Design and Development of Traceability System for Poultry Processors

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Workshop on Development and Application of Trace Technologies for Food Safety & Quality
16 October, 2008
Agenda

• Overview of Poultry Supply Chain
• Traceability Systems for Poultry processors
• Case Studies
• Cost and Perceived Benefits
Poultry Supply Chain

Breeder Farm → Hatcher → Broiler Farm

Retailer ← Secondary Processor ← Primary Processor

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Traceability Systems

- Structures that facilitate the traceability process.
Traceability Systems

- Verifiable
- Cost Effective
- Applied Consistently
- Practical
- Results Oriented
- Defined precision requirements
- Compliant with regulations
Breadth

- Breadth is the amount of information in the traceability system records.
Breadth

Valuable and important information to be recorded and to be retrieved from the next/previous supply chain

- Farm Id
- House Id
- Harvest Date
- Vaccination
- Feeds
- Source of DOC
- Stocking Date
- Mortality Rate
- Feed Conversion Ratio
Depth

• Depth is how far back or forward the system tracks.
Full Chain

Breeder Farm → Hatcher → Broiler Farm → Secondary Processor → Primary Processor → Retailer
One Step Up & One Step Down

- Broiler Farm
- Primary Processor
- Retailer
Precision

- Precision reflects the degree of assurance with which the traceability system can pinpoint a particular food movement in the supply chain.
Precision

The trace unit may be a container, a truck, a crate, a shift, a day production etc

Larger trace unit

Lower precision
Precision

A Crate

A Despatch
Precision

One Shift Production

One Day Production
Precision

A Packet

A Pallet
Precision

A Pallet

A Container
Primary Production
Primary Production

A Farm

A productive unit made up of one or more houses that hold the broilers

Broilers are raised under same conditions

Isolated either by a perimeter fence or geographically
Primary Production

A Farm

Farm 1

Farm 2

Farm 3
Primary Production

A Batch

A group of broilers belonging to a given house

Farm 1
Slaughtering Plant
Slaughtering Plant

Slaughter Lot & Slaughter Sub-Lot

Slaughter Lot
- The number of slaughtered birds on the same day
- Composed of one or more slaughter sub-lots

Slaughter Sub-Lot
- Number of slaughtered birds on the same day
- Originating from one lot or one farm or one delivery
Slaughtering Plant

Production Lot & Production Sub-Lot

Production Lot

• All products (whole or cut-up, fresh or frozen), originating from one slaughter lot.

Production Sub-Lot

• All products (whole or cut-up, fresh or frozen), originating from one slaughter sub-lot.
Processes Affecting Precision

**Air Chilling**
- Continuous processes
- Carcasses are hang individually
- Separators can be easily applied between each slaughtering sub-lot
- Smaller trace unit, more precision

**Water Chilling**
- Continuous processes
- Mixing of chicken carcasses
- Slaughtering sub-lot difficult to apply
- Larger trace unit, less precision
Slaughtering Plant

Air Chilling

Farm 1

Farm 2

Farm 3

Slaughtering Lot

Slaughter Sub-Lot

Slaughter Sub-Lot

Slaughter Sub-Lot

Production Lot

Production Sub-Lot

Production Sub-Lot

Production Sub-Lot
Slaughtering Plant

Air Chilling

Farm 1

Farm 2

Farm 3

Slaughtering Lot

Slaughtering Sub-Lot

Production Lot

Production Sub-Lot

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Slaughtering Plant

Water Chilling

Farm 1

Farm 2

Farm 3

Slaughtering Lot

Production Lot

Slaughtering

Production

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FBO’s Decisions

- Traceability objectives & scope
- Processes and products nature
- Product risks & recall history
- Practicality
- Costs & benefits analysis
Case Study Malaysia

- **Company**: Lay Hong Bhd

- **Location**: Klang, Malaysia

- **Sector**: One of the leading poultry producers

- **Commitment**: Food Safety & Consistent Quality, HACCP & Veterinary Health Mark Certified

- **Strength**: Poultry integrator, Air Chilling technology, 15,000 – 25,000 birds per day

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Scope

Develop chain traceability

- Breeder farms, hatchery, broiler farms and slaughtering plant

One Product

- NutriPlus Chilled Whole Chicken
Traceability System

**Breadth**
- Breeder farms – Farm id, house no., parent stock, mortality rate & alerts, egg production and despatch lot id, etc
- Hatchery – Hatcher id, hatching rate, despatch lot id, etc
- Broiler farms – Farm id, house no., mortality rate & alert, feed conversion ration, despatch lot id, etc
- Slaughtering Plant – Halal slaughtering, dead on arrival, HACCP, etc

**Depth**
- From Chilled Whole Chickens trace back to the parent stock at breeder farms and vice versa

**Precision**
- Slaughtering lot for NutriPlus Chilled Whole Chicken
How is it done?

Enter Lot Id
Results

Mock recall demonstrated to Department of Veterinary Services (DVS)

- Random pick 3 Delivery Orders by the DVS officers
- Enter the unique identification (RG Code) printed on the Delivery Order
- Retrieve all information within a few seconds
- Status: Successful

Production efficiency

- Improve production efficiency
- Alerts to rectify issues

Speed of Traceability

- Manual: on average 1 – 2 hours
- Electronic: a few seconds
Case Study China

- **Company**: Beijing Dafa Chia Tai Co., Ltd.
- **Location**: Beijing, China
- **Sector**: a large modern agro-livestock enterprise
- **Commitment**: Food Safety and Quality Certification (ISO9001 & ISO22000)
- **Strength**: Poultry integrator
  - Good manual traceability system
  - 140,000 birds per day

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Scope

Develop Internal Traceability & Electronic Records

- Internal traceability for further processed product and electronic inspection records

One Product

- Yakitori Chicken
Traceability Systems

**Breadth**
- Slaughtering Plant – Broiler inspection, material inspection, semi-finished product inspection, processes, finished product inspection & containerization

**Depth**
- From Yakitori Chicken trace back to the broiler received from which farm(s)

**Precision**
- Production lot for Yakitori Chicken
How is it done?

Enter Lot Id
Inspection Report
Results

To be carried out on 17 October, 2008

- Evaluation of system
- Improvements
- Next steps
Costs & Perceived Benefits
Costs & Perceived Benefits

- **Cost to implement traceability system**
  - Malaysian Poultry operator: 1.44% net profits

- Traceability obligatory in EU and countries exporting to EU

- But: adoption of electronic traceability very slow

**Ilemma:** What are the perceived benefits?
Summary

- Committed to produce safe & quality food

- Little pressure because
  - Electronic & manual system in place
  - No recall or withdrawal so far

- Perceived benefits
  - Improved production efficiency
  - Improved speedy recall
  - Improved food safety

- Perceived benefits not strong enough to encourage fast deployment to other poultry products
Conclusions

Traceability is not yet fully understood

- FBOs currently value cost more than benefit
- Much of the “theoretical” benefits are not *perceived* as such
- Privacy plays an overly big role

Then traceability is going to be big

- Traceability will be the backbone of providing all interested parties with the right information
- Traceability will be a prerequisite, instead of an add-on
Thank You

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