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Purina® Omega Match™ Ahiflower® Oil Supplement Contains a Unique Fatty Acid Profile that can be Utilized by the Horse to Support Performance

A SUMMARY OF RESEARCH CONDUCTED AT THE ATLANTIC VETERINARY COLLEGE OF THE UNIVERSITY OF PRINCE EDWARD ISLAND EVALUATING THE EFFECTS OF SUPPLEMENTATION OF PURINA® OMEGA MATCH™ AHIFLOWER® OIL ON THE CIRCULATING WHOLE BLOOD FATTY ACID PROFILE IN HORSES.[1]

< BACKGROUND >

Specific fatty acids from different fat sources can have various physiological effects in the horse. An optimal balance of omega 3, 6, and 9 fatty acids in the body can help shift biochemical processes to produce anti-inflammatory molecules and provide the basis for better physiological health.[2] Thankfully, through manipulation of the diet it is possible to shift the balance to support the production of more beneficial end products that can support the horses' needs during training and exercise and through different life stages. Purina® Omega Match™ Ahiflower® Oil is a plant-derived omega fatty acid source for horses that is composed of omega-3 fatty acids such as alpha-linoleic acid and stearidonic acid, and omega-6 fatty acids like gamma-linolenic acid. To that end, a trial was conducted to evaluate the fatty acid profile in horses following supplementation of Purina® Omega Match™ Ahiflower® Oil, flaxseed oil, and corn oil. Additionally, the effects of fat supplementation on indices of inflammation were also evaluated.

< MATERIALS AND METHODS >

Standardbred horses (n=30) from four locations on Prince Edward Island were selected for this trial and were blocked by age and location. Horses (n=10) were randomly assigned within each block to one of three treatments: Purina® Omega Match™ Ahiflower® Oil (AF), flax oil (FL), and corn oil (CO). The fatty acid profiles of the supplemental oils are presented in **Table 1**. Horses were fed a standard ration designed to meet nutrient requirements and concentrate was top-dressed with 40 mL daily of their assigned oil for 70 days. Trainers were blinded to treatment and horses continued training during the supplementation period. Whole blood was collected via jugular venipuncture on days 0 (prior to supplementation) and 70. Measurements included fatty acid profile, complete blood cell count, blood chemistry, and fibrinogen (used as a marker of inflammation).

< RESULTS >

All horses remained clinically healthy through the course of the trial and no differences were observed by trainers in behavior or training. On day 0 all measured parameters were similar for all horses. A summary of the fatty acid profile of whole blood from the supplemented horses is below in **Table 2** along with the change in fatty acid composition from day 0 to day 70.

[1] McNiven M & Rodriguez JC (2016) *Ahiflower Oil Demonstrates Improved Anti-Inflammatory Activity and Long-Chain Polyunsaturated Fatty Acid Conversion in Horses: Results of A Randomized Controlled Dietary Trial*, Atlantic Veterinary College, University of Prince Edward Island (unpublished report available on request)

[2] Hess T (2014) *Omega fatty acid supplementation in horses*. R. Bras. Zootec., 43(12):677-683.

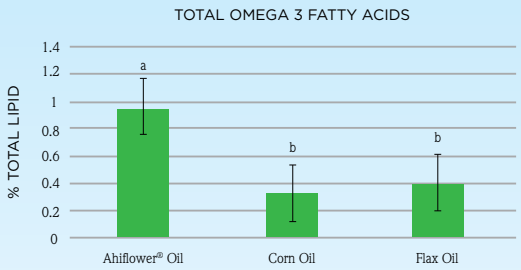
Horses supplemented with Purina® Omega Match™ Ahiflower® Oil had significantly more omega-3 fatty acids in whole blood compared to the corn oil group. Interestingly the horses fed Purina® Omega Match™ Ahiflower® Oil had ten times the level of eicosapentaenoic acid (EPA) compared to the flax-oil fed horses. **Figure 1** shows the change in total omega-3 fatty acids in whole blood following 70 days of supplementation while **Figure 2** shows the change in EPA levels after the same period of time. Two different indices of inflammation were analyzed. The ratio of arachidonic acid to DHA + EPA was significantly lower in the Purina® Omega Match™ Ahiflower® Oil supplemented horses. A second inflammation index, utilizing a ratio between totalblood protein and fibrinogen was numerically lower in the Purina® Omega Match™ Ahiflower® Oil supplemented horses, but was not significant (**Table 3**).

< DISCUSSION AND IMPLICATIONS >

These data provide strong evidence that Purina® Omega Match™ Ahiflower® Oil contains a unique fatty acid profile that can be converted through various metabolic pathways, into highly specialized fatty acids and biochemical endpoints. Further, these data provide evidence that Purina® Omega Match™ Ahiflower® Oil can support optimal levels of inflammation in horses during the stress and rigors of training, which promotes the overall performance of the horse.

FIGURE 1

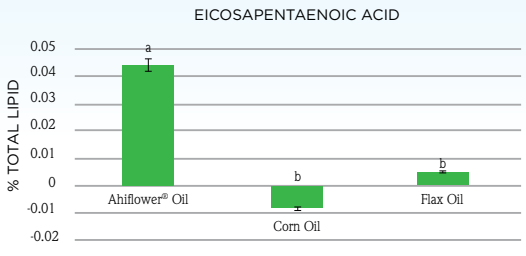
Differences in total Omega-3 fatty acids from day 0 through day 70.



*Differing superscripts indicate significance at P < 0.05

FIGURE 2

Change in eicosapentaenoic acid levels in whole blood of horses supplemented for 70 days.



*Differing superscripts indicate significance at P < 0.05

TABLE 1 FATTY ACID PERCENTS OF OILS SUPPLEMENTED TO HORSES AT 40 ML DAILY

	AHIFLOWER® OIL	CORN OIL	FLAX OIL
PALMITIC ACID	4.68	11.9	5.24
STEARIC ACID	1.77	1.62	3.28
OLEIC ACID	8.9	28.3	18.6
VACCENIC ACID	0.65	0.78	0.82
LINOLEIC ACID	12.1	55.5	15.6
GAMMA-LINOLENIC ACID	5.13	ND*	ND*
ALPHA LINOLENIC ACID	43.1	0.89	55.9
STEARIDONIC ACID	21.9	ND*	ND*
ARACHIDIC ACID	0.25	0.42	0.12
GONDOIC ACID	0.49	0.34	0.19
EICOSADIENOIC ACID	0.11	ND*	ND*

*ND = NOT DETECTED

TABLE 2 FATTY ACID PERCENTS OF WHOLE BLOOD FROM HORSES SUPPLEMENTED FOR 70 DAYS AND CHANGE IN FATTY ACIDS FROM DAY 0 TO DAY 70

	AHIFLOWER® OIL	CORN OIL	FLAX OIL
SATURATED FATTY ACID	30.1	29.9	30.2
MONOUNSATURATED FATTY ACID	17.3	17.4	16.5
POLYUNSATURATED FATTY ACID	52.7	52.7	53.3
OMEGA-3	2.78^{a}	1.95^{b}	3.00^{a}
OMEGA-6	49.9	50.8	50.3
LONG CHAIN OMEGA-3	1.41^{a}	1.09^{b}	1.28^{ab}
LONG CHAIN OMEGA-6	1.95	1.99	1.86
OMEGA-6 : OMEGA-3	18.8^{b}	26.6^{a}	17.4^{b}
DIFFERENCES DAY 70 – DAY 0			
DIHOMO-GAMMA-LINOLENIC ACID	0.08^{a}	$(0.02)^{b}$	0.00^{b}
ALPHA LINOLENIC ACID	0.21^{ab}	0.02^{b}	0.65^{a}
STEARIDONIC ACID	0.17^{a}	$(0.01)^{b}$	0.02^{b}
EICOSAPENTAENOIC ACID	0.044^{a}	$(0.009)^{b}$	00.005^{b}
TOTAL OMEGA 3 FATTY ACIDS	0.96^{a}	0.33^{b}	0.41^{b}

TABLE 3 INFLAMMATORY INDICES OF HORSES SUPPLEMENTED WITH DIFFERENT OIL SOURCES FOR 70 DAYS

	AHIFLOWER® OIL	CORN OIL	FLAX OIL
ALBUMIN : GLOBULIN	0.81	0.83	0.78
NEUTROPHIL : LYMPOCYTE	1.56	1.71	1.88
INFLAMMATION INDEX	38.1	43.1	48.2
INFLAMMATION INDEX CHANGE (D 0 – D 70)	-10.3	1.8	-0.003
AA / EPA + DHA	12.2^{a}	28.2^{b}	18.1^{c}

*DIFFERING SUPERSCRIPTS INDICATE SIGNIFICANCE AT <0.05

< FOR MORE INFORMATION > Contact your local Purina representative if you would like more information about this study.