

Advice 18-2018 of the Scientific Committee of the FASFC regarding the risk to bee health of contaminated and adulterated beeswax

Questions

The Scientific Committee has been asked to answer the following questions:

1. What are the known beeswax contaminations and adulterations?
2. Which substances are likely to pose a risk to bee/colony health following wax contamination or adulteration (after single use or following the use of recycled wax)?
3. Regarding the possible presence of these substances in wax can an action limit be proposed in order to preserve bee health?

Method

The advice is based on expert opinion and on different scientific references. With regard to plant protection product, biocide and veterinary drug residues, the risk to bee health posed by these substances has been assessed based on three exposure scenarios. The first scenario corresponds to the exposure of larvae following their close contact with the wax constituting the cells in which they develop. The second scenario corresponds to the exposure of larvae following consumption of royal jelly and bee bread that have been contaminated via the wax during storage in the wax cells. At this level, the initial contamination of pollen that is returned to the hive by bees and royal jelly when produced in the hive has not been taken into account. The third scenario corresponds to the exposure of adult bees following the wax mixing during cells preparation and based on a worst-case scenario (consumption (= ingestion) of wax).

Answers to questions

1. The Scientific Committee has identified several substances that may adulterate or contaminate beeswax. Wax is mainly adulterated by adding stearin and is mainly contaminated with residues of processing aids used in the production of beeswax comb foundations, with heavy metals or with pesticide and veterinary drug residues.
2. The substances likely to pose a risk to bee/colony health are:
 - regarding the adulteration of wax: stearin and palmitin,
 - regarding the contamination of wax:
 - o residues of detergents used as processing aids in the production of beeswax comb foundations,
 - o heavy metals such as cadmium, copper, lead and selenium, and
 - o the following pesticide and veterinary drug residues: acrinathrin, amitraz, carbofuran, chlorpyrifos(-ethyl), coumaphos, cyfluthrin, cypermethrin, DDE, DDT, deltamethrin, flumethrin, imidacloprid, lindane (γ -HCH), mevinphos, pyridaben, tau-fluvalinate, thiamethoxam and thymol.
3. The Scientific Committee proposes the following action limits for re-melted beeswax placed on the market:
 - regarding the adulteration of wax:
 - o the acid value of wax should be greater than or equal to 17 and less than or equal to 24, and
 - o the ester value (= saponification value – acid value) of wax should be greater than or equal to 63 and less than or equal to 87.

- regarding the contamination of wax:
 - o regarding heavy metals:
 - Arsenic : ≤ 3 mg/kg
 - Lead: ≤ 2 mg/kg
 - Mercury: ≤ 1 mg/kg
 - o regarding pesticide and veterinary drug residues:
 - Acrinathrin: 0,6 mg/kg
 - Amitraz: 400 mg/kg
 - Carbofuran: 0,4 mg/kg
 - Chlorpyrifos(-ethyl) : 2 mg/kg
 - Coumaphos: 40 mg/kg
 - Cyfluthrin: 0,06 mg/kg
 - Cypermethrin: 0,3 mg/kg
 - DDE: 40 mg/kg
 - DDT: 40 mg/kg
 - Deltamethrin: 0,1 mg/kg
 - Flumethrin: 1,5 mg/kg
 - Imidacloprid: 0,03 mg/kg
 - Lindane (γ-HCH): 0,09 mg/kg
 - Mevinphos: 0,2 mg/kg
 - Pyridaben: 1,5 mg/kg
 - tau-Fluvalinate: 20 mg/kg
 - Thiamethoxam: 0,04 mg/kg
 - Thymol: ~~2~~1500 mg/kg

Conclusion

The Scientific Committee has identified substances that may be present in beeswax through contamination or adulteration and may pose a risk to bee health. The Scientific Committee proposed action limits for re-melted beeswax placed on the market.

The full text is available on this website in dutch and in french.