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## Dietary (n-3) fatty acids from menhaden fish oil alter plasma fatty acids and leukotriene B synthesis in healthy horses.

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### Abstract

The study objective was to determine the effect of feeding corn oil or fish oil to horses on plasma fatty acid profiles and leukotriene B (LTB) synthesis by stimulated peripheral blood neutrophils. Two groups of horses (n = 5) were randomly assigned to diets supplemented with either 3.0% (by weight) corn oil or fish oil for a period of 14 weeks. The ratio of (n-6) to (n-3) fatty acids in oil supplements was 68.1:1 for corn oil and 0.12:1 for fish oil. Production of LTB<sub>4</sub> and LTB<sub>5</sub> by peripheral blood neutrophils stimulated with calcium ionophore A23187 and plasma cholesterol, triacylglycerol, and alpha-tocopherol concentrations were measured. At 12 weeks, horses fed fish oil had increased plasma concentrations of eicosapentaenoic acid (27-fold; 8.5 versus 0.3 g/100 g fatty acids; P < .0001), docosahexaenoic acid (34-fold; 5.1 versus 0.1 g/100 g fatty acids; P < .0001), and arachidonic acid (8.3-fold; 4.1 versus 0.5 g/100 g fatty acids; P < .0001) compared with horses fed corn oil. Neutrophils from horses fed fish oil produced 78-fold (P = .01) more LTB<sub>5</sub> and 9.5-fold (P = .003) more LTB<sub>4</sub> compared with predietary levels, and 17.6-fold (P = .01) and 3.3-fold (P = .02), respectively, more than horses fed corn oil, and the ratio of LTB<sub>5</sub> to LTB<sub>4</sub> concentrations was 4.0-fold (P = .002) higher in horses fed fish oil.

This study suggests that dietary polyunsaturated fatty acids modulate the leukotriene inflammatory response of horses. If the ratio of LTB<sub>5</sub> to LTB<sub>4</sub> concentrations is important in determining how inflammatory processes are mediated, then fish oil supplementation may have value in treatment of equine inflammatory diseases.