Controlling campylobacteriosis in the Netherlands
Cost-utility analysis

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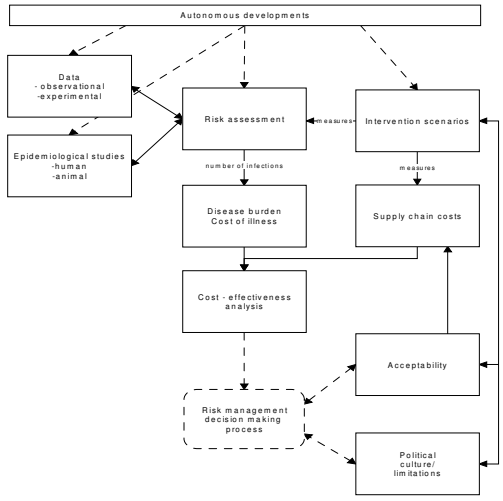
Introduction

Campylobacter infections pose a serious public health problem in the Netherlands. Chicken meat is held responsible for at least 20% of all campylobacteriosis cases in the Netherlands. This is equal to minimum of 16,000 campylobacteriosis cases/year, a disease burden of 240 DALYs and cost-of-illness of € 4 million/year. Several intervention measures are available to reduce the contamination of chicken meat and thereby reduce the incidence of human infections with Campylobacter in the Netherlands. The aim of this study was the estimation of the cost-utility of various intervention measures to control Campylobacter infections in the chicken meat chain.

Material and methods

The costs of the interventions in the chicken meat chain minus the cost savings associated with the reduced number of patients is related to the averted number of DALYs. This results in a cost-utility ratio (CUR), expressing the relative efficiency of several policy options to reduce the number of Campylobacter infections.
The relative risk was estimated by a risk assessment model (Nauta et al., 2005). The costs of the interventions for all stakeholders in the chicken meat chain (Mangen et al., 2005), the disease burden (expressed in DALYs) and the costs-of-illness (Mangen et al., 2004) were all estimated in previous studies within the CARMA (**CA**mpylobacter **R**isk **M**anagement and **A**ssessment) project, and served as input for the current calculations (see figure 1).

Figure 1. Overview of the CARMA project

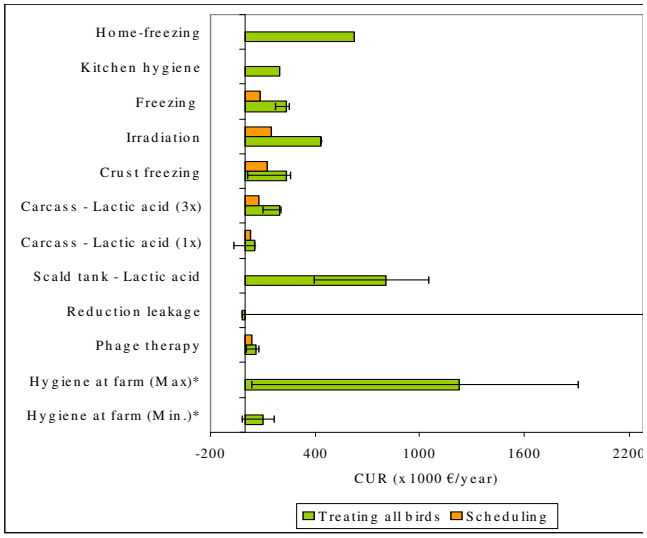


The following interventions have been selected for evaluation

- Farm-level: e.g. improved farm hygiene; phage therapy.
- Processing plants: e.g. reduction of faecal leakage; chemical decontamination; crust-freezing; freezing; irradiation.
- Consumer-level: at home-freezing; improved kitchen hygiene.

Results

Figure 2. Estimated CUR for interventions, assuming most likely value for relative risk[1] and intervention costs.



1) Error bars expressing an uncertainty interval that results from using optimistic and pessimistic interpretation of the effects of the interventions.

Conclusions

There are some potentially interesting intervention measures, based on their theoretical efficiency and effectiveness.

- Scheduling and treating only positively tested flocks is in general more cost-effective than treating all birds.
- There is considerable uncertainty in all factors of the cost-utility estimations, which were based partly on assumptions. Identified options need to be confirmed by further studies.
- The most promising intervention measures from a cost-utility perspective are: reduction of faecal leakage in the slaughter line, decontamination of the carcass by dipping, and a combination of both.
- Phage therapy on the farm might be another cost-effective intervention measure, depending on assumed costs/chicken and proven effectiveness.
- However, none of these interventions can guarantee Campylobacter-free chicken meat.
- Irradiation of all chicken meat is the most effective intervention, however, it is also one of the least efficient interventions

References

Mangen MJJ, Havelaar AH, De Wit GA. (2004) *Campylobacteriosis and sequelae in the Netherlands – Estimating the disease burden and the cost-of-illness.* National Institute for Public Health and Envrionment (RIVM), Bilthoven. RIVM report 250911 004.
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All reports are available at the CARMA website: www.rivm.nl/carma

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