Figure 11.7c. COSTS OF POOR QUALITY AND PRODUCTIVITY: Consumer Goods

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Well done! It's the safe way to cook burgers, scientists say

By Julian Armstrong
Montreal Gazette

Make your hamburgers on the slim side – under three-quarters of an inch thick – and cook until well done.

That's how to avoid risk of a food poisoning dubbed "hamburger disease," federal health authorities say.

Equally important, because the bacteria can be transmitted person-to-person, is washing your hands before eating, particularly after handling meat or going to the bathroom, doctors and microbiologists advise.

A mid-January outbreak of the disease in Washington and three other western states was traced to undercooked hamburgers from Jack In The Box fast-food restaurants. More than 500 Americans, mostly children, fell ill. Three children died. Two remain in hospital.

You can go on enjoying your roasts and steaks rare or medium-rare as long as they're well cooked on the outside, says federal scientist Hermy Lior from his post at Ottawa's Laboratory Centre for Disease Control.

But avoid the raw-beef dish called steak tartare, Lio warns. If the potentially toxic bacteria known as verotoxigenic E. coli (VETC) is present on meat surfaces, it's easily spread when meat is ground and can cause food poisoning if eaten uncooked, he said.

VETC bacteria live in the intestines of cattle, pigs and sheep and, when the animals are butchered, can get on to the outer surfaces of the meat.

Federal scientists who search vigilantly for it in meat plants and supermarkets have often failed to find it, says researcher Bob Clarke of the Agriculture Canada animals health laboratory in Guelph.

The bacteria seem to be "sporadic and seasonal," said the veterinary microbiologist.

But Clarke says people are best advised to handle meat – ground beef in particular – "as though the toxin might be there. You have to be vigilant at all times."

The illness strikes between two and 10 days after consumption of the contaminated food, explained a 1990 federal health department bulletin that called it Barbecue Syndrome.

An updated edition of this bulletin is due shortly from the Health Protection Branch. Federal epidemiologist John Spika said research shows home cooks tend to cook meat safely, but cooking at large, occasional events such as fund-raising picnics or barbecues could pose problems.

If you attend such an event, "Don't be afraid to ask that your hamburger be recooked," he suggested.

Mild cases of this food poisoning result in diarhea, fever, vomiting and stomach cramps. About 10 per cent of victims develop hemolytic uremic syndrome, which can result in permanent damage to kidneys and the nervous system.

Federal health and agriculture departments have been collaborating for many years in studying meats for "disease-causing" bacteria, Lior said.

Numbers of reported cases of hamburger disease have declined since a national peak in 1989 of 2,432. The 1991 total (the most recent available) was 1,565, many cases occurring in one outbreak in the Northwest Territories.

"It's an area of serious concern," said Lior, whose research published in 1983 was the first in the world to show that the coliform bacteria produces the toxin.

"Make sure you cook your hamburgers or ground meat very well," Lior said. An internal cooked temperature of 160°F (71°C) kills the bacteria, he said.

The U.S. Food and Drug Administration recently raised its recommended internal temperature for burgers to 158°F (70°C).

A higher temperature, from 170 to 175°F (77 to 80°C) is recommended by microbiologist Phibang Ngo Dansereau of the federal health department's Quebec City office.

"If the patty is thick, say one inch thick, and is cooked until charred on the one side, then flipped and charred on the other side; this creates an insulation that protects the meat inside from being fully cooked, said Danser-

Burger tidbits

- "Dangerous if pink" is the Beef Information Centre's warning about ground-beef cooking.
- Forget the idea that an "off" smell to ground beef warns of a potential health problem.

  "Most bacteria which cause food-borne illness cannot be seen, smelled, or tasted," the Beef Information Centre warns.
- Press patties so they are flat on the grill for the entire cooking time. The grill temperature should be 375° F (190°C), and the meat cooked until its internal temperature is 155°F (55°C).

Chains brush up on rules

Canadian fast-food chains specializing in hamburgers direct staff to cook patties until their internal temperature is between 156 and 200°F (66 to 80°C). No burgers are allowed to be served rare, said officials of the chains.

Harvey's requires its hamburgers be cooked to an internal temperature of 170°F (76°C). The chain sets meat fresh on to a charcoal grill that cooks from below.

Rather than cooking a prescribed number of minutes, staff watch for "doneness" and run random tests for bacteria counts, said Dave Barlow of Cara Operations.

Wendy's has a minimum cooked burger temperature of between 170 and 175°F (76 to 77°C). The chain uses fresh meat, setting the burgers on a grill that cooks them from below, and timing them to be done in four minutes, said Yvette Cumus, Quebec communications manager.

McDonald's requires a cooked internal temperature of from 156 to 163°F (66 to 72°C). Using frozen patties, the chain uses a "clam shell" grill that cooks the meat from both sides simultaneously.

Burger King's requirement is 160°F (72°C). They use frozen patties and an automated "flame-throwing" process that cooks the meat from both top and bottom, said marketing director Drew Sansom. "The 'coming-out' temperature is critical."

Scientist Hermy Lior points out that automated cooking times don't compensate for busy periods during which some grills may be cooler because they're covered with extra frozen patties.

Lior prefers overhead broilers because the heat tends to be more stable. If you prefer chains that grill from below, patronize them during quiet periods, he says.

(*continued overleaf*)

eau, who is a member of a federal health department committee studying hamburger disease bacteria.

It's her recommendation that no patty should be thicker than five-eighths of an inch (1.5 cm). "Instead of high heat, use medium and cook the burger longer," Dansereau said.

Lior's final caution concerns a rolled roast. Because bacteria attach themselves to the surface of meat, this cut should be cooked until well done.

"Don't score your steak before cooking," Lior said.

1 The article EM9323 reprinted overleaf on page 11.37 and above gives *fourteen* grill and cooking temperatures in °F, together with the corresponding temperatures in °C. List the two sets of temperatures in order of *in*creasing magnitude; identify clearly the place in the article where each pair of figures is given.

- Comment critically on your findings.

HINT: The Fahrenheit-Celsius conversion is: $°C = \frac{5}{9}(°F - 32)$.

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