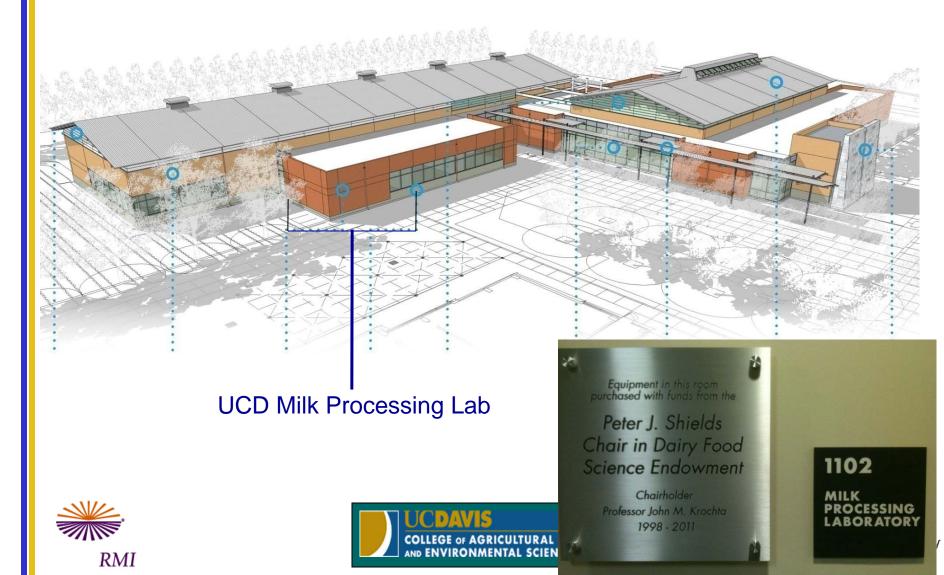
RMI Winery, Brewery and Food Science Lab



Raw Milk Processing System

- Separates whole milk into skim & cream
 - Raw milk, skim & cream tanks
 - Milk pump
 - Heat exchanger
 - Separator



- Recovers heat added to milk for separation
- Separates 100 gallon of milk in 1 hour
- Keeps raw milk, skim & cream cool







Raw Milk Receiving Tank

- Receives pre-chilled (~ 5 ° C) milk from UC Davis dairy herds
- 100 gallon capacity
- Provides agitation
- Jacketed for chilled water to maintain raw milk at ~ 5 ° C









Heat Exchanger

- 3-section sanitary design
 - <u>Section #1</u> for pre-heating cold raw milk with separated warm skim milk (i.e., cooling skim milk with cold raw milk)
 - <u>Section #2</u> for further heating raw milk with hot water for efficient separation into skim and cream
 - <u>Section #3</u> for further cooling skim milk for holding at ~ 40° F before processing









Milk Separator

- 100 gallon/hr capacity
- Runs with raw milk at 21-57 $^{\circ}$ C (70-135 $^{\circ}$ F)
- ≤ 0.1% skim efficiency
- 10-40% milkfat cream









Skim and Cream Receiving Tanks

- Receive milk from separator
- Skim milk tank: 100 gallon capacity
- Cream tank: 25 gallon capacity
- Provide agitation
- Jacketed for chilled water









Milk, Skim or Cream Heat Processing

- Pasteurization/UHT Unit
- Homogenizer for milk
- Ultra-clean filler for heat-processed milk, skim
 or cream

















Homogenizer

- Manufactured by GEA Niro Soavi, an industry leader
- Variable speed motor to match flow of pasteurizer/UHT unit
- 2 homogenizing stages for most effective homogenization
- Sterilizable by pasteurizer/UHT unit
- CIP cleanable









Filler with Automatic Fill Control

- Ultra-clean filling environment
 - Room air is HEPA filtered
 - Filler hood has shower of additionally HEPA filtered sterile air
- Produces packaged product suitable for research studies:
 - Refrigerated shelf life studies
 - Product-package interaction studies
 - Sensory panels
 - Clinical trials









Membrane Filtration System

- Manufactured by GEA
 Process Engineering
- Capable of micro-, ultra-, nano-filtration and reverse osmosis for separating milk into its components
- Module for simultaneously screening several flat-sheet membranes
- Module for separations using larger spiral membrane









Additional Equipment

- •Delta LactoScope FTIR Advanced complete dairy analyzer
- Lipids
- Protein
- Carbohydrates
- Total Solids
- Free Fatty Acids
- Citric Acids
- NPN/Calculated Urea
- True Protein
- Casein
- Density
- Freezing Point

