

Donairs

Description

Donairs are a meat sandwich typically consisting of beef, lamb, or chicken that has been assembled to form a cone-shaped mass, and slowly roasted on a vertical, rotating spit. Thin slices are carved from the outer surface of the meat as it cooks, and typically served on pita bread with a variety of toppings and sauces. Donairs or similar products are traditional foods in the Middle East and in countries such as Greece and Turkey, and may also be known as shawarma, shawirma, chawarma, gyro, kebab, dona kebab and döner-kebab. Locally, donairs are available at a number of fast-food outlets and restaurants.

Similar dishes

- Tacos al pastor: a Mexican dish consisting of marinated pork slowly roasted on a vertical rotisserie with pineapple on top. Thin slices are carved from the spit and served on corn tortillas, typically with chopped onions and cilantro.



Chicken (left) and beef (right) donair cones in broiler

How donairs are produced and served

There are many regional variations in the ingredients and preparation of donairs. Donairs can be made with beef, lamb, pork, chicken, or any combination thereof. The seasoned meat is either ground or sliced, and mounted on a skewer to form a cone-shaped mass. The cones are then refrigerated or frozen to allow the fat and moisture particles in the meat to cohere. The size of donair cones can range from 4.5 to 40kg, although cones of 6 to 15kg appear to be most common. Donairs are produced at manufacturing facilities and at food establishments that cook and serve the product.

Raw donair cones are typically cooked at food service establishments in a countertop broiler powered by gas or electricity. The broiler is open at the front, and the cone rotates vertically on a skewer in front of a heating element at the back. As the cone rotates on the skewer, the surface of the meat is slowly roasted. Thin slices of cooked meat are carved from the outer surface of the cone as it cooks, exposing less-cooked surfaces to the heating element. The slices of meat are either served immediately, held in a warming tray until served, or undergo a secondary cooking process (i.e., grilling) before being served. The meat is typically served as a sandwich in pita bread, with toppings such as onions, parsley, lettuce, and tomatoes, and a dressing such as tahini sauce (sesame seed paste), yogurt, or sour cream.



Beef and lamb gyro (left) and chicken shawarma (right)

Potential food safety risks

- According to the Federal/Provincial/Territorial (FPT) Donair Working Group, the primary microbiological risks associated with the consumption of beef, lamb, and chicken donairs are *Escherichia coli* O157:H7, *Salmonella* spp., and *Campylobacter* spp. These organisms may be introduced by meat from infected animals or from cross-contamination during preparation.
- Donair cones are often cooked from a frozen state, creating a temperature gradient from the center to the outer portions of the meat that may allow bacteria to grow. During cooking, temperatures are generally sufficient to kill pathogenic foodborne bacteria at the surface and shallow outer layers, but not in the interior regions of the cone.
- Depending on the size of the donair cone, fully cooking the whole cone on the broiler may not be possible without charring or burning the outside. Currie *et al.* (2007) found that a donair cone could last up to a full day undergoing surface heating while the center of the cone remained raw or partially cooked. As a result, cooked meat is often removed from the exterior of the cone and served to consumers while the interior of the cone may still be raw or partially cooked. Consumers may be served undercooked meat inadvertently cut from the cone, or cooked meat contaminated by surfacing raw juices or knives not adequately cleaned between slices.
- During periods of low consumer demand, some food service operators may turn the heating element down or off to prevent overcooking or drying of the surface meat.
- It is common for food service operators to have a partially cooked donair cone remaining on the broiler at closing time. The leftover cone is typically cooled, refrigerated or frozen overnight, and then reheated and served the following day. A large donair cone may take a long time to cool and reheat the following day. During these periods, the donair meat may be held at temperatures conducive to the growth of pathogens that produce heat-resistant toxins, such as *Clostridium perfringens* and *Staphylococcus aureus*.

Associated outbreaks

- In September 2004, beef donairs were identified as a risk factor in an outbreak of *E. coli* O157:H7 in Calgary, Alberta that resulted in 43 confirmed cases; of which 8 required hospitalization and 2 developed hemolytic uremic syndrome (Currie *et al.*, 2007).
- In May and June 2006, 7 cases of laboratory-confirmed *E. coli* O157:H7 in Edmonton, Alberta were associated with the consumption of beef donairs from a local restaurant chain (Honish *et al.*, 2007).

Food safety legislation

While donairs are not specifically addressed in Regulation 562 (Food Premises) made under the *Health Protection and Promotion Act*, a number of its requirements are applicable to donairs:

- Donairs meet the definition of a “hazardous food” as defined in Subsection 1(1), and is thus subject to subsection 33(2) that states that “a hazardous food shall be distributed, maintained, stored, transported, displayed, sold and offered for sale only under conditions in which the internal temperature of the food is, (a) 4°C, or lower; or (b) 60°C, or higher.”
- For donair cones containing poultry, subsection 33(5) states that a food mixture containing poultry must be cooked to reach an internal temperature of at least 74°C for at least 15 seconds.
- For donair cones containing pork or other ground meat, subsection 33(7) states that pork, pork products, or ground meat (that does not contain poultry) must be cooked to reach an internal temperature of at least 71°C for at least 15 seconds.
- For leftover donair cones that are reheated for use the following day, subsection 33(10) states that a hazardous food that is cooked, cooled, and reheated must reach an internal temperature during the reheating process that is at least as high as the minimum internal temperature the food must reach during cooking.

Safe food handling of donairs

In 2008, the Federal/Provincial/Territorial (FPT) Donair Working Group published recommendations for the safe processing, cooking, and handling of donairs in *Management of the Risks Related to Consumption of Donairs and Similar Products (Gyros, Kebabs, Shawarmas and Shawarmas)*. For example, one of the recommendations is that portions of meat sliced from a donair cone should undergo a secondary cooking step designed to achieve an internal temperature of 71°C in the case of beef, lamb, and pork containing products, or 74°C in the case of chicken containing products. The document is available on the Health Canada website at: http://www.hc-sc.gc.ca/fn-an/legislation/guide-ld/manage_ris_donair-eng.php.