

Hemp Seed Meal 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 meal as an equine feed ingredient would create a domestic offtake market for U.S. hemp farmers and processors while giving horse owners a palatable, fiber-rich feedstuff supported by controlled equine research. Applying the Coalition's assumption library to a U.S. horse population of 6.65 million, at a conservative 5 percent adoption rate and the feeding rate horses actually consumed under controlled conditions, the equine market would require roughly 277,520 acres of hemp cultivation and generate an estimated \$467 million to \$545 million in combined annual revenue across the hemp supply chain, supporting 1,388 to 1,943 direct agricultural jobs before secondary multiplier effects.

U.S. farmers harvested 7,515 acres of hemp for grain in 2025. A single approved equine market at modest adoption would require roughly thirty-seven times that acreage, and about 0.16 percent of the 178.6 million acres U.S. farmers planted to corn and soybeans in 2025.

1. The feeding rate, and why this one

The single most consequential input in this model is the assumed daily hemp seed meal intake per horse. This analysis is anchored to 1.48 lb per horse per day, which is what horses actually ate in a controlled acceptability trial rather than an assumed percentage of ration.

What the trial found

Springer (2023), a Master's thesis at Tarleton State University, offered horses 1.0 kg of hemp seed meal daily over six consecutive days. Intake rose from 0.287 kg on day 1 to 0.695 kg on day 5, then eased to 0.652 kg on day 6. The two final days did not differ, at P equal to 0.73, so the figure used here is the mean of days 5 and 6, being 0.674 kg or 1.48 lb. That plateau is a more defensible anchor than day 5 alone, which is the single highest day of a six-day acclimation period. One horse was removed from the trial for complete diet refusal.

Independently bracketed

Walker (2025), a capstone study, fed concentrate at 0.4 percent of body weight with hemp seed meal at 40 percent of that concentrate, delivering roughly 1.9 lb per horse per day. That produced no feed refusals, no change in whole-diet protein digestibility, no change in hay intake or fecal consistency, and no change in body weight. The modeled rate sits below the highest rate Walker fed without adverse effect.

The modeled rate against rates actually fed to horses

The Coalition models below every rate that produced no adverse effect in a published equine trial.

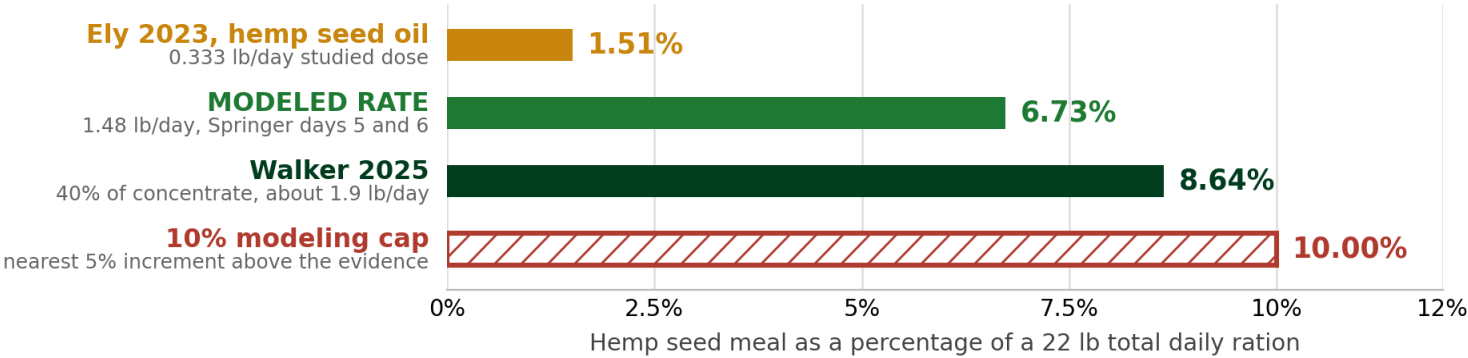


Figure 1. The modeled rate against rates actually fed to horses in published equine work.

Expressed against a 22 lb total daily ration, being a 1,100 lb horse consuming 2 percent of body weight, the modeled rate is 6.73 percent of the diet.

2. Scenario range

Because inclusion rate drives every downstream figure, the model is presented as a range rather than a single number. The Coalition caps the upper scenario at 10 percent, the nearest 5 percent increment above the highest rate any published equine trial has fed. Rates above that are not modeled, because no equine evidence supports them.

Acreage by inclusion rate, at 5 percent market adoption

Inclusion expressed against a 22 lb total daily ration. The Coalition models the rate horses actually consumed in trial.

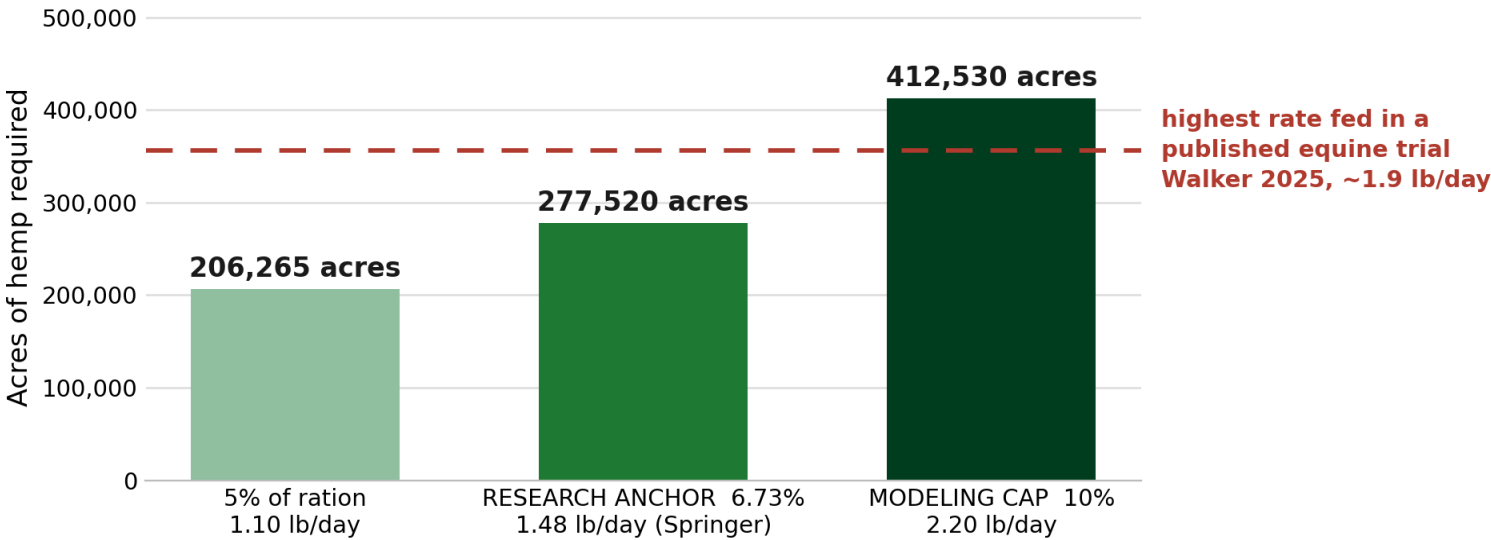


Figure 2. Acreage by inclusion rate at 5 percent adoption, with the research anchor marked. Acres are computed at the USDA NASS 2025 national average grain yield of 966 lb per acre.

Inclusion of total ration	Rate (lb/day)	Annual HSM (lb)	Acres required	Basis
5%	1.10	133,498,750	206,265	Below all published equine feeding
6.73% RESEARCH ANCHOR	1.48	179,616,500	277,520	Springer 2023, day 5-6 plateau intake
10% MODELING CAP	2.20	266,997,500	412,530	Nearest 5% increment above the evidence

Adoption sensitivity at the research-anchored feeding rate

1.48 lb per horse per day, applied to a U.S. horse population of 6.65 million.

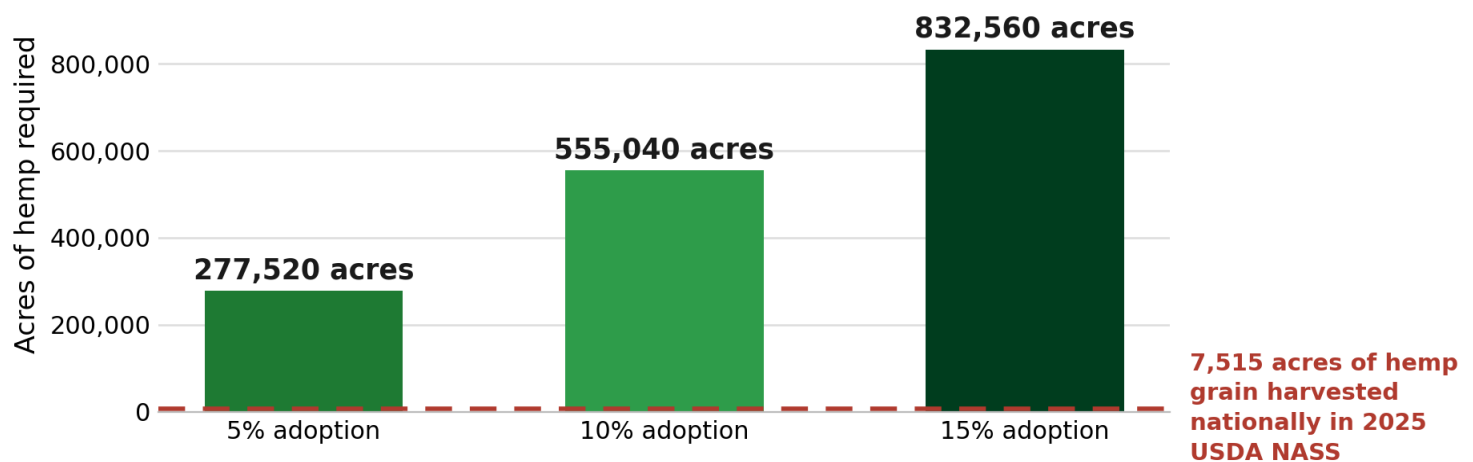


Figure 3. Adoption sensitivity at the research-anchored feeding rate of 1.48 lb per horse per day.

3. Economic calculations at the research anchor

Step	Calculation	Result
1. HSM demand	$6,650,000 \times 5\% \times 1.48 \text{ lb/day} \times 365$	179,616,500 lb
2. Grain required	$179,616,500 \div 0.67$	268,084,328 lb
3. Acres required	$268,084,328 \div 966 \text{ lb/acre}$	277,520 acres
4a. Farmer revenue, low	$268,084,328 \times \$0.60$	\$160,850,597
4b. Farmer revenue, high	$268,084,328 \times \$0.70$	\$187,659,030
5. HSM processor revenue	$179,616,500 \times \$0.275$	\$49,394,538
6a. Oil co-product, 25% yield	$(268,084,328 \times 0.25 \div 7.5) \times \28.75	\$256,914,148
6b. Oil co-product, 30% yield	$(268,084,328 \times 0.30 \div 7.5) \times \28.75	\$308,296,978
7. Jobs, 5 to 7 per 1,000 acres (directional)	$277,520 \times 5 \div 1,000 / \times 7 \div 1,000$	1,388 to 1,943

Revenue summary

Revenue stream	Low	High
Hemp grain, to farmers	\$160,850,597	\$187,659,030
Hemp seed meal, processor	\$49,394,538	\$49,394,538
Hemp seed oil, co-product	\$256,914,148	\$308,296,978
TOTAL	\$467,159,283	\$545,350,545

Oil revenue is the largest single line and depends on a parallel approved market for hemp seed oil. The grain and meal revenue, \$210.2 million to \$237.1 million, is the portion that flows to farmers and primary processing and does not depend on the oil market. Oil is recovered from the same grain pressed for meal, so it is not double-counted.

Farmgate value is worth isolating. The \$160.9 million to \$187.7 million in hemp grain revenue is direct payment to U.S. farmers. USDA valued the entire national hemp grain crop at \$2.62 million in 2024, so this single market would increase farmgate hemp grain value roughly sixty-one to seventy-two fold.

4. Why this market, and why now

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

USDA reached a similar conclusion about the crop's constraints more than a century ago. Its 1913 Yearbook carried a sixty-page monograph on hemp by the Department's Botanist in Charge of Fiber-Plant Investigations, which credited the crop with near-total weed suppression, rated it easier on soil humus than every crop except clover and alfalfa, and placed it in ordinary rotation in about the same position as oats. The Department attributed declining American production not to any problem with the plant but to labor scarcity and the absence of harvesting machinery.

5. What the evidence establishes, and what remains open

Established

- Hemp seed meal 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.
- Three published equine studies support the ingredient: Springer (2023) on palatability and digestibility, Walker (2025) on protein digestibility and safety at inclusion up to 40 percent of concentrate, and Ely (2023) on the oil fraction.
- Horses accepted hemp seed meal voluntarily and increased intake across a six-day exposure.
- At 40 percent of concentrate, no feed refusals, no change in whole-diet protein digestibility, hay intake, fecal consistency or body weight.

Open

- Published equine feeding trials ran six to seven days. A longer-duration study would strengthen the demand assumption this model applies across 365 days.
- No equine trial has fed hemp seed meal above roughly 9 percent of total ration, which is why the model caps at 10 percent.

Neither open item concerns cannabinoid exposure. That question has been examined across laying hens, cattle, sheep and horses, and across both the meal and oil fractions, with consistent findings.

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.

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. That is the honest picture, and it is why the yield question matters.

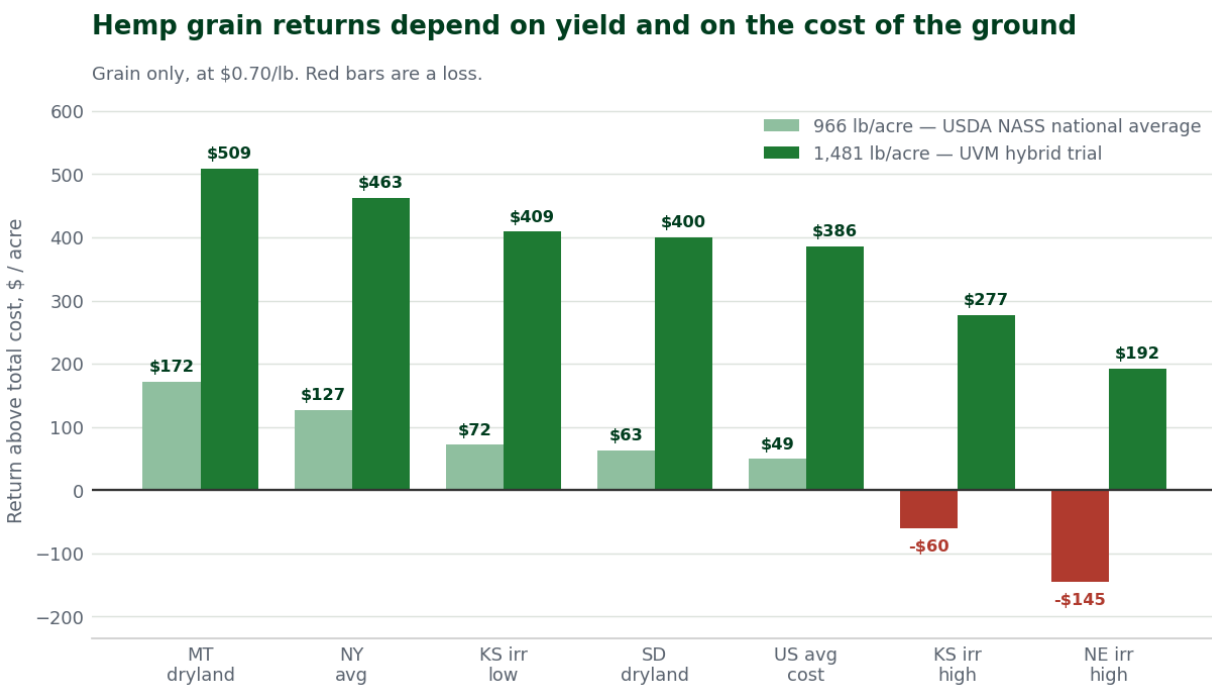


Figure. Return above total cost per acre by land class, grain only at \$0.70/lb. Source: HFC Farm Return Matrix, Master Model v5, 08-03-26.

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, including the highest-rent irrigated ground.

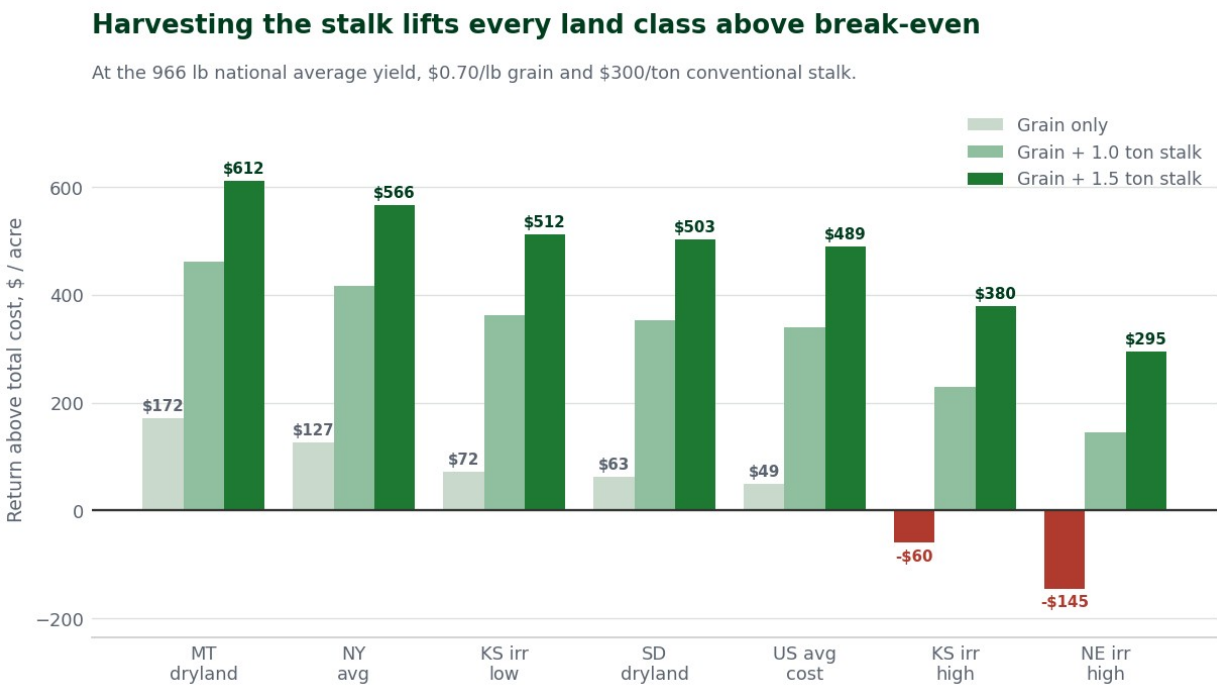


Figure. Effect of harvesting the stalk, at the 966 lb national average yield. Source: as above.

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 the benefits of 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 acreage and farm-gate 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, the land cost register 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% base, 10% and 15% shown	HFC standard
Total daily ration	22 lb dry matter	1,100 lb horse at 2% of body weight
HSM feeding rate	1.48 lb/day	Springer 2023, mean of day 5 and day 6 intake

Assumption	Value	Source
Inclusion cap	10% of total ration	Nearest 5% increment above published equine feeding
Feeding days per year	365	HFC standard
HSM yield per lb grain	0.67 lb	HFC Master Model v5, 08-03-26
Grain yield per acre	966 lb	USDA NASS 2025 national average; adopted in Master Model v5, 08-03-26
Grain farmgate price	\$0.60 to \$0.70/lb	HFC Master Model v5, 08-03-26
HSM price	\$0.275/lb	HFC Master Model v5, 08-03-26
Oil yield / conversion / price	25-30% · 7.5 lb per gallon · \$28.75/gal	HFC Master Model v5, 08-03-26
Jobs per 1,000 acres	5 to 7 direct	HFC Master Model v5. Directional only; multiplier not independently sourced
U.S. hemp grain acreage 2025	7,515 acres harvested	USDA NASS National Hemp Report
U.S. corn and soybean acreage 2025	178.6 million acres planted	USDA NASS Acreage, 30 June 2025 (corn 95.2M, soybeans 83.4M)

Sources: American Horse Council (2023). · HFC HSM Economic Impact Master Model, Version 5, 08-03-26. · USDA NASS National Hemp Report. · USDA NASS Acreage, 30 June 2025, for corn and soybean planted acres. · Springer, R.W. (2023), Tarleton State University, MSc thesis. · Walker, T. (2025), capstone project. · Ely, K. (2023), Virginia Tech, PhD dissertation. · Mohamed, N. et al. (2024), ACS Food Sci. Technol. 4(1):88-103. · USDA Yearbook of Agriculture (1913). · AAFCO Official Publication (2026), definition 71.5.

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