

Hemp Seed Oil for Equine

Economic Impact Analysis

Prepared by the Hemp Feed Coalition | August 2026 | CONFIDENTIAL — Contact the Hemp Feed Coalition regarding distribution or citation.

Executive Summary

Legalizing hemp seed oil as an equine feed supplement would create a domestic offtake market for U.S. hemp farmers and processors while giving horse owners a fatty acid supplement with a profile no commodity oil matches. Applying the Coalition's assumption library to a U.S. horse population of 6.65 million, at 5 percent adoption and the dose used in the only controlled equine trial of the ingredient, the market would require roughly 139,453 to 167,344 acres of hemp and generate an estimated \$253.8 million to \$281.7 million in combined annual revenue across the supply chain, supporting 674 to 1,132 direct agricultural jobs.

U.S. farmers harvested 7,515 acres of hemp for grain in 2025. A single approved equine oil market at modest adoption would require roughly eighteen to twenty-two times that acreage.

1. The supplementation rate

The most consequential input in this model is the assumed daily hemp seed oil intake per horse. This analysis is anchored to 0.333 lb per horse per day, which is the dose administered in the only controlled equine trial of the ingredient.

Ely (2023), a doctoral dissertation at Virginia Tech, supplemented six Thoroughbred geldings with 168 mL of hemp seed oil daily across a 35-day period in a crossover design, followed by a 28-day clearance period. Applying the Coalition's oil conversion factor of 7.5 lb per gallon, 168 mL is 0.333 lb per day, or about 5.3 fluid ounces. Anchoring the model here means the economic projections describe the same rate at which the published equine results were obtained.

Against a 22 lb total daily ration, being a 1,100 lb horse consuming 2 percent of body weight, 0.333 lb is approximately 1.5 percent of the diet, and sits within the range of added dietary fat commonly used in equine concentrate feeding.

The modelled rates against the only dose fed to horses

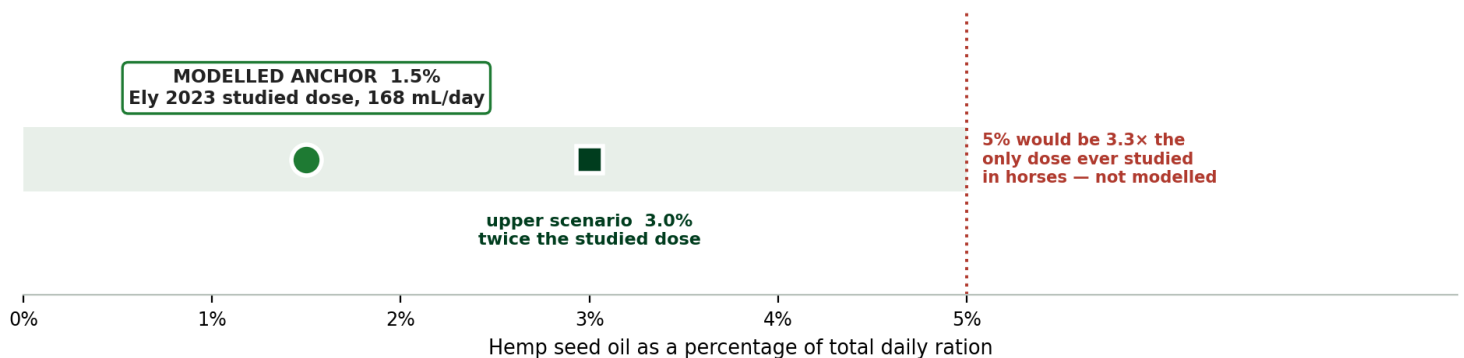


Figure 1. The modeled rates against the only dose ever fed to horses.

The Coalition models a second scenario at 3.0 percent of ration, twice the studied dose. It does not model 5 percent. At 1.10 lb of oil per day that would be more than three times any dose fed in equine research, and is not a credible rate for a single oil in an equine diet regardless of what a rounding convention might suggest.

2. Method

Because oil is the primary product, grain requirements are derived backward from oil demand, and hemp seed meal is treated as the co-product of the same grain. No grain is double-counted.

The low and high scenarios move in a way that merits explanation. The low-acreage case pairs the higher oil extraction yield of 30 percent with the lower grain price, because a higher oil yield means less grain is needed for the same oil, which reduces both acreage and farmer revenue. The high case pairs the lower 25 percent yield with the higher grain price. Oil revenue is identical in both, because total oil demand is fixed by the feeding assumption rather than by extraction efficiency.

3. Economic calculations

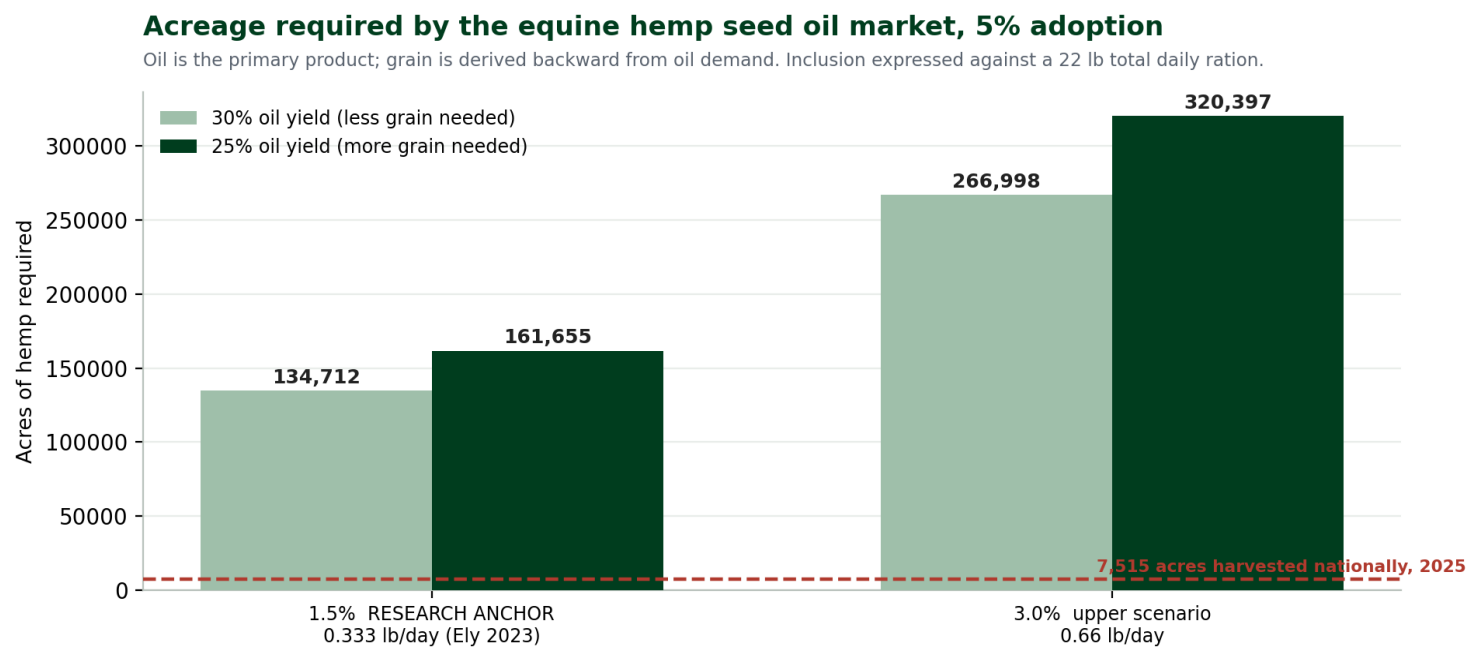


Figure 2. Acreage required at each inclusion scenario, 5 percent adoption.

At the research anchor, 1.5 percent of ration

Step	Calculation	Low	High
1. Oil demand	$6,650,000 \times 5\% \times 0.333 \text{ lb/day} \times 365$	40,411,913 lb	40,411,913 lb
2. Grain required	$\text{oil} \div 0.30 \text{ / } \div 0.25$	134,706,375 lb	161,647,650 lb
3. Acres required	$\text{grain} \div 966 \text{ lb/acre}$	139,453	167,344
4. Farmer revenue	$\text{grain} \times \$0.60 \text{ / } \times \0.70	\$80,827,200	\$113,158,500
5. Oil revenue	$(40,411,913 \div 7.5) \times \28.75	\$154,912,331	\$154,912,331
6. Meal co-product	$(\text{grain} \times 0.67) \times \0.275	\$24,819,600	\$29,783,580
7. Jobs	$\text{acres} \times 5 \text{ to } 7 \div 1,000 \text{ (directional)}$	674	1,132

Revenue summary

Revenue stream	Low	High
Hemp grain, to farmers	\$80,827,200	\$113,158,500
Hemp seed oil, primary product	\$154,912,331	\$154,912,331
Hemp seed meal, co-product	\$24,819,600	\$29,783,580
TOTAL	\$260,559,131	\$297,854,411

The grain and meal revenue, \$98.9 million to \$126.8 million, is the portion that reaches farmers and primary processing. Realizing the meal co-product revenue assumes a parallel approved market for hemp seed meal; meal is recovered from the same grain pressed for oil, so it is not double-counted.

At 3.0 percent of ration

Measure	Low	High
Acres required	276,395	331,674
Farmer revenue	\$160,198,800	\$224,277,900
Oil revenue	\$307,024,663	\$307,024,663
Meal co-product	\$49,194,000	\$59,033,100
TOTAL	\$516,417,463	\$590,335,663
Jobs	1,335	2,243

4. Why this market

The constraint on U.S. hemp grain production has not been agronomic. It has been offtake. Without approved end markets processors cannot commit to volume, and without processor commitments farmers will not plant. An approved market gives processors a reason to contract acres, and a contracted acre is what lets hemp enter the rotation as a commercial option rather than a speculative one.

The equine supplement channel is a favorable place to start. It is high-awareness and premium-priced, and horse owners are accustomed to paying for differentiation. Hemp seed oil enters it with a fatty acid profile no commodity oil matches and with published equine data behind it.

Relationship to the equine meal market

Hemp seed oil and hemp seed meal are co-products of the same pressing operation, and the two equine markets should be read together rather than added. Because the meal market is modeled at a substantially higher per-animal feeding rate, meal demand is the binding constraint when both are considered: the grain required to serve the equine meal market would yield more oil than the equine oil market requires. Approving both would not double the acreage. It would improve the economics of every pressed bushel by giving both output streams a legal destination.

5. The state of the evidence

Established

- Hemp seed meal, the co-product of the same pressing, holds an official AAFCO ingredient definition. A tentative definition for laying hen feed was adopted at the AAFCO Annual Meeting on 7 August 2024, where 48 states voted to approve and 2 abstained. It was moved to official at the Annual Meeting on 4 August 2025 and first printed as definition 71.5 in the 2026 Official Publication.
- FDA issued no-questions responses to three GRAS notices covering hulled hemp seed, hemp seed protein powder and hemp seed oil in December 2018.
- Hemp seed oil fed to horses for 35 days raised gamma-linolenic acid in serum and synovial fluid, demonstrating absorption and incorporation into equine tissue.
- No cannabinoids were detected in equine plasma or synovial fluid to a 50 parts-per-billion limit of detection after 35 days of feeding the oil fraction.

Open

- One controlled equine trial of hemp seed oil exists, with six horses over 35 days. The model applies that dose across 365 days, which is reasonable for a daily supplement but would be strengthened by a longer study in more animals.
- No equine trial has fed hemp seed oil above roughly 1.5 percent of total ration, which is why the upper scenario is capped at 3 percent.

Neither open item concerns cannabinoid exposure. That question was tested directly in horses, in the fraction where lipophilic cannabinoids would be expected to concentrate, and none were detected.

6. What this means on the farm

Acreage is set by demand, not by yield. The acres in the calculations above are what an approved market would call for. What yield determines is whether those acres pay the grower who plants them, and that is the question a farmer asks first.

One point specific to oil. The farmer does not sell oil. The grower sells grain, and the oil is created downstream by the processor who presses it. The farm-gate figures in this report are grain revenue only; the oil and meal values belong to the processing stage and should not be read as farm income.

The Coalition's farm work models return above total cost per acre, the figure that decides planting, rather than gross revenue. Two things drive it: yield, and the cost of the ground. At the USDA NASS national average of 966 lb per acre and \$0.70 per lb, hemp grain returns roughly \$172 per acre on Montana dryland, \$127 in New York, and \$49 on average-cost land, while losing money on high-rent irrigated ground in Kansas and Nebraska, at about negative \$60 and negative \$145. At today's average genetics, hemp grain is a viable rotation on moderate-cost land and a poor fit on expensive irrigated acres.

Hemp grain returns depend on yield and on the cost of the ground

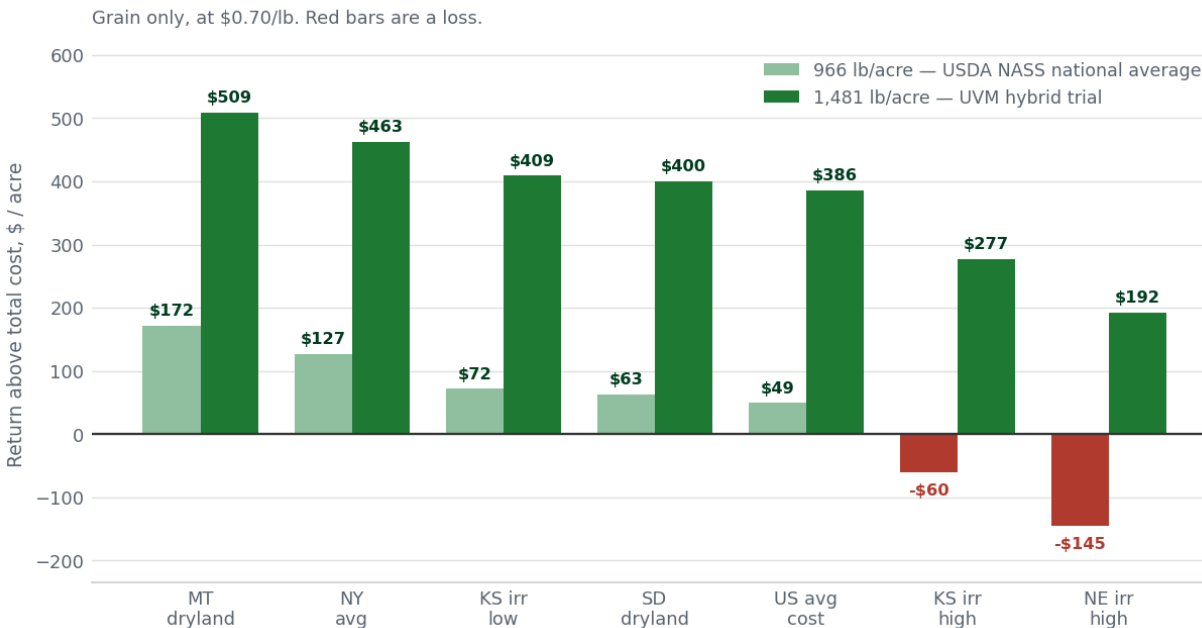


Figure. Return above total cost per acre by land class, grain only at \$0.70/lb. Source: HFC Farm Return Matrix, Master Model v5, 08-03-26.

Genetics change it. At the 1,481 lb per acre recorded in University of Vermont hybrid trials, the same \$0.70 price returns roughly \$509 per acre on Montana dryland, \$386 on average-cost land, and stays positive on every land class in the register, including Nebraska irrigated at about \$192. Hybrid development for the U.S. market is underway at several companies, one of which, New West Genetics, is represented on the Coalition's board.

Harvesting the stalk changes it again. A grain crop whose stalks are also taken yields roughly one to one and a half tons, sold conventionally at about \$300 per ton for hurd and short fiber. On the national average yield that dual-purpose return runs from roughly \$339 to \$489 per acre on average-cost land and stays positive across every land class.

Harvesting the stalk lifts every land class above break-even

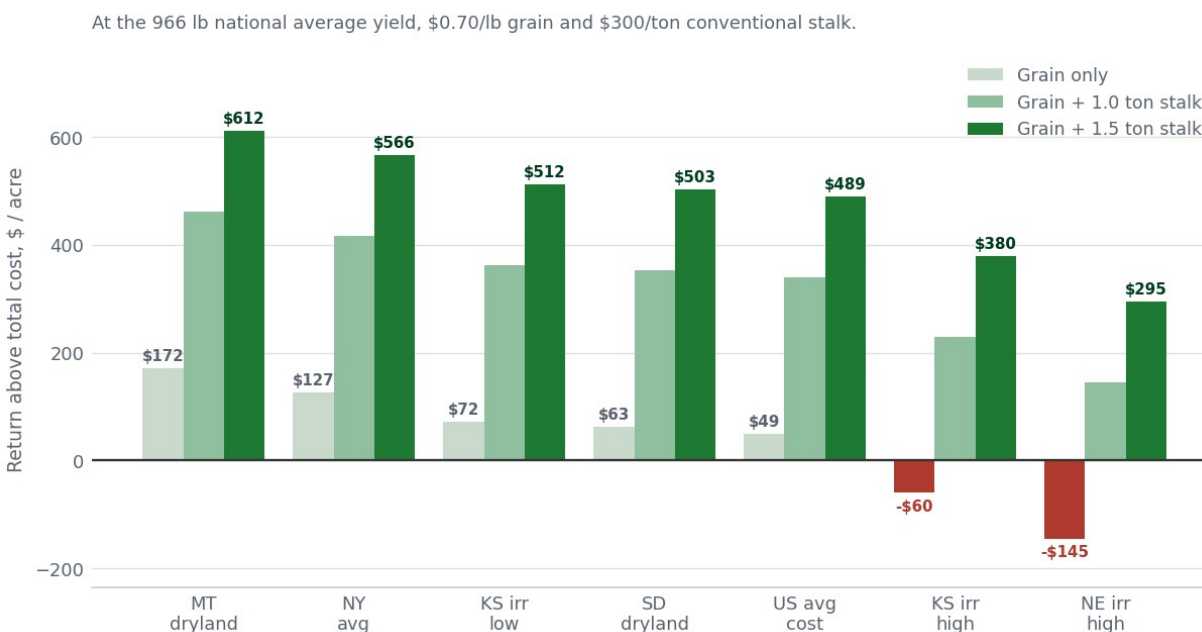


Figure. Effect of harvesting the stalk, at the 966 lb national average yield. Source: as above.

No pesticides are currently labeled for hemp across most of the United States, so the crop carries no pesticide cost and needs fewer field passes than the row crops it would rotate with. Growers also commonly report yield gains in the crop that follows hemp, consistent with added rotational diversity, though hemp is not a nitrogen fixer and that effect is anecdotal rather than measured.

The binding constraint has never been agronomic. It is offtake. Without an approved end market processors cannot commit to volume, and without processor commitments growers will not plant. The figures above describe what becomes possible once that constraint is removed.

Figures are given as a range across land classes rather than as a single per-acre number, because the spread between a Montana dryland acre and a Nebraska irrigated acre is wider than the difference between the crops being compared. Full derivation and every cost assumption are set out in The Farm Economics of Hemp Grain.

Appendix: assumptions

Assumption	Value	Source
U.S. horse population	6,650,000	American Horse Council, 2023 Economic Impact Study
Market adoption	5%	HFC standard
Total daily ration	22 lb dry matter	1,100 lb horse at 2% of body weight
Oil supplementation rate	0.333 lb/day (168 mL)	Ely 2023 studied dose, converted at 7.5 lb/gallon
Upper scenario	3.0% of ration	Twice the studied dose; 5% not modeled
Supplement days per year	365	HFC standard
Oil yield per lb grain	25% to 30%	HFC Master Model v4, 08-01-26
Oil conversion / price	7.5 lb per gallon · \$28.75/gal	HFC Master Model v4
Grain yield / farmgate price	966 lb/acre · \$0.60-0.70/lb	HFC Master Model v4; cf. USDA NASS 966 lb (2025)
HSM yield / price	0.67 lb per lb grain · \$0.275/lb	HFC Master Model v4
Jobs per 1,000 acres	5 to 7 direct	HFC Master Model v4. Post-farm processing basis; multiplier not independently sourced.
U.S. hemp grain acreage 2025	7,515 acres harvested	USDA NASS National Hemp Report

Sources: American Horse Council (2023). · HFC HSM Economic Impact Master Model, Version 4, 08-01-26. · USDA NASS National Hemp Report. · Ely, K. (2023), Virginia Tech, PhD dissertation. · Ely, K. et al. (2023), J. Equine Vet. Sci. 124:104355, conference abstract. · Mohamed, N. et al. (2024), ACS Food Sci. Technol. 4(1):88-103. · AAFCO Official Publication (2026), definition 71.5.

Economic projections are estimates built on documented assumptions and do not constitute financial advice or a guarantee of market outcomes. Regulatory framing is to be confirmed by counsel before external use.

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