RMI Winery, Brewery and Food Science Lab

UCD Milk Processing 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
  • **Section #1** for pre-heating cold raw milk with separated warm skim milk (i.e., cooling skim milk with cold raw milk)
  • **Section #2** for further heating raw milk with hot water for efficient separation into skim and cream
  • **Section #3** 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 °C (70-135 °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