Mondelēz International
Dairy Products Processing
Expectations

Web Seminar for MEU & EEMEA based Dairy Suppliers of MDLZ

September 03, 2014

Agenda Topics

- **Introduction and Company Presentation**

  Manfred Kerner — **5 min**

- **Introduction of Microbiology Department in Mondelēz International**

  Peter McClure — **5 min**

- **Mondelēz International Dairy Products Processing Expectations**

  Karen Crowley — **30 min**

- **Supplier Food Safety Assessment: most common issues**

  Karen Crowley — **20 min**

- **Questions** — **30 min**

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OUR DREAM: CREATE DELICIOUS MOMENTS OF JOY

We offer many of the world's favorite brands

Mondelēz International
the power of big. and small.

Fast Facts

- net revenues of $35 billion in 2013
- global snacks powerhouse
- products marketed in 165 countries
- #1 in biscuits, chocolate, candy & powdered beverages *
- #2 in gum & coffee *
- over 100,000 employees
- donated more than one billion servings of food since 1997

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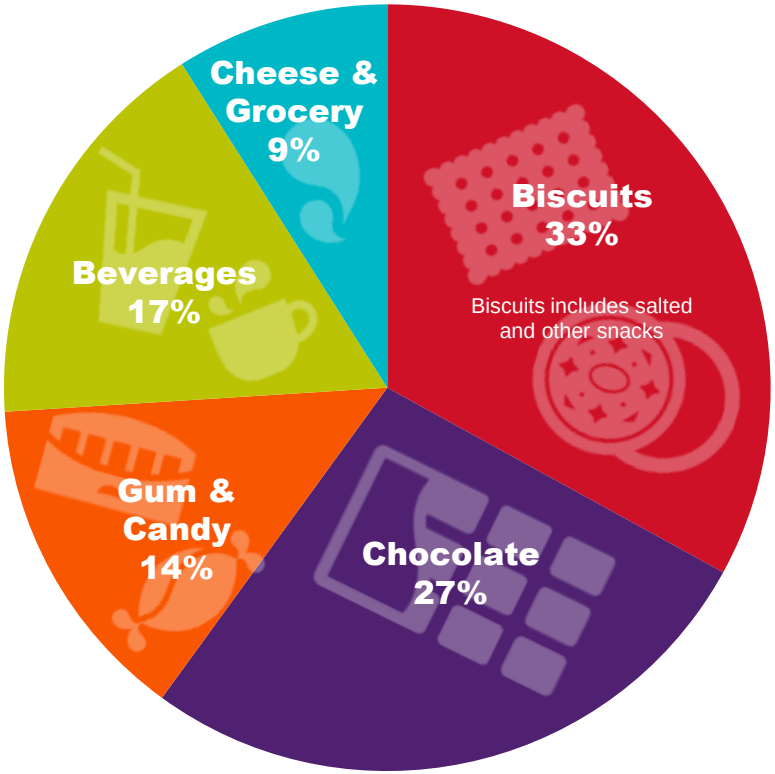
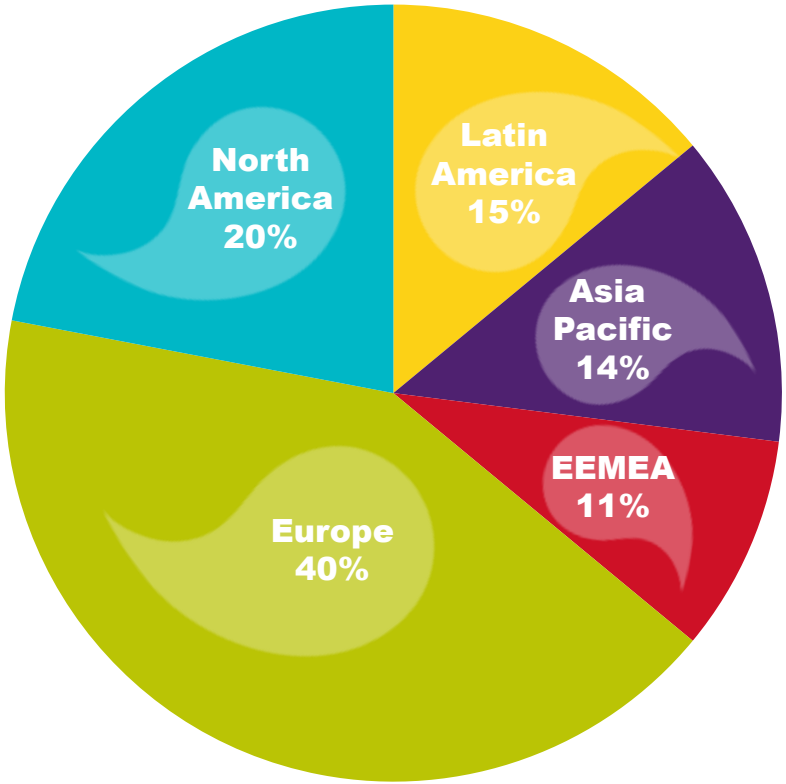
* Source: Euromonitor market share

A Global Snacks Powerhouse with Net Revenues of $35 billion in 2013



Nearly 75% of revenues in fast-growing snacks categories



80% of revenues come from outside North America

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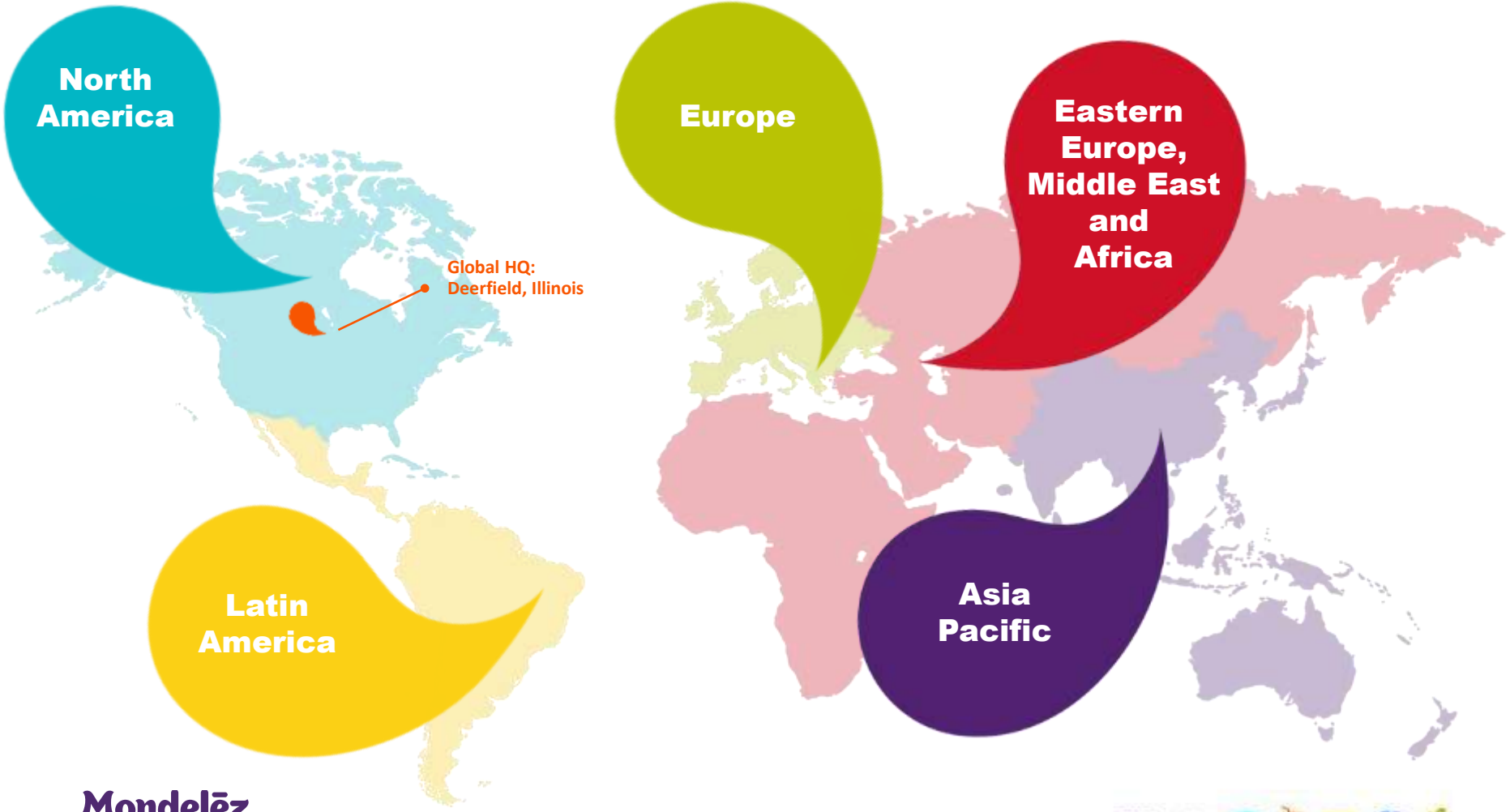
Our Regions



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Supplier Quality Management at Mondelēz Intl

A comprehensive approach to managing supplier quality

Policy/Contract Requirements

- Quality Policy
- WW Supplier Quality Expectations (SQE)
- Supplier HACCP Manual
- Material Specifications

Selection/Approval

- Risk Assessments
- Supplier Pre-Assessment
- Quality Audit Approval
- Approval of material

Monitoring

- Continuous Quality Audit Program
- Food Safety Assessments
- COA Verification
- Materials Monitoring Program
- Supplier Performance Monitoring

Continuous Improvement

- Supplier Quality Partnerships
- Supplier Development
- Supplier Forums
- Supplier QI Program
- Industry Benchmarking

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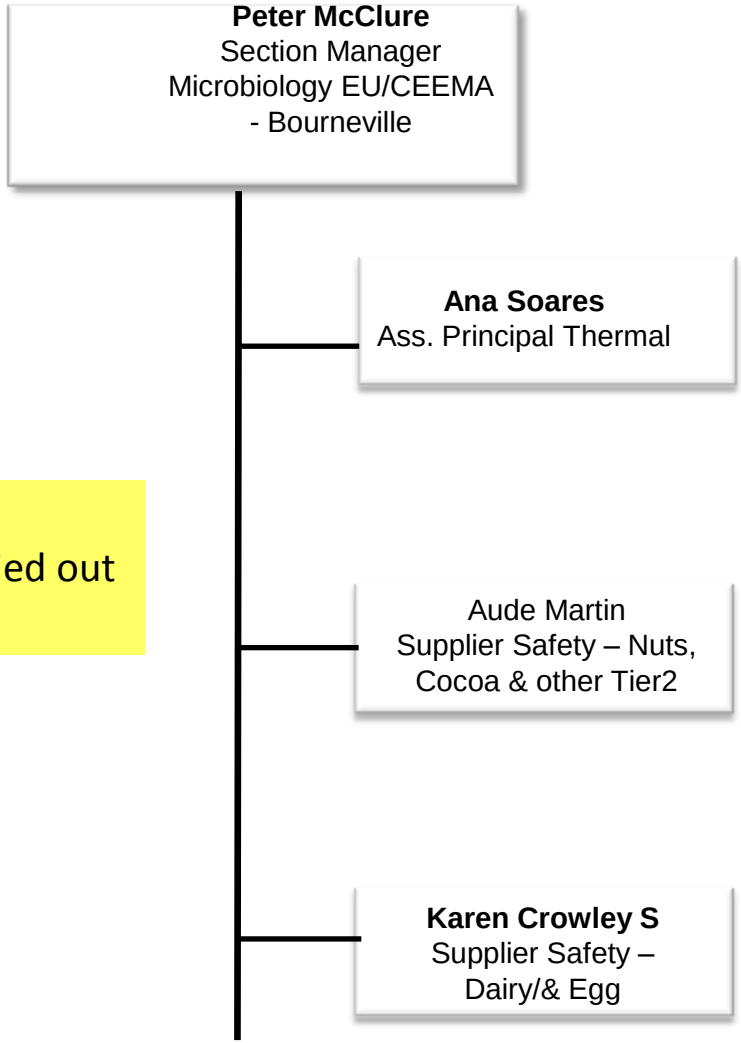
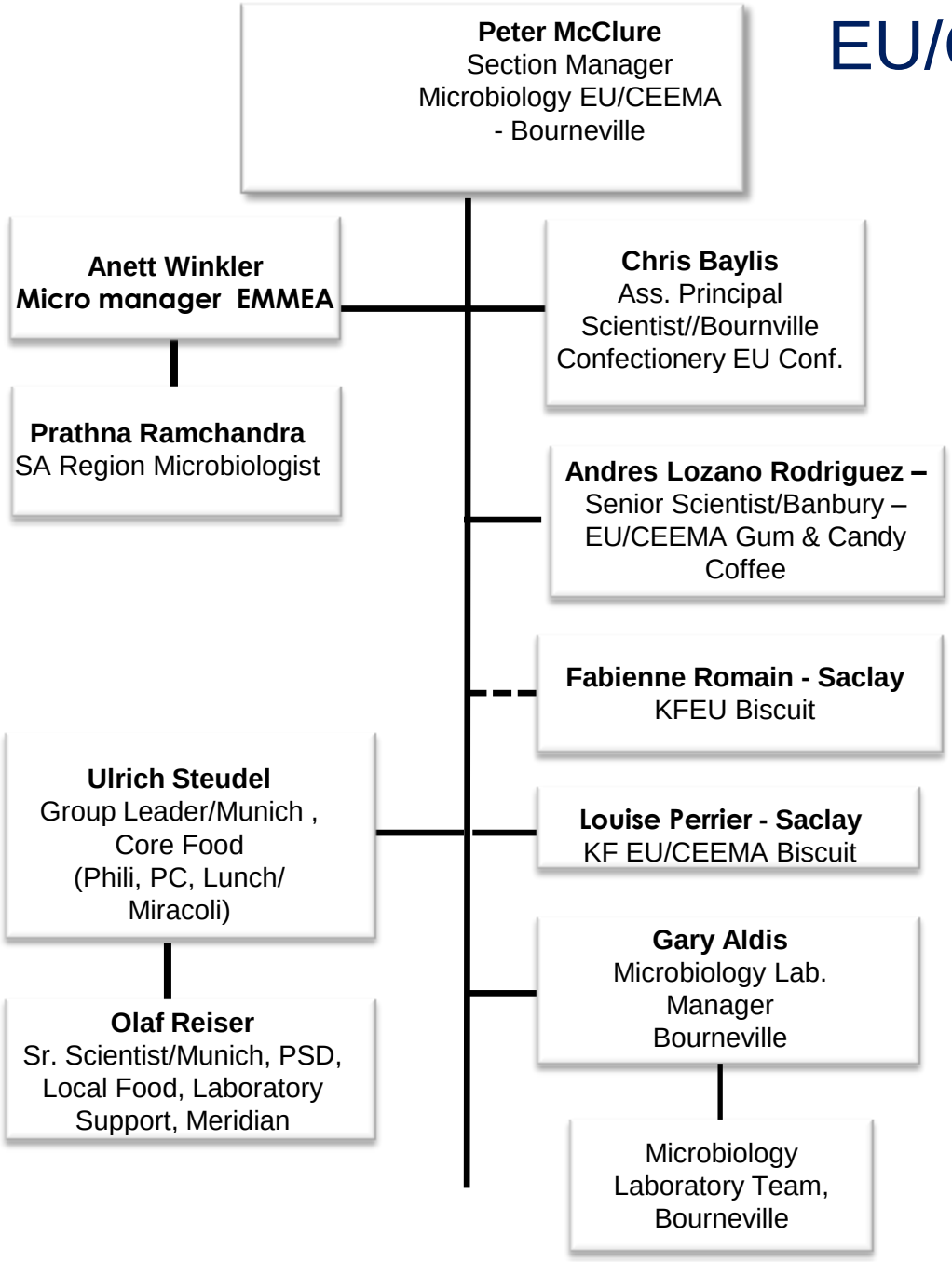
Supplier Safety Team



❖ Supplier Safety Assessments are carried out by this Team

EU/CEEMA Micro Team



Mondelēz International Supplier Quality Web Site

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Browser Address:

http://www.mdlzsupplierquality.com/

New Dairy Processing Expectations

Main changes

Introduction to the Dairy Processing expectations:

What is this document?

Who is it relevant for?

Why did we up-date and make changes to the document.

Dairy expectations – key changes

Objective

- Up-dated to state additional processing conditions are outlined in SQE , EMQR, HACCP, but not included in the dairy processing expectations.

Scope

- All relevant pathogens affecting milk are now listed

Purpose

- Reflects current knowledge ensuring food safety based on current processing and handling, should be amended when new data becomes available.

Path Finder Table

Product /Other controls/remarks/ Food safety applicable models, time and temperatures

- Re-designed to include additional dairy ingredients, scientific references including target micro organisms, summary of applicable CCP models, time/temperatures.

5.1. **Table**: Pathfinder table outlining product type and Minimum Applicable Food Safety Models and Minimum Applicable Time and Temperature:

Product	Other controls / Remarks	Minimum Applicable Food Safety Models and Minimum applicable Time/Temperature
Anhydrous Milk Fat: When the CCP is applied to the cream step.		Follow CCP1 or CCP2.
[6,15,21,37]Anhydrous Milk Fat: When the CCP is controlled at the polishing step in the process	Target organism: *Listeria monocytogenes*	Polishing step: Temperature of water/oil mix must be controlled to reach 85°C
[6,,21] Anhydrous milk fat: produced from melted butter	Target organism: *Listeria monocytogenes*	Follow CCP1 or CCP2 for melted butter but apply 72.°C/15 sec (z=6.71C°) or CCP2 65°C for 35 min (z=6.71C°)
Cream cheese	Please see section 8.5 for specific requirements	Follow CCP1 or CCP2 in addition to CCP6 and CCP9

Dairy expectations – key changes

- Added Food safety Model summary so as to link quickly to the pathfinder table the applicable CCP model depending on the dairy product.

Added paragraphs to clarify:

- All manufacturing facilities that receive liquid Dairy ingredients whether **raw or pre-pasteurised** must ensure ingredients are subjected to **a CCP heat treatment on-site**.

- The time/temperatures outlined in the table above are derived from scientific studies, Supplier can perform **challenge study** or provide other scientific evidence to prove a lower time/temperature achieves an adequate kill .These studies will be assessed and **approved by the MDLZ International Corporate Microbiology.**

- Alkaline phosphatase test recommendation .

Dairy expectations – key changes/up-dates

REQUIREMENTS: Biological CCP models

- **All CCP models have monitoring/recording/corrective actions sections up-dated.**

Appendix 1:

- **Theoretical calculation** explanation more clearly defined and examples included on how to determine whether flow is turbulent/ laminar, n-efficiency factor standard and subsequent determination of the residence time or holding tube length.
- Note added when using salt test or columetric test to determine the residence time, type of flow of the real product must be taken into consideration.

Critical limit sub heading: CCP1

- Paragraph with more detail on product characteristics e.g. total solids 18%, increase temperature by 3°C, or if concentrates processed instead refer to pathfinder table.

Corrective action activity:

- Corrective action includes information on **location of the valve** when after cooling section or evaporator, or leading to dead areas during divert (system must be CIP).

Dairy expectations – key changes/up-dates

Minimum CCP verification activities:

- **Pressure monitoring** not required when product-to-water regeneration is used, risk assessment on circulating and cooling water required.
- Added note to say Duo safety plates are acceptable alternative to pressure monitoring. Reaction time of valves to be monitored.
- -**Crack tests** on plate heat exchangers required once per year. **(Not stated in previous D.P.E)**
- Flow meters to be verified once per year (not stated in previous document)
- New paragraph added to state that yearly system controls or after any line modifications required - relating to alarm functionality and FDD at the set production temperature.

- CCP equipment (indicating, recording thermometer, chart recorder, salt test, etc) changed for alignment with calibration frequency outlined in the SQE, (once per year as opposed to every six months.)

Dairy expectations – key changes

- PROCEDURAL ELEMENTS: Hygienic requirements

C.I.P requirements:

- New section added on CIP requirements when shared between raw and pasteurised.
  Not requesting separate CIP systems as per old document.

1. The same Clean-In-Place system may be used to clean raw and pasteurized RTE systems.
   1.1. If this is the case, the Clean-In-Place system shall be sequenced to clean the RTE system separately from the raw side.
   1.2. After cleaning the raw side the cleaning solution shall not be sent directly to the RTE side.
   1.3. If there is no separate CIP system for (micro sensitive) raw and pasteurized /RTE products or if there are butterfly valves in the CIP system, the following criteria for temperature, time and concentration shall be met as a minimum:

	% Concentration of NaOH		% Active Alkalinity	
Temp °F	170	160	170	160
Temp °C	77	71	77	71
Time (Min)				
3	0.57	0.86	0.43	0.65
5	0.43	0.64	0.33	0.49
7	0.36	0.53	0.27	0.40

Dairy expectations – key changes

REQUIREMENTS: General requirements

Analytical requirement for raw milk table

- 12˚C acceptable temperature with conditions instead of 10˚C, new somatic cell limit for outside the EU added (1 million cell/ml).

Prevention of contamination:

- Zoning, air and PEM section refer to the SQE . Removed paragraphs from older version.

Incoming milk- Extraneous matter:

- **Note Added** If the supplier can demonstrate they have alternative means in the process stream to remove extraneous matter from the milk, then this may be considered as acceptable on review e.g. bactofuge. Before specific filtration size was required.

Dairy expectations – key changes

Cheese brine requirements

- Up-dates made to the requirements relating to the process type and microbiological guidelines.

Air Quality

- F5 filtration requirement no longer necessary, only coarse filtration when temperature exceeds 120°C.

Spray dryer

- Crack test frequency changed from six months to frequency sufficient to demonstrate control.

Sweetened condensed milk requirements

- Added new paragraph outlining additional control requirements when aw is greater than 0.85.

Process cheese requirement

- Added requirement that process must be reviewed by MDLZ process authority

Dairy expectations – key changes

Reference documents

- Up-dated the scientific references which include additional studies and scientific basis for CCP models, removed some non-applicable references

Glossary

- Definitions of non-dairy creamer, timing pump, continuous monitoring added

Key Programs For Dairy Suppliers

- CCP management: Pasteurisers must meet with MDLZ International requirements
- Pathogen Environmental Program must be in place (PEM) must be in place.
- Zoning program and assessment must comply with the MDLZ International requirement s
- Environmental monitoring programs must be in place (Water, air)
- Traceability exercise
- Don’t forget to comply with SQE, HACCP, in addition to the Dairy processing expectations.

Pasteurization CCP management

A/ THEORITICAL CALCULATION

Parameters sometimes forgotten:

- Type of flow (Laminar/ Turbulent)
- Flow rate exceeding maximum stated in the calculation, compromising residence time.
- Product characteristics not considered: 72°C **+ 3°C** e.g. if fat content > 10% or when concentrate is used.
- Holding time not calculated for temperature critical limit

B/ TEMPERATURE

- Accuracy of temperature probe > 1°C
- No indicating probe present
- Recording and Indicating probes at the beginning of the holding tube (not coldest point)

Pasteurization CCP management

C/ PRESSURE

- Pressure differential between raw and pasteurised milk not monitored in case of plate heat exchanger with product to product regeneration.
- Crack test not done or not frequently enough (once per year).

D/ FLOW

- No record of real flow during the production. Flow rate must be monitored

E/ IVERT VALVE

- Cut in/cut out not done at a sufficient frequency
- No record of divert valve position
- No automatic divert valve on the system
- Divert valve after spray drier (non approved supplier)
- Divert valve located after the cooling section, no CIP in case of CCP failure.

F/ SPRAY DRIER

- Wet clean frequency too long (1,5 years)
- Crack test frequency very long (5 years)

Zoning

- No zoning risk assessment.
- No traffic people , waste and equipment map.
- No hygiene barrier between wet and dry.
- No dedicated clothes for dry area.
- Butter: no separation between culture preparation and following steps.
- Raw milk tanks, Pasteuriser and spray dryer located in the same zone.

Sanitation Verification

- Swab tested for *Salmonella* instead of TVC and Coliforms.
- Only ATP testing. Require also microbiological swabbing in conjunction with ATP.

P.E.M.

- Direct product contact surfaces are tested for Salmonella without blockage of previous products.
- PEM procedure and practice doesn't reflect that swabbing should be done 3-4h after production starts.
- Salmonella positive corrective actions procedure does not include a requirement for having 3 consecutive negative tests in 3 weeks time frame prior to returning to the routine testing.
- Cotton swab used instead of sponge on large surface areas.
- Sampling points not defined according to most critical area of potential contamination.
- Dust from vacuums cleaners used around packing lines is tested for Salmonella.
- No sampling points defined.
- *Listeria monocytogenes* tested instead of Listeria spp.
- No Listeria spp. testing carried out in wet production areas.
- No PEM implemented.

Finished Product testing

- Laboratory cross contamination of salmonella to finished product, common strain used.
- 10 sample of 25g not taken, one lot of 250g sample taken for testing, or inadequate amount tested e.g. 100g.

Utilities

A/ WATER

- Turbidity test of well water not performed
- No limits for TVC defined.
- Water tested per 1ml volume instead of 100ml for coliforms
- No certificate of analyses for incoming water.
- Process water + CIP water not analysed monthly.

B/ AIR

- No air filtration for storage tank after heat treatment.
- Air filtration type not known.
- No limits established for yeast and mould when air testing.
- No air filtration, air pressure and air monitoring for packaging area. (non approved supplier).

Top 12 issues

from our dairy supplier disapproval and non-approval experience

- Most issues in CCP management relate to pasteurizers or evaporators.
- Followed PEM (« Pathogen Environmental Monitoring ») not meeting MDLZ requirements
- Wrong CCP set up
- Zoning issue : raw / treated and wet / dry areas in same zones.
- Maintenance issue
- Corrective actions follow up « repeat issue from previous audit ».
- Issues relating to sanitation
- Remarks on GMP « Good manufacturing practices »
- Issues with storage tanks
- Issues with the metal detection.
- Some sites had issues with their Finished product testing / hold & release procedure.
- Incorrect air filtration system inside the facility

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Thank you very much!

Questions & Answers

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