State of New York
Department of Agriculture & Markets

Governor Andrew M. Cuomo
Commissioner Darrel J. Aubertine

Chris Hylkema
Dairy Products Specialist II
PPS Update 2013
Overview

- Division of Milk Control & NYS dairy update
- 2013 IMS Proposals
- Broken Pasteurizer Seals
- Pasteurizer Charts
- Proper Cleaning Chemical Review
- Equipment Install / Modification Application Process
- Equipment Review
Division of Milk Control

• Casey McCue promoted to Division Director in June 2012

• Division staff:
  • Field Staff:
    • (6) DPS 2 - Regional Supervisors
    • (27) DPS 1
      • Includes 8 LEO, 5 Farm SRO and 3 Plant / Farm SRO
    • (1) DPS 2 - Dairy Equipment Review & IMS Program
  • Albany Office:
    • (1) DPS 1 - Labeling
    • (1) DPS 2 - Product Compositional Standards Compliance
Milk Inspection Regions - 2012

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Patrick Mest
Skip Wilson

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Division of Milk Control

- Casey McCue – Director
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- Kathy Laviolette – Labeling
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- Kris Danielsen – Product Sampling, Identity and Compositional Standards
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- Charles Lindberg – Laboratory Evaluation Program
  - Charles.lindberg@agriculture.ny.gov

- Chris Hylkema – Equipment Review & IMS Program
  - Christopher.hylkema@agriculture.ny.gov

- Staff Map and other info on Department Website
  - http://www.agriculture.ny.gov/
Division of Milk Control

- Currently have 341 process facilities statewide – this is a 31% increase since 2008 (234)
- In 2012 we conducted over 6600 inspections & investigations (17 categories)
  - 2200 plant inspections and 1610 pasteurizer inspections
- Collected 25,000 Official product samples
- Federal Work
  - Rating officers completed 89 ratings (plant & farm)
  - Lab evaluation officers completed 80 lab evaluations
NYS Dairy Growth

- In 2011, New York’s dairy manufacturers employed 8,070 people with total wages of $414 million – 14% increase since 2005
- Dairy farming and processing combined presents a total impact of $8.9 billion to New York’s economy
Yogurt and NY

- Gov. Cuomo held “Yogurt Summit” in August 2012
- Since 2000, the number of yogurt processing plants in New York has increased from 14 to 29
- From 2005 to 2011, New York's yogurt plants doubled in production. Over the same time period, the amount of milk used to make yogurt in New York increased dramatically from 158 million pounds to about 1.2 billion pounds
Pasteurizer Seals

- Broken seal program allows plants to legally pasteurize milk or milk products if certain conditions are met.
- Applies to DMC/DS applied seals on public health controls on HTST, HHST, & certain vat pasteurizers (Anderson AJ 300 R/C).
Pasteurizer Seals

Order of Events

- Plant determines repairs are needed to a sealed piece of equipment
- Plant contacts (by phone) DPS assigned to plant or Supervisor
- Plant makes necessary repairs to equipment
  - Note - Repairs must actually correct a problem with the public health control
Order of Events (con’t)

- Relevant tests are performed on the equipment by certified plant personnel and the test results are recorded
- A temporary seal is applied to the equipment
- Contact DPS to set up time for testing
- Take samples for phosphatase analysis upon start up and every 2 hours during processing and/or whenever product change over occurs
Order of Events (con’t)

- Samples are tested by a laboratory accredited (IMS) or licensed and approved (NYS) for testing and the results recorded
- Product processed under the temporary seal is placed on hold
- DPS conducts relevant tests, re-seals equipment, reviews plant broken seal report, equipment test and phosphatase test results. If OK- product released for sale
Pasteurizer Seals

What is Needed to Participate in the Program?

- Trained and certified plant employee(s) (Re-certified annually)
- **Written test procedures specific to each pasteurizer and each seal**
- **Testing equipment**
- Temporary seals (no specifications)
- Report form (no specifications)
- Proper sampling equipment
HTST Chart Requirements

- Plant name and location
- Date
- Identification of pasteurizer if more than one
- Name or initials of operator
- Cut-in & Cut-out temperatures at start of production day
- Reading of indicating thermometer at beginning of day and immediately upon chart change
- Volume & Identity of each product in the run
- Record of any unusual occurrences
- Record of the position of the FDD (frequency pen purpose)
Northern Food & Dairy Inc.
710 West 1st Street
P.O. Box 525
Fosston, MN 56542
Plant #27-111
Location: Ever MagFlow
Date: 6-19-01
S. 00 Am
Proper Detergent

- Chlorinated Alkaline Cleaner – for dairy / food processing equipment
  - NO HOUSEHOLD TYPE DISH SOAPS (Dawn, Joy, etc.)
- Need higher Chlorine content to remove fat / proteins
- Test daily upon makeup
Cleaning Review

- **Proper Acid**
  - Proper Strength (verify by testing) and Type for your process
  - *Talk to supplier* about maintaining your stainless

- **Consider your water and process**
  - Hard water / high heat
  - *Milk stone starts to form above 140°F (60°C)*
  - Raw side of operation may only need occasional acid
  - Yogurt makers *may* want to start with acid wash before detergent – *talk to your supplier*
Proper Sanitizer

- EPA Registered
- Instructions for sanitizing non-porous food contact surfaces, dairy / food – need to be available (ex. **Mix this much into that much water to get this much PPM sanitizer**)
- Test the strength daily
- **STAY CLEAR OF:**
  - “Splash-less” Clorox Bleach
  - Scented bleaches – lemon fresh, springtime, etc.
- Plants with Receiving bays
  - Make sure that sanitizer is readily available to drivers to sanitize pumps and other hand wash items – **your personnel are signing the wash tags!!**
Cleaning Review

- **Manual wash**
  - High foam / lower temperature for hand wash
  - Mechanical action – a.k.a. **ELBOW GREASE**
  - **Brushes** – solid nylon bristles, hard plastic handles
    - No wood handles, NO SPONGES
  - **Scouring Pads**
    - Steel wool / SOS-type pads will **RUIN** your stainless steel
      - Removes the passive layer / could lead to rusting and corrosion
    - Green or maroon scrubby pads – THOUGHTS FROM THE GROUP ON THESE??????????
Cleaning Review

- CIP Cleaning
  - Work with suppliers on proper process but..........
  - REMINDER – still a lot of hand wash items even with a CIP system – **don’t forget the prep work**
    - air blow assemblies, check valves, door gaskets, plug valves, butterfly valves, sample cocks, pump impellers.................
Great Cleaning Resources

Dairy Practices Council Guideline #29: Guidelines for Cleaning and Sanitizing In Fluid Milk Processing Plants

- $6.00 – available at www.dairypc.org
- YOUR CHEMICAL SUPPLIER
The Dairy Practices Council publishes educational guidelines for the dairy industry. We are a nonprofit organization of education, industry, and regulatory personnel concerned with milk quality, sanitation and regulatory uniformity.
New equipment installations require an application to review plan and process

- 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.

- Detailed plans that include product flow (P&ID) and locations of equipment including drain layout in relation to equipment, distances to walls and other equipment. Please include a key with all drawing types.
New equipment installations require an application to review plan and process – (cont.)

- List of equipment to be installed including any applicable documentation that will aid in approval (ex. 3A certifications, compliance with CFR, FDA issued equipment M-b) – this information may be included within the process narrative.

- List of installers / fabricators and contact information including anyone conducting sanitary welding of stainless steel.
Equipment / Process Modifications

- If installing a HTST / HHST:
  - Need form DMC-1512
  - Full schematic of unit
  - Ladder Logic for PLC
  - Wiring Diagram for Dairy legal box
Equipment / Process Modifications

- It is suggested that you make purchases contingent on final approval by regulatory authorities.

- Eventual Plan:
  - New application process / add to website
  - Revise HTST / HHST application
  - Add documents to website – PMO, FDA Red Cow Book, FDA Dairy Product Equipment Review Guideline, etc
Equipment Installation Review

References:
- 3A Standards
- USDA Equipment Guidelines
- Equipment manufacturers
- PMO
- NYCRR Part 2
- CFR
Equipment Installation Review

• **Materials:**
  - 300 series Stainless Steel 304 or 316 (not 301 / 302)
  - Finish / Surface Texture
    - $R_a < 32\text{µm} (0.8\text{µm}) = \text{No. 4 Finish} = 150 \text{ grit}$
  - Aluminum & Copper (limited use)
  - NO LEAD – white “dairy metal” contains up to 5%
  - Brass & Bronze not acceptable
  - Rubber & Plastic Materials – 3A Std. 18-03 and 20-20, also CFR 177.xxx
Equipment Installation Review

- **Construction**
  - Food contact surfaces free of sharp corners & crevices
  - Easily disassembled for cleaning
  - Self draining

There should be no threads on product contact surfaces except where necessary for non-permanent joints in piping and for making various attachments to equipment.

- Thread angle less than 60° and no more than 8 threads per inch (JP or John Perry fittings / bevel seat fittings) – manual clean
- Other particular functional applications – separators, high pressure nozzles on dryers

- Proper radii on internal angles (1/4” on angles 135° or less)
- Welds are continuous / Surfaces not overlapped
**Square Corner/Radius**

Unacceptable

SQUARE CORNER

Acceptable

RADIUS

(Required size of radius depends upon application)

**Internal Angles and Corners**

Unacceptable

Acceptable

Figure 3

Figure 4

Permanent Joints – Welded

Unacceptable

Acceptable

Lap weld

Butt weld

Source: EHEDG and Trends in Food Science and Technology (1995) Vol. 6(9) pp. 306 (modified)

Figure 11
Acceptable Sanitary Thread

\[ P = \text{PITCH} \]

\[ SD = \text{SINGLE DEPTH} \]

\[ TF = \text{TOP FLAT} \]

\[ BF = \text{BOTTOM FLAT} \]

\[ TPL = \text{TH'DS PER INCH} \]

\[ P = \frac{1}{TPL} \]

\[ SD = 0.433 \times P \]

\[ TF = 0.250 \times P \]

\[ BF = 0.227 \times P \]
Bolts in Product Areas

Unacceptable

Acceptable

Unacceptable

Acceptable for limited application (such as attaching pump impeller to shafts)

Figure 6

Source: EHEDG and Trends in Food Science and Technology (1995) Vol. 6(9) pp. 305-310 (modified)

Equipment Installation Review

- Connections / Valves
- **Close Coupled:** Should mean mating surfaces or other juxtaposed surfaces that are less than twice the nominal diameter or cross section of the mating surfaces or a maximum of 5 in. (127 mm) which ever is less.

- “Prominent” chemical / CIP representative stated that “anything \( > 1.5d \) **WILL NOT WASH**”
Dead Ends

Unacceptable

Acceptable

Equipment Installation Review

- Proper shielding – for tank openings / filling machines
- Placement of Equipment
  - Not over drains
  - Away from walls – need room to clean around
  - Pay attention to traffic patterns to avoid possible contamination issues
    - Cheese vats, flavoring / mixing vats, etc.
- Understand operation and care / maintenance
Acceptable Shields and Covers

Equipment Supports and Mounting

Unacceptable

Acceptable

Source: EHEDG and Trends in Food Science and Technology (1995 Vol. 6(9) pp. 305-310) (modified)

Figure 7

Vat Chart Information

- Date
- Vat ID / Recorder ID
- Name of Dairy Plant
- Signature or Initials of Operator
- Name and amount of each product by a batch or run on the chart
Vat Chart Must Show:

- Continuous record of the product temperature
- Extent of holding time including fill and emptying times for HOT fill and emptying (cooled outside vat)
- Air Space thermometer reading at start & end of holding period
- Mark beginning of hold time
- Reading of the indicating thermometer at the start of holding at a given time or reference point as indicated on chart
- Record of any unusual occurrences
IT vs. RT Check

Airspace checked at beginning

MARK START OF HOLD

AS at end
Vat Construction

- Vats must be built to meet or exceed 3A standard 24-03 for non-coil type batch pasteurizers
- Leak detect outlet valves must be built to 3A standard 56-00
Vat Instrumentation

- Indicating Thermometers, Airspace Thermometers, Recording Devices must meet criteria as stated in Appendix H of the Pasteurized Milk Ordinance (PMO)
- This includes mercury in glass (MIG) and digital
Vat Instrumentation

- IT – 1°F Increments (2°F if only for >160°F)
- AS – 2°F Increments
- RT - 1°F – 10 minutes – 12 hours
- RT - 2°F – 15 minutes – 24 hours (when unit is used only for >160°F)
Vat Pasteurization

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>145°F</td>
<td>30 minutes</td>
</tr>
</tbody>
</table>

*If the fat content of the milk product is 10 percent or more, or if it contains added sweeteners, the specified temperature shall be increased by 5°F (3°C); provided, that eggnog and frozen desserts shall be heated to at least the following temperature and time specifications:

| 155°F       | 30 minutes |

*Must maintain airspace temperature ≥5°F higher than minimum pasteurization temperature throughout hold time

Cream for butter making – 165°F for 30 minutes
Vat Operating Standards

- Vat cleaned, sanitized and drained (including outlet valve, and appurtenances)
- Outlet valve fully closed and capped off prior to fill
- Chart in place – see next slide
Chart Information

- Date
- Vat ID / Recorder ID
- Name of Dairy Plant
- Signature or Initials of Operator
- Name and amount of each product by a batch or run on the chart
Chart Must Show:

- Continuous record of the product temperature
- Extent of holding time including fill and emptying times for HOT fill and emptying (cooled outside vat)
- Air Space thermometer reading at start & end of holding period
Chart Must Show: (continued)

• Mark beginning of hold time
• Reading of the indicating thermometer at the start of holding at a given time or reference point as indicated on chart
• Record of any unusual occurrences
Vat Operation cont.

- All required thermometers in place
- All covers positioned and closed
- Fill pipe **DISCONNECTED** prior to pasteurization beginning
- Agitator Operating
Remember......

- Nothing added after start of holding time
- No overlapping of charts
- Any interruption.....START OVER!!!! – lid or cover opened up, loss of temperature, agitator stopped
Adding Ingredients Post Pasteurization

Every person who operates a milk plant at which frozen desserts are manufactured shall ensure that all flavoring agents added to frozen desserts after the frozen desserts have been pasteurized are sterile, aseptically processed or otherwise treated to a temperature which will render them free of all pathogenic bacteria, or alternatively have a water activity (aw) value of 0.85 or less or have a pH level of 4.6 or less. All flavoring agents shall, insofar as possible, be completely used up during each day's manufacturing.
2. All milk and milk products, i.e., milk solids, whey, nonfat dry milk, condensed milk, cream, skim milk, etc., eggs, egg products, cocoa, cocoa products, emulsifiers, stabilizers, vitamins and liquid sweeteners shall be added prior to pasteurization. Provided, ingredients which may be added after pasteurization are those flavoring ingredients and other ingredients which have been found to be safe and suitable and which include:
   a. Ingredients permitted by the CFR standards of identity when considering a standardized milk or milk product;
   b. Fresh fruits and vegetables added to cultured milk and milk products provided the resultant equilibrium pH level (4.6 or below when measured at 24°C (75°F)) of the finished product is reached without undue delay and is maintained during the shelf life of the product.
   c. Ingredients subjected to prior heating or other technology, which has been demonstrated to FDA to be sufficient to destroy or remove pathogenic microorganisms;
   d. Ingredients having a $a_w$ of 0.85 or less;
   e. Ingredients having a high acid content (pH level of 4.6 or below when measured at 24°C (75°F)) or high alkalinity (pH level greater than 11 when measured at 24°C (75°F));
   f. Roasted nuts;
   g. Dry sugars and salts;
   h. Flavor extracts having a high alcohol content;
   i. Safe and suitable bacterial cultures and enzymes; and
   j. Ingredients, which have been found to be safe and suitable by FDA.

All such additions shall be made in a sanitary manner, which prevents the contamination of the added ingredient or the milk or milk product.