Who is Carolina Innovative Food Ingredients (CIFI)?

Food ingredients manufacturing company founded in 2014 as a subsidiary of Universal Corporation

- Universal Corporation – leading global leaf tobacco supplier – 24,000 employees with operations in 30 countries.

- CIFI based in Nash County, N.C. (NE of Raleigh)

- Focus: juice and dehydrated products derived from locally grown sweet potatoes.
U.S. sweet potatoes are primarily grown for fresh market sale (“No. 1’s”). Non No. 1’s (“No. 2’s”) are just as wholesome and nutritious – just the wrong size for the supermarket aisle.
Fresh market demand for sweet potatoes had been increasing rapidly, creating a large supply of No. 2’s with limited demand.
How It Started

- Many No. 2 sweet potatoes were not being harvested by growers (plowed over) due to lack of demand.
- North Carolina Sweet Potato Commission, N.C. State University and others sought to develop and promote uses of sweet potatoes – investigated dehydration of sweet potatoes for pet food initially.
- Market demand is high for dehydrated sweet potatoes and derived products.
How It Started

• Dehydration’s high energy costs initiated an idea to “squeeze” the water out of potatoes prior to drying.
• 🌟 Any value to the squeezing's?

• Co-product concept: sweet potato juice and dehydrated pulp.
Expanding Veggie Juice Opportunities

- 2014: $12.5 billion
- 1.3% growth per year
- 1999: Health-conscious consumers
- Demand for new products is expected to expand juice production industry's revenue 1.3% per year to $12.5 billion
- U.S. juice market
- Citrus is continuing a pattern of decline, while vegetable juices are the most promising growth area
- 57% citrus juice
- 37.9% non-citrus juice
- 5.1% vegetable juice
- Growth area

- 17% of consumers agree that vegetable juice has fewer calories than fruit juice
- Juice buyers age 18-34: Significantly more likely to purchase products that offer functional benefits

Carolina Innovative Food Ingredients, Inc.
Why A Tobacco Company?

Sweet potato synergies with tobacco growing:

• Nearly 50% of the U.S. sweet potato production is in eastern NC – same area where majority of U.S. flue cured tobacco is grown.
• Similar growing conditions as tobacco.
• Rotation crop for tobacco.
• Similar harvesting labor requirements.
Why A Tobacco Company?

Further Synergies:

• Provides sweet potato growers a revenue opportunity for a portion of their crop currently of limited value.
• Enhances sustainability for the company and growers.
• Existing tobacco processing facilities provide site and back-office support for Greenfield facility.
The CIFI Sequence

Opportunity
- Increasing potato production to meet fresh market demands
- Limited demand for off-size potatoes

Concept Generation
- NC Sweet Potato Commission
- N.C. State University
- Industry consultant-entrepreneurs

Business Development
- Universal Corp.
- Pilot juicing trials
- Financial modeling
- Vendor engagement
- Process development

CIFI

Summer 2014
Founded Feb. 2015
Finished Product Development

Initial Process: Juice > Sterilize > Packing

Pilot Run No. 1: We learned about starch

2nd Generation Process: Juice > De-starch > Sterilize > Pack

Pilot Run No. 2: We thought we were there

Pilot Run No. 3: We learned about clarity

3rd Generation Process: Juice > De-starch > Filtration > Sterilize > Pack
Product attributes we determined could not be compromised throughout our process design iterations:

- Input potatoes locally sourced – GAP growers / robust traceability / low raw transport costs.
- Sustainable grower relationships.
- High capacity domestic juice supplier – volume / cost structure to compete with imported juice.
Product Attributes (cont.):

- Aseptic packaging capability / Just-In-Time delivery capability.
- Flexible product specifications – ability to customize products to customer requirements.
Greenfield Plant Initial Products

- Concentrated sweet potato juice
  - Varying levels of filtration.
  - Acidified or non-acidified.
  - Frozen or aseptically packed.
- Dehydrated sweet potato pulp
  - Human or pet food.
  - Granules to flour.
- Single-strength sweet potato juice
Juice Filtration Possibilities
Dehydrated Sweet Potato

- Used for both for pet and human food.
- Gluten-free, low glycemic index.
- Natural sugar source.
Implementation

Concurrent Activities Prior to Plant Opening:

- Raw material sourcing: relationships and system building.
- Staffing.
- Marketing / branding.
- Sales development.
- Regulatory and quality systems development.
- Product development.
- Process design / plant construction.
CIFI Capabilities

Installed Production Capabilities:

- Year round raw material storage.
- Broad input product size capability.
- Juice clarification.
- Juice filtration.
- Evaporation.
- Refrigerated, frozen, or aseptic packaging.
- Dehydrate product grinding – flour.
CIFI Timeline

- Process / plant design initiated: Aug. 2013
- First pilot plant trials: Nov. 2013 (JBT)
- Second pilot plant trials: May 2014 (JBT/UofF)
- Building construction initiated: Sep. 2014
- Third pilot plant trials: February 2015
- Plant production starts: October 2015
Our Facility
Lessons Learned:

- Pilot process runs are critical / build pilot line first.
- Vendor / contractor selection is critical.
- Flexibility in process and equipment design is a key to profitability.
- Estimate a project timeline and then double it and pray for good weather.
More Lessons Learned:
The Catch-22’s for a Greenfield juice business:

• Orders are needed to begin production / Customers don’t order until they can inspect facility during production.

• Production must be underway for final quality certifications / customers reluctant to purchase until quality certifications are in place.
Questions?

Thank you!