Food safety behaviour in butchers’ shops

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Introduction

The fatal accident enquiry into the worst outbreak of *E. coli* 0157 food poisoning in the UK, established that among many defects in the butcher’s shop at the centre of the outbreak was a widespread failure to separate raw and cooked meats. The business did not provide separate knives/tools, separate tables/work surfaces, scales or vacuum packers. The butcher and his staff appeared to be ignorant of food safety behaviour that would reduce the risk of cross-contamination.

The Pennington Group (1997) which investigated the outbreak recommended that butchers’ shops selling raw and ready-to-eat products should be licensed and that a requirement of the licence would be the physical separation of raw and cooked products during storage, production, sale and display. This was to include the use of separate refrigerators, production equipment, utensils, and where possible staff. Where a business could not use separate staff, it was suggested that the rigorous use of a HACCP system might be considered acceptable along with the use of additional hand washing facilities in the serving area.

The Food Safety (General Food Hygiene) (Butchers’ shops) Amendment Regulations were laid before Parliament in April 2000. The regulations will introduce a statutory licensing scheme for retail butchers’ shops handling and selling unwrapped raw meat together with ready-to-eat food. Licensing will be subject to demonstration of the implementation of an effective HACCP system, enhanced staff training and compliance with the Food Hygiene Regulations and Food Safety (Temperature Control) Regulations 1995.

When the butcher devises a HACCP system, the hazard analysis will identify those points in the operations where there is a likelihood that ready-to-eat foods might become contaminated by contact with soiled utensils, equipment or surfaces. The effective sanitization of utensils, equipment and surfaces will, therefore, need to be included as control measures in the management of the critical control points (CCP) in the handling of ready-to-eat foods. These CCPs will require monitoring, records will need to be kept and appropriate corrective actions formulated.

The aim of this study was to investigate food safety behaviour in butchers’ shops prior to the implementation of a HACCP system. The focus of the study was behaviour that...
could result in cross-contamination during the handling of ready-to-eat high-risk products. Where necessary, advice would be given to butchers to improve food safety behaviour so that their HACCP systems would be adequately supported and relevant critical control points would be under control.

Method

The study was conducted between March 1999 and February 2000. The 91 businesses, which sold both raw and cooked products, were taking part in the Accelerated HACCP project organised by the Meat and Livestock Commission (MLC) and funded by the Department of Health. One person in each business had completed a training course on general food hygiene and HACCP and the business was receiving follow-up advice from a consultant to assist with the design and implementation of a suitable HACCP system for the business.

Observations were carried out, over a three to eight hour period, by the consultant during a number of visits to the premises and were recorded on a standard proforma. Information was gathered on the:

- extent of physical separation of raw and cooked products during storage, preparation, and display;
- procedures used for the service of raw and cooked meats;
- facilities for hand washing and hand hygiene practices;
- procedures used for cleaning selected items of equipment and hand contact surfaces.

Further information was gathered by enquiry during an interview with the manager or owner and was recorded on a standard proforma. Information was gathered on the:

- volume and nature of cooked meat handling;
- work practices for setting up and taking down meat displays (if these were not observed);
- cleaning programme;
- cleaning priorities;
- staff food hygiene training.

Following a pilot study eight surfaces in the premises were selected for investigation. These were:

- the meat slicer;
- the cooked meat scale pan;
- the hand tap at the wash hand basin;
- the cooked meat chiller handle;
- the vacuum packer;
- the keys of the cash till;
- a cleaning cloth used for cooked meat surfaces; and
- the butcher’s apron.

The procedure used for cleaning the meat slicer and the scale pan was observed.

Results

The volume and nature of cooked meat handling

Although the butchers’ shops handled both raw and cooked products, typically 75 per cent of the sales were of raw meat and poultry. In addition to meat and meat products, butchers’ shops may sell a wide variety of other products. Nearly half (48 per cent) of the businesses had two or fewer members of staff.

The bulk of activities were concerned with the preparation and sale of raw meat and raw meat products. Much of this preparation took place early in the morning prior to the shop opening. It resulted in the early soiling of hands, aprons, cloths, and equipment like vacuum packers and scale pans. Although raw and cooked products were separated completely while displayed for sale, cooked product displays were often set up after raw meat displays, increasing the opportunities for cross-contamination by hands that may touch soiled hand contact surfaces such as handles of chillers, tap handles, soap dispensers, raw meat cloths. Some businesses assigned one member of staff to handle cooked products only during the setting-up process but in most of the shops there was either a single member of staff or staff were involved in both raw and cooked meat handling (Table I).

The extent of physical separation of raw and cooked products

Only two businesses had separate staff for handling cooked products during the trading period. Generally staff were involved with all aspects of the business such as receiving deliveries, preparation activities, serving, removal of waste and cleaning. Nearly all of the businesses had separate utensils, slicers, scales and packaging for the preparation and service of cooked items (Table II).

About 60 per cent of the businesses in this study had separate refrigerators for cooked and raw products. However, in many shops cooked meats were stored in the main chiller.
and vacuum packers, film wrapping machines and scales were used for both raw and cooked products.

In all but two of the shops, members of staff who served the public handled money and used a cash till. Staff were not observed to wash their hands routinely after using the cash till.

The number and condition of wiping cloths varied greatly. Generally they were not colour coded but were kept in separate locations.

At the end of the trading period, cooked meat on display was often transferred to storage in the main chiller or to a separate under-counter chiller unit. Products were usually overwrapped with film or greaseproof paper or vacuum packed and then placed in separate containers, if held in the main chiller.

The cleaning of all equipment/utensils, surfaces was usually undertaken by all members of staff and it was unusual for staff to be assigned to the cleaning of cooked meat displays and equipment only.

Handling of cooked meats

Cooked meat was sliced to order in 95 per cent of businesses. The practices that were used in the service of sliced cooked meats are summarised in Table III.

Table II Proportion of butchers’ premises with separate preparation facilities for raw and ready-to-eat foods

<table>
<thead>
<tr>
<th>Preparation facility/equipment</th>
<th>Percentage separate</th>
<th>Percentage not separate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knives</td>
<td>93.0</td>
<td>7.0</td>
</tr>
<tr>
<td>Chillers</td>
<td>62.0</td>
<td>38.0</td>
</tr>
<tr>
<td>Meat slicers</td>
<td>96.0</td>
<td>4.0</td>
</tr>
<tr>
<td>Vacuum packers</td>
<td>65.0</td>
<td>35.0</td>
</tr>
<tr>
<td>Wiping cloths</td>
<td>89.0</td>
<td>11.0</td>
</tr>
</tbody>
</table>

It was noted that meat slicers were not routinely cleaned between use and that cooked meat often remained on the meat slicer until the next use.

The hand washing facilities and practices

The facilities for hand hygiene are summarised in Table IV.

In a minority of businesses the following facilities for hand hygiene were regarded as unsatisfactory:
- no dedicated wash hand basin;
- the basin located distantly from the service area;
- the only wash hand basin being located in the toilet area;
- water temperatures too hot for hand comfort;
- no hot water;
- hand pumped water supply that was slow in operation;
- wet fabric hand towels; and
- soiled bars of soaps.

No butchers were observed to move from the service of raw meat to the service of cooked products without hand washing. Hand washing was not routine after handling money or using the cash till.

Cooking of meats and meat products

Over half (58 per cent) of the businesses cooked meat or meat products on the premises. Bulk meats such as gammons and hams were cooked in boilers in back preparation rooms; pies, faggots, pasties, etc. were cooked in ovens and chickens were usually cooked in rotisseries located in the shop area.
The facilities for cooking and cooling meat and meat products are given in Table V.

The cleaning programme
All the businesses had sanitation programmes but written cleaning schedules and cleaning records were almost non-existent before the start of the HACCP project. If a written cleaning schedule was present it had often been produced on the advice of an EHO. It usually took the form of a limited listing of some of the equipment and surfaces that required daily cleaning. The cleaning method was identified by a phrase or single word such as “wash” or “scrub” or “sanitize” with an indication of cleaning frequency. Some schedules indicated the generic category of cleaning product such as “bleach, detergent, washing-up liquid, sanitizer”, fewer identified the actual product or gave dilution rates. Schedules did not have information on rinsing, contact times, or drying. Schedules never contained information on who should undertake the cleaning or the standard to be reached or any safety precautions or equipment to be used.

Cleaning practices
A minority of butchers (15 per cent) did not clean the meat slicer until the end of the trading session but most claimed to provide periodic cleansing of the equipment as required. The cleaning procedure usually involved the removal of food debris with a wet cloth and the wiping or spraying of the slicer blade, guard and base plate with sanitizer but rarely entailed the dismantling of the slicer and the sanitizing of component parts. Sanitizer was usually applied by means of a stockinet or cellulose cloth or a hand-held spray. Most butchers (75 per cent) selected a cloth already in use for this cleaning task but a minority (25 per cent) used a new cloth or paper. Some (20 per cent) carried out cleaning of the blade with the equipment turned on and a cloth held to the rotating blade claiming that this practice assisted cleaning. A minority (7 per cent) used an alcohol impregnated wipe for the cleaning task. The equipment was rarely rinsed with clean water and was generally left to air dry or dried with a paper towel.

Most butchers (75 per cent) admitted to infrequent cleaning of hand contact surfaces such as handles of equipment, tap handles, till keys, etc. Spillages in chillers were cleaned daily and the equipment was usually completely cleaned out weekly, while wash hand basins were generally cleaned at the end of the day. Only two businesses in this study had a knee-operated tap at the wash hand basin, several had infra red sensors which enabled the water supply to be turned off and on without hand contact but most had conventional plastic or metal taps.

Discussion
A recent extensive survey of butchers’ premises in the UK prior to the introduction of licensing (Little and de Louvois, 1998) concluded that most butchers’ premises have appropriate physical control measures in place. Although nearly all businesses in the present investigation had separate utensils, slicers, scales and packaging for cooked items, it was observed that these might easily be contaminated by the staff, who handle raw products on a continuous...
basis throughout the day and whose work schedules allow for little segregation of activities. Contaminants may be transferred to cooked product equipment, surfaces or utensils by hands or wiping cloths. Contaminants could be transferred from hand contact surfaces, packaging or food contact surfaces. Hand and equipment washing facilities are often inconveniently located.

Vacuum packers, film wrapping machines, and scales were often used for both raw and cooked products with a risk of cross-contamination. Main chillers used for the storage of raw meat were frequently used to cool cooked products as they were less adversely affected by a rise in temperature.

Cleaning schedules
A critical report on the butcher’s shop (Cox, 1998) at the centre of the outbreak of *E. coli* 0157 identified a failure to devise or enforce separate cleaning schedules and equipment for the shop as one of many defects in their system.

The correct cleaning of equipment, the following of staff hygiene rules on hand hygiene and appropriate staff training were control measures identified on the HACCP plans drawn up by the butchers for the handling of ready-to-eat products in their businesses. Because these control measures were to be employed at the critical control points of preparation, storage and display of these products, they were required to set critical limits, keep records of monitoring and to formulate appropriate corrective actions.

In order to demonstrate that adequate sanitation procedures were in use and were monitored, owner/managers were advised to construct cleaning schedules and records. They were guided to produce comprehensive schedules that indicated cleaning frequency and provided information on:
- the type and concentration of chemicals;
- the use and treatment of cleaning equipment;
- a detailed cleaning method, including the requirement to allow an appropriate contact time, and to rinse and dry where necessary.

They were encouraged to increase the frequency of cleaning for high-risk equipment like meat slicers and cooked meat preparation surfaces and to ensure that the segregation of wiping cloths was maintained at all times.

They were advised to apply food grade sanitizers to cleaned cooked meat surfaces with the aid of a spray dispenser.

Once the cleaning schedule had been devised it was recommended that all staff were trained to follow its directions and that cleaning and training records were maintained. This was essential if they were to demonstrate to the licensing authority that they had communicated the HACCP system to all the staff and were capable of supervising its effective implementation.

Staff training
The report on the Scottish butcher implicated in the *E. coli* outbreak, concluded that he failed to maintain a safe shop and that the main ingredient of his failure was ignorance of the requirements which would produce that result. The business admitted that basic food safety procedures were ignored while staff received no formal hygiene or cleaning training.

In this study, all staff were involved in cleaning and owners or managers claimed that staff were trained to clean as part of their apprenticeship into the meat trade. When questioned about the most important cleaning tasks in the shop, many staff identified high-risk surfaces such as slicers, scales, and knives. But many included the butchers’ blocks, window display units, and the mincer as the most important items to be cleaned. Few identified the cleaning of high-risk storage areas, hand contact surfaces and equipment used for both raw and cooked food such as film wrappers and vacuum packers as priorities.

At least one member of staff in each of these butchers’ shops had attended a recent course of food hygiene and HACCP and approximately half of the staff had undertaken formal basic food hygiene courses, which includes information on cleaning and disinfection. Gillespie *et al.* (2000) found that significantly fewer unsatisfactory or unacceptable samples of cold meats were found in food premises where the manager had received advanced food hygiene training (14 per cent), compared with those that had received intermediate training (23 per cent), basic (26 per cent) or no food hygiene training (33 per cent).

The staff in the butchers’ shops spent at least one hour cleaning at the end of the trading day and many were involved in periodic cleaning during the day. Observation of cleaning activities indicated that, in many
businesses in this study, staff had not been trained adequately on the correct use of sanitizers and the use of paper towel for drying equipment. There was a lack of awareness of the importance of cleaning and disinfecting hand contact surfaces and in a minority of businesses the use of cleaning cloths was a potential hazard.

It was recommended that owners/managers assist staff to reduce potential opportunities for cross-contamination by providing them with adequate cleaning facilities and training them to clean effectively.

They were encouraged to provide:
- colour coded cloths;
- disposable cloths or paper for use on cooked meat surfaces;
- dispensers of chemicals so that the recommended dilutions could be prepared;
- sanitizers for use on cooked product surfaces and hand contact surfaces;
- hand sprayers for applying sanitizer to fixed high-risk food surfaces and hand surfaces both during interim and final cleaning procedures;
- paper towels for drying high-risk surfaces;
- two sets of wash and rinse buckets for raw and cooked food areas.

Cleaning and hand hygiene could be improved if butchers provided:
- larger and deeper equipment washing sinks;
- brushes for scrubbing equipment and surfaces;
- wash hand basins closer to the service area;
- a water supply of constant temperature to wash hand basins;
- paper towels for hand drying;
- taps that do not require hand operation;
- disposable aprons that could be used during the setting-up periods to reduce contamination of the protective clothing.

**Conclusion**

Small retail butchers do not have sufficient staff to provide separate handling of cooked and raw products. They do have separate smaller items of equipment, but given the volume of raw product handling and the work routines in many butchers’ shops there is a danger that hand contact and some food contact surfaces may become contaminated. The techniques observed for the service of cooked meats would minimise the opportunities for cross-contamination but the location and adequacy of hand washing facilities were often judged to be inadequate.

There was a lack of systematic cleaning programmes and records, and some inadequate cleaning protocols. The efficacy of cleaning could be improved by the correct use of cleaning chemicals and cleaning materials and by increasing the awareness of staff to the opportunities for cross-contamination and the importance of sanitizing hand contact surfaces in the shop.

Butchers’ shops on the HACCP project had to adopt the use of written cleaning schedules, routine monitoring and cleaning records to support their HACCP system. Owners/managers were required to demonstrate that staff had received adequate training in cleaning and other associated activities such as hand washing that would regulate critical control points.

The butchers in this investigation had many lessons to learn to bring their food hygiene management system to a standard that would be regarded as adequate for the granting of a licence. It is clear that there are many other food businesses, such as caterers, responsible for handling raw meat and cooked products that also need to learn the lessons from the *E. coli* outbreak if they are to assure the safety of food on the plate.

**References**

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