University trial shows oregano essential oil can help reduce antimicrobial resistance in calves

Antimicrobial resistance is one of the greatest threats globally to human health and has been predicted to be responsible for 10 million deaths a year by 2050 if not acted upon.

The levels of E. coli bacteria, that are resistant to a fourth-generation cephalosporin antibiotic, can be significantly reduced by adding an oregano essential oil to calf diets, according to research undertaken at the University of Reading in the UK.

University researchers, Dr Partha Ray and Dr Caroline Rymar, undertook a trial to determine the effect of supplementing Angania’s Oreg-O-Stim Liquid (a source of 100 percent natural oregano essential oil), in waste milk fed to dairy calves, on the population of antimicrobial resistant bacteria in their faeces.

Holstein male calves were offered either waste milk treated with Oreg-O-Stim Liquid for ten days or a control diet of the same waste milk source without the addition of Oreg-O-Stim Liquid. After the initial ten days, all calves were fed the same ration of untreated waste milk and concentrates until weaning.

The results of the study were very promising, offering a potential solution in helping to reduce the presence of antimicrobial resistant bacteria. In the faeces of calves fed waste milk with no Oreg-O-Stim, 44.1 percent of E. coli present were resistant to the cephalosporin antibiotic (ceftiofur). However, in calves fed waste milk supplemented with Oreg-O-Stim Liquid until day ten, this was significantly reduced to only 19.6 percent of total E. coli being resistant to ceftiofur.

“Oregano essential oil supplementation not only reduced the abundance of ceftiofur-resistant E. coli but also delayed the emergence of resistance to ceftiofur,” says Dr Partha Ray, lecturer in dairy animal science at Reading University. “We are conducting further studies to understand the mechanism underlying the effect of Oreg-O-Stim feeding on antimicrobial resistance in the gut of young cattle. Improving our understanding of the mechanism is the only way we can refine the practice of feeding the essential oil based supplement to make it more sustainable.”

These antibiotics are commonly used in human and animal medicine and are classified as ‘highest priority critically important’, therefore safeguarding their use is an absolute necessity.

“Feeding supplements which have antimicrobial activity may themselves encourage the development of antimicrobial resistance. It was therefore very pleasing that there was no evidence that feeding Oreg-O-Stim increased the resistance of E. coli to any of the antibiotic classes tested. It was even more promising that resistance to the critically important ceftiofur was reduced,” said Dr Caroline Rymar, associate professor of animal science at Reading University.

Oreg-O-Stim is a 100 percent natural source of oregano essential oil, which has a proven broad-spectrum antimicrobial effect as a result of its composition and the presence of compounds such as carvacrol, p-cymene and thymol.