



The Citri-Fi® Showcase

Exciting News and Information from Fiberstar!

We hope all of our customers and partners are enjoying the summer of 2010. We are pleased to report that sales are steadily rising and Fiberstar Inc. has never been stronger or more optimistic (which is hard to believe if you've ever met President and CEO Dale Lindquist!). Our partnerships around the world are strengthening as food manufacturers, including many of the largest in the world, are turning to Citri-Fi to improve the quality, profitability and nutrition of their food. In this newsletter we will share some new applications of Citri-Fi as well as give updates on the most successful uses. We would also like to thank our partners and customers for their continued efforts in promotion of Citri-Fi products.

Sincerely,

The Fiberstar Team

Global Conference on Citri-Fi Research and Development

We are planning to hold our first global conference for Citri-Fi distributors this fall. Our goal is to have the top decision maker from each distributor that is responsible for setting Citri-Fi sales strategies attend this conference. We plan to invite each of the top ten Citri-Fi distributors to make a presentation on the Citri-Fi applications that have provided their organizations with the greatest sales growth. We trust that this cross-pollination of experience and expertise in various Citri-Fi applications will motivate each of our distributor organizations to pursue the full sales potential that Citri-Fi is able to provide them in their respective territories. We believe that this conference will help lay the foundation for significant Citri-Fi sales growth for each of our distributors in 2011 and beyond. Invitations and other information including dates and topics will be coming soon.

Grinding Facility & Package Customization

Fiberstar Inc. has finalized plans to construct and operate our own milling facility in River Falls, Wisconsin. Construction should begin in August and we expect to be milling Citri-Fi products within four months. Having our own mill will streamline operations and allow Fiberstar to be more responsive to our customer's needs. With our new facility we are also considering offering customized batch size packaging solutions to our customers. We will be distributing a survey to gauge interest in alternative packaging in the near future.

Welcome New Distributors

Fiberstar is excited to welcome two new European distributors. We have just received our first orders from Alsiano, an experienced food ingredient distributor that represents Fiberstar in Denmark and Sweden. Alsiano has knowledgeable sales staff supported by a team of 5 applications specialist, each working in their area of expertise in the food industry. Casmo OY is our new distributor in Finland. Casmo OY has great experience with meat applications which will help advance some of Citri-Fi's newest and most exciting applications.

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- From the Moscow State University of Food Industry



Designed by Nature.
Enhanced by Fiberstar.™

For use in...

- Baked Goods
- Beverages
- Dairy Products
- Dressing and Sauces
- Frozen Foods
- Fruits and Vegetables
- Meats



Highlighted Applications From Around the World

Citri-Fi is being used in many products around the world. Following are four examples of food manufacturers or meat processors using Citri-Fi to accomplish different objectives with fantastic results.



Coffee Cake: Latin America

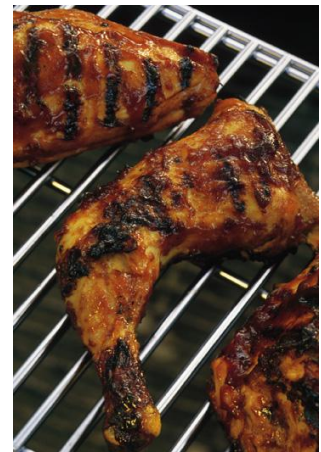
Primary Objective: Partial Egg Replacement

In Latin America a research and development laboratory for a large global bakery has had incredible success using Citri-Fi and extra water for partial egg replacement in three of their coffee cake recipes. The bakery's objective was to partially replace formula whole eggs to reduce costs, reduce water activity and improve the nutritional profile. While the bakery succeeded in all three of its objectives, it also more than doubled the shelf life of the product from 28 days to 60 days. The company is continuing to refine Citri-Fi in their products as the formula adjustments reach commercialization.

Marinated Grill Meat: Norway

Primary Objective: Increase Moistness After Cooking

Our distributor in Norway has developed a new application for the summer grilling season. Citri-Fi's ability to tightly bind and hold moisture, even during high temperature grilling, is helping improve the quality of grilled meats in Norway. Pre-marinated, ready to grill meats are a popular new convenience food. When Citri-Fi is added, these meats become easier to grill. Consumers sometimes have trouble determining when a piece of meat is fully cooked, which leads to overcooking, that can dry out, toughen and reduce the overall quality of the meat. With Citri-Fi added into the injection brine or marinade, a consumers can grill meat for a longer period of time but still maintain a moist and succulent texture. Meat processors also enjoy a yield increase because less water is lost during processing.



Fish Sausages: South Korea

Primary Objective: Reduce Formula Fat for Better Nutrition and Cost

In South Korea Citri-Fi 200 is being incorporated into fish sausages at 0.6% of total formula weight with 3.25% extra water. The addition of Citri-Fi and extra water has allowed the manufacturer to replace 50% of the total pork fat. Replacing fat has reduced costs and improved the products nutritional profile. The product binds more moisture through cooking to improve yields while characteristics such as texture and mouthfeel are also improved.

Emulsified Sausages: Thailand

Primary Objective: Improve Yield

In a frozen sausage product in Thailand Citri-Fi is added to control moisture release while thawing. Citri-Fi 200 is added at 0.25% to 0.50% of total formula weight to bind free water in the formula. Citri-Fi will improve yields and reduce costs by binding free water and oil during processing, storage, and cooking. Citri-Fi's ability to emulsify oil and water ensures great texture and mouthfeel with excellent flavor delivery.



Gluten Free Bread: USA

Primary Objective: Improve Texture and Mouthfeel, Maintain Freshness

Several bakeries in the United States are using Citri-Fi in gluten free breads to increase moisture in the product. Using Citri-Fi to bind moisture enhances the softness of the bread. The bread also stays fresher for a longer period of time because Citri-Fi prevents moisture migration by binding water more tightly than alternative ingredients. Remember, although using Citri-Fi with extra water will maintain or lower water activity Citri-Fi is not an antimicrobial or preservative. Citri-Fi's functionality makes it a great choice for gluten free formulations.



Use Citri-Fi for Emulsion Stabilization and Thickening

For Beverages, Dairy Products, Frozen Sauces, Oven Marinades, Salad Dressings and Sauces

Citri-Fi tightly binds oil and water to stabilize long lasting emulsions in a wide variety of food products. In thickening and stabilization applications, Citri-Fi often provides multiple benefits at the same time. For example in butter, layering fat and margarine, Citri-Fi is used to replace fat to improve profit margins and nutrition, and thicken and stabilize food emulsions while replacing chemical emulsifiers to improve label declarations. Following are three examples of products in which Citri-Fi is used for emulsion stabilization and thickening applications.

Mayonnaise and Dressing: South Korea

Primary Objective: Replace Synthetic Ingredients

In South Korea one customer has successfully replaced modified starch with Citri-Fi 100 FG in mayonnaise and dressing. Citri-Fi is used to stabilize and emulsify the products while improving the label declaration for the manufacturer. Citri-Fi's ability to tightly bind oil and water gives the formulation a great mouthfeel.



Ice Cream: Taiwan

Primary Objective: Replace Artificial Ingredients

An ice cream manufacturer in Taiwan is using Citri-Fi to replace artificial stabilizers in their formulation. Citri-Fi's ability to stabilize emulsions through freezing makes it uniquely suited for this all natural ice cream application. Please note the Citri-Fi logo in the lower left corner of the ice cream packaging.





Yield Comparison Study of Brine Formulas in Poultry Injection

A study was performed by an Australian poultry processor to compare the effectiveness of different brine formulations in poultry injection. The study included three brines: a salt and phosphate control brine, a brine with kappa carrageenan, and a brine with Citri-Fi combined with kappa carrageenan.

Objective

This comparison is designed to address several ingredient challenges meat processors experience in poultry injection. Many processors are interested in replacing phosphates in their injection brines to create a product that is more appealing to consumers. Kappa carrageenan is currently the most popular natural alternative to phosphates for moisture management in meat applications because of its ability to create three dimensional networks that effectively trap water. A drawback of carrageenan is that it needs to be heat activated to provide this functionality. Also, carrageenan must be used in low concentrations or it can form undesirable clumps of gel in the finished

Poultry Injection with Citri-Fi

While Citri-Fi has an unparalleled ability to bind moisture through processing, freezing, storage, and cooking, our customers have found that Citri-Fi is exceptional at reducing purge in injected meats. By reducing the purge after injection, the overall yield of the product is increased.

Purge Reduction during Processing and Improved Cooked Yield

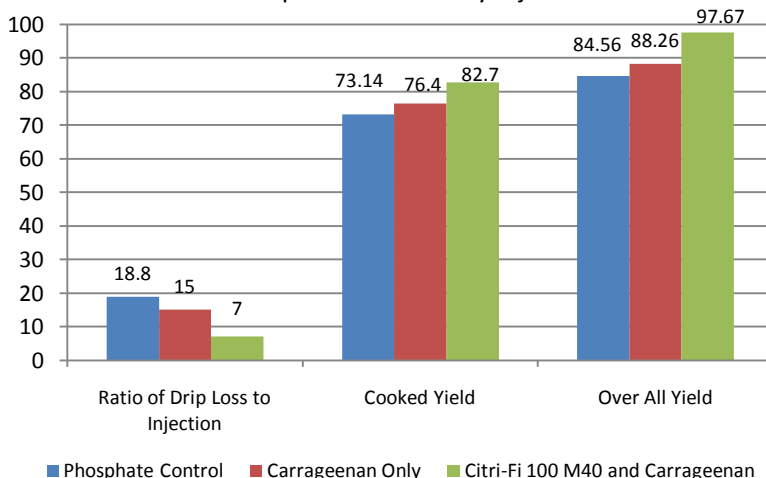
For this study 0.5% kappa carrageenan and 0.3% Citri-Fi 100 M40 (percentages are listed by the amount in the finished product) were injected into raw poultry. After injection the drip loss for the phosphate control was 18.86%, 18.92% for the test containing kappa carrageenan only, and 7.9% for the test containing both the kappa carrageenan and Citri-Fi. The samples with Citri-Fi and carrageenan also had the best cooked yield in the study.

Better Overall Yield and Cost Effectiveness

The reduction in drip and cooking loss resulted in an overall yield of 97.67% for the poultry injected with the carrageenan and Citri-Fi brine solution. By adding Citri-Fi to the brine with kappa carrageenan cooked yield improved by 10%. The Citri-Fi and kappa carrageenan injection outperformed the phosphate control by 13.1%. In addition to increased yield, Citri-Fi offers other benefits such as the ability to replace synthetic ingredients and offers cleaner flavor profile.

	Phosphate Control	Kappa Carrageenan	Citri-Fi and Kappa Carrageenan
Ingredient Cost Per Kg.	\$0.648	\$0.658	\$0.666
Total Yield	84.56%	88.26%	97.67%
Yield Adjustment Cost Per Kg.	\$0.766	\$0.746	\$0.682

Yield Comparison of Poultry Injection



Calculations

Ratio of Drip Loss to Injection:

Purge weight divided by weight of poultry immediately after injection.

Cooked Yield:

Weight of poultry after cooking divided by weight immediately before cooking.

Over All Yield:

Weight of the poultry immediately after cooking divided the weight of the poultry immediately before injection.



Use Citri-Fi to Improve Quality in Bread

Improve Profits, Quality and Nutrition

Use Citri-Fi to Increase Moistness and Eating Quality in Sandwich Bread

Bakers are using Citri-Fi to increase moistness in bread to improve yield and eating quality. For this application, Citri-Fi is added to bread recipes at 0.5% to 2.0% of the weight of flour. Extra water is added at 4 to 5 times the weight of Citri-Fi. Adding Citri-Fi and extra water will improve yields by allowing the bread to absorb more moisture without increasing water activity. The added water raises the moisture content of the bread, bound tightly by Citri-Fi, creating a product that stays fresher for a longer period of time. With the moisture tightly bound, moisture migration is inhibited to preserve freshness. Adding Citri-Fi and extra water improves nutrition by reducing the calories per serving and improves profits by reducing the cost per unit. Citri-Fi 100 FG, Citri-Fi 200 FG, Citri-Fi 100 and Citri-Fi 200 are the recommended products for increased moistness applications.

Procedure:

- 1) Add liquid ingredients to the mixing bowl followed by dry ingredients.
- 2) Using dough hook attachment on a Hobart mixer, mix at first speed for one minute and second speed for ten minutes.
- 3) Proof dough for 50 minutes at 85% relative humidity and 100° F (38° C).
- 4) Divide proofed dough into 525 g dough balls, sheet, mold, and proof to template for 50 minutes.
- 5) Bake bread at 400° F (204° C) for 16 minutes.

Ingredients	Control (kg)	Citri-Fi (kg)
Winter Patent Flour	100.00	100.00
Water (chilled)	65.00	65.00
Sugar	6.00	6.00
Yeast	3.00	3.00
Shortening / Oil	3.00	3.00
Salt	2.00	2.00
Non fat dry milk	2.00	2.00
SSL	0.15	0.15
Citri-Fi	0.00	1.00
Additional Water	0.00	5.00
Optional Ingredients		
Ingredients	Control (kg)	Citri-Fi (kg)
Dough Conditioner	0.50	0.50
Calcium Propionate	0.35	0.35



Improve Profit Margins

Adding Citri-Fi and extra water to a bread formulation will improve yield while reducing the cost per unit. See a cost analysis of oil replacement applications in our March 2010 Showcase at <http://www.citri-fi.com/pressreleases.html>.

Improve Quality

Citri-Fi and extra water can increase the moisture level of a product while maintaining a firm and pleasant texture. Citri-Fi binds moisture for a longer period of time than other ingredients to prevent moisture migration and staling. The ability to bind moisture longer than other ingredients extends shelf life. Citri-Fi is not a preservative or antimicrobial.

Improve Nutrition and Label Declarations

Citri-Fi is GRAS, non-GMO, all natural and non-allergenic. Adding Citri-Fi and extra water can reduce overall calories and fat per serving.

By: I.U. Kusova, Candidate of Engineering, G. G. Dubtsov, Doctor of Engineering, MSUFI; N.E. Shestopalova, LLC "Georgia"

In the laboratories of The Moscow State University of Food Industry, the effects of using Citri-Fi 100 products on quality in reduced fat bakery were examined. The enhanced fibers ability to emulsify oil and water makes it an ideal fat replacement product in bakery. Manufacturers use this functionality to reduce fat in their products which consequently reduces costs and improves nutrition. In the laboratories of the Moscow State University of Food Industry, we examined the effect of using Citri-Fi 100 on product quality in the preparation of reduced fat bakery. Analytical values of Citri-Fi 100 can be found in Table 1.

A standard white bread loaf formulation was used for testing. The formula used sugar and fat (margarine) incorporated at 4% of the weight of flour. The full fat reference formula used 300 g of flour, 12 g of sugar and 12 g of margarine. Two particle sizes of Citri-Fi products were tested. Standard grind Citri-Fi has greater than 95% passing 30 mesh, and fine grind Citri-Fi has 95% ± 4% passing 100 mesh. Citri-Fi was used at 0.15%(0.45 g) the weight of flour to replace 50% of the formula fat, and 0.30% (0.90 g) the weight of flour to replace all of the formula fat. Extra water was added to the formulations with Citri-Fi until the formulations matched the dough rheology of the full fat control. Table 2 shows the formulations and treatments used for the experiment. Panloaf and sole bread samples were baked and evaluated after 12 hours of cooling. Results of the analysis are presented in Table 3. The results show that total fat replacement in the bread leads to a noticeable loss of quality in the product. In the zero fat formulation the volume and porosity deceased and the stability of the shape is reduced.

The 50% reduced fat formula with 0.45 g Citri-Fi and extra water compares almost identically with the full fat reference sample. In addition, the 50% reduced fat version with 0.45 g Citri-Fi had a higher level of moisture which suggests increased yield. The zero fat samples had unacceptable sensory characteristics even when 0.90 g Citri-Fi and extra water were added. The particle size of Citri-Fi was also found to have a major effect in the sensory characteristics of the bread. The fine grind (100 mesh) fiber gave the most desirable sensory results. Concluding we should state that the orange dietary fiber product "Citri-Fi" is an efficient ingredient when used to partially replace fat in bakery products. Adding the citrus fiber at 0.15% of the weight of the flour with additional formula water allows cutting the amount of margarine in half and at the same time, ensuring high functional and sensory characteristics.

Table 1. Analysis of Citri-Fi 100 Enhanced Natural Citrus Fiber

Component	% Composition	Characteristics	Observation
Lipids	1.5	Color	Creamy
Total Carbohydrates	80.7	Odor	Neutral
Total Dietary Fiber	68.2	Taste	Neutral
Soluble Fiber	33.3	pH	4.0 - 5.0
Sugars	7.4	Grams of water held per gram of fiber	10.0 - 10.5
Proteins	8.7		
Ash	2.65		
Water	10		

Table 2. Formulations and Process Parameters

Raw Materials	Control Sample		Citri-Fi 100 Sample	
	With 100% Margarine	Without Margarine	50% Margarine Reduction	Total Margarine Replacement
Formulation				
Premium Quality Flour, g	300	300	300	300
Compressed Yeast, g	12	12	12	12
Salt, g	4.5	4.5	4.5	4.5
Sugar, g	12	12	12	12
Margarine, g	12	-	6	-
Citri-Fi, g	-	-	0.45	0.9
Water, ml	156.7	152.7	161.5	166.2
Process Parameters				
Initial Dough Temperature			32° C	
Fermentation Duration			60 min.	
Proving Duration			Until optimal	

Table 3. Physical and Sensory Characteristics

Quality Factors	Control Sample		Using Citri-Fi 100 (fine ground)		Using Citri-Fi 100 (standard ground)	
	With 100% Margarine	Without Margarine	50% Margarine Reduction	Without Margarine	50% Margarine Reduction	Without Margarine
Specific Volume, ml/g	3.77	3.23	3.76	3.2	3.5	3.0
Stability of Shape, H/D	0.60	0.58	0.65	0.43	0.43	0.40
Moisture, %	43.0	42.00	43.4	44.0	43.4	44.0
Porosity, %	77.0	73.0	77.0	73.0	74.0	73.0
Acid Value, degree	1.6	2.0	1.8	1.0	1.6	1.8