

## Are plant derived agents able to control *Campylobacter jejuni* in broiler chickens?

**Cemil Kurekci<sup>1,2</sup>, Errol Hassan<sup>1</sup>, Nguyen Thi Thu Huong<sup>1,3</sup>, Shakir Hassan<sup>4\*</sup>, Chris McSweeney<sup>5</sup> and Rafat Al Jassim<sup>1</sup>**

1: The University of Queensland, School of Agriculture and Food Sciences, Gatton QLD 4343 Australia;

2: Faculty of Veterinary Medicine, Department of Food Hygiene and Technology, Mustafa Kemal University, Hatay, Turkey;

3: Ministry of Agriculture, Vietnam,

4: College of Agriculture, Baghdad University, Iraq;

5: CSIRO Animal Food and Health Sciences (CAFHS), Queensland BioScience Precinct, St Lucia, Queensland, 4067 Australia

### Résumé

*Campylobacter jejuni* is the most common cause of human gastroenteritis in the world. Most persons infected with *Campylobacter* have symptoms including bloody diarrhoea, abdominal cramps, fever and vomiting. *Campylobacter* are usually transmitted to humans by eating contaminated foods, particularly chicken products and there are no control strategies to control the organism in commercial flocks at the moment. In this study, we focused on the use of natural plant-derived compounds including extracts which have been increasingly studied as a source of antimicrobials.

According to in vitro assays two plant extracts (*Acacia decurrens* and *Eremophilaglabra*) and Lemon myrtle oil, terpinene-4-ol, palmarosa oil and formulation of compounds named  $\alpha$ -tops were selected for the animal trials. The number of *C. jejuni* was determined by using the traditional culture and real time PCR methods from the faecal and caecal samples. Body weight gain (BWG) and feed intake (FI) were recorded weekly, and feed conversion efficacy (FCE) was calculated. In addition, a comparison of bacterial DNA profile of caeca among the treatments was carried out by using the PCR-DGGE analysis with bacterial primers targeting the V3 region of the 16S rRNA gene.

The mean log<sub>10</sub> counts of *C. jejuni* tended to be lower in faecal and caecal samples obtained from  $\alpha$ -tops supplemented group than other treatments and control diet. However, other supplementations did not ( $P > 0.05$ ) cause differences in *C. jejuni* numbers. No difference in broiler performance (BWG, FI and FCE) was obtained for dietary supplementation. The supplementation of *E. glabra* extract in feed resulted in serious toxicity in chicken. The diversity of bacterial species in caecal content of chickens differed in  $\alpha$ -tops and *A. decurrens* supplemented groups when compared with the other groups. In general, results of this study suggested that supplemental natural compounds from the plants did not reduce the *C. jejuni* population to desired level, but may provide a means to reduce *C. jejuni* contamination in broilers.

**Key words:** Antimicrobial activity, Plant derived agents, *Campylobacter Jejuni*