

Hemp Seed Meal for Equine

Health and Feed-Value Analysis

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Executive Summary

Hemp seed meal is the protein- and fiber-rich fraction remaining after oil is pressed from hemp grain. Three published equine studies have examined it or its co-product in horses. Across that work horses accepted the ingredient voluntarily, protein digestibility of the whole diet was unchanged at inclusion up to 40 percent of concentrate, forage intake and fecal consistency were unaffected, and no cannabinoids were detected in plasma or synovial fluid to a 50 parts-per-billion limit of detection. No published equine study has identified an adverse effect attributable to hemp seed products.

Hemp seed meal already holds an official AAFCO ingredient definition for laying hens, definition 71.5, adopted under the more demanding standard that applies when the resulting eggs enter the human food supply. Horses do not enter the human food supply in the United States.

1. What the ingredient is

Hemp seed meal is what remains after hemp grain is mechanically pressed for oil. It is a seed byproduct, not whole-plant material. This distinction governs everything that follows: the seed fraction and the flowering fraction of *Cannabis sativa* behave differently, and the legislative and regulatory ask concerns the seed fraction alone.

Chemical characterization of eight cold-pressed hemp seed derivatives, including hulls, dehulled seed, oil and cake or meal, was published by Mohamed et al. (2024) in ACS Food Science and Technology. That work provides the compositional basis for the nutrient values used here. Hemp seed meal is typically 25 to 39 percent crude protein, with a favorable omega-6 to omega-3 ratio of approximately 3.2 to 1 in the meal fraction, and a fiber fraction substantially higher than conventional protein concentrates.

Why the low non-structural carbohydrate load matters

For a horse, the significance of a high-fiber, low-starch protein source is not academic. Non-structural carbohydrate load is the primary dietary concern in equine metabolic syndrome, insulin dysregulation and laminitis risk. A protein and energy source that delivers calories through fiber and fat rather than starch is useful precisely for the horses hardest to feed. Hemp seed meal is that kind of ingredient. This is a mechanistic argument rather than a measured clinical outcome, and no equine trial has yet tested hemp seed meal in metabolic horses.

2. The equine evidence

Springer (2023) — acceptability and digestibility

A Master's thesis at Tarleton State University. Horses were offered 1.0 kg of hemp seed meal daily across six consecutive days. Voluntary intake rose from 0.287 kg on day 1 to 0.695 kg on day 5, the highest daily intake observed, easing slightly to 0.652 kg on day 6. Hay consumption declined across the period, but the author's correlation analysis found no relationship between hay intake and hemp seed meal intake, and he concluded the two were independent. One horse was removed from the trial for

complete diet refusal. Springer's own conclusion from the nutrient profile is that hemp seed meal's niche in equine rations may lie in replacing lower-quality roughage rather than competing directly with conventional protein concentrates.

Walker (2025) — protein digestibility at inclusion

A capstone study feeding hemp seed meal to horses in a 4 × 4 Latin square design, replacing soybean meal as the primary protein source at 20 and 40 percent of concentrate. There were no feed refusals at any inclusion level. Whole-diet nitrogen digestibility, hay intake, fecal consistency and body weight all showed no significant change. This is the highest inclusion level fed to horses in published work and it produced no adverse finding.

Ely (2023) — the oil fraction, and the cannabinoid question

Ely's Virginia Tech doctoral dissertation fed hemp seed oil to six Thoroughbred geldings for 35 days in a crossover design, with a 28-day clearance period. Gamma-linolenic acid rose significantly in serum and synovial fluid, and dihomo-gamma-linolenic acid rose in synovial fluid, demonstrating that dietary fatty acids from hemp seed are absorbed and incorporated into equine tissue. No cannabinoids were detected in plasma or synovial fluid when tested to a 50 parts-per-billion limit of detection.

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

Ely fed the oil fraction rather than the meal. It is cited here because it answers the cannabinoid question directly in the species, and because oil is the fraction in which lipophilic cannabinoids would be expected to concentrate. It is not offered as evidence about hemp seed meal's nutritional performance.

3. The cannabinoid question

The objection most often raised against hemp in animal feed concerns cannabinoids. For horses the question is narrower than it first appears, and the evidence is consistent.

AAFCO definition 71.5 specifies numerical ceilings of 20 ppm total cannabidiol and 2 ppm total tetrahydrocannabinol, computed as the neutral form plus 0.877 times the acid form. Any figure quoted as a simple sum of acid and neutral forms is not comparable to those limits, and the analytical method matters: the method FDA accepted for the laying hen application is the reference standard for subsequent submissions.

In horses specifically, Ely tested for cannabinoids in plasma and synovial fluid after 35 days of feeding the oil fraction and detected none to 50 ppb. Across other species fed the seed fraction, tissue cannabinoid concentrations have been either non-detectable or confined to fat at parts-per-billion levels far below thresholds regulators treat as safe for people eating the resulting meat.

For horses the human food-safety rationale does not apply at all. Horses kept in the United States are not raised, processed or exported for human consumption. The chain of exposure the strict tissue standard exists to interrupt is absent.

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.

These are descriptions of practice, not evidence of safety or efficacy by modern standards, and none of it was generated under controlled conditions. The eighteenth-century sources also 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

- Horses voluntarily accept hemp seed meal and increase intake across repeated exposure.
- At 40 percent of concentrate, the highest level published, there were no feed refusals and no change in whole-diet protein digestibility, hay intake, fecal consistency or body weight.
- Dietary fatty acids from hemp seed are absorbed and incorporated into equine serum and synovial fluid.
- No cannabinoids were detected in equine plasma or synovial fluid to 50 ppb after 35 days of feeding the oil fraction.
- No published equine study reports an adverse effect attributable to hemp seed products.

What remains open

- Published equine feeding trials ran six to seven days. A longer-duration study to a target animal safety protocol has not been completed in horses.
- No equine trial has tested hemp seed meal in metabolic or insulin-dysregulated horses, where the low starch load would be most clinically relevant.

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

Appendix: sources

Source	Type	What it supports
Springer, R.W. (2023), Tarleton State University	MSc thesis	Acceptability, voluntary intake, in vitro digestibility
Walker, T. (2025)	Capstone project	Protein digestibility and safety to 40% of concentrate
Ely, K. (2023), Virginia Tech	PhD dissertation	Fatty acid incorporation; cannabinoid non-detection to 50 ppb
Ely, K. et al. (2023), J. Equine Vet. Sci. 124:104355	Conference abstract	Synovial fluid fatty acid results only

Source	Type	What it supports
Mohamed, N. et al. (2024), ACS Food Sci. Technol. 4(1):88-103	Peer-reviewed	Chemical characterization of hemp seed derivatives
AAFCO Official Publication (2026), definition 71.5	Regulatory	Ingredient definition and cannabinoid ceilings
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.

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