

On-Farm Dairy Processing Webinar

May 21st, 2020, 7-8pm

Cornell Cooperative Extension
Harvest New York



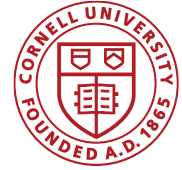
**Agriculture
and Markets**

Cornell Cooperative Extension

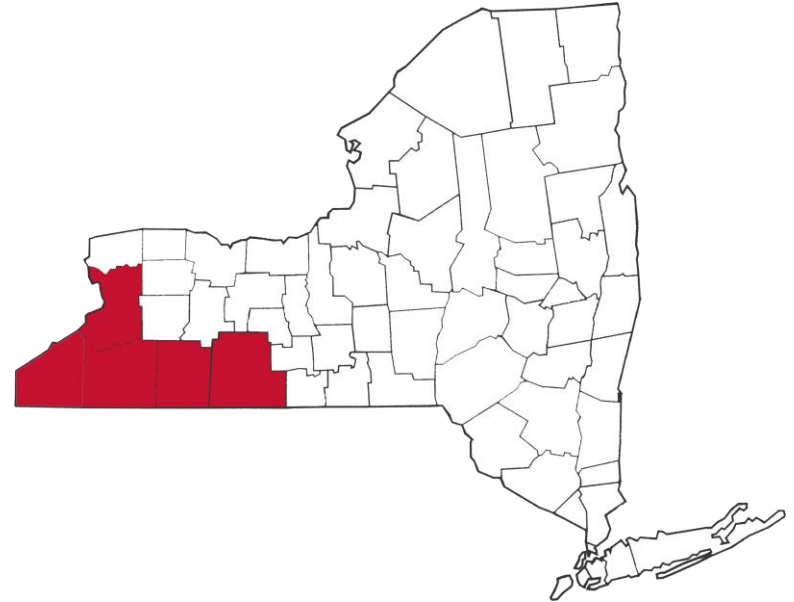
Southwest NY Dairy, Livestock and Field Crops Program

Alycia Drwencke

Dairy Management Specialist

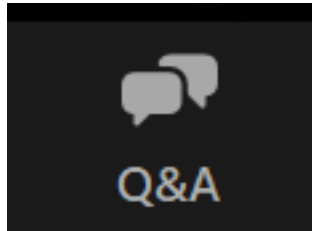


The **Southwest New York Dairy, Livestock & Field Crops Program** is a Cornell Cooperative Extension partnership between Cornell University and the CCE Associations in 5 counties.



House Keeping Items

- This webinar is being recorded
- Everyone is muted
- Please place your questions in the “Q&A” box
 - You can up-vote questions you would answered
 - We will address questions at the end



Survey

- We greatly appreciate your feedback!
- 5 min or less
- Will appear at the end of the webinar and emailed with the recording

Speakers

Anika Gianforte



Becca Durant



Contact information

- Alycia Drwencke, SWNYDLFC Program
 - amd453@cornell.edu | 517-416-0386 | <https://swnydlfc.cce.cornell.edu/>
- Anika Gianforte, Harvest New York Program
 - <https://harvestny.cce.cornell.edu/>
- Becca Durant, Department of Agriculture and Market's Division of Milk Control and Dairy Services
 - <https://agriculture.ny.gov/dairy/milk-inspections>



Cornell CALS

Life-Changing Research, Education and Outreach

Anika Gianforte

Dairy Processing Specialist

*Harvest NY, A Cornell Cooperative Extension
Program*

Background

- Program focus on agricultural economic development in New York State
- Two dairy processing specialists

<https://harvestny.cce.cornell.edu/>

Cornell Cooperative Extension
Harvest New York



Motivations for Value-Added Ventures

Current market conditions

- “The milk price is low, we need to differentiate or vertically integrate”

Next generation

- “We need to create room for the next generation to come home”

Passion

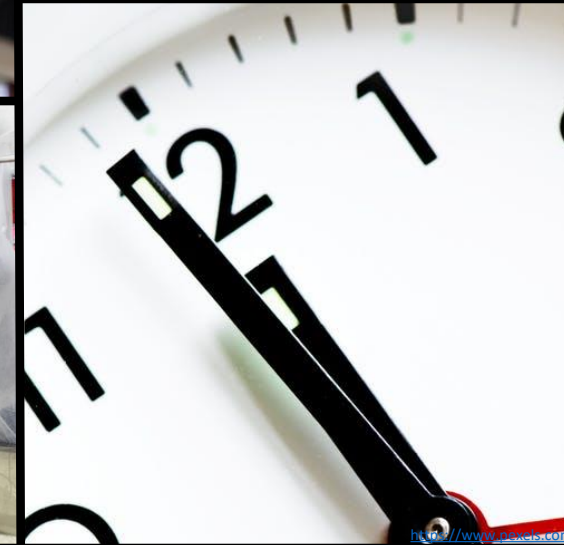
- “I know I can create a great product”

Should the Dairy Farmer be the Dairy Processor?

Maybe, Maybe Not

Skills for Success

- **Marketing**
 - Know-how
 - Time
 - Motivation
 - Logistics
- **Processing knowledge**
- **Understand regulatory and food safety requirements**
- **Time**



Marketing- Considerations

- Myth
 - If you build it they will come*
- Who/where is your market?
 - Seasonal?
- Who is doing the marketing?
- Time

Product

Price

Place

Promotion

Marketing- Considerations

- Product
 - What *exactly* is your product, and what need does it fill for consumers?
- Price
 - How much do you want to buy your milk for? What are consumers truly willing to pay for your product?
- Place
 - How are you going to get your product to the right place? Where is the right place?
- Promotion
 - Promoting your product to your customers.
 - Consumers
 - Other businesses

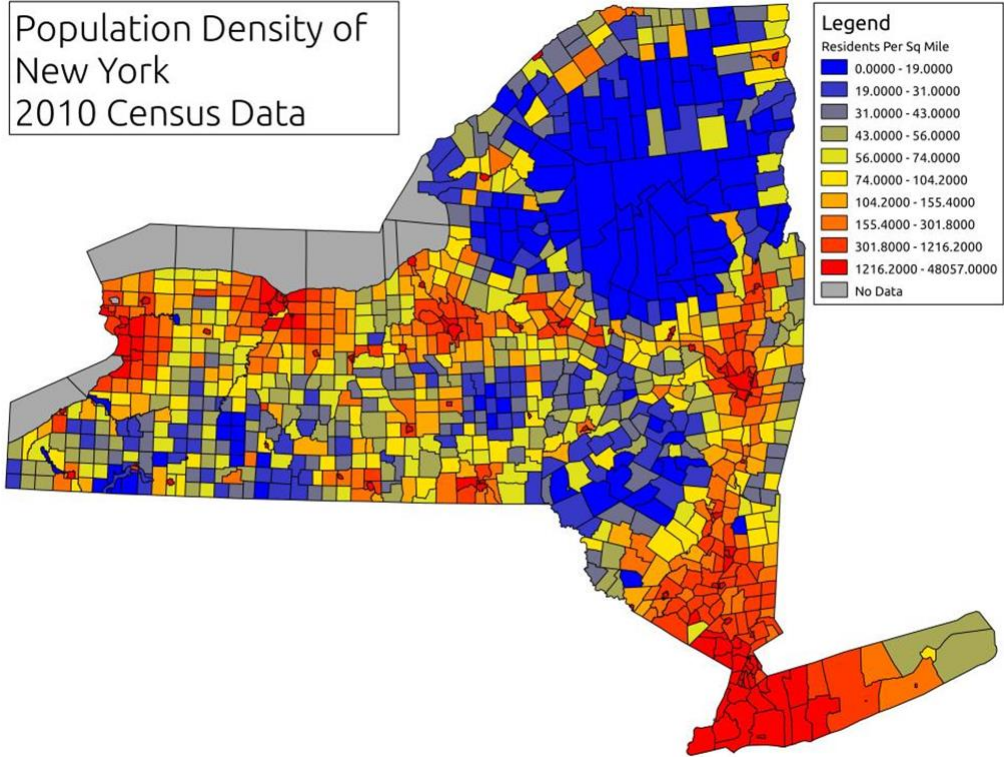
Marketing- Logistics

- Don't underestimate the time it takes to get your product where it needs to go
- Determine what volume you need to move through potential customers to make it worth the trip



<https://www.pexels.com/photo/map-maps-american-book-32307/>

Where is your Market?



Processing Knowledge

1. Does it taste good?

- Getting recipes right takes effort and knowledge
- Don't just ask your close friends

2. Is it safe?

- Food safety regulatory and customer requirements become more stringent



Processing Knowledge

- Recommendations
 - Get training before breaking ground
 - Test out your recipes at a processing facility before building a plant
 - Understand the regulatory requirements at the State and Federal level before entering the business

Dairy Extension

[About Us](#) [Programs](#) [Services](#) [People](#) [Affiliations](#) [Food Safety Resources](#) [News](#) [Calendar](#)



WELCOME

The Cornell University Dairy Foods Extension team, with the [Department of Food Science](#) in the [College of Agriculture and Life Sciences](#), is a diverse group of faculty and staff with extensive knowledge that spans nearly all aspects of dairy science and technology.

While our mission is to provide information and training programs to the dairy production and processing sectors, consumer questions and concerns are addressed as well. The Dairy Foods

UPCOMING COURSES

[2020 Course Schedule](#)

<https://dairyextension.foodscience.cornell.edu/>

Understanding Food Safety

Do you see more food recalls in the news?

- Food is not becoming less safe, but we are better than ever and tracking down where outbreaks come from
- Food companies of all sizes need to be on top of food safety issues
- Stakeholders:
 - State agencies
 - Federal agencies
 - Customers
 - Consumers

PulseNet uses DNA fingerprinting of the bacteria that are making people sick to detect outbreaks. PulseNet has detected thousands of local and multi-state outbreaks since it began in 1996. As a result of PulseNet, we have been able to prevent foodborne outbreaks and continuously improve our food safety systems – changes that might not otherwise have occurred. [PulseNet International](#) performs a similar role for foodborne illnesses that occur around the world.

Pathogens Covered

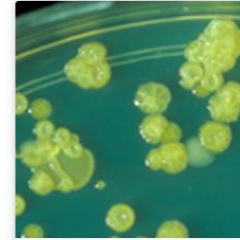
PulseNet detects subtypes of:



E. coli O157*



Campylobacter



Cronobacter



Listeria monocytogenes



Salmonella



Vibrio cholerae



Vibrio parahaemolyticus



Shigella

* and other Shiga toxin-producing *E. coli*

Time

Dairy processing is not a
part time job

- Marketing
- Production
- Record keeping
 - Food safety plan
 - Sanitation documentation
 - Production records/traceability
 - Training
- Dedicated Personnel

Other Business Considerations

- Understand your cooperative's requirements
- Is co-packing an option as you start up and become familiar with your market?
- Building a plant- not just a processing room
 - Don't forget room for sanitary entry, sampling and product retention, packaging storage, chemical storage, refrigerated storage, and room for growth
 - Poor facility design can make or break a business (food safety)

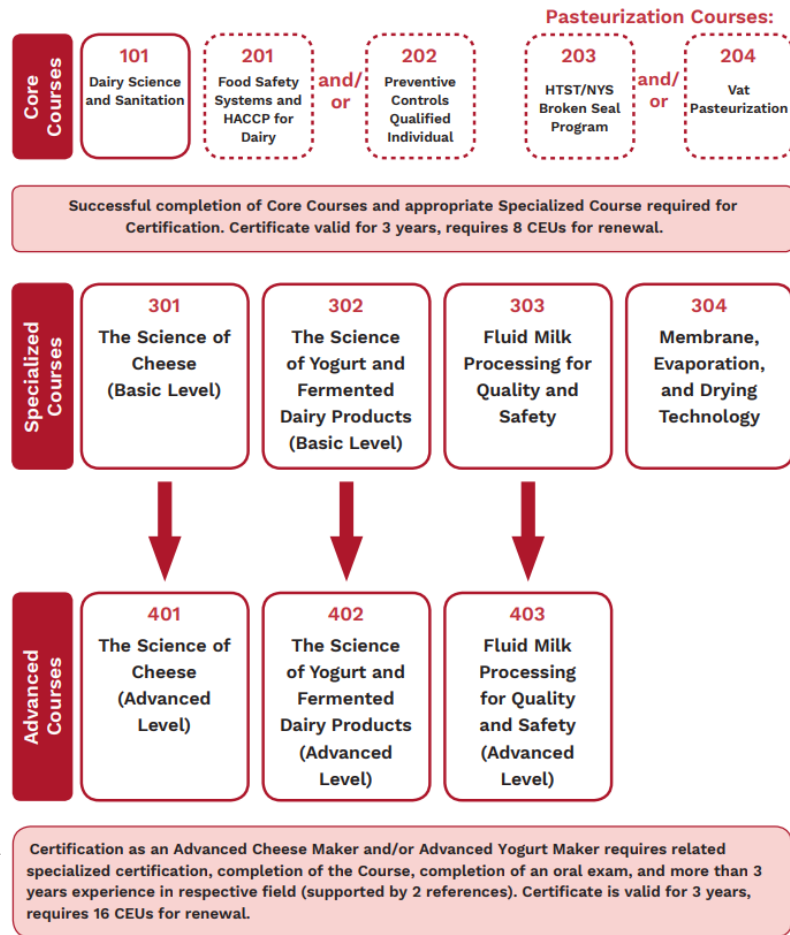
Other Business Considerations

- The type of products you want to make has a strong influence on facility design and size
- Cleaning chemicals specifically formulated for dairy food processing equipment and environments!
- Some products may require a scheduled process

Cornell Resources

- Certificate program
- Extension associate consultation
- Food Processing Development Laboratory
- Reach out to us!
 - <https://harvestny.cce.cornell.edu/>
 - <https://dairyextension.foodscience.cornell.edu/>

Steps to Earning a Certificate



Key Points

- Are you ready to run a completely different business?
- Planning is key: Marketing & Distribution, Industry Knowledge, and Time Allocation
- Food safety requirements are a major component that should be understood before operation
 - Critical to stay open
 - Important for customers
- Reach out to our team with questions

Anika Gianforte: adz8@cornell.edu

Karen Ospina: karen.ospina@cornell.edu

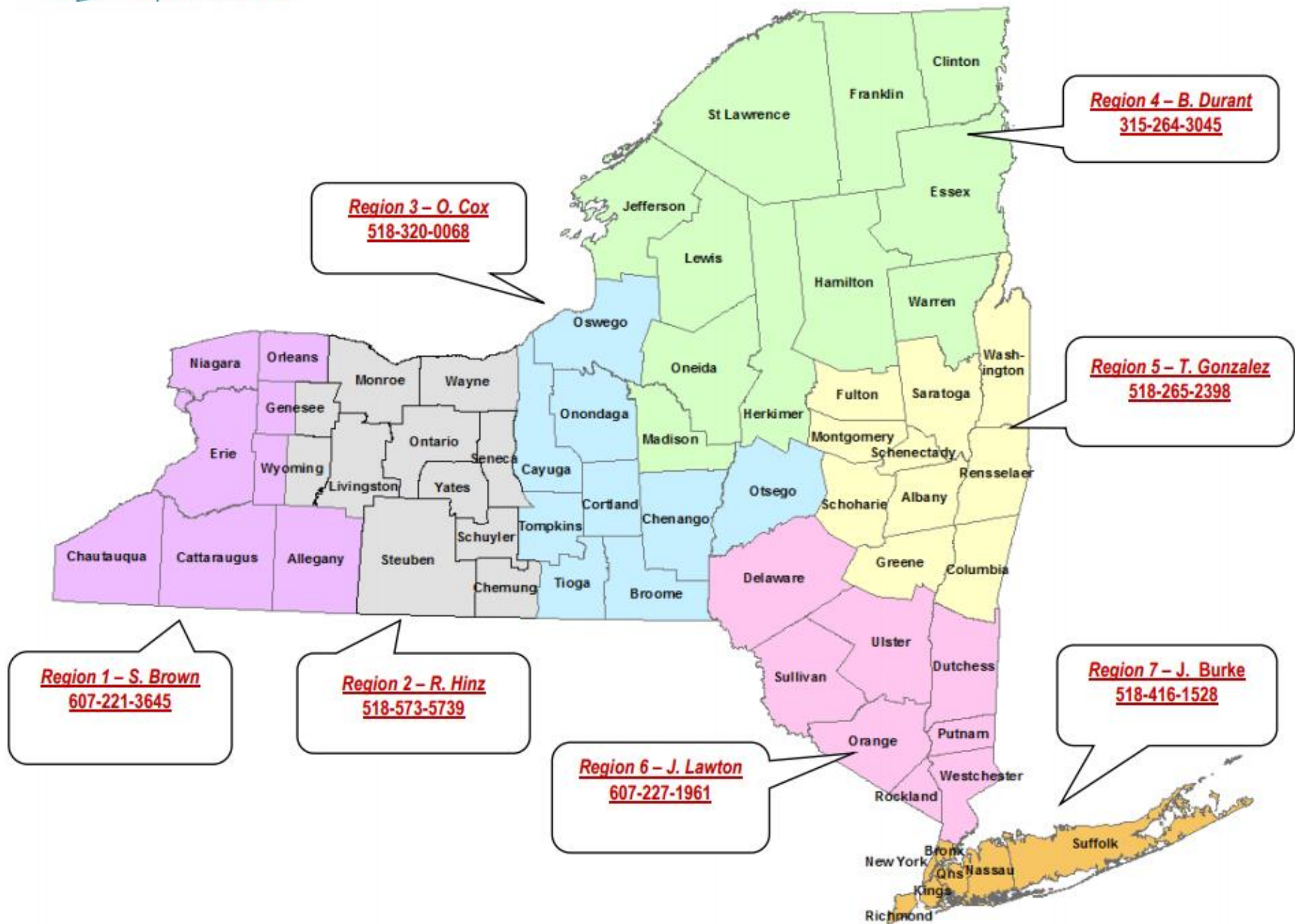


**Agriculture
and Markets**

**Small Scale Commercial Value Added
Dairy Production
Regulatory Perspective
May 21, 2020
Becca Durant**

NYS Department of Agriculture & Markets

Milk Inspection Regions



New Plant/Product Start-Up

How Ag & Markets Helps

- Review general plan, suggest direction
- Review regulations & required permits
- Equipment guidance, review & approval
 - will not recommend (discourage junk)
- Site visits
 - Building, equipment, property
- Label review for compliance
- Inspection, testing, inspection, testing

New Plant/Product Start-Up= Paperwork

Milk Dealer License

Part 2 Permit

Processing Plant Superintendent (PPS)

Wholesale Frozen Dessert

Milk Receivers License

FDA registration under the Bioterrorism Act of 2002

NYS Agriculture & Markets Home Page

<http://www.agriculture.ny.gov>

----select "Milk and Dairy"

----select "Dairy Businesses"

DECIDING ON A PRODUCT

- FLUID MILK
- YOGURT
- PASTEURIZED CHEESE
- RAW MILK CHEESE- AGED AT LEAST 60 DAYS
- SOUR CREAM
- COTTAGE CHEESE
- CULTURED MILKS
- BUTTER

Facility Planning and Plan Submission Process

- DMC 1505 Application to install or Modify Dairy Processing Equipment
- DMC-1512 Application to Install or Modify HTST Pasteurizer
- DMC-1517 Application to Install Farm Milking Equipment
- Instructions for DMC-1505 and DMC 1512=> milk plant
- Installer Guidelines for DMC-1517 => Dairy Farm

New Plant/Product Start-Up

Contact the Regulatory Agency

- Put everything in writing before starting construction!
- Prepare a General Plan DMC-1505; present to NYSA&M
 - Product, varieties, volumes, containers, labels
 - Ingredients, product storage & distribution
 - Facility construction and layout;
 - building materials, lighting, proximities, zoning
 - receiving, storage, processing areas, raw/pasteurized
 - utilities, boiler room, lab, toilet, septic/waste disposal

New Plant/Product Start-Up

Premises, Equipment, Process

Suitable Building

- water (h/c), utilities, waste disposal

• Building Layout

- separate rooms, ventilation, lighting, sufficient room for equipment

• Toilet & Hand Washing Facilities

• Processing Equipment

- Legal pasteurizer, filler/packaging, storage tanks, handling packaging, capping, labeling, records



New Plant/Product Start-Up

Premises, Equipment

- Packaging and Labeling
 - Appropriate/approved packaging-food grade
 - Appropriate/approved labels-Albany review
- Finished product storage & handling
 - Temperature/humidity/light control
 - Protection from damage/tampering
- Finished product distribution
 - Vehicle suitability
 - Temperature/humidity/light control
 - Protection from damage/tampering
 - Returned product not reprocessed



Plant Layout- Keeping Food Safety in Mind

- Plant traffic flow must be from low risk to high risk
- Keep raw with raw & pasteurized with pasteurized
- Keep a dry environment
- Product storage to eliminate contamination
- Limit access to essential personnel
- Know what allergens you have and how to control cross-contact

DMC-1505

1. Process Narrative

- A process narrative detailing the scope of the project including, but not limited to, the start date, product type, the type of equipment to be installed, the flow of product within the system, unique instrumentation and other detailed aspects of the process as applicable. Some detailed aspects could include **process temperatures, flow rates, storage times, etc.**

DMC-1505

2.Plans

- Detailed plans of the process flow including both product and CIP. Process and Instrumentation drawings (P&ID) and other types of flow diagrams must be color coded to differentiate between product, CIP, water and others.
- These drawings must also be coded for direction of flow with arrows. Process modifications must show differentiation between the modifications that are new and those that are not changing. Please include a symbol key with all types of drawings. In addition to process flow drawings, a plant layout

DMC-1505

3. List of Equipment

- Include a list of equipment and appurtenances to be installed with applicable documentation specifying material type and finish, including gaskets, o-rings, valve seats, etc.
- Also include any certifications that will aid in approval (ex. 3-A certifications, compliance with CFR, FDA issued equipment M-b).
- **Be sure that the information submitted is specific to the model of equipment you are installing. Please do not submit brochures listing specifications for several different models.** This information may be included within the process narrative. Please note that equipment is not required to be 3-A certified to be acceptable, however, the 3-A standards may be employed as reference during the evaluation of equipment.

DMC-1505

4. Installer Information

- Include a list of installers / fabricators and contact information. Any outfit performing sanitary welding of stainless steel in a dairy operation must be registered with this Department (application available on web site).

Make Procedure for Individual Products/Flavors

- Step-by-step procedure
- List of ingredients
- How ingredients are added/blended
- Equipment used
- Time, Temperatures and pH
- If flavorings are not commercially prepared or packaged
- Process authority may be required

Plant Records

- Appendix N
- Plant inspections-90 days
- Pasteurizer inspection-90 days
- Product Sampling Results- Monthly
- Vitamin sample results- 6 months
- Vitamin reconciliation log
- Water samples- 6 months
- Licensed Milk Receivers- Annual
- Food safety plan
- Environmental monitoring plan

FSMA- Food Safety Modernization Act

- Will require documentation of:
 - GMP training
 - SOPs
 - Hazard Analysis
 - Allergen control
 - Process controls
 - Recall plan
 - Environmental sampling
 - Supply chain controls

Water Supply

- Do you have enough water- hot and cold?
- Private or municipal supply?
- If private- proper location and construction.
- No cross connections between safe and unsafe supplies
- Samples are taken every 6 months on private wells/
recirculated cooling water/ glycol

Cleaning and Sanitizing Containers and Equipment

- All multi-use containers and utensils thoroughly cleaned after each use
- All equipment thoroughly cleaned at least once each day used (24hrs.)
- Storage tanks shall be cleaned when emptied (emptied at least every 72hrs.//frozen dessert plants-96hrs.)
- Raw milk storage tanks & silos used to store product longer than 24hrs.require 7 day temperature recorder

Raw Milk Cheese

- Must be aged minimum of 60 days.-(maintain accurate record keeping)
- Cheeses must be identified
- Aging room maintained at a temperature not lower than 35°F.
- Daily temperature check of aging room and written log maintained
- Control of cheese mites-(fumigants //heat room 140°F for 30 minutes)
- Aging begins AFTER cheese is brined
- Tested for Listeria Monocytogenes monthly



Pasteurization

- Vat pasteurization
 - 145°F for 30 minutes
- Fat content 10% or greater / added sweeteners legal past. Temp = 150°F. (eggnog and ice cream mix heated to at least 155°F for 30 min.)
 - Airspace temperature- 5°F above **LEGAL** product pasteurization temperature
 - Leak detect valve –meets regulatory requirements
 - Approved indicating, recording and airspace thermometers (appendix H of PMO)
 - Recording charts have required information.

VAT PASTEURIZATION



Pasteurization continued

- HTST PASTEURIZATION

- 161°F for 15 seconds
- If fat content is 10% or more, or product contains added sweeteners HTST past temp. increases to 166°F.
- Eggnog and ice cream mix heated to 180°F for 15 seconds (175°F/25 seconds).
- Annual HTST training course held at Cornell University.



A stainless steel control panel with a large circular gauge on the left side, featuring a red needle and a black dial. To the right of the gauge are two toggle switches and a digital display. Below these components is a row of seven buttons with different colored caps (red, white, black, white, black, white, black). The panel is mounted on a stainless steel frame.

A smaller stainless steel control panel with a prominent red emergency stop button and a power switch, connected to the main apparatus by various wires.

A complex network of stainless steel pipes and valves, including a vertical column with multiple stages of internal components, likely for distillation or filtration. The system is supported by a stainless steel frame.

A large stainless steel pot with a sloped lid, mounted on four legs. It is connected to the piping system above it.

A second large stainless steel pot, similar in design to the first, also mounted on legs and connected to the piping system.

A white plastic bowl with a blue rim and a white handle, sitting on the floor in the foreground.

A window with a white frame, located on the right wall of the room, providing natural light to the area.

A vertical yellow metal beam or support structure on the right side of the image.

Cooling of Milk and Milk Products

- Milk products (raw and pasteurized) stored at 45°F or less.
- Containers must be filled when the milk is cold.
- Each refrigerator room is equipped with an indicating thermometer in warmest section of room.
- Each storage tank equipped with indicating thermometer
- Recirculated cooling water from safe source & properly protected-tested semi-annually.

Packaging

- All milk and milk products bottled and packaged at plant where final pasteurization is performed
- All bottling and packaging performed on approved mechanical equipment (includes manually operated valves)
- Capping done in a sanitary manner-(no hand capping-3 gallon or more exceptions)
- Drip deflectors installed on each filler valve-protection from condensation
- Overhead shielding as required (form, fill, close)

Small Bottle Filler



Special Challenges

- Meeting airspace heating requirements/ reduced batch sizes
- Raw milk storage- processing every day- every other day- once per week?
- Waste management/disposal of whey and fat
- Adequate space/separate rooms
- Fabrication of processing/filling equipment for small scale production –proper construction
- Sizing of your plant- starting too small to save money can become a problem if successful
- Record keeping, marketing, distribution

QUESTIONS PP