



BEST VANTAGE[®] Inc.

Strategic Food Business & Technology Solutions

Since 1995

Gluten-Free Formulation

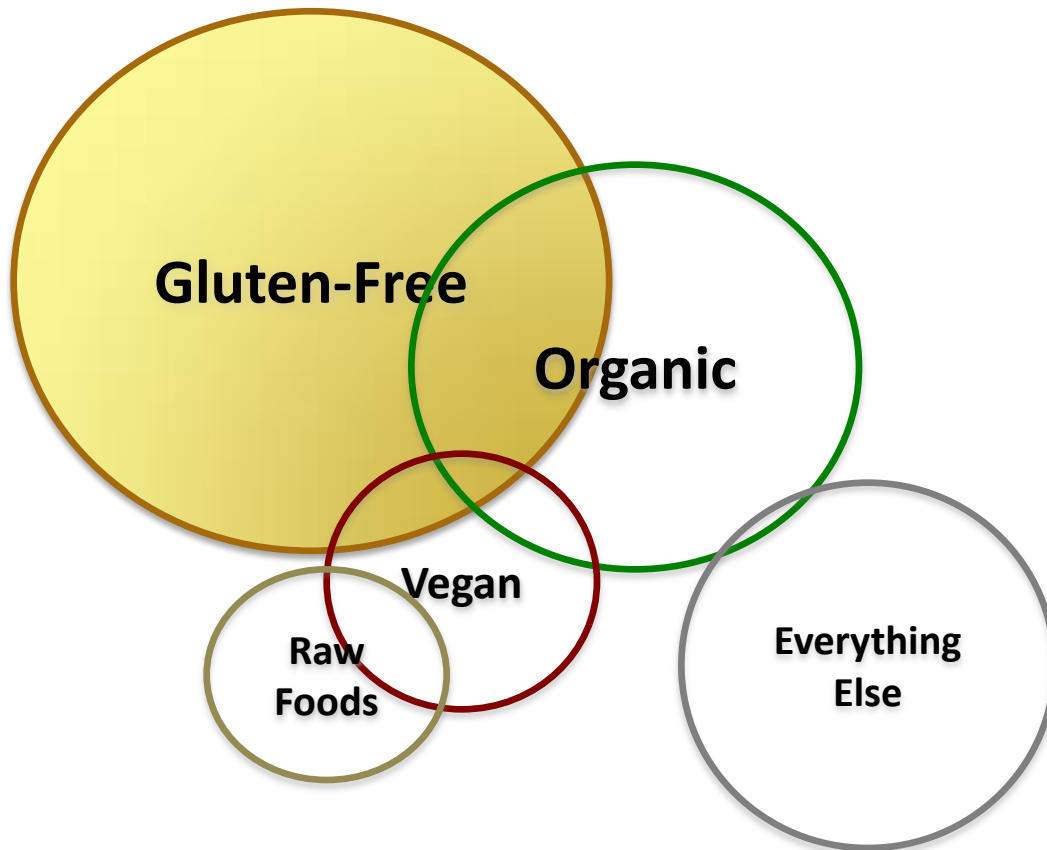
As good...or better?

Presentation for
Chicago Section IFT & Mintel Technical Breakfast Meeting
April 3, 2014

Presentation Agenda

- ❑ **Gluten-free foods: here to stay?**
- ❑ Reinventing foods
- ❑ Better than conventional

What I Saw At NPE-WEST 2014



Gluten-Free Foods: Here To Stay?

- ❑ Celiac disease is a very real disease condition.
- ❑ Wheat is a serious allergen.
- ❑ Food is a family affair.
- ❑ Sympathy pains
- ❑ Consumer logic
- ❑ True believers

“It is startling to realize how much unbelief is necessary to make belief possible.” — Eric Hoffer

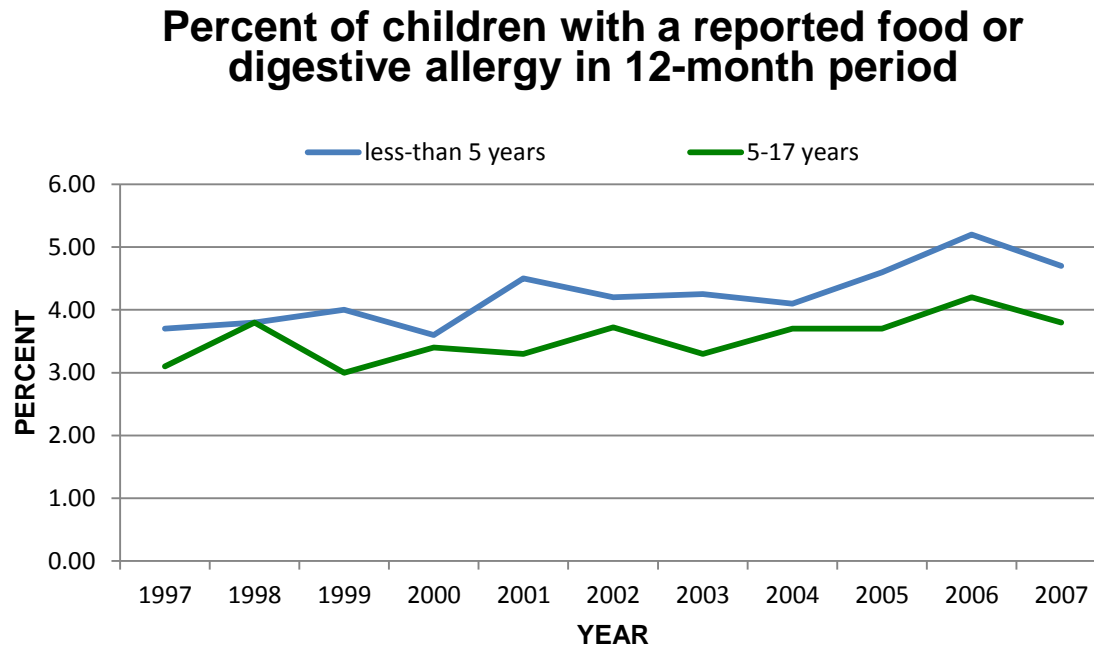
Why Gluten-Free and Allergen-Averse Products?

U.S. Food Allergen Labeling and Consumer Protection Act of 2004 (FALCPA)

FALCPA passage was based on estimates that **eight major food allergens** account for 90% of all food allergies:

- Milk
 - Eggs
 - Fish
 - Crustacean shellfish
 - Tree nuts
 - Peanuts
 - **Wheat**
 - Soybeans
- FALCPA required all foods to clearly identify all ingredients that contained one or more of the identified allergens.
 - **In 2013**, the FDA established a gluten limit of 20 ppm in order to make a “gluten-free” claim.
 - Some disagree.

Why Gluten-Free and Allergen-Averse Products?

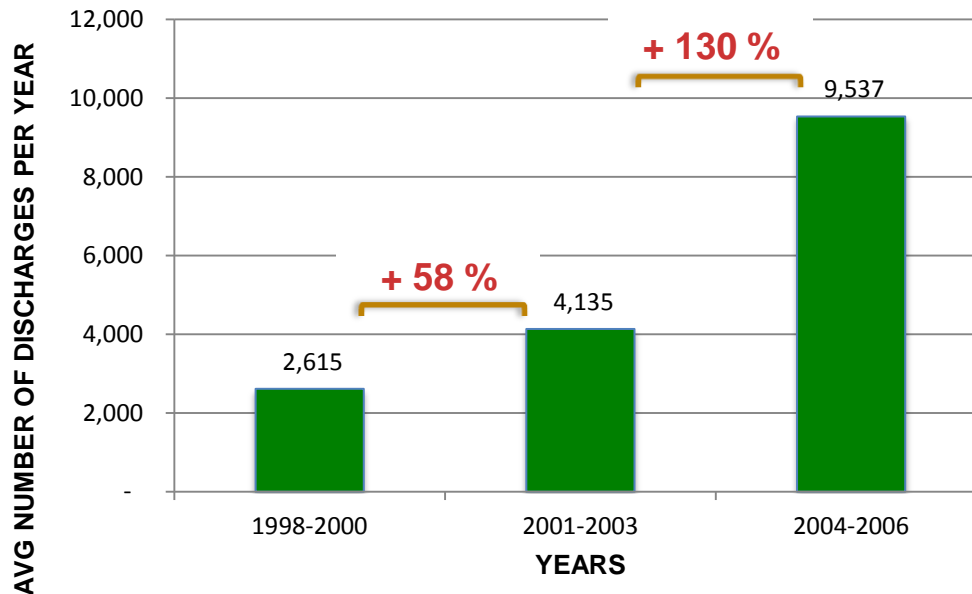


The incidence of food allergies in children has been trending steadily upwards.

Adapted from : Branum A, Lukacs S. Food allergy among U.S. children: Trends in prevalence and hospitalizations. National Center for Health Statistics Data Brief. 2008. Retrieved from <http://www.cdc.gov/nchs/data/databriefs/db10.htm>

Why Gluten-Free and Allergen-Averse Products?

Average Number of Hospital Discharges per Year
children under 19 with food allergy-related diagnoses



In 2004, The U.S. Congress stated in its FALCPA introduction that...

...“millions of Americans” suffer food allergy reactions every year,

...leading to 30,000 hospitalizations

...and 150 deaths per year.

Hospitalizations of children for food allergy-related problems have increased exponentially.

Adapted from : Branum A, Lukacs S. Food allergy among U.S. children: Trends in prevalence and hospitalizations. National Center for Health Statistics Data Brief. 2008. Retrieved from <http://www.cdc.gov/nchs/data/databriefs/db10.htm>

Gluten-Free Foods: Here To Stay?

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How Big Is The Gluten-Free Market Opportunity?

IF YOU INCLUDE:

- Retail market scanning data
- Walmart (about 15% of all retail food and foodservice sales)
- Trader Joe's
- Restaurant /food service
- Store brands
- PLU (coded-entry sales)
- Multilevel marketers
- Internet Sales
- Other



BEST VANTAGE Inc. estimates the current gluten- and allergen-free market size at \$10 - 15 billion with a potential to reach **\$70 billion** by 2020.

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- ❑ Gluten-free foods: here to stay?
- ❑ **Reinventing foods**
- ❑ Better than conventional

A Working Premise

**THERE IS NO REASON WHY
GLUTEN-FREE AND ALLERGEN-AVERSE FOODS
CANNOT BE AS GOOD OR BETTER THAN CONVENTIONAL
GLUTEN-CONTAINING PRODUCTS!**

Gluten in Foods

Gluten Sources

Wheat



Rye

Barley

Cross-contaminated grains

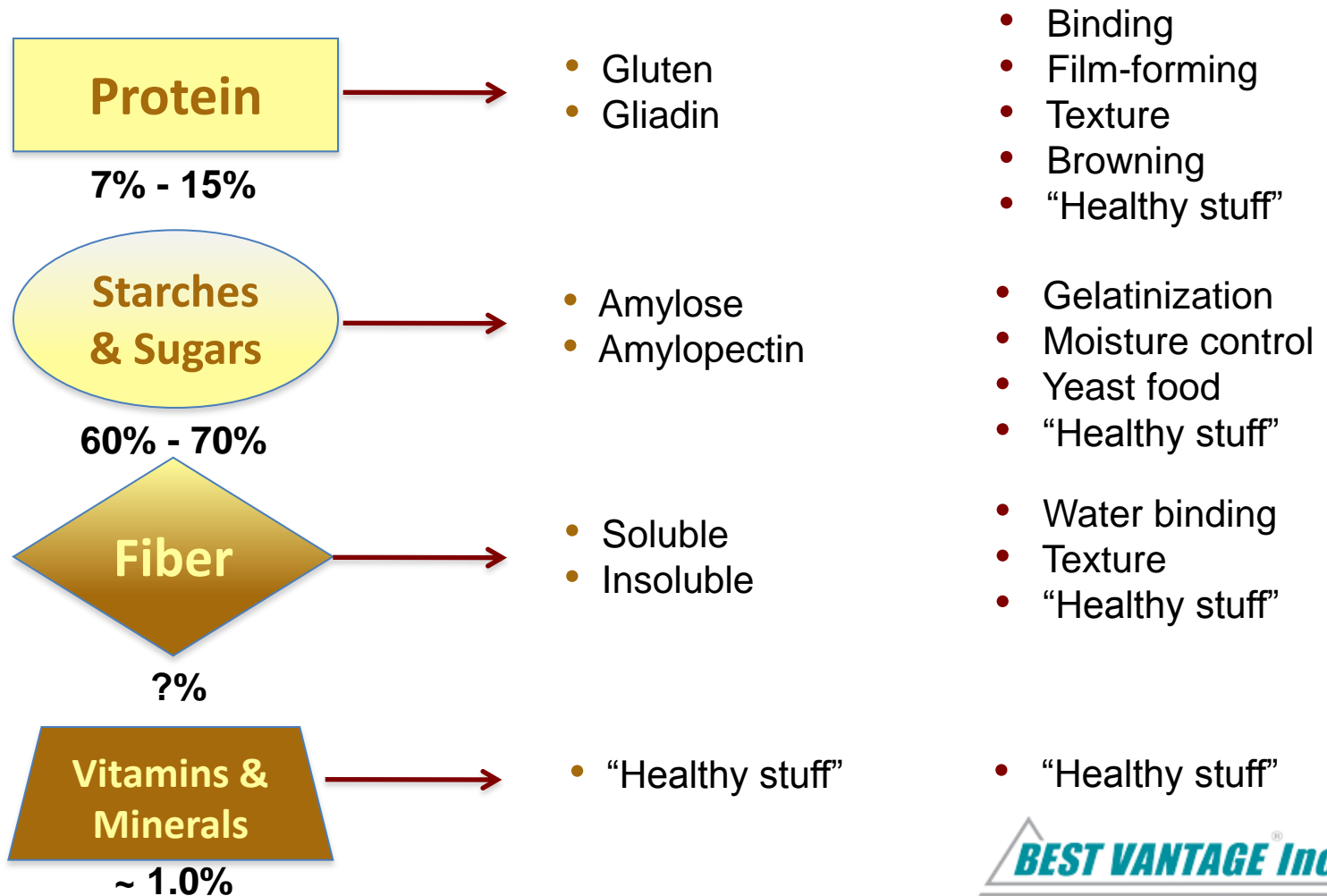
Ancient Varieties & Hybrids

- Einkorn
- Emmer
- Kamut
- Red Fife
- Triticale
- Other hybrids

Sources of Cross-Contamination

- Field contamination (volunteers)
- Harvesting, storage and transportation
- Manufacturing-related cross-contamination

Functionally, What Is Wheat Flour?



The Importance of Nutritional Parity

1. Wheat flour is one of the most important venues of vitamin and mineral enrichment in the U.S. diet.
2. By replacing wheat, gluten-free/allergen-averse products risk making themselves vulnerable to claims of being nutritionally inferior to wheat-containing products.
3. We recommend **additional fortification and enrichment**, as needed.



Gluten-Free & Allergen-Averse Formulation

Major Food Allergens

- Milk
- Eggs
- Fish
- Crustacean shellfish
- Tree nuts
- Peanuts
- Wheat
- Soybeans

Some Food Ingredient Alternatives

The development of lighter alternatives products has incentivized the introduction of many new, interesting and exciting ingredients into the U.S. food supply.

- Corn flour
- Oat flour
- Potato flour
- Pulse flours
 - Rice flour
 - Sweet potato flour
 - Tapioca flour
 - Millet
 - Quinoa
 - Sorghum
 - Teff
 - Corn, pulse, tapioca and other starches
 - Pulse and other proteins
 - Xanthan gum

Gluten-Free & Allergen-Averse Formulation

The most important ingredient of them all...



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The Functionality of Pulse Ingredients

PULSE COMPOSITION [g/100g]

Food Reference	Protein	Fat	Starch & Sugars	Fiber
Beef ¹	77.5	8.6	0.0	0.0
Whole Soy Flour - Raw	35.0	20.0	25.6	9.6
Dry Peas	23.7	1.3	45.5	16.6
Regular Lentils	26.3	1.1	45.0	13.6
Chickpeas	24.4	5.9	41.1	8.7
Whole Wheat	13.2	2.5	61.3	10.0
Whole Rice Flour	5.6	1.4	77.7	2.4
Tapioca Flour	0.2 [†]	0.0	87.8	0.9

¹ Whole Chuck, 10% moisture basis

Sources: Canadian Grain Commission; U.S. Dept. of Agriculture-ARS; Cho, S., Prosky, L. and Dreher, M. Complex Carbohydrates in Foods, 1999, Marcel Dekker, Inc., New York, NY.

Plus...

- Superior amino acid profile
- Vitamins
- Minerals
- Low-Glycemic Index
- Non-GMO

Gluten-Free Shortbread

INGREDIENTS: Gluten-Free Flour (tapioca flour, rice flour), Sugar, Butter, Eggs, Salt, Baking Soda, Flavor, Xanthan Gum.

Replacement of 30% of a gluten-free blend of tapioca and rice flours with lentil flour resulted in:

- Increased **protein** from 1g to 2g per 30g serving.
- Increased **Total Dietary Fiber** from 0g to 2g per-30g serving.

Nutrition Facts			
Serving Size (30g)			
Servings Per Container			
Amount Per Serving			
Calories	120	Calories from Fat	45
% Daily Value*			
Total Fat	5g		8%
Saturated Fat	3g		15%
Trans Fat	0g		
Cholesterol	25mg		8%
Sodium	55mg		2%
Total Carbohydrate	19g		6%
Dietary Fiber	0g		0%
Sugars	6g		
Protein	1g		
Vitamin A	4%	Vitamin C	0%
Calcium	0%	Iron	0%
*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:			
	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Saturated Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g
Calories per gram:			
	Fat	9	Carbohydrate 4 • Protein 4

Nutrition Facts			
Serving Size (30g)			
Servings Per Container			
Amount Per Serving			
Calories	120	Calories from Fat	45
% Daily Value*			
Total Fat	5g		8%
Saturated Fat	3g		15%
Trans Fat	0g		
Cholesterol	25mg		8%
Sodium	55mg		2%
Total Carbohydrate	18g		6%
Dietary Fiber	2g		8%
Sugars	6g		
Protein	2g		
Vitamin A	4%	Vitamin C	0%
Calcium	0%	Iron	4%
*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:			
	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Saturated Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g
Calories per gram:			
	Fat	9	Carbohydrate 4 • Protein 4

Gluten-Free and Allergen-Averse Formulations

Gluten-Free Pasta

Examples of gluten-free pasta ingredient statements:

[INGREDIENTS: Corn Flour; Rice Flour, Mono & Diglycerides]

[INGREDIENTS: Organic Rice Flour; Organic Rice Starch; Organic Potato Starch; Organic Soy Flour]

[INGREDIENTS: Rice Flour; Rice Bran Extract]

[INGREDIENTS: Lentils; Water]



Gluten-Free Pasta

CONVENTIONAL

Nutrition Facts	
Serving Size 2 oz (56g - about 1/8 box)	
Servings Per Container about 8	
Amount Per Serving	
Calories 200	Calories from Fat 10
% Daily Value*	
Total Fat 1g	2%
Saturated Fat 0g	0%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 0mg	0%
Total Carbohydrate 42g	14%
Dietary Fiber 2g	8%
Sugars 2g	
Protein 7g	
Vitamin A 0% • Vitamin C 0%	
Calcium 0% • Iron 10%	
Thiamin 35% • Riboflavin 15%	
Niacin 15% • Folate 30%	
* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:	
Calories:	2,000 2,500
Total Fat	Less than 65g 80g
Sat Fat	Less than 20g 25g
Cholesterol	Less than 300mg 300mg
Sodium	Less than 2,400mg 2,400mg
Total Carbohydrate	300g 375g
Dietary Fiber	25g 30g
Calories per gram:	
Fat 9 • Carbohydrate 4 • Protein 4	

GLUTEN-FREE

Nutrition Facts	
Serving Size 3 oz (85g)	
Servings Per Container 4	
Amount Per Serving	
Calories 310	Calories from Fat 10
% Daily Value*	
Total Fat 1g	1%
Saturated Fat 0g	0%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 10mg	0%
Total Carbohydrate 56g	19%
Dietary Fiber 13g	54%
Sugar 6g	
Protein 21g	
Vitamin A 0% • Vitamin C 2%	
Calcium 20% • Iron 40%	
Vitamin D 0% • Thiamine 20%	
Riboflavin 15% • Niacin 8%	
Vitamin B6 10% • Folate 30%	
Vitamin B12 0% • Zinc 25%	

With Gluten-Free Formula:
[RACC* serving size: 55g]

	Conventional	Gluten-Free
Calories	200	204
Total Fat	1 g	1 g
Sodium	0 gm	7 mg
Total CHO	42 g	37 g
Dietary Fiber	2 g	9 g
Protein	7 g	14 g
Thiamin	35%	13%
Niacin	15%	5%
Riboflavin	15%	10%
Folate	30%	20%

Plus...

An Excellent Source of Protein

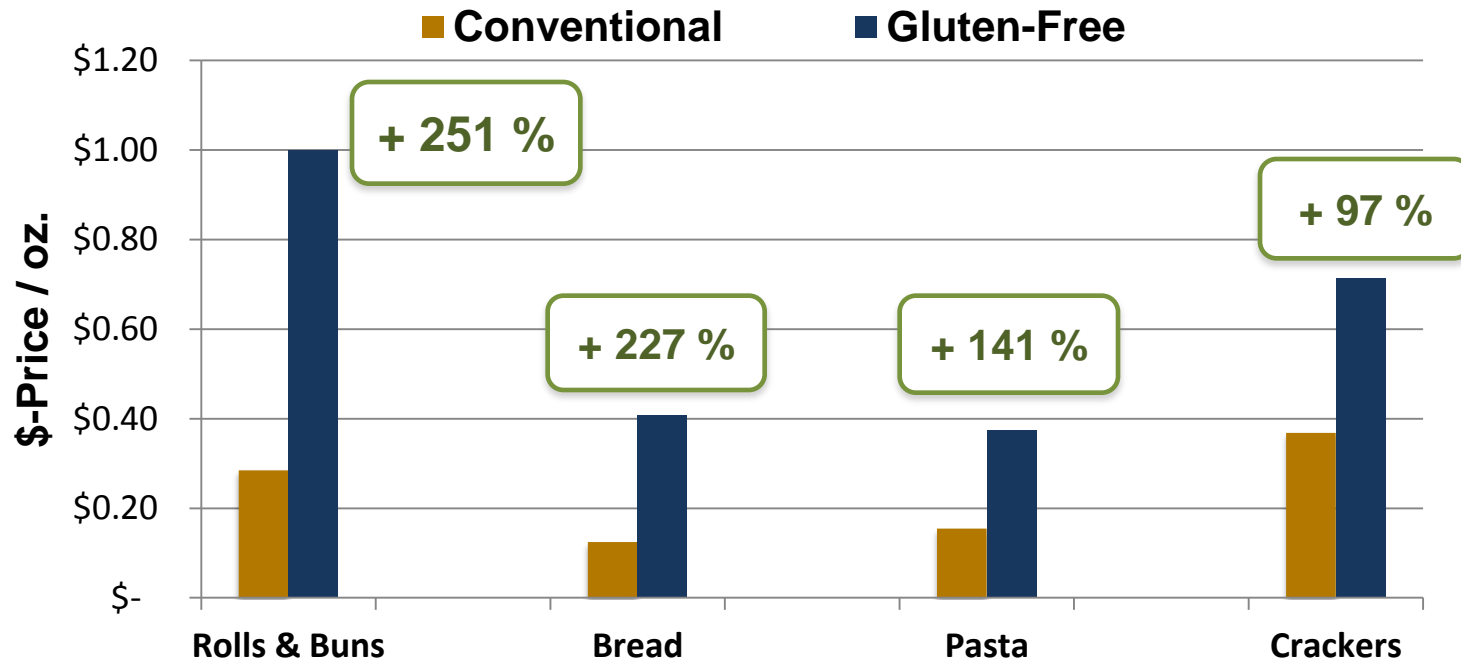
An Excellent Source of Fiber

* USDA "Reference Amount Customarily Consumed"



For Now, Gluten Free = Premium Price

Gluten-Free Price Premiums



Based on random retail store checks conducted by BEST VANTAGE Inc. in the Chicago metropolitan area during May 2013.

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Why “Gluten-Free” is Here to Stay

CONCLUSIONS

1. Gluten-free foods are here to stay: the market for gluten-free and allergen-free foods will continue to expand rapidly.
2. Through understanding the functionality of specific food ingredients and their components, gluten-free foods can be made “as good” or “better” than conventional gluten-based foods.
3. Gluten-free food demands provide opportunities to make foods more nutritional (i.e., “better”) than ever.

QUESTIONS?



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