regular and nutritious part of its diet.





from 1990 to 2000, research into this topic at Brookfield Zoo generated more than 50 journal articles and provided essential information about nutrient composition and metabolism in exotic animals.



Director of nutrition Dr. Jennifer Watts has run the Nutrition Department since 2007, and the projects she is undertaking offer a fascinating glimpse into the work that goes on behind the scenes to ensure that the animals have the highest quality of life possible. For one study, she and her team are examining the composition of the yolk in bird eggs to ensure that chicks are receiving the appropriate nutrients to survive. In other research, they are looking into whether tannins in fish are necessary to regulate iron in dolphins under professional care in zoos and aquariums.

It is under Watts' watch that the nutrition program will continue studies like these but will also launch into a new phase of discovery about this most important aspect of animal care. ■

Thanks to **ComEd**
for its generous support of the browse program.

SOMETHING TO CHEW ON

Think your grocery bill is big?

Below is a list of just some of the foods we give to the animals at Brookfield Zoo each year.



Produce

100,000 pounds



Meat



30,000 pounds

Eggs



more than 5,000

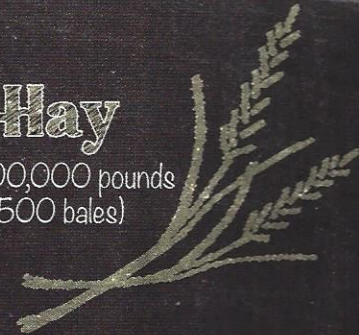
Fish



almost 150,000 pounds

Hay

over 200,000 pounds
(3,500 bales)



Insects

8,000 earthworms and
2,000,000 crickets

Pasta

400 pounds of dry pasta