

# Can blockchain support traceability?

Dr Donna Champion and Dr Rachel Ward

# Agenda

- Food system challenges
- What is the blockchain?
- What can blockchain do (and what can't it do)?
- Is there a value proposition?

# Food System Challenges



- WHO reports that every year globally 1 in 10 people fall ill, and >420,000 die from foodborne illness<sup>1</sup>
- Food fraud is costing UK food industry £12bn per annum<sup>2</sup>
- Food recalls continue to increase and food withdrawal / recall processes are inefficient<sup>3</sup>

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<sup>1</sup> WHO estimates of the global burden of foodborne diseases. December 2015

[https://www.who.int/foodsafety/publications/foodborne\\_disease/fergreport/en/](https://www.who.int/foodsafety/publications/foodborne_disease/fergreport/en/)

<sup>2</sup> Crowe Clarke Whitehill 'Minimising Fraud and Maximising Value in the UK Food and Drink Sector'. May 2017 <https://www.croweclarkwhitehill.co.uk/uk-fooddrink-companies-losing-12-billion-annually-fraud/>

<sup>3</sup> FSA 'Review Of The Food Withdrawal And Recall System In The UK Food Retail Sector' – see FSA Board report FSA17/09/13

# Food System Challenges

- Infrastructure capacity and capability
- Inaccurate / inefficient food system data
- Lack of trustworthy evidence of food safety
- Learnings rarely shared (following withdrawals/recalls)

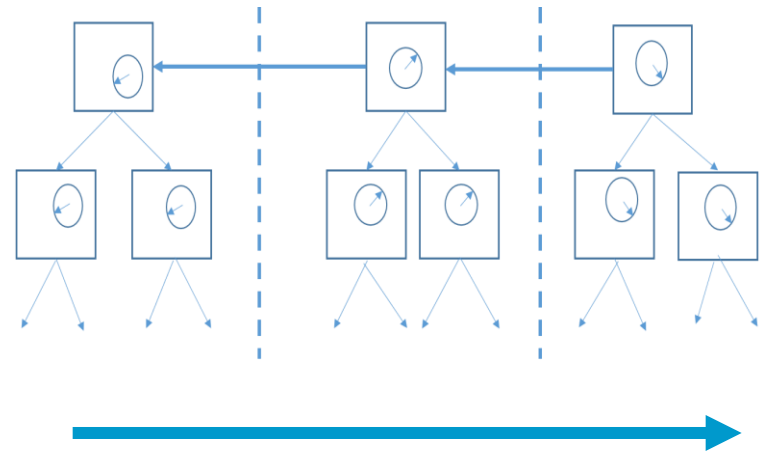


# What is a Blockchain?

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A blockchain is a type of distributed ledger, that holds a secure record of transactions for a particular community.

The data is added to the ledger in blocks and cryptographically secured to the data in the previous block, creating a 'tamper-evident' chain of data –the ledger of transactions.



# Three Types of Distributed Ledger

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Open Ledger

No  
Centralised  
Control

Permissioned  
Ledger

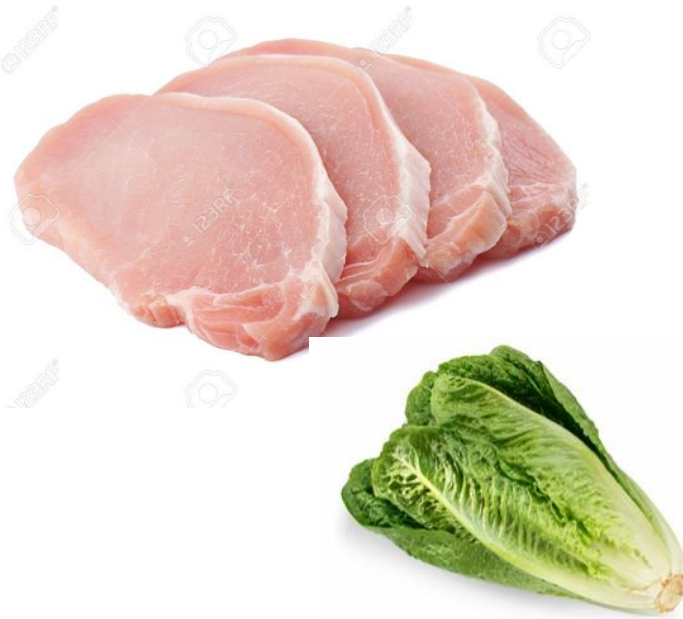
Different  
types of  
Control

Private  
Ledger:  
Membership  
only

Centralised  
Control

# How is Distributed Ledger Technology being used?

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**IBM and Walmart Pilot Studies**

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# Addressing Food Fraud



TE Food International Ltd





# Is there a Value Proposition?

**If used with smart devices such as geospatial technology, sensors, detectors and smart packaging, and your business software, then blockchain/distributed ledgers could support:**

- Supply chain transparency
- Real-time live data
- Secure, permissioned access to data for specific purposes
- Demonstrate food safety and regulatory compliance
- Cost reduction through information exchange and better data analysis

**Physical, cyber, economic and political infrastructures also need to be in place**

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# Food System Data

## Food Safety

Food Safety Management Systems  
Safe Product / Pack Design  
Batch Control

## Certification

Supplier / Site / Line  
Batch / SKU / Shipment

## Regulatory Compliance

**Composition** (Novel food, additives, GMO, etc.)  
**Label** (Ingredients/nutrition/weight declaration, use by date, artwork, etc.)  
**Claims** (QUID, variety/breed, source, PDO/PGI, natural, fresh, traditional, allergen free, nutrition/health, ethical/environmental status, recycled packaging, marketing, etc.)

## Supply

Availability  
Price

## Operations

Capacity

## Markets

Demands / Trends  
Regulatory changes

## Distribution / Storage

Approved providers / Storage conditions / Shipment status

## Supply

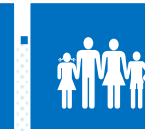
Approved Suppliers  
Approved Sites  
Contracts  
Price  
Batch Supplied

## Manufacture

Own Sites  
Co-Manufacturers  
Co-Packers  
Processes  
Batch Produced/Packed

## Markets

Channels  
Customers  
Product / SKU



**TRACEABILITY**

# Food System Data Value

- Upgraded data access / collection capability
  - ‘Live’ tracking of the status and location of food products – batch/lot/shipment
  - Rapid access to evidence of compliance (incl. data held elsewhere)
  - Up-to-the-minute supply vs demand status
  - ‘Full’ sight to source (traceability)
- Enhanced ‘sight’ improves decision making
  - Operations planning
  - Resource utilisation (water, energy, materials, transport)
  - Waste reduction and/or revalorisation
  - Logistics, delivery acceptance and border crossings
  - Hold/release and recall

# Conclusion

# Thank You for Your Attention!

Any questions?



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