

APIMONDIA – KIEV  
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# DEFINITIONS, CONTROLS AND BEEKEEPING PRACTICE: Impact on Beehive Quality

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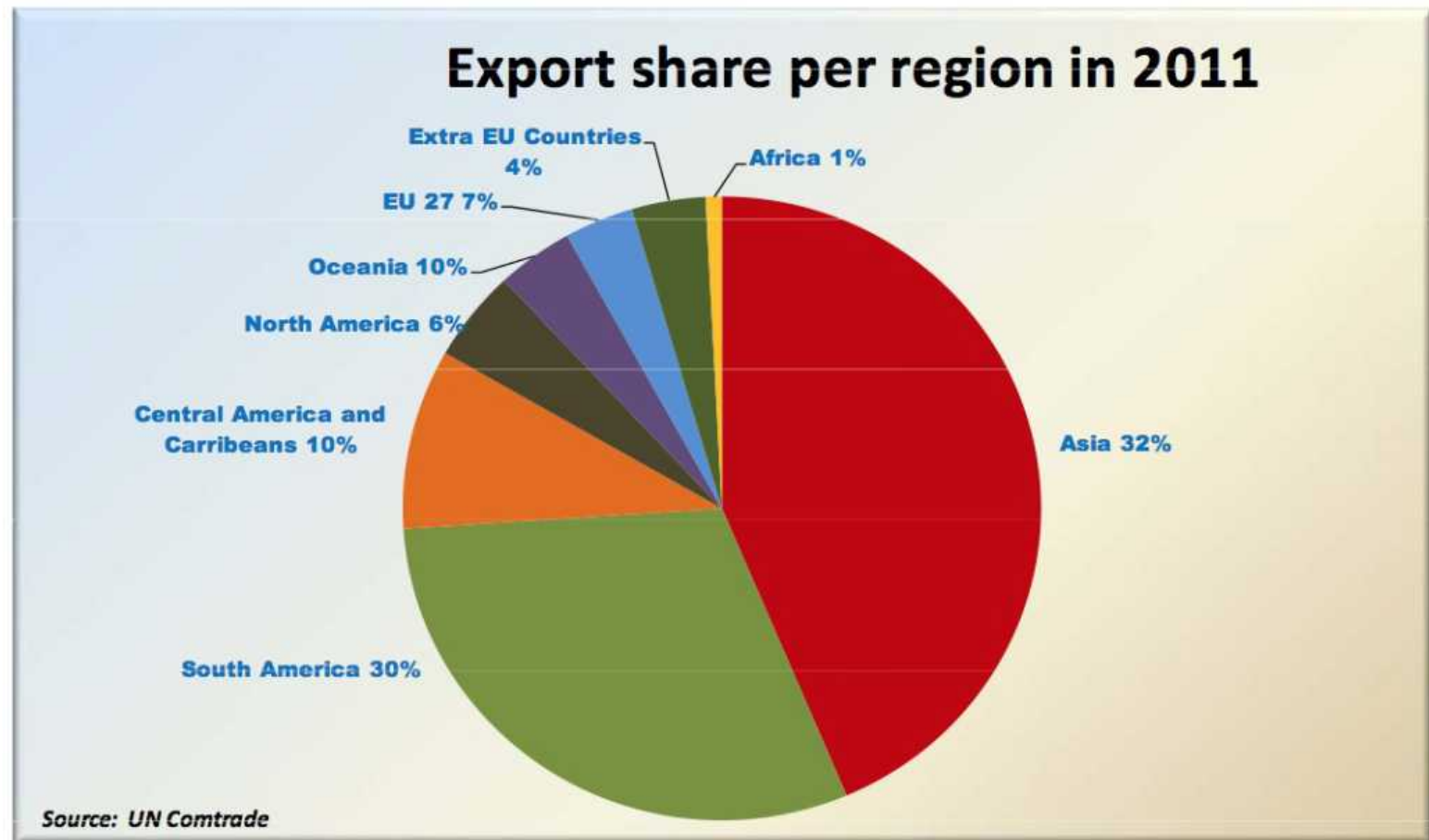
# Beehive products



- For the consumer, the products of the hive are collected and/or produced by the bees without processing or external inputs.
- The images of "Nature" and "Health" are very important for the public.
- The presence of foreign substances or damage is therefore viewed critically and very devaluing.

# Beehive products

- Global market for honey, royal jelly, wax, propolis



# Problems

- Quality:
  - ▣ Contaminants (environment, treatment, food ...)
  - ▣ Inappropriate harvest
  - ▣ Degradation (packaging, storage)
- Adulterations
- Lack of traceability
- Analysis of critical points for each product
  - ▣ Set the limits in the definitions
  - ▣ Direct the type of controls to be performed

# Definition and control



## □ Definitions

- ▣ The official definition of a product provides an essential framework for commercial transactions
- ▣ Provides acceptable limits to naming a product
- ▣ Today, only the honey enjoys an international definition.
- ▣ Note: The definition of products should meet the expectations of consumers for pure and natural hive-products.

# Definition and control



## □ Controls

### ▣ The purpose is to check:

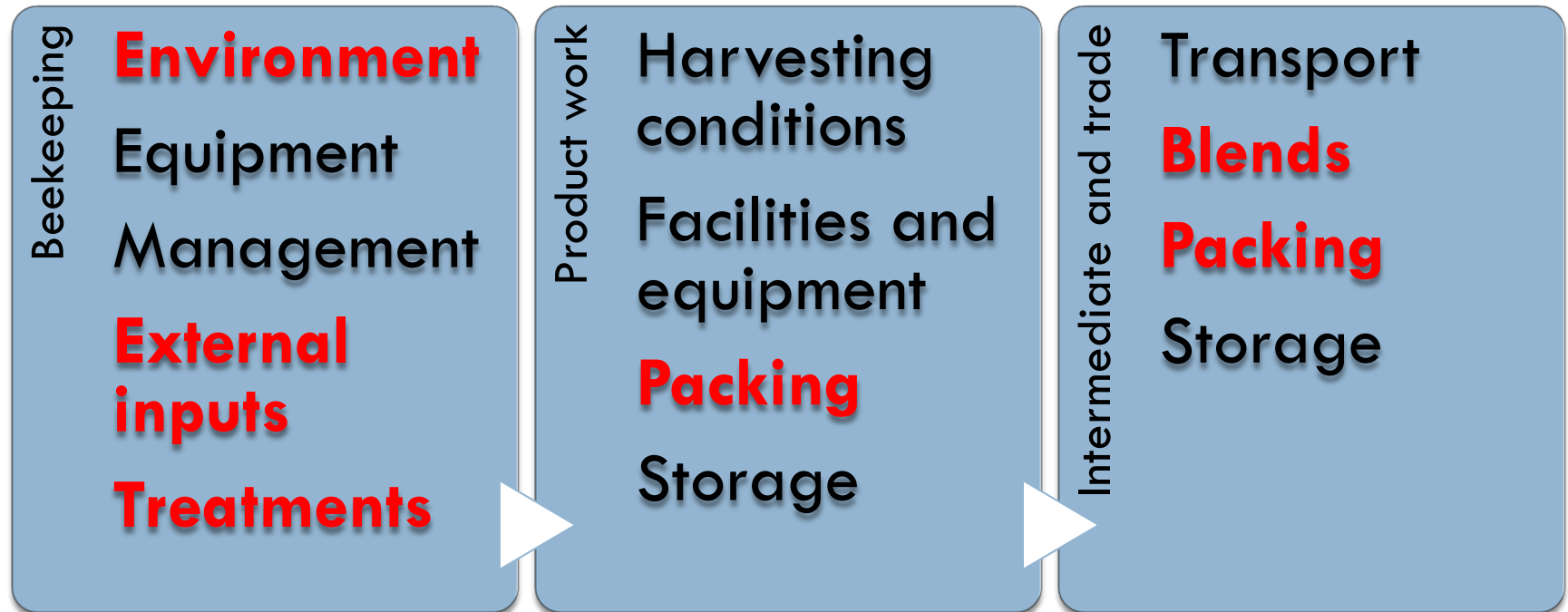
- If the product corresponds to its name based on its definition
- Compliance with hygienic standards established in the country that conducts testing (drug residues, pathogens ...)
- Compliance with other laws (GMOs ...)
- Verification of compliance with quality criteria announced in case of labelling quality controls

# Definition and control

## □ Controls

- ▣ They are mainly made in the healthcare setting (only with control imposed in the EU)
- ▣ Problems of adulteration search
- ▣ Methods related to laboratories, constantly changing
- ▣ No legal framework determining the limits of an adulterated product
- ▣ No standardized analytical framework with validated techniques
- ▣ No system of notification and / or warning except for prohibited substances (hygiene)

# Critical points: honey



**Environment:** alkaloids, GMO

**External input:** feeding- foreign enzymes ...

**Treatment:** antibiotics, miticides

**Blends:** contribution syrups (forbidden)

**Packing:** by melting honey, filtration (UF => loss of traceability) ...



# Honey definitions and controls



- Definition
  - ▣ Honey is the natural sweet substance produced by *Apis mellifera* bees
    - from the nectar of plants or
    - from secretions of living parts of plants or
    - excretions of plant-sucking insects on the living parts of plants, which the bees collect
  - ▣ Any external input or removal is forbidden (ultrafiltration in certain cases)...
- Controls: medicine residues, degradation, GMOs, adulteration, origin

# Pollen in the EU honey

- Council Directive 2001/110/EC
  - ▣ 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.
  - ▣ => Pollen is part of the particles that derive from the harvest of honey.

# Pollen in the EU honey

- The quantity of pollen is mainly linked to the honey extraction technique (CJEU)
  - ▣ => Pollen as an **ingredient**
- Pollen is linked to the activity of bees and is naturally occurring within the honey (Commission)
  - ▣ => Pollen as a **constituent**

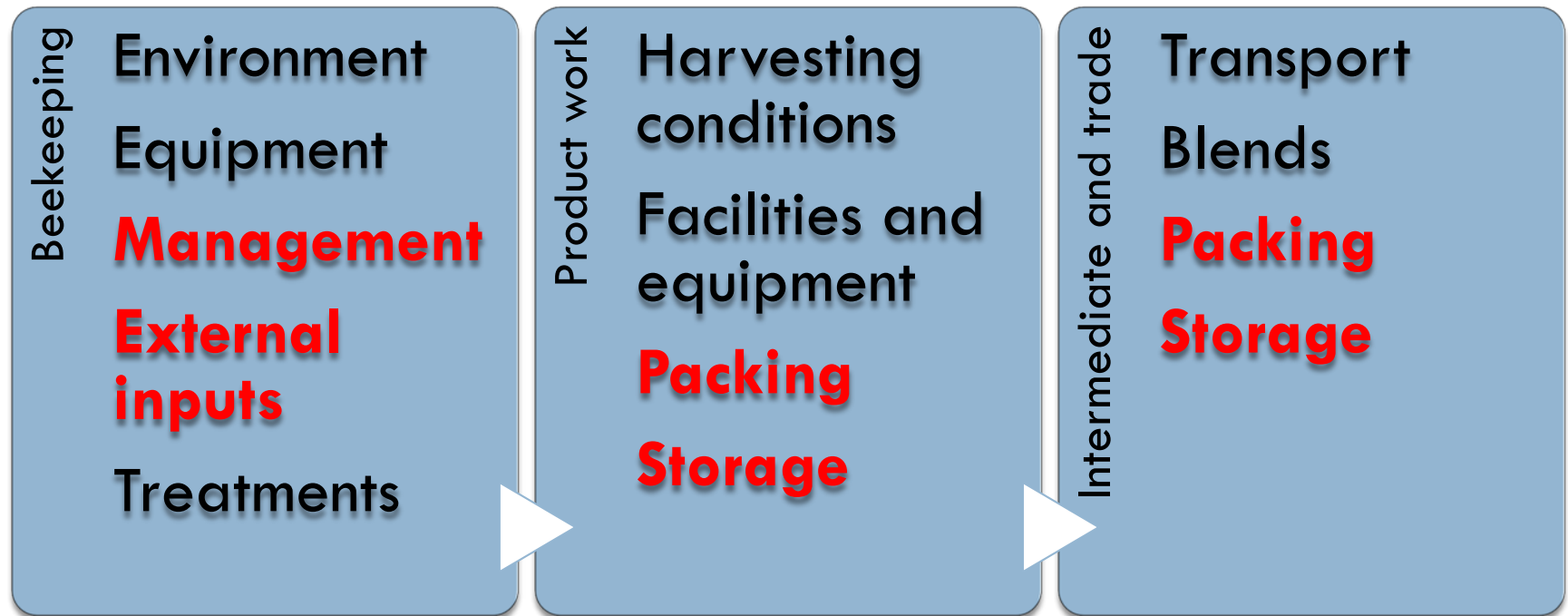
# Pollen in the EU honey

- Regulation 1829/2003 :
  - ▣ Produced starting from GMOs means the product derives entirely or partially from GMOs
  - ▣ Authorization and supervision obligations exist whatever the proportion of GMOs contained in the product => The GMOs must be authorised
  - ▣ If more than 0.9% of the material contains, consists of or is produced starting from GMOs, or if the presence of this material isn't inevitable=> mandatory labelling

# Pollen in the EU honey

- **If the pollen is an ingredient**
  - ▣ Labelling according to Regulation 1839/2003  
if  $> 0,9\%$   $\Rightarrow$  Produced starting from GMO pollen
- **If the pollen is a constituent**
  - ▣ No labelling for anemophilous pollen (corn) as it always constitutes under  $0,9\%$  of the honey mass.
  - ▣ ? Labelling ? If presence of pollen from melliferous plants indicating the nectar is produced starting from a GMO culture.

# Critical points : royal jelly



**Management** : impact of larval age during picking

**External inputs** : importance of the sugar and protein feeding (natural or not)

**Packing** : impact of the technique used: cooling- freezing- lyophilisation

**Storage** : importance of the cooling chain (for cooled or freezed products)

# The definition of royal jelly



- There is no official definition for royal jelly
- Work is in progress for ISO/CD 12824 norms
  - ▣ Royal jelly is the mixture of secretions from hypopharyngeal and mandibular glands of worker bees, free from any additive. It is the food of larval and adult queens. It is a raw and natural food, unprocessed except for filtration which does not undergo addition of substances. The colour, the taste and the chemical composition of royal jelly are determined by absorption and transformation by the bees fed with the following two types of foods during the royal jelly production time:
    - type 1 : only bee's natural foods (pollen, nectar and honey)
    - type 2 : bee's natural food and other nutrients (proteins, carbohydrates, ...)

# The definition of royal jelly



## □ Definition

- This definition clearly refers to a production technique and generates a separation of royal jelly into two categories.
- We are working within the frame of quality norms/regulations.
- This work should establish the bases for an international definition of royal jelly.

## □ Controls

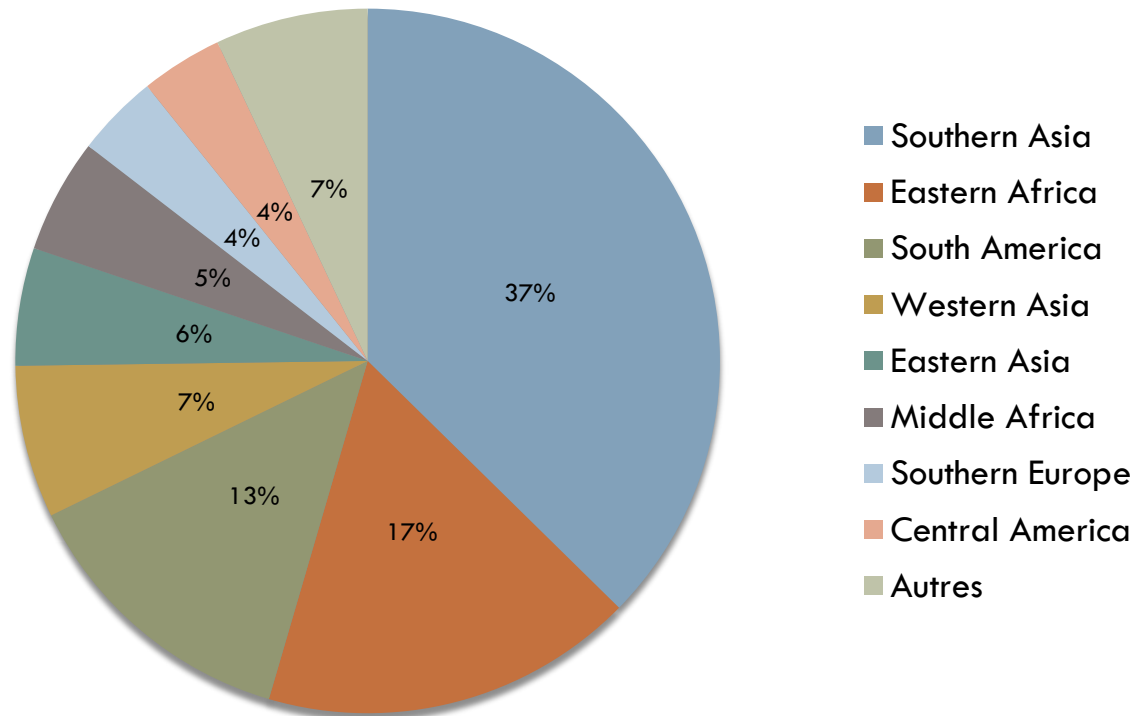
- *Hygiene, degradation (10 HDA - 10-Hydroxy-2-Decenoic Acid ), feeding (sugars), furosine, origin.*



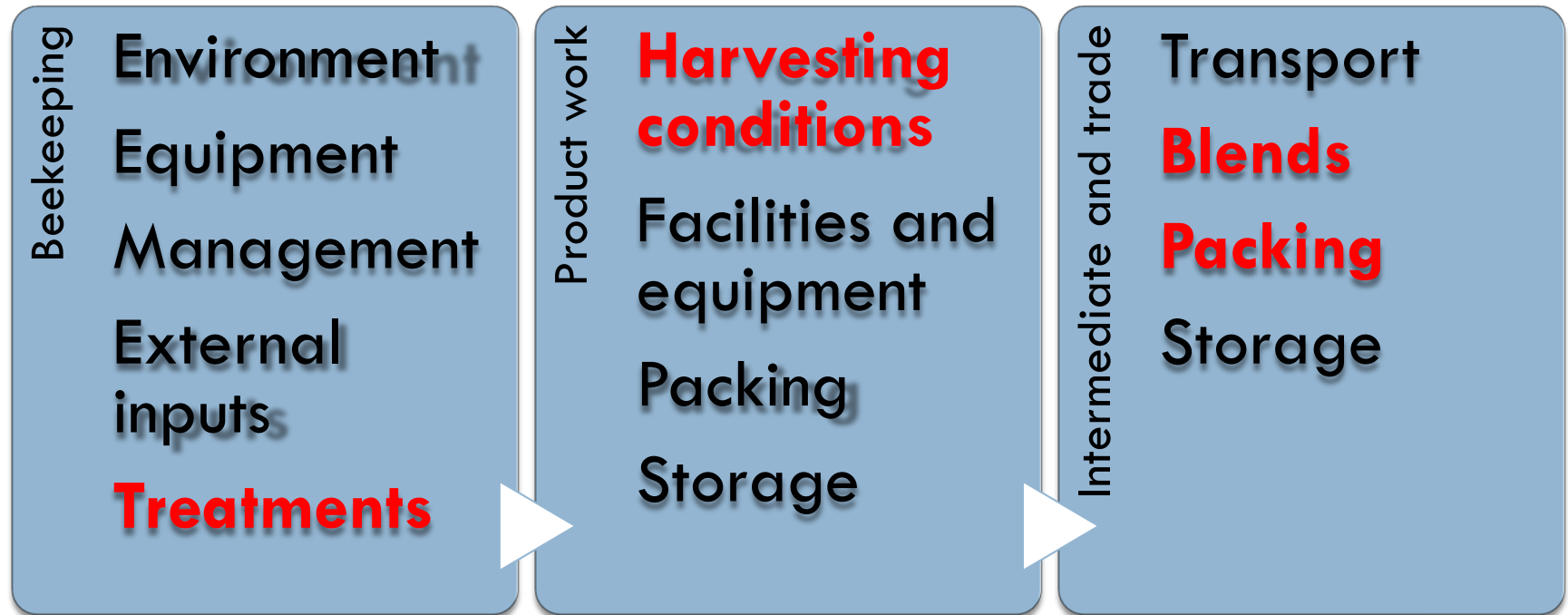
# The definition of wax



- International standards and definition do not exist (ex. : Polish standard PN-72/R-78890, 1996)
- International market (64.116T – FAO 2011)



# Critical points: wax



**Treatments** : treatment products residue

**Harvesting conditions** : type of frame used for remelting

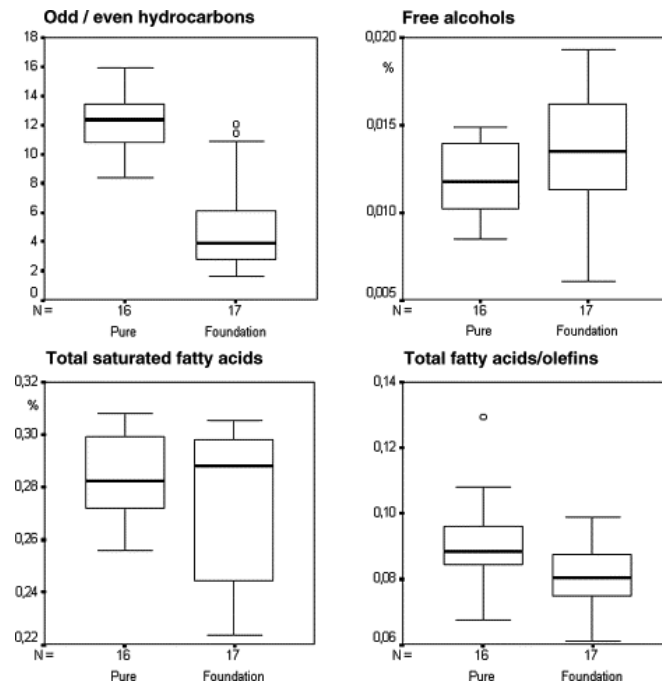
**Blends** : controls of the wax origins (geographic and quality), adding of external substances

**Packing** : purification techniques used

# Definition of wax



- The quality of the wax will be linked mainly to its purity.
  - ▣ Absence of medicine residues (acaricides...)
  - ▣ Important percentage of adulterations
    - > 30 foreign substances
    - Systematic adding of paraffin!

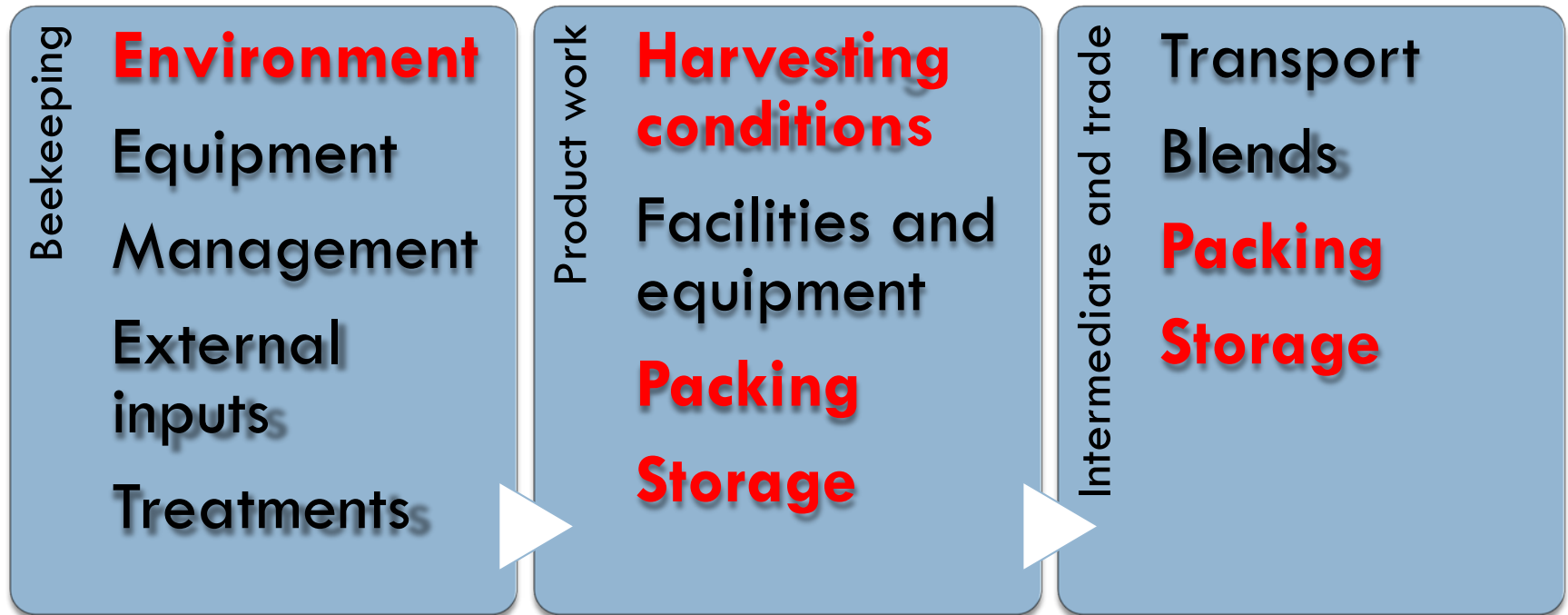


# Definition and control of wax

- Text basis for a discussion :
  - ▣ Beeswax = matter of lipidic nature elaborated starting from secretions of the worker bees' wax glands and used for the manufacture of honeycombs. It is a natural product which can be remolten and filtered but no adding of foreign substances is tolerated.
- Controls :
  - ▣ *Treatment residues, adulteration*



# Critical points: pollen



**Environment** : contamination sources should be avoided

**Harvesting** : the harvesting frequency is very important

**Packing**: quality of the selection, drying and freezing is very important

**Storage** : the life expectancy of the product and its storage conditions must be complied with

# Definition of pollen



## □ Definitions

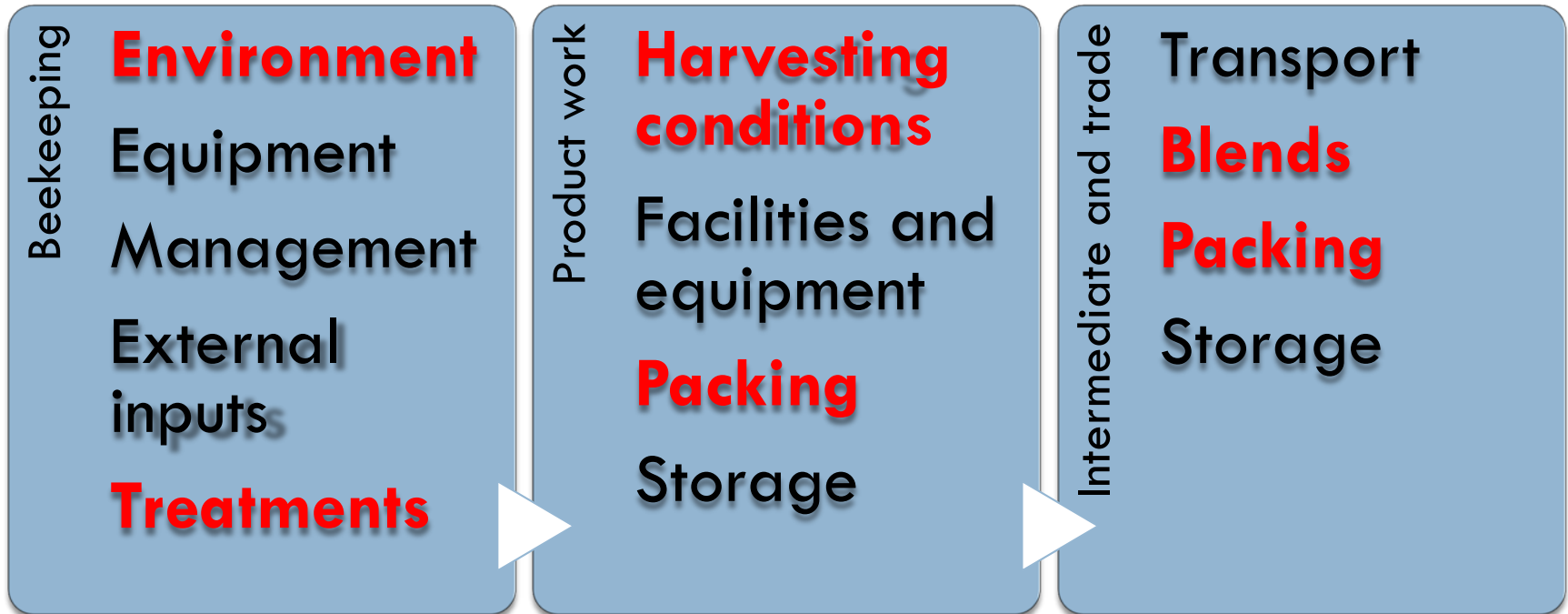
- **Pollen pellets** originating from aggregates of pollen grains collected by the worker bees of the *Apis mellifera* species and compacted on their hind legs with the addition of honey or nectar.
- **Honeycomb pollen or bee bread** : pollen pellets placed by the bees into the honeycomb cells and having undergone certain natural transformations due to the presence of enzymes and micro-organisms. This pollen may potentially be covered with honey.
- **Controls** : *humidity, mycotoxins, alkaloids.*

# Propolis



- The propolis market is expanding but there are no official statistics.
- The quality of propolis is strongly linked to
  - ▣ Its production technique (scraping, grid...)
  - ▣ Its harvesting period (outside treatment period)
  - ▣ Its botanical – geographical origin
- This product can be adulterated by the adding of vegetal resins. Techniques exist allowing the detection of certain frauds.

# Critical points : propolis



**Environment** : propolis is sensitive to external contaminants (heavy metals...)

**Treatments** : treatment products stick to the propolis

**Harvesting conditions** : the harvesting technique and period are important

**Blends** : risk of adulteration with vegetal resins

**Packing** : product extraction mode and presentation are very important



# Propolis definition and control

- Definition project:
  - ▣ Substance collected by worker bees on certain plants and to which they add their own secretions (mainly wax and salivary gland secretions) in order to use it as mortar.
  - ▣ Types of propolis should be distinguished according to the harvesting method and the extraction mode :
    - By scraping, by grids...
    - Extraction with alcohol, ...
- Controls : wax % and impurities, adulterations



Thank you for your attention

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