Ask the **Expert**

Controlling Shiga toxin-producing *E. coli* on veal carcasses

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Figure 1

What do your animals look like at shipping time?

While every animal may not be as clean as Figure 1, avoid shipping animals with as much tag as Figure 2 to avoid costly delays during processing.

"Shiga toxin-producing *Escherichia coli (E. coli)*", or STEC for short, cause human foodborne illness which can range from mild diarrhea to very severe and life-threatening conditions, even death. There are several STEC strains frequently associated with human illness in North America; the most common is *E. coli* O157:H7. STEC live within the gut of cattle without causing them illness and are therefore also present in manure and on hides as well. Throughout processing, if a carcass is contaminated with STEC, it is possible for contaminated meat to enter the food chain and potentially infect consumers.

The main food safety goal during growth and processing of bovines is to minimize and remove bacterial contamination because this is a major risk for subsequent food-borne illnesses in humans.

Ongoing work at OMAFRA

The Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) conducted a study in 2016 that showed that levels of STEC on bovine carcasses processed at provincial plants were high. Veal were more than twice as likely as beef to be carrying STEC in their gut and on the hides. Since this study, OMAFRA has been actively working with provincially-licenced abattoirs to control this risk.

How *E. coli* and STEC growth are controlled during processing

Throughout processing, it is critical to maintain excellent Good Manufacturing Processes (GMPs) and apply microbial control interventions to the surface of carcasses to reduce the risk of STEC. Since July 1, 2019, provincially-licenced abattoirs have been mandated to apply an approved microbial control intervention to all bovine carcasses processed in their facilities, the most common of these being organic acids like peroxyacetic/peracetic acid (PAA), lactic acid, acetic acid, hot water (greater than 74 °C), and closely monitored dry-aging.

What can veal farmers do on-farm and during transport?

The in-plant control measures mentioned above are not enough to prevent pathogens from entering the food chain. Other jurisdictions have shown that greater emphasis needs to be placed on prevention during the growth phase of meat production. This translates to a farm-to-plate approach where food safety controls are in place at all stages of bovine production, including controls in herd management, as well as during all transport and handling.

There are a number of factors that influence how much STEC is carried by veal and beef: farm management practices, season of the year, whether cattle come from a farm or feedlot, age, fasting or temporary change of ration prior to processing, cleanliness of hides, and transport and handling conditions between farm and processing.

Basic recommended principles or best practices of cattle management to reduce spread of STEC during the production cycle include:

- Providing clean water, clean feed, and a clean environment that is appropriately drained, as well as separate housing of calves and heifers. Farms that house bovines from a large number of herds, overcrowded conditions that cannot be managed to control hide cleanliness, as well as lack of efficient manure removal systems, can create situations where STEC will persist in the herd and spread to younger animals.

Figure 2

As a rule of thumb, the Verified Veal Program (VVP) recommends that 75 per cent of calves on-farm have no more than 30 per cent of their abdomen coated in manure. To help keep veal cattle sufficiently clean at all times, including their flanks and legs, there are a few things you can do:

1. **Keep cattle bedded and investigate bedding material options.**
2. **Improve drainage in pens.**
3. **Avoid overcrowding.**
4. **Clip cattle with long hair.**

verified veal
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- Implementing biosecurity management practices to prevent the movement of disease-causing agents on to, and off of, agricultural operations.
- Excluding animals other than livestock from access to cattle feed and water since rodents and other animals such as sheep and deer are known to be carriers of STEC.
- Maintaining clean clothes and equipment for farm and feedlot personnel to help reduce the opportunities to transmit STEC between herds or between cattle on the same farm.
- Reducing feed volume prior to transportation can help reduce hide contamination that often occurs during transit and holding by reducing gut contents.
- Transporting animals in sanitary trailers and housing them in pens with sufficiently clean bedding will decrease the amount of mud, manure, contaminated bedding, and other materials present on hides that increases the risks of carcass contamination during dressing.

Management at processors should consider farms that incorporate practices that reduce carriage of STEC and contemplate relying on those farms as the source of animals. Processors may need to retain dirty animals and/or take additional time during dressing to decrease the risk that contaminants from the hide get onto the carcass. These measures can result in delay and extra costs for both producers and processors.

There is no single activity that will control all pathogens in the entire meat production process, but rather a multiple step approach that includes each step from on-farm through transportation and processing. Food producers need to recognize that applying effective controls at all levels are the most effective means to producing safe food and safeguarding the industry.