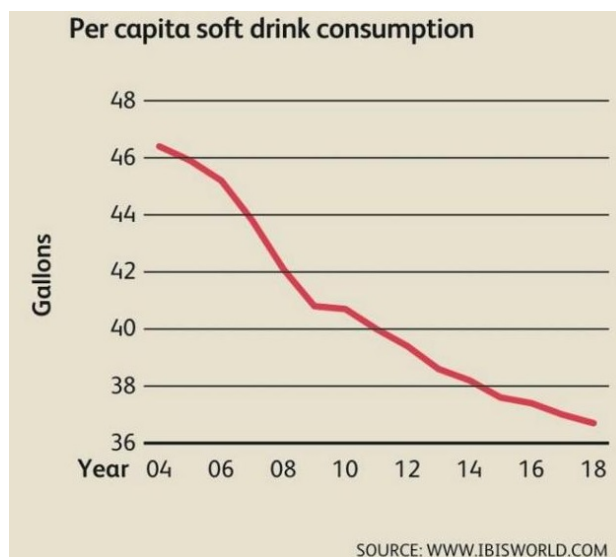




If you are thinking of developing your own Maple Soda product, you probably already understand the benefits that value-added products bring to your business. Diversification of your product offerings sets you apart from your competition, generates more sales while boosting profitability, mitigates risk in the event of price downturn, and helps relieve the industry from supply pressure. Additionally, there are a few attributes that make maple the perfect candidate for a value-added makeover. Maple fits in with the ethos of the new generation of conscious consumers. These consumers seek out products that are Sustainably Produced, Locally Produced, All-Natural, and Clean Label*. Consumers are becoming more concerned with their own well-being and with the well-being of the planet. Maple is a healthy, natural, sustainable, local, and authentic sugar that a consumer can feel good about. This gives it a competitive edge in many product sectors, including the beverage industry.

*Clean label is a buzzword that means a label with a short list of simple ingredients that are natural, familiar, and easy to pronounce. The consumer has a clear idea of what the ingredients are and where they came from. High Fructose Corn Syrup is not a “clean label” ingredient.

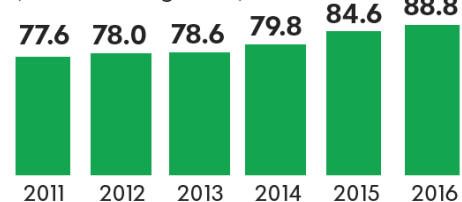
The soft drink industry today



CRAFT SODA SALES EDGE UP

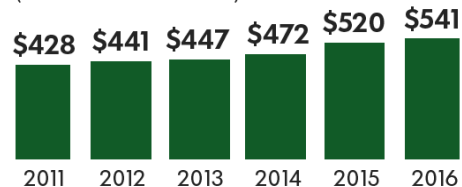
Production

(in millions of gallons):



Wholesale sales

(in millions of dollars):



NOTE Figures are by fiscal years
SOURCE Beverage Marketing Corp.
Karl Gelles, USA TODAY



Mainstream soda is in decline, but Pepsi still made \$43 billion in revenue last year. That means, despite the decline in sales, there is still a massive market. What's more, some of the loss in market share of the major soda corporations has been to craft, small batch, and alternative soda companies. The craft soda industry has been steadily growing over the last decade. This is the ideal moment to try to win some of that fickle customer loyalty that the soda conglomerates have been losing.

Maple Soda Development Thus Far

So far, the Cornell Maple Program has experimented with three soda flavors: Maple Lemon Ginger, Maple Orange, and Maple Orange Cream. We have developed the recipes, done some market testing, and gotten process approvals to see what is needed for shelf-stability. These three flavors have been taken all the way to commercial market successfully by Roxbury Mountain Maple (see their product to the right).

The following recipe is meant for immediate consumption. It is the basic starting point for the commercial version of the beverage. For learn about the additional steps needed for mass production, including packaging, achieving shelf stability, and obtaining scheduled process approval, continue reading.



At Home Recipe: Maple Orange Sodas

This recipe will make 1 Gallon of soda. Find the proportions to adapt to any batch size below.

Ingredients:

2 2/3 cup	Maple Syrup	(Dark is a good option for color and flavor)
1/3 cup	Orange Extract	
5 tsp	Vanilla Extract	(optional. To make a Maple Orange soda similar to Crush, exclude this ingredient. For a Maple Orange <u>Cream</u> soda, vanilla is vital.)
1 gal	Carbonated Water	
22.4 g	Citric Acid	

Instructions:

1. Thoroughly combine the maple syrup, orange extract and vanilla extract (if using).
2. Dissolve the citric acid fully into the maple orange syrup mixture.
3. Add the flavored syrup mixture about a half cup at a time to the carbonated water. Be sure that the carbonated water is very cold and stored in a pressure safe, airtight container that has enough room for the flavored syrup made in step 1.
4. As you add the flavored syrup to the cold carbonated water, the soda will bubble up tremendously. To retain carbonation in the final beverage, have the lid handy as you add the syrup, and quickly seal the container to lock in gas between additions.
5. Store the soda at a cold temperature and allow the flavors to combine for at least an hour before serving. This soda will last up to one week in the refrigerator.

To adapt the soda to any batch size, use the following proportions to calculate:

(recipe continued next page)

Flavored Syrup

1/2 cup	Maple Syrup
3 tsp	Orange Extract
1 tsp	Vanilla Extract (optional, see above)
4.2 g	Citric Acid

Soda Proportions

1 cup	Carbonated Water
3 tbsp	Flavored Syrup

Notes and Tips

Using this recipe, the pH should be at about 3.35. However, pH changes depending on level of carbonation, temperature, acidity of the water used, and how well the acids have been dissolved. We made our soda water highly carbonated and maintained citric acid at a level that was palatable. Citric acid not only helps bring the acidity to food safe level, but also brings a citrusy tang to the soda that the orange extract itself does not contain. Furthermore, be sure to use pure, filtered water. This will help you control pH as well as flavor. Poor flavored water can ruin a soda. Using a Soda Stream or similar product to carbonate the water yourself will help you to maintain quality control. Keeping the water very cold will help you to retain carbonation, as CO₂ dissolves better at cold temperatures. Follow manufacturer's instructions.

At Home Recipe: Pure Maple Soda

There are only two ingredients in this recipe: pure maple syrup and carbonated water. The same rules and advice applies to preparing this soda. The following proportions were rated favorably by a large sample tasters, but you may always change the proportions slightly to your own taste.

For a pitcher:

1 cup	Maple Syrup
7 cup	Carbonated Water

For a glass:

1 fl oz	Maple Syrup
7 fl oz	Carbonated Water

Additional Notes and Tips

Always add sugar to carbonated water, never the other way around. If you add carbonated water to sugar, you will have a bubbled over mess on your hands. The reaction is quite dramatic. There will still be some bubbling that occurs when you add sugar into the carbonated water, and this may make your drink less fizzy than you hope for. To inhibit some of this excessive bubbling, add the maple directly into the bottom of the container by pouring it through a straw or tube. Make sure your container has a sealable lid. Agitate the container gently while the lid is sealed and then allow the carbon dioxide to re-dissolve into the beverage. Again, carbon dioxide dissolves better if the water is as cold as possible. This recipe is meant for immediate consumption.

Shelf Stability

This product is considered an *acidified food*. This means, the pH must be kept low to prevent pathogens from growing. A pH of 4.6 is low enough to control most spore forming pathogens, including botulism. However, mold can grow at an even lower pH, so it is recommended to take pH to 3.5 or lower. For reference, the pH of Coca-Cola is about 2.3. This is one of the most acidic commercial sodas, however. Other major sodas are usually kept around 2.5-3.0 pH.

Options to lower pH are to increase carbonation, within reason, and to add acids. Citric acid is a good choice for citrusy flavors because it naturally occurs in citrus fruits like oranges and grapefruit. It contributes majorly to the familiar flavor of those fruits. Phosphoric acid is another option that is commonly used in commercial settings. It is fairly neutral in flavor and is cheaper than citric and other ingredients commonly used to acidify foods.

To inhibit microbial growth in your product long-term, however, you have two options: preservatives or pasteurization. Each has its benefits and drawbacks. Preservatives are highly effective. Sodium benzoate inhibits bacteria and mold growth, while potassium sorbate stops both mold and yeast in their tracks. Using preservatives will help you avoid difficult and costly pasteurization processes. However, they may not appeal to consumers seeking a clean label product. Pasteurization will help you avoid additional ingredients that may be off-putting to potential customers, but it comes with its own set of challenges. To pasteurize something, you need to raise its temperature for a different length of time depending on the temperature. Hot water baths are a simple option, but are not convenient for large batch sizes. Steam tunnels are commonly used for bottled products, but they are extremely expensive and it can be difficult to find a co-packer who has one. Furthermore, dealing with glass bottles and carbonation is dangerous. Raising the temperature of a carbonated beverage causes its gasses to expand, and can easily lead to breakage and product loss.

*A **scheduled process** must be designed, reviewed, and approved by a process authority to deliver a “commercially sterile” or “shelf-stable” food product.* You can acquire a scheduled process approval through the Cornell Food Venture Center. For a small fee, you can send them a sample of your product, your recipe, and the **scheduled process approval form** which can be found at the end of this document. They will get back to you with any changes that need to be made to your production process or additional ingredients they recommend to ensure safety of your product. <https://cfvc.foodscience.cals.cornell.edu/>

Other Challenges

Packaging your product poses a challenge. The cost of the machinery used to run reasonably sized batches is a considerable barrier to entry in the soda industry. For this reason, small beverage companies sometimes partner with a **co-packer**. Unfortunately, there is currently a higher demand than supply of co-packers. Furthermore, few co-packers have carbonation capacity, and most demand a high minimum run size.

Another barrier to entry is the nature of the soda industry itself. It has traditionally been a High Volume / Low Margin industry. To be successful, you would likely have to focus on moving high volumes of your product. This type of business requires significant initial investment. Furthermore, moving such high volumes requires a sophisticated distribution network.



Please feel free to contact the **Cornell Maple Program** with any pressing questions.

Funding for this project was made possible by a cooperative agreement from the U.S. Department of Agriculture (USDA) Agriculture Marketing Service. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the USDA.



U.S. DEPARTMENT OF AGRICULTURE



Cornell University
College of Agriculture and Life Sciences
Department of Natural Resources

Scheduled Process Form for Acid, Acidified or Low Water Activity Foods

Product Name _____
Company Name (if chosen) _____
Name of person responsible for product _____
Address _____
City, State, Zip _____
Telephone _____
Email _____

☐ Check this box if this is an AMENDMENT (change) to an existing Scheduled Process with us. Please highlight your changes.

☐ Check this box if you think this can be considered a VERSION (for example: mild, medium or hot) of an existing Scheduled Process with us.

☐ Check this box if you would like this service to be EXPEDITED. Please refer to current pricing at our website homepage.

Product Analyses: Please record values for product samples if known.

pH _____ a_w _____ °Brix _____
(Water Activity)

For CFVC Lab Use Only: L _____ S _____ ☐ NPB ☐ NW ☐ AA

Ingredients: MUST LIST BY WEIGHT

	Ingredient*	Descriptors (fresh, canned, sliced, etc.)	Weight (oz, lb, g, kg)**
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

* If using vinegar, note the acid strength (stated on the bottle) of the brand you use. Ex: Vinegar (5%).

** All ingredients, even liquids must be WEIGHED. Do not assume that 1 cup = 8 oz; a cup of garlic powder weighs much less than a cup of molasses. Fluid ounces are NOT a weight.

Scheduled Process Form for Acid, Acidified or Low Water Activity Foods (Cont.)

Product Name _____

Procedure: List ALL steps necessary to make your product.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____

Container type and size (s): _____

How will product be sold? ☐ Shelf-stable

☐ Refrigerated: Optimum shelf life: _____

☐ Frozen