The allocation of liquid food by workers to larvae, a central process in ant biology, could be regulated by the frequency of trophallaxis, its duration, or both. In 4th-instar fire ant larvae, the duration of trophallaxis, bolus size, and the rate at which boluses were swallowed were all constant, indicating that the volume of food ingested during each worker-larva trophallaxis was both small and constant. Neither larval size over a 20-fold volume range nor larval starvation had a significant effect on duration of trophallaxis (mean = 11s, SD = 2s), bolus swallowing rate (mean = 2/s, SD = 0.5/s), or bolus volume (mean = 0.0675 nl, SD = 0.0002 nl, based on the assumption that the stomodaeum's epithelial layer is not expandable). Larval body orientation and larval location within the brood pile also had no effect on duration. Durations of trophallaxis by workers of different sizes were similar. Durations of trophallaxis for 1st-, 2nd-, and 3rd-instar worker larvae were also constant but greater than that for 4th-instar worker larvae. Fourth-instar minim larvae (from founding colonies) and 4th-instar worker larvae (from mature colonies) were fed for the same duration by workers but for different durations by founding queens. Founding queens fed minim larvae longer than they fed worker larvae. The durations of feedings to 4th-instar sexual larvae were more variable than those to worker larvae. Altogether, these findings indicated that 4th-instar worker larvae ingested a small, nearly constant volume of food (mean = 1.50 nl, SD = 0.005 nl) during each trophallactic event. Consequently, the long-term allocation of liquid food by workers to these larvae is regulated by the frequency of trophallaxis. Several other ant species showed a similar brevity and constancy in the duration of worker-larva trophallaxis. This brevity of worker-larva trophallaxis is in contrast to the duration of worker-worker trophallaxis. Although the duration of worker-larva trophallaxis appears to be determined by the worker, the data are not totally consistent with this interpretation.