

OP-228 [Beekeeping Technology and Quality]
HoneyTrace - Using Blockchain Technology to trace Honey from the Jar back to the Hive

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This presentation examines how blockchain technology can be applied to fight fraud and increase traceability of bee products.

Problem description

Concerns over honey authenticity often receive mainstream news coverage, impacting consumer trust and not only putting profits at risk, but also bee-keeping practices, and therefore the bees themselves. To help address this, the Honey EU "Breakfast Directive" EU 2024/1438, will require specification of the exact countries where honey was harvested for honey labelling. However, to achieve this highly detailed level of traceability requires a new approach and the application of innovative technology.

Methodology

Intertek has applied its global honey testing expertise to address this global issue, developing a technology platform that enables honey traders, producers, exporters, importers and packers, to trace each batch of honey as it moves through the supply chain. The platform uses blockchain technology to securely verify the identity and location of beekeepers, store laboratory test results, and track batches from hive to jar. Blockchain is a decentralised, distributed ledger technology that records transactions securely and transparently across a network of computers. It enables trustless peer-to-peer transactions without the need for intermediaries, using cryptographic hashing. By tracking the product's journey step by step, HoneyTrace minimises the opportunities for adulteration and helps ensure the integrity of honey products worldwide, protecting both consumers and producers of honey products.

Results and conclusion

This presentation will discuss how HoneyTrace will set a new standard in honey traceability, helping businesses throughout the supply chain meet regulatory requirements and safeguard their reputation. It will be explained how global expertise in honey testing and compliance has been applied to build the platform, as well as how it ensures privacy of results and commercial confidentiality. Furthermore, it will be shown how this technology can be applied to all hive-based products, impacting not just the food industry, but other industries that use honey, bees wax and Royal Jelly.

Practical implications for beekeepers

As the foundation of the honey supply chain, it's valuable for beekeepers to understand how technology is protecting the integrity of the honey they produce and the industry as a whole.

HONEYTRACE - USING BLOCKCHAIN TECHNOLOGY TO TRACE HONEY FROM THE JAR BACK TO THE HIVE

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Dr. Klaus Beckmann, Intertek Food Services GmbH
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THE CHALLENGE OF HONEY AUTHENTICITY

Growing concerns over honey adulteration after several (media) campaigns

- “From the Hives” (2023), DNA testing campaign (2024/25)

Challenges/limitations for analytical testing

- Highly cleaned-up sugar syrups often difficult to detect with current techniques
- Natural influences on test results

U.S.-American USP: Honey Fraud Mitigation Guidance

- Document recommends additional tools to fight honey fraud

→ Traceability system could particularly help here



EU BREAKFAST DIRECTIVES: CLEARER LABELLING AND COMPOSITION

Why is it changing?

- To ensure free movement in the internal market and help consumers make informed choices
- Increase transparency in the food chain

How does it affect the honey industry?

- Mandatory origin labelling for honey
- Countries appear in descending order with percentage share on label

→ Traceability of origin required to comply with labelling rules



INTRODUCING HONEYTRACE

TRACEABILITY FROM HIVE TO JAR



What is HoneyTrace?

- Solution for honey traceability, built on blockchain technology
- Developed by a team of Intertek experts in honey and in world-wide honey trade
- In combination with a partner company, specialized in blockchain traceability solutions

HoneyTrace provides:

- An end-to-end traceability solution
- Tracking of honey from beekeeper/hive to jar
- Beekeeper verification
 - Visibility of origin, blending, and test reports
 - A secure system that keeps the supply chain data confidential and is only visible to the appropriate stakeholders



BLOCKCHAIN-TECHNOLOGY



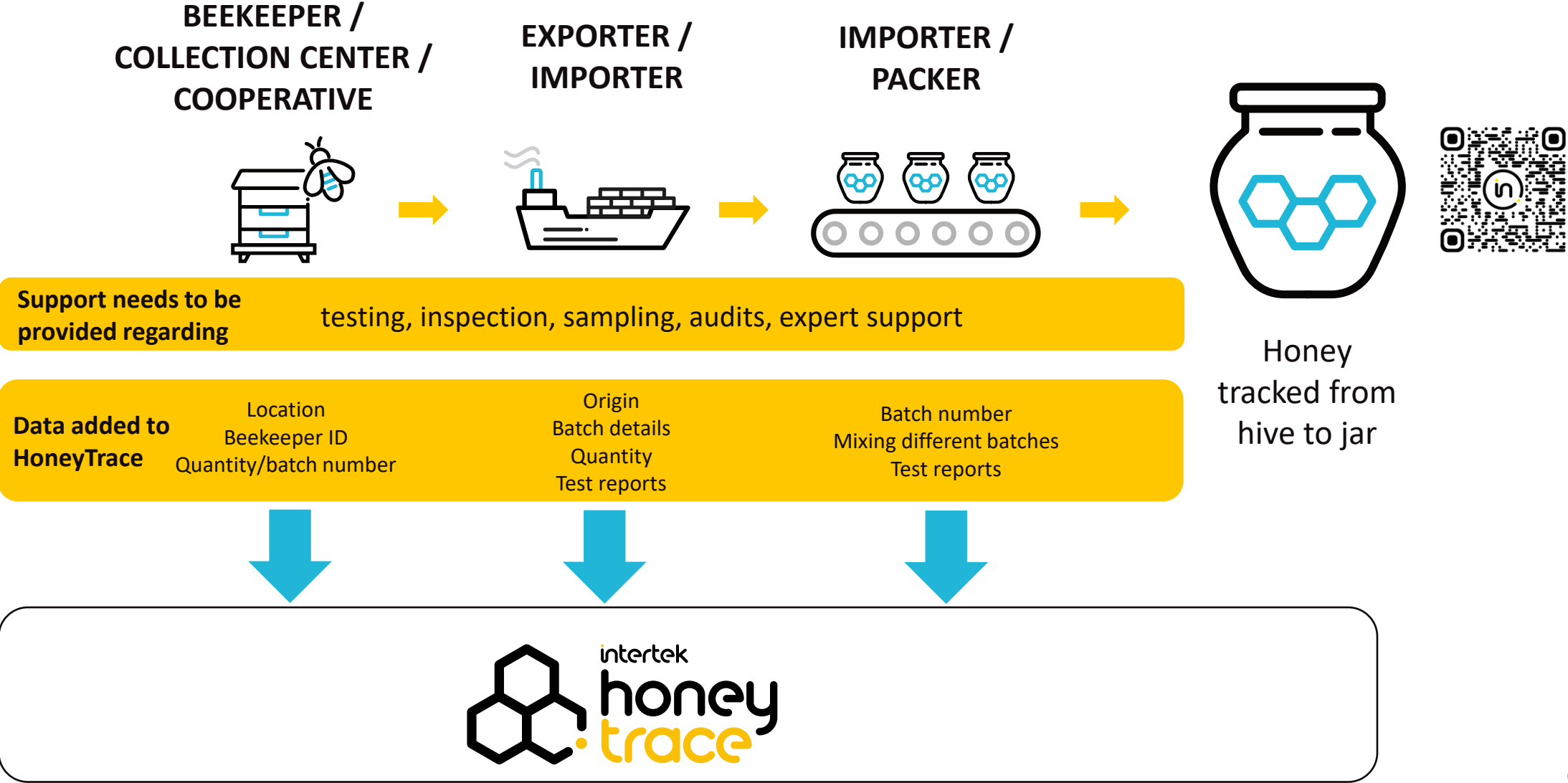
Blockchain is a decentralized, transparent and secure digital ledger

- It records transactions across multiple computers so that the data cannot be altered retroactively
- In the honey supply chain, each step - from the beekeeper harvesting the honey to the jar reaching the consumer - is documented
- This ensures that the honey's origin, quality tests, transport, and packaging are all securely recorded



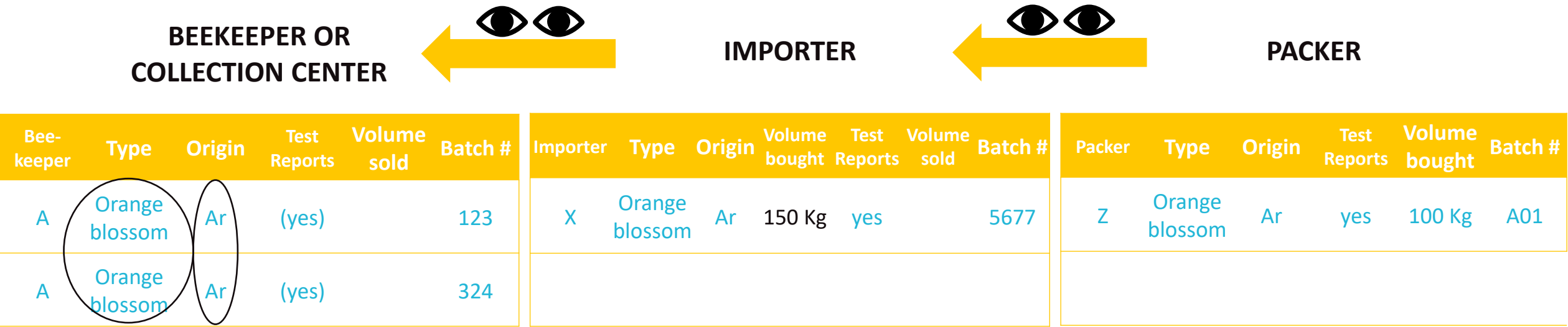
HONEYTRACE

HOW IT WORKS



DATA PROTECTION: WHO SEES WHAT

EXAMPLE OF DATA VISIBILITY



- Example: Packer **Z** would only see the information highlighted in **blue**
 - Top-down-principle: beekeepers/importers do not see, what packer is doing
- Blockchain provides full traceability of batches without exposing unnecessary details

ALERTS AND CONTROLS



MASS BALANCE

Quantities are compared between each step in the supply chain



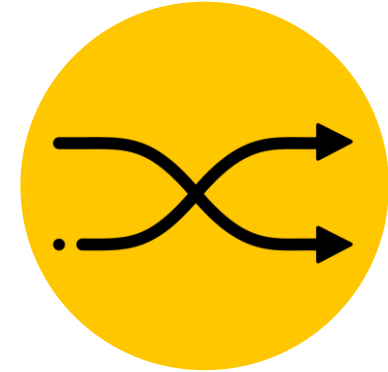
FAILED COA

Identifies batches where COA results are not in conformity



MISSING COA

Identifies missing COA documentation when a testing event is added to the system



COMPONENTS MIXING

Identifies bad practices and the mixing of different honey types

→ Alerts: Surplus / Loss

HOW DOES IT BENEFIT ME?



BEEKEEPERS

Verification of identity,
location, and hives

Becoming a trusted
supplier worldwide



EXPORTERS/IMPORTERS

Combination of testing and
traceability to manage
authenticity risk of the
honey which is purchased

Track any blending of
batches

Management of suppliers



PACKERS & RETAILERS

Visualization of the full
honey journey from hive
to jar for confidence in
your products

Build consumer trust

HOW DOES HONEYTRACE BENEFIT THE MITIGATION OF HONEY FRAUD?



- **Intentional addition of foreign sugars** (by other parties than beekeepers)
→ Would lead to a “surplus” in the mass balances → tracked by HoneyTrace
- **Mislabelling of geographical (+ botanical) origin**
→ Location of beekeepers verified → tracked by HoneyTrace
- **Technical moisture reduction** (by other parties than beekeepers)
→ Would lead to a significant loss in the mass balances → tracked by HoneyTrace
- **Excessive feeding of bees**
→ Basic amount of produced “honey” is entered into blockchain → cannot be tracked by HoneyTrace
- **Technical moisture reduction by beekeeper**
→ Basic amount of produced “honey” is entered into blockchain → cannot be tracked by HoneyTrace



CONCLUSIONS /SUMMARY BENEFITS

HoneyTrace provides:

- End-to-end visibility of the honey supply chain
- Additional tool to mitigate honey fraud
- Tool to combine all data and test results
- Better control of risk management regarding quality safety for honey
- Saves a lot of manual tasks, such as email correspondence
- Support to meet future legal requirements in the EU
- Improved management/control of analytical tests
- Positive marketing effects

**Booth
B23**



**Thank you for your
attention and interest!**

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HoneyTrace Webpage



Honey Factsheets

