



Introducing Citri-Fi 100M20!

Fiberstar has expanded our Citri-Fi line to include a new product, Citri-Fi 100M20. Citri-Fi 100M20 is pure citrus fiber and has the smallest particle size of all Citri-Fi products available, Citri-Fi 200 and 300 will not be offered at this particle size. The smaller size provides some advantages when compared to other grinds of Citri-Fi. As the particle size of the pure orange pulp becomes smaller the color of Citri-Fi becomes lighter and more uniform in appearance. This makes Citri-Fi 100M20 ideal for products where a brilliant white color is necessary. Citri-Fi 100M20 is also excellent for use in applications where extremely delicate texture and mouthfeel are needed. The smaller particle size does not affect the water and oil holding functionality of Citri-Fi but will not provide as much viscosity as larger particle sizes.

Citri-Fi 100M20 to Prevent Syneresis in Cream Cheese

Citri-Fi 100M20 is being used in Asia to prevent syneresis in cream cheese. For this product the manufacturer is individually wrapping squares of cream cheese into small snack sized portions. Before the addition of Citri-Fi the manufacturer was experiencing problems with syneresis. Water was migrating out of the cream cheese and settling into the corners of the packaging, diminishing product quality and shortening shelf life. The manufacturer was drawn to Citri-Fi's all natural status and attractive labeling, a perfect match for their healthful product. The customer liked Citri-Fi's functional benefits, which are not diminished even with the smaller particle size. The customer also discovered that they could use Citri-Fi 100M20 without affecting the brilliant white color of the cream cheese.



Citri-Fi 100M20 is used to control syneresis in a cream cheese product in Japan.

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Increased Softness Bagels with Citri-Fi 100

Citri-Fi 100 has been incorporated into a new line of products to enhance the softness of bagels. The Aunt Millie's brand has introduced three varieties of soft bagels with Citri-Fi 100, honey multi-grain, brown sugar swirl, and white with whole grain. Citri-Fi and extra water can be added to virtually any baked goods formula to tightly bind and hold more moisture (reducing baking losses) to improve the eating qualities of the product and extend product freshness. Below is an example formula from Fiberstar where Citri-Fi 100FG and water are incorporated to improve the moistness and freshness of bagels. In increased moistness applications Citri-Fi 100FG is best incorporated at 1.0% or less of the overall ingredient weight with additional water added at 3.5 to 6 times the weight of Citri-Fi. In the formula below Citri-Fi 100FG is added at 1.0% of total ingredient weight and extra water is added at 5.5 times the weight of Citri-Fi. Citri-Fi should be pre-mixed with the formula's dry ingredients, additional water can be added with the standard formula water.

Increased Softness Bagels with Citri-Fi Comparative Formula from Fiberstar		
Ingredient	Control (kg)	With Citri-Fi (kg)
High Gluten Flour	100.00	100.00
Diastatic Malt	4.68	4.68
Sugar	1.56	1.56
Water	54.68	54.68
Salt	1.56	1.56
Yeast	1.56	1.56
Citri-Fi 100FG	-	1.64
Water (Additional)	-	9.02
Total	164.04	174.7



Fiberstar at the IFT Booth #6119

Come visit Fiberstar Inc. at the Institute of Food Technologists Expo in New Orleans from June 12th to the 14th. Our customers have had many exciting product introductions since last year's IFT, so please stop by to learn how Citri-Fi can be used in your products. New applications include ice cream, injected and tumbled meats, beverages and partial egg replacement.



Zero Fat Bread and Stable Fruit Filling

Zero Fat Bread with Citri-Fi 100FG

Citri-Fi 100FG has been used to formulate a zero fat baguette that is sold in delis in one of the world's largest retail chains in South America. The baguette is baked and sold fresh at the in-store delis. Citri-Fi helps hold moisture in the bread to improve the eating qualities and extend the freshness of the product. Replacing fat can reduce the per unit cost and improves the overall nutrition of the product. In applications like this, Citri-Fi is best used at 0.125 times the amount of fat replaced. Additional water should be added at 6 to 9 times the amount of Citri-Fi. Citri-Fi is simply mixed with other dry ingredients in the formula. In the example formula below an extra emulsifier is added at 0.7% the weight of flour.

Zero Fat Bread Comparative Formula from Fiberstar		
Ingredients	Control (g)	Citri-Fi (g)
Flour	1000.00	1000.00
Water	650.00	650.00
Sugar	60.00	60.00
Oil	30.00	0.00
Yeast	30.00	30.00
Salt	20.00	20.00
Citri-Fi 100FG	-	3.75
Additional Water	-	26.25
Sterlac (PURAC® emulsifier)	-	7.00
Total	1790.00	1797.00



Procedure: Mix all ingredients in a 20 quart bowl using a mixer with a dough hook for 10 minutes on medium. Keep the temperature around 80° F (26.6° C). Allow to sit for 30 minutes. Divide dough into 560 gram balls and place into 1 pound dough pans. Proof for 1 hour at 95° F (35° C) and 95% humidity. Bake at 400° F (204.4° C) for 16 minutes.

Stabilize Fruit Fillings in Pastry

We wanted to revisit an old application that is being used with great success in multiple recent product launches. Citri-Fi is excellent at preventing the blowout and syneresis of fruit fillings and jams in pastry. To the right are three products that are using Citri-Fi to control moisture in jam and fruit fillings. In the mango cake product from Taiwan, Citri-Fi is used to stabilize the jam filling and in the cake exterior to hold moisture.



Example Application

Citri-Fi 200FG can be incorporated at 1% to 2% of the overall weight of fruit filling. To incorporate simply mix Citri-Fi into the finished fruit filling. The two examples below were cooked for 12 minutes at 375° F (190° C).

Cherry Strudel Filling Comparative Formula from Fiberstar		
Ingredient	Control	Test
Cherry Strudel Filling	90.90%	89.30%
Water	9.10%	8.90%
Citri-Fi 200FG	-	1.80%
Total	100.00%	100.00%

Photos: Citri-Fi has been incorporated into the fruit filling in the pastry on the left, which shows significantly reduced syneresis compared to the pastry without Citri-Fi on the right. Both pastries were baked for the same amount of time.



With Citri-Fi



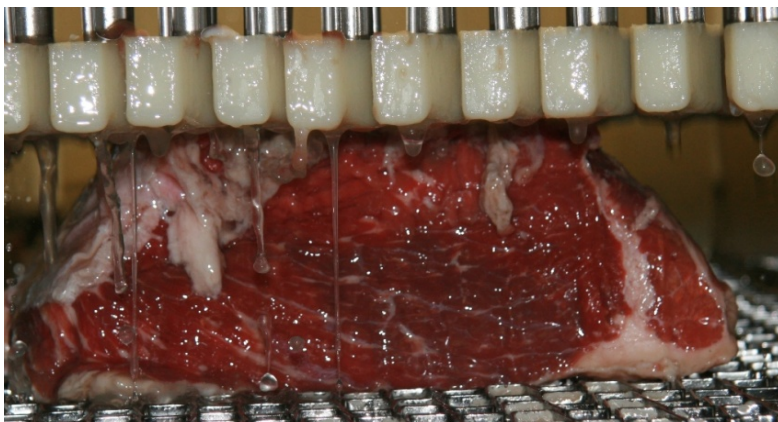
Without Citri-Fi



New Meat Applications with Citri-Fi

Citri-Fi in Injected Corned Beef

Citri-Fi 300M40 can be used to control purge in a variety of injected whole muscle meats and poultry. In this comparative test, a combination of Citri-Fi and high grade kappa carrageenan was used to increase yield and margins in injected corned beef. Testing was done to compare the drip loss, cooked yield, overall yield and profitability of injected corned beef with 40% and 75% extension. Three different brine formulas were compared; a control with salt and cure, a test with salt, cure, carrageenan and xanthan gum, and a test with salt, cure, Citri-Fi 300M40 and carrageenan. The tests with Citri-Fi and carrageenan had the lowest drip loss, best cooked yield, and best overall yield in the study. The Citri-Fi and carrageenan test also had improved flavor, texture and slicability compared to the control and the carrageenan/xanthan test. The tests with Citri-Fi and carrageenan were the most profitable when the cost of the injection brines were compared to the overall yield. Citri-Fi was incorporated into the brine formula with agitation. Another benefit of using Citri-Fi 300M40 in an injection brine is that the Xanthan gum in Citri-Fi 300M40 will keep the insoluble citrus fiber particles and the carrageenan suspended in the brine solution. All of the information for this application was kindly provided by IMCD Australia Limited.



Example Formulas for Brine Solutions

Control: 3.48% cure, 89.55% water and 6.97% salt. **Carrageenan/Xanthan Gum:** 3.45% cure, 88.67% water, 6.90% salt, 0.98% carrageenan and xanthan gum blend. **Citri-Fi 300M40 & Carrageenan:** 3.42% cure, 88.06% water, 6.85% kg salt, 0.98% Citri-Fi 300M40 and 0.68% carrageenan. A high grade kappa carrageenan extract is used for all formulas.

Ratio of Drip Loss to Injection		
	40% Extension	75% Extension
Control	17.90%	24.10%
Kappa Carrageenan & Xanthan Gum	14.70%	15.70%
Citri-Fi 300 M40 & Carrageenan	13.80%	10.70%
Percent Cooked Yield (purge weight/cooked weight)		
	40% Extension	75% Extension
Control	88.00%	87.20%
Kappa Carrageenan & Xanthan Gum	86.90%	92.10%
Citri-Fi 300 M40 & Carrageenan	92.90%	91.60%
Percent Overall Yield (green weight/cooked weight)		
	40% Extension	75% Extension
Control	115.40%	124.20%
Kappa Carrageenan & Xanthan Gum	117.90%	140.30%
Citri-Fi 300 M40 & Carrageenan	120.80%	145.80%

Gross Profit on 40% Extension		
	Gross profit/kg fresh meat	% GP over control
Control	\$4.15	-
Carrageenan and Xanthan	\$4.29	3.40%
Citri-Fi 300M40 & Kappa Carrageenan	\$4.47	7.70%
Gross Profit on 75% Extension		
	Gross profit/kg fresh meat	% GP over control
Control	\$4.90	-
Carrageenan and Xanthan	\$5.92	17.20%
Citri-Fi 300M40 & Kappa Carrageenan	\$6.29	28.40%

Meat Pre-Emulsions with 30% Less Fat

Meat processors are using Citri-Fi 200FG to replace up to 30% of the pork fat in meat pre-emulsions. Meat pre-emulsions are made as a base for use in products like sausages and meat fillings. Replacing 30% of formula pork fat can lead to significant cost savings and nutritional improvement. In this formula, Citri-Fi 200FG is incorporated at 0.0833 times the amount of fat replaced and extra water is added at 12 times the weight of Citri-Fi. To make the meat emulsion, blend soy protein isolate and water until a gel forms, add the fat and Citri-Fi and continue to blend for 3 to 5 minutes, add the cure salt and mix for one more minute.

Low Fat Meat Pre-Emulsion Comparative Formula		
Ingredient	Control	With Citri-Fi
Pork Fat	40.00	28.00
Water	40.00	40.00
Soy Protein Isolate	10.00	10.00
Cure Salt (200 ppm NO ₂)	1.80	0.90
Citri-Fi 200FG	-	1.00
Additional Water	-	11.90
Total	91.80	91.80



Gluten Free Bread, Eggless Mayonnaise and Soft Cookies



Gluten Free Bread with Citri-Fi



Gluten Free Bread Developed by Fiberstar

Gluten Free Bread Comparative Formula from Fiberstar

Ingredients	Weight (g)
Water	165.00
Egg Whites	172.50
Cider Vinegar	27.00
White Rice Flour	105.00
Brown Rice Flour	105.00
Corn Starch	90.00
Non Fat Dairy Milk	12.00
Xanthan Gum	8.00
Sugar	15.00
Salt	5.50
Yeast	6.50
SSL	3.00
Oil	20.00
Calcium Propionate	2.40
Citri-Fi 200FG	3.00
Extra Water	12.00
Total	751.90

Gluten Free Bread

Manufacturers use Citri-Fi to provide the strength and structure that is lost when gluten is removed from various baked goods. Citri-Fi also holds moisture in the baked goods to improve the texture and mouthfeel of dry gluten free products. Citri-Fi has been successfully incorporated by our customers in sandwich bread, tortillas and rolls. Fiberstar spent several weeks testing different gluten free bread formulas, the formula to the left provided the best physical structure and eating qualities.

Procedure: Mix wet ingredients for 1 minute on medium setting. Add dry ingredients and mix for 1 minute on medium setting. Scrape bowl and mix for two more minutes. Proof for 60 minutes and bake at 355° F (179.4° C) for 40 minutes.

Eggless Mayonnaise Formula

Laura Valverde also created a new eggless mayonnaise formula to demonstrate Citri-Fi's ability to replace egg in mayonnaise, dressings and sauces. Citri-Fi will stabilize the oil/water interface and prevent coalescence throughout freeze/thaw cycles, baking or cooking, and during a products shelf life because of its hydrophilic and lipophilic properties. In this application Citri-Fi 300M40 is incorporated at 5.0% of the amount of the eggs replaced and extra water is added at 19 times the weight of Citri-Fi (example: 2.5 units of Citri-Fi 300M40 and 47.5 units of water to replace 50 units of egg). Replacing egg with Citri-Fi reduces formula costs and improves nutrition by reducing cholesterol and fat.

Procedure: Blend egg (if applicable), lemon juice, vinegar and water (if applicable) using a hand blender on low for approximately 10 seconds. Combine all the spices and the fiber (if applicable) and add them in the blender. Mix for 30 seconds on low. Slowly pour in the oil and blend on low for approximately 2 minutes and scrape as needed.



Photo: Eggless mayonnaise sample prepared by Laura Valverde, Fiberstar Inc. Technical Sales Representative.

Eggless Mayonnaise Comparative Formula from Fiberstar

Ingredients	Control (kg)	With Citri-Fi (kg)
Lemon Juice	10.00	10.00
Eggs	50.00	-
Soybean Oil	161.00	161.00
Vinegar	11.00	11.00
Salt	5.00	5.00
Sugar	10.00	10.00
Dry Mustard	1.00	1.00
Citri-Fi 300M40	-	2.50
Water	-	47.50
Total	248.00	248.00

Use Citri-Fi to Improve the Softness of Cookies

One of the largest supermarket chains in the United States is using Citri-Fi 200FG to add moisture to its fresh baked cookies. Adding Citri-Fi and additional water improves the freshness, and enhances the eating qualities of the cookies. Citri-Fi tightly binds the added water and retards moisture migration which prolongs the products shelf life. In this application Citri-Fi 200FG is added at 0.5% of the original formula weight along with 8 times its weight in additional water. Citri-Fi is mixed with the sugar and brown sugar, then the margarine is added and mixed in an electric mixer for two minutes. Next, the eggs, corn syrup, vanilla, and additional water are added and mixed for two minutes on medium. Finally the flour, baking soda and salt are mixed in for one minute on low before the chocolate chips are folded in. The 30 g dough balls are baked for 9 minutes at 338° F (170° C).

Enhanced Softness Cookies Comparative Formula from Fiberstar

Ingredients	Control (kg)	With Citri-Fi (kg)
Margarine	14.25	14.25
Granulated Sugar	20.50	20.50
Brown Sugar	8.75	8.75
Whole Eggs	6.75	6.75
Vanilla Flavor	0.25	0.25
All Purpose Flour	31.75	31.75
Baking Soda	0.50	0.50
Salt	0.25	0.25
Chocolate Chip Cookies	15.00	15.00
Corn Syrup	2.00	2.00
Citri-Fi 200FG	0.00	0.50
Extra Water	0.00	2.00
Total	100.00	102.50



Use Citri-Fi to Address the Rising Cost of Commodities

As Seen in 'Food and Beverage New India'

Agricultural commodities like oil and wheat can rise unpredictably and crush your bottom line. With high ingredient prices, manufacturers need new cost saving strategies to protect their margins. One of the best methods to reduce and control formula costs is to replace ingredients that are expensive or have unpredictable prices. New functional ingredient innovations are providing manufacturers with better ways to reduce and control formula costs without sacrificing quality. For many manufacturers, edible oil is the largest contributor to cost and pricing uncertainty. Now many are turning to oil and fat mimetics to replace oil and fat in their formulas as a way to reduce costs and hedge themselves against volatile ingredient markets.

Fat mimetics are used to replace oil and fat in a wide variety of foods. They are designed to mimic the mouthfeel, texture and cooking or baking properties that oils and fats contribute to different foods. Some fat mimetics can be used to reduce formula costs when they cost less than the oil or fat they are replacing. Also, the cost of mimetics are not as volatile as the cost of oils and fats. Newer and better fat replacers are allowing manufacturers to reformulate without sacrificing the eating qualities of their products. Despite the many solutions currently available to replace oil and fat in food products, all of them have limitations. The limitations are in the form of cost, ease of use, shelf-life, regulatory concerns, taste, texture, percentage of fat they are able to replace, and/or food applications for which they are suitable.

New varieties of oil and fat mimetic ingredients are being made from processed plant cell wall materials. Fiberstar Inc. of the USA offers Citri-Fi®, a natural food ingredient which functions as an oil or fat replacer in a variety of applications. Citri-Fi products have a smooth mouthfeel, high water holding capacity, and tightly bind water and oil over time so products stay fresher for longer. Citri-Fi products perform exceptionally well to replace fat in baked goods. Manufacturers use the product to replace 10% to 50% of formula oil or fat to reduce costs and improve nutrition without affecting product quality. Cost calculations show Citri-Fi will almost always reduce formula costs because Citri-Fi and extra water cost less than the oil they replace.

Citri-Fi is a multifunctional food ingredient made from orange pulp. Citri-Fi contains both soluble and insoluble fiber and protein. Fiberstar processes Citri-Fi in a way that expands the internal surface area of the fiber. This enables Citri-Fi to employ multiple bonding mechanisms; liophilic bonding of protein to fat, hydrogen bonding of water soluble and insoluble fiber, and entrapment and surface tension forces exerted by the expanded fiber matrix. These physio-chemical properties allow Citri-Fi to bind and hold more oil, fat and water through cooking, baking, freezing and a products shelf life than any comparable ingredient while providing excellent mouthfeel and texture.

When using Citri-Fi in baked goods, the objective is to find the optimum combination of cost savings, quality, taste, texture and nutritional improvement. Reformulation for cost benefits can only work when product qualities are acceptable, but the benefits of lowered costs and improved nutrition can be achieved with excellent results using Citri-Fi.

Partial Replacement of Oil with Citri-Fi Cost Savings Analysis

When Citri-Fi and extra water are used to replace fat, 8 to 13 parts of oil/fat is usually replaced with 1 part Citri-Fi and from 7 to 12 parts extra water. Our customers use Citri-Fi and extra water to replace 10% to 50% of original formula fat and oil. In the table below we compared the cost of Citri-Fi and extra water to the cost of the oil they can replace.

Cost Savings Using Citri-Fi to Partially Replace Oil: Estimated Soy Bean Oil Costs USD \$1.27 / kg						
Parts Water Per 1 Part Citri-Fi	7	8	9	10	11	12
Cost of Oil Removed from Formula	\$10.16	\$11.43	\$12.70	\$13.97	\$15.24	\$16.51
Cost of Citri-Fi in Formula	\$6.60	\$6.60	\$6.60	\$6.60	\$6.60	\$6.60
Cost Savings from Citri-Fi	\$3.56	\$4.83	\$6.10	\$7.37	\$8.64	\$9.91
Percent Cost Savings	35.0%	42.3%	48.0%	52.8%	56.7%	60.0%

Cost of Soybean Oil from 5/27/2011, Milling and Baking News

Reduced Egg Soft Cakes

Partially replacing a portion of dried whole egg or whole liquid egg in baked goods is another great way to reduce formula costs. In this application, Citri-Fi 200FG is used to replace 50% of the whole liquid egg in a soft cake with no loss of organoleptic qualities. In many cases using Citri-Fi to partially replace egg extends product shelf life by holding the moisture in place for a longer period of time. In this application Citri-Fi 200FG is used at 0.055 times the amount of dried egg replaced and additional water is added at 17 times the weight of Citri-Fi. Citri-Fi is premixed with all of the dry ingredients and oil before formula water is slowly mixed in.

Reduced Dried Whole Egg Layer Cake Comparative Formula		
Ingredients	Control	Citri-Fi
Cake Flour	70.00	70.00
Sugar	50.00	50.00
Eggs	40.00	20.00
Oil	10.00	10.00
Emulsifier	4.00	4.00
Water	16.00	16.00
Milk Powder	6.00	6.00
Citri-Fi 200FG	-	1.10
Additional Water	-	18.90
Flavor & Salt	4.00	4.00
Total	200.00	200.00



Test with Citri-Fi



Control



Fiberstar Webinar Initiative

We are creating a Webinar Training Program which will enable us to offer up to 4 webinar training programs to our distributors and customers each year. These webinars will teach you how to use Citri-Fi in various applications. Working with you, we will customize each webinar to your specific market needs and applications, local food categories and formulas of your choosing and in your local language, if desired. Using specialized software, we will coordinate and facilitate the design, promotion, invitation, pre-registration, presentation, follow-up and permanent website library access for each webinar. We also plan to offer 'Quick Start Training' courses to help train your newly appointed personnel as well as 'Ongoing Training' to keep all of your personnel up-to-date on how to use Citri-Fi in a wide variety of food and beverage applications. We will be able to give you detailed information based on our past successes so you can incorporate Citri-Fi into various products and realize its many benefits. Please let us know as soon as possible if you wish to take advantage of this opportunity to train your technical and sales personnel and customers this cost effective manner.

Citri-Fi Makes its Small Screen Debut on the BBC!

Citri-Fi recently appeared on 'Jimmy's Food Factory' a television show on BBC1 in the United Kingdom. This program follows the host Jimmy Doherty as he re-engineers supermarket products to help viewers understand how their food is made. In an episode that aired last December Jimmy decided to recreate the elements of his ham, cucumber, and light mayonnaise sandwich. Citri-Fi 100FG was featured as a fat mimetic in the extra-light mayonnaise. Jimmy used a combination of Citri-Fi 100FG, xanthan gum and starch to give the low fat mayonnaise volume, viscosity and texture. The rest of the formula includes egg yolks, vinegar, salts, a small amount of oil, and spices. When talking about Citri-Fi he says, "food factories absolutely love this stuff."

10 minutes and 50 seconds into the video (linked below) Jimmy introduces Citri-Fi. He has pre-mixed Citri-Fi with oil and uses a high powered mixer, "Brenda the Blenda," to incorporate the Citri-Fi and oil mixture into water. The simple extra-light formula Jimmy makes tests out fine with many of the people in the video, but we know that a sophisticated reduced oil formula with Citri-Fi would be excellent. Please follow the link below to see the video! Citri-Fi on BBC1's Jimmy's Food Factory: <http://www.youtube.com/watch?v=GKR5T00kGCo>

New Low Fat Mayonnaise Formula

A new formula for low fat mayonnaise has been developed by Laura Valverde our technical sales support representative in the E.U. Interest in low fat mayonnaise, dressings and sauces is always high so Laura worked to develop a new great tasting formula that demonstrated excellent shelf life stability. This formula uses Citri-Fi 100FG and additional water to replace 50% of the original formula oil.

Procedure: Blend eggs and water on low for approximately 10 seconds. Combine all spices and Citri-Fi (if applicable) and add them to the blender. Mix for 30 seconds on low. Slowly pour in the oil and blend on low for approximately 2 minutes and scrape as needed. Add vinegar and lemon juice and blend on low for approximately one minute.

Low Fat Mayonnaise Comparative Formula from Fiberstar		
Ingredients	Control (kg)	With Citri-Fi (kg)
Soybean Oil	120.00	60.00
Water	63.00	63.00
Pasteurized Egg Yolk	4.20	4.20
Vinegar	2.66	2.66
Modified Starch	2.00	2.00
Salt	1.80	1.80
Sugar	1.34	1.34
Mustard	0.80	0.80
Citri-Fi	0.27	0.27
Lemon Juice	0.20	0.20
Guar Gum	0.20	0.20
Citri-Fi 100FG	-	3.75
Additional Water	-	56.25
Total	196.47	196.47

Welcome New Distributors!

Fiberstar is excited to announce that three more distributors have joined our global network so far in 2011. Rudolf Lietz Inc. will be representing Citri-Fi products in Vietnam, the Willis International Sales Corporation will be representing Citri-Fi in the Philippines, and Cardsystems Ltd. will be representing Citri-Fi in Ukraine. Visit www.citri-fi.com/contact.html for their contact information.

Upcoming Events in 2011

Please come visit Fiberstar at these upcoming industry trade shows. Be sure to check the events page on our website for regular updates!

- IFT International Food Expo. June 12th to 14th
 - New Orleans, LA, USA
- Food Pro Exhibition July 10th to 13th
 - Sydney, Australia
- Food Ingredients Asia Sept 21st to 23rd
 - Bangkok, Thailand
- AACC International Oct 16th to 18th
 - Palm Springs, CA, USA
- Food Ingredients Europe Nov 29th to Dec 1st
 - Paris France