

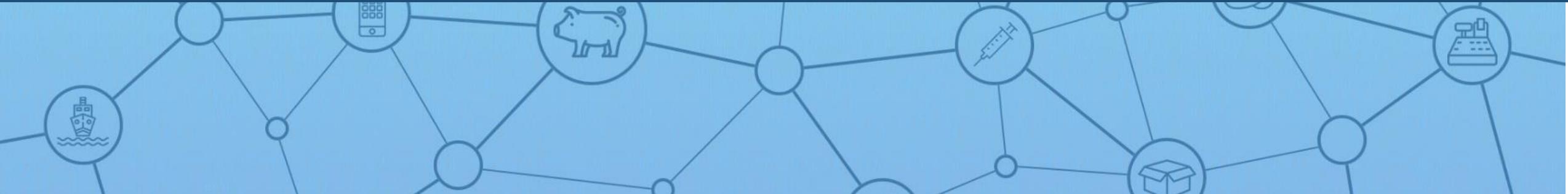


# Optimizing Animal Traceability with Digital Technology



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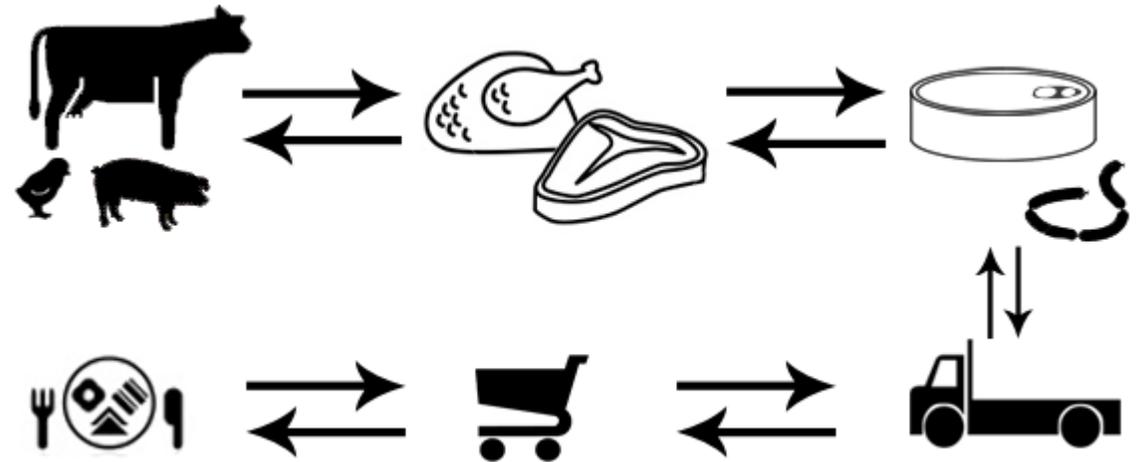


# Outline

- Why animal traceability systems?
- How do they work?
- What are the key challenges/problems?
- Is there a role for digital technologies?
- Ideas for creating an enabling environment...

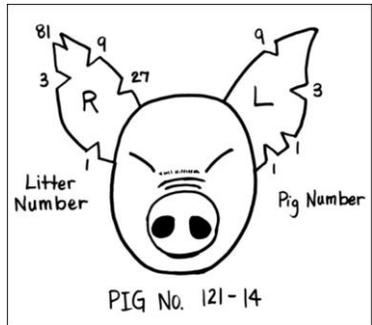
# Why is animal traceability important?

- Animal traceability systems (ATS) are fundamental to:
  - Animal health and disease
  - Food safety and quality
  - Certifying exports
  - Facilitating int'l trade
  - Consumer awareness



# How do animal traceability systems work?

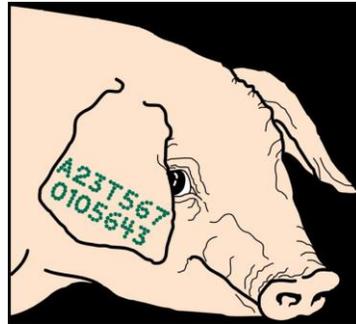
## 1. Animal identification (individual or homogeneous groups)



Notches



Brands



Tattoos



Ear tags



RFID



Implants

## 2. Data collection

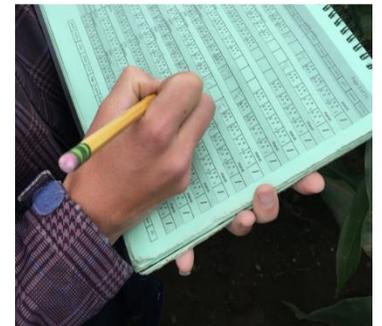
- Non-electronic IDs use manual data collection and recordkeeping entering manually into database

## 3. Data registry or database

## 4. Data exchange

# What are the key challenges?

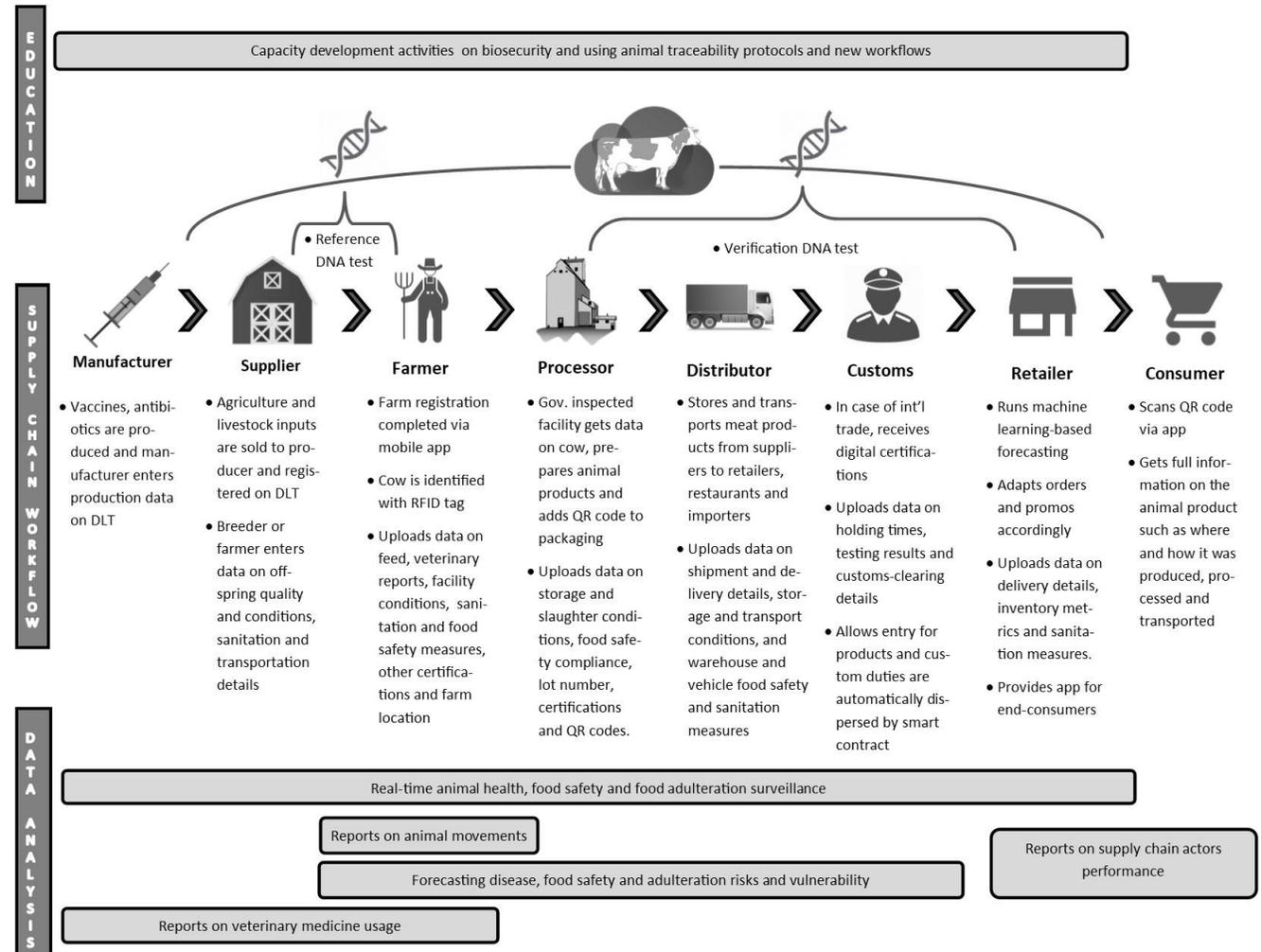
- Animal traceability systems are absent in many parts of the world
  - % of OIE members reporting to have available data on:
    - Animal traceability (28%)
      - of which 57% is in electronic format (88% in EU, 48% in Asia and 28% in Africa)
    - Animal identification (26%)
    - Animal movement (23%)
- Inefficient, insecure and expensive
  - Paper reports and manual database still prevalent
    - Paper reports sent by mail used by 62% of OIE members
  - Electronic centralized database
    - Constraints related to data sharing by owners, confidentiality and security



# Is there a role for digital technologies?

Data and information help protect animal and human health, and facilitate trade.

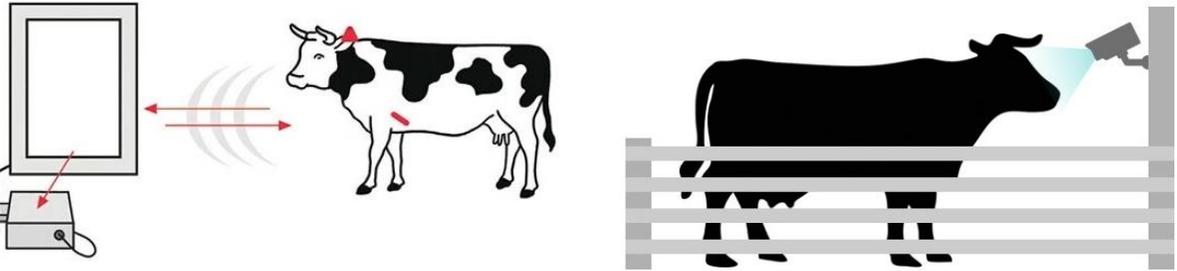
- Accurate product-process links
- Data collection in e-format
- Data sharing fast and securely
- Data analysis for data-driven decisions



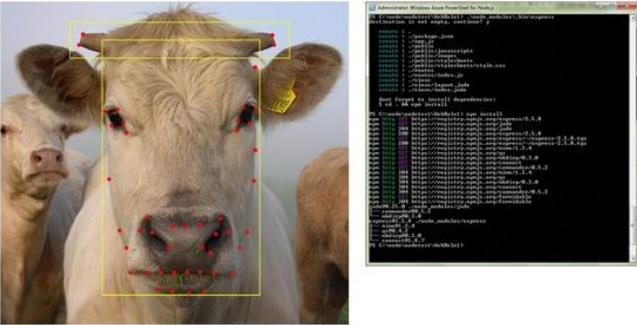
# Product-process links

- Linking live animals to products to ensure authenticity

## Animal identification

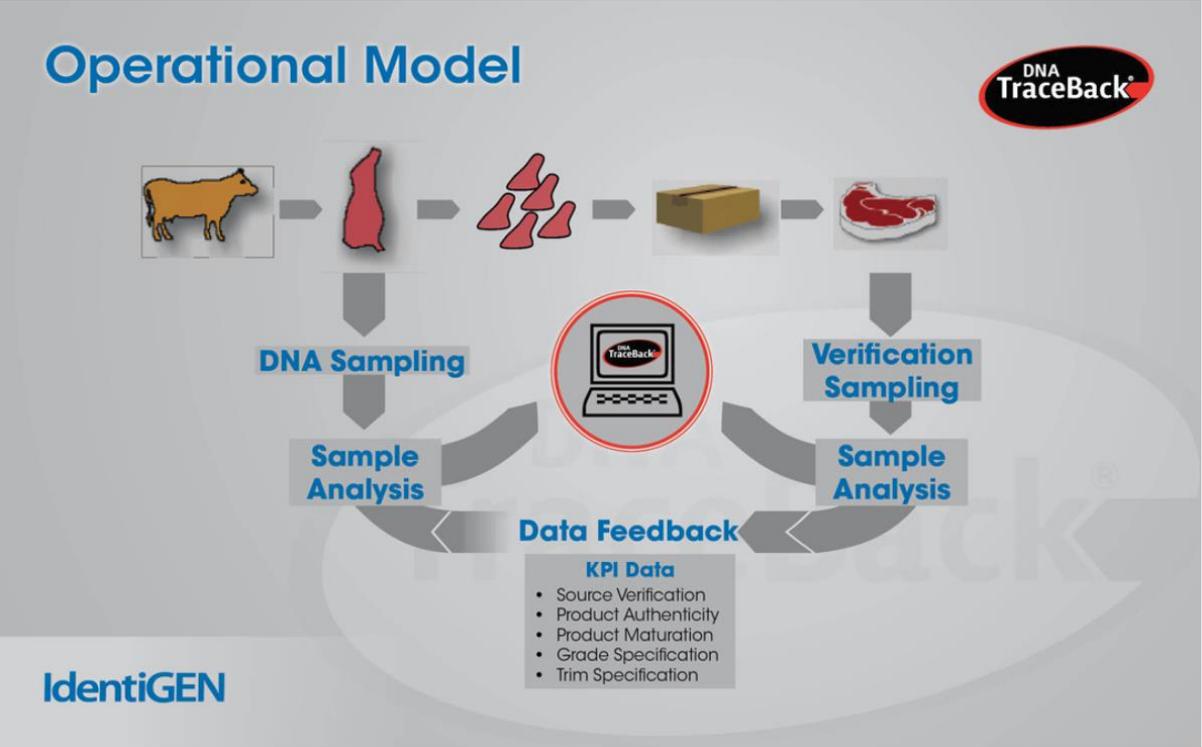


Electronic IDs



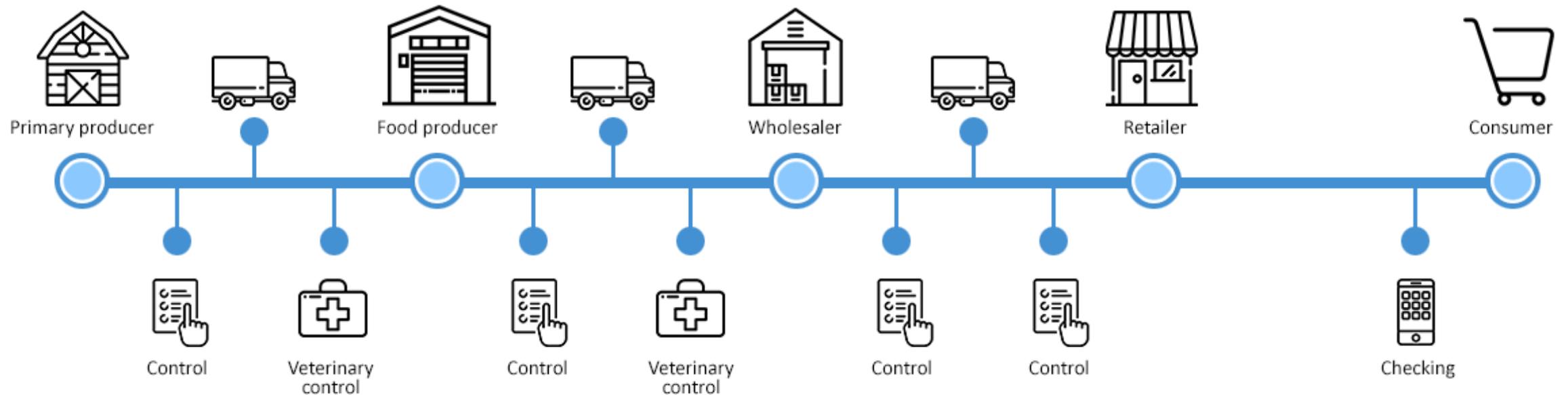
Facial recognition

## Product identification



# Data sharing in supply chains

- Data sharing to integrate fast and secure communication and exchange between supply chain actors and authorities (blockchain)



# Data collection in electronic format

- Data sources (mobile phones, IoT sensors, biosensors, robots and internet)
  - Remote sensors collect data in real-time
    - **Animal health and welfare data to detect early signs of animal disease** (body temperature, heart rate, animal movements and behaviour, stress levels, animal sounds (like coughing), analytes (e.g. protein and enzyme levels) and detect the presence of disease pathogens)
    - **Behavioural data to optimize feeding and animal performance** (feeding patterns, movement and animal weight)
  - Manual (and automatic) collection via mobile devices
    - **Data for animal disease surveillance and control, food safety risk assessment and certifying exports** (animal feed, veterinary medicines, laboratory tests and other information on animal health)
    - Proves product attributes and optimize quality controls (organic, free-range, grass-fed, hormone-free and antibiotic-free)

# Data-driven decisions and predictive analytics

- Data analysis to inform data-driven decision making and predict outcomes (artificial intelligence and machine learning, other big data analytics)
  - Monitoring tool to detect disease outbreaks, contaminated products, food fraud and noncompliance with food standards
  - Examples:
    - Motion-sensors to collect behavioural data and AI to detect if cattle are ill, less productive or ready to breed;
    - Infectious disease outbreaks identified from digital behaviour patterns through web search and social media
    - Using data to learn patterns and predict noncompliance for better targeting on-spot inspections

# Digital solutions for improved safety and quality

- Blockchain-based animal traceability systems
  - TE-Foods combating ASF by using mobile phones and blockchain to enable direct communication between supply chain actors and authorities
- AgVoice Global: voice-to-data capture
- New detection tools
  - E-tongue using AI and electrochemical sensors to test food products for fraud and adulteration (applicable for liquids and in the future solids)
- Electronic phytosanitary certification (ePhytos)
  - IPPC's ePhytos Solution Project allows countries without their own national system to produce, send and receive ePhytos in a harmonized format



Voice



Data



Analytics

# How do we create an enabling environment?

- Producers, processors and other private actors
  - Adopt technologies and new protocols
- National authorities and private sector
  - Develop new protocols for using technology in ATS and incentives for stakeholder buy-in
  - Strengthen human capital (extension services, education, training, digital skills)
  - Regulations that enable the adoption of digital technologies in livestock value chains
  - Improve digital and physical infrastructure
  - Facilitate public and private investments to support farmers and startups in livestock value chains.



Thank you!

