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[How Could Dinosaurs Reach over 110 Tonnes by Eating Ferns and Gingko?](#)

Dinosaurs' salad, more nourishing than thought

The largest ever land animals were the enormous plant-eater dinosaurs called sauropods, of which Apatosaurus (former Brontosaurus) is the best known. These creatures could grow up to 42 m (130 ft) in length (but the neck and tail could be longer than their body) and at least 110 tons in weight. Researchers have been puzzled by one thing: these reptiles ate ferns, ginkgoes, conifers and related plants, as the flowering plants of today appeared during the Cretaceous, the late Age of Dinosaurs, when most sauropods were gone. But ferns and gymnosperms are regarded as nutritionally poor compared to flowering plants, like grass. But a new study published in the Proceedings of the Royal Society B journal has come with surprising findings, by investigating in artificial dino guts, made of airtight glass syringes containing sheep gut microbes, the nutritional value of the living relatives of the plants living during the Dinosaur Era. The team ground up ginkgoes, horsetails (a type of fern), common ferns and conifers and placed them in the artificial guts, then fermented them with the bacteria. The mix delivered a reasonable quantity of energy, almost as much as grasses and temperate foliage, explaining how sauropods and other plant-eater dinosaurs "could exist on the food sources available to them at that time," said co-author Jürgen Hummel, a zoologist at the University of Bonn in Germany. Considering that sauropods had the same metabolisms with elephants, the team found that a 77-ton dinosaur had to eat over four times the quantity of dry food required by an 11-ton elephant. That posed no problem for the sauropods, which did not chew the food, swallowing it whole, thus they could consume large amounts of food in short periods of time. The long necks allowed sauropods to feed like giraffes from the top of the trees. Still, sauropods were reptile, and their energy requirements were lower in reality than those of the elephants, thus these huge beasts lived on even less food. Araucaria, one type of conifer now restricted to southern continents (South America and Australia), but widely spread during the time of the dinosaurs, was digested slowly, but released large quantities of energy, and this fermentation could have happened in the huge stomachs of the sauropods. But the plants eaten by dinosaurs have few consumers today, and the team speculates that those plants may have become more toxic since the Age of Dinosaurs to face the competition with flowering plants (Angiosperms).