

Performance improvement with a feed added coated blend of essential oils, a coated blend of organic and inorganic acids with essential oils, or virginiamycin in broilers challenged with *Clostridium perfringens*

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The objective was to evaluate the anticlostridial efficacy of feed additives RepaXol, a blend of double coated essential oils (EO), AciXol an encapsulated blend of organic and inorganic acids along with the essential oils (as in EO) (ACI) or virginiamycin, an antibiotic. A randomized block design with 6 replications of 10 birds per cage was used. The treatments were nonmedicated, non-challenged (NMNC), nonmedicated, challenged (NMC), EO 100 ppm, ACI 500 ppm, and virginiamycin (VIR) 22 ppm. Birds were challenged on Day 14 with *E. acervulina* and *E. maxima* and on Days 19, 20, and 21 with *Clostridium perfringens*. The parameters measured were feed conversion and weight gain, Necrotic Enteritis (NE) mortality and NE lesion scores. There was a significant improvement in feed conversions and weight gains for EO, ACI and VIR. The percent NE mortality for NMC was 33%. There was no significant difference in percent NE mortality between EO (23%), ACI (22%) and VIR (12%). All treatments had significantly lower NE lesion scores compared to NMC. This study demonstrated the benefits of adding EO 100 ppm, ACI 500 ppm, or virginiamycin 20 ppm into the feeds of broiler chickens exposed to *Clostridium perfringens*.

Keywords: *Clostridium perfringens*; RepaXol; AciXol; Virginiamycin; Necrotic Enteritis

Table 1: Comparison of control of Necrotic Enteritis in broilers with a feed added blend of essential oils, a blend of organic and inorganic acids with essential oils, or virginiamycin

Treatments	Feed Conversion ¹	Wt. Gain (kg) ²	NE Lesion Score ³	% NE Mortality ⁴
1.NMNC	1.461 c	0.963 a	0.0 c	0.0 c
2.NMC	1.726 a	0.774 b	0.6 a	33.3 a
3.EO 100 ppm	1.586 b	0.915 a	0.3 b	23.3 ab
4.ACI 500ppm	1.577 b	0.901 a	0.1 bc	21.7 ab
5.VIR 22 ppm	1.519 bc	0.935 a	0.2 bc	11.7 bc

NMNC nonmedicated, non-challenged, NMC nonmedicated, challenged, EO 100 ppm of a blend of double coated essential oils (RepaXol), ACI 500 ppm of a blend of organic and inorganic acids with essential oils (AciXol), VIR virginiamycin 22 ppm

^{a-c} Means within a column with no common superscript differ significantly (P< 0.05).

¹ FC=Feed conversion: total feed consumption/ ((final live weight + mortality weight)-Day 0 weight)

² Live weight gain (kg): (final weight/ number of live birds)- (Day 0 weight/ number of birds)

³ All birds were scored for Necrotic Enteritis lesions on Day 22, wherein 0 is normal and 1, 2, or 3 indicate increasing severity of infection.

⁴ Percent Necrotic Enteritis: (number of NE related mortalities per cage/ total number of birds per cage)X 100