



Researchers have discovered that *Ficus* plants are a key part of a Sumatran rhino's diet.

Ficus Frenzy:

Helping Save the Sumatran Rhino One Fig Leaf at a Time

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Ipuh spent some time at the San Diego Zoo in 1991 before leaving for the Cincinnati Zoo, impressing visitors with his woolly good looks.

As a Zoological Society of San Diego member, you're aware of many aspects of our worldwide conservation efforts. You know about CRES, our department of Conservation and Research for Endangered Species. You may even be aware that we harvest food both on and off Zoo grounds to feed the animals. However, most visitors and members I have spoken with are surprised to find out that the San Diego Zoo also collaborates with other zoos to provide browse for the animals in their care. So, what exactly is "browse"?

Just Browsing

The word "browse" is both a noun and a verb. As a noun, browse is the leaves and other plant parts that animals eat. As a verb, browse means "to feed on leaves and twigs." Browsing is a little different from grazing, which is stooping and eating grasses the way domestic cows do. At the Zoo, we use the term "browsing" in yet a third way: to describe what we browse workers do. We say we are "just browsing" when we go out and collect food for the animals. The San Diego Zoo currently employs eight full-time browse workers and one part-time browse packer. This is the Browse Division, recently formed out of the Horticulture Department.

We are fortunate to be in San Diego, where it is possible to grow thousands of species of plants. We can, and do, plan for "edible landscaping" whenever we plant new areas around the Zoo. The result is beautiful grounds that also provide food for our animals.

The Sumatran Rhinoceros: Critically Endangered

Dicerorhinus sumatrensis, or the two-horned Asiatic rhinoceros, is the recipient of more San Diego-based browse than any other animal. These small and woolly rhinos are considered critically endangered. The Sumatran rhino is elusive and difficult to count, but scientists estimate that their entire worldwide population numbers about 300. Just 15 years ago, that number was 600. Habitat destruction is part of the problem, but the worst contributor to the Sumatran rhino's demise is the erroneous belief in some parts of Asia that

the horn holds aphrodisiac and healing qualities. Keeping poachers at bay is a daunting task. Conservationists and the Indonesian government decided in the mid-1980s that they should bring some of these creatures into zoos in order to save the species.

Ipuh and the Magic Ingredient

The Indonesian government rescued Ipuh, a male Sumatran rhino, from logging operations in 1990. He came to the United States in 1991 and spent a few months at



Emi poses with her calf, Andalas, born in September 2001 at the Cincinnati Zoo, the first Sumatran rhino born in a zoo in 112 years.

Photo courtesy of Cincinnati Zoo



Photo courtesy of Cincinnati Zoo

Suci isn't really eating *Ficus* leaves yet, but she mouths some of Emi's breakfast. Soon she will be munching about 100 pounds of *Ficus* a day like her brother, Andalus, who now lives at the Los Angeles Zoo.

picture. In September of 1994, the Cincinnati Zoo staff asked the San Diego Zoo to send them *Ficus* cuttings. It must have been the magic Ipuh needed, because almost as soon as the keeper put the leaves in front of him, he perked up, started to eat, and did not stop eating for two days—he regained more than 200 pounds in a week!

Emi Brings Hope

Emi is a female Sumatran rhino currently residing at the Cincinnati Zoo along

the San Diego Zoo, until the Cincinnati Zoo completed his permanent home. But after spending a few years in Cincinnati, Ipuh began to lose a lot of weight and then completely stopped eating.

Ipuh was not the only Sumatran rhino that was having trouble. These gentle and docile creatures were proving to be extremely difficult to keep in a zoo environment, and between poaching and habitat destruction, it became critical to learn how to care for them. When conservationists first brought Sumatran rhinos into managed care, they slowly weaned them off their natural diet and transitioned them to hay and alfalfa. This seemed to work fine for a while, but eventually the rhinos began to develop gut problems. Since then, researchers have found that *Ficus* (various fig species) is a key component in the rhinos' diet.

Most of the *Ficus* in Cincinnati grew in the safe realm of pots in heated homes. Because *Ficus* trees are tropical, it was not feasible to grow enough for the rhinos locally. That's when the San Diego Zoo's Horticulture Department reentered the

with Ipuh. She came from Los Angeles to Cincinnati in 1995, after being captured in the wild in 1991 as an orphaned calf. Conservationists believe poachers most likely killed her mother for her horns. Following ancient East Asian tradition, the rhino keepers arranged the "marriage" of Ipuh and Emi.

With such a small population in the wild, Sumatran rhino reproduction in managed care has become a crucial step in their survival. During Emi's first five pregnancies, she miscarried each time. For her sixth pregnancy, Dr. Terri Roth and others at the Center for Research of Endangered Wildlife (CREW) in Cincinnati decided to try giving progesterone to Emi.

The sixth pregnancy lasted 475 days and was successful, although there was a lot of anxiety among the staff until Emi's baby, Andalus, took his first steps and began to nurse. Andalus was the first successful captive birth in 112 years! His birth in September 2001 is celebrated as a huge step forward in the preservation of his species.

Weaned after two years, Andalus now resides at the Los Angeles Zoo and Botanical Garden. According to curator Jeff Holland, Andalus is doing great, happily munching on 100 pounds of *Ficus* leaves a day, along with three flakes of hay, fruits and vegetables, and grain and beet pulp (which helps with digestion). Andalus is gaining 10 pounds each day and weighs in at around 1,400 pounds. Like other Sumatran rhinos, Andalus likes to roll around in the mud, and he loves a good belly scratch.

In 2002, Cincinnati got good news again: Emi was pregnant, this time with no administered progesterone. Sixteen



Gardener Bob Jones works with some *Ficus* trees at the San Diego Zoo's off-grounds browse farm. The Zoo sends about 2,000 pounds of *Ficus* browse to the Cincinnati Zoo each week. The browse farm also grows eucalyptus for koalas and other Australian animals that is shipped to other zoos, as well as a variety of other plants also used as animal food.

In July 2004 at the Cincinnati Zoo, Emi gave birth to her second calf, named Suci, which means "sacred" in Indonesian.



Photo courtesy of Cincinnati Zoo

months later, on July 30, 2004, Suci (pronounced Sue-Chee) was born, weighing in at 75 pounds. Suci is an Indonesian word meaning "sacred."

Would You Like That Supersized?

Before Suci was born, the San Diego Zoo's Browse Division was shipping about 28 boxes of fig leaves per week to Cincinnati. These boxes each hold between 40 and 50 pounds of leafy material. After Suci's birth, the keepers asked us to up the order to 35 boxes per week, and a few weeks later, the count went up to 42 boxes per week. Although Suci is not eating the leaves yet, her mother needs the extra nutrients for nursing. That adds up to roughly 3½ tons of *Ficus* a month shipped to Cincinnati alone. The San Diego Zoo also ships three boxes per week for Rapunzel, an aging female Sumatran rhino living at the Bronx Zoo in New York.

A Garden-Fresh Ficus Salad

We have to deliver the browse quickly to keep it fresh, so we divide the load in half and ship twice a week. Every Wednesday and Friday at 5 A.M., the boxes of *Ficus* are delivered to the San Diego airport. We unload at 5:30 A.M., and the browse ships within hours to Cincinnati, where the rhino keepers load it up and bring it to the hungry herbivores.

Some Southeast Asian *Ficus* species growing around the San Diego Zoo are Benjamin fig *Ficus benjamina*, rusty-leaf fig *Ficus rubiginosa*, Indian laurel fig *Ficus microcarpa*, and the Bodhi tree *Ficus religiosa*. Like humans, the rhinos prefer variety in their diet, so we try to mix up the greens. We have found that

the larger leaf species like rusty-leaf fig stay fresh longer. When we cut Benjamin fig or Indian laurel fig, we make sure to box and ship the leaves within a day or two, depending on the air temperature. We keep the leaves out of the direct sun after we cut them to ensure the freshest salad on the other end. It is also important to make sure the browse has not been sprayed with any pesticides. Fortunately, we do not have to worry about that at the San Diego Zoo, since we never apply pesticides to the trees.



Waste Not, Want Not

Little is wasted when we trim the *Ficus* trees around the Zoo. After we prune the trees, we cut the pieces down into sizes that we can fit into boxes. The pieces we send are leafy stems no bigger than ¾ of an inch to 1 inch in diameter. After we box the browse, we deliver the large leftovers to our own Elephant Mesa, where our African and Asian elephants tear into it. They can actually break apart and eat pieces of *Ficus* up to 8 to 10 inches in diameter! It's quite a sight to see if you ever happen to come by when Tembo, Devi, and Sumithi are deftly destroying and eating *Ficus* logs.

Next time you visit the San Diego Zoo, look *up* as you look *around*. You might just gain a new appreciation of the trees around you, knowing that they are not only there to beautify and cool the Zoo. They are also playing their part in the conservation of some marvelous rare rhinos. 🍽️

Ficus for two: Having a leafy snack breaks the ice in the introduction of Ipuh to a potential mate.