

7 Summary

Comparative studies on rapid methods for the detection of thermophilic *Campylobacter* spp. in innate and artificial contaminated poultry meat as well as in poultry faeces

Human Campylobacteriosis is the most frequent disease to be notified to the authorities caused by bacteria in Germany besides Salmonellosis. In 2005 about 61.823 cases have been reported. These are 6.502 more than the year before, when 55.321 have been counted.

Therefore a rapid and reliable detection of pathogenic organisms is needed to ensure microbiological safety and quality.

The classical cultural methods for the detection of *Campylobacter* spp. are time-consuming and well trained laboratory personal is required for each type of bacteria.

To examine samples potentially contaminated by *Campylobacter* spp. just in time, new and more specific screening methods have to be developed.

Those methods have to be evaluated in order to establish such new systems in routine diagnostics.

In this study three new rapid screening methods for the qualitative detection of thermophilic *Campylobacter* spp. were investigated.

The practical orientation was estimated using essential parameters of evaluation.

Two commercially purchasable immunological systems and one genotypical method were compared with the cultural reference method following ISO 10272.

Poultry meat, poultry giblets and faeces of poultry were examined for thermophilic *Campylobacter* spp. in the three systems qualitatively.

Artificially contaminated meat was used in the three systems, too.

Definitive concentrations of *Campylobacter* spp. in poultry meat were accomplished by using a process encountered in previous studies of artificial contamination.

The incidence of thermophilic *Campylobacter* spp. was investigated in poultry parts of different type (meat, giblets) and different terms of storage (fresh, frozen).

High rates of contamination were found in poultry samples naturally contaminated by *Campylobacter* spp. Especially in fresh samples *Campylobacter* spp. was isolated significant more often compared to frozen samples.

In faeces of poultry high rates of contamination were found as well. Therefore flocks carrying a heavy burden may be found at the abattoir.

Because of the high rates found, the slaughtering process seems not to mean an obstacle to the survival of *Campylobacter* spp..

Rather considerable cross contamination has to be expected.

The results of this study show that high numbers of samples can be examined in all three alternatives systems taking far less time compared to the cultural reference method. Especially the both immunological systems are favourable for HACCP in terms of timesaving. Presumptive positive results can be obtained within two days.

In official food surveillance presumptive positive samples have to be confirmed by cultural methods.

It takes about six days to isolate and specify *Campylobacter* spp. through the cultural reference method.

ELFA or rather GLISA shortens the time to proof contamination with *Campylobacter* spp. by three days including cultural confirmation of presumptive samples.

The two immunological methods evaluated in this study, proof to be specific and sensitive, accounting to their proceeding principles.

ELFA is even more sensitive than GLISA.

Both methods are rapidly learnable and can be easily established in routine diagnostics.

The genotypical method compared in this study is a very sensitive and rapid system to detect thermophilic species *Campylobacter coli* and *Campylobacter jejuni* in meat, giblets and faeces of poultry. It can be established for routine diagnostics in specialized laboratories only.

Positive results can be obtained after three days, including 48 h for enrichment.

It is the most sensitive method of the three tested alternative systems.

PCR products should be verified.

The results of this study show that new systems for the rapid screening of *Campylobacter* spp. exist and that they could be established in routine diagnostics.

To ensure microbiological safety and quality of consumer protection even more effectively new methods should find entry into the acknowledged collections of methods (like in § 64 LFGB).

This will help to guarantee the quality of food surveillance in implication of the European order "from stable to table".