

Method for Sampling Beef Carcasses

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An instrument resembling a surgical dermatome, for microbiological sampling of beef carcasses, is described.

The various methods for estimating microbiological levels on carcass meat have been reviewed by Patterson (3), Baldock (1), and Ingram and Roberts (2), who point out that the best method for recovering microorganisms from carcasses is to remove the surface to be analyzed. Despite being the best technique, it has a number of disadvantages. Ingram and Roberts (2) list these as: (i) it is restricted to comparatively small areas; (ii) it is laborious; and (iii) it is prohibitively damaging to a carcass and is not possible with some surfaces.

Yokoya and Zulzke (5) used a template (area, 8.24 cm²) method for sampling meat surfaces. We assessed their technique using a larger template (area, 20 cm²) and found considerable difficulty in obtaining a satisfactory sample, especially from chilled carcasses. Another sampling method was described by Thomas et al. (4). These authors used two scalpels (fixed 5.68 cm apart) to make parallel cuts on a meat surface. Samples were removed with a scalpel and forceps, using the parallel cuts as guides.

In an attempt to make further improvements on sampling methods, we have devised an excision method that uses an instrument based on a surgical dermatome. The instrument (Fig. 1) is constructed of stainless steel, with a high-density nylon handle. The sampling method (Fig. 2) is straightforward and requires a slight sawing action for the blade to cut through the meat. Once the desired sample size is taken, it is held with tweezers and is removed by turning the blade away from the meat surface. In use, the cutting edge of the blade becomes dull, and based on our experience we would recommend that a maximum of 50 samples per blade be taken. The blades are inexpensive, being a slight modification of those commonly used for trimming wall-paper.

The device can be autoclaved, but for disinfection between samples, immersion in hot (80°C) water for 30 s is adequate.

The depth of cut can be varied between 1 and 5 mm, in 1-mm increments. It is generally accepted that most of the bacteria associated with carcass meat are located at or near the surface.

Based on the analysis of 40 samples taken from beef carcasses, about 90% of the bacteria present in the top 6 mm were recovered if a 4-mm sample was taken. Since the instrument gives samples of near uniform thickness, it is possible, knowing the sample weight, to express bacterial numbers as counts per unit area.

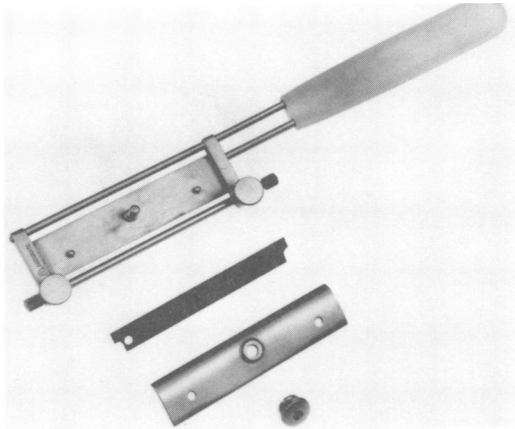


FIG. 1. Disassembled instrument.

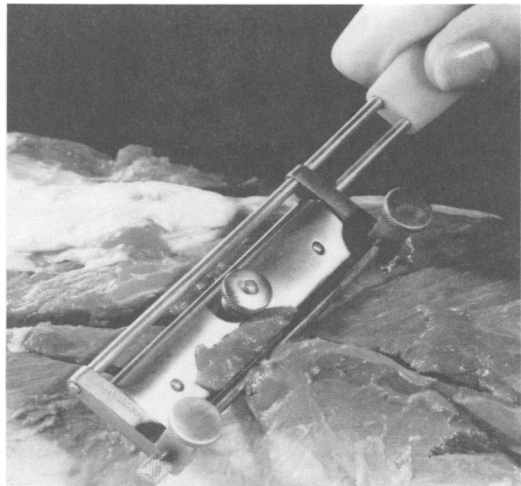


FIG. 2. Instrument in use.

The dermatome has been used to sample more than 130 chilled beef carcasses for microbiological assessment. Most of the samples were taken from the neck area and were 4 mm thick, each representing about 20 cm² of surface area.

From this trial, we have found the instrument easy to use, giving minimal defacement of the carcass.

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