MEAT SLAUGHTERING AND PROCESSING METHODS FOR CONTROLLING ESCHERICHIA COLI 0157 H:7

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Recent outbreaks of <u>Escherichia coli</u> 0157 H:7 meat and milk have called for improved sanitary practices in slaughtering and processing these products. The presence of these organisms in the udder and intestinal tract of beef and dairy cattle requires greater care in processing meat and milk. Since small numbers of organisms have been isolated from farms and testing for them is expensive, the Food Safety and Inspection Service (FSIS), U.S. Department of Agriculture has taken steps to control potential sources of contamination with this bacteria following the Washington State outbreak in January 1993.

The electronic media in the United States has recently reported on United States Food and Drug Administration studies on the prevalence of <u>E.coli</u>. These somewhat alarming reports have increased the concern of the public over the presence of this bacteria in ground meat products throughout the United States. The FDA reported isolation of <u>E.coli</u> 0157:H7 from a number of products on retail supermarket display. It was reprted that <u>E.coli</u> had been isolated from a large number of these retail meat samples, but it was not emphasizes that 0157:H7 made up only small numbers of these positive samples. Unfortunately, the implication was that <u>E.coli</u> 0157:H7 had been isolated in large numbers.

Proper hide removal, evisceration, and removal of lactating udders must be practiced to reduce contamination. Previously, certain fecal material, ingesta, and milk contamination could be trimmed prior to any washing of the carcass. However, washing often drives organisms deeper into the tissue and precludes their removal. This sometimes results in more serious contamination since the organisms may not be removed but actually become more tightly adhered to the tissue. Inspection personnel closely monitor slaughter and processing operations to insure that plants have control of their production procedures. A zero tolerance level for feces and ingesta is in effect on carcasses and boneless beef.

A number of methods of carcass decontamination have been attempted. The use of organic acids as a wash following dressing of the carcass has been successful in some cases, but from an industry standpoint this method of carcass decontamination is expensive. The installation of a considerable amount of new equipment in most plants will be required as well as production of the acid wash. Another method to prevent the contamination of carcasses may in the long run be more economical and more successful. It has been recognized for many years that some of the contamination on a carcass comes from material on the hide that is deposited on the skinned portions of the carcass during the hide removal process.

Many methods of mechanical hide removal are used in the United States. Some are more succesful than others in reducing carcass contamination from the hide, but unfortunately none of these methods completely eliminate carcass contamination. Experimental wirk is presently being conducted which would remove the hair from the hide prior to removing the hide from the carcass. Since most of the contamination is found on the hair, removal of the hair before opening the hide and exposing the muscle tissue of the carcass should lead to a more sanitary carcass. This is a more expensive process, but part of the cost is offset by recovery of the hair which can be reprocessed as a protein byproduct if the hair is properly removed. This offsets some of the costs of the process. Since the hide is a valuable byproduct of cattle slaughter, any method such as this must be conducted ina manner which does not effect hide quality and impair its use for. Preliminary results of this technology indicate that it produces a high quality hide.

Studies are underway to determine the efficacy of washing the underside of cattle prior to slaughter in order to

lessen contamination on the kill floor and enhance carcass dressing. This could be easily accomplished at most cattle abbattoirs abd should result in considerably less contamination reaching the floor.

FSIS has published a new labeling rule which would mandate safe handling labels on raw meat and poultry, including comminuted products. This labeling would caution consumers about proper handling and cooking of these products, give instructions on proper thawing and storage, and illustrate safe use of leftovers. The specific safe handling instructions of these labels state that for your protection, follow these safe handling instructions:

(1) keep refrigerated or frozen; thaw in refrigerator or microwave

(2) keep raw meat and poultry separate from other foods and wash working surfaces thoroughly after touvhing raw meat or poultry

(3) cook thoroughly

(4) keep hot foods hot; refrigerate leftovers immediately

FSIS has issued new regulations for heat-processing temperature/time combinations on fully/partially-cooked patties which include maximum internal temperatures for cooling. A cooking instruction label requirement has been added for partially-cooked patties as well. Specific temperature time cycles that have been demonstrated as necessary to kill <u>E.coli</u>0.157:H7 in meat products are as follows:

<u>EMPERATURE (°C)</u>	<u>TIME (Min</u>
60.0	8.34
62.2	2.11
65.6	0.53
68.3	0.13

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These temperatures/time cycles are of special importance to the fast food service industry because most of the <u>E.coli</u> outbreaks have occurred in their products resulting in well-founded consumer concerns about these products. One slogan which refers to the appearance of well-cooked meat patties is being used to promote consumer education and reads: Red is out, gray is in.

These and other methods are being studied to determine if they will reduce the incidence of <u>E.coli</u>0.157:H7 on meat products and help restore the badly-eroded confidence of the American consumer in its meat supply.

Hopefully, the Washington state tragedy will serve as a <u>wake-up call</u> to industry, scientists and regulators and prevent such events from being repeated.