Proposition of microbiological criteria for the quality control of faecal contamination in Belgian slaughterhouses and cutting rooms

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Introduction

- The faecal contamination is likely the main source of potential human pathogens including Salmonella, Campylobacter and enterohemorrhagic Escherichia coli on animal carcasses and on meat. Leakage from the gastrointestinal tract or contact with the animal skin could cause widespread contamination. In warm-blooded animals, the best indication of faecal contamination is Escherichia coli numberling. This microorganism is widely present in the gastrointestinal tract and survives under refrigerated conditions but temperatures below 7°C prevent its growth.
- The USDA has chosen E. coli as indicator of faecal contamination and the enumeration has to be done mandatory for all industries commercializing meat in the United States of America.
- The Belgian surveillance of meat in 1998 has allowed the evaluation of the sampling method and criteria for the Belgian production surveillance are proposed.

Material and Methods

- In 1998, the Belgian surveillance program has assessed the contamination with E. coli of meat from beef, pork, layers, broilers and turkeys.
- The sampled matrices are described in Table 1.
- The enumeration of E. coli has been realised on the chromogenic Rapid E. coli 2 medium (Sanofi Diagnostics Pasteur, France) after an incubation of 24 hours at 44°C.

Results and discussion

The results of the enumeration of E. coli are presented in figure 1-10.

After critical analysis of the results, the following criteria (Table 2) could be proposed:
- The satisfactory limit (=3m) correspond to the percentile 75 level and the acceptability limit (M) to the 95 percentile.
- Interpretation must be done on the last 5 (=n) assayed samples and only 1 sample on 5 is tolerated between the satisfactory and acceptability limits and none above the acceptability level.
- If the criteria were not encountered, new hygienic measures must be performed in order to obtain conform analytical results.

In pork, a correlation may be described between the presence of pathogens (especially E. coli) and the enumeration has to be done mandatory for all industries commercializing meat in the United States of America.

In poultry, the prevalence of pathogens and the contamination in Belgian slaughterhouses and cutting rooms (Sanofi Diagnostics Pasteur, France) after an incubation of 24 hours at 44°C.

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In pork, a correlation may be described between the presence of pathogens (especially Salmonella) and the enumeration of E. coli (Figure 11). In poultry, the prevalence of pathogens and the E. coli level are too high to establish a relationship really useful in order to protect Public Health (Figure 12). However, E. coli enumeration is a good mean in order to evaluate hygienic measure efficacy in all meat industry.

Conclusions

These criteria are proposed for internal quality control. They will allow an evaluation of the normal contamination rate of the industry, in excluding the accidental contaminations. These criteria must be regularly reevaluated.

Bibliography

Food Safety and Inspection Service (FSIS), Federal Register of Department of Agriculture, FSIS, Part II, 9CFR Part 304 Pathogen reduction; HACCP Systems; Final rules, partim pages 38846-38848.

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