Cooking Meat Using Inline Steam Cooking

Presented by

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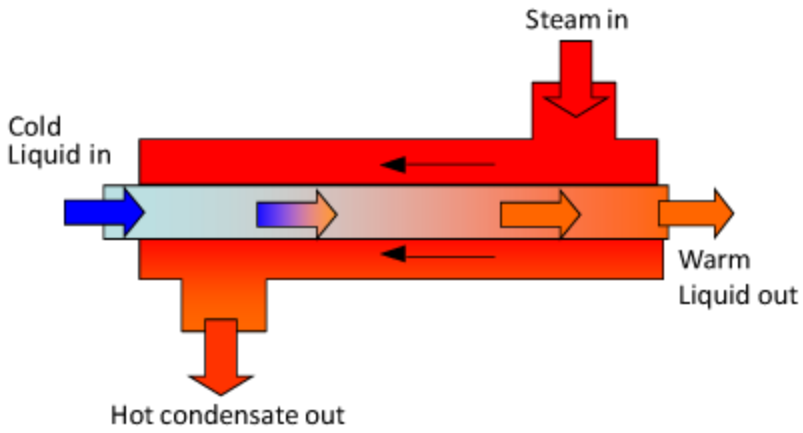
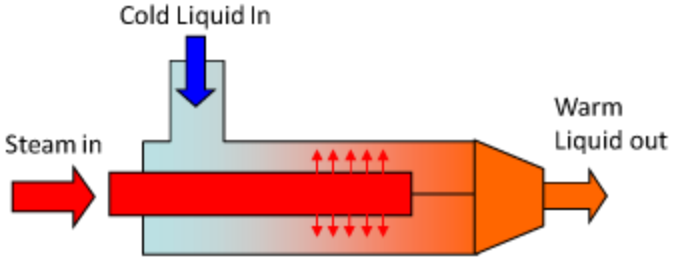
Today's Agenda

- Basics of steam cooking
- Applications
- Specific customer examples
- Five common questions
- How to get started?

Indirect or Direct Heating

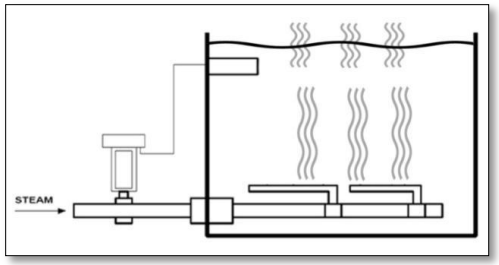


IN-DIRECT HEATING

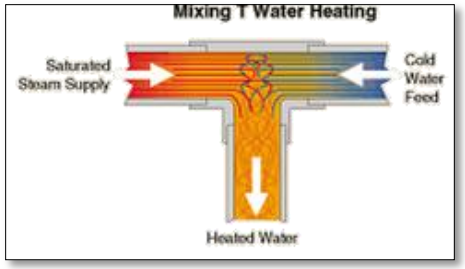


DIRECT HEATING

What is Steam Cooking?



Sparging



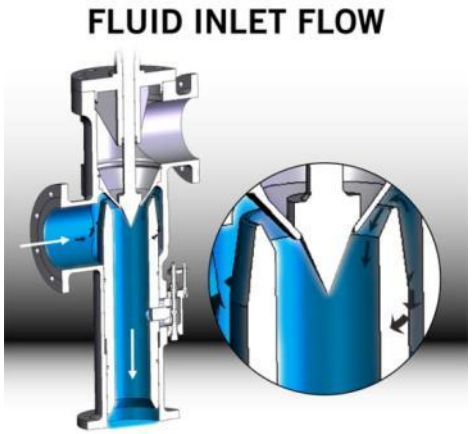
Mixing Tees

Hydroheater

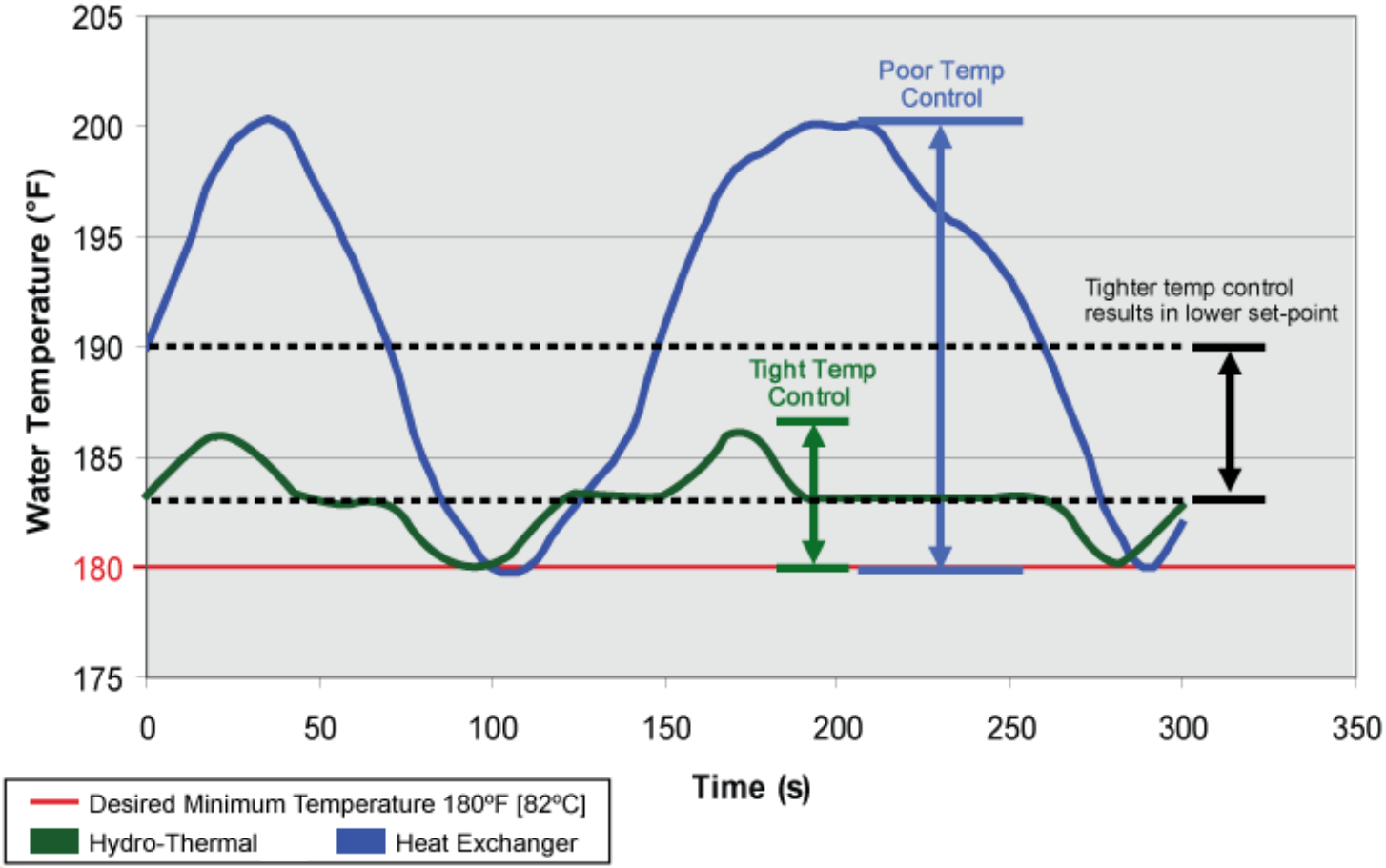
Lowest Engineered

Continuous, Recipe Driven Steam Heating

Patented Heating Technology



Precise Temperature Control = Efficiency



Steam Cooking Advantages

- Rapid and uniform heating—important in starches and food products
- Can heat thick meat paste
- Handles difficult to heat or abrasive foods —avoids “burn-on”
- Compact footprint
- Minimizes plugging and fouling
- Rapid response time

Application Examples

Meat

Ingredient Water

Meat De-Icing

Gravy/Flavoring

Color/Dying

CIP

Meat Cooking

Criteria

- Steam: 100 PSIG
- Fluid: Meat
- Flow rate: 45-60 GPM
- Temp in: 95ºF
- Temp out: 195ºF

Challenges

- Must reach proper temperature
- Consistent and uniform cook
- No plugging or downtime

Current Heating System:
Jacketed Kettle with Steam Sparging

Solution

- Two sanitary steam cookers
- #1 for water heating
- #2 for meat heating

Results and Successes

- Estimated energy savings of over $22,367/yr
- Reduction in maintenance and downtime
- Process cycle time improvement
- Plant floor space savings
- Consistent product, improved quality

Other opportunities have been found for future projects

Meat Installations

- Oklahoma
- Colorado
- Pennsylvania (2 locations)
- Ohio
- Iowa
- Brazil
- Mississauga (soon to be installed)

- Dog and cat food producers
- Two applications
- Driven by desire to improve product consistency and save energy

De-Icing Meat

Defrost meat, turn into paste and heat to exact temperature for next batch/cook process

Steam cooking vs. Tank sparging

- Temperature control
- Batch time improvement
  ~45 minute reduction
- Burn-on / product quality

Design Criteria & Challenges

Criteria

- Fluid: Meat 30%
- Steam: 100 psi
- Flow rate: 80 GPM
- Temp in: 35ºF
- Temp out: 150ºF

Re-circulates until hits temp

Current Heating System: Sparger

Challenges

- Reaching proper temperature quickly
- Consistent and uniform heat
  - eliminate burn-on & damaged product
- Batch time improvement

Solution & Results

- Steam cooker
- Heats up water in tank first
- Meat is introduced and macerated
- It is re-circulated to bring to temp
  - No clogging or fouling

Results:

- Consistent results (uniform cook, tight temp control)
- No damaged product from burn-on
- Savings
  - Batch time cut from 60 minutes to 15 minutes
  - Cut steam usage needed due to consistent heating

Gravy/Flavoring

Cooking gravy to be added as a flavoring for canned dog food

Criteria:

- Steam: 120 PSIG
- Fluid: 8% starch gravy
- Flow Rate: 155 GPM
- Temp In: 40ºF
- Temp Out: 180ºF

Current Heating System: Sparger

Solution & Results

- Sanitary skid system
  - Using a sanitary steam cooker

Results:

- Enhanced starch cook for proper viscosity
- Consistent results
  - Uniform cook
  - Tight temperature control ± 1˚F
- No down time
- Stable operation
  - No hammering or vibration

Color/Dying Heating

- Heat batch tank of water and dye powder to ensure proper viscosity and mix

Design Conditions

Criteria

- Steam: 100-120 PSIG
- Fluid: Water-like solution
- Flow rate: 100 GPM
- Temp in: 40ºF – 60ºF
- Temp out: 100ºF

Current Heating System: Sparger

Solution

Steam Heating Skid

Results

- Saved 3 hours of batch time over sparging
- Consistent results
  - Uniform heat
  - Tight temperature control ± 1˚F
  - Increased product quality
- Saved on dye due to accurate temp/recipe
  - Allowed for consistent inventory control

Clean-In-Place

CIP system for geographic area: batch tank, spray-balls and hoses

Steam cooking vs. heat exchanger

- Temp control for USDA
- Energy savings
- Self cleaning design with hard water and high temperatures

Design Conditions

- Steam: 120 PSIG
- Fluid: Water with chemical
- Flow rate: 40-60 GPM
- Temp In: 55-60ºF
- Temp Out: 205ºF

Current Heating System:
Heat Exchanger

Process Challenges

- Reaching proper temperature quickly
- Energy savings
- Accurate temp control
- Self-cleaning design

Solution

Sanitary steam cooking system

Results

- Energy Savings of $15,000 year
- Maintenance savings of 4 tube bundle cleanings/yr
- No downtime due to USDA temp regulations
  - Accurate temp control ±1ºF

Five Common Questions

- Is steam acceptable to add to food?
  - 3A vs. standard industrial
- Does adding steam change the recipe?
- How long has steam cooking technology been utilized in the pet food industry?
- What's the usual maintenance on your heating system?
- Why would we want to switch from our current heating method?

How to Get Started?

- Talk to us after this presentation
  - Determine how steam cooking can benefit you and your specific sanitary applications.
- Visit www.hydro-thermal.com to learn more about steam cooking technology
  - Fill out an application data sheet online to have a steam cooking specialist contact you.
  - Look at literature available on the Knowledge Center.

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