

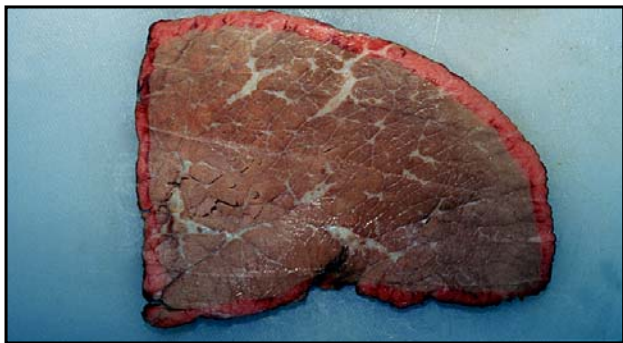
The Secret of Pit Smoked BBQ



Pit Smoked
BBQ

ALKAR
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Discovering the True Cause of Pink Ring



Known: Gas burners cause pink ring in non-cured meats—a color defect or requirement

Finding: The culprit is nitrogen dioxide (NO_2)

Our Original Research Objective:

Develop low-NO_x burner for cooking non-cured meats in a direct-gas oven:

- Direct-gas ovens have lower cost of operation than that of indirect-heated ovens
- Combustion gases cause pink ring
- Known pinking agents (NO, CO, NO₂) are contained in combustion gases

Very Minimal Quantities of NO₂ Caused Pink Ring

- Turkey: 0.4 ppm
- Roast beef: 2.5 ppm

Cornforth et al. (1998). CO, NO, and NO₂ levels in gas ovens related to surface pinking of cooked beef and turkey. J Agric Food Chem 46: 255-261.

The "Pinking" Chemical Reaction

Nitrogen dioxide absorbed into moist surfaces

- Highly water soluble
- Pink ring is thicker for meat cooked in humid processes than for dry processes



- Nitrous acid + pigments
- Follows cured meat reaction
 - NO-Hemochrome

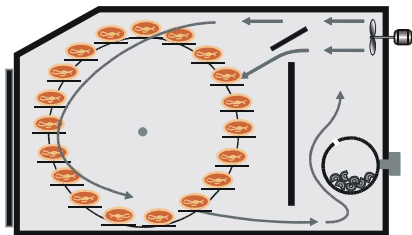
To Minimize Pink Ring:

- Use an indirect heat source:
 - Use steam, electric, indirect gas, thermal oil
 - Eliminate sources of NO_2
- If you must use a direct-gas oven:
 - Cook in a plastic bag
 - Keep the burner clean
 - Dry the surface as fast as possible
 - Inhibits absorption of NO_2

To Promote Pink Ring for BBQ:

- Keep the surface moist:
 - Promote NO₂ absorption
 - Reduce airflow to prevent drying
- Burn a dirty fuel:
 - Incomplete combustion creates more NO₂
 - Burn green wood
 - Need flames; can't just smolder

Older "Free Convection" Rotisserie-Style Ovens

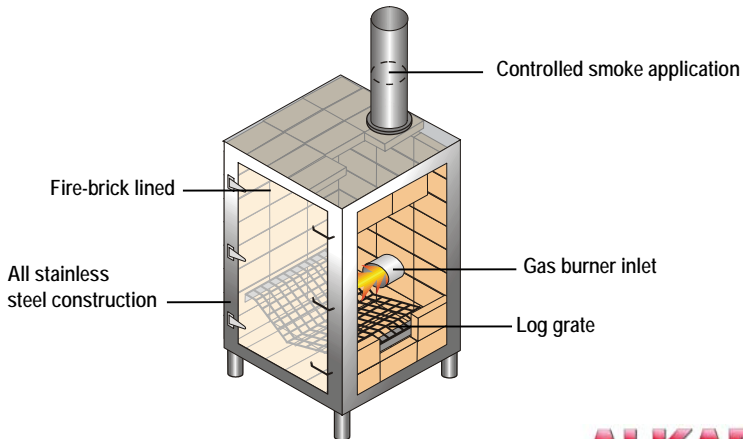


Air velocity = 200 fpm (2.25 mph)

- Inconsistent process time
- Product variability batch to batch
- Limited capacity
- Low density; more floor space

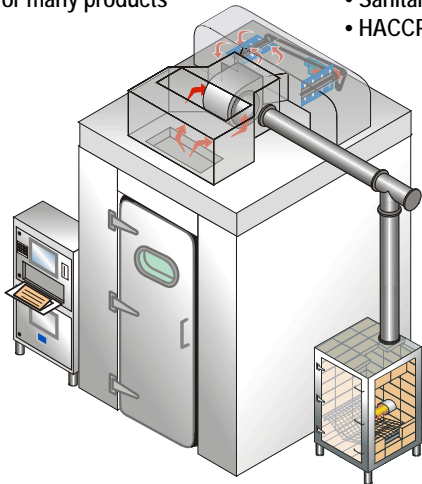
ALKAR BBQ Smoker

Create and Control High-Density "Firepit" Smoke
for Maximum BBQ Flavor and Color



ALKAR "Pit BBQ" System

- High capacity
- Minimize floor space
- Flexible for many products
- Controlled "Optimized" process
- Repeatable cook times
- Sanitary design/cleanable
- HACCP documentation



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Traditional "Pit-Smoked" BBQ Flavor



Consistent Quality; High-Volume Production