

Enrichment: Up To Scratch?

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What is our goal?

Data on foraging in wild callitrichid monkeys is available in 4 studies of the Emperor tamarin, *Saguinus imperator*, Geoffroy's tamarin, *S. oedipus geoffroyi*, Saddle-back tamarin, *S. fuscicollis* (see figure) showing foraging at about 10% for fruit plus 5% for vegetables plus 20% for insect protein, a total of **35% of the day**. This value might be a goal for foraging enrichment for these diminutive monkeys.

Where did we try it?

Monkeys were chosen from those living in 5 large family groups (9-15 members) of cotton-top tamarins (*Saguinus oedipus oedipus*) and common marmosets (*Callithrix jacchus jacchus*), and were tested in their 33 m³ home enclosures. Normally these monkeys spend only about **4%** of their day feeding on their chopped fruit, fresh vegetable, liquid protein, and acacia-gum diet.

How did we try it?

- ◇ **String-pull:** We tied peanuts at 10cm intervals onto a long, weighted string and allowed the monkeys to pull up the string to get the nuts—increasing foraging time from 4% to **6%**.
- ◇ **Log holes:** In the wild 25% of feeding is on exudates such as gum, involving ventral clinging, mostly on branches over 32 cm, accounting for 33% of their non-insect diet. We drilled holes into a log and jammed peanuts and raisins into the holes—increasing foraging time **7%**.
- ◇ **Hanging fruit:** In the wild about 20% of all feeding is spent feeding on fragile branches under 0.8 cm in diameter, and 40% of this time is spent hanging from the branch. So we hung extra fruit (photo ↑) from thin branches—and we increased foraging to **6%**.



- ◇ **Search holes:** In the wild some callitrichids search in holes for insects. So we constructed a box with many holes (photo ←) which had food located so that it could be felt but not be seen—and we increased foraging to **7%**.
- ◇ **Covered search holes:** To make the task more difficult, we then put cut rubber flaps over the holes (photo ←)—thereby increasing foraging to **8%**.
- ◇ **Forage box:** In the wild they search through litter in trees for insects. So we filled a box with wood chips and buried food (photo →) in the chips—and increased foraging to **10%**. In singly housed callitrichid monkeys, foraging in this device occupies **40-70%** of the first hour and over **40%** for the next 4 hours, showing no habituation over weeks.



Did we come up to scratch?

We did for singly-housed marmosets and cotton-top tamarins; but not yet for group-housed marmosets and tamarins.

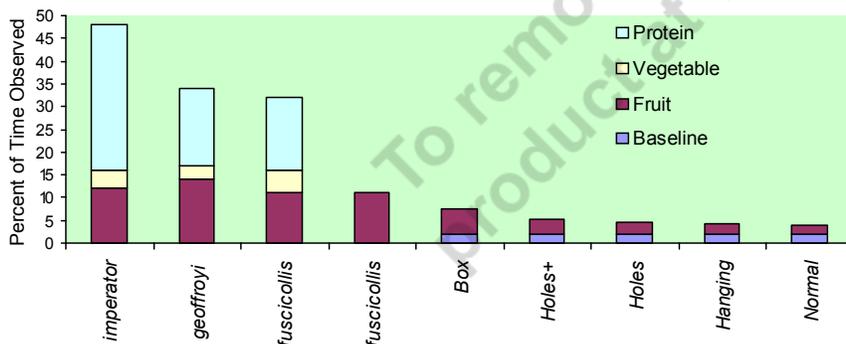


Figure. Daytime foraging in 4 callitrichid monkey studies (left) versus forage box, covered holes, holes, hanging fruit, and normal feeding.