FFA MANSON, WA

How a Chicken's Diet Affects the Omega-6 to Omega-3 Ratio in its Eggs

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LAB VERIFIED Lipid Technologies

+135%	−44%	10.5→2.5	2×	60 Hens
More Omega-3 per Egg	Less Omega-6 per Egg	Omega-6:3 Ratio	DHA per Egg	3 Months · 2 Lab Tests

PURPOSE & HYPOTHESIS

Americans consume approximately **259 eggs per person per year.** Most store-bought eggs contain omega-6 levels up to **26× higher** than omega-3 — a ratio linked to chronic inflammation and disease.

The purpose of this project is to determine if changing what a hen's diet consists of will significantly change the fatty acid profile of the eggs it produces.

Hypothesis:
Hens fed flax, camelina, and pea-based feed will produce eggs with a significantly lower omega-6:omega-3 ratio compared to hens fed standard corn and soy.

WHY IT MATTERS

Modern Western diets reach omega-6:omega-3 ratios of **20:1** — far above the recommended 4:1. This imbalance is linked to:
•Cardiovascular disease & inflammation
•Type 2 diabetes & obesity
•Metabolic syndrome
•Non-alcoholic fatty liver disease
Because eggs are one of America's most consumed animal products, improving their fatty acid profile could have meaningful **public health impact at scale.**

Did you Know?
The omega 6 to omega 3 fatty acid ratio of the different feed ingredients is crucial to this experiment.
- Corn = 50:1 ·
- Soybean = 7:1 ·
- Flax = 1:4 ·
- Canola = 2:1

MATERIALS & METHODS

Materials Needed	Amount
Logbook	1
Kaniksu Mega Layer Mash chicken feed	50lbs every two days
Country Companion Layer Crumble chicken feed	50lbs every two days
Nesting boxes	6
5-gallon water dispenser	2
Laying hens	60
50-pound feed capacity feeder	2
10ftx20ft chicken coop	1
50ftx15ft fenced run	1
6ft lateral roosts (wooden posts)	15
Egg carton for shipping	2

- **Baseline established:** ~60 laying hens fed Country Companion Layer Crumble (corn/soy) for 8 months. 50 lbs every 2 days
- **Nov 13, 2025 — First collection:** 12 eggs collected at random, submitted to Lipid Technologies. Tested Dec 4, 2025.
- **Feed transition:** Same flock switched to Kaniksu Mega Layer Mash — flax, camelina, pea-based. Same 50 lbs/2 days.
- **~3 months later — Second collection:** 12 more eggs submitted Feb 18, 2026 to same lab, identical methods.

✗ DIET 1: CORN/SOY	✓ DIET 2: FLAX/PEA
Country Companion Layer Crumble Grain products, plant protein Corn Omega 6: Omega 3 = 50:1	Kaniksu Mega Layer Mash Peas, wheat, barley, flax, camelina Flax Omega 6:Omega 3 = 1:4

Analysis:
Fatty acid profiles compared omega-3, omega-6, DHA content, and overall omega-6:omega-3 ratio.

Controlled variables:
- Same 60 hens
- Same coop
- Same outdoor run
- Same water
- Same feeding rate

- only feed ingredient composition changed.

Lab Testing:
Both egg samples analyzed by Lipid Technologies. Same methodology for both samples ensures a valid comparison.

RESULTS — FIGURES 1–4

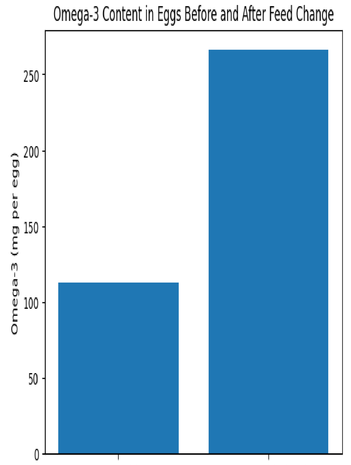

Fig. 1 — Total Omega-3 per Egg (mg)

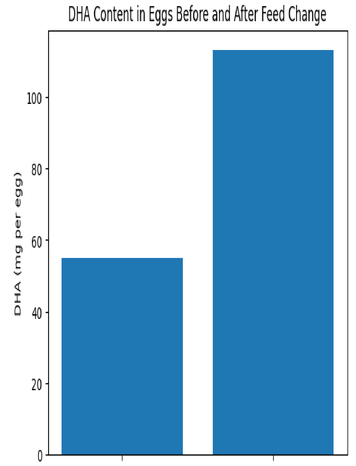

Fig. 2 — DHA per Egg (mg)

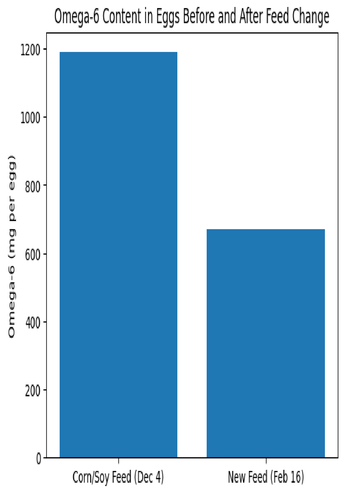

Fig. 3 — Total Omega-6 per Egg (mg)

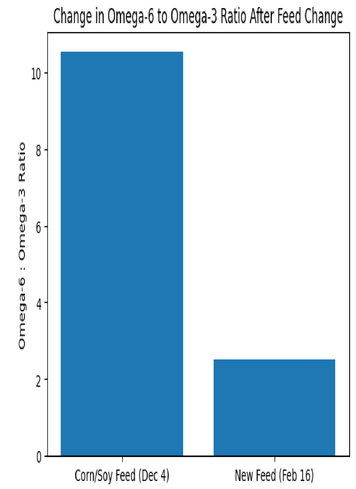

Fig. 4 — Omega-6 : Omega-3 Ratio

Feed Diet	Omega-3/egg	Omega-6/egg	DHA/egg	Omega-6: Omega-3 Ratio
Corn & Soy	113 mg	1,189 mg	55 mg	10.5 : 1
Flax / Camelina / Pea	266 mg ↑	670 mg ↓	113 mg ↑	2.5 : 1 ✓

DISCUSSION & CONCLUSIONS

The results **strongly support the hypothesis.** Switching from corn/soy to flax/camelina/pea produced dramatic improvements in egg fatty acid profiles within just three months — confirming chickens deposit dietary fatty acids directly into egg yolks.

Omega-3 increased **135%** while omega-6 dropped **44%.** DHA more than **doubled** — 55mg to 113mg per egg. Ratio improved from 10.5:1 to 2.5:1

These findings demonstrate that farmers have real, measurable power to improve the nutritional quality of food through feed decisions alone.

+135% Omega-3 per egg increase	**−44%** Omega-6 per egg reduction
55→113 DHA mg per egg (doubled)	**4×** Overall ratio improvement

*"You are what you eat — **and so is your chicken.**" What farmers choose to feed has a direct, measurable impact on the nutritional value of food that reaches people's plates. Agricultural decisions are public health decisions.*

Skills Learned:
What your food eats is really important. Although Omega 6's and Omega 3's are one part of the whole picture. It has shown me the importance of asking questions and has grow my curiosity of nutrition of the food we consume.

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