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Honeybee foragers adjust crop contents before leaving the hive

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Honeybee foragers leave the nest after loading a small amount of honey in the crop. The honey serves as fuel during a foraging trip. The present study demonstrated that both nectar and pollen foragers of *Apis mellifera* finely regulate crop contents upon departing the hive. When waggle dancers advertizing nectar sources and their followers were examined, their crop contents upon departing the hive increased with food-source distances expressed in waggle-run durations. It was also found that the crop contents were generally smaller in dancers than in followers. Another experiment showed that they significantly reduced crop contents at departure as repeatedly visited a feeding site. Bees with limited information for food sources such as followers and inexperienced bees may carry more fuel to increase likelihood to reach an unfamiliar food source. Pollen foragers had larger crop contents upon leaving the hive than nectar foragers. This can be explained by additional honey to be mixed with collected pollen (called 'glue' honey). When bees collected pollen from a single pollen-source species, their crop contents at departing the hive increased with food-source distances as in nectar foragers. However, this tendency disappeared when analyzing a group of waggle-dancers visiting various pollen-sources. Interestingly, their followers still showed a positive correlation between crop contents at departure and food-source distances expressed in waggle dances. These results suggest that experienced pollen foragers learn an actual need of honey for glue which may vary among pollen-source species and subsequently adjust amounts of honey carried from the hive but such information was not transmitted to nestmates through waggle dances.