

Benchmarks and Rapid Results for a Jam Producer



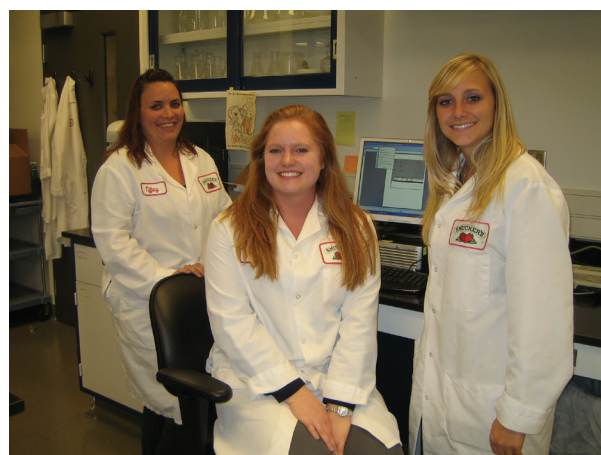
The Smucker's Barn Store and Café.

In 1897, Jerome M. Smucker built a small apple cider mill on a street that is now called Strawberry Lane in Orville, Ohio. Farmers would bring their apples to Smucker for pressing into cider. If there was a surplus of pressed juice, they would sell the extra cider back to Smucker who used it to make apple butter. This first product was sold off the back of a horse drawn wagon. Officially incorporated in 1921, the J. M. Smucker Company installed additional equipment for the manufacture of preserves and jellies a few years later. National distribution throughout the US began in 1942 when preserves and jellies were initially shipped to Los Angeles, California. In the early 1960's, the company began to grow and expand acquiring existing jam and jelly manufacturers and introducing a line of peanut butter. Today, the J. M. Smucker Company owns or licenses multiple recognizable brands in the US including Pillsbury, Hungry Jack, Folgers, Jif, Knotts Berry Farm, Laura Scudgers, and Crisco. Brands sold to Canadian consumers include Crosse & Blackwell, Robin Hood, Carnation, and Bick's. Recent acquisitions include True Roots gluten free products and Sahalie nuts and trail mix.

In 2013, the Discovery Lab at Smucker went through a planned reorganization to upgrade their technical equipment and automate their processes. Prior to the reorganization, they were testing approximately eight juice samples per week for multiple parameters. Using traditional methods, the analysis of sugars only could take up to one week, however, their R&D department required benchmark values daily. To improve their processes, they added a Thermo Scientific™ Arena™ discrete analyzer to their laboratory with excellent results.

"Now we can run 50 samples in one hour," said Tiffany Highben, Senior Analytical Chemist at Smucker's Discovery Lab, then she added, "It's really easy to teach the idea of a color change to a new technician."

Their new Arena analyzer uses a photometer with a halogen lamp to read samples and provide results. Since all the steps in the process are automated, it is easy to use, requires minimal intervention from the analyst, and provides results quickly.

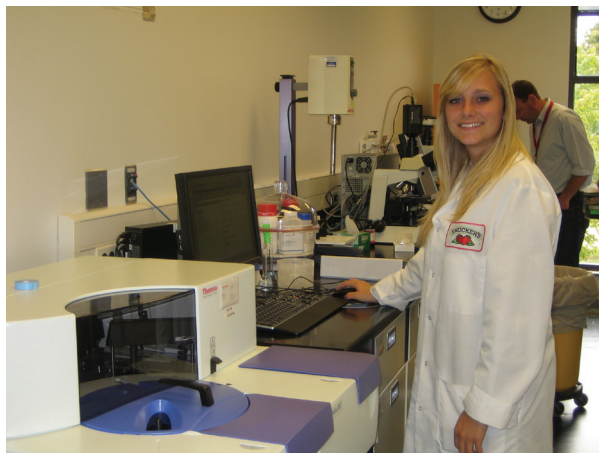


Tiffany Highben, Megan Perz, and Brittany Pleat
Analytical Chemists, J. M. Smucker Company.

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Smucker's Discovery Lab.



Brittany Pleat with the Arena analyzer.

Calibrator	Response (Absorbance)	Calculated Concentration	Concentration (mg/L)
ACS-30	0.198	29.787	30
ACS-100	0.677	100.363	100
ACS-200	1.352	199.851	200

Highben, accompanied by her colleagues, Megan Perz and Brittany Pleat, also Analytical Chemists, run a variety of sugar and acid tests as back up for an outside lab as well as for internal R&D purposes.

"If we need to do a benchmark test, we use discrete analysis," shared Megan Perz.

Fruit juices and purees as well as flour are tested for the flowing sugars: glucose, fructose, and sucrose, and these acids: acetic, ascorbic, and citric. To authenticate fruit products, d-malic and l-malic acid tests are run.

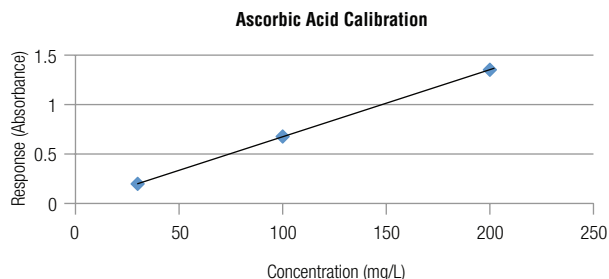


Figure 1. Ascorbic acid calibration data.

"Now we can run 50 samples in one hour."

Tiffany Highben
Senior Analytical Chemist, Smucker's Discovery Lab

Ethanol, calcium, pH, protein, and glycerol tests are also done on fruit products. In addition, a frozen liquid coffee product which is available only to industrial customers has its production and process water tested.

Most testing is done on research samples, hence the requirement for a quick turnaround. The Arena discrete analyzer is fast and flexible and can provide the desired results in a timely manner.



About Ascorbic Acid Testing

Ascorbic acid is the scientific name for vitamin C and its addition to fresh wheat flour as a refined, denatured substance improves baking quality. Categorized as a dough conditioner, it acts as a reducing agent which helps weaken the protein network of flour. In the presence of O₂, ascorbic acid becomes an oxidizing agent allowing the dough to retain gas and ultimately produce bread with a finer crumb cell structure while maintaining its plump shape. In other words, it improves the activity of yeast during fermentation and baking. Benefits include reduced mixing and proofing times and improved elasticity.

Added in this manner to flour, ascorbic acid is present in much smaller quantities than the daily recommended dose for vitamin C. It also does not contain the beneficial bioflavonoids or nutrients usually found in fresh fruit. In addition, any mill adding ascorbic acid to its flour is required to declare the substance (E300) on its label.

www.thermoscientific.com/discreteanalysis

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