

## DIFFERING BIPEDAL AND TRIPODAL FEEDING MODES IN SAUROPODS

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Regularly increasing vertical reach by rearing requires a skeleton that has the adaptations and strength needed to stand on two legs. Small tailed elephants are not well adapted to stand bipedally, yet do so occasionally to feed. Trackways indicate that giant sloths could walk bipedally, massive dorsal vertebrae and stout tails with protective sled-chevrons suggest they often fed tripodally. All sauropods had large tails, their vertebral columns were stronger than those of elephants and approached or exceeded those of giant sloths, and sauropod hindlimbs were always stronger than the fore (including brachiosaurs). All sauropods should have been able rear up more easily than elephants, most appear to have been adapted to do so on a regular basis. Sauropod rearing came in four basic types. Caudal and pelvic adaptations were minimal in cetiosaurs. In shunosauers and diplodocids sled-chevrons protected the prop-like tail, while a normal pelvic orientation did not allow the hindlimbs to function when the body was erect, so an immobile tripod posture was favored. In camarasauers the absence of sled-chevrons suggest that the tail was kept clear of the ground, while a retroverted pelvis allowed slow bipedal walking when high feeding. Mamenchisaurs and omeisaurs with sled-chevrons and retroverted pelvis could probably feed both tripodally, and while walking slowly on the hindlegs.