

Nutrient Comparison between Enhanced and Non-Enhanced Fresh Whole Turkey



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Abstract Objective: A recent CDC report indicates 90% of Americans consume more sodium than is recommended for a healthy diet and 65% of sodium comes from foods purchased in retail stores. Based on industry estimates, 98% of whole turkeys in the retail market are typically enhanced with solutions of water, salts, and flavorings to improve taste and tenderness. The objectives for this study included evaluating the mineral content of enhanced and non-enhanced raw, whole turkeys available in the retail market and updating nutrient profiles of non-enhanced and enhanced whole raw turkey data in the National Nutrient Database for Standard Reference (SR). **Materials and Methodology:** Non-enhanced (n = 4) raw turkeys were purchased from local food outlets and producers, and enhanced (n = 11) turkeys were purchased using a nationwide sampling plan developed for USDA's National Food and Nutrient Analysis Program. Refuse, (bone and connective tissue) was discarded. Light meat, dark meat and skin from each turkey were composited separately and homogenized prior to analysis for nutrient content. Proximate composition and minerals were determined by commercial laboratories using validated methodology (Inductively Coupled Plasma AOAC 985.01 and 984.27). Quality assurance was monitored using commercial reference materials, in-house control materials, and random duplicate samples. Nutrient values for non-enhanced and enhanced cuts were compared using the Mann Whitney U test (Critical value $p < 0.05$). **Results:** Sodium values were significantly higher with enhancement ($p = 0.0252$). In enhanced turkey, calcium, iron, phosphorus and magnesium contents were significantly greater than in non-enhanced product ($p < 0.05$). **Significance:** Sodium content was 30 to 37% higher in enhanced turkey compared to non-enhanced. These newly released data can be used by dietitians and other health professionals for dietary counseling of individuals with sodium-related health issues, and by researchers and government agencies for nutrition monitoring, consumption surveys, and policy development.

Introduction

Based on a recent CDC report 90% of Americans consume more sodium than is recommended for a healthy diet and 65% of the sodium comes from foods purchased in retail stores and 25% from restaurants¹. In the current retail market according to industry estimates, 98% of whole turkeys are typically enhanced with solutions of water, salts and other flavorings to improve taste and tenderness. A collaborative effort is being conducted by scientists at USDA and Texas Tech University to monitor sodium and other mineral content of enhanced and non-enhanced raw, whole turkeys in the retail market place.

Objectives

To determine the content of sodium and other minerals for enhanced and non-enhanced raw, whole turkeys available in the retail market. To update the values for sodium content and other nutrients for enhanced and non-enhanced raw, whole turkeys in the National Nutrient Database for Standard Reference (SR).

Methodology

Sampling: Using a nationwide sampling developed for USDA's National Food and Nutrient Analysis Program (NFNAP)² four samples of Non-enhanced raw turkeys were purchased from local food outlets and producers eleven samples of enhanced turkeys were purchased from retail stores.

Preparation: Prior to analysis, refuse (bone and connective tissue) from each turkey was discarded. Light meat, dark meat and skin from each turkey were composited separately and homogenized.

Analyses: Proximate composition (ash, moisture, nitrogen and fat) were determined by commercial laboratories using standard AOAC methodology³; minerals were analyzed by ICP methodology³.

Quality Control: Quality assurance was monitored through the use of standard reference materials (SRM), in-house control materials, and random duplicate samples.

Statistics: Data were evaluated using The Mann Whitney U test⁴. Critical value was set at $p < 0.05$.

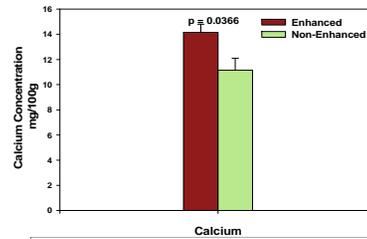


Fig 1. Comparison of Calcium for enhanced and non-enhanced whole turkey with skin. Statistical significance was determined by the Mann Whitney U test ($p < 0.05$).

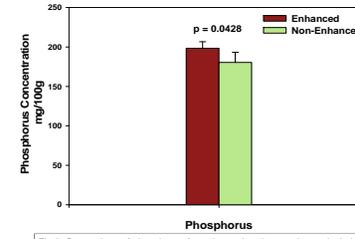


Fig 2. Comparison of phosphorus for enhanced and non-enhanced whole turkey with skin. Statistical significance was determined by the Mann Whitney U test ($p < 0.05$).

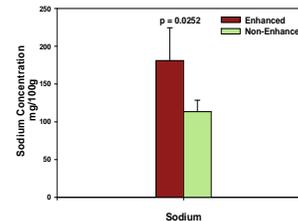


Fig 3. Comparison of Sodium for enhanced and non-enhanced whole turkey with skin. Statistical significance was determined by the Mann Whitney U test ($p < 0.05$).

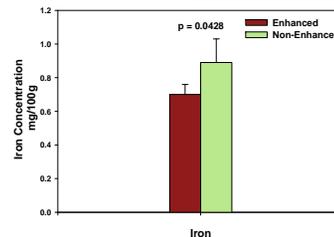


Fig 4. Comparison of Iron for enhanced and non-enhanced whole turkey with skin. Statistical significance was determined by the Mann Whitney U test ($p < 0.05$).

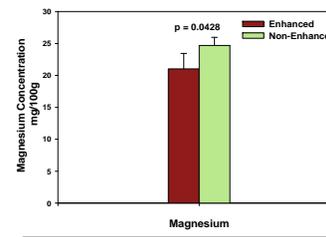


Fig 5. Comparison of magnesium for enhanced and non-enhanced whole turkey with skin. Statistical significance was determined by the Mann Whitney U test ($p < 0.05$).

Nutrients	Enhanced		Non-Enhanced		² p-value
	N	mg/100g	N	mg/100g	
Moisture	6	73.15±1.38	4	73.25±1.40	0.7491
Protein	6	19.28±1.05	4	20.45±1.88	0.4555
Fat	6	7.27±1.87	4	6.15±0.30	0.4555
Calcium	6	14.15±0.65	4	11.14±0.95	0.0366
Iron	6	0.70±0.06	4	0.89±0.14	0.0428
Sodium	6	181.00±43.64	4	113.35±15.27	0.0252
Phosphorus	6	198.22±8.40	4	180.38±12.91	0.0428
Potassium	6	213.17±14.75	4	228.66±11.25	0.1658
Magnesium	6	21.01±2.43	4	24.68±1.27	0.0428
Zinc	6	1.89±0.22	4	1.92±0.07	0.7491

¹ Value represent LS means ± S.E.M. ² p-values highlighted in red are significant.

Results

- In enhanced turkey, calcium, phosphorus and sodium content was significantly greater than in non-enhanced turkey ($p < 0.05$) (Fig 1, 2, and 3).
- Levels of sodium were significantly higher ($p = 0.0252$) in the enhanced turkey (181 mg) when compared to the non-enhanced (113 mg) (Fig 3).
- Moisture and protein, levels were very slightly elevated in non-enhanced turkey and fat levels were higher in enhanced but not statistically significant, whereas by comparison potassium and zinc levels were only mildly increased in non-enhanced turkey (Table 1).

Conclusion

- These results agree with industry estimates indicating that 98% of whole turkeys in the retail market are typically enhanced with solutions of water, salts, flavorings and other "added ingredients".
- Nutrient levels of sodium, calcium and phosphorus are significantly elevated in enhanced products due to the enhancement process.
- Sodium concentration between enhanced vs non-enhanced turkey was 30 to 37% elevated indicating a direct relationship to its presence as an "added ingredient" in enhanced whole turkeys.
- These results indicate consumption of enhanced products can impact an individual's daily total sodium intake. These data available in SR will be useful to dietitians, health researchers, and government agencies involved in the National Sodium Reduction Initiative (NSRI).

References

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