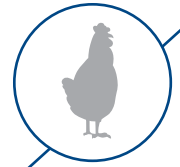


Research Notes P-67

Arm & Hammer Animal and Food Production



CELMANAX improves broiler performance and immune function in response to *E. coli*.

CELMANAX™ is a multicomponent, all-natural feed supplement containing Refined Functional Carbohydrates™ (RFCs™) that has Generally Recognized as Safe (GRAS) status as a feed ingredient.

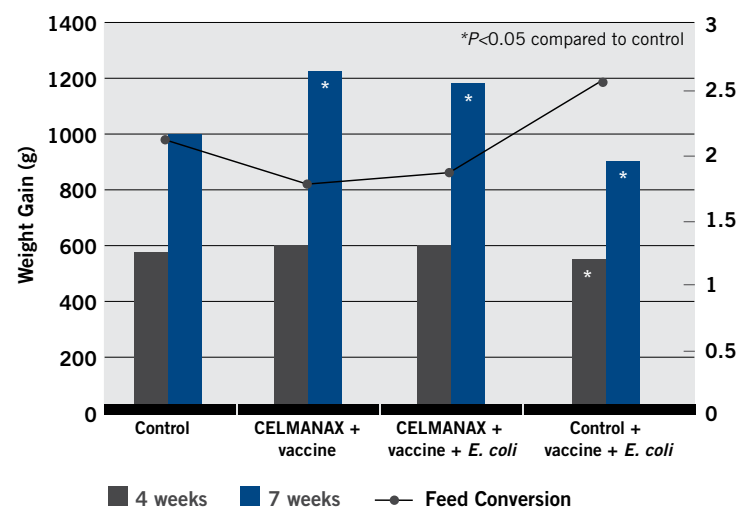
STUDY OVERVIEW

- The objective of this study was to determine the effect of CELMANAX Liquid on performance and immune function of broilers challenged with *E. coli* O₇₈.
- 300 one-day old broiler chicks were assigned to three replicate pens per treatment with 25 birds/pen. The treatments were as follows:
 - Control
 - CELMANAX Liquid 0.5 ml/L in drinking water 3 days before and 3 days after vaccination with LaSota vaccine (administered at day 20)
 - CELMANAX Liquid 0.5 ml/L in drinking water 3 days before and 3 days after vaccination with LaSota vaccine (administered at day 20). On day 21 chicks were infected orally with *E. coli* O₇₈ 1x10⁴ cfu/ml
 - Control plus LaSota vaccination on day 20 and orally infected with *E. coli* O₇₈ 1x10⁴ cfu/ml on day 21
- Body weight, feed intake and mortality were measured. Feed conversion was calculated and blood samples were collected to determine immune response. A portion of birds in each treatment were sacrificed for internal organ analysis.

RESULTS

- Weight gain and feed conversion were significantly improved ($P < 0.05$) in birds receiving CELMANAX (Figure 1).

FIGURE 1: Effects of CELMANAX Liquid on weight gain and feed conversion.



- Immune function in birds receiving CELMANAX™ was improved:
 - Significantly greater phagocytic activity of heterophils ($P < 0.05$) as shown in Figure 2
 - Lymphocytes were higher following vaccination
 - Antibody titers were significantly higher as shown in Figure 3
- Only 20% of chicks were morbid in the *E. coli* + CELMANAX group compared to 80% in Control + *E. coli* group.
- No mortality was recorded in the *E. coli* + CELMANAX group whereas 30% mortality was recorded for the Control + *E. coli* group.
- *E. coli* was re-isolated from various internal organs in 10% of the birds from *E. coli* + CELMANAX group versus from >90% birds in the Control + *E. coli* group, as shown in Table 1.

CONCLUSION

- Supplementation of CELMANAX Liquid significantly improved performance, resulting in 253 g heavier birds at the end of the trial compared to the control.
- CELMANAX Liquid also reduced morbidity and mortality in birds infected with *E. coli* compared to untreated birds.

FIGURE 2: % heterophil phagocytic activity before and after CELMANAX Liquid use.

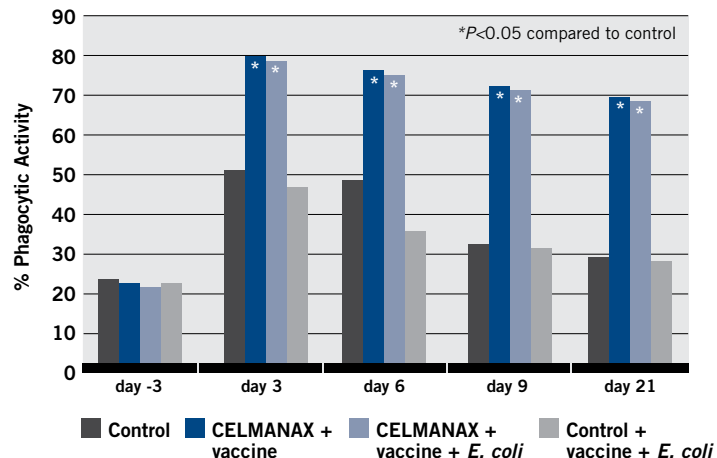


FIGURE 3: Effect of CELMANAX Liquid on NDV titer.

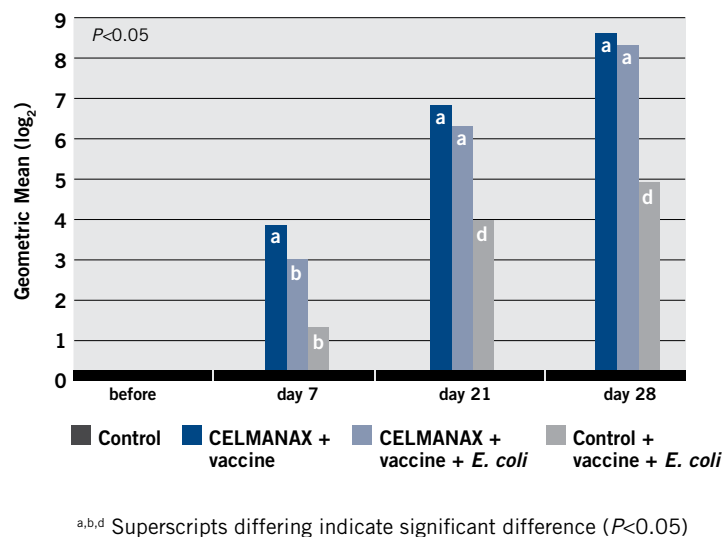


TABLE 1

Re-isolation of *E. coli* from organs.

Treatment	Morbidity %	Mortality %	Liver	Spleen	Heart	Caecum
Control	0	0	0/10	2/10	2/10	4/10
CELMANAX + vaccine	0	0	0/10	0/10	0/10	1/10
CELMANAX + vaccine + <i>E. coli</i>	20	0	0/10	0/10	1/10	2/10
Control + vaccine + <i>E. coli</i>	80	30	10/10	10/10	8/10	10/10



To learn more about CELMANAX contact your nutritionist, veterinarian or ARM & HAMMER™ representative or visit AHfoodchain.com.

