

In vitro rearing of honey bees at Bees@wur

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The rearing of larvae in a laboratory (*in vitro*) is highly attractive because of controlled laboratory conditions and the reproducibility. Biologically relevant factors such as weight, development (e.g. hypopharyngeal gland) and the survival of the larvae, or longevity and behaviour (e.g. flight performance) of artificially reared adult workers can be easily monitored under laboratory conditions. Hence, a large advantage of *in vitro* rearing of larvae is that feedback mechanisms on the colony level can be excluded to study the pure effects of the factors of interest. Many *in vitro* tests are hampered by high mortality of the test subjects, lack of standardization and repeatability. In our lab, we are able to rear larvae up to day 6, but after that, they die and turn black. Out of the >2000 larvae we started to rear between April and October 2011, we only managed to rear one sad little bee, which died a few days after it was born. We used the protocol of Aupinel (2005), occasionally using the nicotplast egg laying method from Hendriksma (2011). During the season, we observed differences in laying behaviour between colonies. Some queens refused to lay eggs in the nicotplast, even when the nicotplast were waxcoated. Towards the end of the bee season, survivability of the larvae decreased, which could be a natural phenomenon. Within batches, we observed that that units (wells plates) that were filled with crafted larvae first and were subsequently fed first, showed higher larval survival than units crafted and fed last. We assume that larvae crafted last, were longer exposed to the cold and therefore less vital. Additionally, due to the cooling down of feed during feeding, larvae fed last suffer from cold food. Conclusion, craft fast and rewarm food between units.