

# *E. coli* O157

## Research and Education Strategy Fact Sheet



### *Developing and Testing of a Prototype Automatic Beef Trim Sampler*

#### **Mandated Testing of Beef Trim for *E. coli* O157:H7**

During the fabrication process of beef primal and subprimal cuts, small portions of beef are trimmed away from the product and are collected into combo bins. When filled, each bin can weigh up to 2,000 lb. Beef trims have to be tested for *E. coli* O157:H7 before they leave the facility, to reduce the risk of product containing *E. coli* O157:H7 from entering the marketplace. Current sampling of beef trim in combo bins requires that 60 small pieces (~6.25 g each) of trim be removed for testing per lot (1 to 5 bins). In large plants in Canada, these 60 pieces of trim are often taken from each bin. It can be challenging for plants to obtain representative beef samples throughout the bin, particularly at the bottom.

#### **Design and Construction of a Prototype Trim Sampler**

In addition to collecting small pieces from meat surfaces by excision, samples for microbiological testing can also be collected by swabbing meat surfaces with a synthetic sponge. The latter can cover a much larger surface area which would consequently lead to more representative results. Ten combo bins from a large plant were each sampled at five locations of each of four levels by swabbing or excision. A total of 400 samples were enriched and tested for generic *E. coli*. Overall, 21% of excision samples and 38% of swab samples were positive for *E. coli*. Of the 40 levels that were sampled, 50% were positive by excision and 70% were positive by swabbing. A prototype trim sampler designed to swab beef trim at the end of the production line before it is put into combo bins was then designed and constructed.

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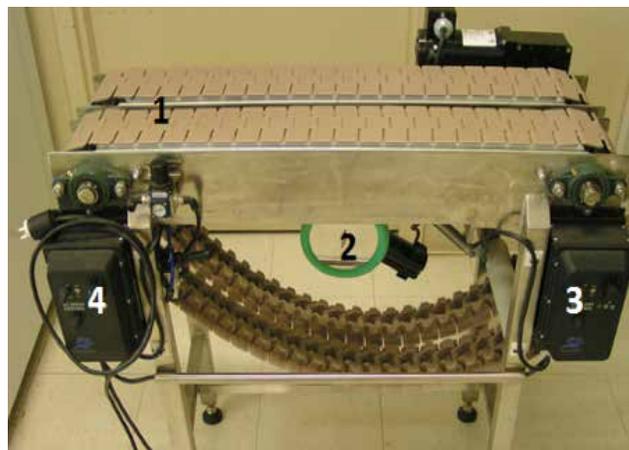


## Testing of the Trim Sampler

Testing of the trim sampler was performed at the AAFC Lacombe Research and Development Centre. The sampler was tested for the weight range of trim it could process and for its ability to recover bacteria, including total aerobes, coliforms and *E. coli*, from trim surfaces. The results were then compared to the recovery of these same types of bacteria using manual swabbing by an experienced technologist. The results show that the trim sampler can process trims up to 1 kg, the normal weight range of trim. When operated at most of the tested parameters the numbers of all three groups of bacteria recovered by the sampler and by manual swabbing were not significantly different.

## Conclusions

The rough prototype of the trim sampler can sample trim of the sizes that would typically be expected at a beef plant. With appropriate parameter settings, it can reliably and consistently recover bacteria. Due to the non-uniform distribution and low number of *E. coli* O157:H7 present on trim in a combo bin, the sampler offers a potential benefit over the current excision method which samples approximately 1,100 cm<sup>2</sup> per five combo bins (10,000 lb of beef) or per one combo bin (2,000 lb of beef). Given that the surface area of trim sampled by swabbing using the prototype trim sampler can be much greater, a better representation of the trim surface can be achieved.



*The prototype trim sampler: divided conveyor, 1; sampling disc, 2; motor fitted for the conveyor, 3; and motor fitted for the sampling disc, 4.*



*Position of the trim sampling disc when activated.*

The CCA is a non-profit federation comprised of eight provincial member cattle associations that provide representation to a national, producer-led board of directors. The CCA's vision is to have a dynamic, profitable Canadian beef industry with high-quality beef products recognized as the most outstanding by customers at home and around the world.