



College of Agricultural &  
Environmental Sciences  
UNIVERSITY OF GEORGIA

# UGA's FoodPIC Center

Part of UGA's Food Science Extension

# FoodPIC = Food Product Innovation and Commercialization

- A Food Production Test Site & Pilot Plant
  - Solving Problems
  - Finding Innovation
  - Commercializing Great Food Products
- Built for Safe, Regulatory Compliant Food Production
- ‘Flash Factory Capable’
- Part of UGA Food Science & Technology Extension

# Facility Basics

- On UGA's Griffin Campus
- 3 independent processing halls, QA lab, and shelf-life testing area.
- 4 walk-in freezer and cooler sets
- Built to exacting food hygiene standards
- Designed for Flexibility and Growth
  - Electric – 3 Phase 480V and more
  - Steam – for future boiler and steam operations
  - Natural Gas
  - H. and C. Water
  - Compressed Air
- Bench and Pilot Scale Equipment

# Food Science Extension Services

Check All that Apply

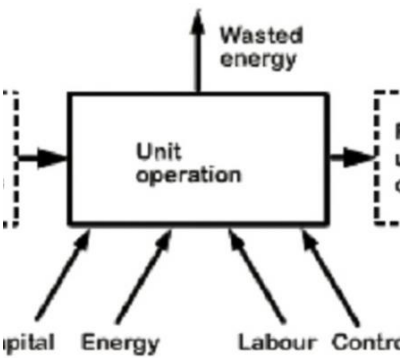
- ☐ Product Development
- ☐ Package Development or Identification
- ☐ Regulatory Classification
- ☐ Food Safety Evaluation (HACCP and Other Preventive Controls)
- ☐ Process Development including for Thermal Processes
- ☐ Pilot Plant Services
- ☐ Costing and Business Model Development
- ☐ Nutrition Facts Panel Development
- ☐ Shelf-Life Evaluation and Analysis
- ☐ Initial Sales Sample Product
- ☐ Start-Up Production
- ☐ Scale-Up Assistance
- ☐ Other Analytical Services (microbiology, challenge studies, proximate analysis)



# Scale



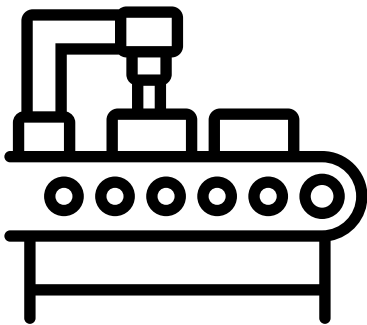
Development  
Kitchen



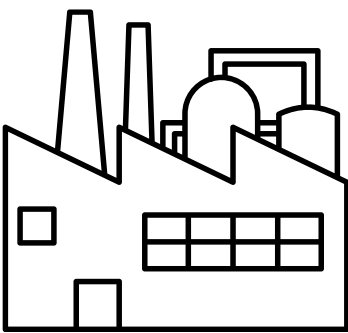
Unit  
Ops



Insight into  
Industrial Scale



Small  
Production



Manufacturing

Product  
Units/Day

1 - 10

10-100

100-1,000

1,000-5,000

10,000+



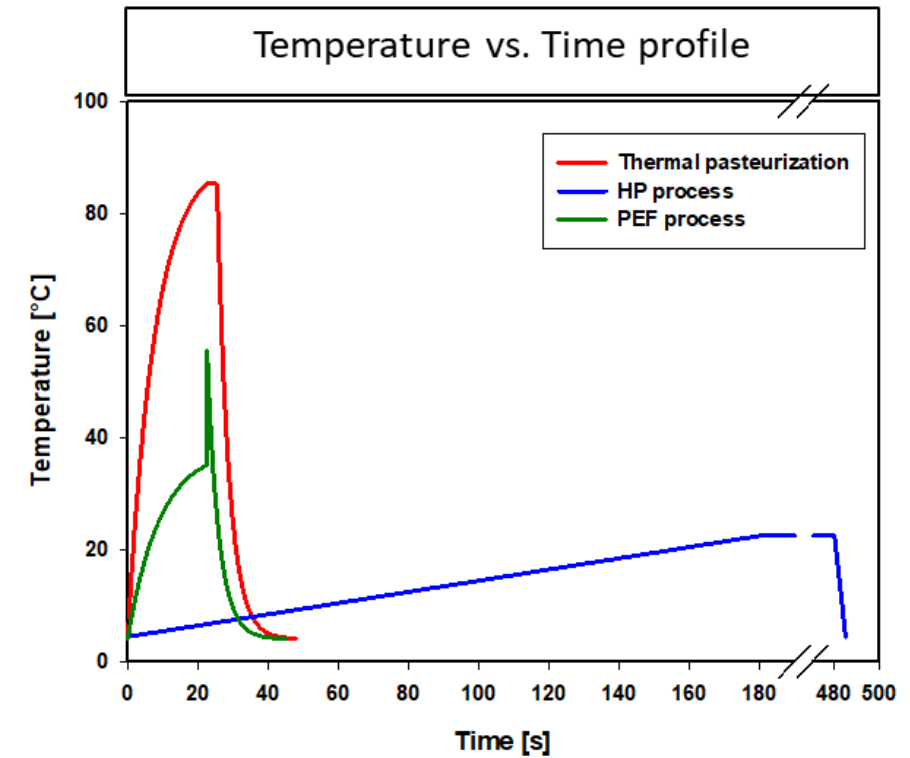
# Pulsed Electric Field as an Alternative to HPP

*Within 3 weeks, we enabled:*

- Custom Utility Drops
- PEF Equipment Set-up and Calibration
- Connection to Georgia Produce Business
- Sample Product Production
- Inoculated Pack Challenges
- Fulfillment of Marketing Logistics
- Removal of Equipment
- A Satisfied Customer



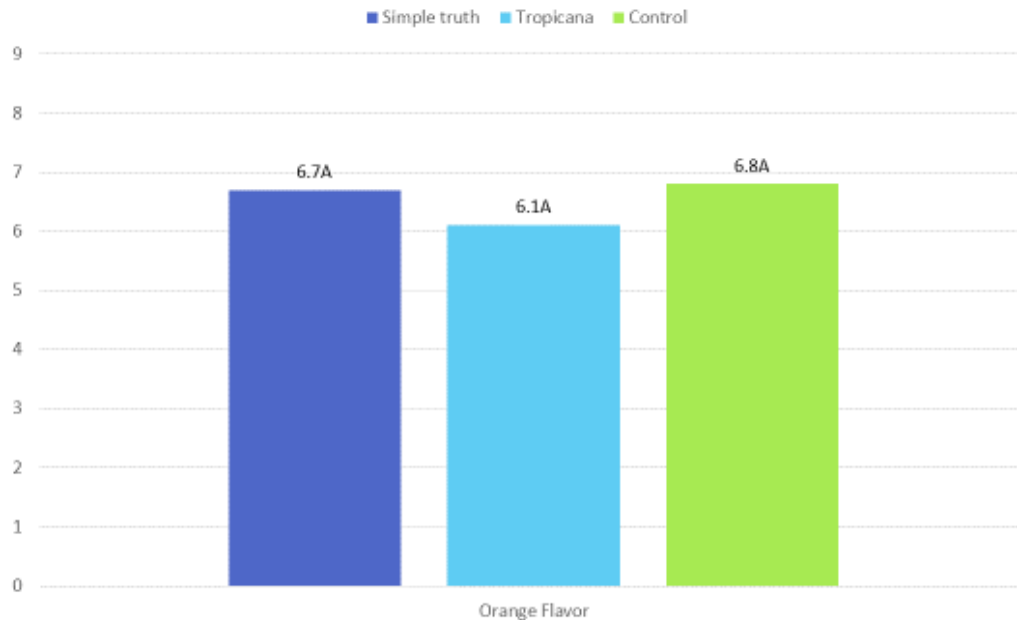
**Food Science & Technology**



**Pulsed Electric Field Processing  
for a Better Juice**

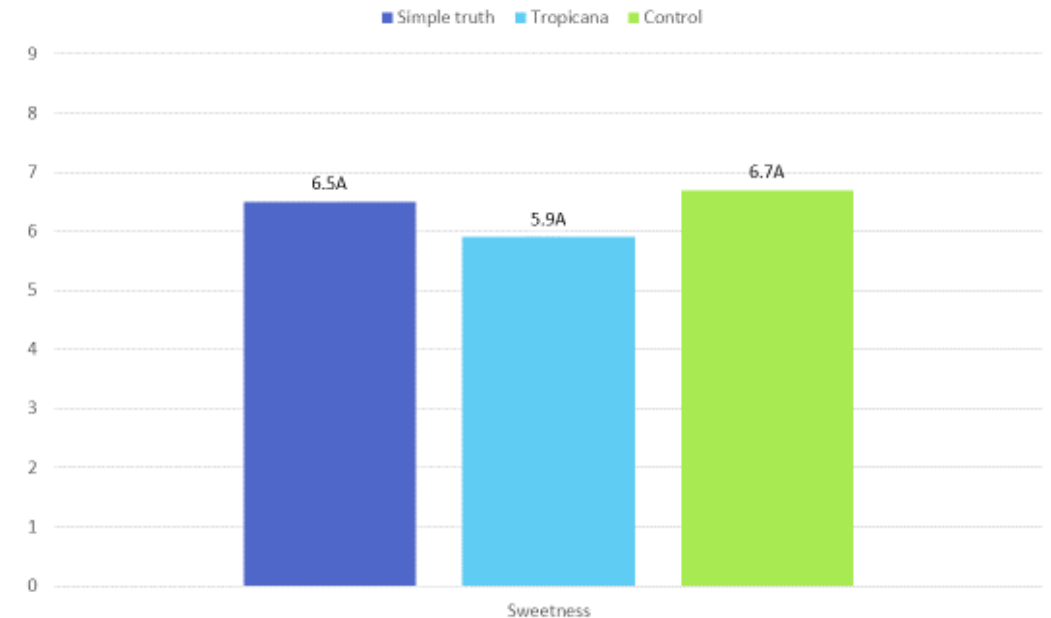
# Could PEF processing be considered as Premium, as Fresh as HPP?

## Orange Flavor – Liking



Scale Values: 1-9

## Sweetness – Liking



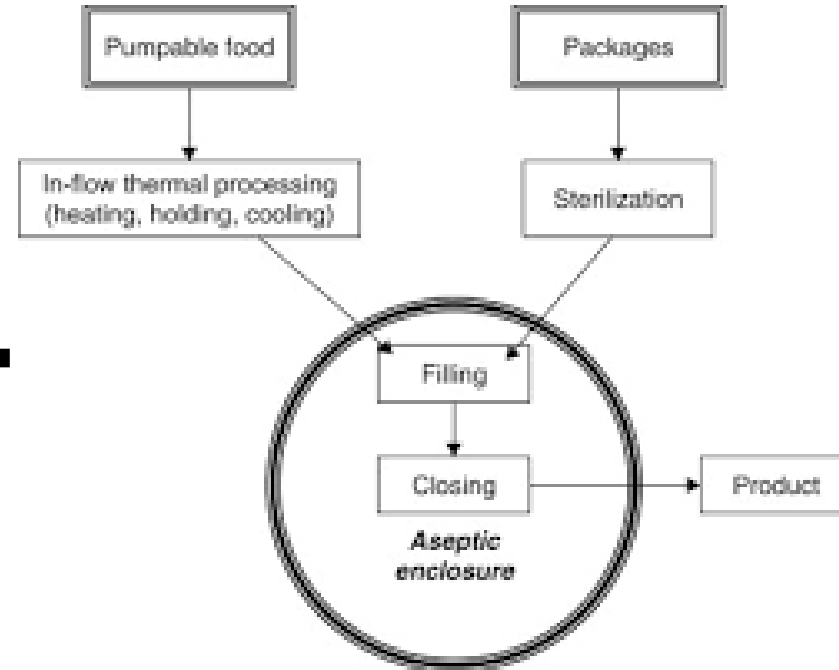
Scale Values: 1-9



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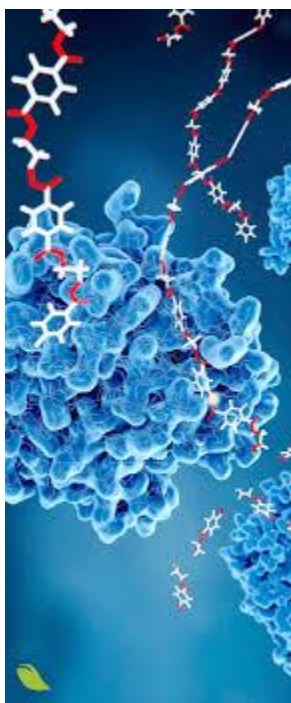
Long Life Nut Milks



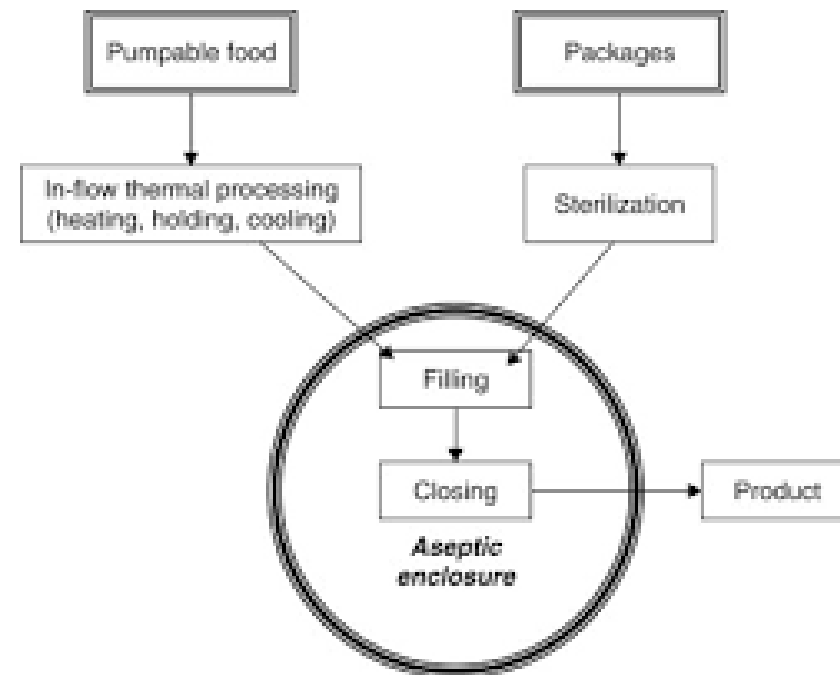


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# ENZYMES



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Long-Life Grain Milks

# Pecan Milk – the Next Alt-Dairy

- Aseptic Processing
- Basic Unit Operations
  - Roasting
  - Milling
- Emulsification Properties
- Sensory Testing



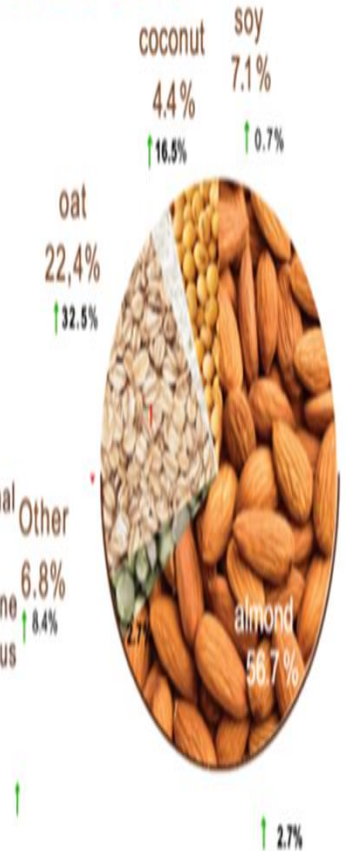
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## PLANT-BASED MILK CATEGORY

\$2.8 B + 3 YR CAGR: 11%

- Now more than 15% of overall milk market, 25% retail shelf space \*
- Plant-based creamers grew 24% in dollars and 12% in units while dairy creamer shrank 1.4%
- New brands/sku's gain trial as consumers seek better taste/nutritional profile ^
- Future growth cannot come from California nuts. Almonds alone use 10% of California's water. Only pecans are native, and thus climate-resilient.

PKN does not use a drop of California water.



Aseptic Technology + Food Chemistry

# What happened in 2019 with Peanut Milk?

Peanut milk product discontinued after just 2 years

May 21, 2019



Elmhurst has discontinued its line of peanut drinks just two years after launching the products. The change includes Milked Peanuts–Chocolate, Chocolate Peanut Protein and Vanilla Protein Shakes. The company stopped making the original Milked Peanuts drink at the end of last year.

“We made this tough decision based on manufacturing difficulties involving peanuts,” Elmhurst said in a statement to its customers. “By removing this ingredient from our portfolio, we will create more capacity—both in research and production—for the exploration of new, innovative products.”

Why did it fail?

Taste?

Need State?

Marketing / Branding?

Determination?

Hypothesis:

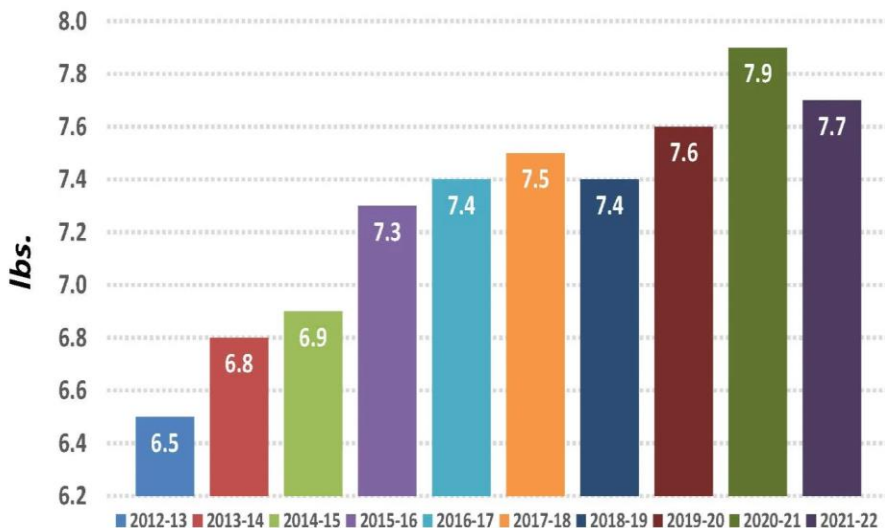
If a product is sensational tasting, fits a need state and well marketed, it will work in the US, but be prepared to start small. This is true of Peanut Milk Too!



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# A Need for Innovation

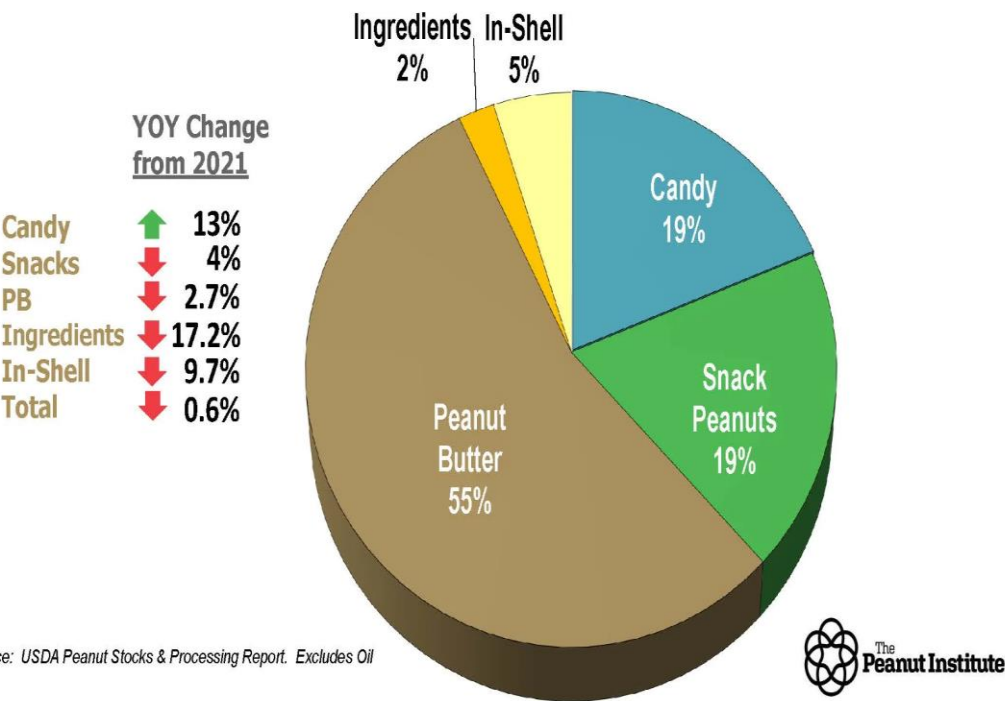
## Peanut Per Capita Consumption



Source: USDA & Census Data. Excludes Peanut Oil



## Total U.S. Peanut Consumption by Category (2022)



Source: USDA Peanut Stocks & Processing Report. Excludes Oil



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# Branding Matters



## WHY PB2?



- ✓ 32 OZ. BOTTLE
- ✓ 6 G OF PLANT-BASED PROTEIN
- ✓ VEGAN, AND GLUTEN-FREE
- ✓ FRESHLY ROASTED PEANUTS
- ✓ THE ORIGINAL PB POWDER



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# The Design of a Future Peanut Milk

Need State: Health, Crave-able, Sustainable.

*Play down Vegan but it is a must. Higher Protein. Plant Based. US Grown. Sustainable measures*

Taste: Very High Liking

*Overall liking scores among concept acceptors should be 7.5 or higher on 9 pt. scale*

Marketing / Branding: A build off a logical existing brand or new

*Start Small and Local. Create a following in the southeast and let it spread from there. Digital marketing to push virality.*

Determination:

*Manufacturer and Brand owner will need to have patience. Time to second acceleration could be a few years.*



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# Equipment

## Sanko Stick Pack Filler

- Stick Packs from 0.5 to 30 grams
- Highly convenient packages replacing plastic bottles
- Powders of all types including spices, herbs, collagen, drink mixes, proteins , etc.



# Equipment

## Microthermics Liquid Pasteurizer

- Hot-Fill, HTST Pasteurizer, Aseptic Sterilizer
- An all-in-one liquid processing system
  - Indirect Heating
  - Steam-Injection/Vacuum Cooling
  - Homogenization
  - Clean Hood Filling
- A great simulation system for many product types

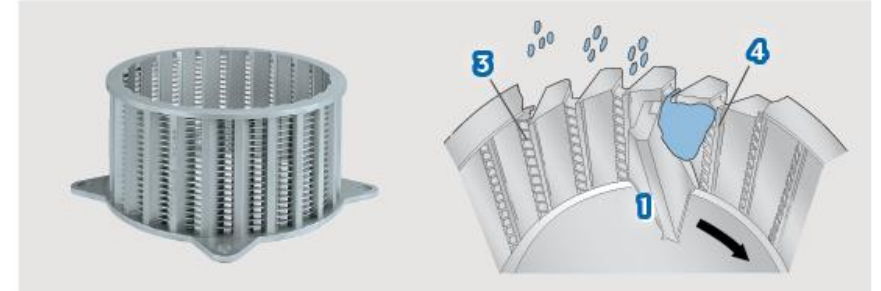




# Equipment

## Urschel Laboratories Communion

- Milling and Grinding
- A combo system mill or puree just about anything
  - Pulpy to Silken
  - Nut Butters
  - Vegetable and Fruit Purees
  - Nut Milks
  - Hot Sauces



# Equipment

## Other

- UHT, Aseptic, Hot Filling Test Lab
- Over Pressure Retorting
- Urschel Milling System
- Decanting
- Spray Dryer
- Air Dryer
- Heating Kettles
- Bar Extruder
- Dry Mixer
- High Shear Liquifiers
- Truck Oven
- Impingement Oven
- Cryo Freezer

## Packaging

- Liquid
  - Bottles
  - Cans
  - Jars
  - Paper Cartons
- Trays, Cups & Pouches with MAP
- Vacuum Sealing
- Stick Packets

# FoodPIC Next Steps

- Improving Daily
  - Job Handling, Documentation and Agreements
  - Sanitation and cGMP's
  - Improved & New Service Products
    - Shelf-Life Testing
    - Aseptic and ESL Processing Pilot
    - Retort System (Summer 2023)
    - Hot Filling System (Summer 2023)
  - FDA and GDA Inspection
  - Supplement Manufacturing Standards
- Strategic Planning
- Outreach & Expansion to Industry

