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Meat hygiene class-year five

Veterinary Medicine

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Subject: Meat hygiene practice

Hygienic production

One of the most important roles of the meat hygiene team within the abattoir is the independent verification of the food safety management system in place. This involves the inspectors allowing the operator the autonomy to operate their own system of monitoring, verification and corrective action, while evaluating the outcome of these controls to ensure they deliver hygienically prepared meat and raw material for edible co-products as well as controlling waste and rejected materials. The inspectorate must be prepared to take effective action when the operator system is flawed or not implemented as intended and the operator fails to identify or correct the problem.

Sources of contamination in meat or carcasses

1- Outer integument – hide, hair, fleece or skin

One of the main sources of carcase contamination is the outer surface of the live animal itself, particularly in winter months when the animals are housed.

2- Gastrointestinal tract

Accidental puncture of the stomach and intestines is a source of contamination on occasions, as is spillage from the rectum and oesophagus. It has been estimated that the mixed bacterial flora of the gastrointestinal tract may reach 10^{10} colony-forming units (cfu) per gram of contents.

3- Physical contact with structures

The design of the line must allow for a full range of sizes of stock so that legs do not touch stands or supports and necks or heads do not drag along the floor, walkways or tables.

Care must also be taken to ensure that the position and height of offal rails is such as to prevent contact with the floor or structures. Swinging viscera, particularly at corners, may come into contact with supporting structures, while poor positioning of the line frequently leads to operatives dragging viscera across the floor, platforms or the line structure for hanging.

4- Operatives

All persons working in the slaughter hall are an important, and extremely mobile, source of contamination and means of cross-contamination for the meat. Movement of all personnel about the plant must be **strictly controlled**, and in the ideal situation, movement would occur only from clean to dirtier parts of the plant. In practice, this is impossible. To minimise the risk of contamination, upgrade stations must be provided where washing, disinfection and, if necessary, a change of outer clothes can take place. Although the movement about the plant of general operatives making social visits can generally be controlled, practical experience has shown that managers, quality control staff, but most of all engineers and fitters, can be the greatest problem in this respect.

5- Equipment and utensils

The equipment used within the slaughter hall is a potential source of contamination. This includes knives, saws and hock cutters which come into direct contact with the meat and so must be regularly cleaned and sterilised. It also involves indirect sources of dirt and debris such as the moving overhead line itself, from which oil or grease may drop on to the meat, and the hide-puller from which faeces may flick on to the exposed carcase and adjacent carcasses.

6- The slaughter hall environment

Ventilation in the workroom must be sufficient to evacuate steam and to prevent condensation forming on the ceiling or inner surface of the roof and overhead structures. A common source of steam emanates from sterilisers which are allowed to operate in excess of 82°C and in which no system is incorporated to discharge the steam. Steam may act as a vector for bacteria and can in addition condense on the carcasses, adding to surface moisture and assisting bacterial growth

7- Vermin and pests

All measures necessary to exclude vermin (rats & mice) and pests from the food-producing factory must be taken. Physical exclusion begins with a fence around the entire premises to keep out cats and dogs, and also includes self-closing external doors and fly-screening on windows.

8- Chemical contamination

Cleaning chemicals may contaminate the meat if they have not been used in accordance with the manufactures' instructions. Only chemicals suitable for use in the food industry should be used for sanitising the slaughterhouse. Most cleaning agents need to be rinsed off the structures correctly. It is not uncommon to find a residue of chemical on sanitised stands and equipment after they have dried. Some sanitising agents are designed to be left on surfaces and do

evaporate to leave a residue-free surface. Chemicals used in the food factory cannot be stored in rooms where food is handled. Ideally, they should be stored in a specifically designated store away not only from food but any materials that might come into contact with food, for example, wrapping or packaging materials.

Methods of reducing contamination

1- Dealing with the dirty animal

It is almost inevitable that, despite all efforts to prevent it, dirty animals will be presented for slaughter, especially in the winter months. The operator must have a procedure for screening and subsequently handling and hygienically dressing the varying degrees and nature of dirty animal presented taking account of animal disease control restrictions and animal welfare considerations.

2- Clipping cattle on line

Clipping after slaughter on the dressing line, as an alternative to clipping cattle in the lairage, has the advantage of removing all animal welfare and handler health and safety concerns. On-line clipping, when compared with clipping in the lairage, resulted in a small but significance difference in ultimate carcass pH, mean 5.59 rather than 5.66.

3- Protecting the meat from the worker

A-Clothing

Under European law, each food business operator must determine what clothing is suitable to protect the food they produce from contamination from the work force. The key stipulation is that whatever clothing is worn, it must be clean.

B-Hands

All operatives in the slaughter hall must have facilities readily available to wash their hands during the working day. The water supply must be premixed to a suitable temperature – too cold and it will not remove the dirt and the operative will not use it; too hot and it will produce steam and the operative will not use it – and must be supplied through taps designed to prevent the spread of contamination. Bactericidal soap is marginally more effective than plain soap and should be non-perfumed to avoid the potential to taint the product. Disposable paper towels should also be provided and bins should be provided to hold the towel waste.

C-Gloves

The wearing of rubber and chain mail gloves presents a dichotomy between hygiene and health and safety. In the slaughter hall, it is likely that with many of the tasks, gloves will become grossly contaminated from the hide with faeces and other soils. With rubber gloves of the

'washing-up' type in common usage, it is almost impossible to wash the entire length of the glove. There is frequently, therefore, a rim of gross contamination around the top of the glove which is readily transferred to the meat.

4- Good hygiene practice

A-Hygienic use of knives

The most common method of sterilising implements is in a cabinet containing water at 82°C, the knife, saw or whatever piece of equipment is to be sterilised being left *in situ* for at least 2 minutes. It is essential that the level of the water covers the handle/blade junction and that the knife or implement is visibly clean before being placed in the steriliser. If it is not washed first, the blood and debris will merely harden on to the blade, which should not be considered sanitised. A 44°C rinse followed by a dip into a steriliser at 82°C will reduce the contamination on a knife to less than 10³ cfu/cm. Sterilising equipment without a flow-through of water is not to be recommended as it can quickly become filthy.

B-Hygienic use of the scabbard

Scabbards of the closed type can usually be considered to be unhygienic and a source of contamination to a sterilised knife. The newer open stainless-steel scabbard is a considerable improvement. A scabbard is necessary, for health and safety reasons, for the transportation of knives to the workstation.

C-Hygienic use of the steel

The steel, which is used to keep the knife sharp, is a source of contamination frequently overlooked in daily operations. A traditional bar steel which is hanging from the user's belt, dangling either inside or against the outside of a wellington boot, cannot be considered as a suitably hygienic surface against which to rub a knife which has just been removed from a steriliser. The cleanliness of the steel, and its storage when not in use, are therefore very important.

Rendering processes

While some meat plants have rendering departments for the treatment of condemned and other inedible material, it is better, from a public health standpoint as well as the efficiency of processing, that the premises should be located away from food outlets and be large enough to handle material from a large area.

The best and most economical method of processing unfit meat and offal is by heat treatment in a jacketed cylinder, which gives complete sterilisation and maximum return from the rendered material. A number of different methods are available for handling inedible material,

all of which are concerned with the separation of the three main constituents, fat, water and fat-free substance, and the production of sterilised technical fat and meat-and-bone meal.

There are four categories of rendering systems which are as follows:

- 1- Conventional batch dry rendering with mechanical defatting.
- 2- Continuous dry rendering with screw press defatting.
- 3- Semi-continuous wet rendering with centrifugal defatting.