

RARE ROAST BEEF

Rare roast beef is a whole muscle beef portion that has been cooked to a low core temperature (46°C to 58°C) and sold unsliced

Further processing of meat and meat products

AS 4696:2007 – *Australian standard for the hygienic production and transportation of meat and meat products for human consumption, Clause 13, Further processing* states that during cooking the temperature at the site of microbiological concern must be maintained at a temperature of 65°C for at least 10 minutes, unless an approved alternative time and temperature arrangement is in place.

AS 4696:2007 defines the site of microbiological concern as:

- (a) if the site on the meat or a meat product where microorganisms of concern are likely to be located is known, that site; and
- (b) in any other case, the thermal centre of the meat or meat product.

Typically, the site of concern for most meat products is the core. However, for a high quality, intact whole muscle beef portion that has not been tenderised, injected or marinated, the site of microbiological concern is the surface of the meat.

Maintaining a temperature of 65°C at 10 minutes ensures a 6D reduction of *Listeria monocytogenes* which is the most heat resistant of the non-spore forming foodborne pathogens of concern. A 6D reduction will reduce the number of bacteria from 1,000,000 cells to one.

Low temperature cooking is where 65°C is not achieved at the slowest heating part of the meat (the core).

Cooking to an equivalent 6D process at the core may not produce a product with the desired characteristics for rare roast beef.

How to determine the site of microbiological concern for rare roast beef

- The site of microbiological concern is the **core** if the beef is:
 - not intact or not whole
 - mechanically tenderised
 - deboned and/or rolled
 - injected with brine
 - moisture infused, e.g. marinated
 - of low quality with a high microbial load
 - sliced after cooking, prior to sale
 - contains lymph nodes.



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- The site of microbiological concern is the **surface** of the beef if the beef:
 - is a high quality, intact, whole muscle with a low microbial load
 - is not mechanically tenderised, injected or marinated
 - is sold whole, unsliced
 - has spices and flavourings added on the outside only
 - a robust shelf life validation study has been conducted.

Validating temperature

If the site of microbiological concern is the surface, then for the purpose of verifying the cooking temperature, the temperature probe should be inserted 1-2 cm under the surface, e.g. if the meat is cooked in a water bath set at 55°C then the meat must be cooked for almost 4 hours to get a 6D reduction on the surface.

Food safety program requirements

The process for making rare roast beef must be fully documented and verified through the business's food safety program. This will complement verification and shelf life testing.

More information

For more information on validating shelf life please refer to http://www.foodauthority.nsw.gov.au/_Documents/scienceandtechnical/self_life_testing.pdf

For information on specific pathogens please refer to <http://www.foodauthority.nsw.gov.au/aboutus/science/science-in-focus/foodborne-illness-pathogens>

Reference

Calculated using lethalties based on Warne, D. (2011). *Low temperature cooking of meats*. Meat and Livestock Australia Limited, North Sydney

Tips

- Use a high quality intact beef portion with a low initial microbial load
- Use beef muscle that is free from any lymph tissue
- Do not marinate, inject or mechanically tenderise the beef. These processes change the site of microbiological concern to the core
- Ensure beef is chilled quickly after cooking to prevent germination and growth of *Clostridium perfringens* spores
- Conduct a valid shelf life study
- Have an approved supplier program for any flavourings used on the surface, e.g. herbs and spices, to ensure flavourings have a low microbial load
- If using a water bath the temperatures should be above 55°C

About the NSW Food Authority: The NSW Food Authority is the government organisation that helps ensure NSW food is safe and correctly labelled. It works with consumers, industry and other government organisations to minimise food poisoning by providing information about and regulating the safe production, storage, transport, promotion and preparation of food.

Note: This information is a general summary and cannot cover all situations. Food businesses are required to comply with all of the provisions of the Food Standards Code and the *Food Act 2003* (NSW).



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