THE EFFECT OF **OMEGA-3 FATTY ACID** SUPPLEMENTATION ON EQUINE BRONCHOALVEOLAR LAVAGE CELL POPULATIONS IN HEALTHY HORSES

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INTRODUCTION

Omega-3 supplementation, used for its anti-inflammatory properties, may help reduce bronchoalveolar lavage fluid (BALF) neutrophil counts (NEU%) in asthmatic horses. However, their effect on healthy equine lungs remains unstudied. This prospective case-control study examined the effects of microalgae-derived omega-3 supplementation on BALF in healthy horses.

METHODS

Thirty clinically healthy horses in a loose-housing system were enrolled. Horses were assigned to negative control- (NCTR, n=8), control feed- (CTR, n=7), or test group (TEST, n=15). The TEST received omega-3 supplementation for 7.5 weeks. BALF samples were collected at baseline and after the trial. Data was ln-transformed and analyzed with repeated measures linear mixed model in which groups, samples and their interaction were as fixed factors and horse as a random factor. Back-transformed model estimates are reported. P values < 0.05 were considered significant.

RESULTS

We observed statistically significant effects in the NEU% of groups (p=0.01) as well as in the groups*sample interaction (p=0.007). The mean (95% confidence interval) BALF neutrophil counts increased during the trial for the NCTR (p=0.01), from 2.12% (1.52–2.97%) to 3.45% (2.3–5.18%). In the TEST, counts decreased (p=0.03) from 4.02% (4.14–5.14%) to 2.96% (2.2–3.97%). For the CTR, counts remained stable at 5.92% (3.15–8.47%) compared to 5.39% (3.49–8.31%). BALF mast cell counts remained unchanged across all groups, with an overall level of 3.45% (2.98–3.99%).

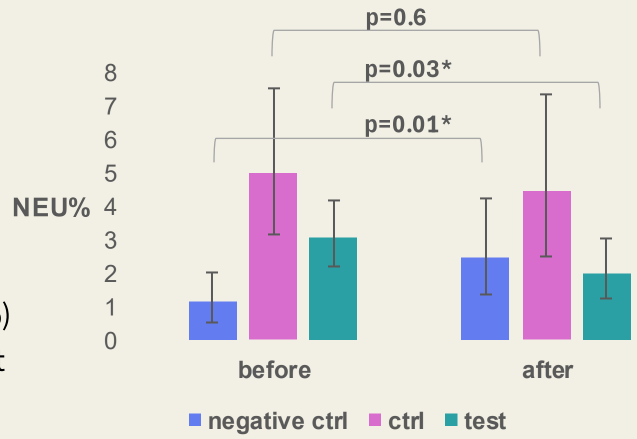

Figure: BALF neutrophil percentage before and after the trial across different groups showing *statistically significant differences in test and negative control groups before and after the trial

DISCUSSION

The decrease in BALF neutrophil percentages in the test group suggests a beneficial effect of the omega-3 supplementation on subclinical lower airway inflammation. Some horses showed BALF cell counts exceeding published reference ranges despite being asymptomatic, likely due to their continuous outdoor access through loose housing conditions.

CLINICAL RELEVANCE

Omega-3 supplementation may help reduce subclinical respiratory inflammation in healthy horses, supporting its potential preventive value. Further research is needed to clarify its effects on inflammatory pathways.

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