

## Abstract

One-third of people with epilepsy do not respond to current medical treatments. Many of these respond positively when treated with Precision Ketogenic Therapy (PKT) that lowers the carbohydrate intake of the diet. Patients are provided PKT recipes personalized for nutritional needs and food preferences. The recipes use brand-specific food products. Patients often wonder if it is necessary to go to a different grocery store to get a specific brand of the product. To address this question, we took a PKT recipe prepared by the PKT program for a specific diet prescription and prepared a nutrient composition database of each of the foods in the recipe. If all brands of a food have the same macronutrient composition, families would not have to spend the time and energy needed to always find the specified brand. Our database identifies brands of food that have the same macronutrient composition and thus can be listed as options in the recipes. However, many brands of the same food in the database have different macronutrient compositions. These data will be used to demonstrate the effect on administered therapy when using different brands to prepare the PKT recipe.

## Introduction

The purpose of this research was to:

- demonstrate how the use of different brands of the same ingredient may change the PKT ratio in recipes
- demonstrate which brands are interchangeable, allowing patient families to have options when grocery shopping

## Methods

To collect the data, various grocery stores in the Gainesville area were visited and nutrition fact label data from various brands of foods were recorded. We created a database of macronutrient and caloric content of food in a PKT-specific recipe with a prescribed ratio. The content of calories, fats, proteins, and carbohydrates were calculated per 100 grams of each product. We calculated coefficient of variation for each ingredient. Brands of identical nutritional content were grouped. Recipes were created with different brands and the PKT ratios were calculated (grams of fat over grams of protein plus grams of carbohydrates) and compared to the prescribed PKT ratio from the clinic.

## Data

Amount in 100 grams of Chicken Breasts				
Product Name	Calories	Grams of Total Protein	Grams of Total Fat	Grams of Total Carbohydrate
• Trader Joe's Butcher Shop Chicken Breast Boneless Skinless with Rib Meat				
• Trader Joe's Organic Free-Range Chicken Thin Sliced Boneless Skinless Breasts				
• Trader Joe's Boneless Skinless Breasts with Rib Meat				
• Trader Joe's Fresh Organic Boneless and Skinless Breasts with Rib Meat	116.07	21.43	2.68	1.56
• GreenWise Chicken Boneless Skinless Breast Fillets				
• Publix All-Natural Boneless Skinless Breast Fillets				
• Publix Boneless Skinless Breast Tenderloins				
• Just Bare Boneless Skinless Chicken Breast Fillets	98.21	21.43	0.89	1.12
• Perdue Harvestland Organic Chicken Thin Sliced Breasts with Rib Meat				
• Simply Nature Free Range Chicken Breasts with Rib Meat				
• Simply Nature Organic Thin Sliced Chicken Breasts with Rib Meat				
• 365 Whole Foods Market Chicken - Boneless Skinless Breasts with Rib Meat				
• Trader Joe's Organic Free Range Chicken Breast Strips				
• GreenWise All-Natural Chicken Boneless Skinless Breast with Rib Meat				
• Publix All-Natural Chicken Boneless Skinless Breasts with Rib Meat	116.07	22.32	2.68	0.67
• Perdue Thin Sliced Chicken Breast				
• Simply Nature Organic Free Range Chicken Breast Strips	107.14	22.32	1.79	0.45
• 365 Whole Foods Market Organic Chicken-Boneless Skinless Breast Tenderloins				
• Perdue Fresh and All-Natural Chicken Breasts				
• Perdue Harvestland Free Range Chicken Breasts				
• Perdue Harvestland Organic Chicken Breast Tenderloins	98.21	22.32	0.89	0.22
• Whole Foods Thin Sliced Boneless Skinless Organic Chicken Breasts				
• Whole Foods Organic Chicken Breast Tenders	107.14	24.11	1.94	0.00

Amount in 100 grams of Peaches				
Product Name	Calories	Grams of Total Protein	Grams of Total Fat	Grams of Total Carbohydrate
• Publix Peach Slices in Heavy Syrup				
• Great Value Sliced Peaches in Heavy Syrup				
• Sweet Harvest Peach Slices in Heavy Syrup				
• Great Value Peach Halves in Heavy Syrup				
• Del Monte Peach Chunks in Heavy Syrup	78.13	0.00	0.00	19.53
• Del Monte Peach Halves in Heavy Syrup				
• Del Monte Lite Sliced Peaches in Extra Light Syrup				
• Market Pantry Sliced Peaches in 100% Fruit Juice	56.45	0.81	0.00	13.71
• Sweet Harvest Peach Slices in Extra Light Syrup				
• Sweet Harvest Peach Slices in White Grape Juice	48.39	0.81	0.00	12.90
• Publix Peach Slices in 100% Fruit Juice				
• GreenWise Organic Peach Slices in Organic Fruit Juice				
• Great Value Sliced Peaches in 100% Fruit Juice	48.39	0.81	0.00	11.29
• Great Value Diced Peaches No Added Sugar				
• Publix Diced Peaches No Sugar Added	27.78	0.00	0.00	6.94
• Del Monte No Sugar Added Diced Peaches				
• Market Pantry Diced Peaches No Added Sugar	23.58	0.00	0.00	5.90

Amount in 100 grams of Green Beans				
Product Name	Calories	Grams of Total Protein	Grams of Total Fat	Grams of Total Carbohydrate
• Publix Green Beans, Cut, Steam-in-Bag				
• Great Value Cut Green Beans (Frozen)	35.29	1.18	0.00	7.65
• Marketside Green Beans (Fresh)				
• Trader Joe's Trimmed & Cleaned Green Beans	29.41	2.35	0.00	7.06
• Publix Original Cut Green Beans, Canned				
• Great Value Cut Green Beans (Canned)	12.50	0.83	0.00	2.50
• Libby's Cut Green Beans (Canned)				

Amount in 100 grams of Heavy Whipping Cream				
Product Name	Calories	Grams of Total Protein	Grams of Total Fat	Grams of Total Carbohydrate
• Publix Heavy Whipping Cream				
• Organic Good and Gather Heavy Whipping Cream				
• Land O Lakes Heavy Whipping Cream				
• 365 by Whole Foods Organic Heavy Cream	333.33	0.00	33.33	8.33
• Organic Valley Heavy Whipping Cream				
• Trader Joe's Organic Heavy Whipping Cream	333.33	0.00	40.00	0.00

Amount in 100 grams of Avocado Oil				
Product Name	Calories	Grams of Total Protein	Grams of Total Fat	Grams of Total Carbohydrate
• 365 by Whole Foods Avocado Oil				
• La Tourangelle Delicate Avocado Oil	866.67	0.00	93.33	6.67
• Ahuacatlán Avocado Oil				
• Primal Kitchen Pure Avocado Oil				
• Publix Avocado Oil				
• Chosen Foods 100% Pure Avocado Oil				
• Trader Joe's Avocado Oil				
• Spectrum Culinary Avocado Oil	800.00	0.00	93.33	0.00

Correlation of Variation (CV) Rankings for the Nutrition Components Normalized to Fats (1-Lowest CV, 4-Highest CV)				
Food	Calories	Protein	Fat	Carbohydrate
Chicken Breast	2	1	3	4
Cream	1	4	2	3
Avocado Oil	2	0	0	4
Green Beans	2	4	0	3
Peaches	2	4	0	3
<b>Total Rankings</b>	<b>9</b>	<b>13</b>	<b>5</b>	<b>17</b>
Rank Total normalized to Fat	1.8	2.6	1	3.4

Effect of Brand Substitutions on PKT Ratio	
<p><b>Recipe From Clinic</b></p> <ul style="list-style-type: none"> <li>• 24.2 g - Chicken Breast</li> <li>• 22.1 g - Avocado Oil</li> <li>• 67.7 g - Green Beans</li> <li>• 51.5 g - Whipping Cream</li> <li>• 60.6 g - Peaches</li> </ul> <p><b>PKT Ratio = 2.5:1</b></p>	<p><b>Recipe #1</b></p> <ul style="list-style-type: none"> <li>• 24.2 g - Trader Joe's Boneless Skinless Breasts with Rib Meat</li> <li>• 22.1 g - 365 by Whole Foods Avocado Oil</li> <li>• 67.7 g - Great Value Cut Green Beans (Frozen)</li> <li>• 51.5 g - Publix Heavy Whipping Cream</li> <li>• 60.6 g - Del Monte Peach Halves in Heavy Syrup</li> </ul> <p><b>PKT Ratio = 1.3:1</b></p>
<p><b>Recipe #2</b></p> <ul style="list-style-type: none"> <li>• 24.2 g - Publix All Natural Chicken Boneless Skinless Breasts with Rib Meat</li> <li>• 22.1 g - Publix Avocado Oil</li> <li>• 67.7 g - Trader Joe's Trimmed &amp; Cleaned Green Beans</li> <li>• 51.5 g - Organic Valley Heavy Whipping Cream</li> <li>• 60.6 g - Great Value Sliced Peaches in 100% Fruit Juice</li> </ul> <p><b>PKT Ratio = 2.2:1</b></p>	<p><b>Recipe #3</b></p> <ul style="list-style-type: none"> <li>• 24.2 g - Whole Foods Organic Chicken Breast Tenders</li> <li>• 22.1 g - Publix Avocado Oil</li> <li>• 67.7 g - Great Value Cut Green Beans (Canned)</li> <li>• 51.5 g - Organic Valley Heavy Whipping Cream</li> <li>• 60.6 g - Del Monte No Sugar Added Diced Peaches</li> </ul> <p><b>PKT Ratio = 3.6:1</b></p>

## Discussion/Conclusions

- Preparing a recipe with a nonbrand-specific approach results in PKT ratios ranging from 1.3:1 to 3.6:1 which alters the therapy.
- The variation in macronutrient/calorie content resulting in different PKT ratios for the recipes demonstrates a requirement to use brand-specific foods when selecting PKT-compliant ingredients.
- There is a need to create a larger database of branded foods and their nutritional content for patients on PKT with an epilepsy diagnosis.
- PKT ratios should be expanded to include the individual components of macronutrients for each brand of food.