INTRODUCTION
It is estimated that there are approximately 9 million cases of campylobacteriosis per year in EU27 with a total annual cost of 0.4 billion Euros (EFSA, 2011). The organism is a Gram-negative, helical, rod shaped bacteria with 1 or more polar flagella (Figure 1). In broilers the highest numbers are in the large intestine, caeca and cloaca. Thinning of broiler flocks has been identified as one route for infection due to contamination on the crates, catching equipment and operatives entering the house. Once infected the organism moves rapidly through the flock due to stress on the birds.

HYPOTHESIS
If we can provide a “barrier” to the initial contamination of the large intestine this would prevent subsequent infection of the whole flock.

ORGANIC ACID USE
Blends of organic acids have been shown to be effective at controlling the growth of various bacterial species and this reduction is particularly effective at low pH. In vitro work with ACTIVATE® WD Max, a blend of methane hydroxy analogue, formic and propionic acids, has shown a dose response effect against Campylobacter jejuni at pH 4.5 (CCL Report, 2009; Figure 2). In the chicken intestine this effect would be most apparent in the proximal part of the gut where there is a low pH environment providing an enhanced barrier to infection in the distal intestine (Figure 3).

EXPERIMENTAL DESIGN

- **Commercial unit with 4 identical houses each holding 26,000 birds.**
- **ACTIVATE WD Max introduced into the water supply of 2 Test houses at 1kg/T (final pH 3.3) at Day 22 and continued until the end of the trial at Day 46.** The two other houses acted as Control flocks.
- **Campylobacter contamination of the litter in all houses was assessed by the use of ‘bootsocks’ on Days 22 and 25 before thinning at day 35.**
- **Caecal contents (10g) were taken from 20 birds from each house at thinning and at Day 46, transported chilled to the laboratory and examined immediately.**
- **Campylobacter counts (converted to log<sub>10</sub> colony forming units per g) in caecal contents in the different sheds were compared using a 2-sample F test for variance and a two tailed t-test.**

RESULTS

**Water Intake –** there was no change in water intake as a result of the inclusion of the organic acid blend in the supply to two rearing sheds. Bootsocks – all bootsocks taken from the four sheds on Days 22 and 25 before thinning were campylobacter negative indicating that at this stage of the production cycle there was no contamination of the litter from faecal excretion of the organism. Caecal Contents Day 35 – campylobacter were not detected (< 10 cfu/g caecal contents) in any of the samples taken from birds in all four houses before thinning. Caecal Contents Day 46 - No campylobacter were detected (<10 cfu/g caecal contents) in the caecal contents of birds from Sheds 1 and 2 which received the ACTIVATE WD Max in drinking water. Birds from sheds 3 and 4 (Control sheds) were colonized with high levels of campylobacter in caecal contents (Shed 3: 7.98 to 9.22 log<sub>10</sub> cfu/g caecal contents and Shed 4: 7.61 to 9.22 log<sub>10</sub> cfu/g caecal contents). See Figure 4.

A two-tailed t-test assaying the variance found that there was no significant difference (p=0.07) between the mean log count for Shed 3 (8.54) and the mean log count for Shed 4 (8.74).

SUMMARY / CONCLUSIONS

1) The broiler producer reported an improvement in litter quality in the two sheds treated with ACTIVATE WD Max in the water supply.
2) Prior to thinning no campylobacter were detected in either the litter or the caecal contents of birds sampled from all four sheds.
3) Post thinning campylobacter were detected in high numbers in the caecal contents of all the birds sampled from the Control sheds.
4) Post thinning campylobacter were not detected in the caecal contents of any of the birds from the sheds which had received ACTIVATE WD Max in the drinking water.

Inclusion of ACTIVATE WD Max in drinking water from Day 22 until clearout may provide an effective way of preventing campylobacter contamination of poultry flocks post thinning.