

Food Safety for Vertical Broilers

Safe handling of al pastor, shawarma, gyros, and doner kebab.

What is vertical rotisserie cooking?

Vertical rotisseries, such as trompos, shawarma spits, and doner kebab machines, cook a cone or stacked layers of marinated meat on a vertical, rotating spit. Radiant heat sears the surface, while the interior cooks gradually. As cooked meat is shaved from the outer layers, the inner portions cook with continued exposure to heat.



Figure.7. Preparing to serve al pastor.

Originating in Middle Eastern and Mediterranean cuisine, this traditional cooking method broils the meat from the outside in, creating a crisp, caramelized exterior. Meats such as pork, beef, lamb, or chicken are used, with seasonings and marinades varying by culture or region.

What are the food safety risk factors?

COMMINUTION. Forming the cone involves grinding the meat or layering multiple cuts of meat into a tall stack. This can drive surface contaminants - like *E. coli* or *Salmonella* or *Staph. aureus* from the meat itself or introduced from a food worker's hands – into the interior of the cone.

Risk Control Step: Prevent cross contamination from raw product, use gloves when building the cone to reduce *S. aureus* contamination, and fully cook the comminuted meat or poultry.

UNDERCOOKING. The inner layers of meat below the cooked surface are often shaved before reaching a safe internal temperature.

Risk Control Step: The shaved portions may receive the final cook on a hot grill before service. Comminuted pork and beef must be cooked to 158°F. Chicken products must be cooked to 165°F.

TEMPERATURE ABUSE. Product can exceed safe time/temperature requirements when cooked intermittently such as when repeatedly turning off the broiler or stopping the rotation.

Risk Control Step: To reduce the risk of spore-former growth and toxin production, cooking time above 50°F should not exceed six hours.

CROSS CONTAMINATION. Cone assembly, marination, and handling of raw animal foods can spread germs.

Risk Control Step: Marinades and tools used to prepare the meat cone and for shaving the meat while cooking may not be used with ready-to-eat foods.

IMPROPER HOT HOLDING, COOLING & REHEATING. Partially-cooked cones and noncontinuous cooking can let spore-forming bacteria grow or heat-stable toxins form.

Risk Control Step: Ensure the cone is continuously cooked to properly save leftovers.

Cooking Options: Raw and Precooked Cones

Raw cones require thorough and continuous cooking to kill vegetative bacteria and to reduce potential growth of *S. aureus*. In contrast, commercially precooked cones must be reheated rapidly to prevent growth of spore-forming bacteria, such as *Clostridium perfringens*.

Raw Cone Cooking Options

1. **Cooking with no interruptions (continuous cooking).** Raw cones must remain under constant heat and rotation. Cone should be completely cooked within six hours – if not, use smaller cones. Continuously cooked product may be served, hot-held, or cooled for later service.
2. **Time as a Public Health Control (TPHC).** If heat source is interrupted, the cone must be fully served or discarded within 4 hours of removing from refrigeration.

Commercially Precooked Cone Options

1. **Reheat within 2 hours.** Commercially pre-cooked cones must be fully reheated to the proper temperature (135°F or hotter) within 2 hours if the meat will be hot held. Product reheated within 2 hours may be served, hot-held, or cooled for later service.
2. **Time as a Public Health Control (TPHC).** Once removed from refrigeration, the cone must be fully used or discarded within 4 hours.

Menu Review Tips for Vertical Rotisserie Cooking

Meats cooked on a vertical rotisserie are often too large or cooked as needed for customer orders. Adjust procedures, such as using smaller cones or monitoring times, to ensure a safe product.

1. **Cone prep.** Verify whether the cones are made in-house or pre-formed. Handling raw meat during cone assembly and marination can spread cross-contamination or introduce *S. aureus* if gloves aren't used. Prevent cross-contamination and use gloves when stacking raw meat.
2. **Heat interruptions.** Confirm the broiler remains on and rotating. If the heat source is turned off or rotation is slowed, the meat cone stays in the danger zone, allowing bacteria to grow. The broiler must stay on continuously to ensure the cone cooks safely. If turned off, follow Time as a Public Health Control (TPHC) and discard after 4 hours.
3. **Slice and serve versus grill finish.** Verify whether shaved portions go straight to service or are finished on a flat-top. Shaving too early may pull in undercooked meat from inner layers that haven't reached a safe temperature and need a consumer advisory. Determine a hot holding method if hot holding in a steam table is not used.
4. **End of day.** It is not safe to return a partially-thawed or partially-cooked cone to refrigeration. Frozen cones (32°F or below) may be saved if approved by the health department. Trim until only the fully frozen part remains. If the product was under continuous cooking, the trimmings may be finished on the grill and cooled. If the product was using TPHC, the trimmings must be discarded.
5. **Time and temperature tracking.** If time and temperature aren't monitored, meat could be held too long at unsafe temperatures. Document time tracking if TPHC applies.

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