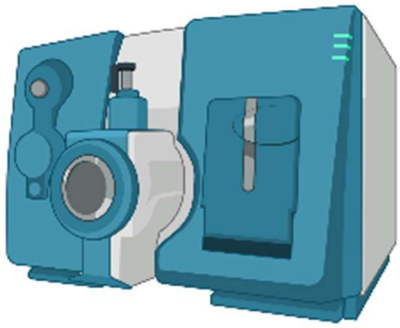
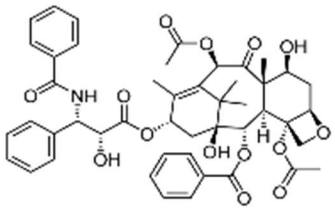
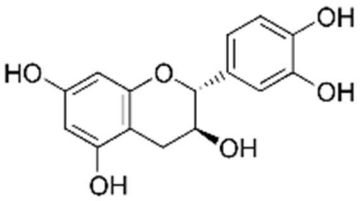
Project Report
Laura Freeman Ribeye
Fall 2024







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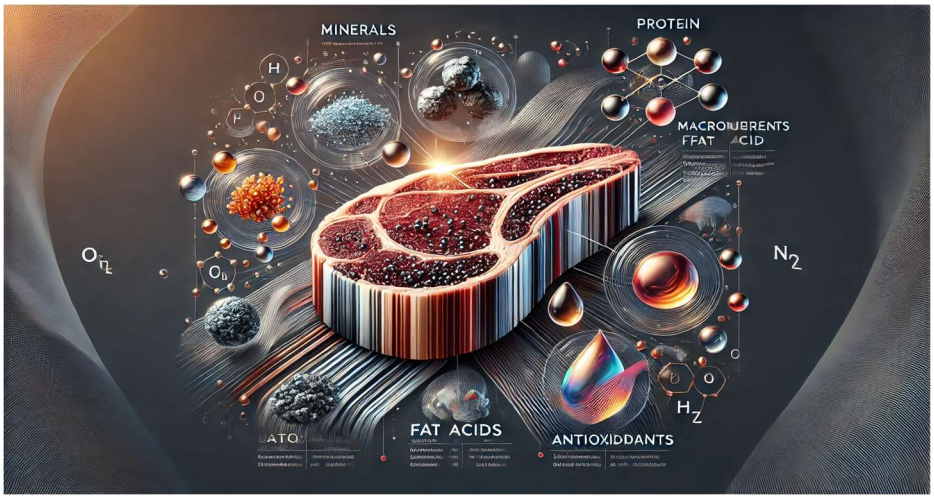
*Interpretation was aided using generative AI.

Introduction



The nutritional composition of beef varies significantly based on factors such as diet, breed, and management practices. This report examines the nutrient profile of Laura Freeman Beef Ribeye compared to both grass-fed and grain-fed benchmarks, with a focus on key health-related compounds. By analyzing fatty acid profiles, mineral content, vitamin concentrations, macronutrient composition, and antioxidant levels, this study provides insights into the potential health benefits.

Key Points:

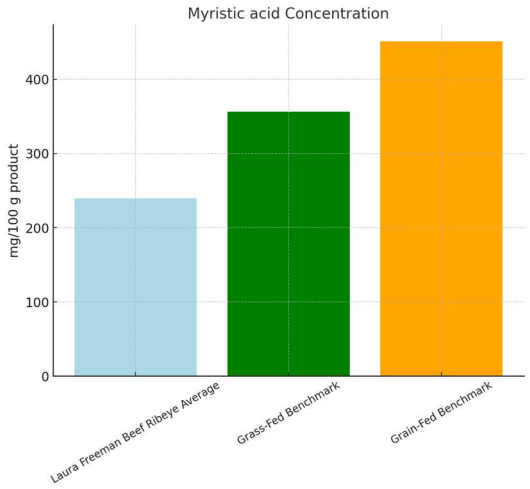
- **Omega-6 to Omega-3 Ratio** – While Laura Freeman Ribeye has a higher omega-6 to omega-3 ratio compared to grass-fed beef, it is still lower than grain-fed beef, which may offer a better balance for reducing inflammation and promoting heart health.
- **Higher Calcium and Iron Content** – Compared to both grass-fed and grain-fed benchmarks, Laura Freeman Ribeye contains higher levels of calcium and iron, which are essential for bone health and oxygen transport in the blood.
- **Lower Total Fat Content** – Laura Freeman Ribeye is leaner than both benchmark beef types, containing lower total fat while still maintaining a high protein concentration, making it a potentially healthier choice for individuals seeking a leaner protein source.
- **Significantly Higher Vitamin B3 (Niacin) Concentration** – Among the B vitamins, Laura Freeman Ribeye has notably higher levels of vitamin B3, which plays a key role in metabolism and maintaining healthy skin and nerves.
- **Higher Antioxidant Content for Certain Compounds** – Laura Freeman Ribeye contains higher concentrations of specific antioxidants such as chlorogenic acid and gallic acid, which are known for their potential anti-inflammatory and cardiovascular benefits.

Fatty Acid Concentrations

Introduction

Fatty acids play a crucial role in human health, impacting cardiovascular function, inflammation, and metabolic processes. This section evaluates the concentrations of key fatty acids, including saturated, monounsaturated, and polyunsaturated fats, in Laura Freeman Beef Ribeye. The balance of omega-3 and omega-6 fatty acids is particularly important, as it influences inflammation and chronic disease risk. By comparing these levels to grass-fed and grain-fed benchmarks, we assess the potential health implications of consuming this beef.

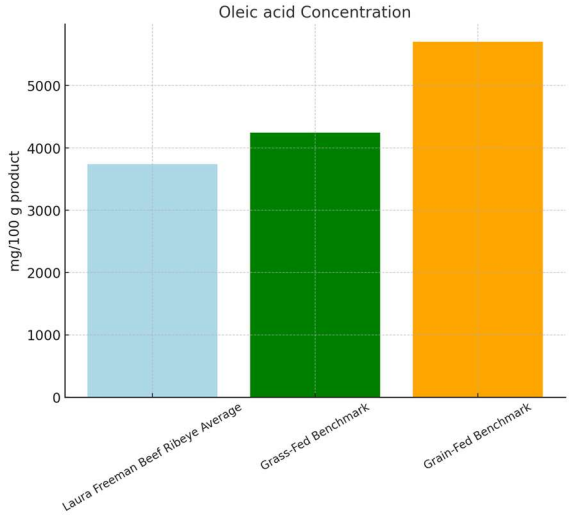
Myristic acid



Laura Freeman Beef Ribeye has the lowest myristic acid concentration, which is lower than both grass-fed and grain-fed benchmarks. Grain-fed beef has the highest concentration.

Health Benefit: Excess myristic acid intake is linked to increased cholesterol levels and cardiovascular risks.

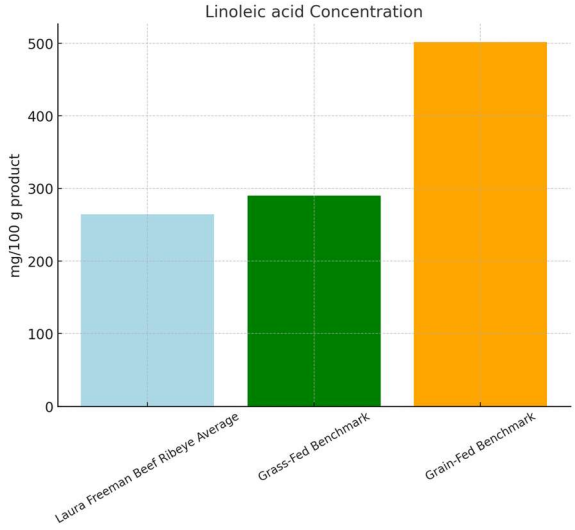
Oleic acid



Analysis: Laura Freeman Beef Ribeye contains less oleic acid compared to both benchmarks, with grain-fed beef having the highest amount.

Health Benefit: Oleic acid is a heart-healthy monounsaturated fat that may help reduce bad cholesterol.

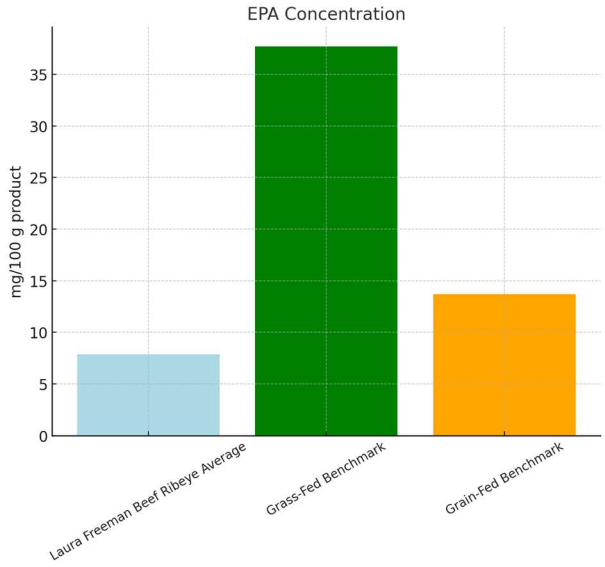
Linoleic acid



Linoleic acid is lowest in Laura Freeman Beef Ribeye, slightly lower than grass-fed but significantly lower than grain-fed beef.

Health Benefit: Linoleic acid is essential for the body, but excessive intake may contribute to inflammation.

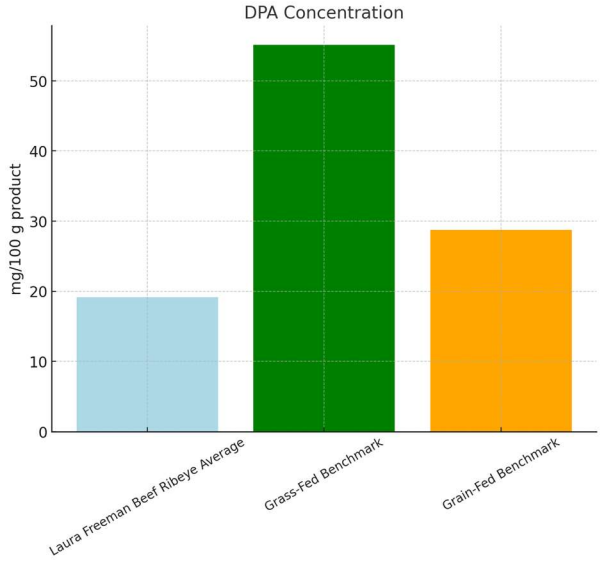
EPA



EPA levels are highest in grass-fed beef, while Laura Freeman Beef Ribeye contains the lowest concentration.

Health Benefit: EPA is an omega-3 fatty acid that supports heart and brain health by reducing inflammation.

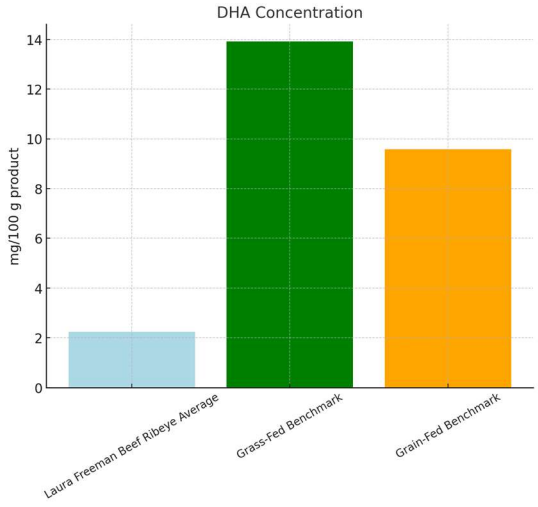
DPA



DPA (Docosapentaenoic Acid) levels are highest in grass-fed. Laura Freeman Beef Ribeye has the lowest concentration.

Health Benefit: DPA is an important omega-3 fatty acid that contributes to heart health and helps reduce inflammation.

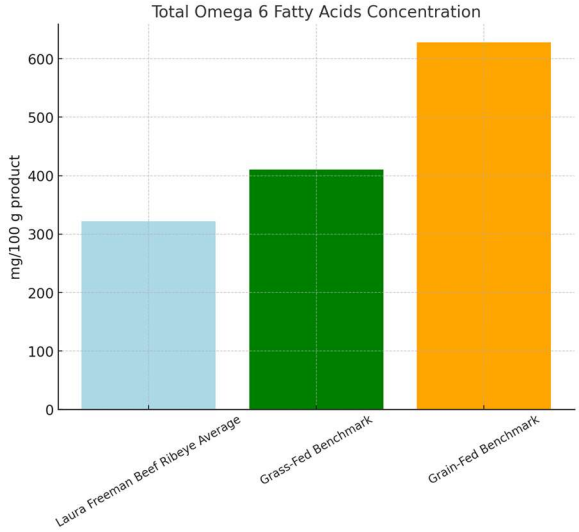
DHA



DHA follows a similar pattern to EPA, with grass-fed beef having the highest concentration and Laura Freeman Beef Ribeye containing the lowest concentration.

Health Benefit: DHA is essential for brain function and eye health, particularly during early development.

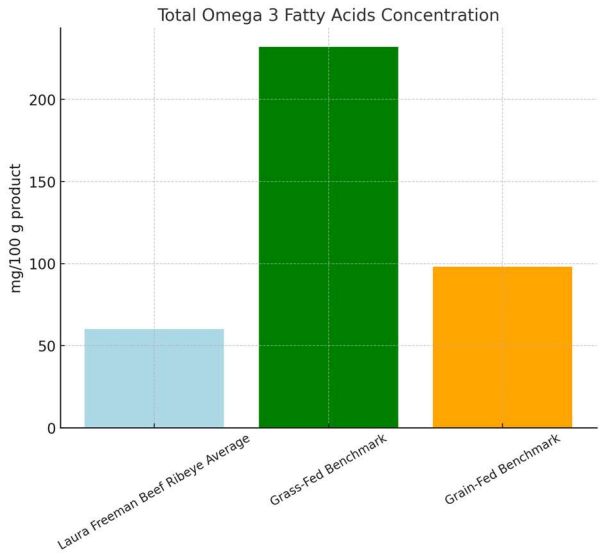
Total Omega 6 Fatty Acids



Omega 6 levels are lowest in Laura Freeman Beef Ribeye compared to both benchmarks, with grain-fed beef having the highest concentration.

Health Benefit: Omega-6 fatty acids are essential but should be balanced with omega-3s to avoid inflammation.

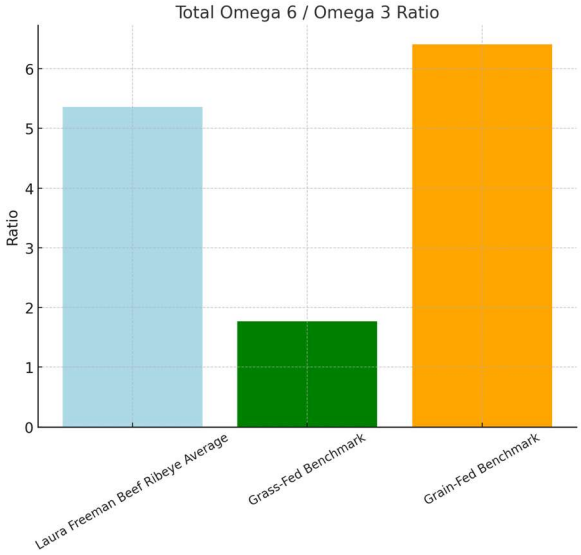
Total Omega 3 Fatty Acids



Grass-fed beef contains the highest concentration of omega-3 fatty acids, while Laura Freeman Beef Ribeye has lower amounts than both benchmarks.

Health Benefit: Omega-3s have strong anti-inflammatory properties and support heart and brain health.

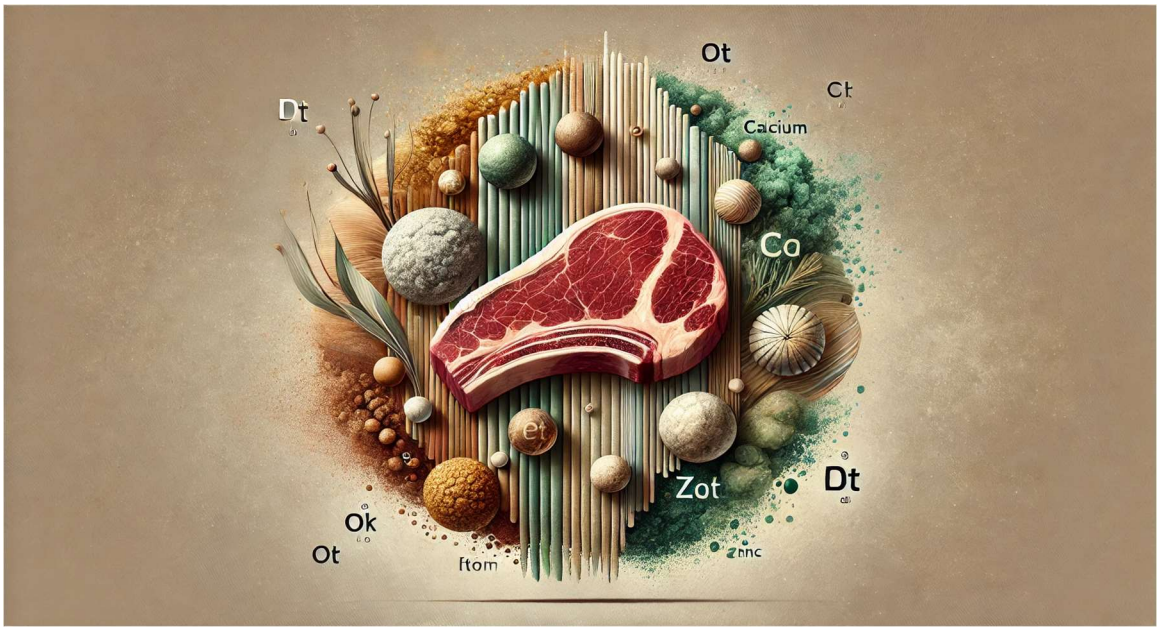
Total Omega 6 / Omega 3 Ratio



A lower Omega 6 to Omega 3 ratio is healthier, reducing inflammation and promoting heart health. Grass-fed beef has the best ratio at 1.77, while Laura Freeman Beef Ribeye is at 5.36, and grain-fed beef has the highest at 6.41.

Health Benefit: Maintaining a lower Omega 6 to Omega 3 ratio is beneficial for cardiovascular health and reducing inflammation risks.

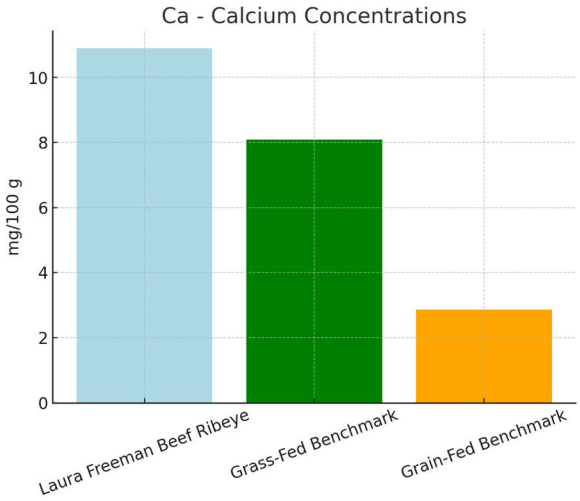
Mineral Concentrations



Introduction

Minerals are essential nutrients required for various physiological functions, including bone health, oxygen transport, and muscle function. This section examines the concentrations of key minerals such as calcium, iron, potassium, magnesium, and zinc in Laura Freeman Beef Ribeye compared to grass-fed and grain-fed benchmarks.

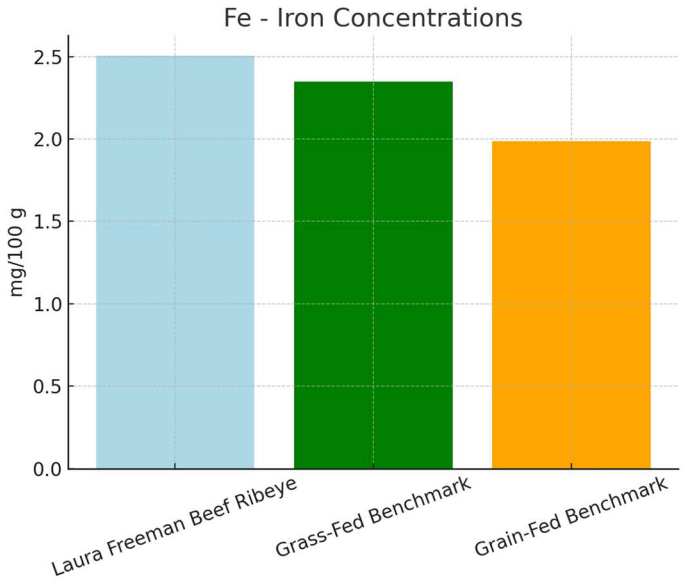
Ca - Calcium



Laura Freeman Beef Ribeye has higher concentrations of Calcium than both benchmarks.

Health Benefit: Calcium is essential for bone health and muscle function.

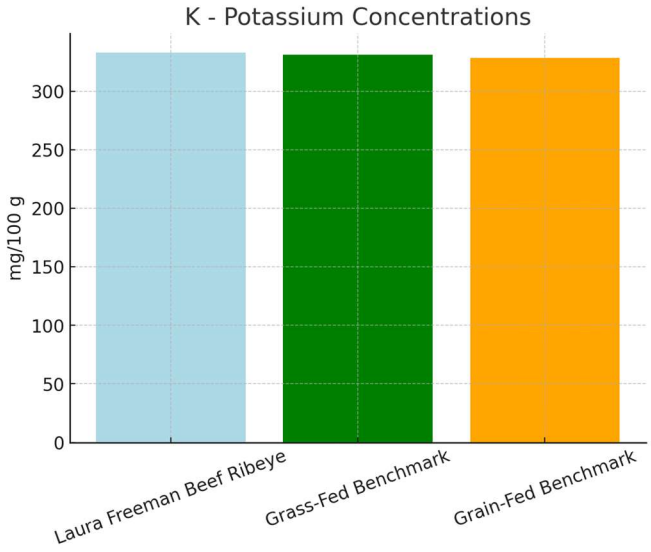
Fe - Iron



Laura Freeman Beef Ribeye has slightly higher concentrations than both benchmarks.

Health Benefit: Iron is crucial for oxygen transport in the blood and preventing anemia.

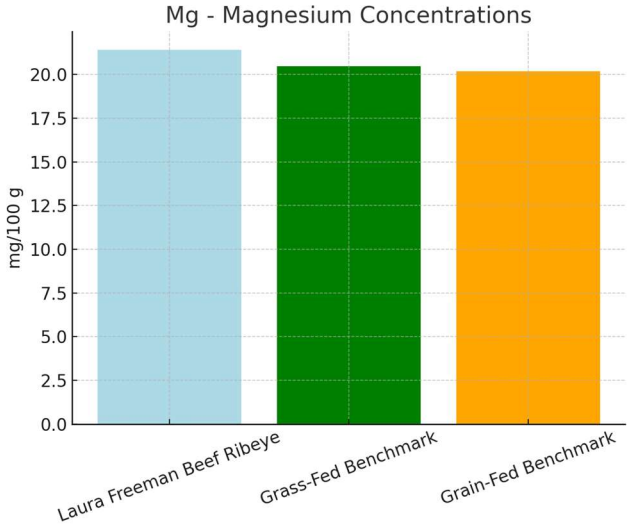
K - Potassium



Laura Freeman Beef Ribeye has intermediate concentrations compared to the two benchmarks.

Health Benefit: Potassium helps regulate fluid balance, nerve signals, and muscle contractions.

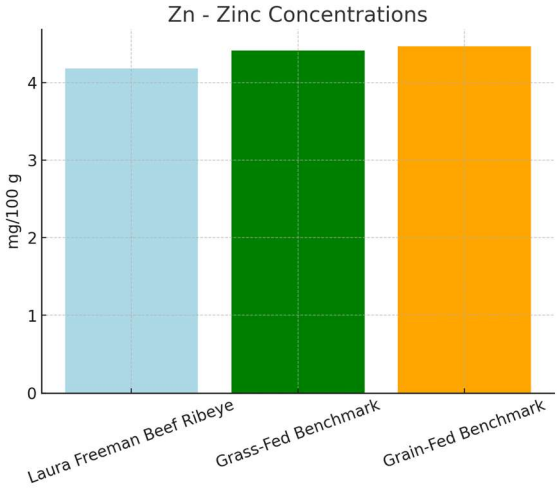
Mg - Magnesium



Laura Freeman Beef Ribeye has concentrations slightly higher than both benchmarks.

Health Benefit: Magnesium supports muscle and nerve function and helps regulate blood pressure.

Zn - Zinc



Laura Freeman Beef Ribeye has lower concentrations than both benchmarks.

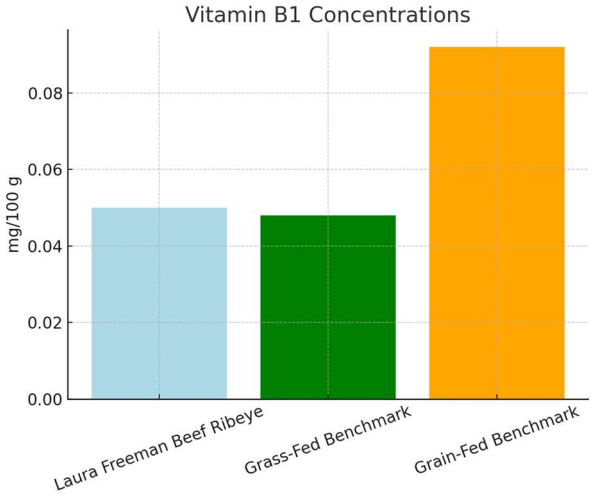
Health Benefit: Zinc is important for immune function, wound healing, and metabolism.

Vitamin Concentrations

Introduction

Vitamins are vital micronutrients that support metabolism, energy production, and overall well-being. This section explores the presence of essential B vitamins and other key compounds in Laura Freeman Beef Ribeye, comparing them to grass-fed and grain-fed benchmarks. Differences in vitamin concentrations can influence the nutritional value of the beef, affecting factors such as energy metabolism, immune function, and neurological health.

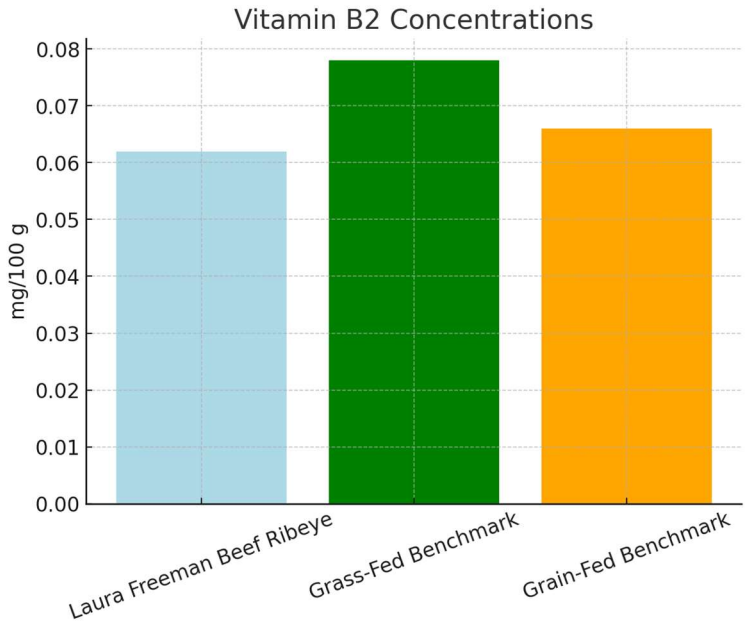
Vitamin B1



Laura Freeman Beef Ribeye has intermediate concentrations compared to the two benchmarks.

Health Benefit: Vitamin B1 helps convert food into energy and supports nerve function.

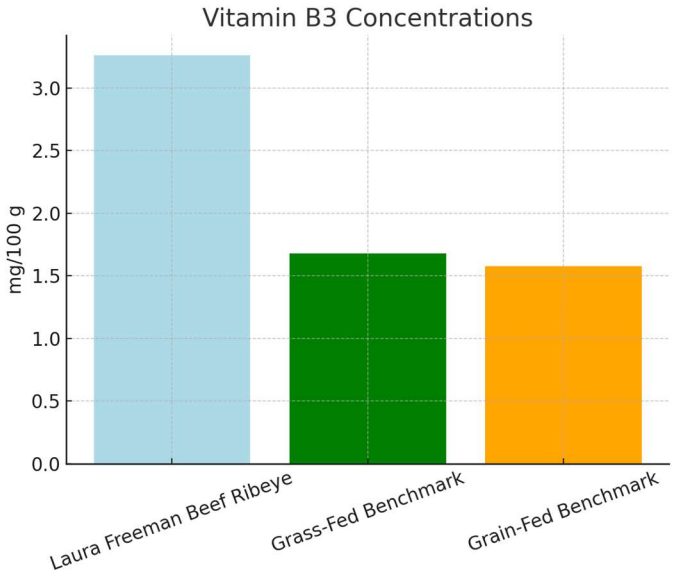
Vitamin B2



Laura Freeman Beef Ribeye has slightly lower concentrations than both benchmarks.

Health Benefit: Vitamin B2 is essential for energy production and cellular function.

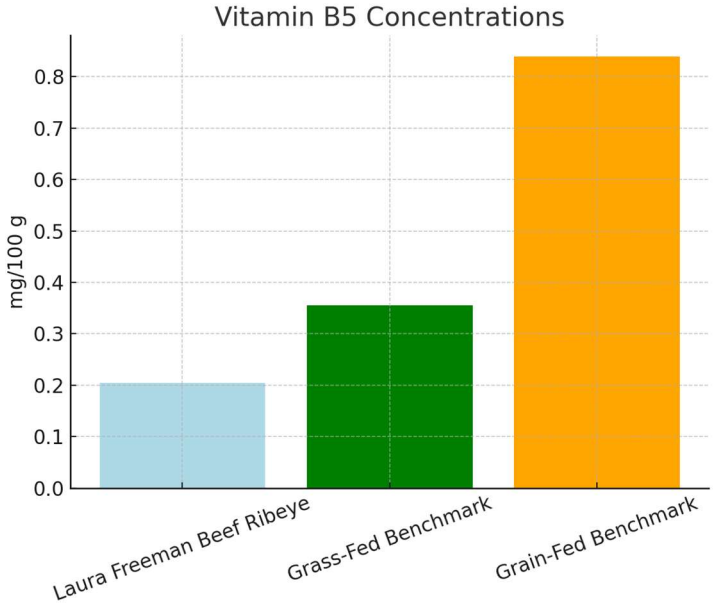
Vitamin B3



Laura Freeman Beef Ribeye has significantly higher concentrations than both benchmark.

Health Benefit: Vitamin B3 supports metabolism and helps maintain healthy skin.

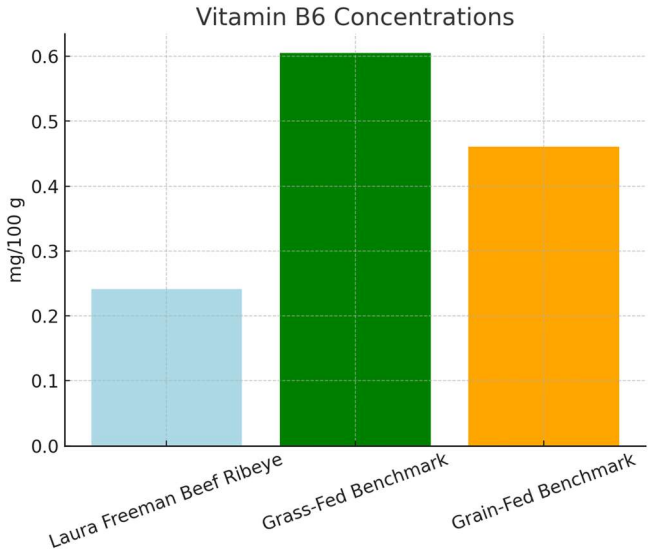
Vitamin B5



Laura Freeman Beef Ribeye has lower concentrations than both benchmarks.

Health Benefit: Vitamin B5 is important for synthesizing coenzyme A and energy production.

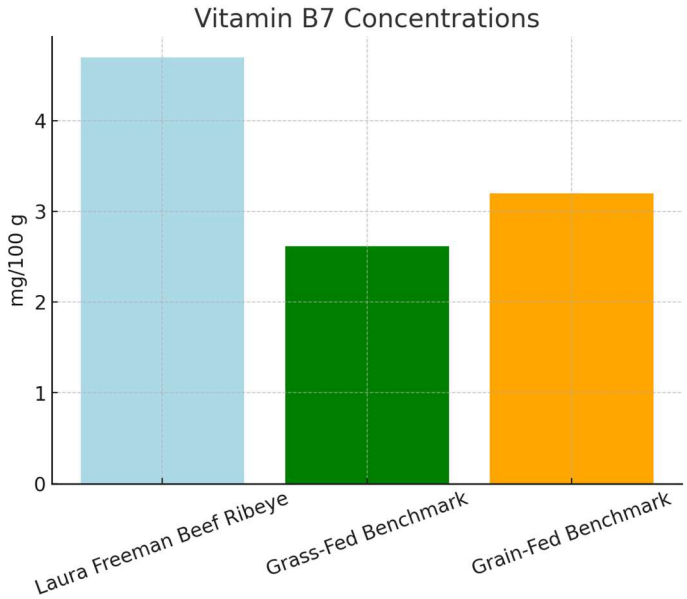
Vitamin B6



Laura Freeman Beef Ribeye has lower concentrations than both benchmarks.

Health Benefit: Vitamin B6 aids in neurotransmitter production and immune function.

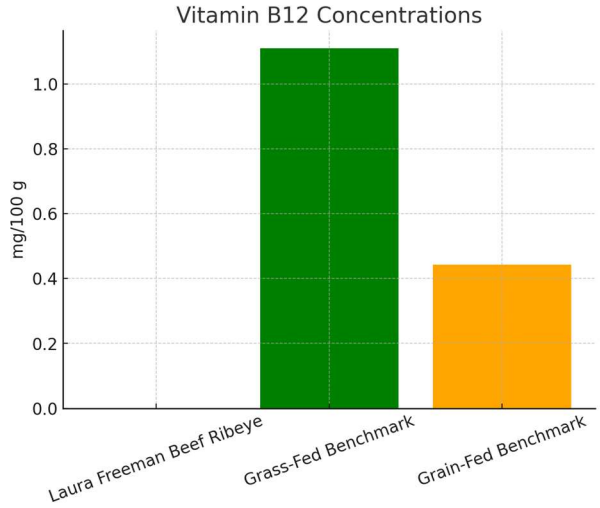
Vitamin B7



Laura Freeman Beef Ribeye has higher concentrations than both benchmarks.

Health Benefit: Vitamin B7 (Biotin) plays a role in metabolism and maintaining healthy hair and nails.

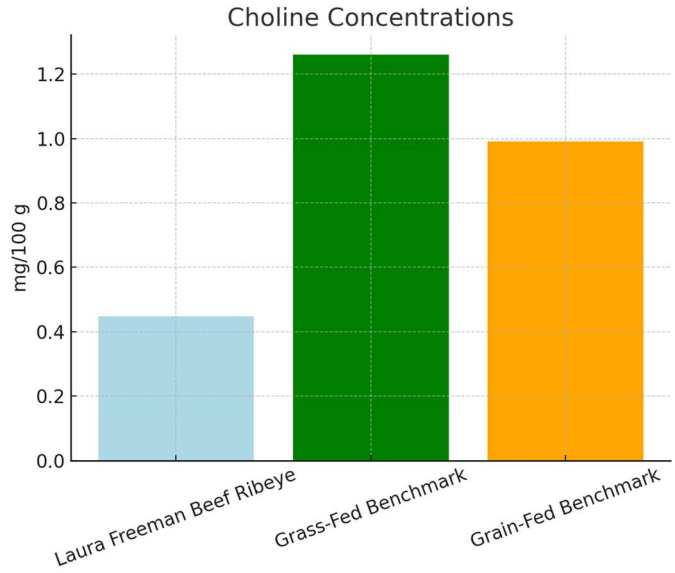
Vitamin B12



Laura Freeman Beef Ribeye had no detectable concentrations.

Health Benefit: Vitamin B12 is crucial for red blood cell formation and neurological function.

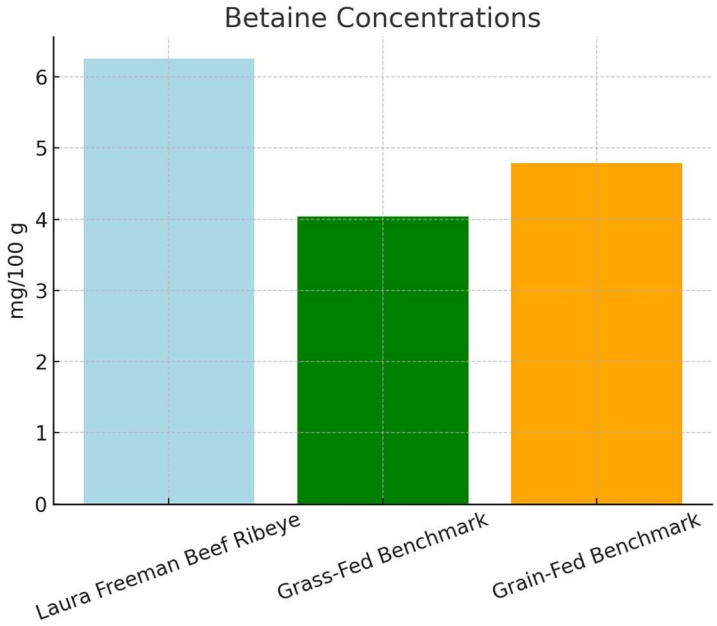
Choline



Laura Freeman Beef Ribeye has lower concentrations than both benchmarks.

Health Benefit: Choline is essential for brain health, liver function, and metabolism.

Betaine



Laura Freeman Beef Ribeye has higher concentrations than both benchmarks.

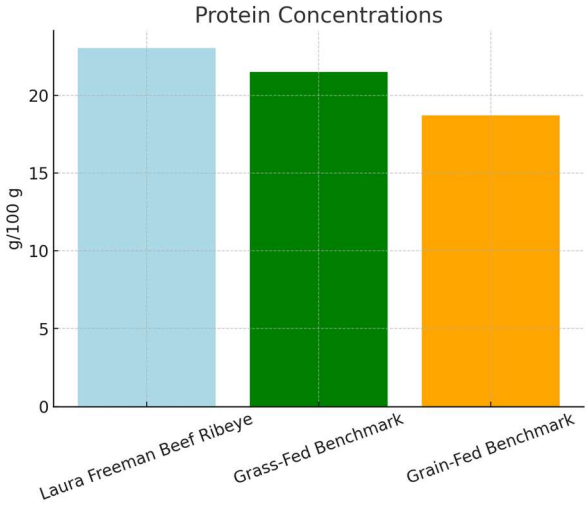
Health Benefit: Betaine supports liver function, cellular hydration, and methylation processes.

Macronutrient Concentrations

Introduction

Macronutrients—proteins, fats, and carbohydrates—serve as the primary sources of energy and structural components in the human body. This section focuses on the protein and fat content of Laura Freeman Beef Ribeye, evaluating how its composition compares to standard benchmarks. Given the importance of protein for muscle growth and fat for energy and nutrient absorption, these macronutrient variations can have significant dietary implications.

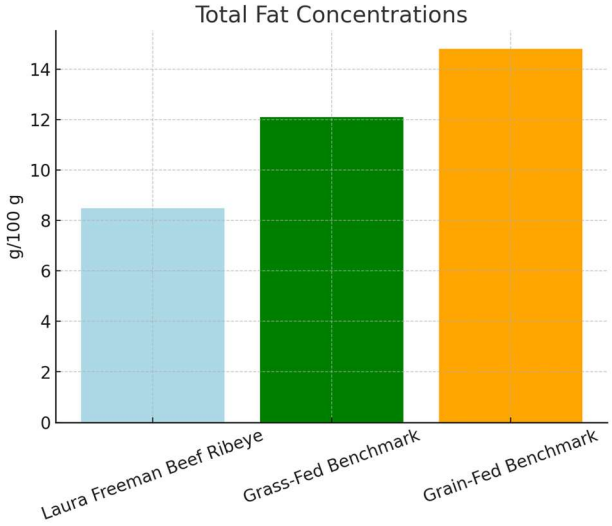
Protein



Laura Freeman Beef Ribeye has higher concentrations than both benchmarks.

Health Benefit: Protein is essential for muscle growth, repair, and overall body function.

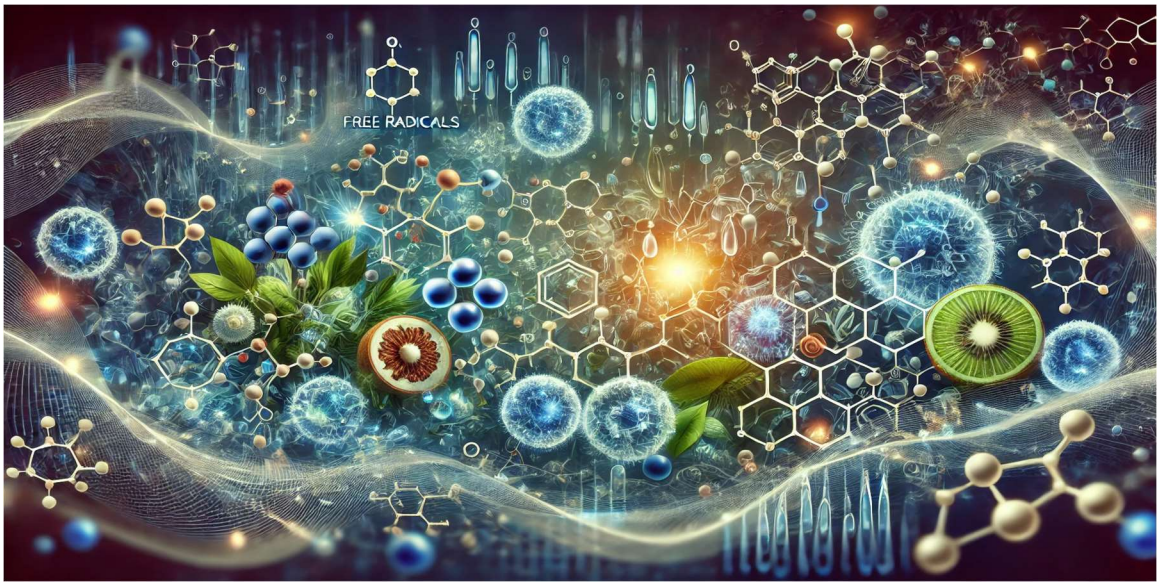
Total Fat



Laura Freeman Beef Ribeye has a lower concentration than both benchmarks, suggesting a leaner cut compared to the alternatives.

Health Benefit: Fats provide energy, support cell growth, and aid in nutrient absorption.

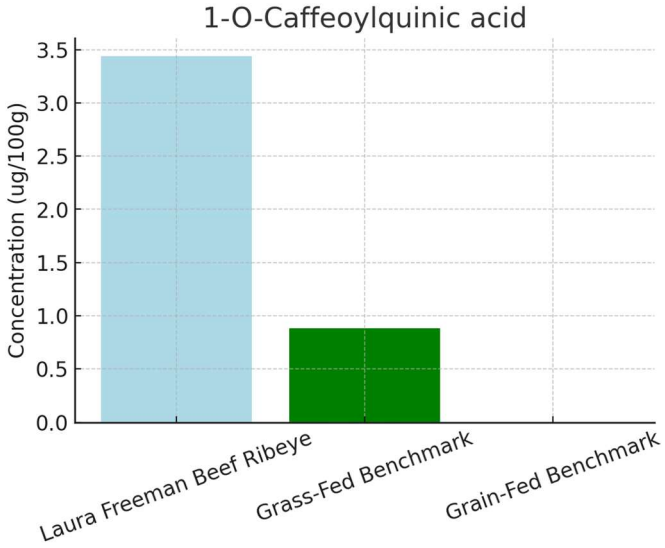
Antioxidant Concentrations



Introduction

Antioxidants help protect the body from oxidative stress and inflammation, which are linked to chronic diseases such as heart disease and cancer. This section examines the concentration of various antioxidant compounds in Laura Freeman Beef Ribeye, including chlorogenic acid, gallic acid, and hippuric acid. By comparing these levels to those found in grass-fed and grain-fed beef, we assess the potential health benefits associated with the consumption of this particular beef variety.

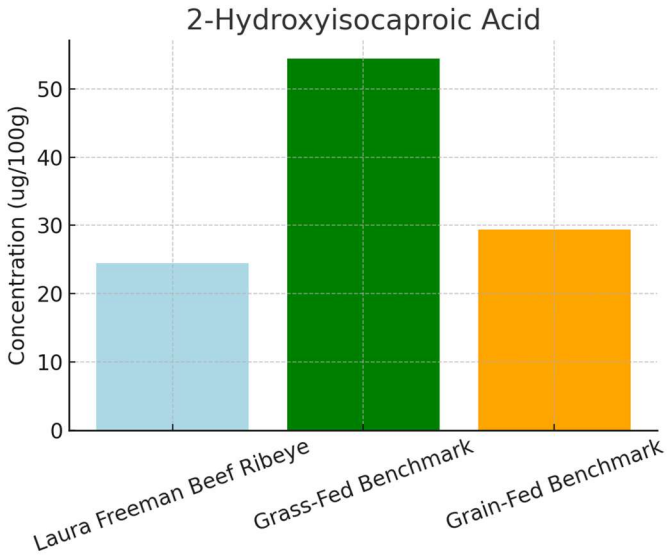
1-O-Caffeoylquinic acid



Laura Freeman Beef Ribeye has a higher concentration than both benchmarks.

Health Benefit: May have antioxidant, neuroprotective, and anti-inflammatory properties.

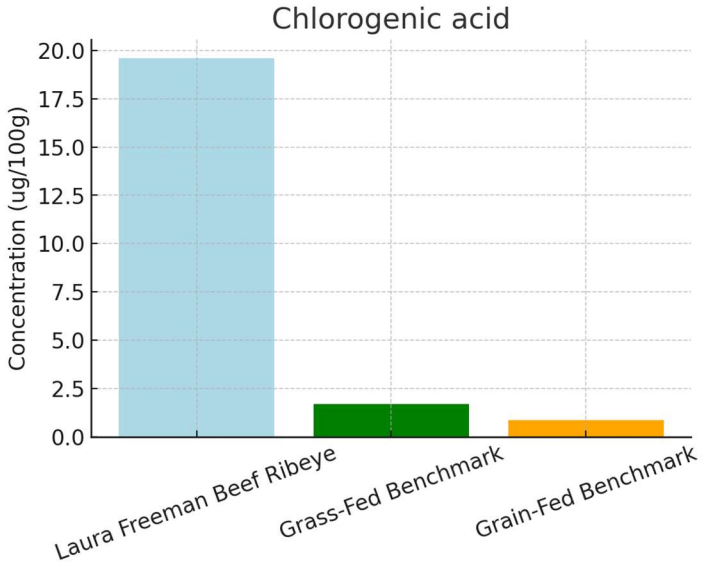
2-Hydroxyisocaproic Acid



Laura Freeman Beef Ribeye has lower concentrations than both benchmarks, particularly the grass-fed benchmark.

Health Benefit: Plays a role in muscle metabolism and recovery.

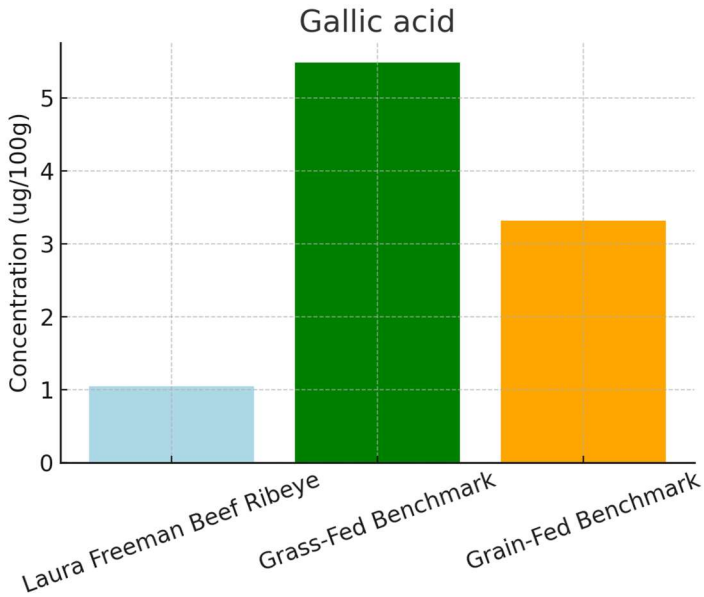
Chlorogenic acid



Laura Freeman Beef Ribeye has a higher concentration than both benchmarks.

Health Benefit: Supports metabolic health and has potential anti-diabetic effects.

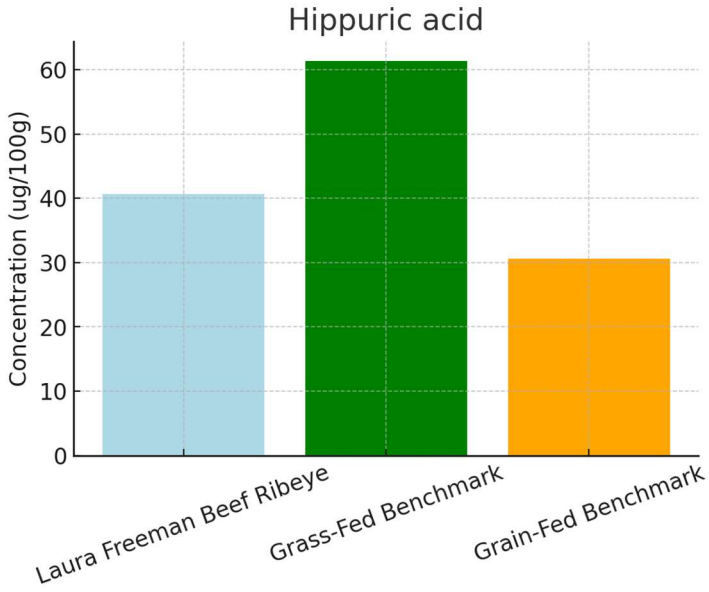
Gallic acid



Laura Freeman Beef Ribeye has a lower concentration than both benchmarks.

Health Benefit: Exhibits strong antioxidant properties and may support cardiovascular health.

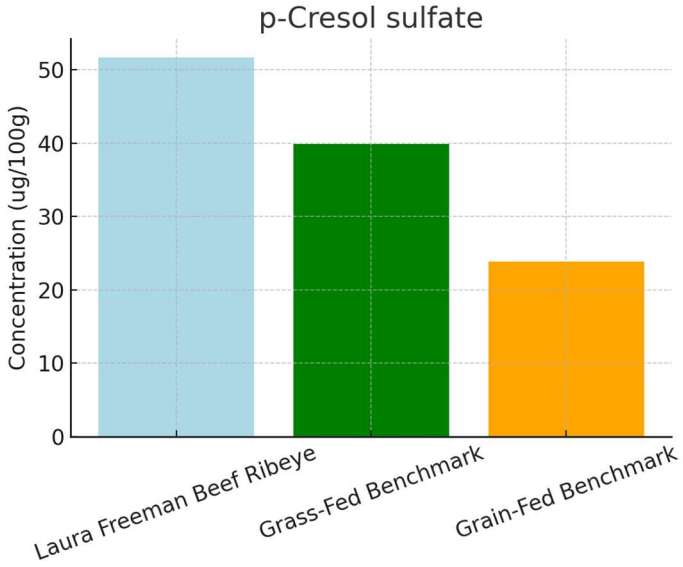
Hippuric acid



Laura Freeman Beef Ribeye has lower concentrations than the grass-fed benchmark, but a higher concentration than the grain-fed benchmark.

Health Benefit: Associated with gut microbiome health and detoxification processes.

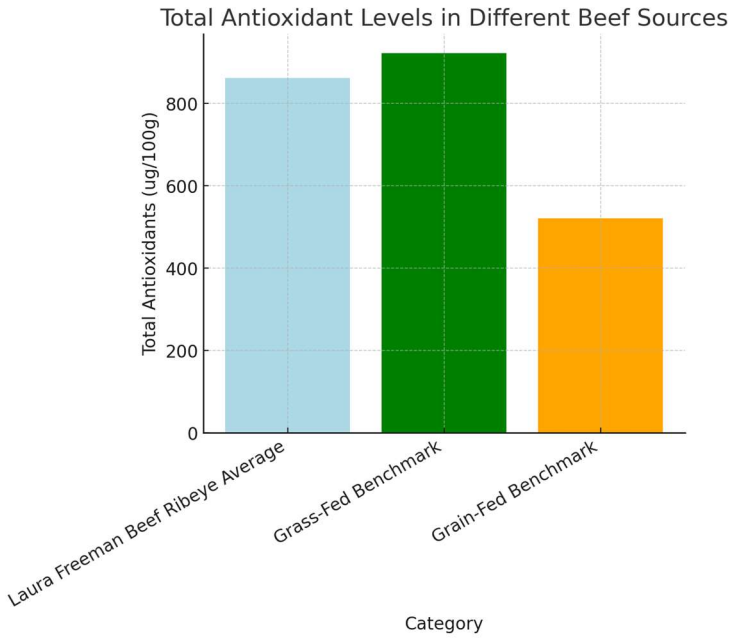
p-Cresol sulfate



Laura Freeman Beef Ribeye has lower concentrations than both benchmarks.

Health Benefit: A biomarker of gut microbial metabolism, linked to kidney function.

Total



Laura Freeman Beef Ribeye has a lower antioxidant concentration than the Grass-Fed benchmark, but a higher concentration than the Grain-Fed benchmark.

Health Benefit: Represents the overall concentration of these beneficial compounds.