



Original thinking... applied

Adult Honey bees – Chronic Oral Toxicity Test (10-Day Feeding): OECD Testing Guideline 245

This laboratory based first tier test addresses the potential risk to adult honeybees (*Apis mellifera* L.) from prolonged oral exposure to residues of plant protection products or chemicals either via contaminated food, stored and consumed by the bees in the hive, or by foraging on contaminated crops or wild flowers.

The study type comprises a dose response test to examine the chronic toxicity of the test item to adult honey bees exposed. Newly emerged honey bees (up to a maximum of 48 hours old) are collected in the laboratory from brood combs removed from our colonies of honey bees and are offered 50% (w/v) aqueous sucrose solution dosed with the test chemical by continuous *ad libitum* feeding over a period of 10 days.

Each test is run with a minimum of five dose rates per test item (usually based on the outcome of a range-finding test), with a minimum of 30 bees per treatment group. The dosed food uptake is measured daily to allow for calculation of actual dose uptake per bee per day.

For each test, equivalent control and toxic reference test units are set up to ensure that the test animals and test system are functioning and meet the test validity criteria set out in the test guideline. Chemical analysis is required for dose verification and demonstration of homogeneity and stability of the test item in dosing solutions under **OECD 19**. This analysis is undertaken using methods validated according to **SANCO/3029/99 rev.4**.

Mortality and behavioural abnormalities are observed and recorded daily during the 10-day test period. The chronic effects of the test chemical are evaluated by comparing the results of the test chemical treated group to those of the respective control group.

Endpoints for this test are;

- Estimation of the median Lethal Concentration (LC₅₀) with 95% Confidence Limits (and if possible LC₁₀ and LC₂₀ values are also estimated) and the median Lethal Dietary Dose or LDD₅₀ values after 10 days of exposure.
- Estimation of the No Observed Effect Concentration (NOEC) and No Observed Effect Dietary Dose (NOEDD).

Test guidelines and references

OECD Guideline 245 for the Testing of Chemicals: Honey bee (*Apis mellifera* L.), chronic oral toxicity test (10 day feeding test in the laboratory) (2017).

OECD 19: Advisory Document of the Working Group on Good Laboratory Practice on the Management, Characterisation and Use of Test Items.

SANCO/3029/99 rev.4 11/07/00: Residues: Guidance for generating and reporting methods of analysis in support of pre-registration data requirements for Annex II (part A; Section 4) and Annex III (part A; Section 5) of directive 91/414.

FERA'S WORK IN BEE ECOTOXICOLOGY

Fera has the expertise and scientific resources to help partners test active ingredients or formulated products for their effects on bee survival, development and behaviour, enabling the development products that are safe for bees.

Fera's specialists are perfectly placed to meet data requirements and our services in bee ecotoxicology range from standard laboratory studies to bespoke higher tier studies to address specific risk assessment needs.

Fera works closely with and is co-located with the National Bee Unit, and we own 150+ colonies of honey bees managed directly by our highly skilled on site bee keeping team. These colonies are used to support our risk assessment work and R&D.

MORE ABOUT FERA

Fera is based at the National Agri-Food Innovation Campus near York, UK.

We work closely with plant protection and veterinary medicine product manufacturers to help develop effective, sustainable and safe chemical products that minimise ecosystem impacts and pollution, while maximising the beneficial effects for crops, plants and animals.

Combining the extensive expertise of our scientists with advanced resources and GLP-compliant laboratories, we provide valuable support to companies in their chemical evaluation and registration efforts.

GET IN TOUCH

For more information and to book a test, call Fera on **+44 (0)300 100 0321**, email **sales@fera.co.uk** or visit **www.fera.co.uk/chemical-regulation**

