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MEDICINAL BEEKEEPING FOR BEEKEEPERS

Module 8

ENVIRONMENTAL CONTAMINATION OF BEE PRODUCTS



2021-1-TR01-KA220-VET-000034632

Module subjects

General sources of contamination of bee products

Indicators of contamination of bee products

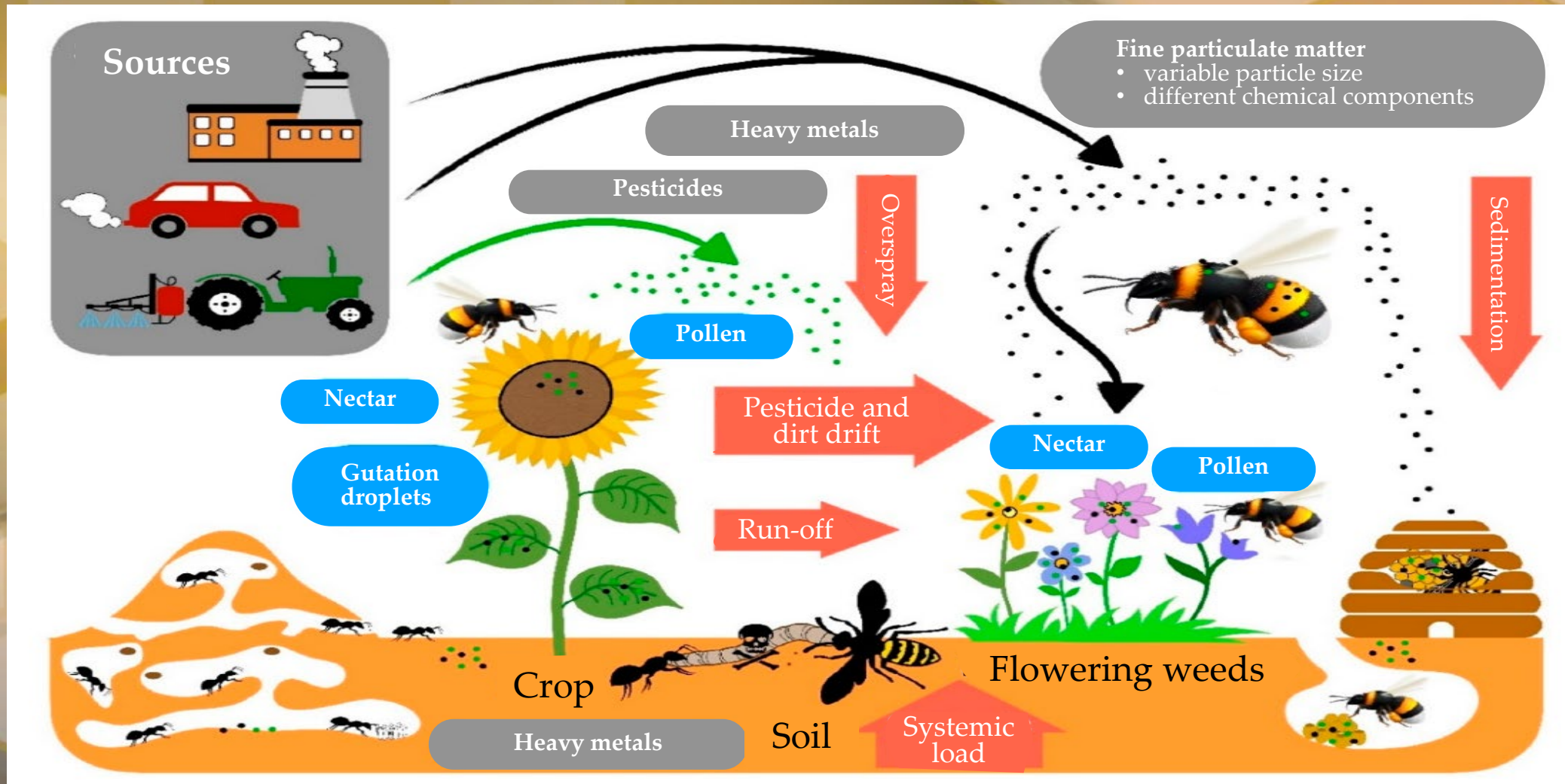
The impact of contaminants on the quality and safety of bee products

Threats to human health resulting from the use of contaminated bee products

Learning outcomes

Knowledge (knows and understands)	Skills (is able to)	Social competencies (is ready to)
<ul style="list-style-type: none"> sources of bee products contamination 	<ul style="list-style-type: none"> ☉ indicate and describe sources of bee products contamination and its sources 	<ul style="list-style-type: none"> take responsibility for safety of bee products
<ul style="list-style-type: none"> indicators of bee products contamination 	<ul style="list-style-type: none"> indicate methods reducing the risk of contamination of bee products 	<ul style="list-style-type: none"> comply with the requirements resulting from technology and the principles of beekeeper work organization
<ul style="list-style-type: none"> hazards resulting from the contamination of bee products for human health and life 	<ul style="list-style-type: none"> indicate hazards of use contaminated bee products 	<ul style="list-style-type: none"> reliable information on safety of bee products data comply with the rules of conduct applicable in professional activities that guarantee the proper quality and safety of bee products

Sources of the environmental pollutants and exposure pathways of social insects to pollutants



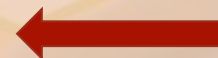
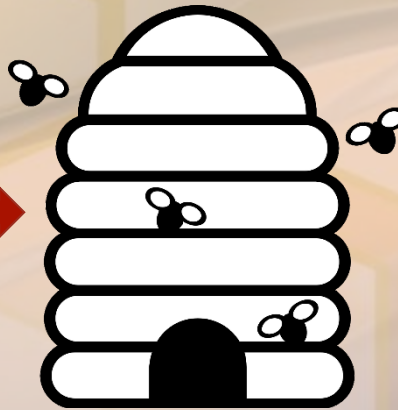
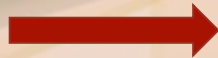
The contamination sources for the bee colony

Environment

- Pesticides
- Heavy metals
- Bacteria
- GMO
- Radioactivity



Plants
Air
Water

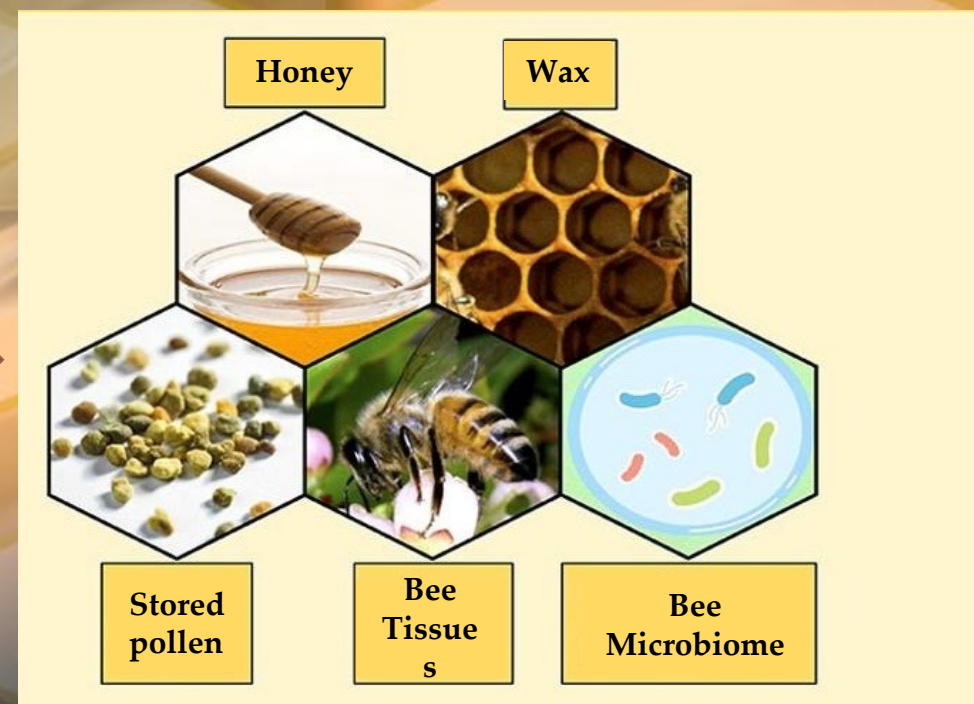
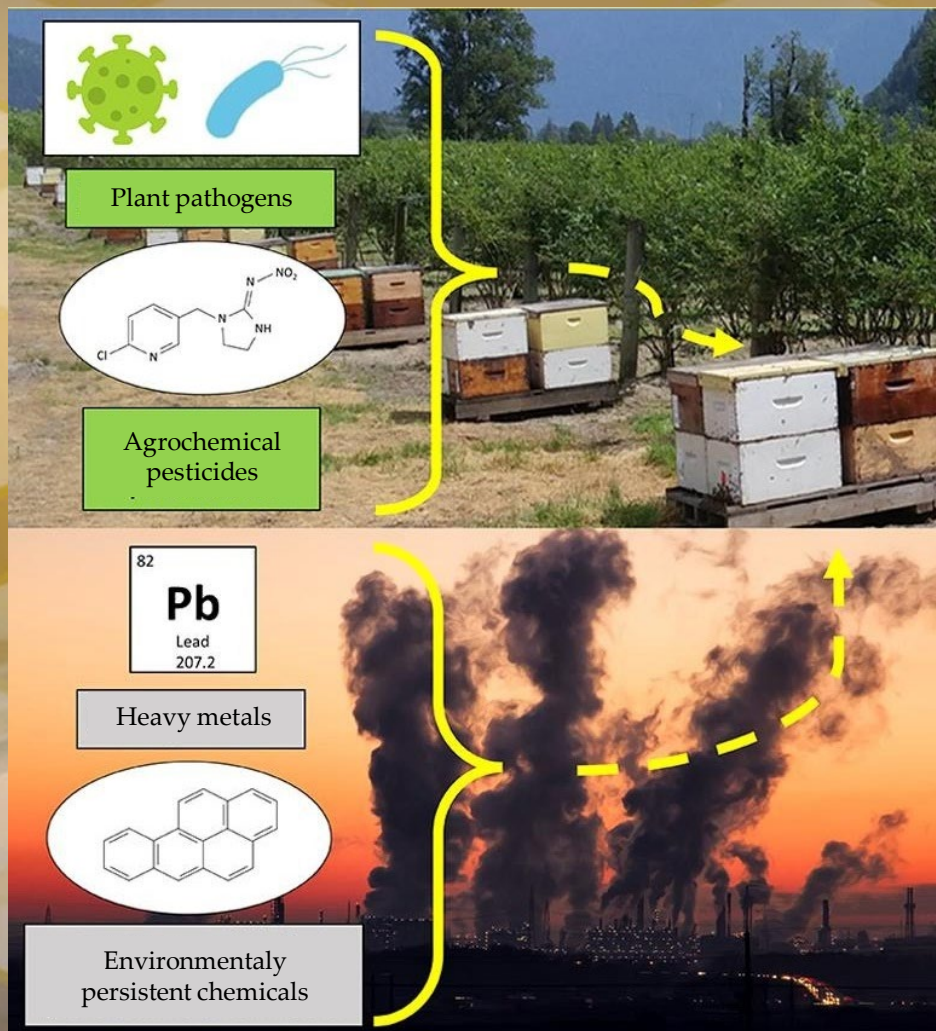


Beekeeping

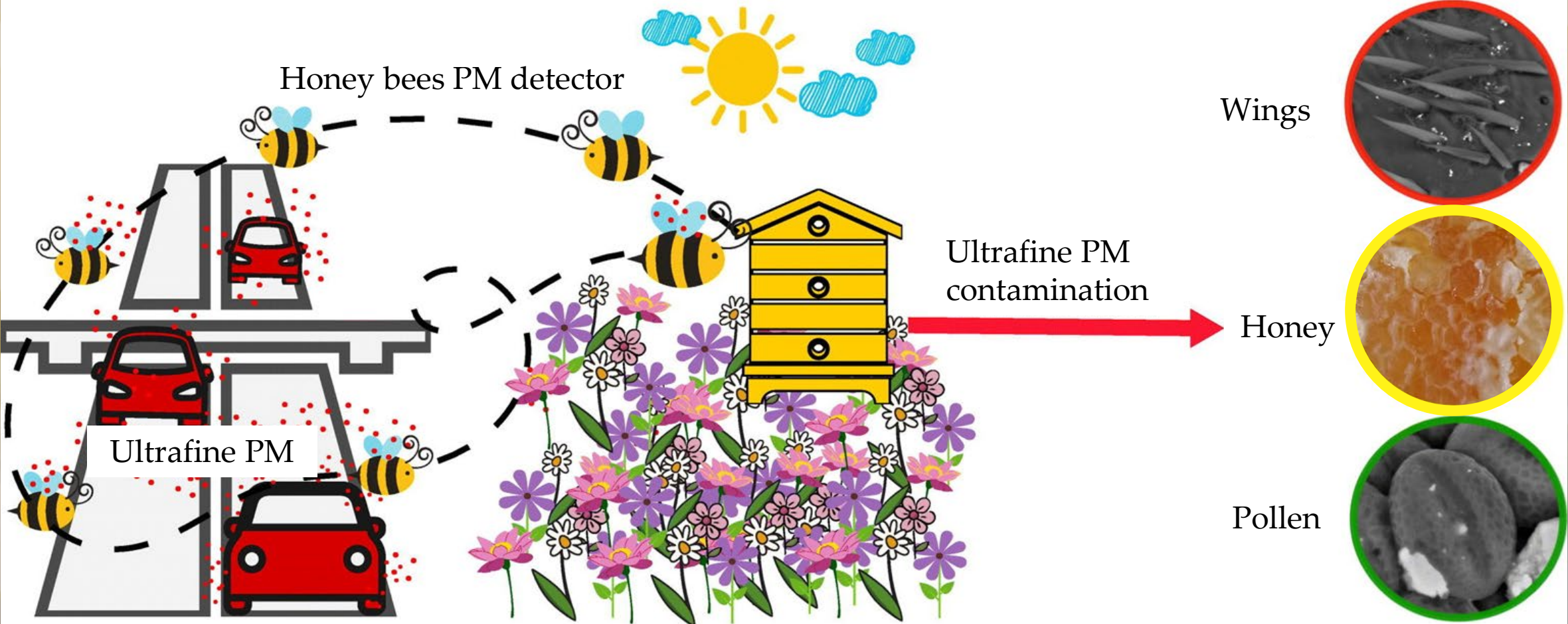
- Acaricides for Varroa control
- Antibiotics against AFB, EFB
- Pesticides for wax moth control
- Pesticides against SHB
- Bee repellents at honey harvest

GMO: genetically modified organisms; AFB: American foul brood; EFB: European foulbrood, SHB: small hive beetle

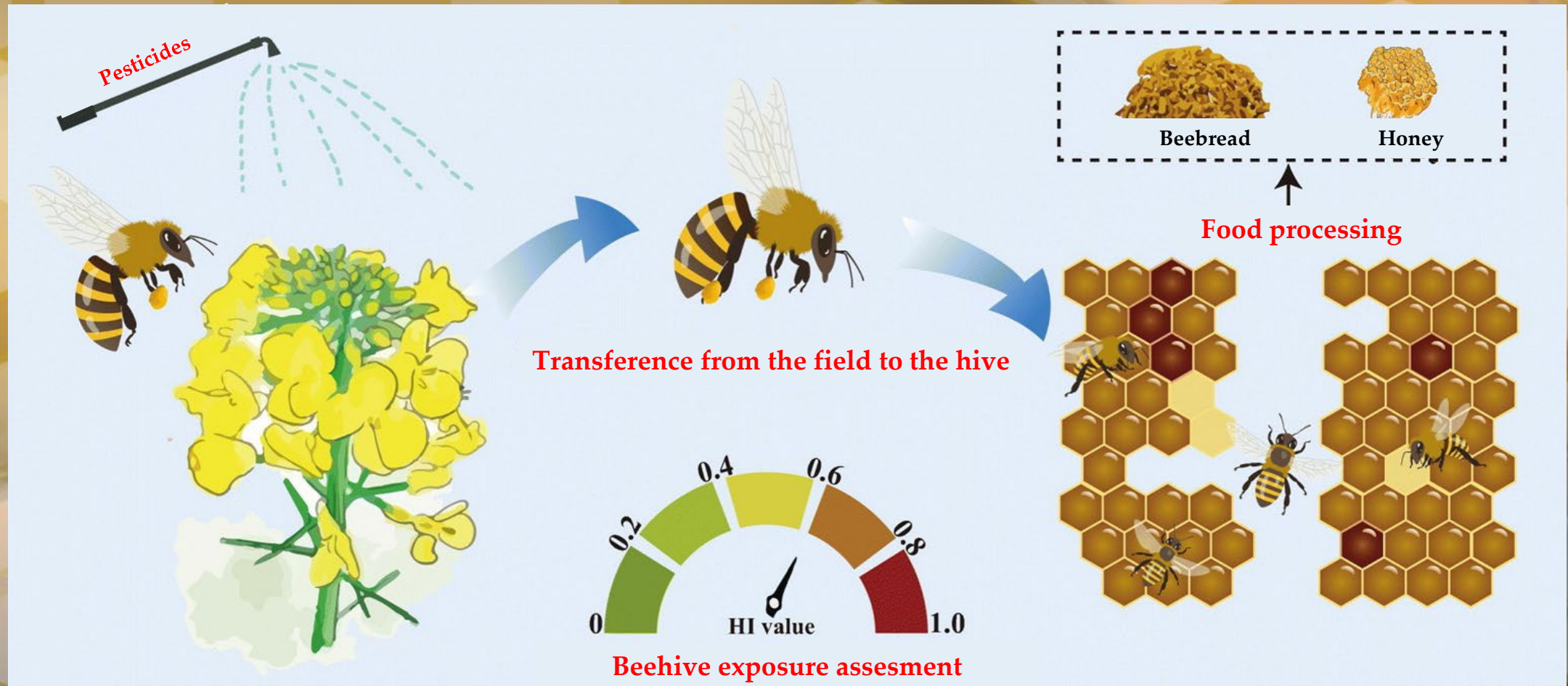
Heavy metals in bee products



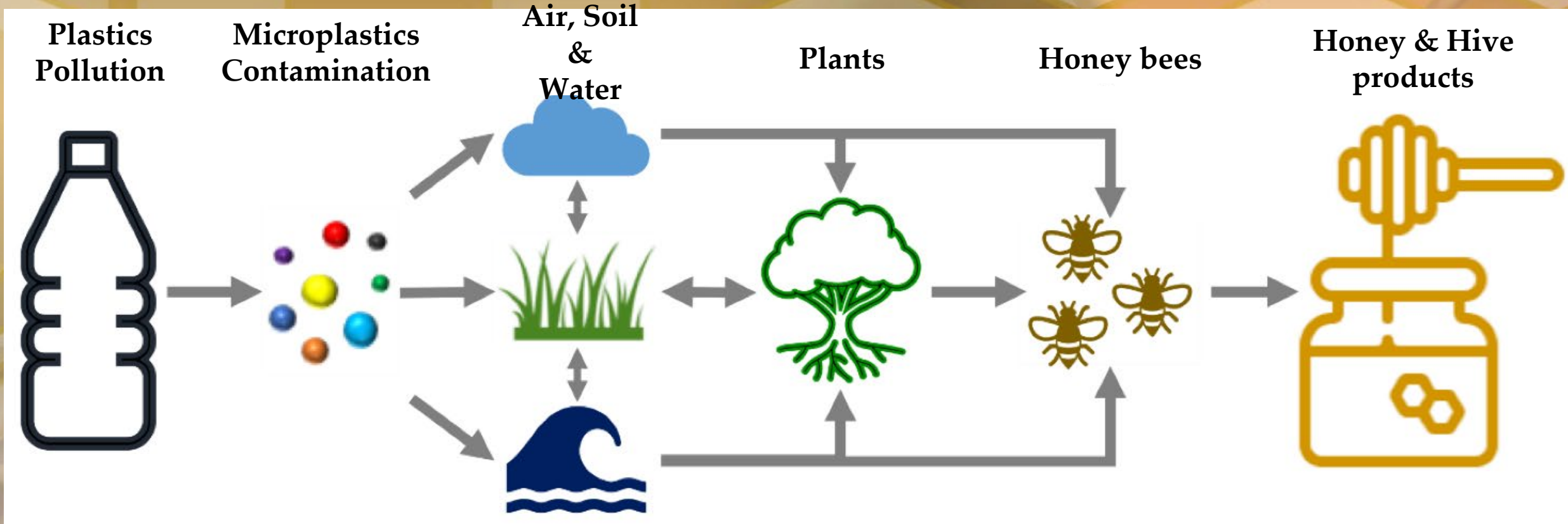
The ways of ultrafine PM contamination of bee products



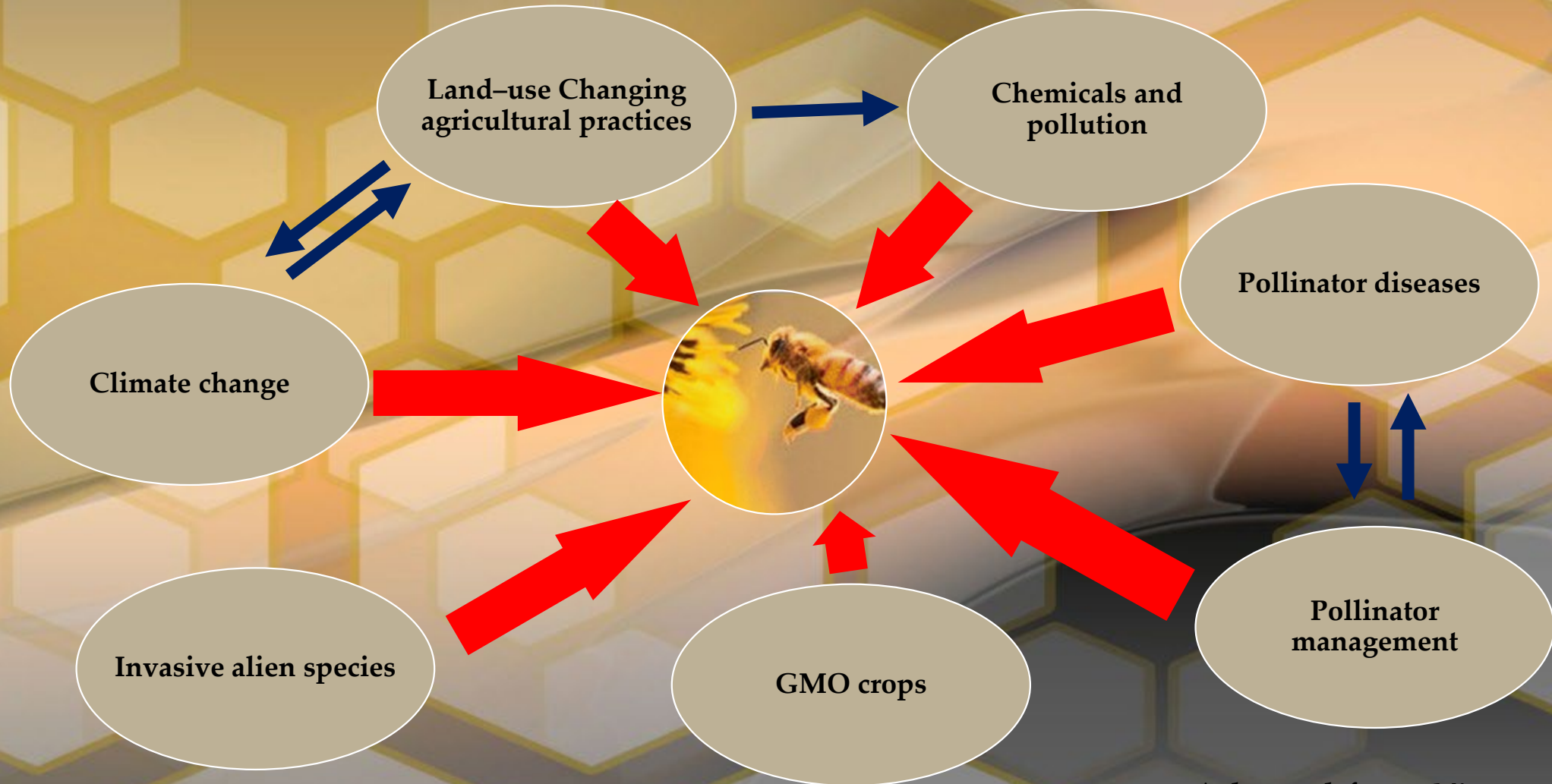
Honey bee exposure to multiple pesticide residues in the hive environment



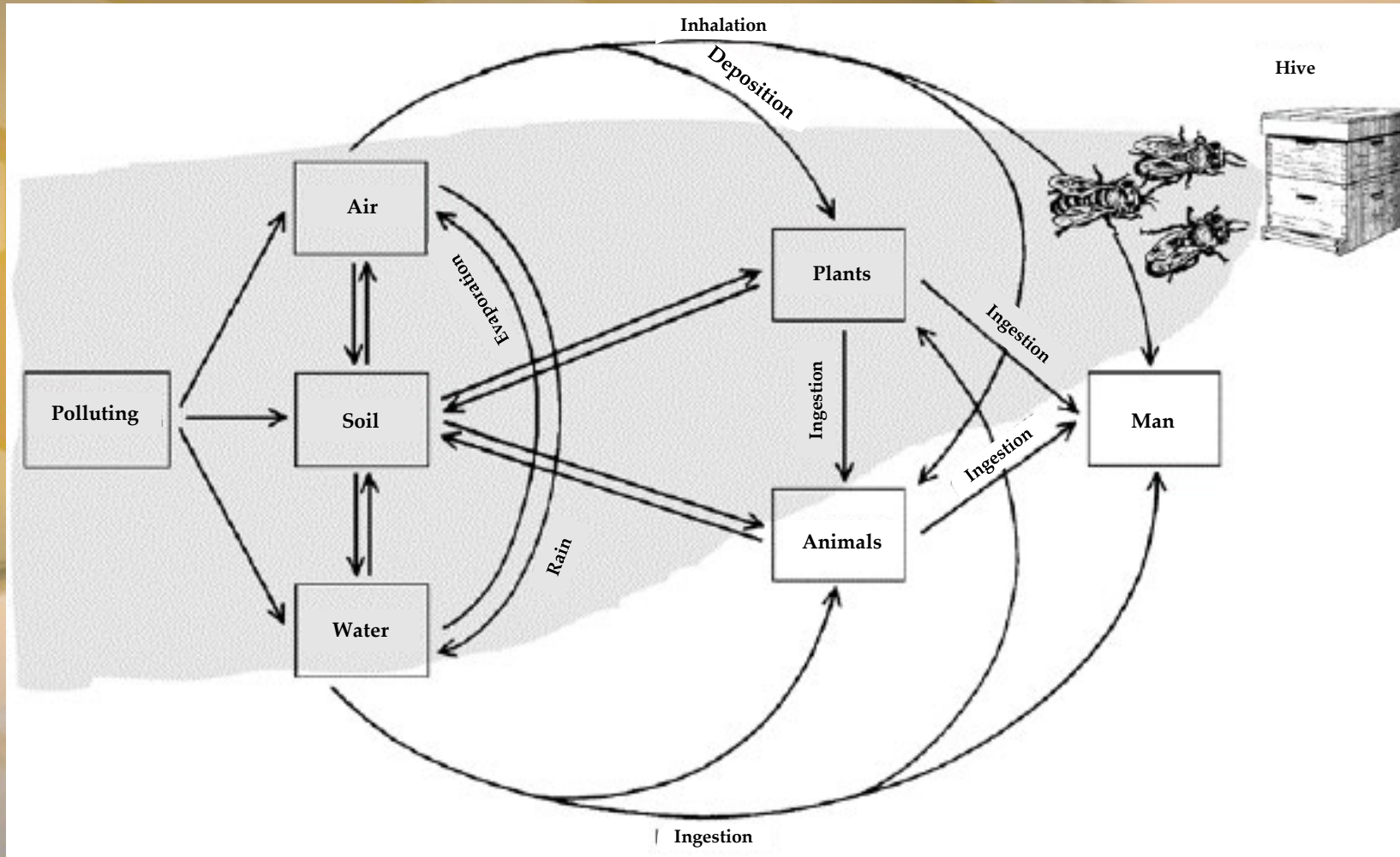
Microplastic particle mass flow in the environment and potential translation into honey bees and other hive products



Main drivers of change of honey bee colony declines



The diffusion of polluting substance in the environment



Porrini et al, 2003

The main contamination risks for the different bee products



Threats to human health resulting from the use of contaminated bee products

- According to European Union regulations, honey as a natural product must be free of chemicals (Directive 2014/63/EU of the European Parliament and of the Council).

DIRECTIVE 2014/63/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 15 May 2014

amending Council Directive 2001/110/EC relating to honey

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty on the Functioning of the European Union, and in particular Article 43(2) thereof,

Having regard to the proposal from the European Commission,

After transmission of the draft legislative act to the national parliaments,

Having regard to the opinion of the European Economic and Social Committee ⁽¹⁾,

Acting in accordance with the ordinary legislative procedure ⁽²⁾,

Whereas:

- (1) Council Directive 2001/110/EC ⁽³⁾ defines honey as the natural sweet substance produced by *Apis mellifera* bees ('bees'). Honey consists essentially of different sugars, predominantly fructose and glucose, as well as other substances such as organic acids, enzymes and solid particles derived from honey collection. Directive 2001/110/EC limits human intervention that could alter the composition of honey and thereby allows for the preservation of the natural character of honey. In particular, Directive 2001/110/EC prohibits the addition of any food ingredient to honey, including food additives, and any other addition other than honey. Similarly, that Directive prohibits the removal of any constituent particular to honey, including pollen, unless such removal is unavoidable in the removal of foreign matter. Those requirements are in line with the Codex Alimentarius standard for honey (Codex Stan 12-1981).

Substantial negative impact of pesticide usage

A decline in the insect population

A decrease in honey output

The destruction of plant communities

The presence of insecticide residues in food

A considerable loss of a beekeeper's revenue.

The primary goals of monitoring bee products

Safeguard consumer health

Increase worldwide commercial competitiveness

Improve product quality

References

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To know more about the project, please visit our website
<https://www.medibeebe.eu/>



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