What Makes Omega Balance Natural Beef ® Different?

Bio Minerals Technologies Inc. (BMT)

Ken Hamilton

Section 1
What Makes Omega Balance Natural Meat® Distinctly Different?

Omega Balance Natural Beef ® is Distinctly Different & Nutritionally Superior to Grass-fed & Grain-fed Beef.

Omega Balance Natural Beef ®

1) Much higher levels of nutrition, anti-oxidants, and anti-inflammatory compounds
   - Diet that matches the cell and metabolic intelligence of the animal
   - Preparation of the forages is all natural and high in nutrition: carbohydrates and mineral content
   - Specialized fermentation which dramatically increases the nutrition being made available for the animal

2) Only use natural forages that are chemical free and non-GMO / no genetic engineering or modifications and glyphosate free

3) OBNB is drug free, no vaccinations (especially any mRNA based), no steroids, no implants, and no antibiotics

4) **No seed oils / grain or vegetable oils**. This makes a balanced ratio of Omega-6 and Omega-3. This is critical for cellular and metabolic health

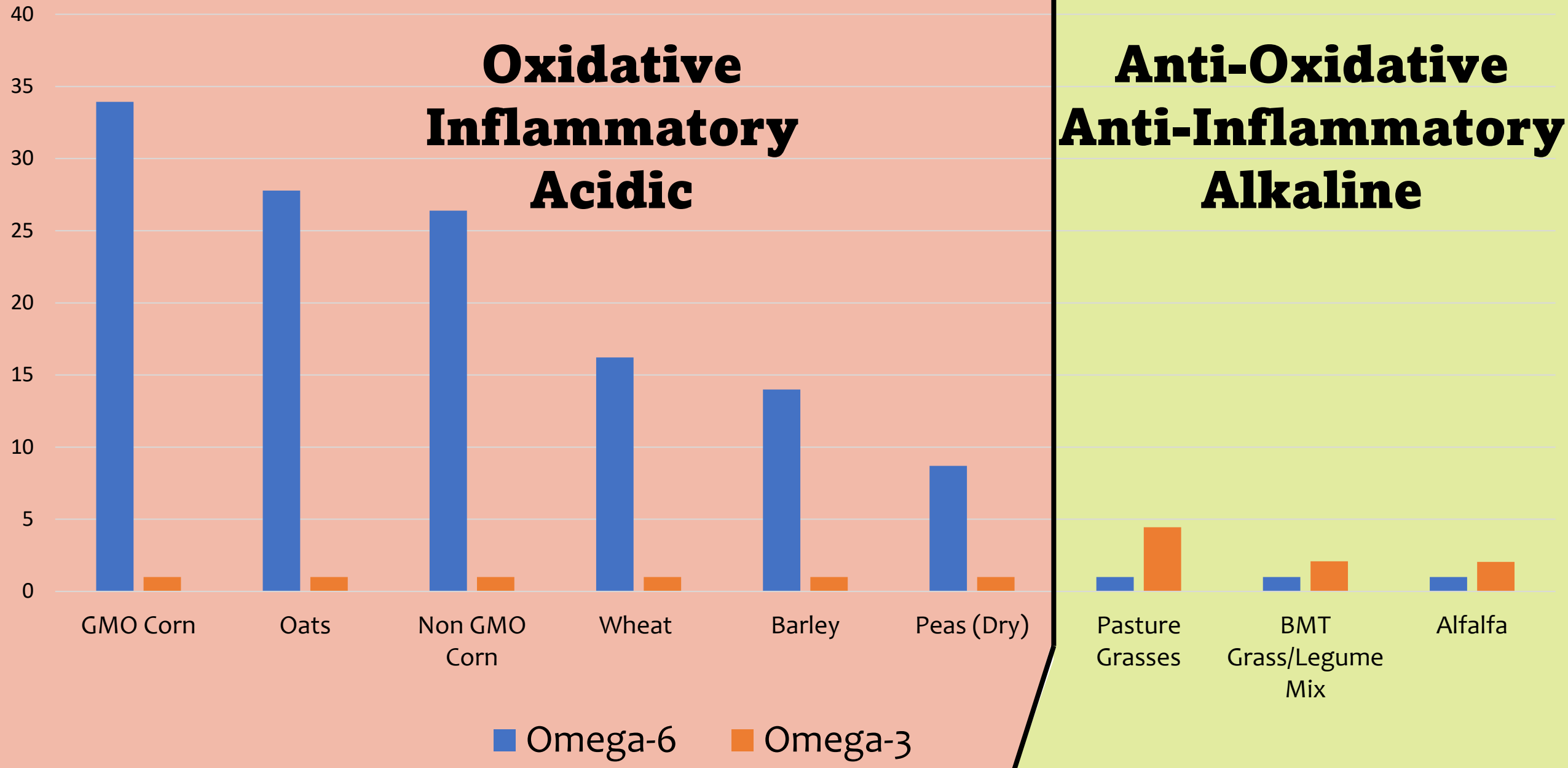
All Meat Is A Direct End-Product Or Result Of Its Diet

Grains Omega 6:3 Ratios

Forages Omega 6:3 Ratios

Oxidative
Inflammatory
Acidic

Anti-Oxidative
Anti-Inflammatory
Alkaline



 Tests Completed @ USU Nutrition, Dietetics & Food Sciences Department & Microbac Labs

Grain-Fed Beef

Grass-Fed Beef

Fermented Forage-Fed Beef

End products may look similar however the nutritional components in these products are very different

Meat *Not the same*	**Since Creation**	**Since 1950s**	**Since 2006**
	Grass-fed Grass-finish Beef	**Grass-fed Grain-finish Beef**	**Grass-fed Fermented-Forage-fed Beef**
Omega-6 to Omega-3 Ratios	2:1-4:1 Antioxidative, Anti-inflammatory	7:1-30:1 Highly oxidative, Highly-inflammatory	1:1 Antioxidative, Anti-inflammatory
Toxic Compounds	None	4-Hydroxy-nonenal, Malondialdehyde, Oxidized linoleic acid metabolites (100+), Acrolein, Carboxyethyl pyrrole, and many more	None
Medicinal/ Nutritional Compounds	Low Plasmalogens: (HRI score 25.013), Lysolecithins: (HRI score 23.178)	Low Plasmalogens: (HRI score 23.178), Lysolecithins: (HRI score 25.013)	Very High Plasmalogens: (HRI score 44.358), Lysolecithins: (HRI score 53.589), Acylcarnitine's, Phospholipids, Omega-3 Fatty Acids and many more

Meat

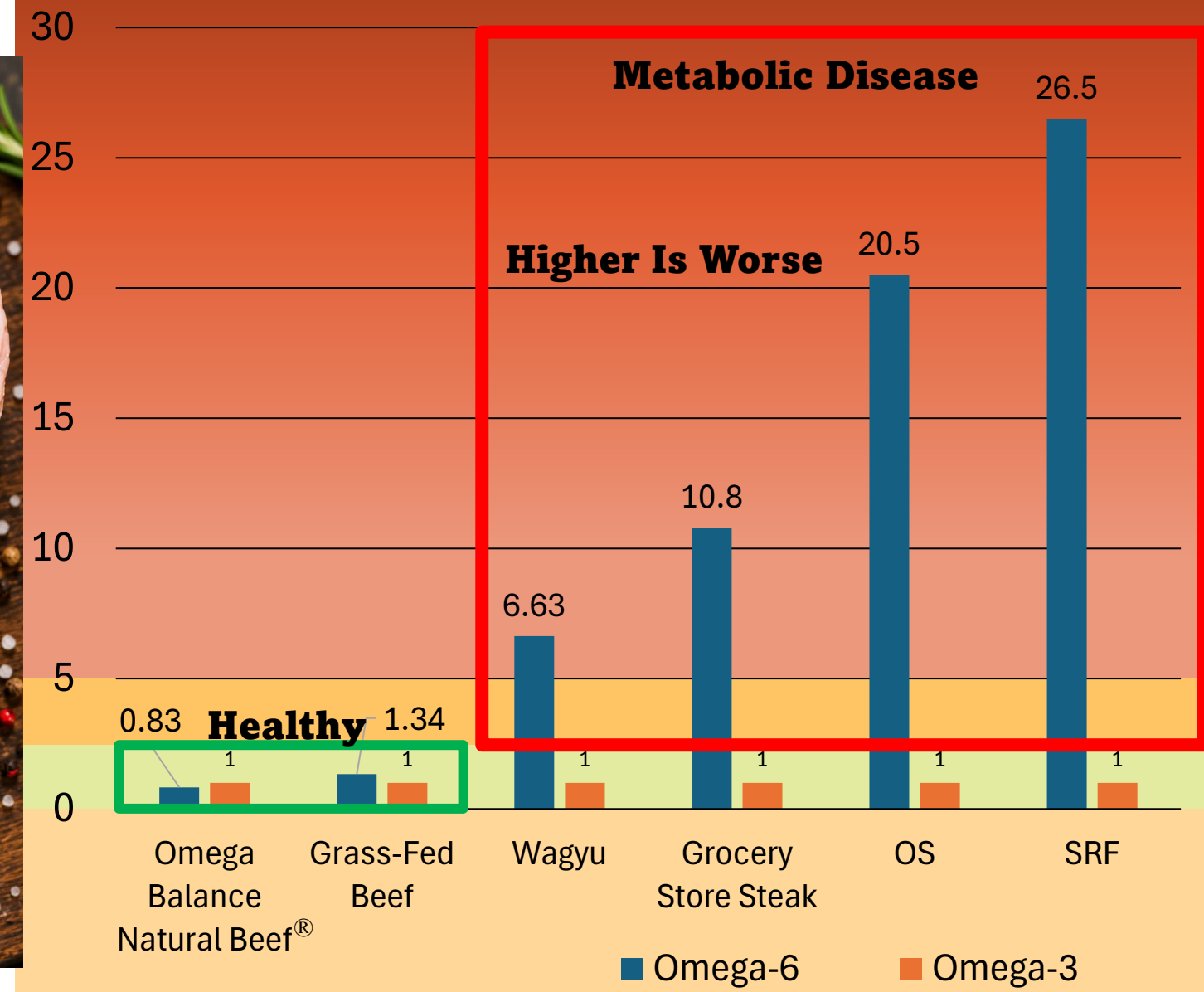
Not the same

	Since Creation	Since 1950s	Since 2006
	Grass-fed Grass-finish Beef	**Grass-fed Grain-finish Beef**	**Grass-fed Fermented-Forage-fed Beef**
Diet	Natural forages	Forages & grain	Natural forages with biological fermentation
Toxins	Some vaccinations	Vaccinations, Antibiotics, Genetically modified organisms (GMO) & genetically engineered food, Agricultural chemicals, Growth implants/hormones, Seed oils	None
Effects on metabolic health	**Health promoting**	**Promotes metabolic dysfunction and diseases in animals and humans**	Higher antioxidants, Higher anti-inflammatory compounds, Higher amino acids, Higher nutrients, Higher fatty acids, **Nutritionally superior**

Omega Balance Natural Beef®

- Omega 6:3 ratio of 1:1
- Graded mostly prime
- Increased marbling
- Great flavor and tenderness
- Non-Oxidative/Non-Inflammatory

Results:



➢ 2021: Omega Balance Natural Beef (OBNB)

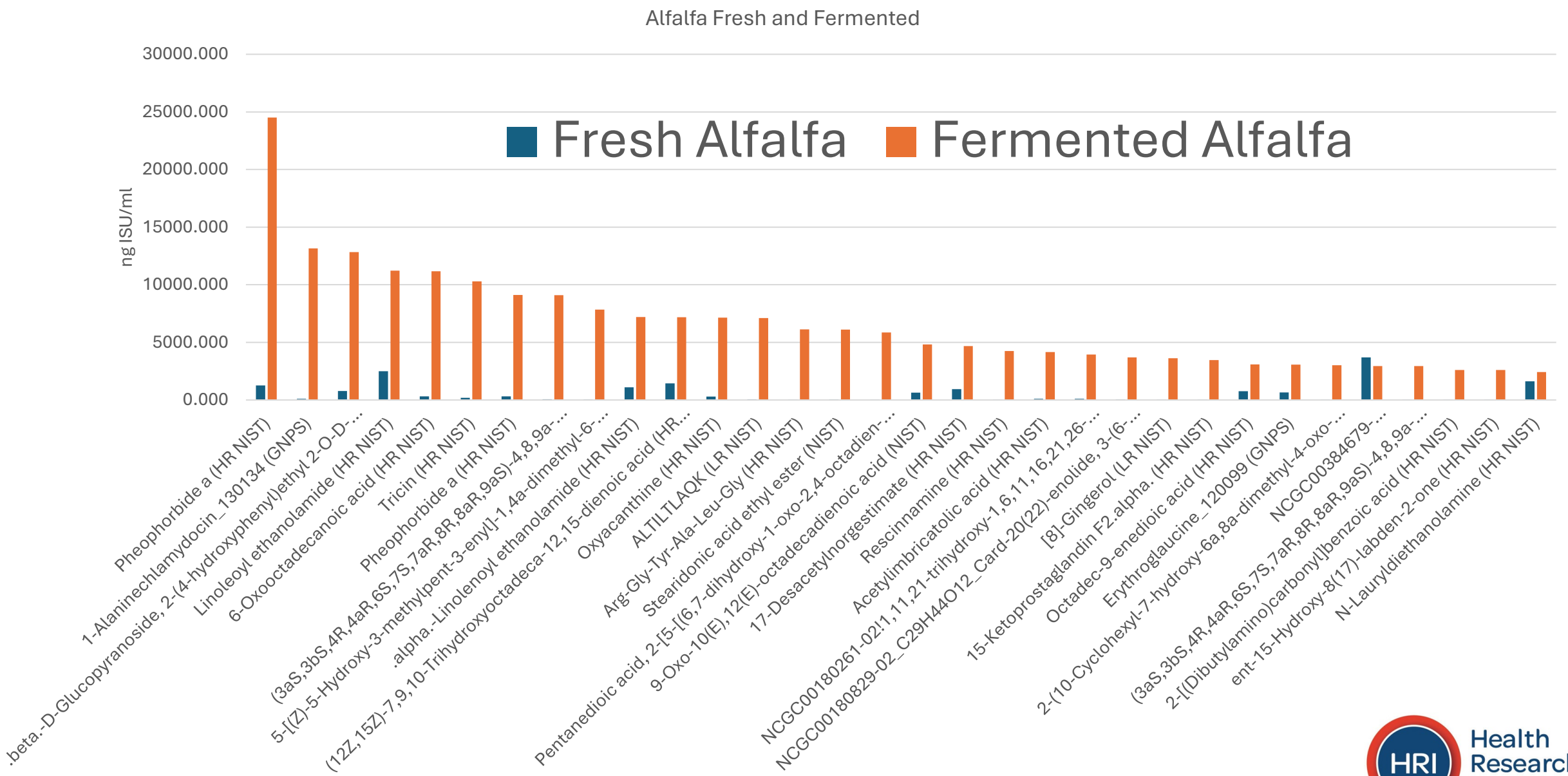
Tests Completed @ USU Nutrition, Dietetics & Food Sciences Department & Microbac Laboratories

Section 2
Fresh Forage vs. Fermented Forage

Fresh or Fermented: What Is The Difference?

Omega Balance Natural Beef uses natural forages and beneficial microbes through fermentation to break down complex forage components into more easily digestible nutrients, supporting healthy growth and development in cattle.

Alfalfa Fresh and Fermented



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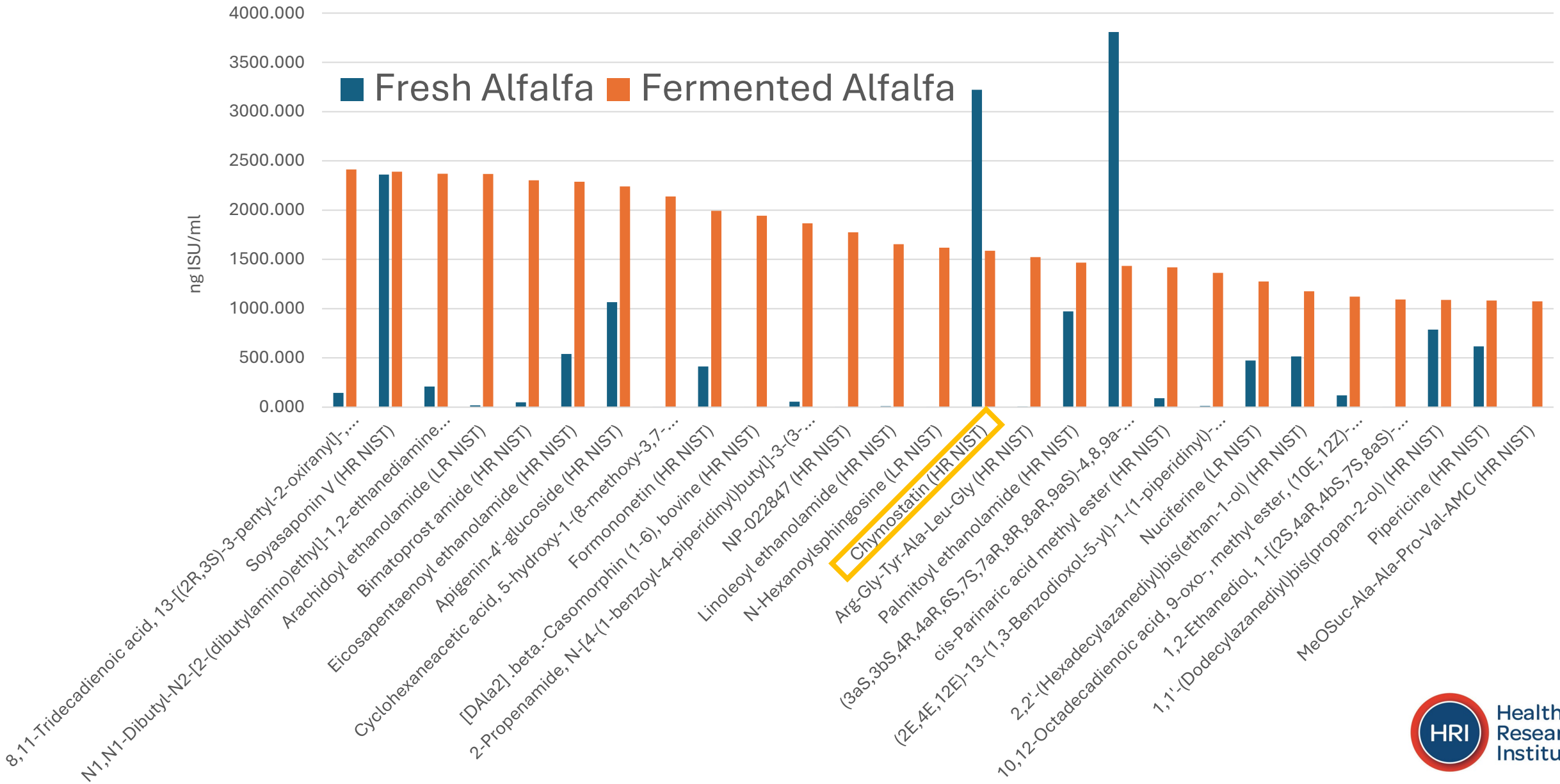
Alfalfa Fresh and Fermented



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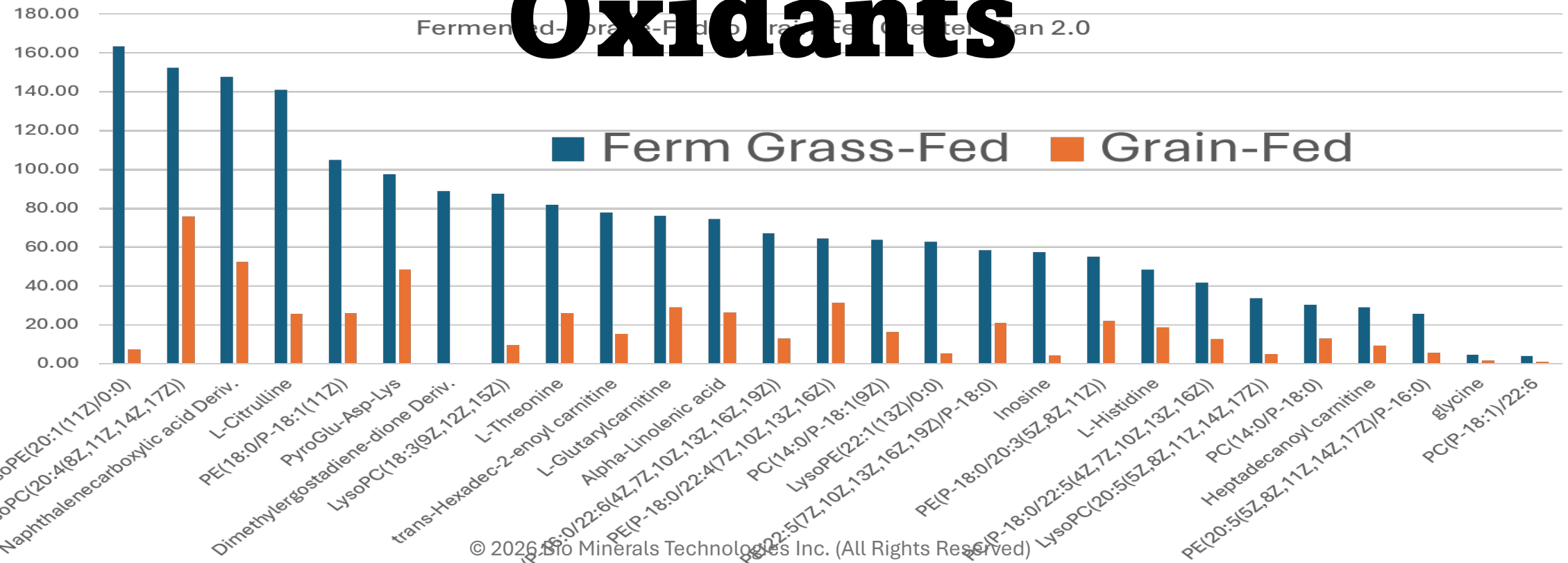
Chymostatin

- Chymostatin is an “inhibitor” of chymotrypsin in animals. Chymotrypsin is a potent digestive enzyme (hydrolase) of protein, manufactured by the pancreas and is active in the digestive tract of cows.
- High amounts of chymostatin decreases digestibility of the forage. Protein digestibility is optimized in the fermented forage because the anti-nutrient chymostatin is degraded by biology improving the action of chymotrypsin in digestion.

What Fermented Forage-Fed Beef Becomes

Section 3
Omega Balance Natural Beef ® Nutrition and Anti-Oxidants



Highest Nutrition & Fatty Acid Levels Of Antioxidant Plasmalogens, Lysolecithins, Acylcarnitine's, Phospholipids, & Omega-3 Fatty Acids

Full Spectrum Mass Spectrometric Analysis

The points that follow from the details and extensive research from the Full Spectrum Mass Spectrometric Analysis is three-fold-

1) Identify the levels of actual nutrition, whether high or low, over the board spectrum.
2) Identify the levels of antioxidation compounds that promote cellular structure, function, and more fully utilize nutrition that promotes health.
3) Identify those oxidative compounds that destroy cellular structure, damage cellular pathways and function causing a loss in nutrition and increasing the rate of metabolic and degenerative disease in the body.

Keep in mind the BLUE represents the Omega Balance Natural Beef utilizing fermented forages. The RED represents grain-fed feedlot beef.

Full Spectrum Mass Spectrometric Analysis of Fermented Grass-Fed Beef and Grain-Fed

- We did 4 separate analytical runs.
- Here, we share the data from one of these.
- We measured 131 compounds.
- 45 of these nutrients were much higher in beef from cattle fed fermented grass-feed compared to grain-fed beef. These were among the most abundant compounds in beef.
- Nutrition is the genetic expression activator.

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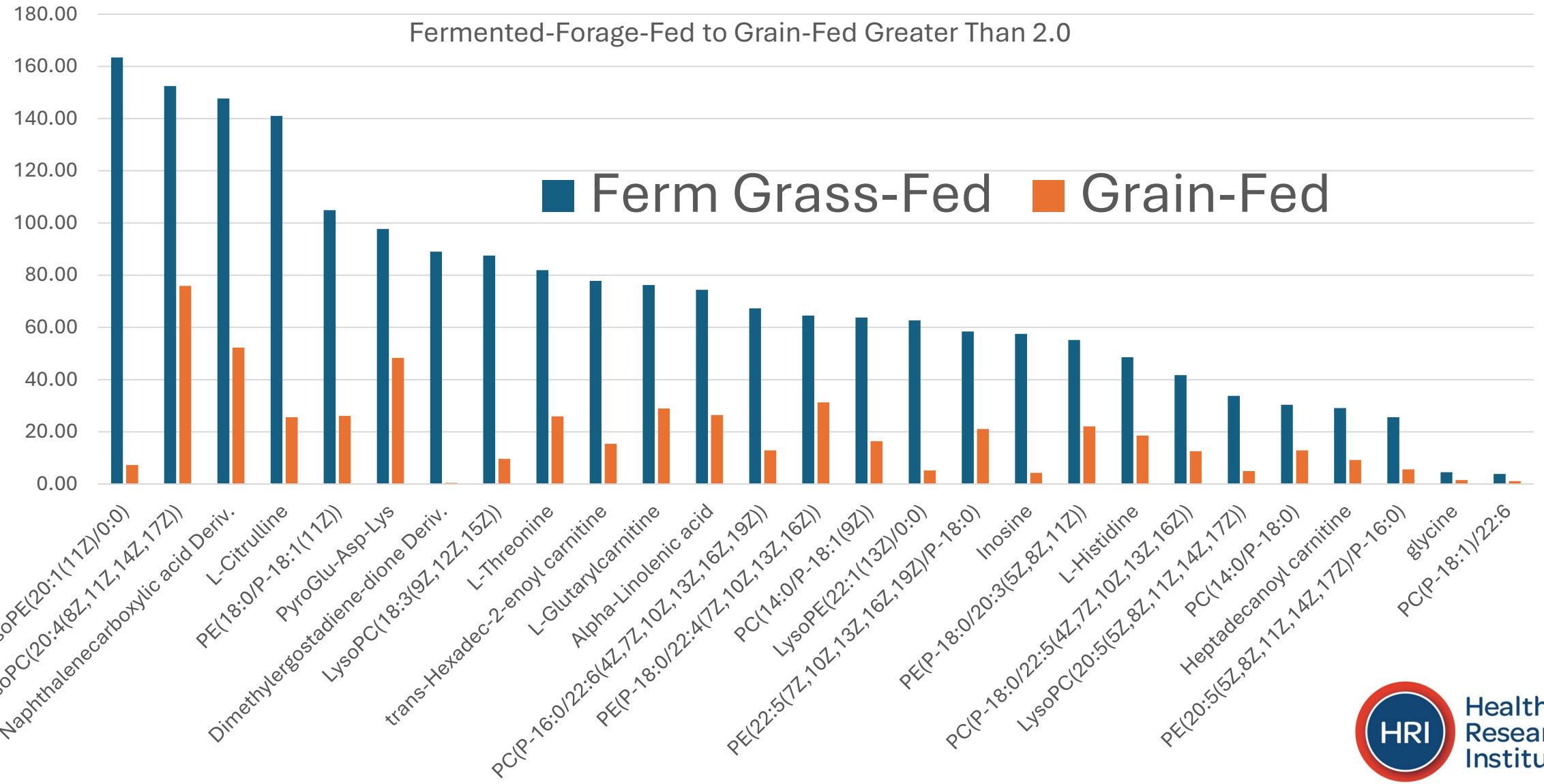
Many Nutrients Are 200% to 21,400% higher in Fermented-Forage-Fed than in Grain-Fed Beef



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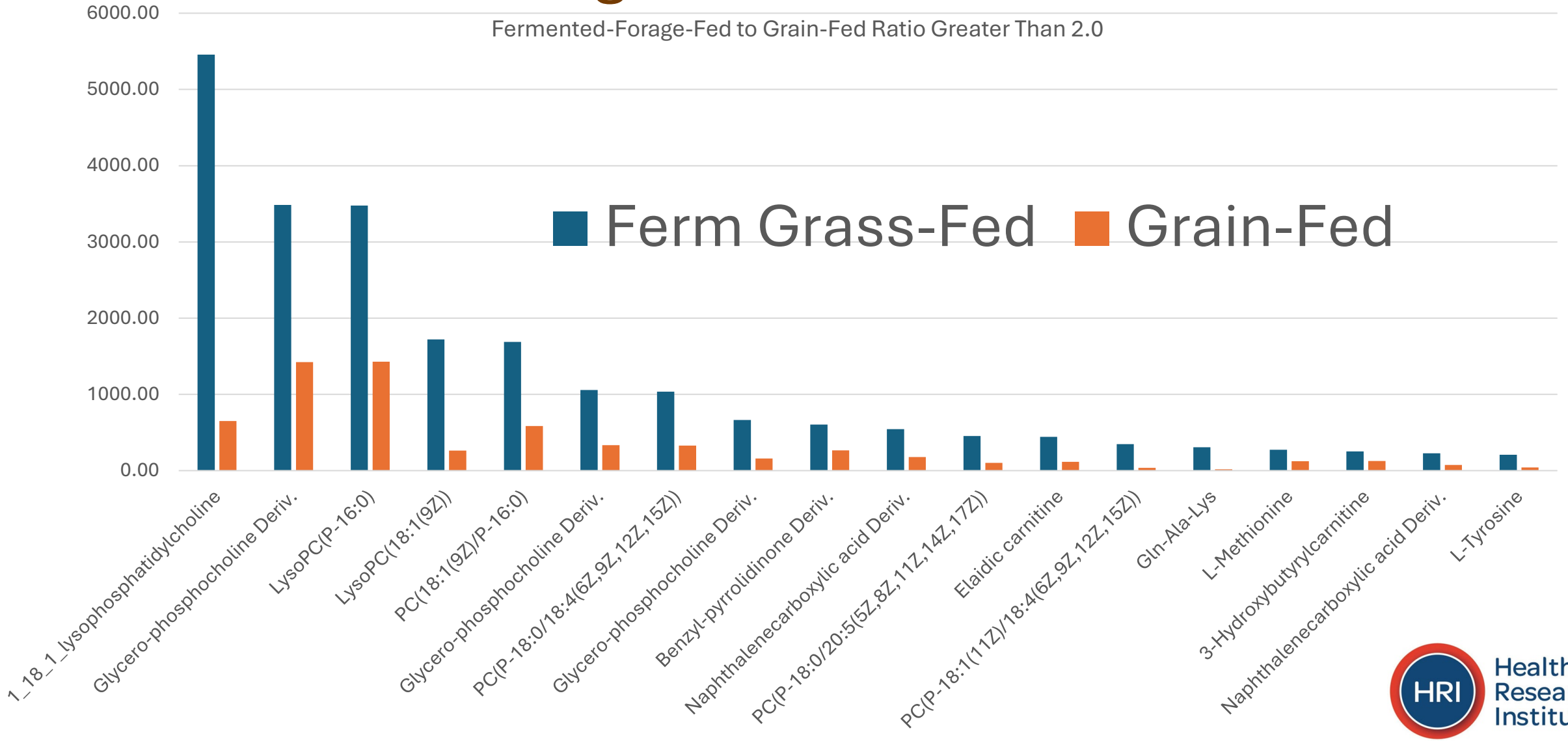

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Nutrients For Health

1_18_1_lysophosphatidylcholine (1-lysoPC):

- Pathway to the brain, which takes up few lipoproteins
- Essential component of normal human brain development
- Transport mechanism for DHA and EPA across the blood-brain and blood-retinal barriers

Glycero-phosphocholine Derivative:

- Result of proper Glycerophosphocholine metabolism
- Cell membrane renewal
- Myelin maintenance
- Antioxidative

L-Tyrosine

- Essential for brain health, cognitive function, and mood

Section 4
Antioxidants & Anti-Inflammatories Found In Omega Balance Natural Beef ®

Plasmalogens:

Their vinyl-ether linkage acts as a sacrificial antioxidant, the first line of defense, scavenging reactive oxygen species and protecting more vulnerable PUFAs, while also modulating membrane curvature, fusion, and signaling. In fermented-forage-fed beef, the PUFA population leans toward omega-3, with antioxidant, anti-inflammatory properties. 10 of the 14 plasmalogens are significantly higher in fermented forage-fed beef than in grain or grass-fed beef.

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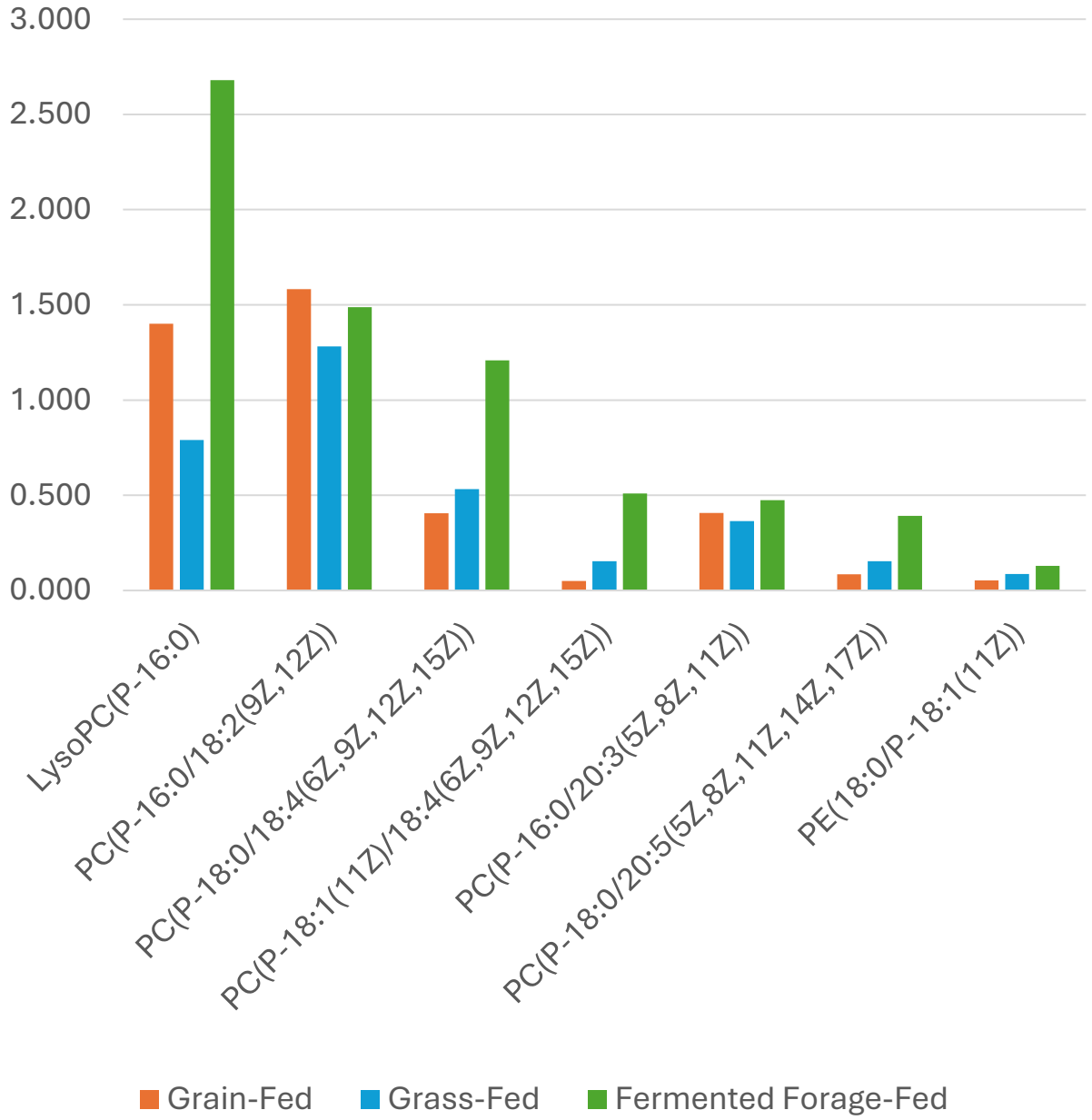
Why are the Plasmalogen levels important?

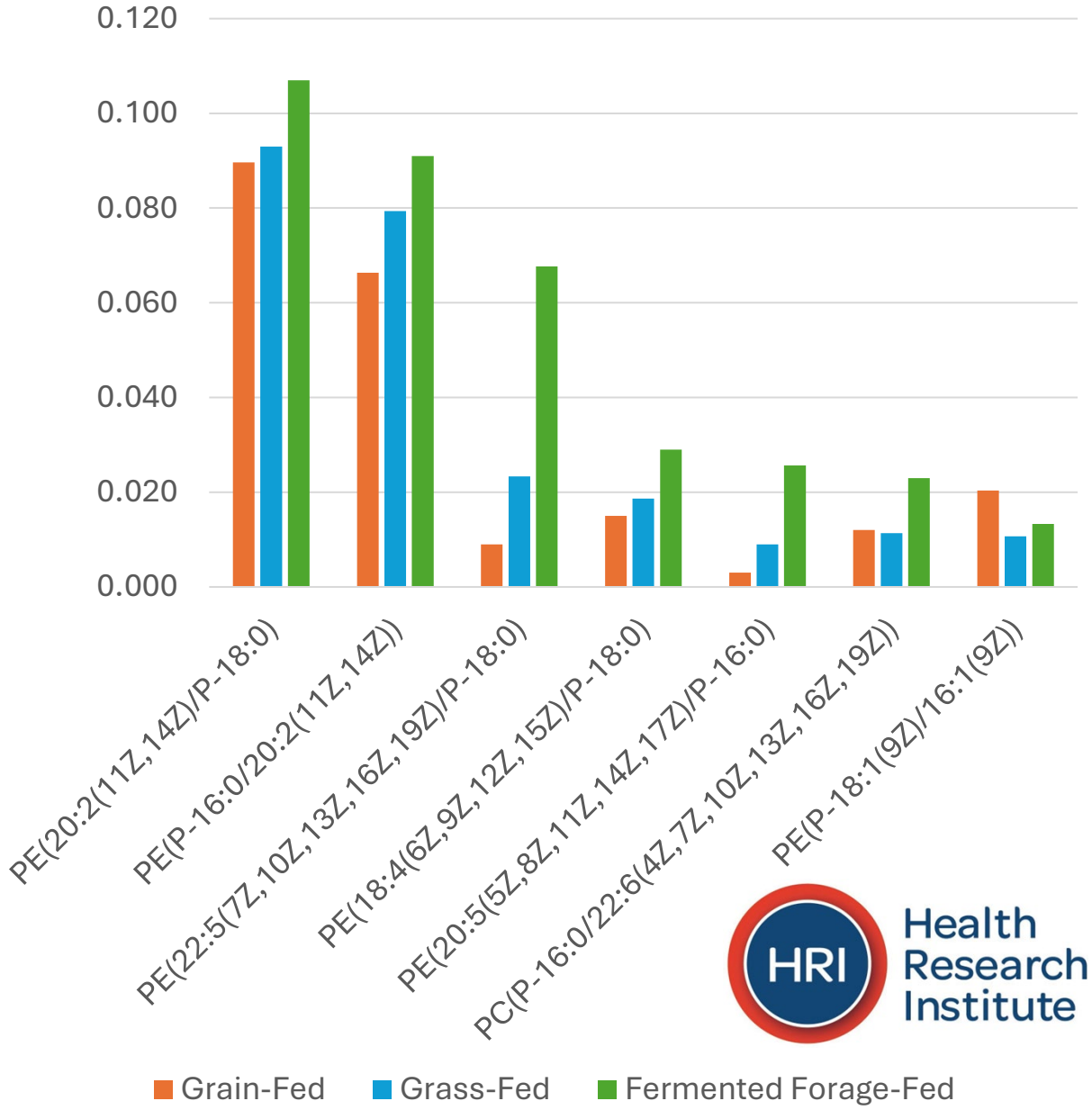
- Plasmalogens
  - Control the structure of the cell and mitochondrial membranes,
  - Are highly effective antioxidants that protect the cells from oxidative damage. They are the first line of defense from oxidative damage.
- Depleted plasmalogens linked to:
  - Neurodegenerative diseases (Alzheimer's, Parkinson’s, Autism, etc.),
  - Cardiovascular diseases,
  - Multiple sclerosis, ALS, Diabetes, other auto immune diseases,
  - Inflammatory conditions,
  - Metabolic syndrome,
  - Ageing, and more.
- Raising Plasmalogen levels protects from these diseases.

Summary of Structural-Functional Categories of Molecules Found in Beef

Classes of Compounds Present in Beef	Total Number of Compounds in Group	**Fermented-Forage-Fed** (Number of Compounds That Increase Significantly with Fermented-Forage-Fed)	Higher in **Grass-Fed**	Higher in **Grain-Fed**
Acylcarnitines	18	10	3	0
Plasmalogens	14	10	0	1
Lysolecithins	18	14	0	2
Phospholipids	23	12	0	2
Fatty Acids	8	4	0	3
Omega-3 Fatty Acids	4	3	0	1
Monoglycerides	2	2	0	0
Steroids	8	4	1	1
Sphingolipids	5	3	1	0
Nucleoside/Nucleotide-Related Compounds	12	3	3	1
Proteogenic Amino Acids	8	4	0	2
Non-Proteogenic Amino Acids	6	3	0	2
Amino Acid Derivatives	6	2	0	1
B Vitamins	5	1	0	1
Diverse Molecules, Diversity of Functions	19	12	1	1
Totals	156	87	9	18

Plasmalogen Levels in Grain-Fed, Grass-Fed & Fermented Forage-Fed Beef





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Plasmalogens—Just one of many nutrients elevated in cattle raised on Fermented Grass Feed—Result greater resilience, adaptability and strength.

- Lyso-Phospholipids
  - Key role in membrane remodeling and cell signaling such as neurite outgrowth, cell motility, and angiogenesis
  - Protect from neurodegenerative diseases (Alzheimers's and Parkinson's), Cardiovascular disease, Inflammatory conditions, Metabolic syndrome & more.
- L-Citrulline
  - Improves exercise performance and recovery,
  - Precursor to nitrogen oxide which enhances endothelial function and blood flow.
- L-Tyrosine, L-Histidine, L-Glycine, L-Threonine and others
  - Essential for protein synthesis
  - Serve important cellular signalling and regulatory functions.
- Trans-Hexadec-2-enoyl carnitine and several other carnitine derivatives
  - Function to carry fatty acids across the mitochondrial membrane,
  - Key role in recycling CoA in the mitochondria.
- Glycine
  - Participates in/supports antioxidant and detoxification pathways, various metabolic processes, neurotransmission and sleep
- Alpha-Linolenic acid
  - supports normal growth and development,
  - incorporated into cell membranes,
  - metabolic precursor to longer-chain omega-3s such as EPA and DHA,
  - involved in neural and visual function.

Only a few of the many other nutritional compounds elevated in fermented forage-fed beef

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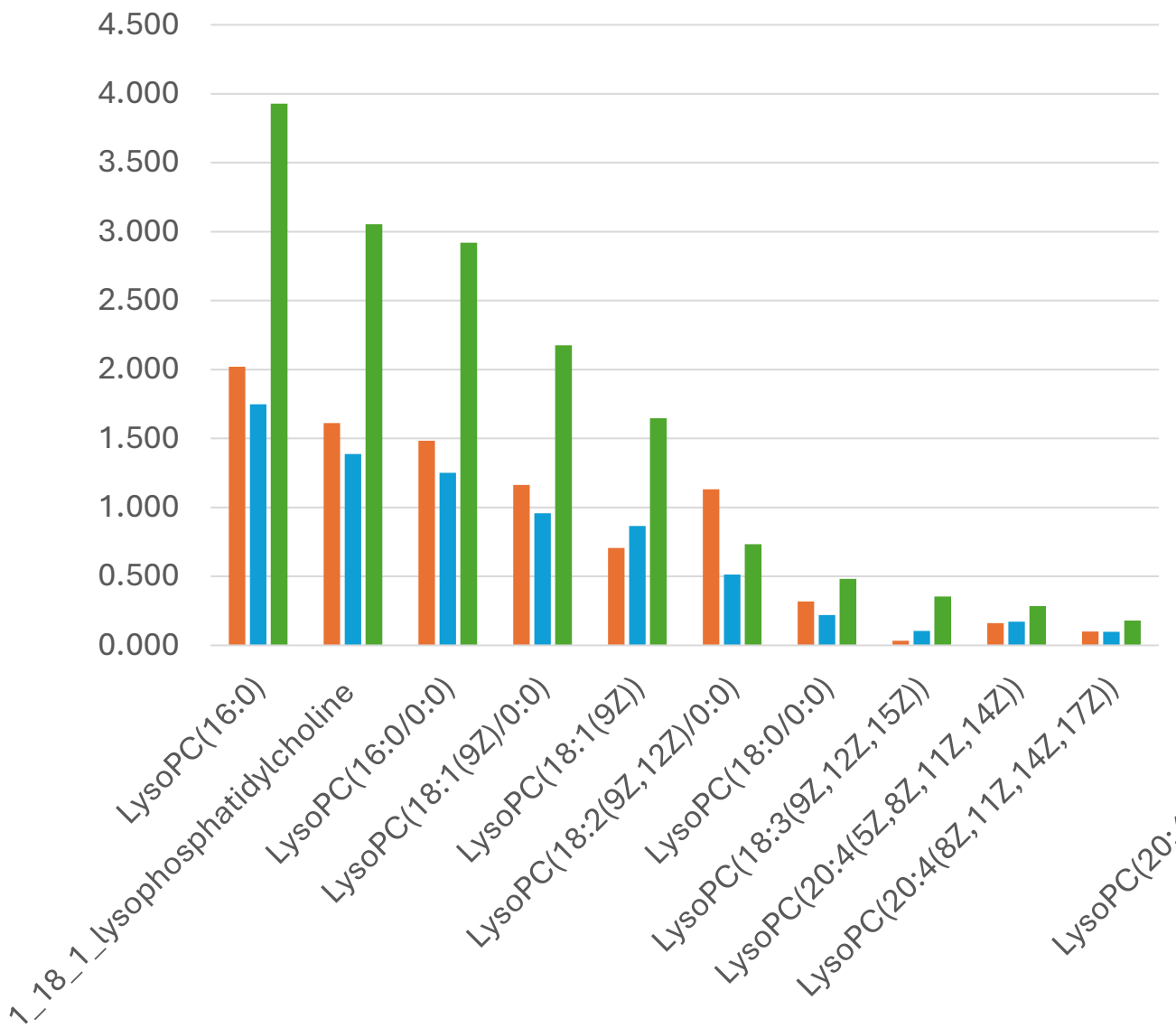
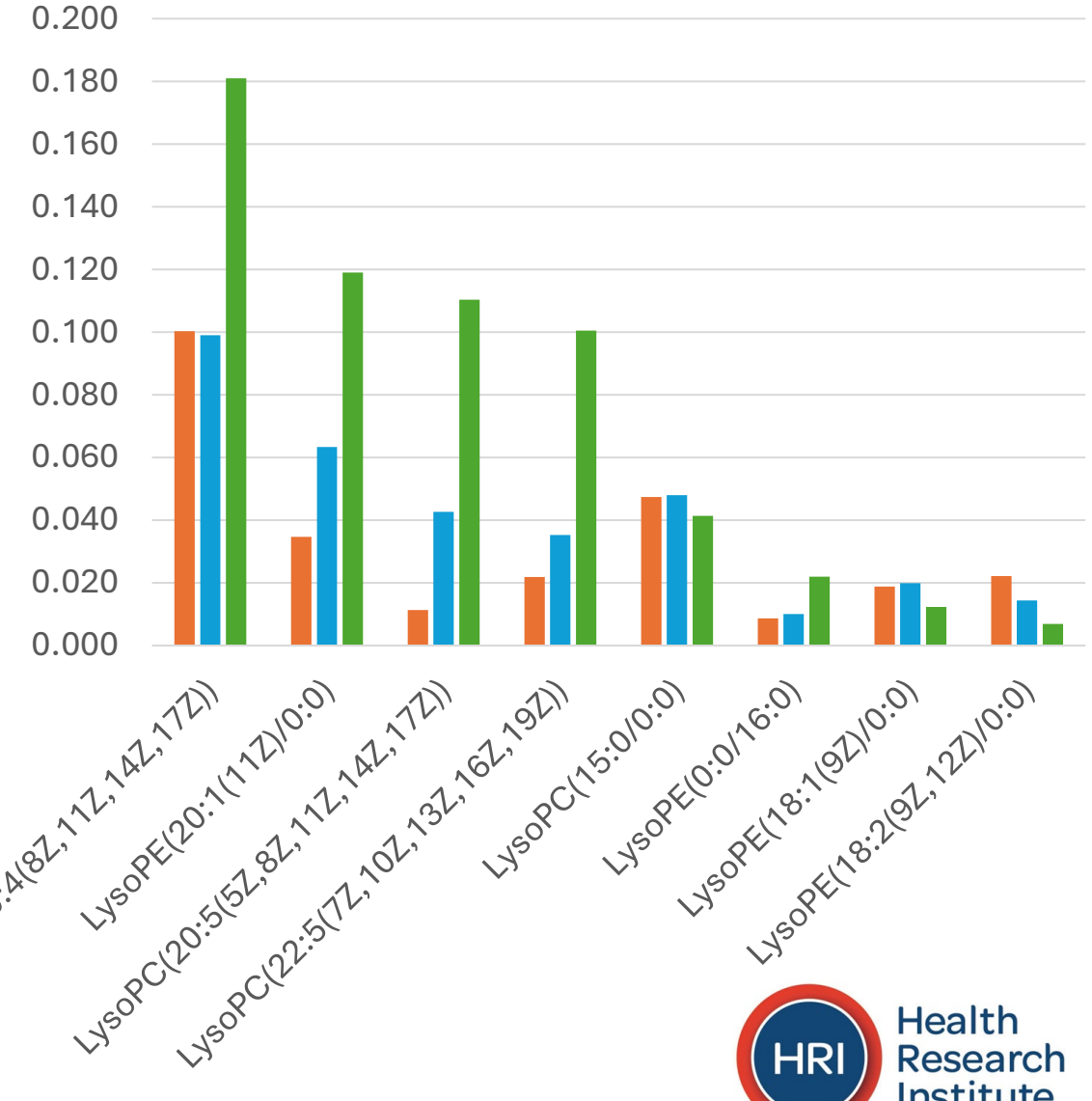
Lysolecithins:

Are potent pro-inflammatory mediators and chemotactic signals, whereas lyso-species carrying long-chain n-3 PUFAs (e.g., LPC-EPA, LPC-DPA) can exert anti-inflammatory and pro-resolving effects. Of the 18 lysolecithins, 14 were significantly higher in fermented forage-fed beef and 5 of these carried antioxidant omega 3 fatty acids. Lysolecithins in fermented forage-fed beef carry substantially higher levels of omega-3 antioxidant, anti-inflammatory fatty acids. Lysolecithins carrying omega-9 and saturated fatty acids can be antioxidant or oxidant and anti-inflammatory or inflammatory based on the context, while those carrying omega-6 fatty acids tend to be consistently inflammatory.

Lysolecithin Levels in Grain-Fed, Grass-Fed & Fermented Forage-Fed Beef





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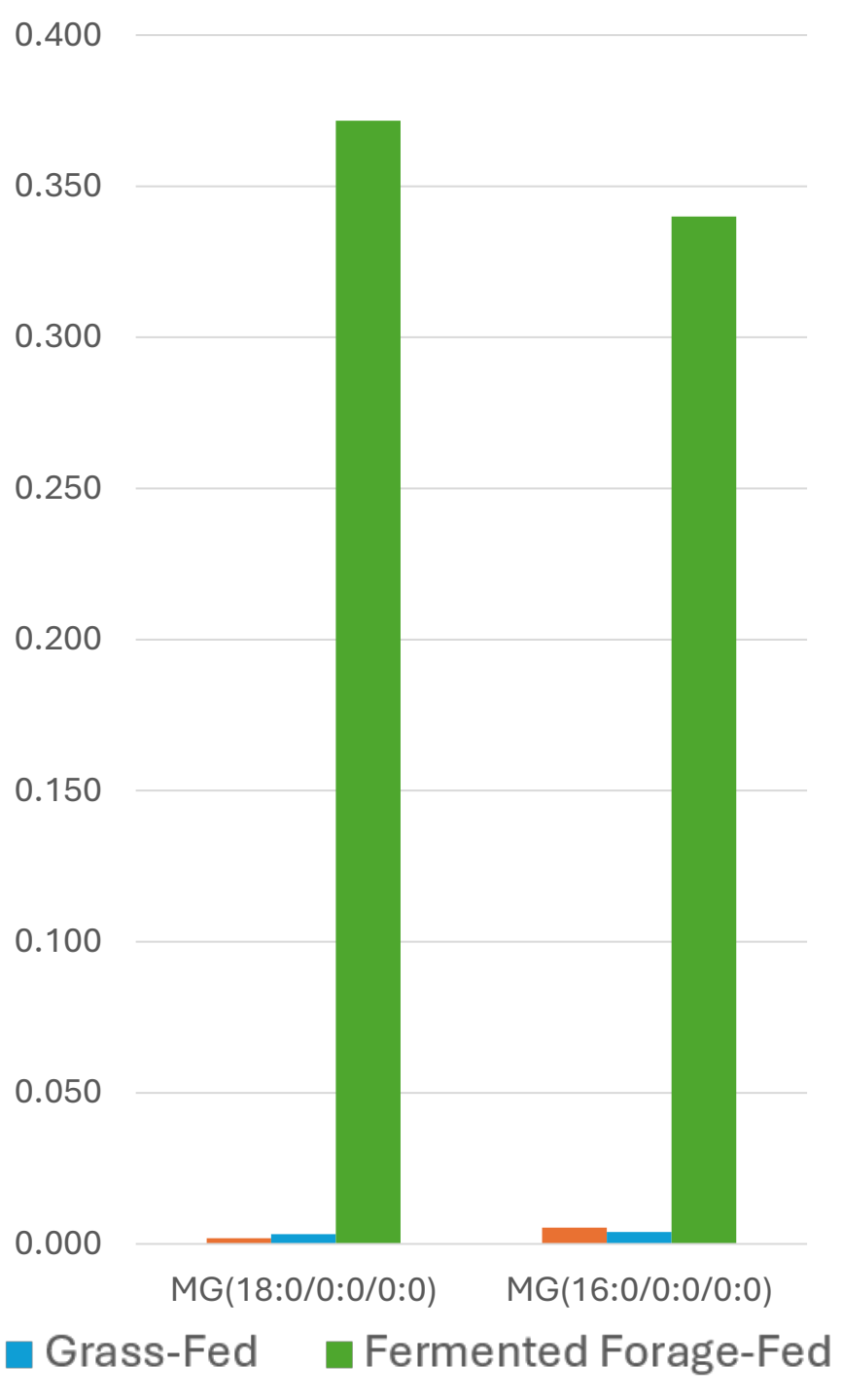
Monoglycerides:

- Their biological effects mirror the attached acyl chain: saturated MGs can participate in inflammatory signaling and metabolic regulation, while MGs carrying n-3 PUFAs may support anti-inflammatory actions or act as transport forms. The levels of monoglycerides carrying omega-3 PUFA fatty acids is two orders of magnitude greater in beef fed fermented forage than in grain fed and even grass-fed beef.



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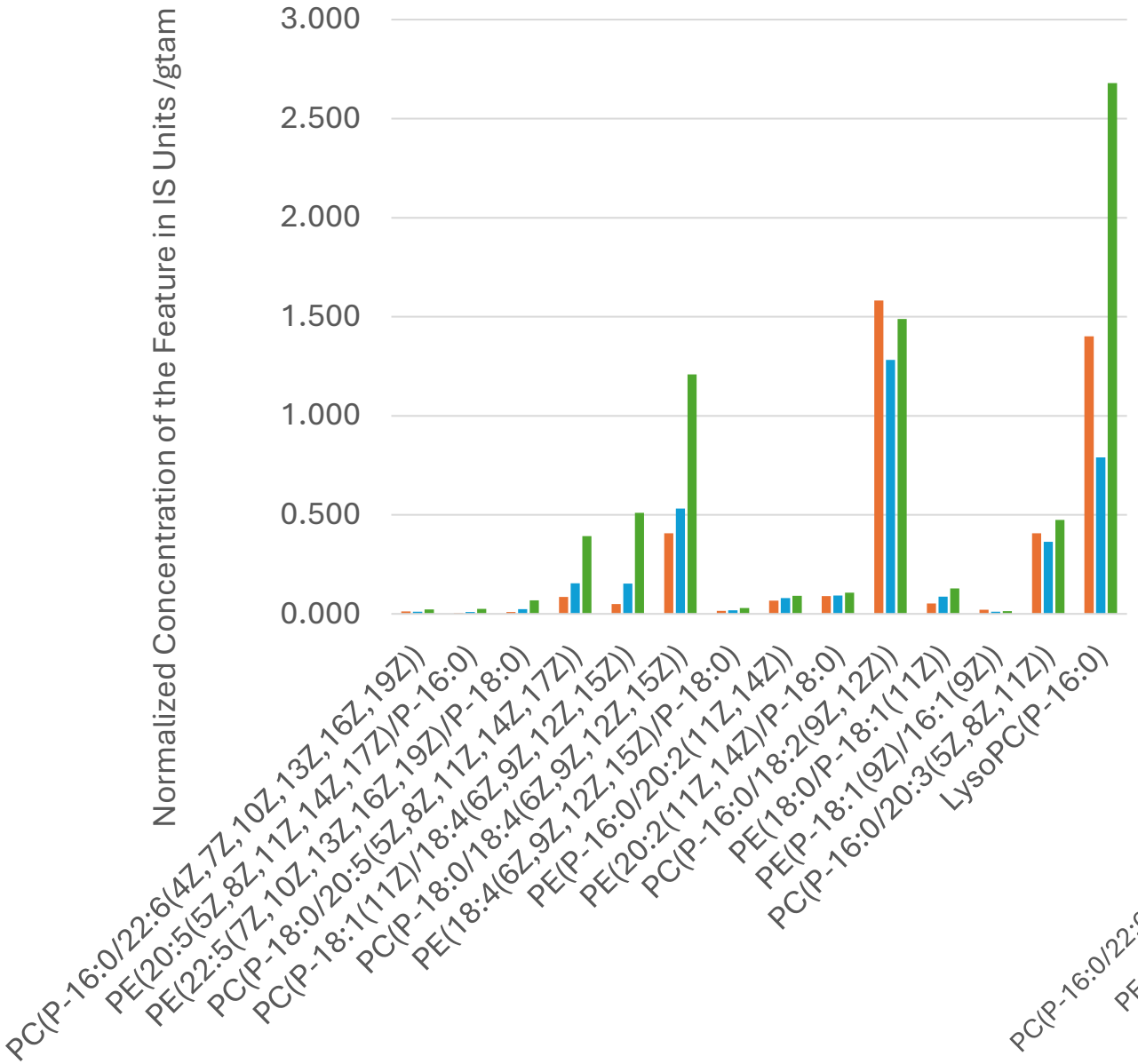
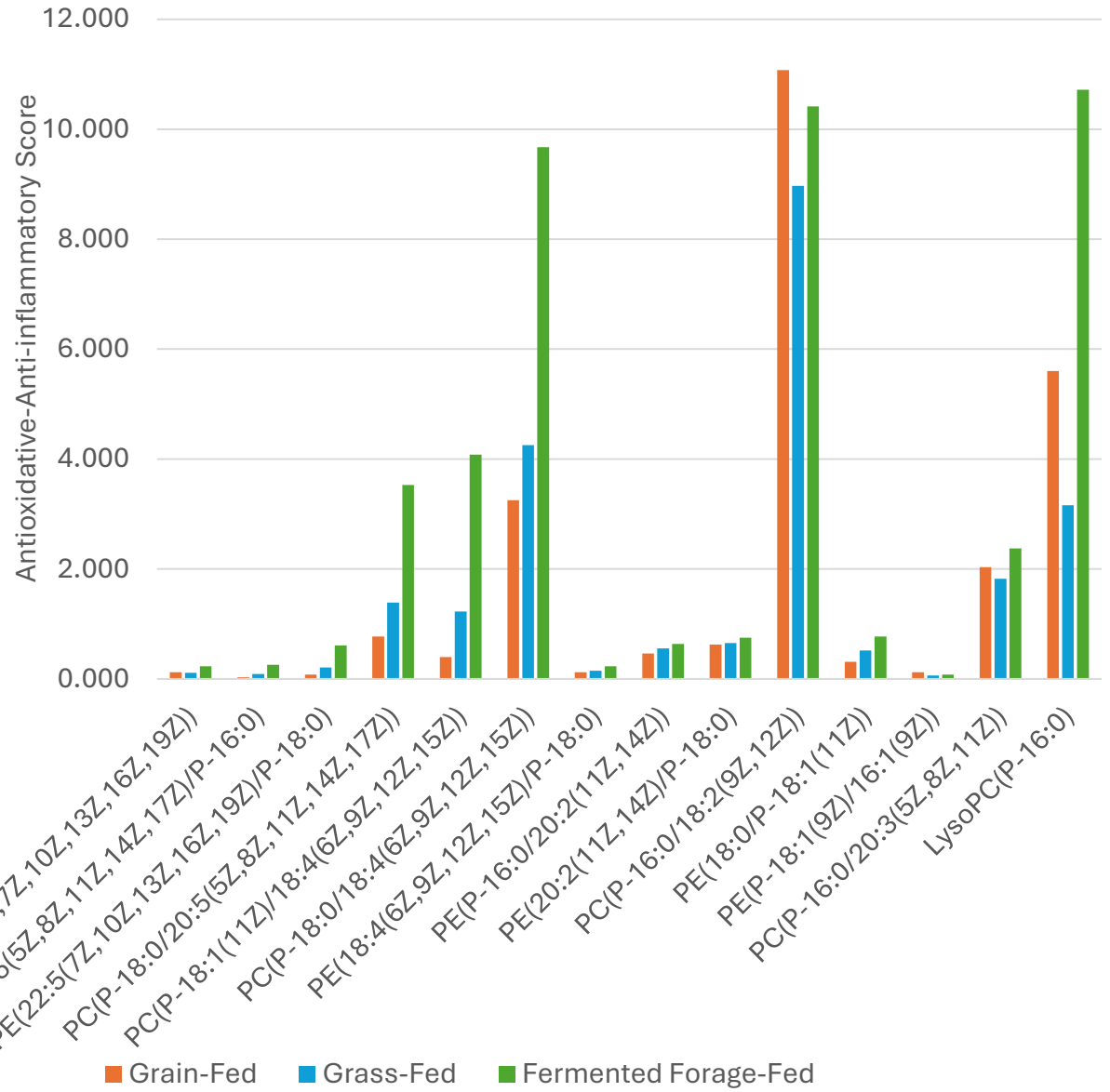
Section 5
Plasmalogens & Lysolecithins Antioxidant and Anti-inflammation Functions
Application of a Scoring System

Antioxidant and Anti-inflammatory Scoring of Plasmalogens

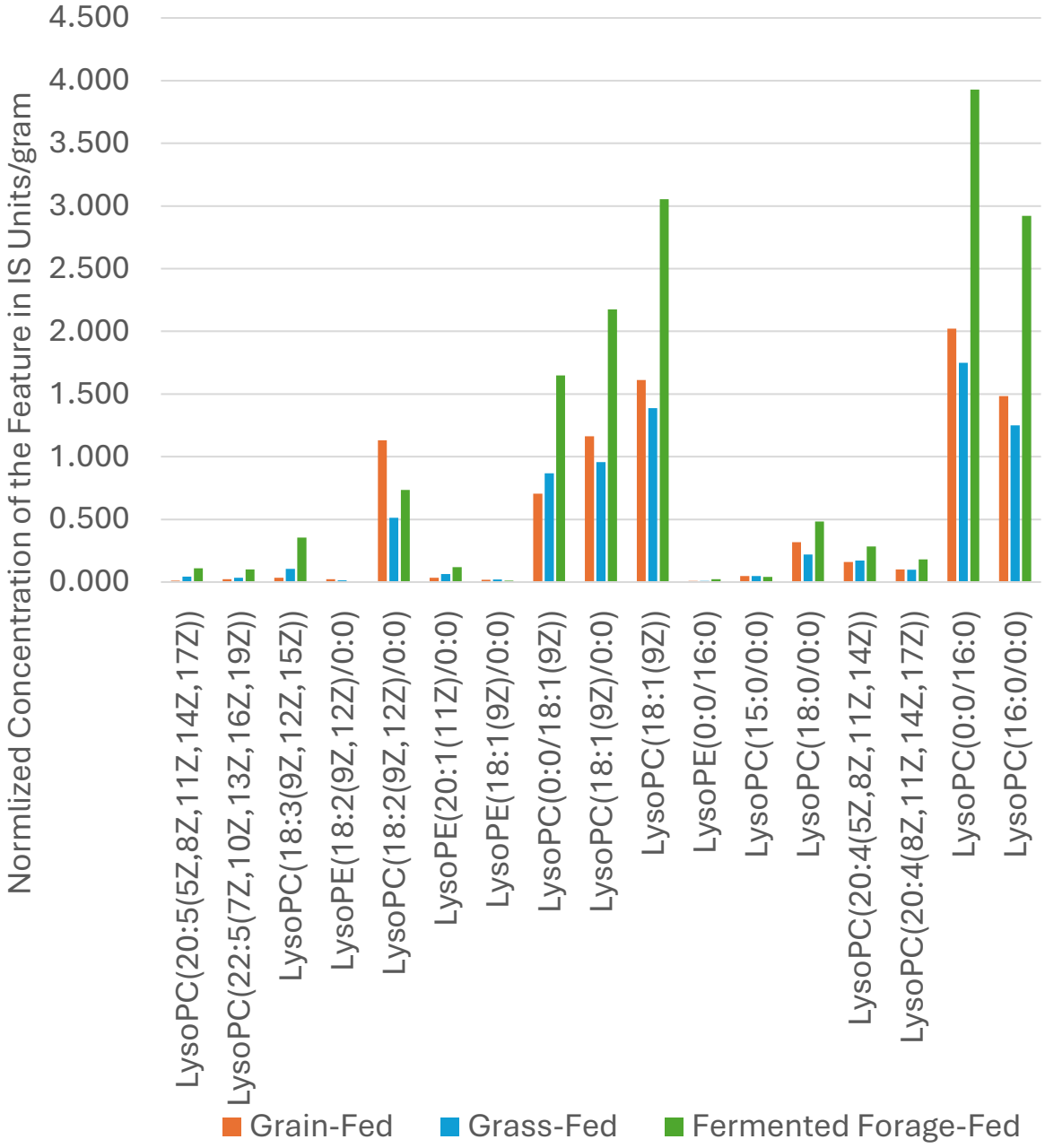


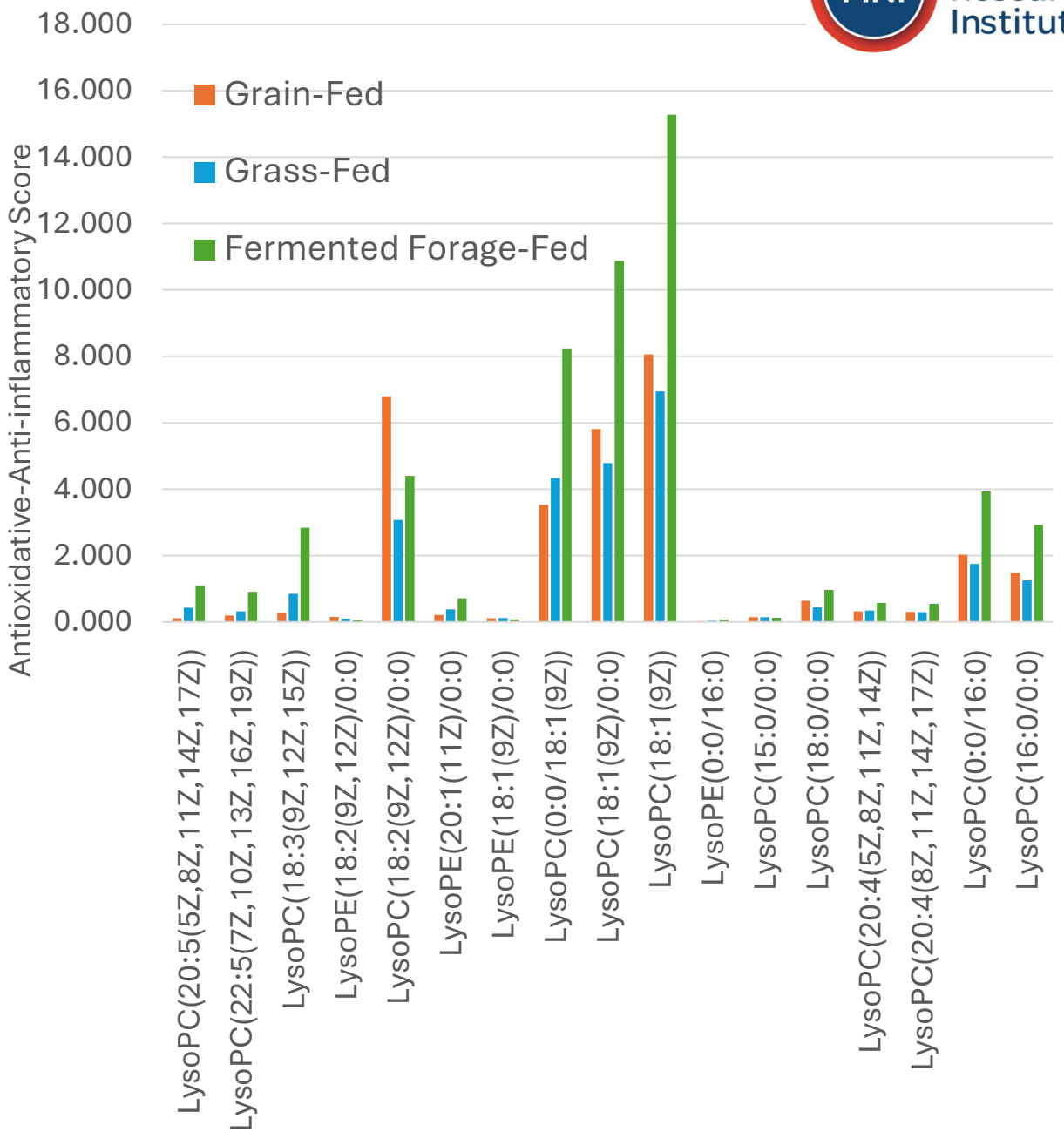


Antioxidative & Anti-inflammatory Score of Plasmalogens in Fermented Forage-Fed, Grass-Fed and Grain-Fed Beef

Compound	Antioxidant / Anti-inflammatory Status (1-10)	Combined mechanistic notes (oxidative and inflammatory status in muscle)	Antioxidative & Anti-inflammatory score of Plasmalogens		
			Grain-fed	Grass-fed	Fermented Forage-fed
PC(P-16:0/22:6(4Z,7Z,10Z,13Z,16Z,19Z))	10	DHA plasmalogen PC is assocaited with reduced chronic inflammation, promotion of specialized pro-resolving mediators, and protection against inflammatory diseases, while acting as a strong sacrificial antioxidant at the vinyl-ether bond with DHA-driven upregulation of antioxidant defenses and membrane protection.	0.12	0.113	0.23
PE(20:5(5Z,8Z,11Z,14Z,17Z)/p-16:0)	10	EPA plasmalogen PE serves as a reservoir for EPA-derived specialized pro-resolving mediators and dampens NF-kappaB and cytokine signaling in multiple tissues, and its vinyl-ether scavenging combined with EPA-enriched inner and mitochondrial membranes lowers ROS and lipid peroxidation.	0.03	0.09	0.257
PE(22:5(7Z,10Z,13Z,16Z,19Z)/p-18:0)	9	DPA plasmalogen PE support resolution pathways and inversely correlates with chronic inflammatory states, while providing redox protection very similar to EPA and DHA plasmalogens, though somewhat less extensively documented.	0.081	0.21	0.609
PC(P-18:0/20:5(5Z,8Z,11Z,14Z,17Z))	9	EPA plasmalogen PC is anti-inflammatory via altered eicosanoid balance and membrane-raft signaling, even though some arachidonic acid release can occur when remodeled, and it acts as a strong membrane antioxidant that protects neighboring neutral lipids from oxidation.	0.771	1.389	3.528
PC(P-18:1(11Z)/18:4(6Z,9Z,12Z,15Z))	8	The n-3-rich plasmalogen PC favors anti-inflammatory signaling and reduced adhesion molecule expression, and the highly unsaturated sacrificial 18:4 n-3 chain promoted adaptive antioxidant responses despite its susceptibility to oxidation.	0.4	1.227	4.08
PC(P-18:0/18:4(6Z,9Z,12Z,15Z))	8	A similar n-3 plasmalogen PC with a strong bias toward an anti-inflammatory lipid mediator profile, in which the n-3 18:4 chain at sn-2 and saturated vinyl-ether together provide strong radical-trapping and chain-breaking antioxidant capacity.	3.251	4.256	9.672
PE(18:4(6Z,9Z,12Z,15Z)/P-18:0)	8	n-3 plasmalogen PE attenuates inflammatory signaling and supports resolution in chronic inflammation models, while its n-3-rich inner-membrane localization protects mitochondrial lipids and supports overall redox homeostasis.	0.12	0.149	0.232
PE(P-16:0/20:2(11Z,14Z))	7	This n-6 plasmalogen PE is generally more anti-inflammatory than non-plasmalogen analogs, although sn-2 n-6 allows some pro-inflammatory eicosanoid generation, and its dihomo-linoleoyl plasmalogen structure provides good sacrificial antioxidant function, somewhat less favorable than n-3 analogs.	0.464	0.555	0.637
PE(20:2(11Z,14Z)/P-18:0	7	It shows a similar moderate anti-inflammatory tendency, supporting membrane organization yet still capable of releasing n-6 eicosanoid precursors, and as an n-6 di-unsaturated plasmalogen PE it protects membranes but offers less systemic antioxidant signaling than EPA and DHA plasmalogens.	0.628	0.651	0.749
PC(P-16:0/18:2(9Z,12Z))	7	Linoleoyl plasmalogen PC is protective against chronic inflammation but less strongly pro-resolving than EPA and DHA plasmalogens, and its vinyl-ether scavenging combined with moderate PUFA-mediated antioxidant responses confers overall protection despite being more prone to peroxidation than n-3 species.	11.074	8.972	10.418
PE(18:0/P-18:1(11Z))	6	This MUFA-rich plasmalogen PE helps maintain membrane structure and can dampen some inflammatory signaling, though less effectively than n-3 species, while the mostly saturated and monounsaturated plasmalogen still uses its vinyl-ether to scavenge ROS but with lower PUFA-linked adaptive antioxidant responses.	0.314	0.52	0.774
PE(P-18:1(9Z)/16:1(9Z)	6	MUFA-plasmalogen PE is largely structural and near-neutral with a mild anti-inflammatory bias, and its MUFA-rich composition offers structural and modest antioxidant protection that is weaker than PUFA plasmalogens but still beneficial.	0.122	0.064	0.08
PC(P-16:0/20:3(5Z,8Z,11Z))	5	This n-6 arachidonic-acid-precursor plasmalogen PC can be structurally protective yet also serve as a source of pro-inflammatory eicosanoids, giving an overall near-neutral to mildly anti-inflammatory effect, while the n-6 eicosatrienoyl chain provides decent sacrificial antioxidant capacity but also feeds some pro-oxidant eicosanoid pathways, slightly lowering net antioxidant benefit.	2.035	1.822	2.373
LysoPC(P-16:0)	4	The plasmalogen lysolipid loses its sn-2 PUFA and gains signaling potency, making it less anti-inflammatory than intact plasmalogens with potential to activate inflammatory pathways while still retaining modest protective traits, and it retains vinyl-ether scavenging but lacks a PUFA at sn-2 and may be more bioactive or pro-oxidant than the intact plasmalogens.	5.603	3.16	10.719
Total Antioxidative and Anti-inflammatory Score			**25.013**	**23.178**	**44.358**

Antioxidant and Anti-inflammatory Scoring of Lysolecithins

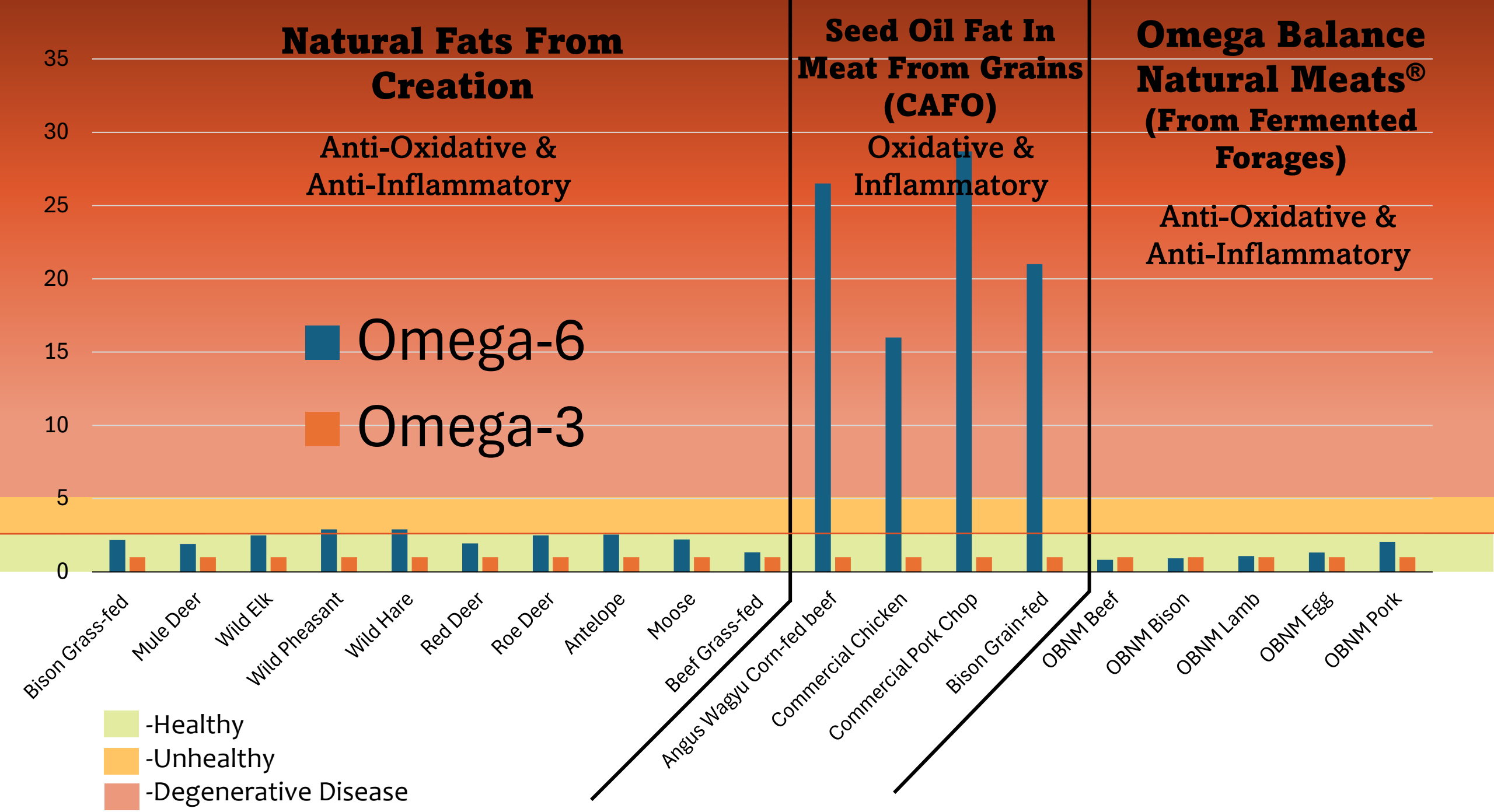




Antioxidative & Anti-inflammatory Score of Lysolecithins in Fermented Forage-Fed, Grass-Fed and Grain-Fed Beef

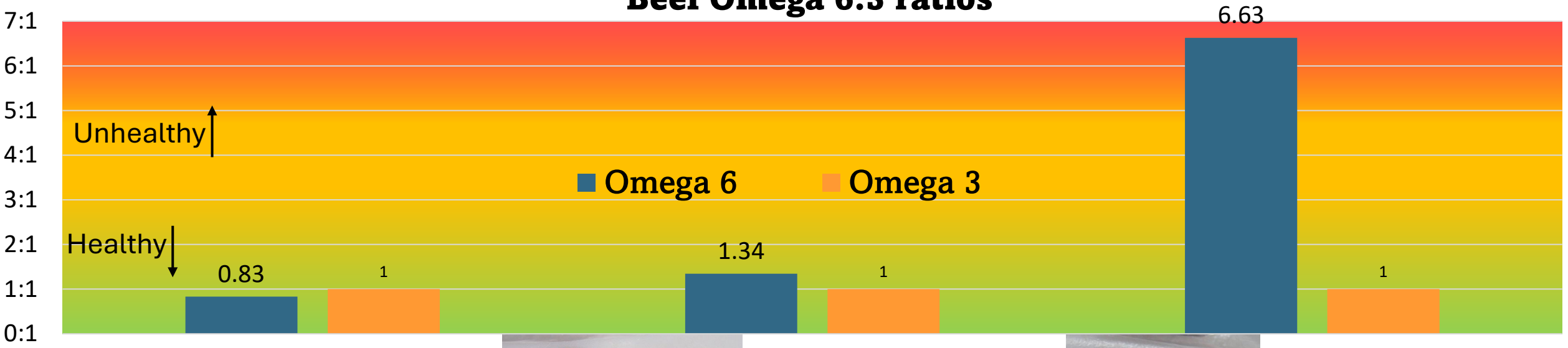
Compound	Antioxidant / Anti-inflammatory Status (1-10)	Combined mechanistic notes (oxidative and inflammatory status in muscle)	Antioxidative & Anti-inflammatory score of Lecithins		
			Grain-fed	Grass-fed	Fermented Forage-fed
LysoPC(20:5(5Z,8Z,11Z,14Z,17Z))	10	EPA-LPC efficiently delivers EPA into muscle membranes, improving mitochondrial function, reducing exercise-induced ROS, and upregulating antioxidant and anti-inflammatory signaling (e.g., Nrf2-linked gene expression), while shifting eicosanoids toward pro-resolving mediators and lowering cytokines and adhesion molecules in n-3 supplementation contexts.	0.113	0.427	1.103
LysoPC(22:5(7Z,10Z,13Z,16Z,19Z))	9	DPA-LPC (n-3) incorporates into phospholipids, shifting the eicosanoid profile toward pro-resolving mediators and supporting mitochondrial efficiency to indirectly lower ROS and oxidative damage, and as a long-chain n-3 it supports resolution pathways and dampens inflammatory signaling similarly to EPA/DHA, though with less extensive data.	0.197	0.317	0.904
LysoPC(18:3(9Z,12Z,15Z))	8	ALA-LPC (likely n-3) enhances n-3 availability for membrane remodeling; despite high peroxidizability, chronic exposure promotes antioxidant enzyme expression and reduces markers of oxidative injury in muscle-relevant models, while an n-3-enriched phospholipid profile tends to reduce NF-κB–driven responses and inflammatory eicosanoid production over time.	0.269	0.845	2.840
LysoPE(18:2(9Z,12Z)/0:0)	7	Linoleoyl LPE locates preferentially to inner membranes and mitochondria, participating in phospholipid remodeling and mitophagy to support turnover of damaged, oxidized lipids and moderately improve redox balance, and its PE localization in inner membranes with involvement in mitophagy/repair confers modest anti-inflammatory, pro-resolution support despite its n-6 character.	0.155	0.101	0.048
LysoPC(18:2(9Z,12Z)/0:0)	6	Linoleoyl LPC serves as a substrate and transporter for PUFA incorporation; although susceptible to peroxidation, physiological levels correlate with better metabolic fitness and can indirectly support adaptive antioxidant responses in muscle, while being less potent than saturated LPCs for leukocyte adhesion and cytokine induction and providing substrate for both pro- and anti-inflammatory eicosanoids.	6.791	3.075	4.404
LysoPE(20:1(11Z)/0:0)	6	MUFA LPE species are relatively resistant to peroxidation, with PE headgroup positioning in mitochondria/ER that stabilizes membranes and modestly limits ROS propagation without strong direct scavenging, and they appear relatively neutral with a slight anti-inflammatory bias by stabilizing membranes and not strongly activating classic LPC inflammatory pathways.	0.208	0.380	0.714
LysoPE(18:1(9Z)/0:0)	6	Oleoyl LPE contributes to membranes with low peroxidation potential, helping preserve mitochondrial integrity and indirectly lowering oxidative stress during muscle activity, and tends to be weakly inflammatory or neutral, with some evidence of supporting cell survival and limiting excessive cytokine production compared with saturated species.	0.113	0.120	0.074
LysoPC(0:0/18:1(9Z))	5	Oleoyl LPC is less damaging than saturated LPCs; at physiological concentrations it supports membrane remodeling and may promote insulin-sensitive, oxidative muscle fibers with relatively lower ROS, and although it can impair endothelial NO in some models it is clearly less pro-inflammatory than 16:0/18:0 LPCs and sometimes behaves near-neutral.	3.527	4.333	8.237
LysoPC(18:1(9Z)/0:0)	5	This sn-1 oleoyl LPC behaves similarly, where the mono-unsaturated acyl chain decreases propagation of lipid peroxides compared with PUFA LPCs and is less strongly linked to ROS-driven muscle damage, while showing moderate, context-dependent inflammatory activity around the midpoint of the pro-/anti-inflammatory scale.	5.811	4.788	10.877
LysoPC(18:1(9Z))	5	Assuming an 18:1 acyl, this unspecified-position oleoyl LPC has moderate membrane-stabilizing and signaling roles with relatively neutral to mildly protective effects on oxidative status, and similarly can activate some inflammatory signaling but far less strongly than saturated LPCs.	8.062	6.942	15.272
LysoPE(0:0/16:0)	3	Palmitoyl LPE places a saturated chain in inner membranes; it does not propagate peroxidation strongly but contributes to rigid, less flexible mitochondria that slightly favor oxidative stress under load, and the saturated chain plus PE headgroup confer mild-to-moderate pro-inflammatory potential, likely less than palmitoyl LPC but still capable of promoting cytokine signaling under stress.	0.026	0.030	0.066
LysoPC(15:0/0:0)	3	This odd-chain saturated LPC, by analogy to 16:0/18:0 species, can activate pro-oxidant and pro-inflammatory pathways, but the shorter odd chain suggests somewhat attenuated ROS-promoting effects, with limited direct data yet an expectation of pro-inflammatory behavior that is weaker than 16:0 LPC.	0.142	0.144	0.124
LysoPC(18:0/0:0)	2	Stearoyl LPC is associated with metabolic dysfunction and oxidative stress; in muscle, elevated saturated LPCs impair mitochondrial respiration and increase ROS generation and redox-sensitive signaling, and stearoyl LPC is linked to inflammatory cardiometabolic phenotypes via activation of ROS-linked, NF-κB–type responses.	0.636	0.439	0.965
LysoPC(20:4(5Z,8Z,11Z,14Z))	2	Arachidonoyl LPC (Δ5-8-11-14) is highly peroxidizable and feeds ROS-linked eicosanoid production with limited net antioxidant benefit, while supplying arachidonic acid for pro-inflammatory eicosanoids such as TXA_2 and prostaglandins, alongside some pro-resolving mediators, giving an overall mildly pro-inflammatory profile.	0.322	0.345	0.569
LysoPC(20:4(8Z,11Z,14Z,17Z))	3	This positional isomer of arachidonoyl LPC shows similarly strong peroxidation susceptibility at the chemical level, and as an AA-related tetraene displays a broadly similar net pro-inflammatory tendency, though with slightly more favorable ω-3-linked signaling in some contexts.	0.301	0.297	0.543
LysoPC(0:0/16:0)	1	Palmitoyl LPC potently induces ROS production, mitochondrial dysfunction, calcium dysregulation, and activation of pro-oxidant enzymes (e.g., NADPH oxidase) in vascular and muscle-related cells, and robustly induces oxidative stress, adhesion molecules, cytokines, and endothelial dysfunction, making it one of the most pro-inflammatory LPC species described.	2.021	1.749	3.928
LysoPC(16:0/0:0)	1	The same palmitoyl LPC species is consistently linked with oxidative stress, myopathy-like changes when LPC levels fall then rebound, and activation of redox-sensitive inflammatory pathways in muscle, and is routinely used as a positive control for LPC-induced inflammatory activation in vascular and immune cells.	1.484	1.251	2.921
Total Antioxidative and Anti-inflammatory Score			**30.179**	**25.582**	**53.589**

Section 6
Grain-Fed Beef & Toxins



 Tests Completed @ USU Nutrition, Dietetics & Food Sciences Department & Microbac Laboratories & Ref: Bio Med Central Research 2015

Beef Omega 6:3 ratios



OBNB

	BMT
C18:2n6 (LA)	87,360
C20:2 n6	3,348
C20:3 n6 (DGLA)	5,581
C20:4 n6 (AA)	10,637
Total 6s	106,926
C18:3 n3 (ALA)	99,006
C20:3 n3	3,319
C20:5 n3 (EPA)	6,778
C22:5n3 (DPA)	17,737
C22:6n3 (DHA)	1,433
Total 3s	128,273
Ratio	0.83
Total units measured	6,975,483

Grass Fed

	Grass-fed
C18:2n6 (LA)	37,805
C20:2 n6	993
C20:3 n6 (DGLA)	2,943
C20:4 n6 (AA)	9,309
Total 6s	51,050
C18:3 n3 (ALA)	22,187
C20:3 n3	800
C20:5 n3 (EPA)	3,823
C22:5n3 (DPA)	9,546
C22:6n3 (DHA)	1,731
Total 3s	38,087
Ratio	1.34
Total units measured	1,621,674

Wagyu

	Wagyu
C18:2n6 (LA)	250,531
C20:2 n6	6,813
C20:3 n6 (DGLA)	11,173
C20:4 n6 (AA)	15,277
Total 6s	283,794
C18:3 n3 (ALA)	36,743
C20:3 n3	875
C20:5 n3 (EPA)	1,064
C22:5n3 (DPA)	4,549
C22:6n3 (DHA)	0
Total 3s	43,231
Ratio	6.56
Total units measured	16,674,869

Tests Completed @ USU Nutrition, Dietetics & Food Sciences Department

 Tests Completed @ Microbac Laboratories

Snake River Farms

Ribeye

Total- Omega-6: **584** mg/100g

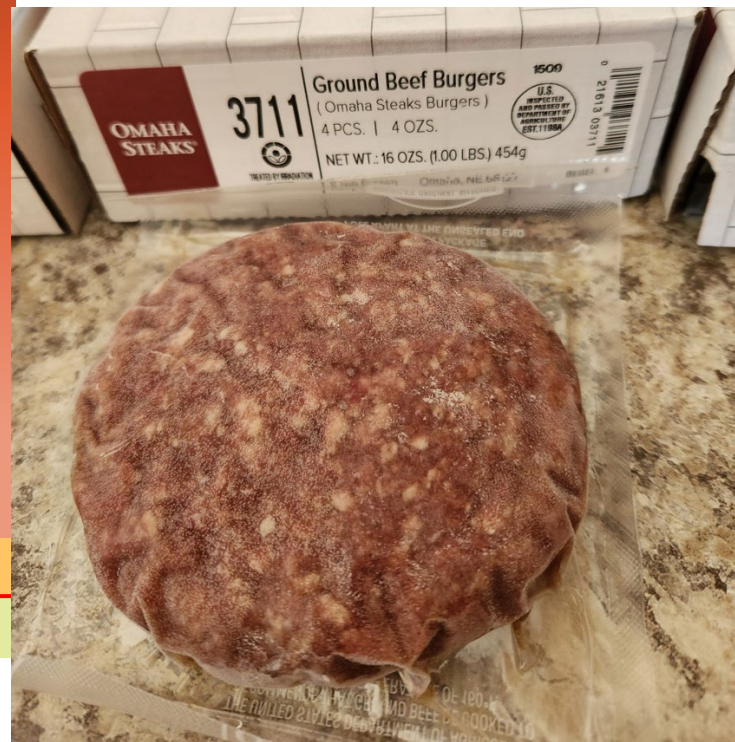
Total- Omega-3: **22** mg/100g

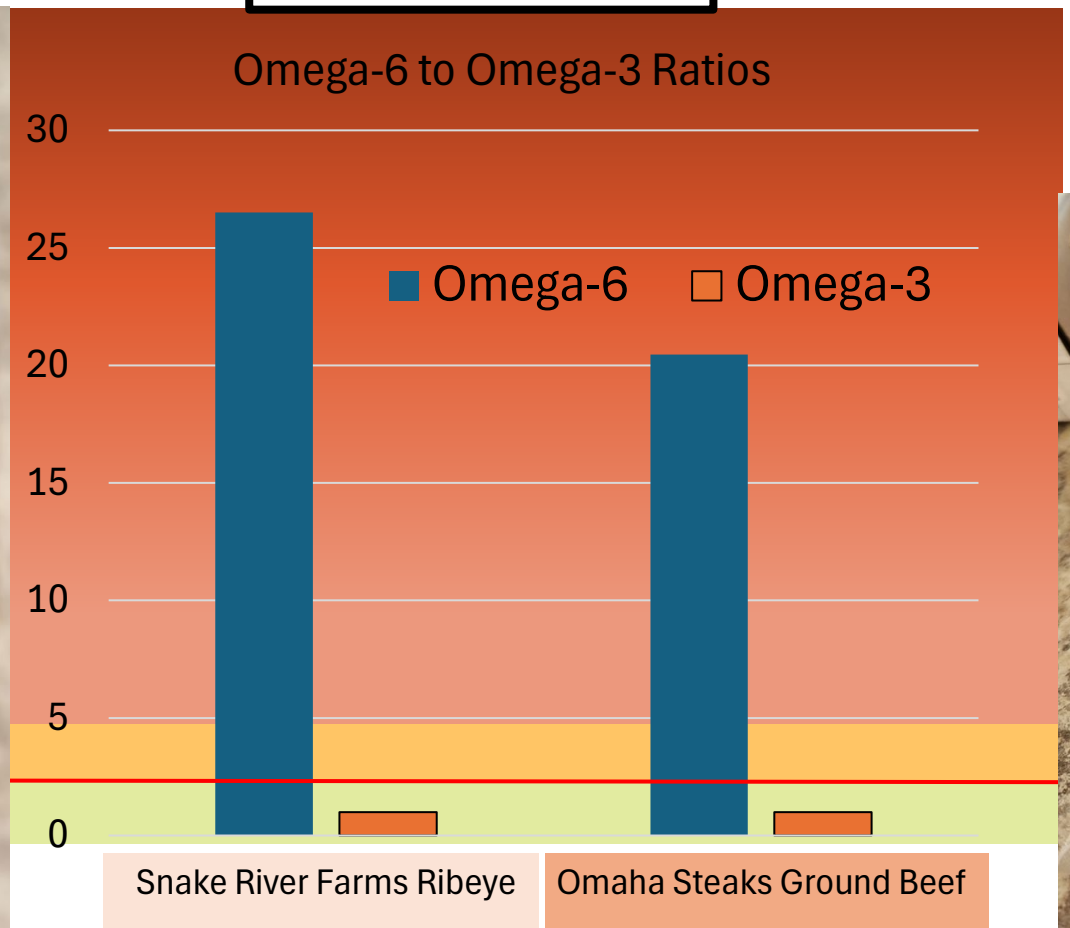
Omaha Steaks

Ground Beef Patty

Total- Omega-6: **532** mg/100g

Total- Omega-3: **26** mg/100g





Grocery store grain fed steak

When the Omega-6 Linoleic acid has been peroxidized in the beef (any meat), the meat contains all these dangerous toxins

Omega 6 PUFA- Mostly Linoleic Acid (LA)

Peroxidation via –OH and HO-2

Lipid Hydroperoxides (LOOH)

- 4-Hydroxy-nonenal (4-HNE)
- Malondialdehyde (MDA)
- Oxidized Linoleic Acid Metabolites (OxLAMs)
- Acrolein
- Carboxyethylpyrrole

Cytotoxic, Genotoxic, Mutagenic, Carcinogenic, Atherogenic, Thrombogenic, Obesogenic, and Teratogenic

1- Dr. Chris Knobbe MD

Once these toxins are inside of you, they will cause cellular mutations, damage genetic information (DNA), cause cancer, cause birth defects, form fatty plaque in arteries, generate blood clots, cause obesity and are toxic to cells

Omega 6 PUFA- Mostly Linoleic Acid (LA)

(Seed/Vegetable Oils)

Peroxidation via –OH and HO-2

Lipid Hydroperoxides (LOOH)

4-Hydroxy-nonenal (4-HNE)

Atherogenic- form fatty plaque in arteries
Thrombogenic- generate blood clotting
Genotoxic- damage genetic info

Malondialdehyde (MDA)

Mutagenic- induce mutations
Cytotoxic- toxic to cell

Oxidized Linoleic Acid Metabolites (OxLAMs)

Mutagenic- Induce Mutations
Carcinogenic- Cancer Formation
Obesogenic- Cause Obesity

Acrolein

Genotoxic- damage genetic info
Mutagenic- induce mutations
Teratogenic- cause defects in fetus

Carboxyethylpyrrole

Carcinogenic- cancer formation
Atherogenic- from fatty plaque in arteries

Dr. Chris Knobbe MD

Full Spectrum Mass Spectrometric Analysis of Fermented Grass-Fed Beef and Grain-Fed

- Some compounds were elevated in grain-fed. Most of these were elevated as part of the physiological process of adapting to the suboptimal diet provided in the feedlot.
- Biomarkers of impaired mitochondrial fatty-acid oxidation and energy metabolism. As seen in many of the following disorders:
  - Cachectic tuberculosis
  - Gestational and type-2 diabetes
  - Broader states of mitochondrial stress
  - Cardiometabolic risk
  - Cerebral edema
  - Neurologic dysfunction
  - Cognitive impairment

HRI Health Research Institute

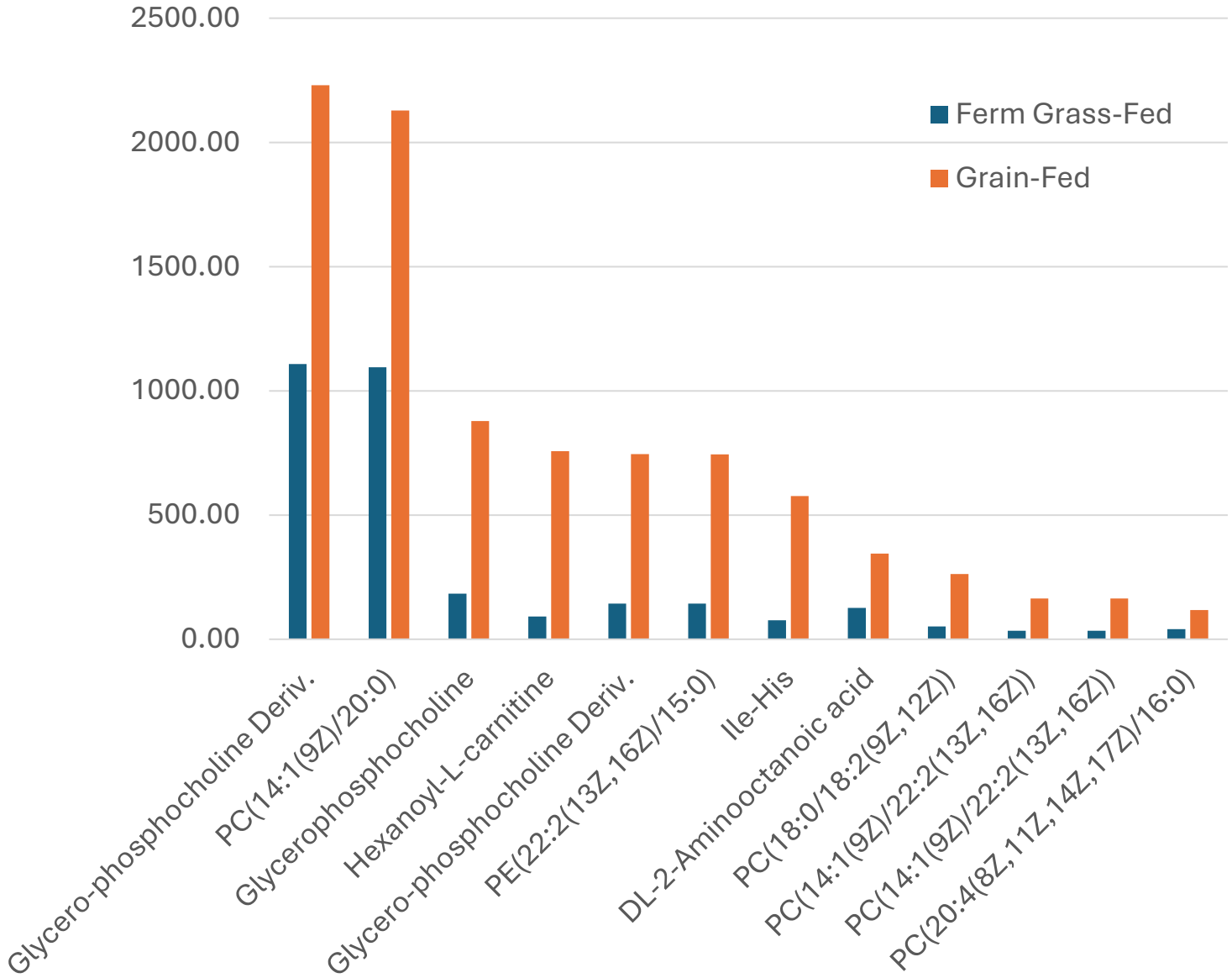
Full Spectrum Mass Spectrometric Analysis of Fermented Grass-Fed Beef and Grain-Fed

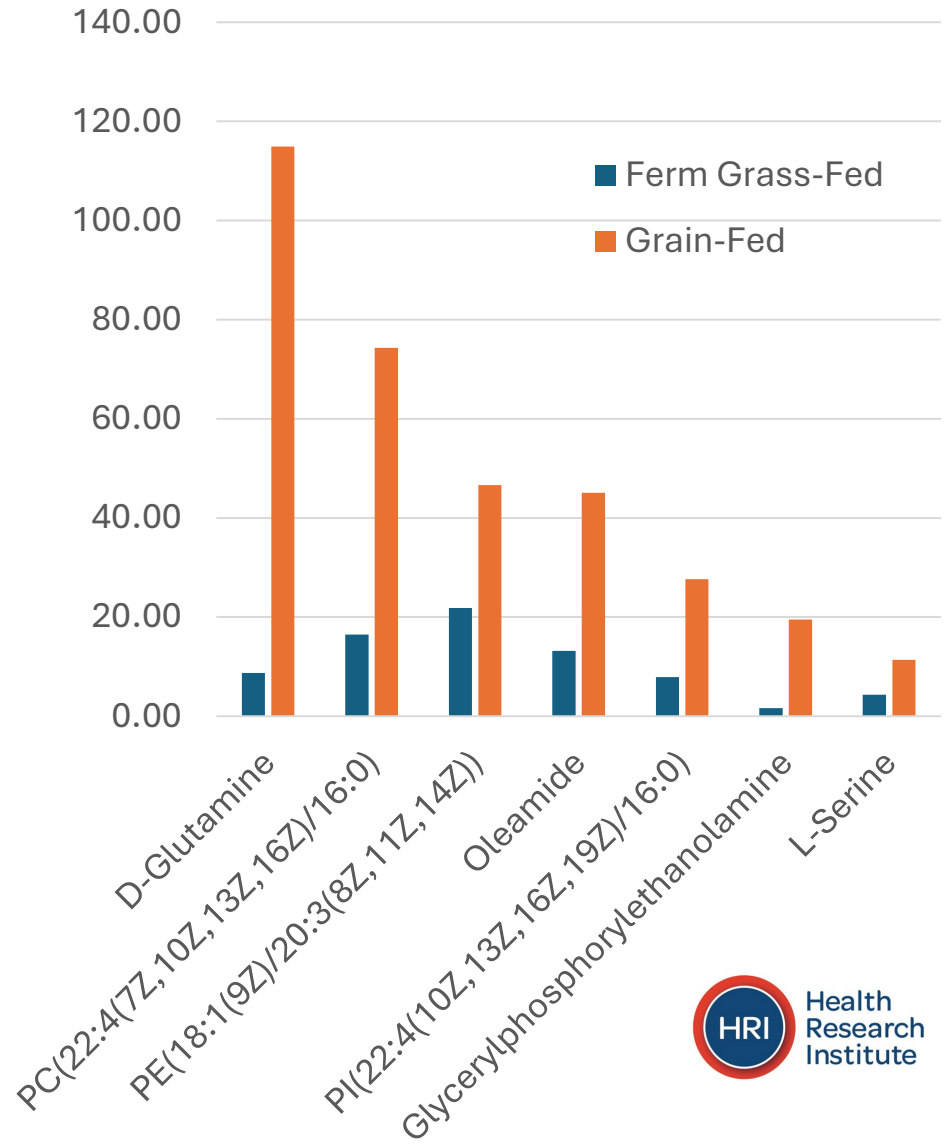
The following slide illustrates that certain compounds in grain-fed beef (Red) far exceed those found in fermented forage Omega Balance Natural Beef (Blue). These are metabolic markers of stress, oxidization, cellular damage and mitochondria dysfunction. These compounds are signaling that there are many things going extremely wrong inside the cells of these animals. This happens because these animals are being fed food sources (grains) that are wrong for their genetic and cellular intelligence and their body is telling us so.

If these compounds are destroying the cattle's metabolic health – they will absolutely destroy your metabolic health when you eat that meat, simple as that! Meat full of toxic oxidative compounds come from very unhealthy cattle. Eating meat from those cattle makes very unhealthy humans.

HRI Health Research Institute

Compounds 2-fold to 13-fold higher in Grain-Fed than in Ferm. Grass-Fed Beef

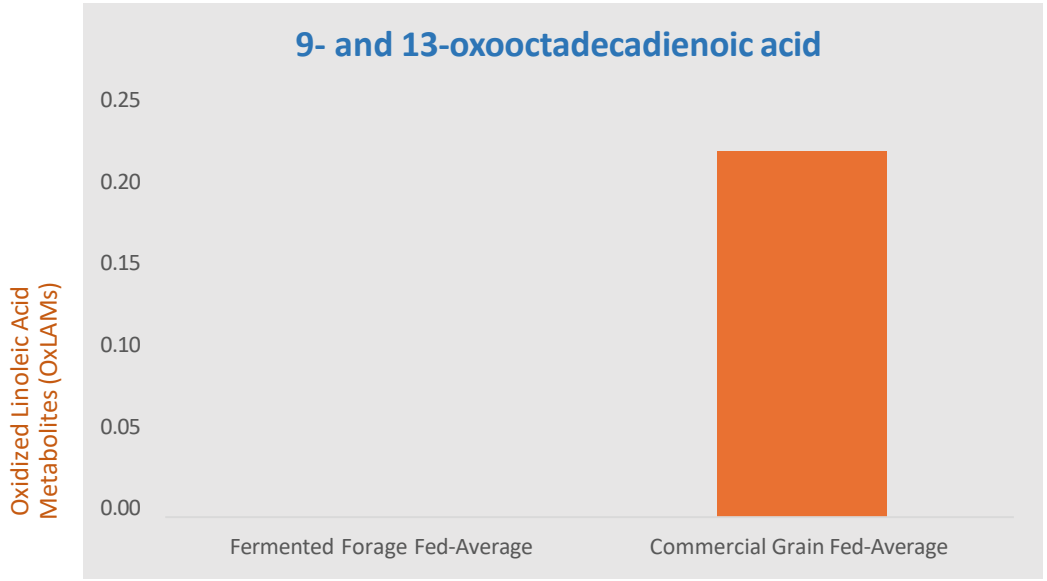




HRI Health Research Institute

9- and 13-oxooctadecadienoic acids (oxo-ODEs)

- Oxidized linoleic-acid (Omega-6) metabolites that act as signaling lipids, influencing lipid metabolism and inflammatory gene expression.
- They are context-dependent mediators.
  - In the absence of oxidative stress, they enhance fatty-acid oxidation, lower triglyceride accumulation, and dampen pro-inflammatory cytokine and chemokine production in intestinal and immune cells.
  - However, ***oxidative stress is exacerbated by oxo-ODEs which are generated in LDLs and inflamed tissues***, amplifying atherosclerosis and other oxidative-stress–related pathologies.
- Because of the prevalence of oxidative stress today, the harmful influences of these molecules predominate.



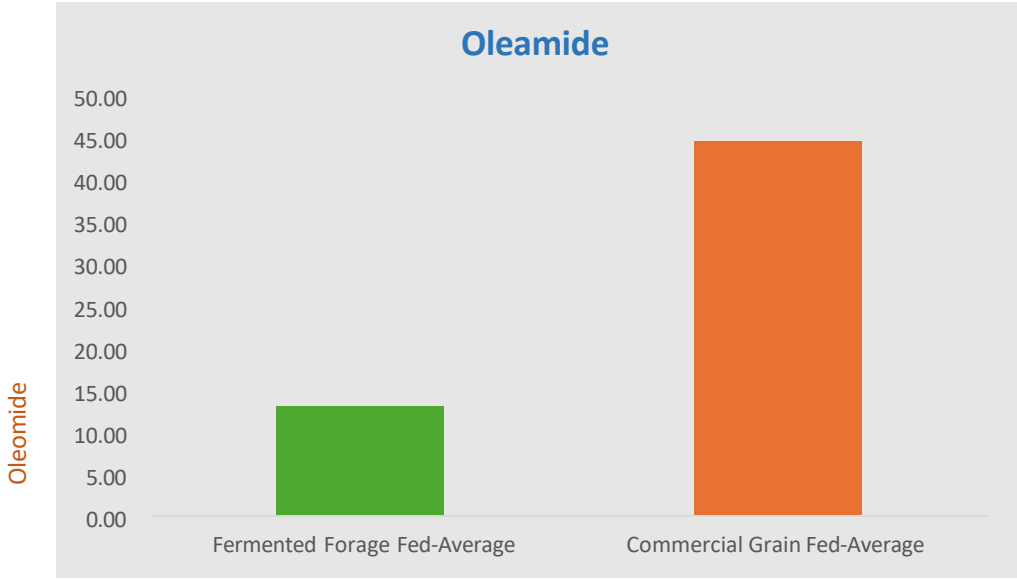
X axis: Average of 3 samples
Y axis: Average Abundance ratio

Fermented Forage Fed-Average	Commercial Grain Fed-Average
0	0.22

Health Research Institute

Oleamide

- An endogenous fatty acid amide derived from oleic acid.
- formed from oleic acid and accumulates when neural and immune cells upregulate fatty-acid amide synthesis in response to stress, sleep loss, and inflammation.
- In grain-fed cattle with ongoing inflammatory and metabolic strain, increased turnover of oleic-acid–containing membrane lipids and activation of N-acylamide–forming enzymes would be expected, so higher oleamide likely reflects ***a compensatory response of the nervous and immune systems to dampen stress signaling and promote rest***, rather than an indicator of robust health.



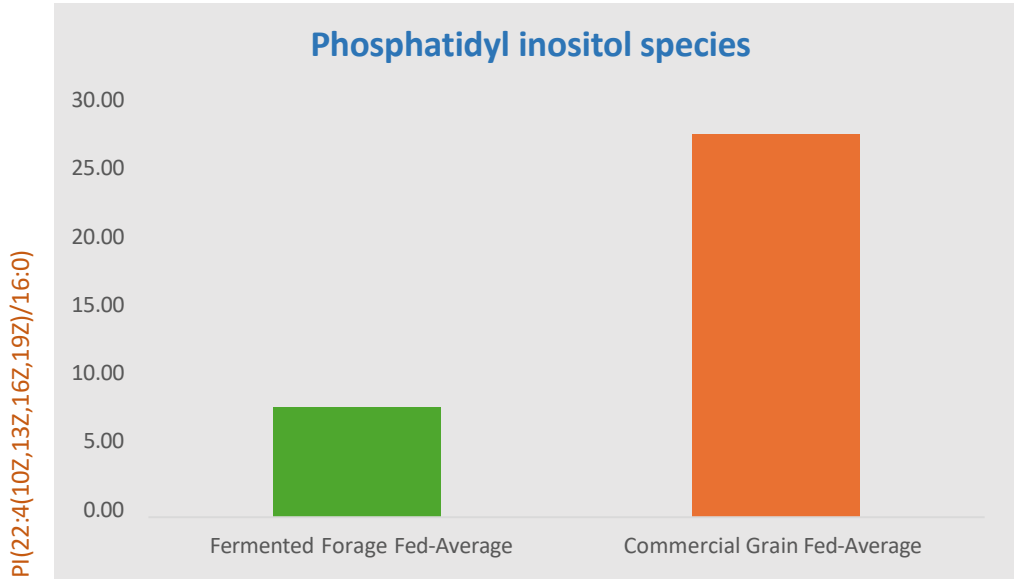
X axis: Average of 3 samples
Y axis: Average Abundance ratio

Fermented Forage Fed-Average	Commercial Grain Fed-Average
13.20	45.09

Health Research Institute

Phosphatidyl inositol species

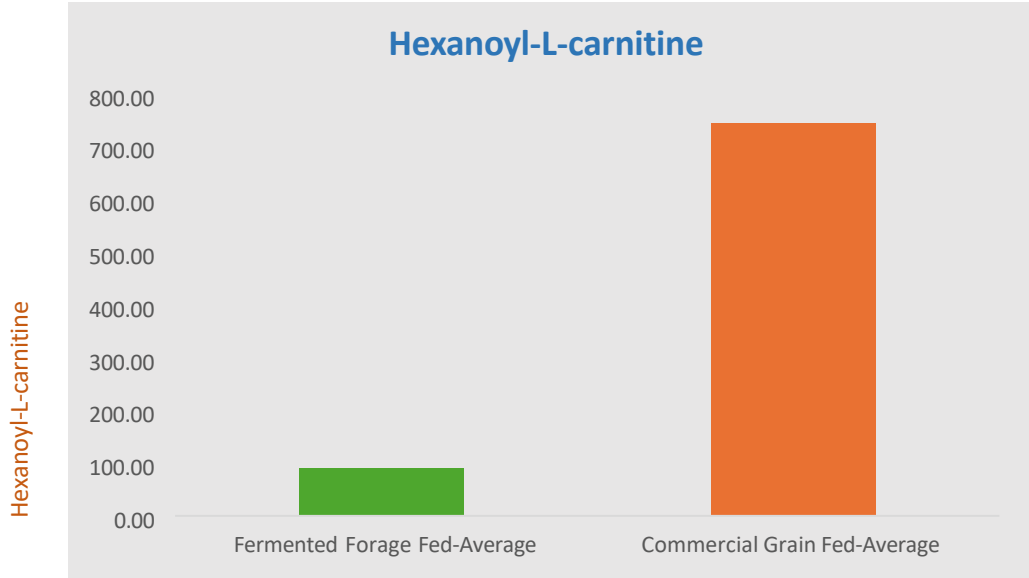
- A minor but crucial anionic membrane phospholipid.
- The adrenic-acid side chain makes this PI a reservoir for 22:4n-6, a long-chain PUFA involved in the generation of eicosanoid-like mediators that can contribute to both pro-inflammatory and pro-resolving responses depending on context.
- PI(22:4/16:0) is part of the phosphatidylinositol pool that is ***continually remodeled when cells are under inflammatory, metabolic, or oxidative stress***.
- In grain-fed cattle, increased turnover of PIs and selective enrichment of adrenic-acid–containing species can occur as membranes are remodeled toward longer-chain n-6 PUFAs and as signaling demand rises.



Health Research Institute

Hexanoyl-L-carnitine

- A medium-chain acylcarnitine formed when hexanoyl-CoA is conjugated to L-carnitine, facilitating mitochondrial transport and excretion of hexanoate and helping maintain fatty-acid β-oxidation and CoA homeostasis.
- Elevated hexanoylcarnitine (C6) in blood or urine is a biomarker of ***impaired mitochondrial fatty-acid oxidation and energy metabolism, as triggered by states of mitochondrial stress and cardiometabolic risk***.



X axis: Average of 3 samples
Y axis: Average Abundance ratio

Fermented Forage Fed-Average	Commercial Grain Fed-Average
91.28	756.92

Health Research Institute

Compounds in Excess Driving Disease

Glycero-phosphocholine

- Elevated levels indicative of
- Impaired cellular function
- Linked to cancer and cardiovascular risk
- Chronic inflammation
- Liver or Kidney strain

Hexanoyl-L-carnitine

- Biomarker of impaired fatty-acid oxidation and energy metabolism
- Diabetes
- Mitochondrial stress
- Cardiometabolic risk

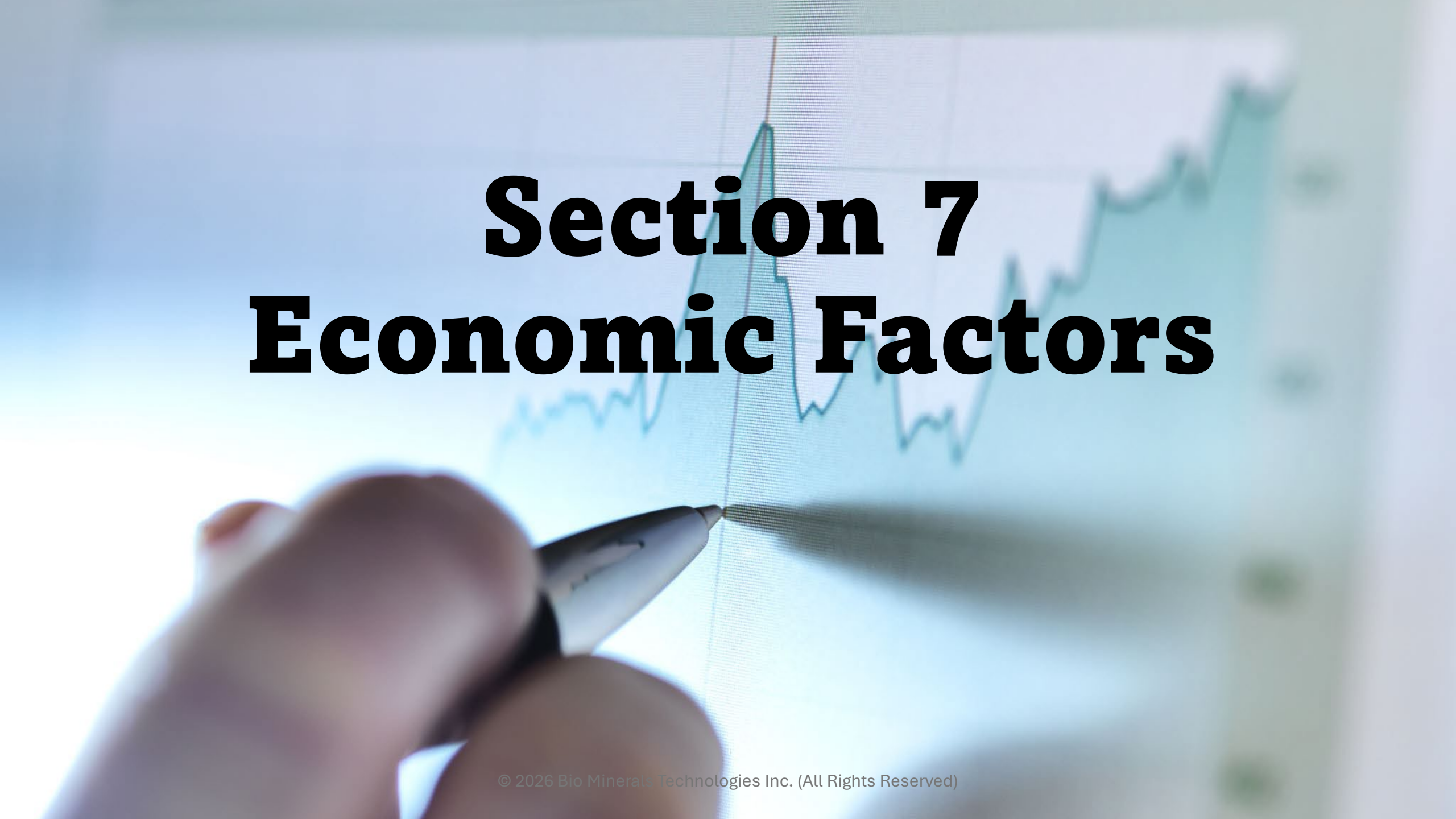
D-Glutamine

- Indicative of mitochondrial and metabolic disorders
- Excess accumulations
- Downgrade energy metabolism
- Hallmark of various cancers
- Cognitive impairment
- Behavioral changes

D-Glutamine

- A non-essential amino acid present abundantly throughout the body and involved in many metabolic processes.
- A principal carrier of Nitrogen and an important energy source for many cells
- ***D-Glutamine is a metabolite found in or produced by Escherichia coli (e-coli).***
- Extreme elevation in grain-fed samples indicative of e-coli in their environment

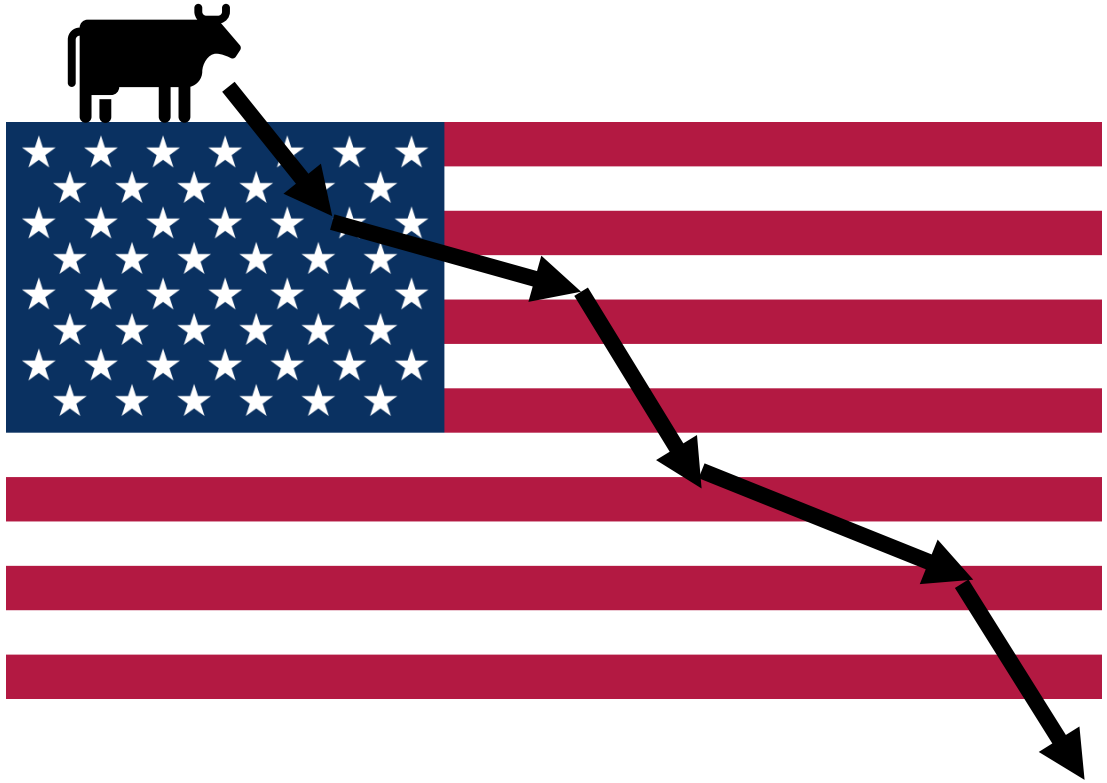
HRI Health Research Institute



Section 7
Economic Factors

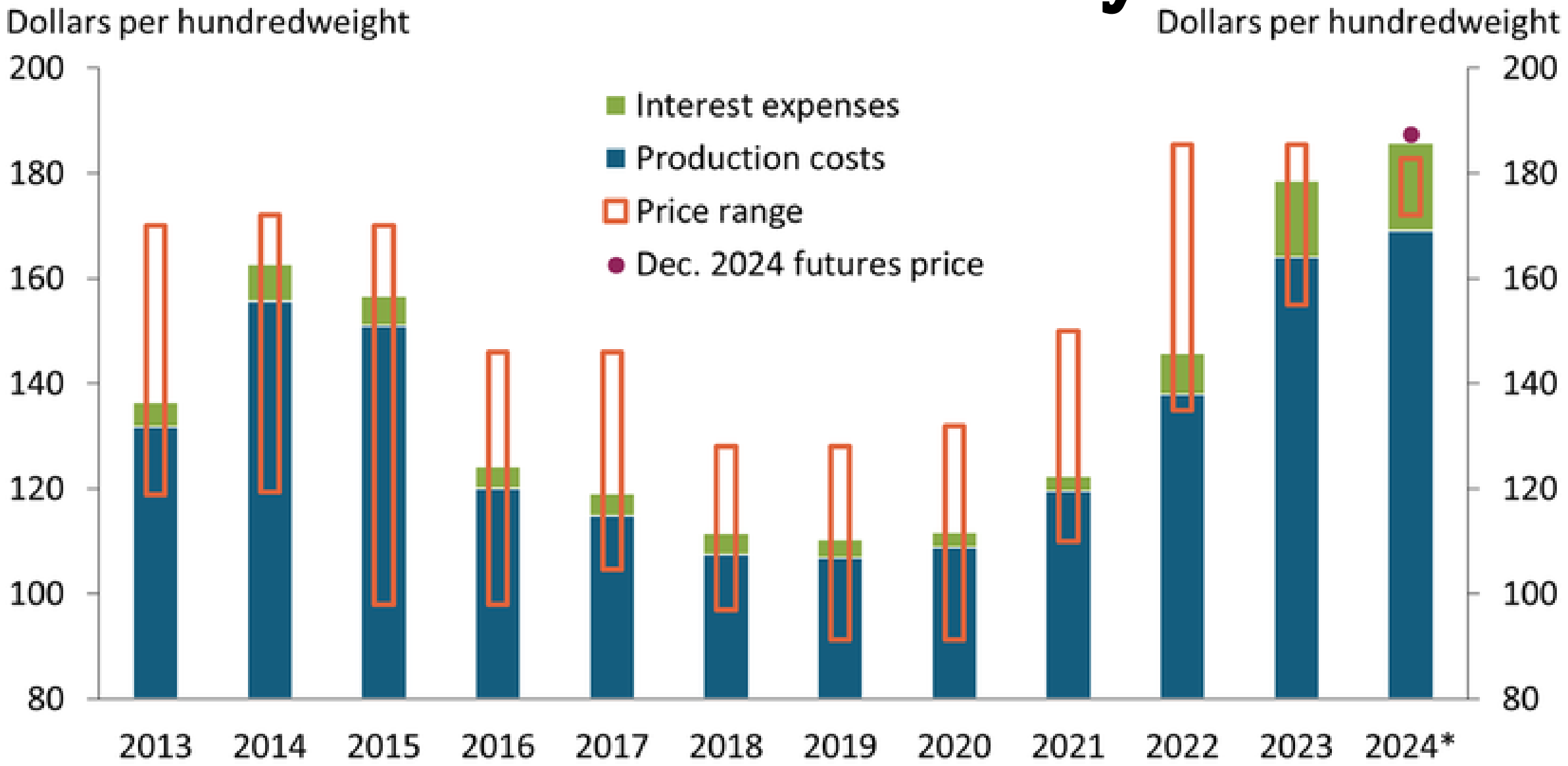
Cattle In Decline

- The size of the U.S. beef cattle herd has been declining since 1975
- America had 6 million cattle producers in 1980. Today there are 700,000 remaining
- America lost nearly 107,000 beef cattle farms and ranches during the past five years
- American herd numbers today are the same as in 1953



2022 Census of Agriculture by the Department of Agriculture

Lack Of Profitability:



Federal Reserve Bank Of Kansas City

Notes: Bar for 2024 represents staff estimates as of February 2024. Production costs are based on estimates from USDA High Plains Cattle Feeding Simulator, and price ranges are live cattle prices reported by the Wall Street Journal.

Sources: U.S. Department of Agriculture (USDA), Wall Street Journal (Haver), Iowa State University, and CME Group.

Grass-fed	
Starting weight	600#
Finishing weight	1200#
Feed	12,000#
Retention of feed	5%
Undigested feed	95%
Time needed	16 months
Number of animals	1 animal
Age of the animal	24 months (30-36)
Revenue of animal	$3,000
Monthly revenue	$188

Fermented-fed	
Starting weight	600#
Finishing weight	1200#
Feed	4,195#
Retention of feed	14.3%
Undigested feed	85.7%
Time needed	9 months
Number of animals	1 animals
Age of the animals	17 months
Revenue of animals	$3,000
Monthly revenue	$333

Grass-fed	
Starting weight	600#
Finishing weight	1200#
Feed	12,000#
Retention of feed	5%
Undigested feed	95%
Time needed	16 months
Number of animals	1 animal
Age of the animal	24 months
Revenue of animal	$3,000
Monthly revenue	$188

Fermented-fed	
Starting weight	600#
Finishing weight	1200#
Feed	12,000#
Retention of feed	14.3%
Undigested feed	85.7%
Time needed	9 months
Number of animals	2.86 animals
Age of the animals	17 months
Revenue of animals (Market price) (Direct sale) $12.00/per lb. $14.00/per lb. $16.00/per lb.	$8,580 $13,728 $16,016 $18,304
Monthly revenue	$953 (market) $1,525-2,034 (direct)