



RESEARCH FACTS

RESEARCH & TECHNOLOGY DEVELOPMENT FOR THE CANADIAN BEEF INDUSTRY



MRSA in Beef

Project Title:

Evaluation of methicillin-resistant Staphylococcus aureus (MRSA) colonization in feedlot cattle

Researchers:

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Background

Staphylococcus aureus is a bacterium that is commonly found in healthy people and many animal species. Approximately 30% of healthy people have S. aureus in their nose.

S. aureus is an 'opportunistic pathogen', meaning that it can be present without causing a problem. But malnutrition, immune deficiency, or other infections can weaken an animal, giving S. aureus an opportunity to infect and cause disease.

Methicillin-resistant Staphylococcus aureus (MRSA) is an antibiotic resistant form of this bacterium. MRSA is less common than regular S. aureus, but can also be found in 1-3% of healthy Canadian noses. MRSA are resistant to all antibiotics in the penicillin family, as well as many other antibiotics. This makes MRSA infections hard to treat.

Due to its antibiotic resistance, MRSA is a tremendous problem in human medicine. It is a leading cause of hospital-acquired infections. Most MRSA-related illnesses are skin infections, abscesses or boils but MRSA can also cause much more serious infections, like 'flesh-eating disease'.

Significant concerns about MRSA in food animals have emerged over the past five years. MRSA has been found in dairy cattle, pigs, and veal calves, as well as horses and dogs. Contact with pigs and veal calves has been identified as a risk factor for human MRSA-associated disease in some European countries. MRSA has not been extensively studied in beef cattle, but it has been found in 5.6% of ground beef samples collected in four Canadian provinces.

Objectives

To determine the prevalence of MRSA in cattle entering Alberta feedlots.

What they did

Nasal swabs and fecal samples were collected from nearly 500 cattle at the time of feedlot entry in Alberta. Methods to selectively isolate methicillin-resistant *S. aureus* (MRSA) were used.

What they learned

MRSA was not isolated from any of the 491 nasal swabs and 488 fecal samples collected. This was somewhat surprising given that recent studies have found MRSA in Canadian ground beef.

The obvious question is: if MRSA is found in ground beef, why wasn't any found in the cattle? There are at least four possible explanations.

It is possible that MRSA is present in beef cattle in Canada but not in Alberta, or that MRSA is clustered on farms. This is unlikely given the relatively large numbers of animals and numbers of farms represented in this study.

Secondly, MRSA may be rare in cattle but might accumulate in the processing environment.

MRSA in meat may originate from humans working with meat at processing plants or retail establishments. The MRSA strains found in ground beef are common human strains, which provides some support for this (although human strains have been found in pigs).

Finally, retail beef may be cross-contaminated with MRSA from pork at the retail level

What it means

The failure to isolate MRSA in cattle in this study is encouraging and suggests that the risk to beef producers is minimal at the present time (as opposed to concerns about occupational infection in pig producers). It also decreases concerns about the impact of current production practices on the emergence and dissemination of MRSA in cattle. The main unknown factor is whether or not MRSA is an emerging disease that could become a problem in the future.

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