

Hemp Seed Oil for Equine

Health and Feed-Value Analysis

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Executive Summary

Hemp seed oil is cold-pressed from hemp grain. It is the only common feed oil that supplies gamma-linolenic acid, an omega-6 fatty acid with anti-inflammatory rather than pro-inflammatory activity. A controlled equine trial demonstrated that dietary gamma-linolenic acid from hemp seed oil is absorbed and incorporated into equine serum and synovial fluid, and that no cannabinoids were detectable in either compartment to a 50 parts-per-billion limit.

Horses in the United States are not raised, processed or exported for human consumption. The tissue residue standard that governs cannabinoids in food-animal feed exists to protect the person eating the resulting meat. That chain of exposure does not exist for horses.

1. What the ingredient is, and why the fatty acid profile matters

Hemp seed oil is the lipid fraction pressed from hemp grain. It is a seed product, not whole-plant material, and the distinction governs everything that follows.

Most grains fed to horses are high in linoleic acid, a pro-inflammatory omega-6, relative to alpha-linolenic acid, an anti-inflammatory omega-3. Corn oil, which has historically dominated equine fat supplementation on cost and palatability, carries an omega-6 to omega-3 ratio of roughly 56 to 1.

Hemp seed oil is unusual in two respects. Its omega-6 to omega-3 ratio is far more favorable, and it contains gamma-linolenic acid, which most feed oils do not. Dietary gamma-linolenic acid is rapidly converted to dihomo-gamma-linolenic acid, a precursor to anti-inflammatory eicosanoids. Altering the fatty acid composition of tissue in this direction may reduce inflammatory signalling.

That mechanism is well established in the general nutritional literature. Whether it produces a measurable clinical benefit in horses has not been demonstrated, and this document does not claim it. What has been demonstrated is the delivery: the fatty acids reach the tissues where such an effect would have to occur.

2. The equine evidence

Ely (2023) — the controlled trial

A doctoral dissertation at Virginia Tech. Six Thoroughbred geldings, mean age 11 years, in a crossover design. Horses received 168 mL of hemp seed oil daily for 35 days, followed by a 28-day clearance period. Samples were taken from serum, synovial fluid from the carpus joint, and skeletal muscle.

Gamma-linolenic acid rose significantly in serum and in synovial fluid in supplemented horses. Dihomo-gamma-linolenic acid, the downstream metabolite, was significantly greater in synovial fluid of supplemented horses than controls. Arachidonic acid did not rise correspondingly, which matters because arachidonic acid is the precursor to pro-inflammatory eicosanoids. The dissertation also documented clearance, with supplemented fatty acids returning toward baseline within about two weeks of withdrawal.

Citation note. A one-page abstract of this work appears in *Journal of Equine Veterinary Science* 124:104355, from the Equine Science Society symposium. That abstract reports the synovial fluid fatty acid results only. The cannabinoid testing, the serum results, the clearance data and the 35-day period are reported in the dissertation and must be cited to it.

The abstract also records one finding not in the Coalition's favor, stated here for completeness: muscle alpha-linolenic acid tended to be greater in the control group than the supplemented group, at $P = 0.07$. That is a weak trend rather than a significant difference, and it does not bear on the synovial fluid results, but it appears in the abstract and the Coalition states it rather than omitting it.

Scale and duration

This is one trial, six horses, 35 days. It is the only controlled equine trial of hemp seed oil in the published record. That is a real limit on what can be claimed, and the Coalition states it rather than leaving it to be discovered.

3. The cannabinoid question, tested directly in horses

The objection most often raised against hemp in animal feed concerns cannabinoids. For hemp seed oil the question has been asked in the species and answered.

Ely measured cannabinoids in the oil supplement itself, then tested for them in the horses. None were detected in plasma or synovial fluid when tested to a 50 parts-per-billion limit of detection, after 35 days of daily feeding.

The oil fraction is the more demanding test. Cannabinoids are lipophilic, so if any fraction of the seed were going to carry them into tissue it would be the oil. It did not, at that limit of detection.

Where the numbers come from, and why the method matters

AAFCO definition 71.5, which governs hemp seed meal, sets ceilings of 20 ppm total cannabidiol and 2 ppm total tetrahydrocannabinol. Both are computed as the neutral form plus 0.877 times the acid form. A figure quoted as a simple sum of acid and neutral forms is not comparable to those limits, and this trips people up regularly.

Method matters as much as the number. The analytical method FDA accepted for the laying hen application is the reference standard for subsequent hemp seed ingredient submissions, and cannabinoid figures generated by other methods are not automatically comparable to the AAFCO thresholds.

4. Historical use

Hemp seed feeding to horses is not novel. The Sportsman's Dictionary, a standard English reference work of 1800, describes it twice as ordinary practice. A breeding passage at page 78 directs that a mare “eat for eight days before she is brought to the horse, about two quarts of hemp seed in the morning, and as much at night,” and adds that “if the stallion eats also of it, it will contribute much” — both sexes, at a substantial daily rate, with no special handling advised. A veterinary passage at page 161 prescribes “a quart of hemp seed every day with his corn” for a horse in recovery.

The practice was neither confined to England nor to one century. Farmer and Stock-Breeder listed hemp in 1913 among the feedstuffs still available under wartime supply restriction, “We have left canary seed, hemp, feed rice, buckwheat,” placing hemp inside the ordinary economics of the feed trade rather than outside it. In the United States, the Department of Agriculture's own 1913 Yearbook described bird-seed hemp as a distinct commercial type, sold through seedsmen and dealers in bird supplies and carrying its own varietal identity, twenty-four years before the Marihuana Tax Act.

The historical sources describe whole or bruised seed rather than pressed oil, so the practice is antecedent to the modern ingredient rather than identical to it; hemp seed oil is the fraction of that seed carrying the fatty acids of interest. These are

descriptions of practice, not evidence of safety or efficacy by modern standards. And the eighteenth-century sources use the long s, which optical character recognition reads as an f; passages that appear in search results as “hemp-feed” read “hemp-seed” on the page. What the record does establish is that hemp seed feeding to horses long predates both prohibition and the 1958 cutoff for establishing general recognition of safety through common use, and that the practice ended for legal reasons rather than in response to any recorded adverse finding.

5. The state of the evidence

What the equine record establishes

- Dietary gamma-linolenic acid from hemp seed oil is absorbed and incorporated into equine serum and synovial fluid.
- Dihomo-gamma-linolenic acid rises in synovial fluid without a corresponding rise in arachidonic acid.
- The effect clears, with supplemented fatty acids returning toward baseline within about two weeks of withdrawal.
- No cannabinoids were detected in equine plasma or synovial fluid to 50 ppb after 35 days of feeding the oil fraction.
- No adverse effect attributable to hemp seed oil was reported, and body weight and body condition were unchanged.

What remains open

- One trial, six horses, 35 days. Longer studies in more animals would strengthen every claim above.
- No clinical outcome has been demonstrated. The fatty acid changes are established; whether they reduce inflammation or improve joint health in horses has not been tested.

Both are addressable with established protocols and both sit on the Coalition’s research agenda. Neither is an adverse finding, and neither concerns cannabinoid exposure.

Appendix: sources

Source	Type	What it supports
Ely, K. (2023), Virginia Tech	PhD dissertation	Fatty acid incorporation in serum, synovial fluid and muscle; cannabinoid non-detection to 50 ppb; clearance kinetics; 35-day period
Ely, K. et al. (2023), J. Equine Vet. Sci. 124:104355	Conference abstract	Synovial fluid fatty acid results only
Mohamed, N. et al. (2024), ACS Food Sci. Technol. 4(1):88-103	Peer-reviewed	Chemical characterization of hemp seed derivatives including the oil fraction
AAFCO Official Publication (2026), definition 71.5	Regulatory	Cannabinoid ceilings and the computation formulas
FDA GRAS notices 765, 771 and 778 (December 2018)	Regulatory	No-questions responses covering hemp seed oil for human food
The Sportsman's Dictionary, 4th ed. (1800), pp.78, 161; Farmer and Stock-Breeder 32 (1913), p.231; USDA Yearbook of Agriculture (1913), p.317	Historical	Hemp seed fed to horses as described practice

Health, nutritional and regulatory statements reflect the current published evidence and the Coalition's reasoned positions. The Hemp Feed Coalition is neither the FDA nor legal counsel. Regulatory framing is to be confirmed by counsel before external use.

Andrew Bish, President, Hemp Feed Coalition · Andrew.Bish@Bishcom.com · hempfeedcoalition.org