



# PAWPAW PICKIN'S



State Chapter:  
Ohio Pawpaw Growers  
Association

Fall 2020  
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## President's Patch by ~ Ron

I want to thank you for your patience this past year. Many of you sent in your NAPGA dues and never once did I receive a complaint about not receiving your E-News and/or your *Pawpaw Pickin's* newsletters.

Terry is much improved and we are thankful for the doctors and the hospital that are ministering to her. We are not sure if she will be able to get the Covid19 vaccine. She has not yet received permission to get the annual flu vaccine! We want to thank everyone who sent "get well" cards and prayed for Terry for the last several years. Again THANK YOU.

One additional E-News will be published this year and it will feature Sarah Francino, doctoral candidate at The Ohio State University researching the NA pawpaw.

I would enjoy hearing from you about your growing interests, outstanding cultivars, lessons learned, pawpaw mistakes, pruning tips, grafting tips, and recent successes with the NA pawpaw. Send in your poetry, stories, questions, and suggestions as a subject for an article.

We are currently in the early planning stages for the Annual Meeting at Wilmington College. We are thinking about a virtual meeting in mid to late April this year. Stay tuned for additional information and if you have any suggestions regarding the agenda of the annual meeting, let us know. Registration will be required and instructions will be in the E-News in Janu-

*NAPGA & OPGA past newsletters are archived at  
The Ohio State University, Piketon, Ohio*

<http://southcenters.osu.edu/horticulture/publications/newsletters/Ohio-pawpaw-growers-association-newsletters>

ary. We will probably not do any grafting demonstrations this year but Ohio State University may do so later in the spring. The focus of the annual meeting will be to discuss the research projects that the universities (Kentucky State University, The Ohio State University, Ohio University, and others) have recently completed, currently conducting or planning. Stay tuned as we continue to develop and finalize the agenda for the annual meeting.

If you desire to receive any scion wood from my collection (excluding the trademarked and patented cultivars), please let me know. I do not publish a list! I do not have any sufficient scion wood of Jerry Lehman's or Woody Walker's cultivars. I may not have much scion wood to share this year as the environmental conditions were not ideal for growth last summer at the farm in Adams County. So be sure to get your requests in early.

**A decision was made to postpone the next International pawpaw Conference to 2022. This will give time for the Covid19 virus to hopefully wind down and everyone can get the vaccine.**

### Mission Statement

#### NAPGA

is an organization of pawpaw enthusiasts, backyard and commercial pawpaw growers, small and large, dedicated to promoting the superior traits of the pawpaw plant and fruit, developing a pawpaw industry and marketing plan, preserving and studying the wild pawpaw genetics.

### Inside this issue

President's Patch	1
Pawpaw Nutrition Information	2
"	3
"	4
"	5
"	6
"	7
Recipe	8a
NAPGA / OPGA Info	8b

**Please check with Ron (Botrytis@fuse.net) regarding your membership status.**

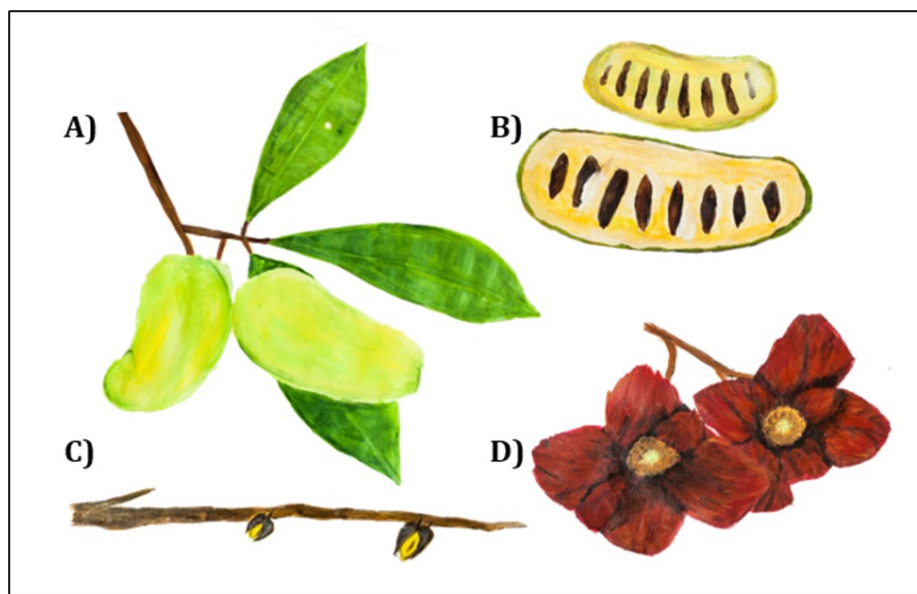
# Pawpaw Nutritional Information

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Maria Coyle, Ohio University

The North American pawpaw (*Asimina triloba*), the largest edible tree fruit native to North America, has been long-supported by the Northern Nut Growers Association. In 2019, we were awarded a generous NNGA research grant which we combined with previously-allocated funds from the Pawpaw Foundation to update the nutritional information about the pawpaw. This article describes the results, the first significant update to pawpaw nutritional information in almost 40 years.

## **Background**

The North American pawpaw (*Asimina triloba*) is the largest fruit native to North America. It has a wide growing range that corresponds to USDA plant hardiness zones 5-8. Pawpaw trees are understory trees that can grow up to 12 meters tall and produce clusters of fruit in late summer to early fall. There are many pawpaw cultivars that range in fruit size, yield and other characteristics but there is little consensus for which cultivars of pawpaw would be best for commercial purposes. Shown below are renditions of parts of the pawpaw plant: A) a mature fruit cluster; B) a mature fruit cut lengthwise to show the kidney bean-shaped seeds; C) a branch with a bud; and D) a springtime blossom (artwork by author M. Coyle).



Pawpaw fruit is becoming more familiar, but a major issue is its short room-temperature shelf life. Thus, marketing the fresh fruit pulp as a food ingredient has the potential to increase pawpaw fruit usage. It can be added to various consumer goods for a variety of reasons, such as providing an intense, tropical-fruit-like flavor, most often identified as a combination of banana and mango, in products like sauces, salsa, ice cream, and beer or replacing fat in baked goods. For those not familiar with the North American pawpaw, we direct your attention to the Kentucky State University Pawpaw Resource website <https://kysu.edu/academics/cafsss/pawpaw/>. One of the deterrents inhibiting the marketing of pawpaw pulp is the lack of up-to-date nutritional information

Contact NAPGA or OPGA: <http://www.NAPGA.com> or <http://www.Ohiopawpaw.com>  
NAPGA Facebook page: <http://www.facebook.com/NorthAmericanPawpawGrowers>

Historical pawpaw nutritional information does exist. We were able to locate pawpaw nutritional information from the 1963 USDA Food Composition Database (Handbook #8), which includes information for the proximates (water, protein, fat, carbohydrate, and ash) and calories. Apparently, pawpaw nutritional values were listed in the database until this time. The entry for pawpaws from the 1963 database is shown below.

TABLE 1.—COMPOSITION OF FOODS, 100 GRAMS, EDIBLE PORTION—Continued															
Numbers in parentheses denote values imputed—usually from another form of the food or from a similar food. Zero in parentheses indicates that the amount of a constituent probably is none or is too small to measure. Dashes denote lack of reliable data for a constituent believed to be present in measurable amount. Calculated values, as those based on a recipe, are not in parentheses															
Item No.	Food and description	Water	Food energy	Protein	Fat	Carbohydrate		Ash	Calcium	Phosphorus	Iron	Sodium	Potassium	Vitamin A value	Thiamine
						Total	Fiber								
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)
1470	Papaws, common, North American type, raw.....	76.6	85	5.2	.9	16.8	—	.5	—	—	—	—	—	—	—

A few years ago, we obtained a copy of a personal communication (shown below) that related a request from an Australian who was seeking pawpaw nutritional information. This led to proximate analysis on pawpaw pulp from California performed at Texas A&M University. Although the communication is not dated, in all likelihood the analysis was performed in the 1980's based on the fact that Dr. Lusas' publishing career began in 1979.

NUTRITIONAL ANALYSIS OF THE PAW PAW		
Bob Kurle	10 S. 055 Madison St.	Hinsdale, IL 60521
<p>Mark Ashton of Kuranda, Australia, had heard that <i>Asimina triloba</i>, the American paw paw had a higher protein value than any other known fruit and he determined to check this out through laboratory research and through feeding experiments. Since there is little or no paw paw in Australia, he put an ad in the Pomona offering to buy 300 lbs. of paw paw pulp for \$600, but as far as I know, he was only able to locate the frozen pulp of two bushels of the fruit and about a pound of dried pulp.</p> <p>Mark contacted the Food Protein Research and Development Center of Texas A &amp; M U. at College Station, TX, and Dr. E. W. Lusas ran a protein analysis on a sample of pulp sent in by John Riley of Santa Clara, CA.</p> <p>Here is the analysis:</p>		
Proximate analysis	(as is)	(moisture free basis)
Moisture	81.16%	
Total Solids	18.84%	
Ash	2.86%	15.18%
Oil		2.35%
Nitrogen	0.38%	2.02%
Crude Fiber	0.87%	4.62%
Protein (%Nx6.25)	2.38%	12.63%
<p>"Please note that protein content of pulp was found to be 2.38% on an as-is basis. This compares with the conflicting values of 0.6 and 5.2% protein for paw paw in the USDA Handbook No. 8."</p>		

In 1982, the NNGA published nutritional data on the pawpaw (Peterson, R. N., Cherry, J. P., & Simmons, J. G., *Composition of pawpaw (Asimina triloba) fruit. Annual Report Northern Nut Growers Association*, 73, 97–107). This team was led by the pawpaw legend Neal Peterson and undertook a much more comprehensive nutritional analysis than the proximate analysis reported by the USDA or performed at Texas A&M. The study reported nutritional information for whole pawpaws including the pawpaw skin. We don't question the accuracy of the analysis, however, the skin is rarely consumed and we often witness these values used to represent the pulp with no disclaimer about the inclusion of the skin.

## **Nutrition Information of Pawpaw**

We used the funding provided by the NNGA and the Pawpaw Foundation to generate nutritional information (subcontracted to a commercial analytical laboratory) for a pooled sample of 16 different varieties of pawpaw harvested at Dr. Powell's Fox Paw Ridge Farm in Adams county, Ohio in September 2019. The sixteen varieties were Estill, Green River Belle, IXL, KSU Atwood™, Lynn's Favorite, Mango, Mitchell, NC-1, Overleese, Pickle, Potomac™, Quakers Delight, SAA-Zimmerman, SAB Overleese, Shenandoah™, and Wabash™. The USDA Nutrient Data Laboratory pre-approved this approach and the pawpaw will be included in the USDA Food Composition Database at some point in the future.

The table below shows the nutritional information for pawpaw pulp without skin and pulp with skin from the 1982 data. We feel that this is the best way to present pawpaw nutritional data because it offers the user a choice to include the skin.

**Table 1: Pawpaw (*Asimina triloba*) nutritional information for 100 g of pulp, one serving of pulp (1/2 cup, 120 g), and 100 g of pulp with skin. "N/A" indicates that the nutrient was not included in the analysis. The "<" symbol indicates the nutrient was analyzed but could not be detected at or above the threshold level.**

		Pulp (without skin)		Pulp and Skin
Nutrient	Unit	100 g	1 serving	100 g
<b><u>Proximates</u></b>				
Calories	KCal	85	102	80
Calories	KJ	357	428	335
Moisture	g	74.5	89.4	73.2
Protein	g	0.7	0.9	1.2
Total Lipid (Fat)	g	0.6	0.7	1.2
Monounsaturated Fatty Acids	g	0.05	0.06	N/A
Polyunsaturated Fatty Acids	g	<	<	N/A
Saturated Fatty Acids	g	<	<	N/A
Trans Fatty Acids	g	<	<	N/A
Cholesterol	mg	<	<	N/A
Ash	g	0.4	0.5	0.6
Carbohydrates (by difference)	g	23.8	28.6	18.8
Total Dietary Fiber	g	4.5	5.4	2.6
Total Sugars (calculated)	g	16.3	19.5	N/A
Sucrose	g	11.4	13.7	N/A
Glucose	g	2.7	3.2	N/A
Fructose	g	2.2	2.6	N/A
Lactose	g	<	<	N/A
Maltose	g	<	<	N/A

<b><u>Vitamins</u></b>				
Vitamin A	IU	N/A	N/A	87
Vitamin C	mg	4.9	5.9	18.3
Vitamin D	IU	<	<	N/A
Thiamin	mg	N/A	N/A	0.01
Riboflavin	mg	N/A	N/A	0.09
Niacin	mg	N/A	N/A	1.1
<b><u>Minerals</u></b>				
Calcium	mg	13	16	63
Copper	mg	N/A	N/A	0.5
Iron	mg	0.2	0.2	7
Magnesium	mg	N/A	N/A	113
Manganese	mg	N/A	N/A	2.6
Phosphorus	mg	N/A	N/A	47
Potassium	mg	201	241	345
Sodium	mg	1.0	1.2	N/A
Sulfur	mg	N/A	N/A	70
Zinc	mg	N/A	N/A	0.9
<b><u>Essential Amino Acids</u></b>				
Cystine	mg	N/A	N/A	4
Histidine	mg	N/A	N/A	21
Isoleucine	mg	N/A	N/A	70
Leucine	mg	N/A	N/A	81
Lysine	mg	N/A	N/A	60
Methionine	mg	N/A	N/A	15
Phenylalanine	mg	N/A	N/A	51
Threonine	mg	N/A	N/A	46
Tryptophan	mg	N/A	N/A	9
Tyrosine	mg	N/A	N/A	25
Valine	mg	N/A	N/A	58

Pawpaw pulp is predominantly moisture (74%) and carbohydrates (24%). Of the carbohydrates, about half is sucrose and 4.5% was dietary fiber. The pulp contains less than 1% fat of which the most predominant was monounsaturated. The pulp contains less than 1% protein. A serving of pawpaw pulp contains less than 10% of adequate intake recommendation of potassium and less than 5% of the recommendation for iron, calcium, and sodium.

## **Pawpaw Compared to Common Fruits**

We feel it is useful to compare pawpaw nutrition to seven common fruits. We have chosen to do this in two ways. Table 2 compares the nutrition of pawpaw pulp to 100g of each of the fruits, in other words a weight-to-weight comparison. Table 3 compares one serving of pawpaw pulp to one serving of the seven other fruits. In this comparison, one serving can range from 118 g (banana) to 182 g (medium apple). In each case, nutritional data for the seven fruits comes from the USDA Standard Reference database.

**Table 2: Comparison of pawpaw pulp nutritional information to existing nutritional information for seven common fruits on a 100-gram basis.**

	<b>Pawpaw 100g</b>	<b>Apple 100g</b>	<b>Banana 100g</b>	<b>Blueberry 100g</b>	<b>Mango 100g</b>	<b>Papaya 100g</b>	<b>Pineapple 100g</b>	<b>Strawberry 100g</b>
<b>Calories (kcal)</b>	85	52	89	57	60	43	50	32
<b>Protein (g)</b>	0.7	0.3	1.1	0.7	0.8	0.5	0.5	0.7
<b>Total fat (g)</b>	0.6	0.2	0.3	0.3	0.4	0.3	0.1	0.3
<b>Carbohydrate (g)</b>	23.8	13.8	22.8	14.5	15.0	10.8	13.1	7.7
<b>Dietary Fiber (g)</b>	4.5	2.4	2.6	2.4	1.6	1.7	1.4	2.0
<b>Total Sugar (g)</b>	16.3	10.4	12.2	10.0	13.7	7.8	9.8	4.9
<b>Vitamin C (mg)</b>	4.9	4.6	8.7	9.7	36.4	60.9	47.8	58.8
<b>Calcium (mg)</b>	13	6	5	6	11	20	13	16
<b>Iron (mg)</b>	0.2	0.1	0.3	0.3	0.2	0.3	0.3	0.4
<b>Potassium (mg)</b>	201	107	358	77	168	182	109	153
<b>Sodium (mg))</b>	1	1	1	1	1	8	1	1

On a weight-to-weight basis, the pawpaw contains more fiber and sugar than the other fruits. Overall, the pawpaw is most comparable to a banana.



**Table 3: Comparison of pawpaw nutritional information from this study (except where noted) to existing nutritional information (U.S. Department of Agriculture, 2019) for seven common fruits per serving.**

	<b>Pawpaw 1/2 cup pulp (120g)</b>	<b>Apple 1 medium fruit (182 g)</b>	<b>Banana 1 medium fruit (118 g)</b>	<b>Blueberry 1 cup fruit (148 g)</b>	<b>Mango 1 cup pieces (165 g)</b>	<b>Papaya 1 cup pieces (145 g)</b>	<b>Pineapple 1 cup chunks (165 g)</b>	<b>Strawberry 1 cup halves (152 g)</b>
<b>Calories (kcal)</b>	102	95	105	84	99	62	83	49
<b>Protein (g)</b>	0.8	0.5	1.3	1.0	1.3	0.7	0.8	1.1
<b>Total fat (g)</b>	0.7	0.4	0.4	0.4	0.7	0.4	0.2	0.5
<b>Carbohydrate (g)</b>	28.6	25.1	26.9	21.5	24.8	15.7	21.6	11.7
<b>Dietary Fiber (g)</b>	5.4	4.4	3.1	3.6	2.6	2.5	2.3	3.0
<b>Total Sugar (g)</b>	19.6	18.9	14.4	14.8	22.6	11.3	16.2	7.4
<b>Vitamin C (mg)</b>	5.9	8.4	10.3	14.4	60.1	88.3	78.9	89.4
<b>Calcium (mg)</b>	16	11	6	9	18	29	21	24
<b>Iron (mg)</b>	0.2	0.2	0.4	0.4	0.3	0.4	0.5	0.6
<b>Potassium (mg)</b>	241	195	422	114	277	264	180	233
<b>Sodium (mg)</b>	1	2	1	1	2	12	2	2

## **Benefits**

Up-to-date nutritional data that reflects the edible portion of the fruit will help many pawpaw stakeholders. Raw fruits and certain low volume small businesses are exempt from having the ubiquitous NUTRITION FACTS labels. However, other small businesses and/or foods for sale that make nutrient claims (e.g. "Gluten free", "Low fat", etc.) are required to have NUTRITION FACTS labeling, even if they are exempt from the label for other reasons. Most food companies provide nutrition facts on their labels whether they are required to or not because it provides a layer of transparency for customers. As the popularity of the fruit grows, demand for up-to-date nutritional information likely will increase. This information will be beneficial for clinicians to use for patients and could lead to pawpaw as a recommendation to increase their fiber intake.

Past nutritional analysis on the pawpaw unintentionally overestimated some nutrients found in the fruit, due to the inclusion of the inedible skin in the analysis. This study found that the pawpaw contains some protein and fat and contains more calories, carbohydrates, and fiber than was previously reported.

# Pawpaw Fritters

(Adapted from a recipe by Natalie Rizzo and by Rymes P Busta)

**Serves:** 9 (3 fritters per serving)

**Prep time:** 10 minutes

**Total time:** 30 minutes

## Ingredients:

- 1 cup pawpaw pulp
- 1/4 cup packed brown sugar
- 1/3 cup skim milk
- 1 large egg
- 1/2 teaspoon vanilla extract
- 2/3 cup all-purpose flour
- 1/2 teaspoon cinnamon
- 1/2 teaspoon baking powder
- 1/4 teaspoon salt
- 2 tablespoons of canola oil
- 2 to 3 tablespoons powdered sugar



## Directions:

Add brown sugar, milk, egg and vanilla to pawpaw pulp.

Whisk to combine.

In a separate bowl, stir together flour, cinnamon, baking powder, and salt.

Add flour mixture to pawpaw mixture and stir until combined.

Over medium heat, add 1/2 tablespoon of oil to a large non-stick skillet.

Using a tablespoon measure, drop batter into skillet.

Cook the first side until bubbles appear on the surface and the edges begin to look dry, in about 3 minutes.

Flip and cook the second side until golden brown, another 2 to 3 minutes

After each batch is cooked and removed from the skillet, add another 1/2 tablespoon oil to the skillet

When ready to serve, dust pawpaw fritters with powdered sugar.

The recipe will yield about 27 fritters.



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## NAPGA/OPGA Dues

Please check with Ron (Botrytis@fuse.net) regarding your dues status or be sure to read the reminder in your E-News correspondence. Your membership dues are now collected on your anniversary date.

Please renew your membership in NAPGA/OPGA to show your support. Your continued support is needed to further the education and the promotion of North American pawpaws.

Go to [www.NAPGA.com](http://www.NAPGA.com), for a membership form.

Membership dues are:     **\$20.00 — Family membership**  
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**Pawpaw Pickin's** is published bi-annually by the NAPGA/OPGA, organizations dedicated to advancing the education and knowledge of North American pawpaw culture, encouraging the planting of pawpaws, the management of native pawpaws, and perpetuating the utilization of all N. A. pawpaw products.

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