



Water Use Reduction in Food Processing

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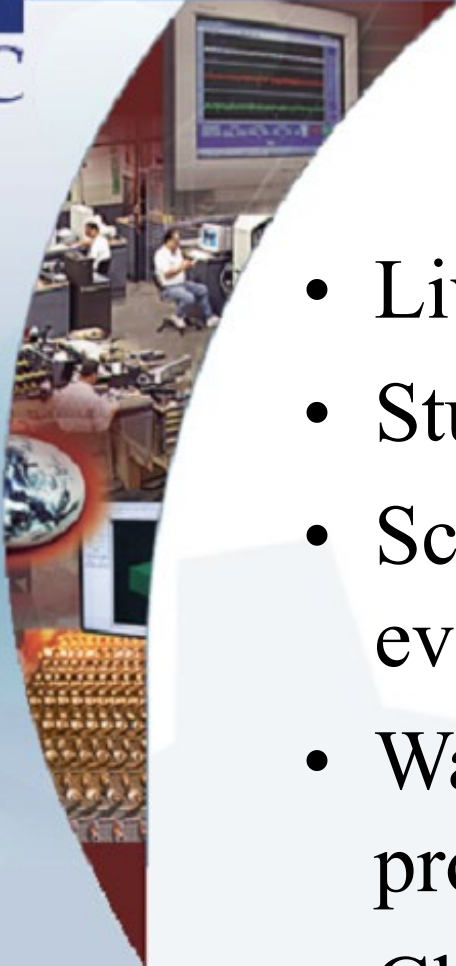
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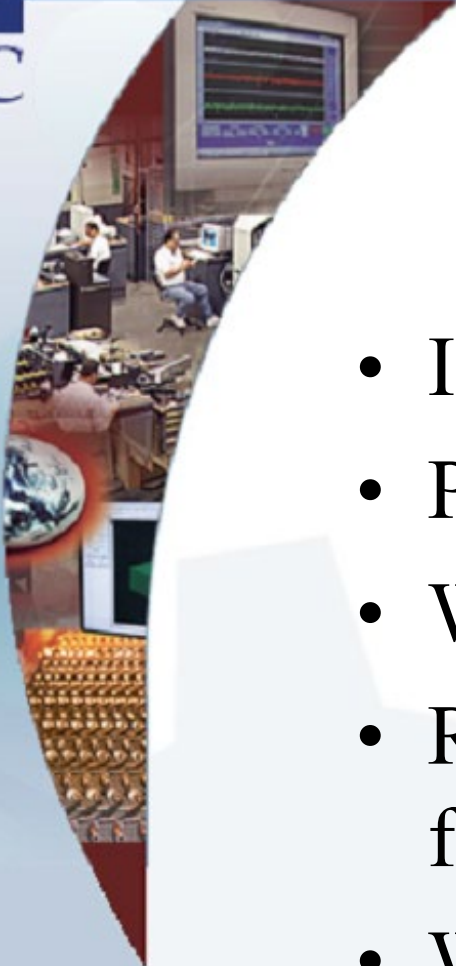
Turkey Processor in Ohio

- 17,000 turkeys processed daily, 5 days a week
- 550,000 gallons wastewater daily discharged to the village lagoon system
- \$2.25 per 1,000 gallons for water and wastewater - very economical



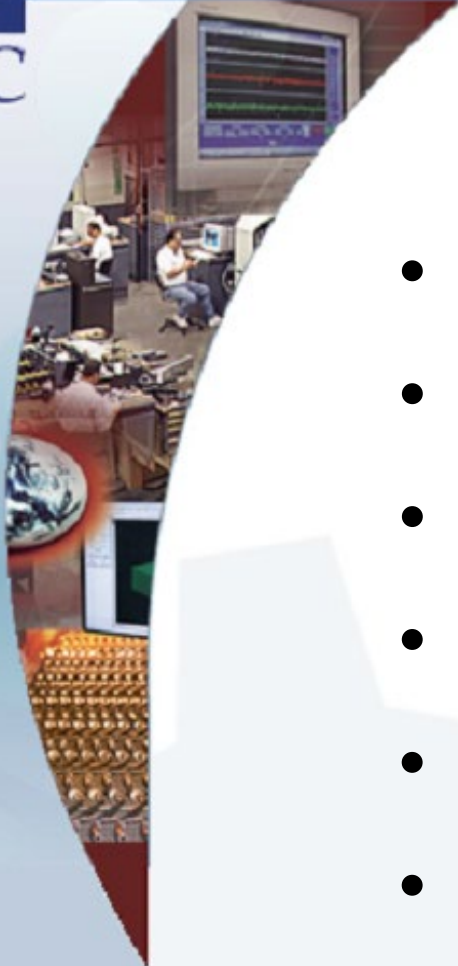
Turkey Processing

- Live bird receiving
- Stunning and slaughter
- Scalding, defeathering, and evisceration
- Washing, chilling and further processing
- Clean-up



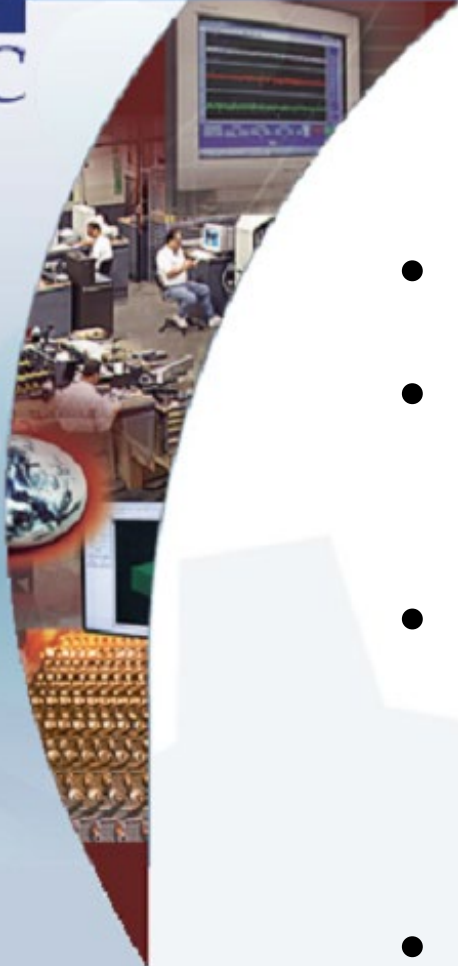
Water Usage Profiling

- Interviews with plant personnel
- Plant surveys
- Water-meter monitoring
- Review of reported information from industry
- Water sampling and testing



Major Water Usage

- Scalding - 45,000 gallons/day
- Evisceration - 85,000 gal/day
- Bird Washing - 70,000 gal/day
- Chilling - 110,000 gal/day
- De-boning - 30,000 gal/day
- Clean-up - 100,000 gal/day



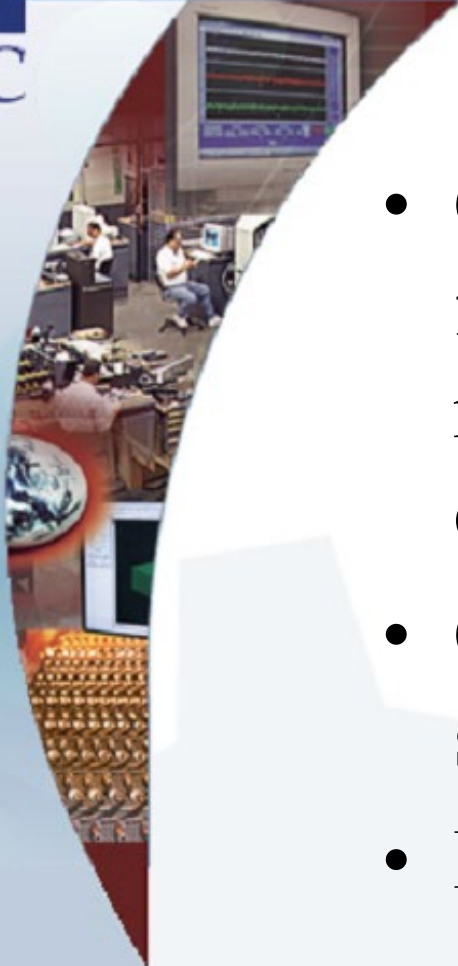
Waste Water Reduction

- Flow restrictors
- Efficient clean-up including partial dry cleaning
- Usage reduction in boiler blow-down, softener system back-flush, closed loop cooling system
- Usage monitoring



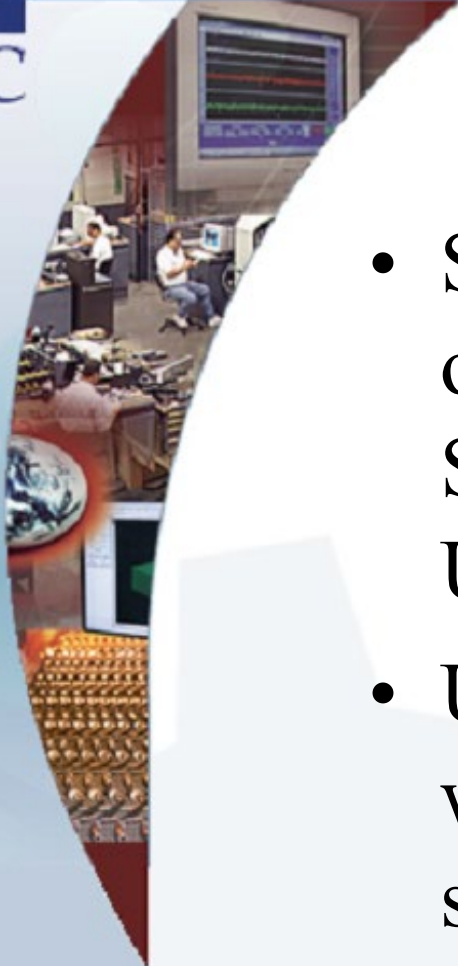
Water Reuse/Recycling

- USDA regulated
- Recycling standards - Coliform, Aerobic Plate Count, Turbidity, Residual Chlorine
- No set industrial protocol; Site-specific recycling systems approved through pilot testing



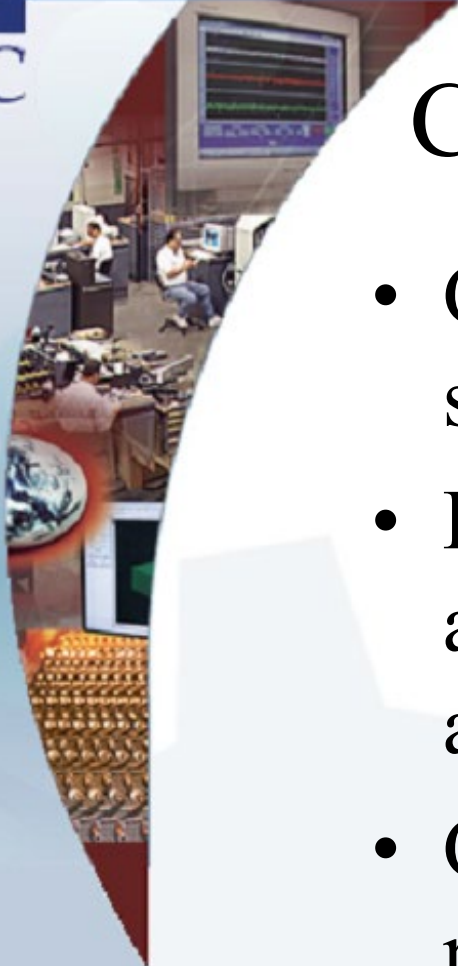
Recycling History

- Chiller water has been targeted for reuse -Large volume, relatively cleaner, energy considerations, ease of collection
- Combination of filtration and sanitization
- Filtration: Sand, DE, Membranes
- Sanitizer: Chlorine, Chlorine dioxide, ozone



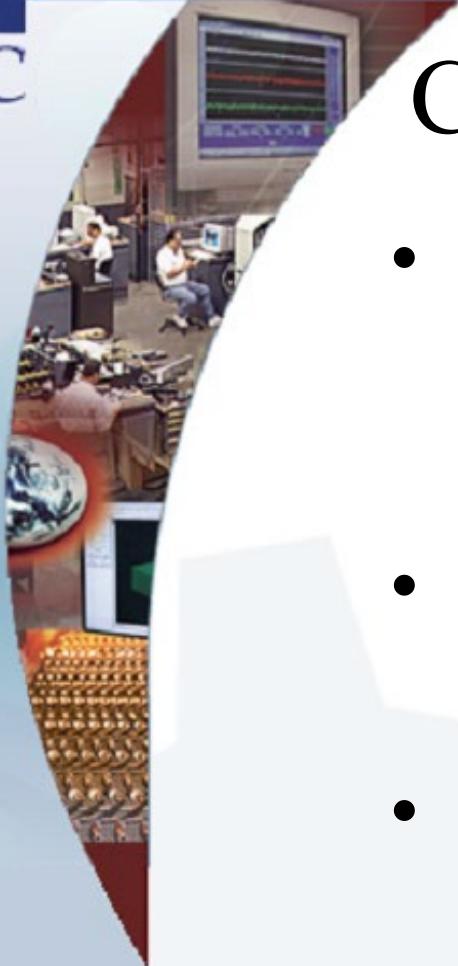
Recycling History

- Sand/DE filtration and ozonation of chiller water by Carawan & Sheldon
USDA standards met
- Ultra filtration of chiller overflow water in California - recycling standards met



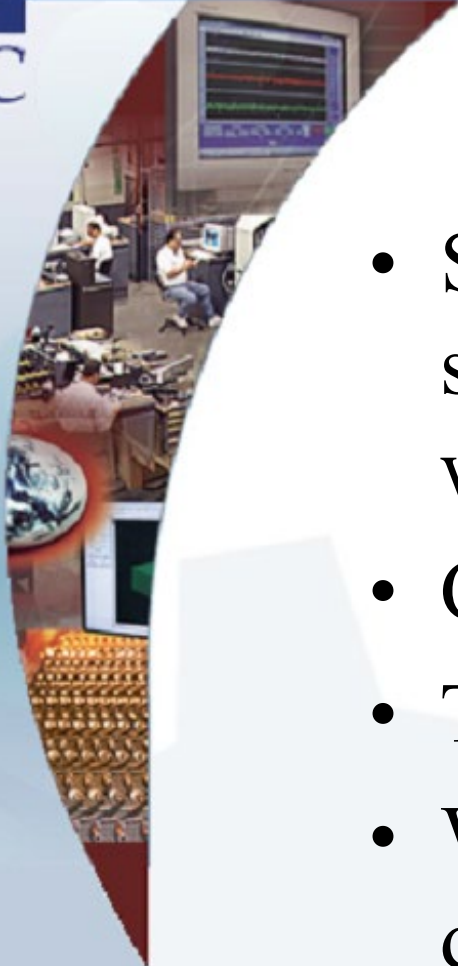
Current Recycling Initiatives

- Chiller and bird-wash water sampled and tested
- Presence of organic solids, fats and micro-organisms (coliform and bacteria)
- Chiller 2 and Bird Washer 1 have relatively cleaner effluent



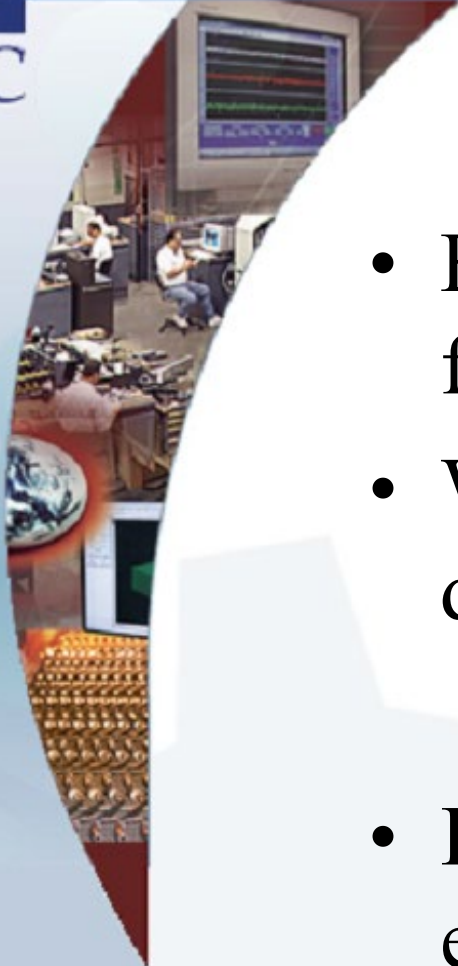
Current Recycling Initiatives

- Treated effluents can be reused for the same application or for other processes
- Need for a system of collecting, transporting and treating the water
- Pilot testing to demonstrate effectiveness of treatment and conformation to standards



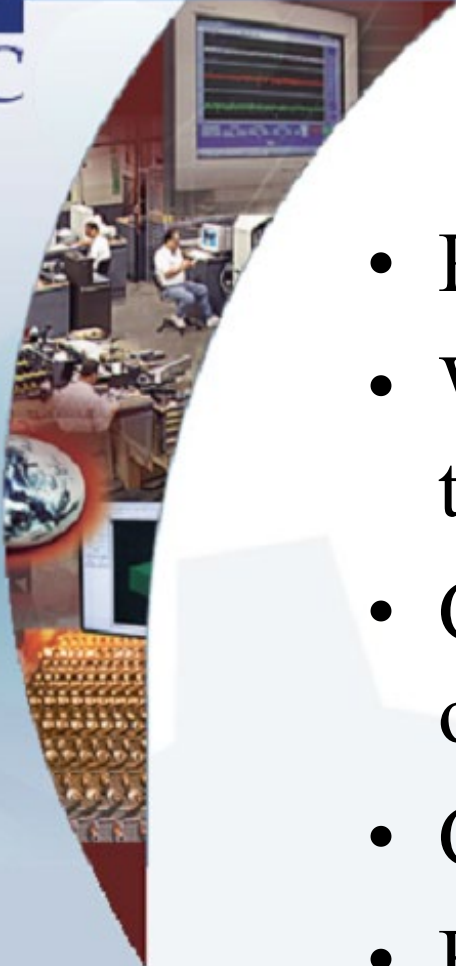
Pilot Testing

- Side-stream trials to filter and sanitize bird-wash and chiller water
- Chlorine dioxide as the sanitizer
- Trials with bag/cartridge filters
- Water sampling and testing for data collection



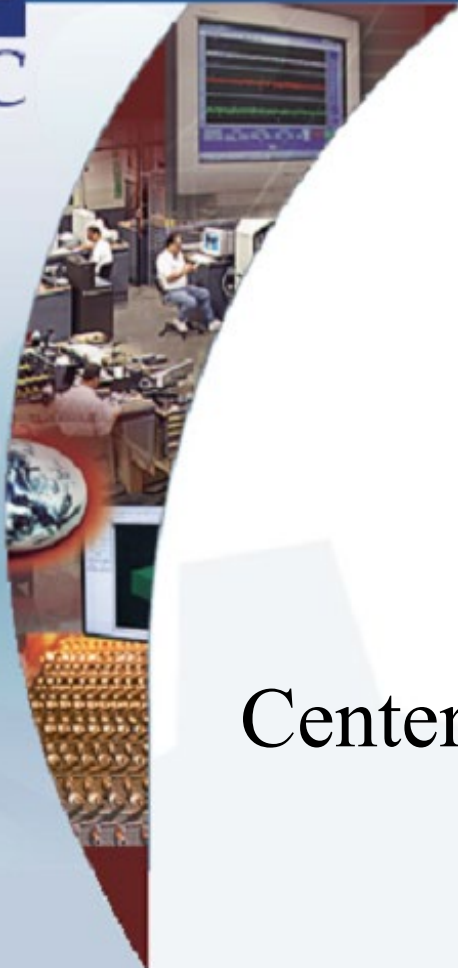
More Testing

- Bench-top testing with membrane filtration; ultra or micro filtration
- Water sampling and testing for data collection
- Incorporate more process-effluents in testing



Challenges

- Product quality
- Wastewater collection and transport
- Characteristics of pollutant load - organics and micro-organisms
- Chlorine dioxide demand
- Filter fouling
- Turbidity



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