The efficacy of broiler farm boot-dip disinfectants against *Campylobacter jejuni*

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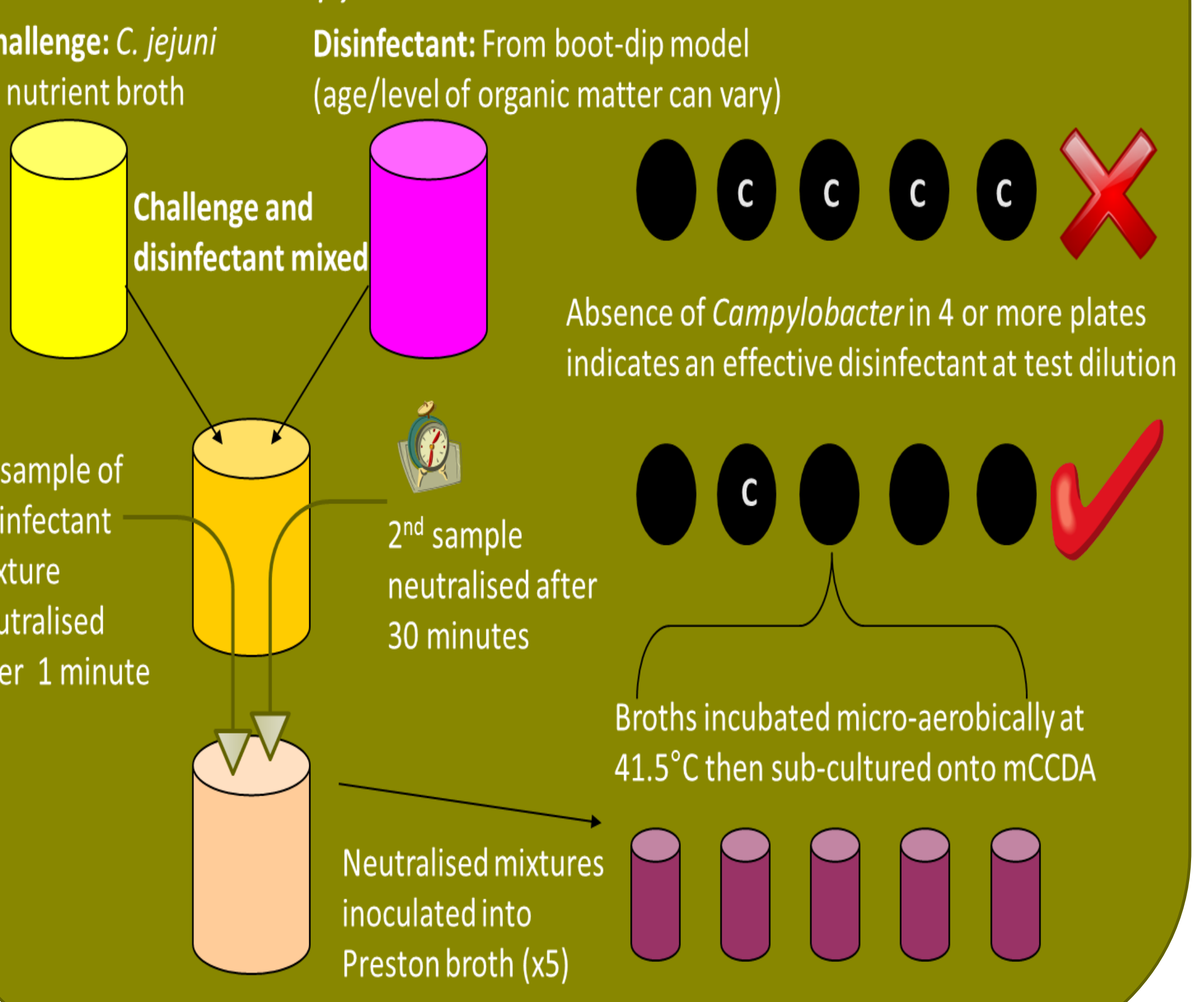
Introduction

- Scientific opinion suggests that 50% to 80% of campylobacteriosis cases are attributed to the chicken reservoir.
- Reducing *Campylobacter* colonisation in chicken flocks may lower the disease burden
- Effective use of disinfectant boot-dips on farm is associated with lower risk of *Campylobacter* colonisation in flocks
- Disinfectants may lose efficacy at working strength over time, and may be inactivated by organic matter such as poultry faeces and litter
- This study aimed to assess the suitability of disinfectants for use in boot-dips for on-farm *Campylobacter* control

Figure 1. Suspension test method for disinfectant efficacy against *Campylobacter* based on BS6734:1986



Method

- Twelve products that covered the main disinfectant classes used on broiler farms were assessed
- Defra General Orders concentrations were used
- In the dirty boot-dip model 2% poultry faeces/litter was added day 0, 3, 5, 7 before efficacy testing. A clean boot-dip (no organic matter) was also tested
- Suspension test method used to assess ability to reduce *Campylobacter jejuni* by >4Log10 (Fig 1)
- Disinfectant samples were tested for efficacy after 1 minute and 30 minute contact times

Fresh clean boot-dip

Organic matter on boots

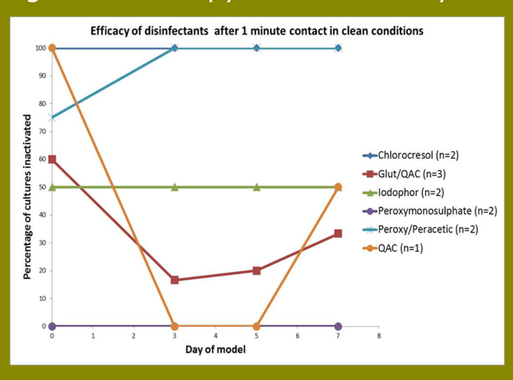
Organic matter in boot-dip

Results

- For a 1 minute contact time, Aldehyde/QAC, QAC and peroxymonosulphates products can be ineffective
- All products were effective (>4log10 *Campylobacter* reduction) after a 30 minute contact time in clean boot-dips
- Addition of organic matter reduced the efficacy of most products immediately at a 1 minute contact time
- After seven days of simulated boot-dip usage only chlorocresol and iodophor products remained effective at 1 minute contact time
- After 30 minutes contact time, most products pass the test but peroxygen/peracetic products and one iodophor product failed the test

Results

Fig 2. Anti-*Campylobacter* activity of disinfectant classes in clean conditions



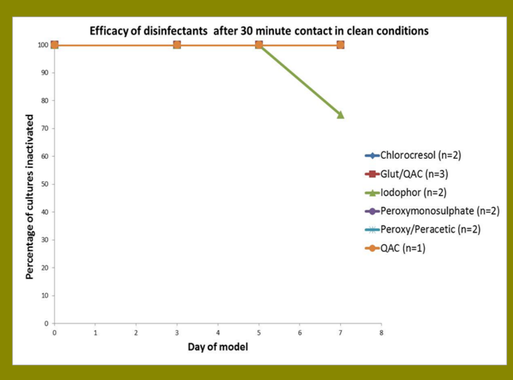


Table 1. Efficacy of individual disinfectants in dirty boot-dip model

Product	Type	1 minute dirty				30 minutes dirty			
		Days storage at 4°C							
		0	3	5	7	0	3	5	7
1	Chlorocresol	**Pass**	**Pass**	**Pass**	**Pass**	Pass	Pass	Pass	Pass
2	Chlorocresol	**Pass**	**Pass**	**Pass**	**Pass**	Pass	Pass	Pass	Pass
3	Aldehyde/QAC	Fail	Fail	Fail	Fail	Pass	Pass	Pass	Pass
4	Aldehyde/QAC	Fail	Fail	Fail	Fail	Pass	Pass	Pass	Pass
5	Aldehyde/QAC	Fail	Fail	Fail	Fail	Pass	Pass	Pass	Pass
6	Iodophor	**Pass**	**Pass**	**Pass**	**Pass**	Pass	Pass	Pass	Pass
7	Iodophor	Fail	Fail	Fail	Fail	**Fail**	**Fail**	**Fail**	**Fail**
8	Peroxy/peracetic	Fail	Fail	Fail	Fail	**Fail**	**Fail**	**Fail**	**Fail**
9	Peroxy/peracetic	Fail	Fail	Fail	Fail	**Fail**	**Fail**	**Fail**	**Fail**
10	Peroxymonosulphate	Fail	Fail	Fail	Fail	Pass	Pass	Pass	Pass
11	Peroxymonosulphate	Fail	Fail	Fail	Fail	Pass	Pass	Pass	Pass
12	QAC	Fail	Fail	Fail	Fail	Pass	Pass	Pass	Pass

Conclusions

- Variable boot-dip disinfectant performance observed with regard to speed of action and inactivation by poultry litter/faeces
- Some products offered rapid action time and capacity to withstand organic loading; qualities that should benefit a boot-dip
- Other products appeared less suitable as boot-dips due to inactivation by organic matter or slow action
- The findings demonstrate that individual disinfectant characteristics should be considered when designing and managing boot-dips for optimal *Campylobacter* control on broiler farms

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