Tracability study on casava export chain
• One step back

• Internal traceability

• One step forward
Methodology for studying produce chains in CR
Produce traceability: Project main phases

Phase I  Analysis and Design
Phase II  Field testing
Phase III  Replicates in different chains
Phase IV  Refinement and extension
Traceability system for fresh produce

Vision:

1. Measure export processes to meet food safety regulations
2. Identify current gaps that prevent a good registration, certification and traceability across the chain
3. Collaborate with the agro-industry and government institutions to increase capabilities
4. To lead the development of a centralized solution focused on helping SMEs
Principles of the methodology

- Covering the entire supply chain
- That integrates three areas: traceability, logistics and food safety
- To catch information required for process modeling
- To take into account the FDA regulations and best practices in food safety
- Systematic Tool: Different observers obtain the same data to analyze the processes in the same way
- Adapted to the reality of Costa Rica
Standard Methodology

FARM
- F-1: Planting
- F-2: Control
- F-3: Harvest
- F-4: Waiting to be shipped to packager
- F-5: Transportation to packager facility
- F-6: Quality control check points

PACK.
- P-1: Reception
- P-2: Weighing
- P-3: Temporary storage
- P-4: Internal transportation
- P-5: Waiting for processing
- P-6: Selection and classification
- P-7: Washing
- P-8: Other processing
- P-9: Drying
- P-10: Packaging
- P-11: Palletizing
- P-12: Storage at cold room
- P-13: Container loading
- P-14: Waiting to be shipped to port
- P-15: Quality control check points
- P-16: Temperature monitoring check points

TRANSP.
- T-1: Land transportation to port
- T-2: Waiting at port
- T-3: Customs inspection
- T-4: Ship loading
- T-5: Sea transportation

EEUU continuity…
Three lenses for processes analysis
METHODOLOGY

CHAPTER AND SECTION STRUCTURE

- Animal exclusion
- Handling
- Product preservation
- Management
- Materials
- Hygiene processes
- Sea/Land transportation
- Costs
- Equipment/Facilities
- Management
- Performance
- Practices
- Records & documentation
- Data collection
- Identification
- Practices

General
Quality
Logistics & Productivity
Traceability

9 questions
36 questions
66 questions
23 questions

Company information
Production information

36 questions
23 questions
66 questions
9 questions

134
Standard reference model

- Mapping of: physically flow, information flow and costs
- Opportunities for standardization
- Waiting points for product/data/information
- Data duplicities
- Automation opportunities
Characterization of the casava supply chain
Yuca in Costa Rica

World Wide
- 230 million tons produced in 2008
- Largest producer: Nigeria
- Largest exporter: Thailand with 77% of world export in 2005

Costa Rica
- Fourth largest exporter with 2.1% of world export
- Total export value for 2010: $52,000,000
  - USA: 61%
  - Europe: 21%
- 10 local packagers contribute to 54% of total export
- Farming is concentrated around La Fortuna, and Los Chiles
- Main variety cultivated
  - Señorita and Valencia
- Average FOB cost/Kg: $0.56
  - At packager
Yuca en Costa Rica

- More than 2,000 little farms in North Region (La Fortuna, and Los Chiles)
Results obtained
Trends in traceability

FINCA

F-1: Growing
F-2: Control
F-3: Harvest
F-4: Transportación to packager facility
F-5: Quality control check points

- Date/Hour
- Person who harvest
- Weight
- 1st y 2nd quality
- Owner of the farm

- Driver name
- Plate number

Kgs 1st y 2nd quality

Nothing

Nothing
Trends in traceability

**PRODUCTOR**

- **P-1**: Reception
  - Boleta de recibo
  - Nada

- **P-2**: Washing
  - Nada

- **P-3**: Drying
  - Nada

- **P-4**: Storage
  - • Grower name
  - • Date
  - Nada

- **P-5**: Parafinado
  - Nada

- **P-6**: Packing
  - Packaged product record

- **P-7**: Pallets conforming
  - • Lot number on the box
  - • Post-it with quantity of boxes per pallet
  - Nada

- **P-8**: Storage
  - Nada

- **P-9**: Container loading
  - Cargo map
  - Documents of shipping line

- **P-10**: Waiting for container loading

**Farms codes**

**Supervisor**

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**GEORGIA TECH Logistics Innovation & Research Center**

A Unit of the Supply Chain & Logistics Institute
Finding gaps and improvement opportunities

- Grower
- Gross / Net weight
- Weight per worker (harvest)
Transport – Entering into the packaging plant
Finding gaps and improvement opportunities

- Grower
- Date
- Driver
- Plate
- Kgs incoming product
Washing – Selection - Drying
Finding gaps and improvement opportunities

- Grower name
- Packing date
Temporal storage – “Parafinado” - Packaging
Finding gaps and improvement opportunities

- Julian date + Farm code
- 111 (21 abril) + 463
Finding gaps and improvement opportunities

- Quantity per lot per box presentation
Packaging records
Finding gaps and improvement opportunities

In mixed pallets:

- How many boxes of each lot in the pallet
Boxes codification
# Lot – Waiting for the container
Finding gaps and improvement opportunities

For each pallet within the container this paper records how many boxes of each lot
Loading map – Inspection – Container loading
Finding gaps and improvement opportunities

- Container inspection
- Container number
- Seal number
- Date/Hour incoming/outgoing
- Shipping Line
- Temperature/Ventilation
Shipping documentation
Current situation at packaging plant level:

- The tracking system operates to trace back but in an inefficient way
- It is even more inefficient when trying to trace forward
- Unsafe traceability practices in the plant
- Risks in the way the information is stored
- Not all information is being registered
Current situation at export chain level:

Oportunity to integer all chain information within the Single Window System
Findings

- Paper preponderance for information record
- Lot code based on the date of packing and internal code producer
- Few records at packaging plant
- No use of barcodes
- No records exist at the farm level
- Disruption of the data provided by the shipping company
- Possibility to trace back to the farm but in an inefficient way
- No segregation into little lots at farms
- Inappropriate practices for lots separation in temporal storage
- Poor separation of different batches when the truck is arriving
- It’s not a common practice to enter diverse product into the production process (low risk for mixing)
- The load map is critical because it is the only document that records the relationship: Client - # Lot
- Low record of cold chain (temperature)
Process modeling with xBPM software
Conclusions
Conclusions of this first experience

1. The country faces the challenge of helping small farmers. No record information culture

2. The main challenges lie in documenting processes, whether in farm or packing plant. As well as improve capabilities for tracing back and forward in less time

3. Systematic methodology to analyze the processes and facilitate graphical representation is essential to find issues and communicate findings properly

4. Prognosis of compliance with FDA regulations