

# Ranking interventions against *Campylobacter* in Danish broiler production by the CARMA & EFSA model

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## Aim

To assess the reduction in the number of human cases of campylobacteriosis when applying interventions in the Danish poultry production targeting i) prevalence of *Campylobacter*-positive broiler flocks (Flynets and Higher level of biosecurity/hygiene) and/or ii) concentration of *Campylobacter* on carcasses at the abattoir level (Lactic acid, Freezing and Reduction of fecal contamination). Two “from farm/slaughter-plant to consumer” QMRA models were used.

## Material & methods

A model developed for the Netherlands (Nauta et al. 2007 – CARMA) and a model developed for the EU (Vose Consulting – EFSA) were used. Originally, both models were created to assess the effect on the number of human cases when applying different *Campylobacter*-positive flock prevalences as well as different concentrations of *Campylobacter* on broiler carcasses as a result of interventions.

**CARMA model:** Each part of the slaughter process is modelled resulting in a number of human cases. This number is then manually compared to a baseline to give a relative reduction in cases – which is the final output.

**EFSA model:** A ‘baseline scenario’ is run at the same time as a ‘future state scenario’ (which include interventions applied or applied to a greater extent). Comparing the outputs from baseline and future state gives the relative reduction in human cases - which is the final output.

## Discussion

Using two models with different structures and assumptions gives more qualified information to decision makers. The strength of the EFSA model is the ease of which new interventions are entered into the model. The CARMA model’s main strength is the customizability - every part of the slaughter process can be modified to fit new information.

## Results

### Relative reduction in cases when applying interventions:

Both models gave the same ranking of interventions. Implementation of Flynets gave the highest reduction in human risk based on a single intervention (Figure).

