



## EVENT AGENDA - TIA EUROPE 2018 AMSTERDAM

Hotel Casa, Amsterdam Holland



### Day 1 - Thursday Sep 6th

Times	SESSION	SPEAKER
0815-0830	Opening remarks, event overview and TIA overview	Jim Kabbani, TIA
0830-0915	European Market Overview	Florencia Moreno, Innova
0915-1000	Wheat flour characteristics and quality	Arnaud Dubat, Chopin
1000-1100	Tortilla Processing Machinery Design Philosophy: Panel with Views of 4 Leading Equipment Manufacturers	Scott Ruhe with JC Ford, Alfredo Juarez with Casa Herrera, Dave Rodriguez with Lawrence Equipment, Bobby Kane with Heat & Control
1100-1145	Effect of Enzymes on Tortillas	Shima Agha, Allied Blending
1145-1230	Best Practices in Food Safety & Sanitation	Andres Rodriguez Luzano
1230-1330	LUNCH	
1330-1415	EU Food Regulations Update	Andres Gavilan, AFCA
1415-1500	Problem solving & troubleshooting in Tortilla production	Joe Desiderio, Corbion Caravan
1500-1545	Flour Issues That Appear During Production & How to Prevent Them	Gabor Nagy
1545-1630	Gluten Free Formulation	Lone Baek, Dupont
1630-1800	Cocktail & Tabeltop Exhibits Reception	
1800-2000	Optional - Canal Boat Tour of Amsterdam with Dinner (included in registration fees)	

### Day 2 - Friday Sept 7th

Times	SESSION	SPEAKER
0800-0845	Innovative ingredients for tortillas	Mercede Pinol, Balchem
0845-0930	The Effect of Processing Parameters on Tortilla Properties	Joe Desiderio, Corbion Caravan
0930-1015	Making Tortillas for Eastern Europe Market - Problems & Solutions	Tijana Lopicic Vasic, DIJO
1015-1100	Gluten-Free : Market Opportunities, Nutrition & Formulation'	Paul Hart, Elm Lea Partners
1115-1145	Depart on Bus for Intralox Facility Visit - NEW!	Intralox Facility
1145-1230	Intralox Facility Tour - Commercial Food Sanitation	Intralox Facility
12:30-1300	Intralox Facility Tour - Commercial Food Sanitation	Intralox Facility





# **Tortilla Industry Association**

**Hotel Casa, Thursday 6 & Friday 7 September 2018**

## **Going Free-From & Clean Label**

**Capitalising on Gluten-Free Market Opportunities**

**– Nutrition and Formulation –**

-:

Paul Hart – Elm Lea Partners: Ingredient Market Development Solutions

# Paul Hart – Elm Lea Partners Ltd.

## Ingredient Business Development Consultancy

- **Savannah Nutrition Ltd.** – Oils & Fats ‘Free-From’ palm applications
- Manages **Gluten-free from & Clean Label Innovation Network** on LinkedIn
- **Member Informa / UBM Advisory Board - FiE, HiE...**



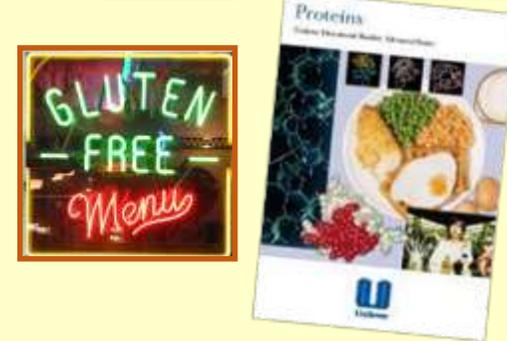
- **AVEBE** – Introduced **Solanic** Potato Protein – across food & nutrition sectors
  - Global Application Technology: Pioneering applications; & USPs
  - Market Manager: Nutrition – Beverages & **Bakery** (Gluten-Free)
- Business Development partnership projects (multi-Million €)

- **Nutraceuticals Ltd.** – Innovation Director

- Diet Health & Wellness Platforms
  - Mineral & Vitamins: RTD Sport beverages
  - Nutritional fats [omega-3] supplemented RTD & Bakery

- **Unilever R&D Colworth** – Ice Cream & Dairy

- Biopolymers Group: ‘blue sky’ R&D
- Corporate Relations
  - Stakeholder relations: CSR; Issues Management GMO



# Agenda

- **Consumer Trends:**
  - Natural, 'Clean Label', 'Free From' etc.
- **Market:**
  - Towards Convenience Fresh Gluten-Free
- **Bakery Product Review: International**
  - Bread & Tortilla
- **Bulk Ingredients:**
  - A Note on: Starch, Protein (& Fat)
- **5 Major Quality Aspects: Formulation Perspective**
  - Water Content & 'Free From' Functional Proteins
- **Production-eering**
  - Cost control
- **Features & Benefits**





# Uncertain World

- Civil Disorder ...
- Brexit; Trump
- Natural Disaster

• Google Search: 'Syria' - Images

<http://www.bbc.co.uk/news/world-middle-east-35806229>

• Google: 'Syria + food' - Images

<http://www.pilotguides.com/articles/syrian-food-four-courses-of-heaven/>



Someone Once Said ...

***“ Food First then Morality ”***

***Bertolt Brecht (1898-1956)***

*German dramatist, poet. "What Keeps Mankind Alive?"*

*Act 2, sc. 6, The Threepenny Opera.*

**YOU ARE  
WHAT  
YOU EAT**



# Trend Definitions

- **Natural:** No regulatory definition anywhere
  - but we *all* know what it means
- **Organic:** fits with ...
- **'Clean Label':** No E-numbers; nothing incomprehensible
  - 5 ingredients: Innocent
- **'Free-From':** *Next slide*
- **Plant Based = Vegan** without activism



- **Defining 'Natural':**
    - '... *Real food does not come in a box, and no-one should have to tell you real food is naaa-tural you should know that when you look at it!*' ...
    - Sarah Hallberg at 12:20 in 'Reversing Type 2 diabetes starts with ignoring the guidelines'
- TEDxPurdueU <https://youtu.be/da1vvigy5tQ>

# Free-From

... means no food allergens: **14 EU**  
(or intolerances)

**Celery**

**Crustacea**

**Egg**

**Fish**

**Lupin**

**Milk (Lactose)**

**Mustard**

**Peanuts**

**Sesame Seed**

**Soy**

**Tree Nuts:** Almond, Cashew, Hickory,  
Pistachio, Walnut

**Wheat**

Plus:

- No E-Numbers
- No colourants
- No MSG
- No GMO
- **Palm Free: *Iceland***
- **Sugar Free**



# UK: New Out-of-town Shopping Retail Park

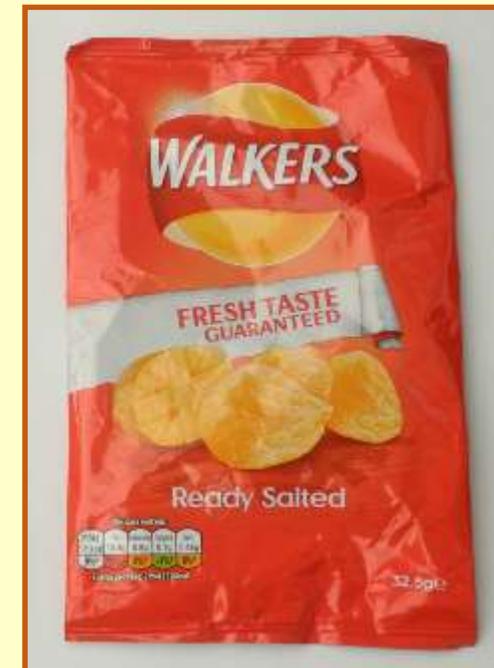


- Prevalence of Free-From Ed's Easy Diner – Elliott's Field, Rugby

# Even Free-From Crisps ...!?!



- **Free-from Packed Lunches**  
From college catering facility:
  - most got regular crisps
  - free-from got 'Gluten-Free' Crisps  
*Gluten, Dairy & Egg Free*



# Free-From: Simple 20 Cent Sauce Sachet

**ALLERGY ADVICE:** now reaches all products

May Contain (gratuitous catch-all):-

- Nuts; Peanuts; Sesame Seeds
- Mustard
- Celery
- **Wheat; Barley**
- Fish; Eggs; Soybeans; Milk
- Sulphites
- **and Cereals Containing Gluten**

**Ingredients:** Water; Glucose-fructose Syrup; Tomato Paste 15%; Modified Maize Starch; Salt; Acidity Regulators (E260, E330); Preservative (E202); Tomato Ketchup Spice.



# Also Drive for 5: 'Clean Label'



Spot the difference



**INGREDIENTS DECLARATION**

Tomatoes  
Onions  
Herbs  
E200 Sorbic acid  
E202 Potassium sorbate  
E203 Calcium sorbate  
E210 Benzoic acid  
E211 Sodium benzoate  
E212 Potassium benzoate  
E213 Calcium benzoate  
E214 Ethyl p-hydroxybenzoate  
E215 Sodium ethyl p-hydroxybenzoate  
E218 Methyl p-hydroxybenzoate  
E219 Sodium methyl p-hydroxybenzoate  
E220 Sulphur dioxide  
E221 Sodium sulphite  
E222 Sodium hydrogen sulphite  
E223 Sodium metabisulphite  
E224 Potassium metabisulphite  
E226 Calcium sulphite  
E227 Calcium hydrogen sulphite  
E228 Potassium hydrogen sulphite  
E230 Biphenyl; diphenyl  
E231 Orthophenyl phenol  
E232 Sodium orthophenyl phenol  
E234 Nisin  
E235 Natamycin  
E239 Hexamethylene tetramine  
E242 Dimethyl dicarbonate  
E249 Potassium nitrite  
E250 Sodium nitrite  
E251 Sodium nitrate  
E252 Potassium nitrate  
E260 Propionic acid  
E281 Sodium propionate  
E282 Calcium propionate  
E283 Potassium propionate

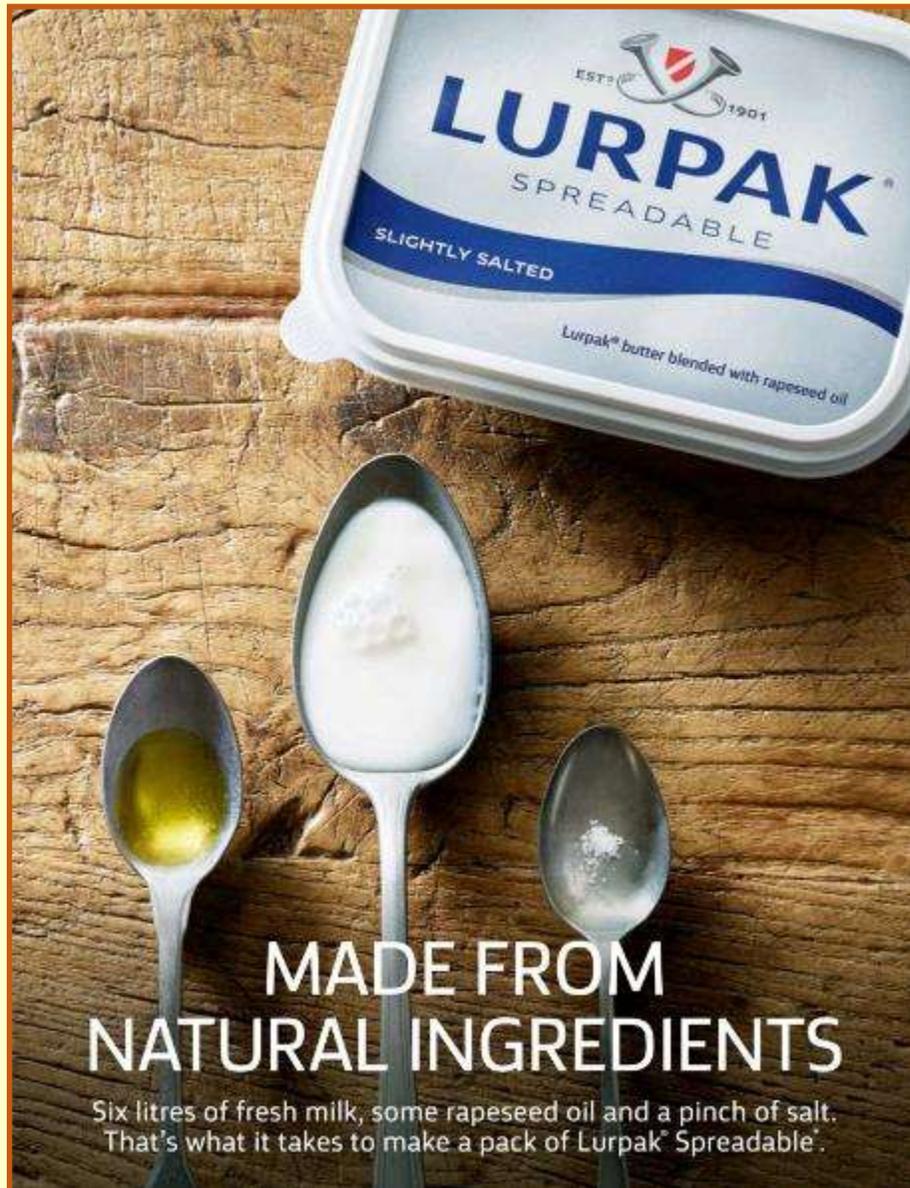


**INGREDIENTS DECLARATION**

Tomatoes  
Onions  
Herbs  
Vegetable extract

**M-DATEM**  
Mono- and Diacetyl  
Tartaric Acid Esters of  
Mono-and Diglycerides of  
Fatty Acids

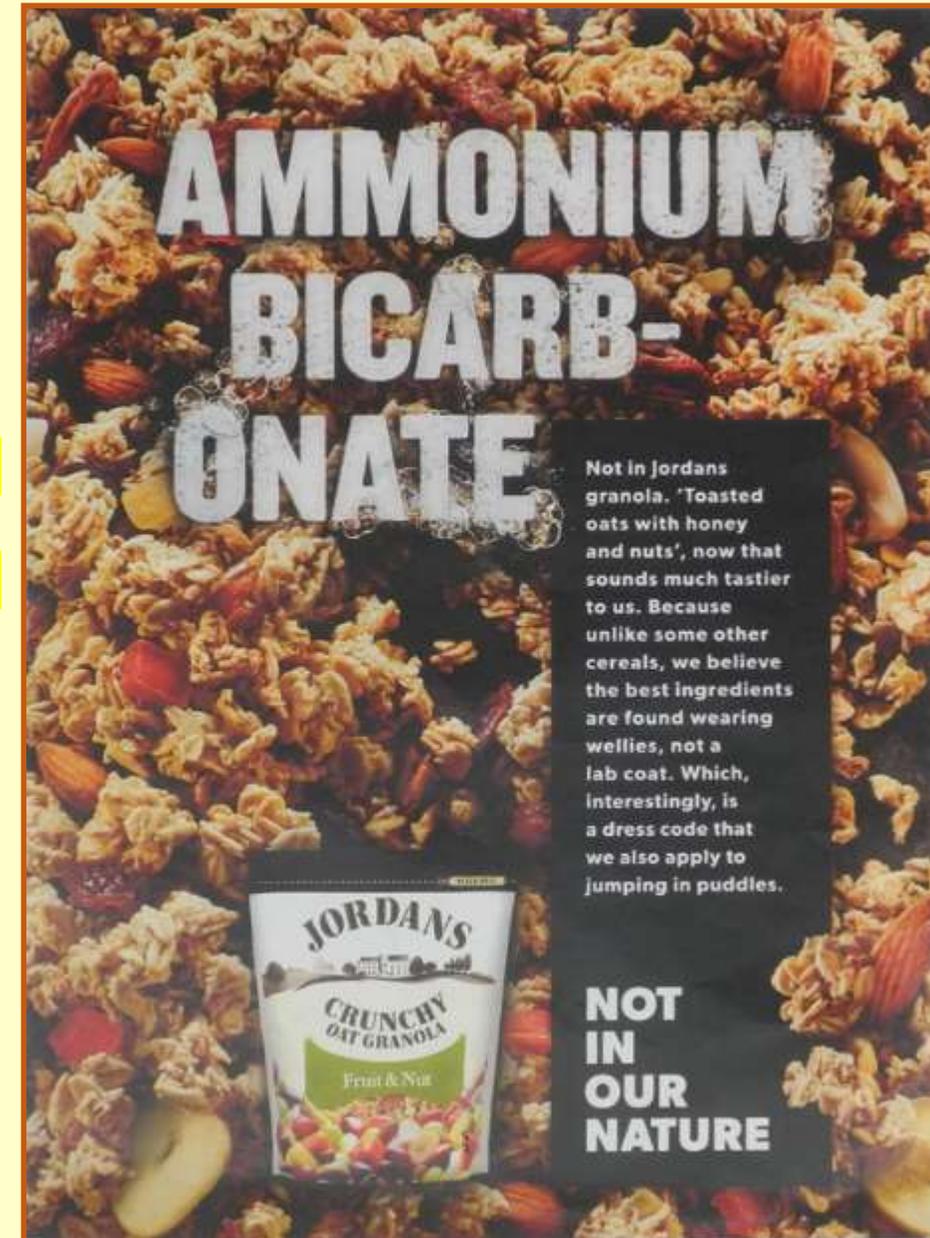
# Other Consumer Trends: Rule of 5 + 'Natural'



**JORDANS: ABSOLUTELY NOTHING ARTIFICIAL**  
*We never add any **salt** or **artificial additives** like **preservatives** or **colourings**, nor do we fortify our ingredients with **vitamins** and **minerals**. **So we'll never use sulphur dioxide or anything you can't pronounce or picture what it looks like**. We choose our ingredients because they have all of this goodness naturally, so why would we need to manufacture it or add it in artificially?*

<https://www.jordanscereals.co.uk/about/our-ingredients/absolutely-nothing-artificial>

Advert DT Style July 2016



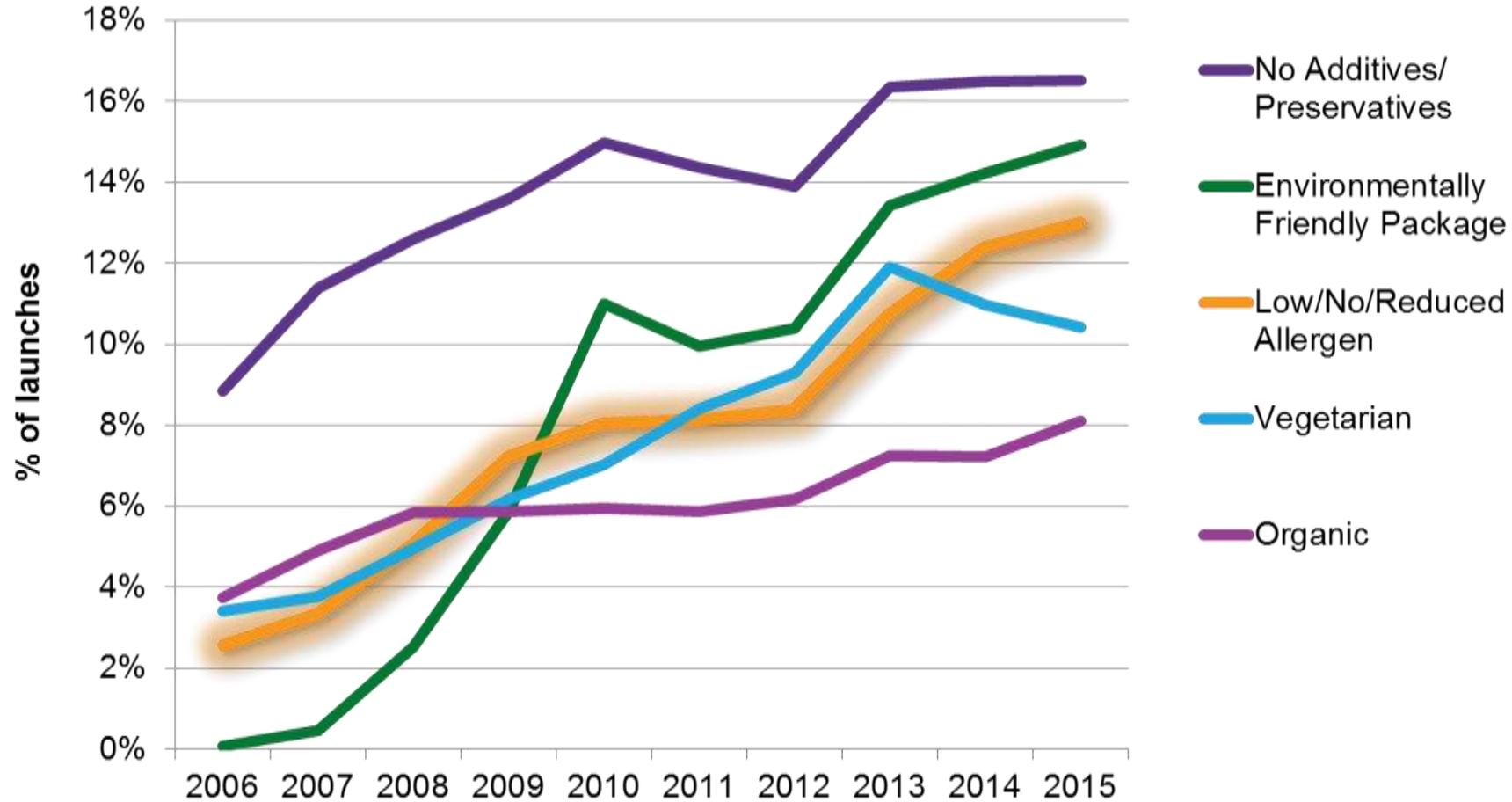
# 'Free From' Bakery The Market

- Convenience Fresh Products  
UK since c. 2010



# The Rapid Rise of Allergen-free Products in Food & Drink NPD

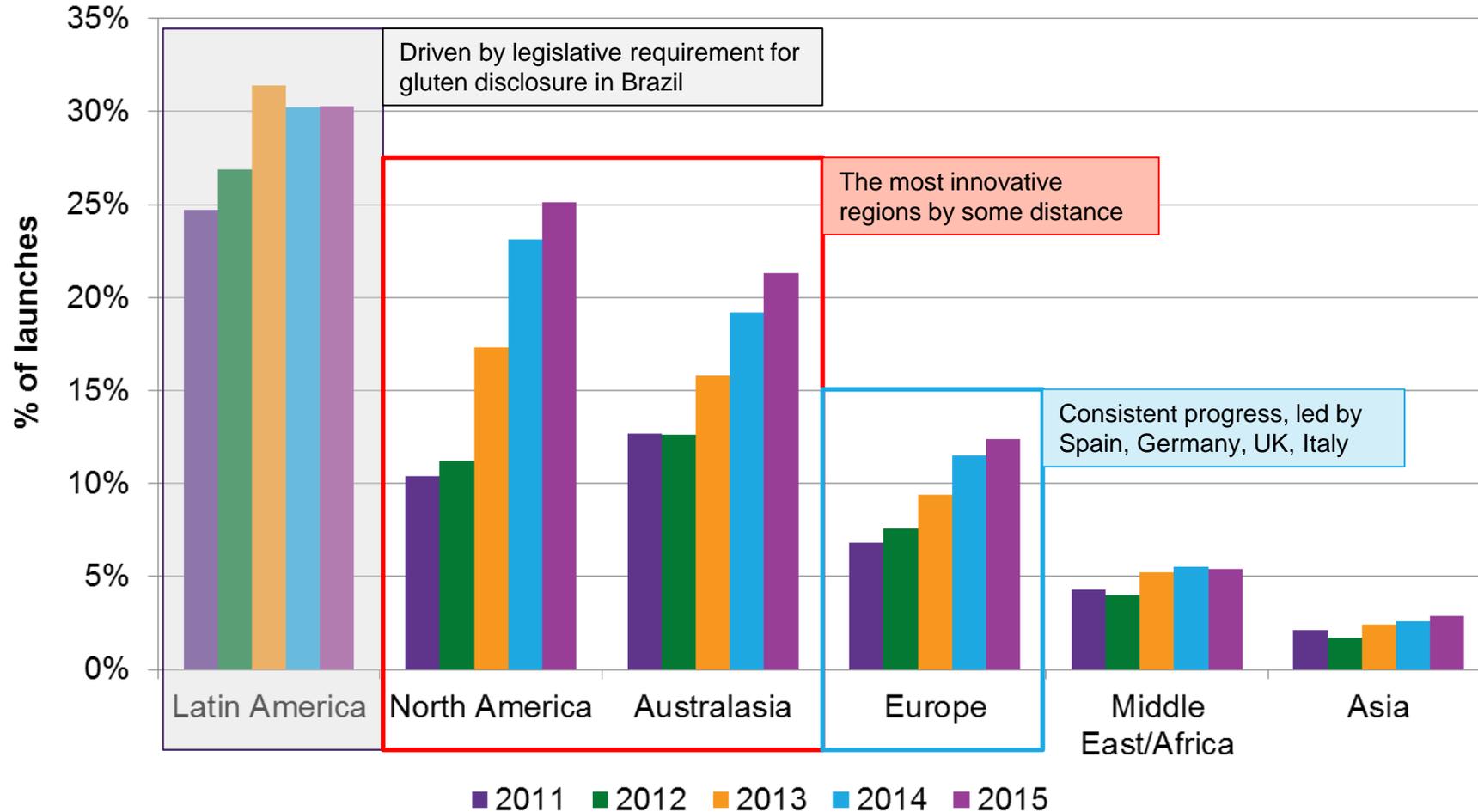
Fastest rising claims in food & drink product launches, Top 5 – Global



2015 is Jan-Sept  
Source: Mintel GNPD

# NPD penetration by region – N. America & Australasia most active

Low/No/Reduced Allergen claim penetration in food & drink launches - per region

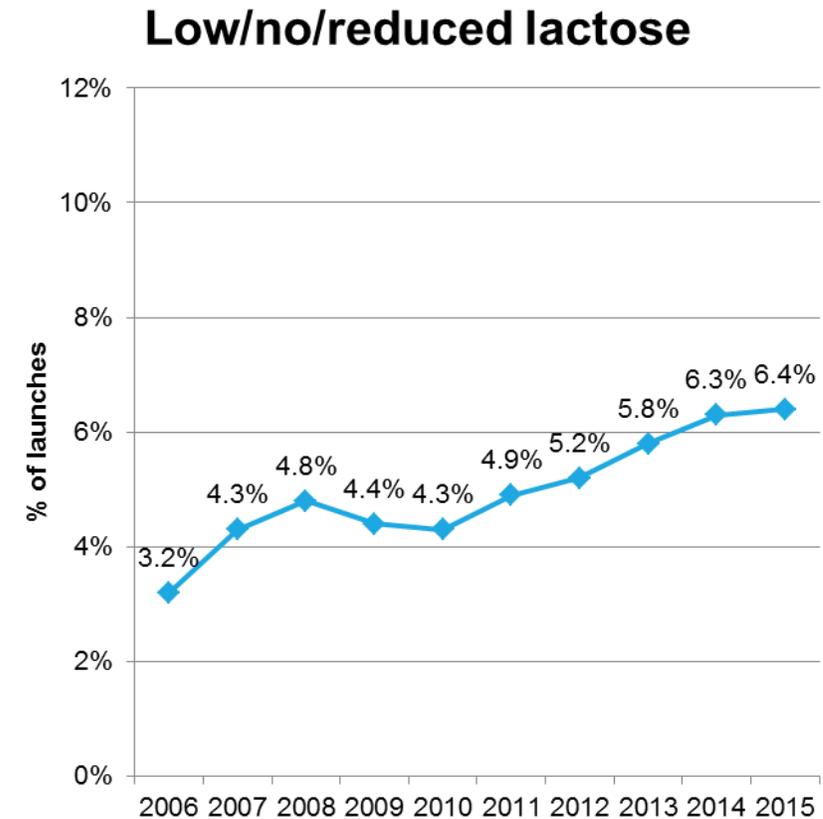
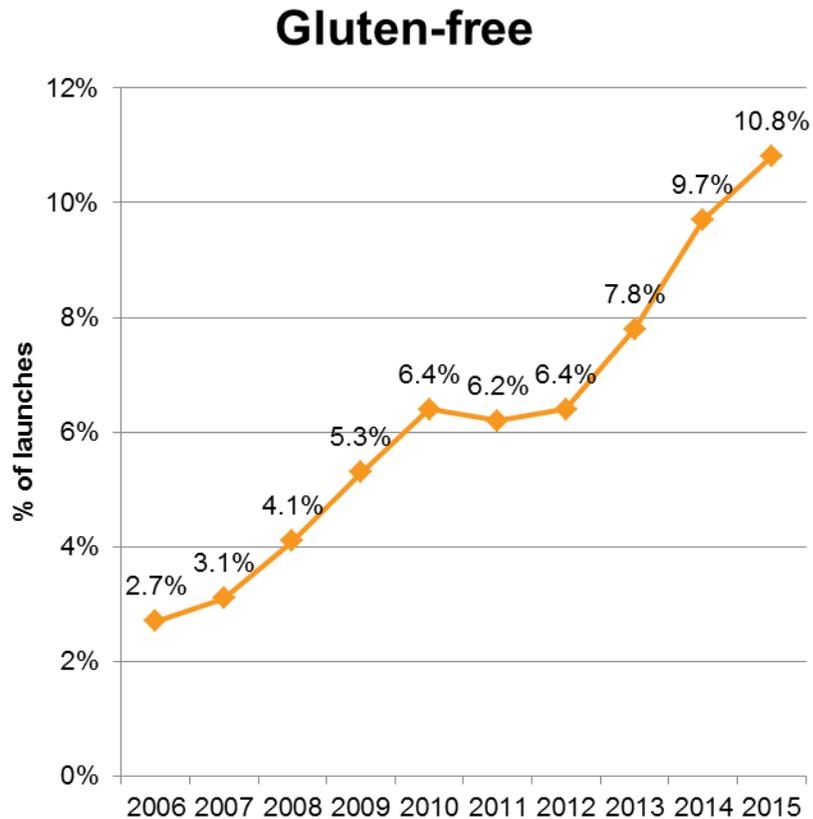


2015 is Jan-Sept  
Source: Mintel GNPD



# Gluten-free and Lactose-Free Progression in NPD

% of new food product introductions\*, global, labelled as gluten-free or low/no lactose



2015 is Jan-Sept; \*Note: gluten-free only covers bakery, cereals, snacks, pasta & noodles; low/no lactose only covers dairy, dairy substitutes & desserts

Source: Mintel GNPD

# US: by far largest market for gluten-free & dairy alternatives



## Gluten-free food & drink

**\$8.8 bn**

market value in 2014

**62%**

value growth forecast 2014-2017

**25%**

of adults said they eat gluten-free versions of food in June 2015, compared to 22% in June 2014

## Non-dairy milk

**\$1.7 bn**

market value in 2014

of which \$1.1bn is almond milk

**46%**

value growth forecast 2014-2017

**30%**

of adults in 2015 said they personally consume almond milk, 23% soy, 15% lactose-free cow's milk, 14% rice milk

# UK Less Dynamic (than US), but still a Fast Growing Market



- Total UK free from market valued at £365m in 2014, forecast to grow by 50% by 2019
- Both the dairy-free and gluten-free segments continue to record impressive growth (both seeing 15% growth between 2013 and 2014)



Gluten/wheat-free:  
£184m in 2014  
+15.0% on 2013

Dairy/lactose-free:  
£181m in 2014  
+15.3% on 2013

Three in 10 bought or eaten free-from food in the six months to June 2014, with gluten-free and dairy substitutes the most commonly purchased/eaten – by 18% & 17% respectively

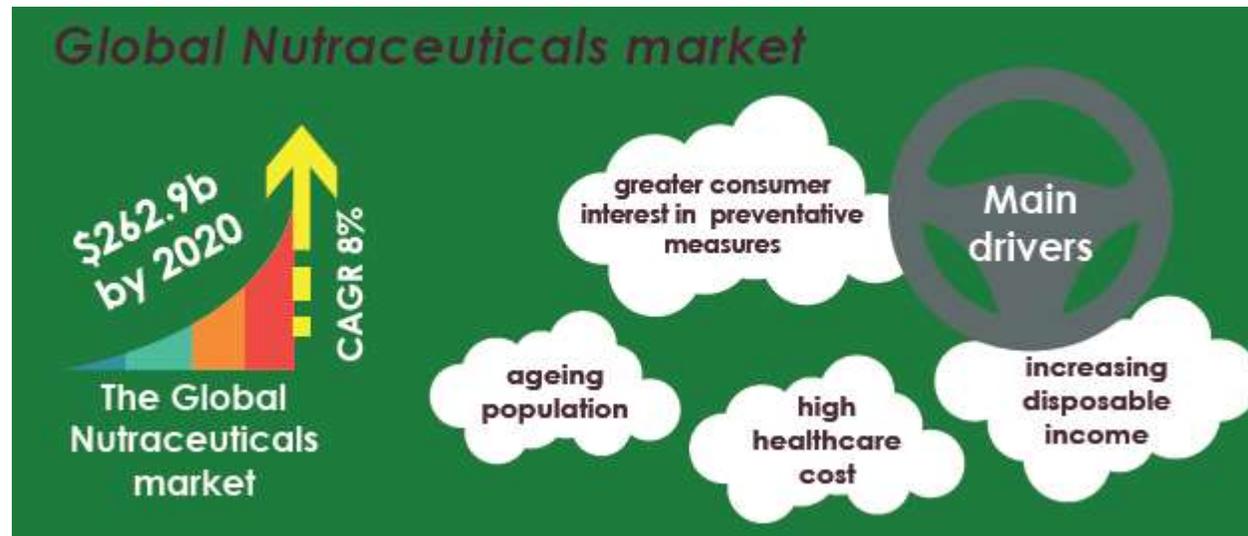
*Excludes prescription sales*  
Source: Mintel Reports (based on IRI/Mintel)

# Market Insights - UBM



## \$1 trillion

On a global scale, the market for organic, functional allergen-free and better-for-you foods will reach a record \$1 trillion in 2017



# Gluten-free surges into mainstream despite challenges

By Gill Hyslop Updated on 05-Sep-2017 at 11:24

According to research, globally, **only 1-2% of people can't process gluten**. That's not to say we should lessen the seriousness of celiac disease or gluten-intolerance, but when did gluten-free become **trendy** among people who don't suffer from these ailments? The notion that removing wheat and gluten-containing grains from our diets is better for overall health is driving the demand in the US, says **Mintel's** Global Food and Drink analyst Chris Brockman. Only 17% specially follow it for the management of gastrointestinal symptoms.

## Follow the Celebs

Many **celebrities** following the diet is spurring the trend, too. Victoria Beckham publicly announced she follows a gluten-free diet because it helps her keep her weight down, while Gwyneth Paltrow wrote in her book *It's All Good* that "every single nutritionist, doctor and health conscious person I have ever come across concurs that gluten is tough on the system and many of us are at best intolerant of it and at worst allergic to it".

## The Demise of G-F Bread

Last year, according to Mintel, the number of new gluten-free products launched globally edged over 14%, compared to 8% in 2012, with the largest number – 19% – being in the snacks category.

However, said Brockman, there are signs **gluten-free breads are reaching their limit** in terms of penetration limits in most developed markets. "This is certainly the case in NPD terms, with the proportion of launches that are gluten-free **falling** in North America, Australia, New Zealand and most European countries in recent years,"

- <https://www.bakeryandsnacks.com/Article/2017/09/01/Gluten-free-surges-into-mainstream-despite-challenges>

# What really is gluten-free? - Regulatory

By 2020, 'gluten-free' is projected by **Markets and Markets** to be worth \$7.59bn globally.

However, there is confusion over what 'gluten-free' actually means.

- The US **Food and Drug Administration** (FDA) allows a gluten limit of less than 20 parts per million (ppm) for foods labeled 'gluten-free,' 'no gluten,' 'free of gluten,' or 'without gluten', and does allow oats.
- **Canada** does not allow oats and gluten must not exceed 20ppm.
- **Codex Alimentarius** – used in many markets and mirrored in EU regulations – uses 20ppm and prohibits oats and has added a “very low gluten” certification for products below 100ppm but above 20ppm.

So how does a manufacturer of gluten-free products confidently label a product and distribute it in their market of choice without getting into hot water? Without a clear global definition of 'gluten-free,' this could be a quagmire. Added to that, manufacturers need to ensure their staff and production processes are fully supported by Good Manufacturing Practices (GMP) and Hazard Analysis and Critical Control Point (HACCP) programs. Certification company SGS is purportedly the only independent certification body that covers a choice of globally-recognized gluten-free certification schemes. In tradition we trust

# Cat among the pigeons

Although most of us could do with **cutting back on processed carbs**, several studies have shown that going strictly gluten-free is not synonymous with “healthy.”

- The European Society for Paediatric Gastroenterology Hepatology and Nutrition compared over 650 products to similar items containing gluten and found the gluten-free versions had a significantly **higher fat content and were often less nutritious**.

[http://www.espgghancongress.org/fileadmin/user\\_upload/ESPGHAN\\_17\\_Vegan\\_Diets\\_in\\_Children\\_Press\\_Release.pdf](http://www.espgghancongress.org/fileadmin/user_upload/ESPGHAN_17_Vegan_Diets_in_Children_Press_Release.pdf)

- Similar results were also found in independent tests conducted by the Netherlands consumer association, **Consumentenbond**. <https://www.foodnavigator.com/Article/2017/08/08/Gluten-free-products-not-as-healthy-as-conventional>
- According to American research published in the British Medical Journal, cutting out whole grains from the diet may lead to increased risk of heart disease.
- A study published in *Epidemiology* found the **unintended consequence of a gluten-free diet** meant that **arsenic** levels were almost twice as high, while mercury levels were 70% higher. The authors speculated this could be because **rice**, which soaks up metals from its environment, is often used as a wheat substitute, but this is just a theory.

[http://journals.lww.com/epidem/Fulltext/2017/05000/The\\_Unintended\\_Consequences\\_of\\_a\\_Gluten\\_free\\_Diet.27.aspx](http://journals.lww.com/epidem/Fulltext/2017/05000/The_Unintended_Consequences_of_a_Gluten_free_Diet.27.aspx)

However, this isn't to say that following a gluten-free diet isn't beneficial. Hundreds of clinical studies suggest following a gluten-free diet aids a person with celiac disease.

# What best describes your attitude to gluten-free products

Region	Better for me	Weight Management	Gluten intolerant	Interested	Not Interested
Global	22%	18%	5%	21%	35%
Americas	17%	14%	5%	19%	45%
Europe	20%	13%	4%	18%	46%
Asia Pacific	28%	24%	7%	25%	16%

## To go gluten-free or not?

There are advantages and disadvantages of both gluten and gluten-free. A study conducted in May 2017 by HealthFocus International said 2,000 US global consumers report they are **interested in gluten-free** products because of gluten **intolerance**. Shopper interest is mainly driven by **health and weight management**.

The survey also noted two out of 10 shoppers are generally interested in learning more about gluten-free products even though they don't know what they are, while there are still a high percentage of consumers that show disinterest.

# Market Definition: Gluten Free

- **'Gluten-Free'**: the marketing description for food and beverage products with **very low [ $>100$  ppm] or no gluten [ $>20$  ppm] – oats excepted**
- **Gluten** = protein in wheat flour; and most other cereals
- retail gluten-free products are in the 'free-from' or Wellbeing aisle
- **Baked Products**: The major market since most depend on wheat flour
- a major commodity ingredient
- **Target Sector:**
  - Bread** – the volume benchmark application
  - Tortilla** – sold alongside in free from aisle



# Industry Driver: Health



## Coeliacs Physiological Imperative

- **Ultimately: core market is genuine coeliacs' adverse reaction**  
- *Indeed gluten-free is the only claim with a health imperative*
- **Gluten intolerant:** chronic bowel condition (diarrhea) and fatigue

**Coeliac Incidence:** Datamonitor Healthcare think >25 million globally

- **World-wide 1: 266** (conservative): diagnosis not uniform  
EU: ~1/300: 1/200 Ger.; 1/100 UK: Coeliac UK ~600k but only 1 in 8 know
  - Diagnosis drives demand: explicitly connects symptoms and diet
  - **'Worried well'**: Potential broader market - Middle class 'Health and Wellness' belief - 'free-from' is better for you
  - Buy into broad **family** 'healthy halo' of on trend 'free-from' food

**Mintel: Note UK 16-34 year olds** are also **40%** more likely than average to avoid wheat or gluten **Lifestyle Choice**

# Market Definition – Gluten-Free Product Range

Baked Goods	Cereal Staples	Other Products
Bagels	Breakfast Cereals	Apple Juice ?!?
Biscuits	Extrusions	Beer
Bread		Confectionary
Cakes	<b>Nederlandse Coeliakie Vereniging 2012</b>	
Crackers	Note: Wheat starch in soups, meat, candy is a 'no go' for coeliacs: potato starch is a low cost alternative.	
Coatings	<b>On poor Quality: - staling</b>	
Cookies	<i>" You can't bake a gluten-free loaf in the morning and enjoy if for lunch...!!!"</i>	
Pastry	Noodles	Dressings
Pizza	Pasta	Gravy
Pretzels	Snacks	Sauces
<b>Tortilla - Wraps</b>	<b>Tortilla - Hard</b>	<b>Sausages</b>

# Lifestyle Gluten-Free, Organic Water ...

CLARA  
GLUTEN-FREE WATER



*Your lifestyle defines who you are – so why limit your choices? Clara Gluten-Free Water is about creating choices for your health and well-being while giving you absolute peace of mind that your life choices are being respected. Clara Water – Because you can never be too sure.*

## 'Gluten-free water' shows absurdity of trend in labeling what's absent

THE CONVERSATION  
09 SEP 2017 AT 10:43 ET



Woman drinking from a water bottle (Shutterstock)

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The food labeling craze coupled with banner headlines about the dangers of gluten, genetically modified organisms (GMOs) and hormones are leading to increasingly absurd results.

For example, you can now buy "premium" water that's not only free of GMOs and gluten but certified kosher and organic. Never mind that not a single drop of water anywhere contains either property or is altered in any way by those designations.

While some labels provide useful information that is not readily detectable by consumers, others contain misleading claims that exploit a knowledge gap with consumers and take advantage of their willingness to pay a premium for so-called process labels. For example, details on a product's country of origin are helpful; labeling a bottle of water "gluten free" and "non-GMO" much less so.



bröd



# Wheat Reference

- Sandwich Bread
- ABF Allied

Nutrition	White %
Protein	9.0
CHO	44.6
Fat	2.0
Fibre	2.7
Salt	1.0
Kcal	238



- Wheat flour; Water, Yeast, Salt, Vinegar, Vegetable oil, Soya Flour, Emulsifier E472e, Preservative: Calcium Propionate (added to inhibit mould growth); flour treatment agent: Ascorbic Acid Vitamin C
- **Contains: Wheat, Gluten & Soya 10 Ingredients**



# Tortilla Talk: Nutritional Information

**Flour tortillas** are a low-fat food and contain iron along with other B vitamins.

- They have about 115 calories with 2-3 grams of fat per serving

**Corn tortillas** are a low-fat, low-sodium food and contain calcium, potassium and fiber.

- An average serving contains about 60 calories with 1 gram of fat.
- Corn tortillas **do not contain gluten**, making them a great alternative to bread for those who are **gluten intolerant**.

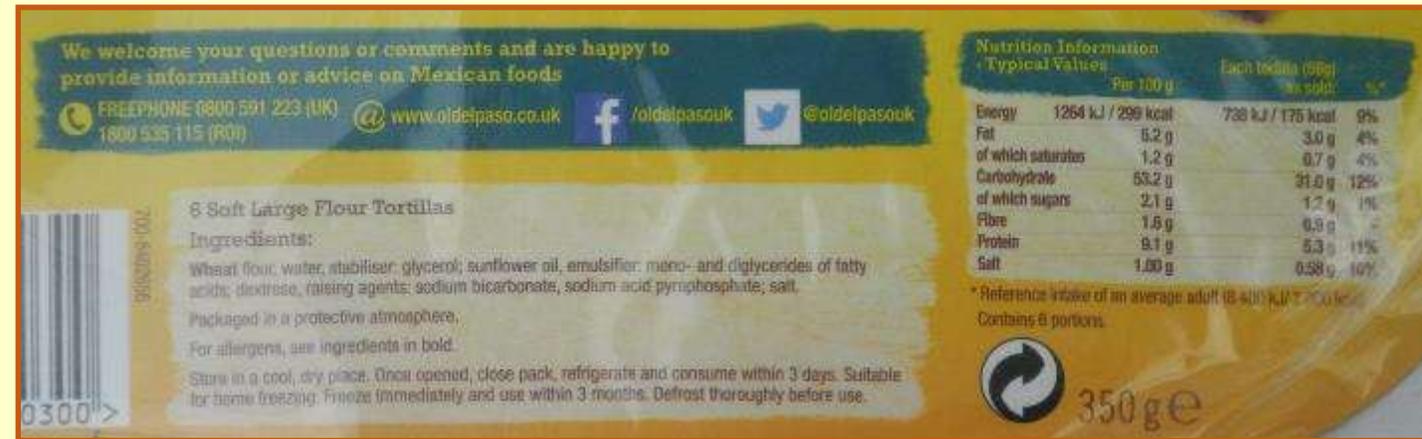
Nutritional Chart		
Nutrient	Corn*	Flour*
Calories	60	115
Protein	<b>1g</b>	<b>3g</b>
Carbohydrate	12g	20g
Fat	<b>1g</b>	<b>2.5g</b>
Calcium	44mg	44mg

\* Source: USDA Handbook 8. Based on the average-sized serving; serving sizes may vary depending on the brand

[Avoid the Wrap Trap - MSN Health & Fitness - Nutrition](#)

<http://www.tortilla-info.com/default.asp?contentID=6>

# Old El Paso: 6 Super SOFT Large Four Tortillas



Nutrition	Flour %
Protein	9.1
CHO	53.2
Fat	5.2
Fibre	1.6
Salt	1
Kcal	299

- **Softness** a consumer trend = emulsifiers

## Ingredients:

**Wheat** Flour, water, stabiliser: glycerol, sunflower oil, emulsifier (mono- and diglycerides of fatty acids), dextrose, raising agents: sodium bicarbonate, sodium acid pyrophosphate, salt.

**Price: £1.50 for 390g (Made in Spain!)  
10 Ingredients**

# Mission: 6 Wheat & White Mini-Wraps 'New Super SOFT'

*'... with the added goodness of wheatgerm and fibre'*



Nutrition	%
Protein	7.5
CHO	50
Fat	6.9
Fibre	3.6
Salt	1.45
Kcal	299

6 WHEAT FLOUR MINI TORTILLA WRAPS WITH THE ADDED GOODNESS OF WHEATGERM & FIBRE		NUTRITIONAL INFORMATION per 100g per wrap	
<b>INGREDIENTS:</b> WHEAT Flour (WHEAT Flour, Calcium Carbonate, Iron, Niacin, Thiamin), Water, Vegetable Oils (Palm Oil, Rapeseed Oil), WHEAT Fibre (4.5%), Humectant (Glycerol), Sugar, Emulsifiers (Mono- and Diglycerides of Fatty Acids, Mono- and Diacetyl Tartaric Acid Esters of Mono- and Diglycerides of Fatty Acids), Salt, WHEAT Germ (0.9%), Stabilisers (Guar Gum, Sodium Carboxy Methyl Cellulose, Cellulose Gum), WHEAT GLUTEN, Raising Agents (Sodium Carbonates, Diphosphates), Preservatives (Calcium Propionate, Potassium Sorbate), Acid (Malic Acid), Flavouring, Flour Treatment Agent (L-Cysteine Hydrochloride).			
Energy	1260 kJ 299 kcal	391 kJ 93 kcal	
Total Fat (of which saturates)	6.9g 2.9g	2.1g 0.9g	
Carbohydrate (of which sugars)	50.0g 3.4g	15.5g 1.0g	
Fibre	3.6g	1.1g	
Protein	7.5g	2.3g	
Salt	1.45g	0.45g	
<b>REFERENCE INTAKE FOR ADULTS</b>			
	per wrap	% reference intake	
Energy	8400kJ/ 2000kcal	391 kJ 93 kcal	5%
Total Fat	70g	2.1g	3%
Saturates	20g	0.9g	4%
Carbohydrate	260g	15.5g	6%
Sugar	90g	1.0g	1%
Fibre	24g	1.1g	5%
Protein	50g	2.3g	5%
Salt	6g	0.45g	7%

**Ingredients:** WHEAT Flour (WHEAT Flour, Calcium Carbonate, Iron, Niacin, Thiamin), Water, Vegetable Oils (Palm Oil, Rapeseed Oil), WHEAT fibre (4.5%), Humectant (Glycerol), Sugar, Emulsifiers (Mono- and Diglycerides of Fatty Acids, Mono- and Diacetyl Tartaric Acid Esters of Mono- and Diglycerides of Fatty Acids), Salt, WHEAT Germ (0.9%), Stabilisers (Guar Gum, Sodium Carboxyl Methyl Cellulose, Cellulose Gum), WHEAT GLUTEN, Raising Agents (Sodium Carbonates, Diphosphates), Preservatives (Calcium Propionate Potassium Sorbate), Acid (Malic Acid), Flavouring, Flour Treatment Agent (L-Cysteine Hydrochloride)

**Price: £0.90 for ~186g ~21 Ingredients**

# M&S Bakery: 6 SOFT Tortilla Wraps



Nutrition	%
Protein	<b>8.0</b>
CHO	49.7
Fat	<b>6.0</b>
Fibre	2.5
Salt	0.75
Kcal	290

**INGREDIENTS** **Wheatflour** contains **Gluten** (with **Wheatflour**, Calcium Carbonate, Iron, Niacin, Thiamin) · Water · Vegetable Oils (Palm, Rapeseed) · Humectant: Glycerol · Raising Agent: E450, Sodium Bicarbonate · Dried **Wheat Gluten** · Sugar · Emulsifier: E471 · Salt · Flour Treatment Agent: E920.

For allergens see ingredients in **bold**.

**IMPORTANT** To avoid danger of suffocation, keep this wrapper away from babies and small children.

NUTRITION	Serves/Portions/Porties: 6	per 100g	per wrap (64g)
<b>Typical values</b> Valeurs moyennes/Gemiddelde waarden			
<b>Energy kJ/Energie/Energie</b>		1223	783
<b>Energy kcal/Energie/Energie</b>		290	186
<b>Fat/Matières grasses/Vetten</b>		6.0g	3.8g
<b>of which saturates/dont acides gras saturés/waarvan verzadigde vetzuren</b>		2.6g	1.7g
<b>Carbohydrate/Glucides/Koolhydraten</b>		49.7g	31.8g
<b>of which sugars/dont sucres/waarvan suikers</b>		1.4g	0.9g
<b>Fibre/Fibres alimentaires/Vezels</b>		2.5g	1.6g
<b>Protein/Protéines/Eiwitten</b>		8.0g	5.1g
<b>Salt/Sel/Zout</b>		0.75g	0.48g

Reference intake (adult) Energy 8400kJ/2000kcal  
Fat 70g Saturates 20g Sugars 90g Salt 6g

**Ingredients:** **Wheatflour** contains **Gluten** (with Wheatflour, Calcium Carbonate, Iron, Niacin, Thiamin) <- Reads Like *Mission produce ...* Water, Vegetable Oils (Palm, Rapeseed), Humectant: Glycerol, Raising Agent: E450 [Potassium and sodium di-phosphates], Sodium Bicarbonate Dried **Wheat Gluten**, Sugar, Emulsifier: E471 [Mono- and Diglycerides of Fatty Acids], Salt, Flour Treatment Agent: E920 [L-Cysteine] <- Source: vegan?  
**Price 95p 13 Ingredients**

# International Gluten-Free Product Review - 2010 on

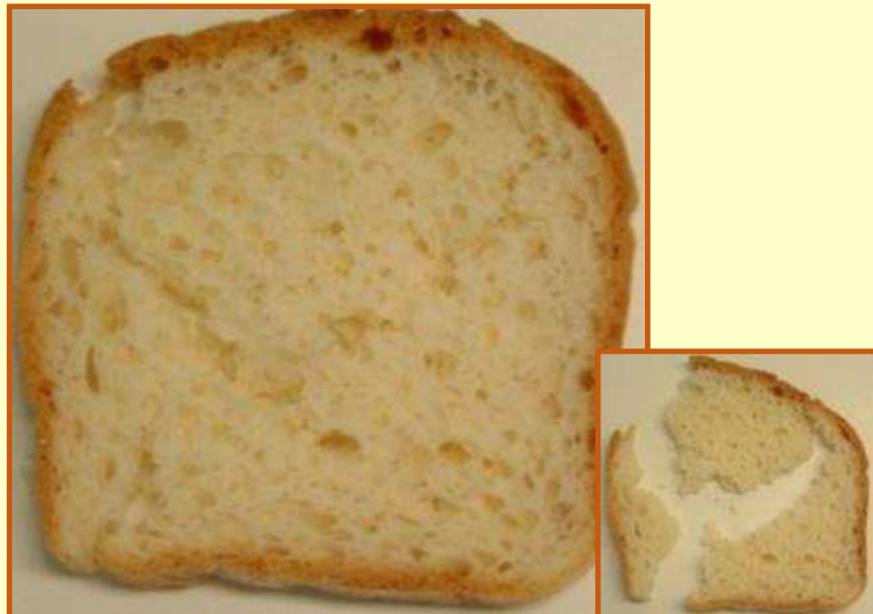


# Udi's USA Leader

- Photographing in *Wholefoods*  
3 consumers took product
- Market leader 2010; brittle texture



Nutrition	Udi's %
Protein	5.26
CHO	38.6
Fat	7.0
Fibre	1.75
Salt	0.74
Kcal	245



Water, Tapioca Starch. Brown Rice Flour, Potato Starch, Canola Oil, **Egg Whites**, Sugar, Yeast, Xanthan, Salt, Na Bicarb. / Corn Starch / CaSO<sub>4</sub> / Mono-Ca Phos. Cultured Dextrose, Ascorbic Acid [Microcrystalline Cellulose Corn Starch], Enzymes

**Contains Eggs 17 Ingredients 12 oz 340g \$6.39!** 38



# Newburn Bakehouse

- 2016: Unsliced gluten free bread with Sunflower, linseed, millet and poppy seed (seed mix 6%)

Nutrition	Boule %
Protein	5.7
CHO	34.5
Fat	10.9
Fibre	6.8
Salt	1.0
Kcal	273



Water, Tapioca Starch, Seed Mix 6% – *above*, Potato Starch, Maize Starch, Yeast, Rapeseed Oil. Pea Protein, **Egg White Powder**, Stabiliser: E464 [Hydroxy-propyl methyl cellulose]; Vegetable Fibre (Psyllium), Sugar, Gluten Free Sourdough Powder (from rice), Fruit Extract (Carob and Apple), Rice flour, Salt, Humectant: Vegetable Glycerine, Caramelised Sugar, Natural Flavourings, Preservative Calcium Propionate (added to inhibit mould growth)

**Contains Eggs 400g    20+4 Ingredients    £3.50 / £3.69**

## ***Check: OK So What's Going on?***

- Allergen – gluten swapped for egg
- Very long ingredient inventory
- ... not 'clean label'

# B'Free: Soft White Sandwich Loaf

- 2014: Unique blend of flours, starches, proteins and fibres
- Sliced lengthways for better sandwich slice
- 'Real bread' texture

***'Each 30g slice contains less than 1g of fat and only 60 calories!'***

Nutrition	B'Free %
Protein	7.7
CHO	35.7
Fat	1.1 *!*
Fibre	8.4
Salt	1.05
Kcal	200



Water, Potato Flour, Corn Starch, Tapioca Starch, White Rice Flour, Buckwheat Flour, Thickening Agent (Xanthan Gum, Cellulose, Agar Agar), Rice Bran, Pea Protein, Yeast, Sourdough (Fermented Quinoa, Rice and Maize Flour), Psyllium Husk, Salt, Rapeseed Oil, Flour Treatment Agent (Ascorbic Acid), Acidifier (Glucono-Delta-Lactone), Acids (Citric Acid, Malic Acid, Tartaric Acid)

**360g?**

**21 Ingredients**

**£3.50**

# Warburtons Newburn Bakehouse 4 White Wraps



Nutrition	Wraps %
Protein	4.5
CHO	49.0
Fat	5.7
Fibre	7.0
Salt	1.08
Kcal	279

NUTRITION INFORMATION			
Typical Values:	Per 100g of product	Per average wrap (60g)	Reference Intake (Adult)
ENERGY	1172kJ 279kcal	703kJ 167kcal	8400kJ 2000kcal
FAT	5.7g	3.4g	70g
of which saturates	0.5g	0.3g	20g
mono-unsaturates	3.2g	1.9g	
polyunsaturates	1.6g	1.0g	
CARBOHYDRATE	49.0g	29.4g	260g
of which sugars	4.6g	2.8g	90g
FIBRE	7.0g	4.2g	
PROTEIN	4.5g	2.7g	50g
SALT	1.08g	0.65g	6g

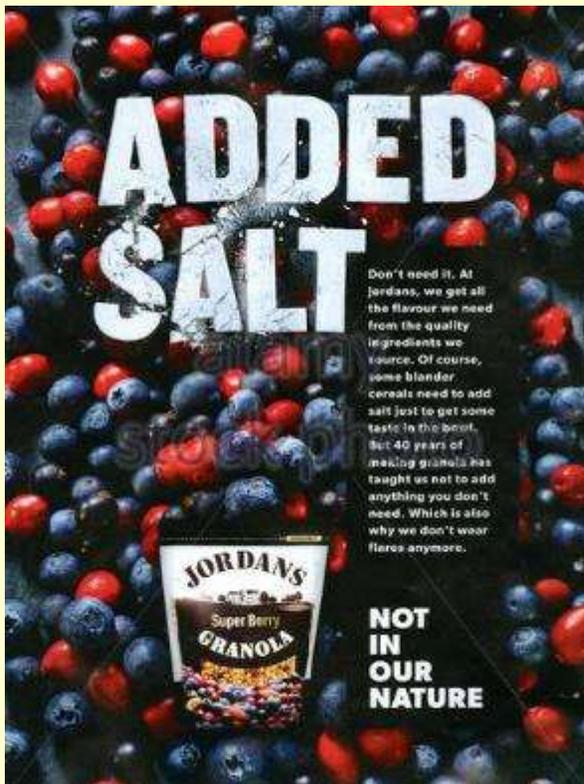
  

INGREDIENTS	
Water, Rice Flour, Tapioca Starch, Fruit Extract (Carob and Apple), Stabilisers: Xanthan Gum, E464, Rapeseed Oil, Cornflour, Pea Protein, Humectant: Vegetable Glycerine; Sugar, Salt, Raising Agents: E450, E500; Preservative: Calcium Propionate (added to inhibit mould growth); Emulsifier: E481; Natural Flavouring.	
SUITABLE FOR VEGETARIANS	
<b>ALLERGY ADVICE</b> This product is produced in a bakery which uses egg.	

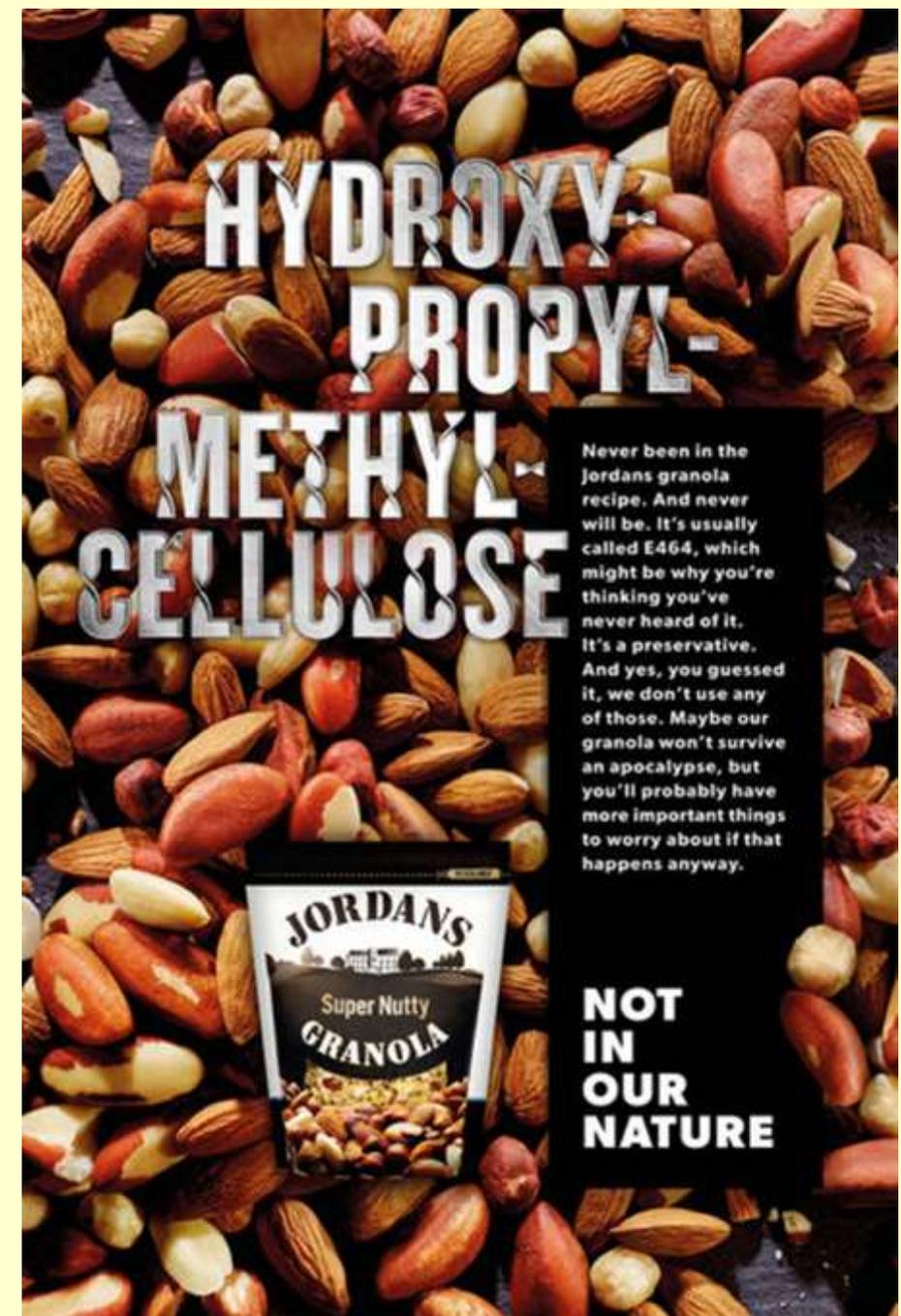
Water, Rice Flour, Tapioca Starch, **Fruit Extract** (Carob and Apple), Stabilisers: Xanthan Gum, E464 [**Hydroxy-propyl methyl cellulose**]; Rapeseed Oil, Cornflour, Pea Protein, Humectant: Vegetable Glycerine; Sugar, Raising Agents: E450 [Potassium and sodium di-phosphates], E500 [Sodium Carbonates]; Salt, Preservative: Calcium Propionate (added to inhibit mould growth); Sugar Beet Fibre, Caramelised Sugar, Emulsifier: E481 [Sodium stearoyl lactate], Natural Flavouring. Suitable for Vegetarians Price: £3.00 21 Ingredients ~240g

# E464: Hydroxy- propyl methyl cellulose

## Jordans: ***Not in Our Nature*** Campaign



<http://media-us-westslateappcom.s3.nbcndn.io/jelly/production/Steven-Bonner-Jordans-Campaignx2-JellyLondon-Lettering.jpg?width=805&height=0&method=resize&quality=80>



# B'Free: 6 Delicious Light & Nutritious Multigrain Wraps



Nutrition	%
Protein	5.9
CHO	40.6
Fat	2.8
Fibre	12.6
Salt	1.2
Kcal	236

Nutritional Information		RI* for a typical adult	
Typical values (as sold):	Per 100g	Per 42g Wrap	
Energy	989kJ 236kcal	415kJ 99kcal	2000kcal
Fat	2.8g	1.2g	70g
of which saturates	0.90g	0.4g	20g
Carbohydrates	40.6g	17.1g	
of which sugar	5.3g	2.2g	10g
Fibre	12.6g	5.3g	
Protein	5.9g	2.5g	
Salt	1.2g	0.50g	6g

**Ingredients:** Water, Mixed Wholegrain Flours (20%: Sorghum Flour, Rice Flour, Corn Flour, Buckwheat Flour, Millet Flour, Teff Flour, Quinoa Flour, Amaranth Flour), Potato Flour, Corn Starch, Tapioca Starch, Sourdough (Fermented Quinoa, Corn and Rice Flour), Thickening Agent (Cellulose, Xanthan Gum, Guar Gum), Psyllium Husk, Pea Protein, Yeast, Salt, Inulin, Sugar, Rapeseed Oil, Flour Treatment Agent (Ascorbic Acid), Raising Agent (Sodium Bicarbonate, Monocalcium Phosphate), Acids (Citric Acid, Malic Acid, Tartaric Acid), Preservative (Sorbic Acid)

**Handling Instructions:**

- Store in a cool dry place away from sunlight.
- For maximum freshness, re-seal bag directly after use or store in airtight container.
- Wraps perform best when gently reheated: 10-15 seconds in microwave or on hot flat grill.

Water, Mixed Wholegrain Flours (20%: Sorghum Flour, Rice Flour, Corn Flour, Buckwheat Flour, Millet Flour, Teff Flour, Quinoa Flour, Amaranth Flour), Potato Flour, Corn Starch, Tapioca Starch, Sourdough (Fermented Quinoa, Corn and Rice Flour). Thickening Agent (Cellulose, Xanthan Gum, Guar Gum), Psyllium Husk, Pea Protein, **Yeast**, Salt, Inulin, Sugar, Rapeseed Oil, Flour Treatment Agent (Ascorbic Acid), Raising Agent (Sodium Bicarbonate, Monocalcium Phosphate), Acids (Citric Acid, Malic Acid, Tartaric Acid), Preservative (Sorbic Acid).

**Price: £3.50**

**~28 Ingredients**

**~252g**

# Mission: White CORN Tortilla Super Soft™



... ‘ a classic favorite because we’ve perfected authentic flavor that you can use for enchiladas, flautas, chilaquiles, and more.

It all comes from our Maseca® corn flour, which is the highest quality corn flour available. They’re even low-fat, with no lard and no cholesterol.

Nutrition	%
Protein	3.3
CHO	43.3
Fat	3.3
Fibre	6.6
Salt	0.41
Kcal	233.3

## Ingredients

Corn masa flour, water, cellulose gum, propionic acid (to preserve freshness), benzoic acid (to preserve freshness), phosphoric acid (preservative), guar gum, amylase. **8 Ingredients**

Nutrition Facts	
Serving Size 1 tortilla (30g)	
Servings per Package 10	
Amount per Serving	
Calories 70	Calories from Fat 10
% Daily Value*	
Total Fat 1g	2%
Saturated Fat 0g	0%
Trans Fat 0g	
Polysaturated Fat 0g	
Monounsaturated Fat 0g	
Cholesterol 0mg	0%
Sodium 5mg	0%
Total Carbohydrate 13g	4%
Dietary Fiber 2g	8%
Sugars 1g	
Protein 1g	
Vitamin A 0%	* Vitamin C 0%
Calcium 2%	* Iron 2%
* 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

# Nutritional Check



	Bread			Old EP	Mission	M&S			
Nutrition	%	Boule %	B'Free %	%	%	%	%	%	%
Protein	9.0	5.7	7.7	9.1	7.5	8.0	4.5	5.9	3.3
CHO	44.6	34.5	35.7	53.2	50	49.7	49.0	40.6	43.3
Fat	2.0	10.9	1.1 !*	5.2	6.9	6.0	5.7	2.8	3.3
Fibre	2.7	6.8	8.4	1.6	3.6	2.5	7.0	12.6	6.6
Salt	1.0	1.0	1.05	1	1.45	0.75	1.08	1.2	0.41
Kcal	238	273	200	299	299	290	279	236	233.3
Ingredts.	10	24	21	10	21	13	21	28	8

## Nutritional Summary: Wraps

- **Lower Protein:** up to 50% lower; **Higher Fibre:** up to 3-4x higher
- **Less calories:** up to 20%

# Gluten Free: Major Quality Issues for Convenience



# Quality Issues: Bread Consumers

**Product Issues** Coeliacs typically don't like taste and texture:-

- Prescription (pharmacies) long shelf-life 'bubble' wrap
- Historically low volume & heavy: **brittle** + defects
- Inferior to wheat: poor quality, Not a 'whole family' purchase:
  - *nothing like fresh bread*



**Tolerance:** High coeliac sensitivity to gluten traces

- And to other special ingredients:
  - Xanthan; HPMC -> bloating

**Good Prototypes:**

Expectation is fresh, soft non-staling products ...



# Major Quality Issues

**Reference:** Versus Fresh Wheat *Bread*



- 1) Dough Vs Batter:** Replacing Gluten function:
  - But which **stabiliser** / hydro-colloid system?
  
- 2) Structure:** Does crumb quality match air cell evenness / fineness / softness and colour?
  - Roll of **functional protein** to stabilise gas cells
  
- 3) Texture & Staling:** Elasticity - Does 'fresh' product stale rapidly?  
... By the afternoon; or in 2 days? – or 7-10 days?
  
- 4) Product type: Shelf-Life:** Producer decision: equipment driven?
  - Long-life or Convenience (fresh)
  
- 5) Nutrition: Status of Protein; Fat; KCalorie loading**
  - **Minerals & Vitamins?**

# Major Quality Issues

**Reference:** Wheat Flour Bread

**1) Dough:** Develops Gluten network: *see right ->*

- Functionality: Depends on protein di-sulphide bridges: – cystine [2x cysteine]
- Long proving gives more flavour [except CBP]
- Traps CO<sub>2</sub> during fermentation [or egg + baking powder]
- Retains integrity & gives oven-spring in cooking

*[Pastry: short texture gluten development prevented.*

*Biscuits-> Cake -> **Wraps** -> Bread - Bread is the most technically difficult]*



**Production Issue: Without gluten** – the **starch blend** may form a **batter**

- Processed like cake batter? – On what equipment? segregated?
- **Tolerance Issue: Retaining gas cells;** *long proving -> moulding de-gasses = collapse -> Holes: Defect control*

# Holes & Defect Control: A Big Issue



**Hey Udi's: What's With the Holes in Your Bread?**

Date: April 15, 2013 Category: [Gluten Discussion](#): [92 Comments](#)

*Dude note on 04/24/15: Udi's bread has gotten worse. Much worse. [Read about it here.](#)*

Last week, [Gluten Free Jenna](#), a fellow celiac, posted the above picture of a loaf of Udi's bread she had just bought (without the Udi's inset...that was my special touch for this blog post).

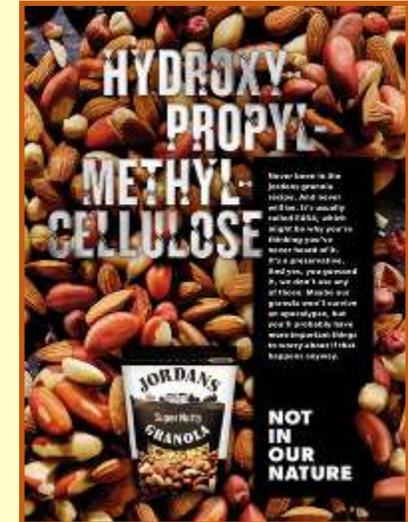
I found the picture comical at first.

**~~W~~HOLE GRAIN BREAD**

<https://glutendude.com/gluten/holes-in-udis-bread/>

# 1] Dough Vs Batter: Stabiliser Systems

- Hydro-colloid system replaces structural protein gluten ‘scaffolding’
  - **Natural ‘clean label’:** LBG / Guar; Xanthan [synergy] – no foam
  - **E-number:** HPMC e.g. Dow K4M – foams  
[Hydroxy Propyl Methyl Cellulose]
- **Issue:** *~2 - 4% stabiliser blend doesn't work the same way as ~7% functional protein [gluten]*
- **Water Content:**  
*‘The cheapest and best improver you can get’*
- Influences Dough < – > Batter transition
  - Depending on production line facility.  
*Balances waisting (sponge / foam) < – > versus holes ...*
- Viscosifiers: pre-gel starch; or absorbent fibre



# Bulk Ingredients: Starch Blend and 'Free From' Functional Protein



# Bulk Nutrition Ingredients: Starch, Protein, (Fat) etc.

Going Gluten-Free: you need to define:

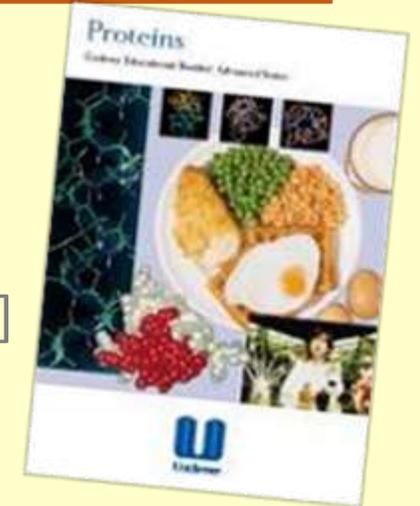
**Starch blend:** [Mix-Blend Companies can help]

- Carbohydrate is up to 50% of product
- Mix of starches: replicating granules in wheat flour - **bi-modal** distribution of starch granules?  
E.g. Rice; Corn (Maize); Tapioca; Potato - **starches or flours**



**Functional Protein:** Care swapping one allergen for another... **gluten for egg?**

- **Bulk** versus **Functional** protein: Gluten is 9 - 12%
- **Functional:** Foaming / Gelling protein – typically 2 - 4% [Too much overbinds]  
E.g. Egg, potato, whey – balance with **Bulk protein:** Legume: pea etc.



**Nutritional equivalence:** [a consideration not many think about]

- **Bulk** protein added to give similar **nutritional profile** as wheat bread [~ 10% protein]

# 'Free From': Very Low Allergenic Functional Protein Selection

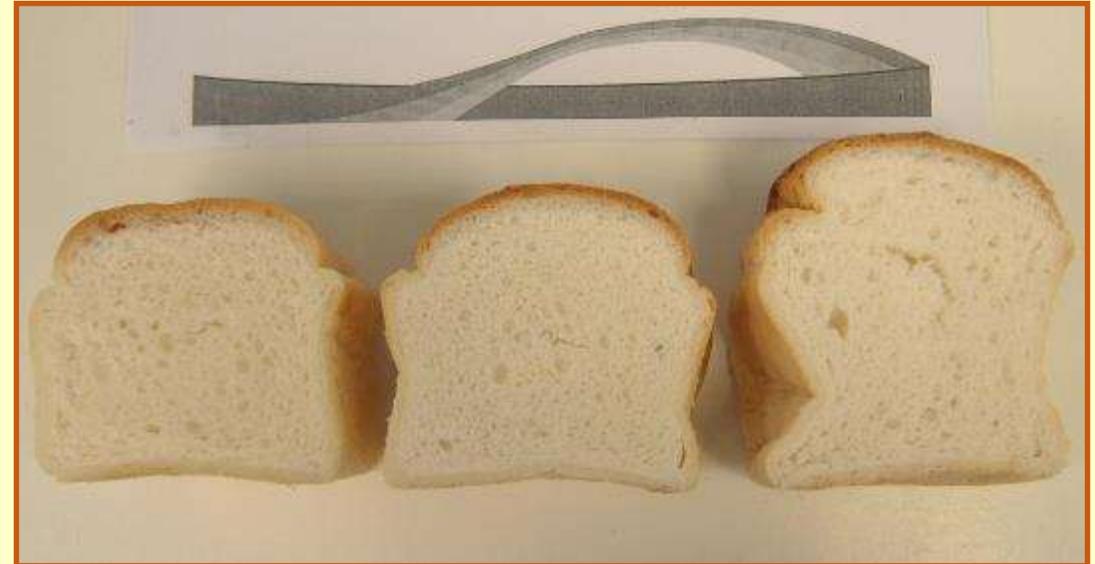
- Functional **commodity** proteins  
e.g. **egg, lupin, milk, soy, wheat** (gluten)  
– are all allergens
- Lower allergenic proteins  
e.g. **pea, rice, maize**  
– tend to be *less functional* than **egg**  
white; and don't really work
- **AVEBE Solanic Advantage: Potato**  
The only high-functional + low-allergenic protein on the market

Food	Positive skin irritation (%)	Positive reaction after test meal (%)
Peanuts	26	12
Eggs	19	10
Milk	17	7
Soy	10	2
Wheat	5	0
Peas	5	0
Fish	4	0
Tomatoes	3	0
Chocolate	2	0
Oranges	1	0
Rice	1	0
Strawberry	1	0
Potatoes	0	0

Source: Survey 2001 Europe

# Gluten-Free Bread: FiE 2011

Ingredients	%	%	%
<b>Rice flour:</b> Remyflo R6 200	7.3	7.3	7.3
<b>Potato starch:</b> Selectamyl D20	3.6	3.6	3.6
<b>Native corn starch</b>	29.6	29.6	29.6
<b>Water</b>	51.4	51.4	51.4
<b>Sunflower oil</b>	0.4	0.4	0.4
<b>Block yeast</b>	2.0	2.0	2.0
<b>Sugar</b>	2.0	2.0	2.0
<b>Salt</b>	1.0	1.0	1.0
<b>Xanthan gum</b> Keltrol F	0.9	0.9	0.9
<b>Emulsifier</b> DATEM	0.1	0.1	0.1
<b>Calcium propionate</b>	0.1	0.1	0.1
<b>Solanic® 200</b>	-	1.6	-
<b>Solanic® 300</b>	-	-	1.6



	Ref.	300	200
		<b>pl &gt;6; majority &gt;8pl</b>	<b>4.8-5.2</b>
<b>Volume:</b>	Low	Better	High
<b>Air Cells:</b>	Coarse	Fine	Fine
<b>Crust:</b>	Light	Brown	Brown

**Conclusion:**  
**After 2 years – starch blend is OK!**

## ***But Why G-F?***

- Didn't work in regular bakery!?!
  - dough relaxant like L-cysteine
- Prepared Application sheet
- Natural vegetal sourced
  - due to cysteine linkages...



# 5 Major Quality Issues (cont'd)

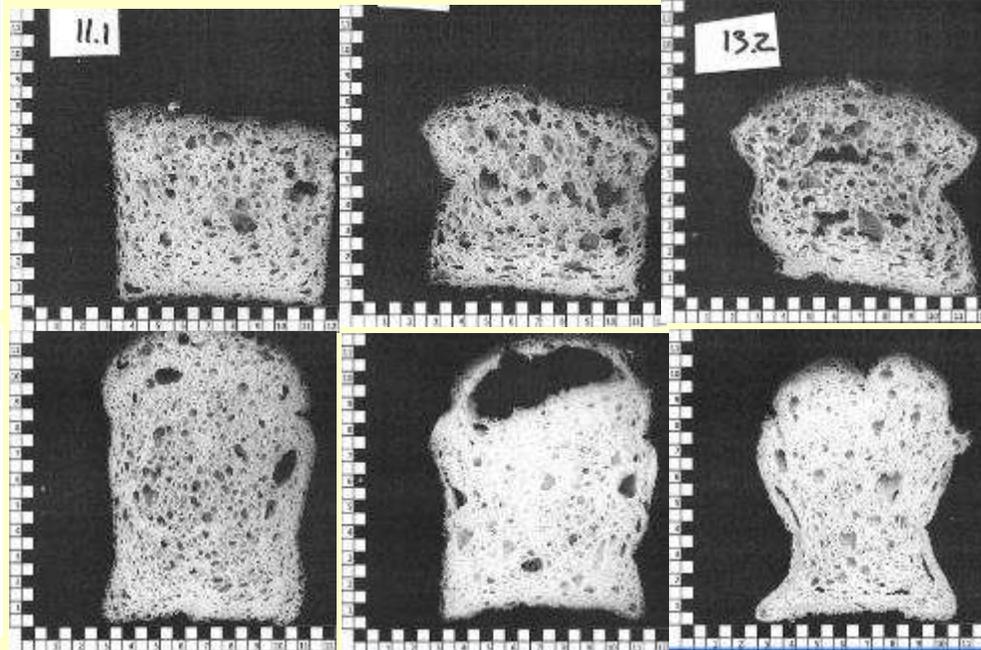
## 1] Dough System

- Functional Protein
- Water Content



Starch Blend	1
Rice Flour	50
Potato starch D20	33.3
Corn Starch	16.7

Starch Blend	2
Rice Flour	17.9
Potato starch D20	9.0
Corn Starch	73.1

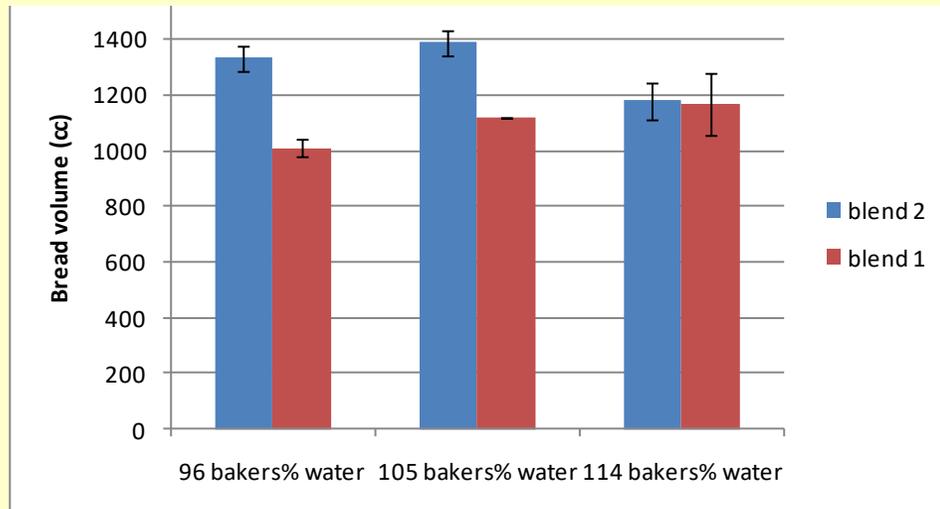


Vary Water Content: 96%; 104% & 114% H<sub>2</sub>O

# Starch Blend & Water Content

## Solanic<sup>®</sup>200

- **Water Level:** (Bakers %) 96% ; 104 %; 114%
  - Wheat bread is ~38% H<sub>2</sub>O



**Volume:** Blend 1 & 2 Vs H<sub>2</sub>O content

- Blend 1 = 'Bricks' + honeycomb
- Blend 2 = Soft & bread like

## 2] Crumb Structure

- Crumb quality often poor
  - Like typical 'Ciabatta' retains large air holes
  - Holes & fractures and other defects!
  - **Lacks elasticity ...**
  - Brittle: breaks apart on buttering
- **Functional protein** helps give **fine** even air cells
  - Stabilises the gas cell interfaces;
    - Forms network on baking; retains more water
    - Think: **Starch pasting** before **protein gelation**
  - Key benefit of 'free from' functional proteins e.g. Solanic; increasingly pea (fractions)
- **... But Protein alone doesn't prevent staling / retrogradation**



# Producers: Shelf-Life Handling = Returns

- Over long shelf-life – customer handling  
*'Squeeze Me Fresh'* leads to dissolution ...



^ Natur Improver  
Company Owner  
Dry Mix Plant >



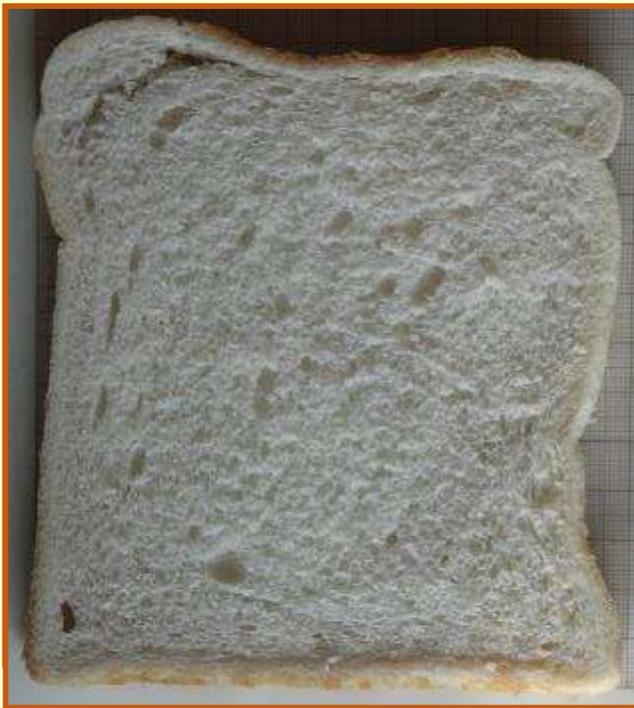
# Bliss Foods.blog



- 2011: Lois Parker tried Solanic in her bread maker, used lentil flour – gets no ‘slumping’+ fine crumb!

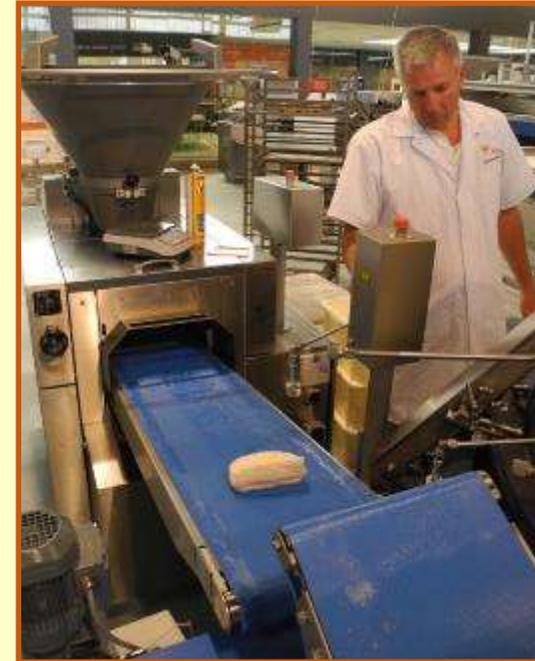
<http://blissglutenfree.blogspot.nl/2011/10/gluten-free-bread-test-using-solanic.html>

- Top: control; below + **Solanic®200**



- *It may well be like a normal standard sliced loaf - but I never ate that even before I gave up gluten.*
- *My preferred breads are artisan sourdough types*

# Workshop: Dough Divider; Moulder



**Summary Comment:**  
*'So any baker can produce  
Gluten-Free products  
on regular equipment'*

*'Yep!'*

*'You give too much away ...' !!!* 63

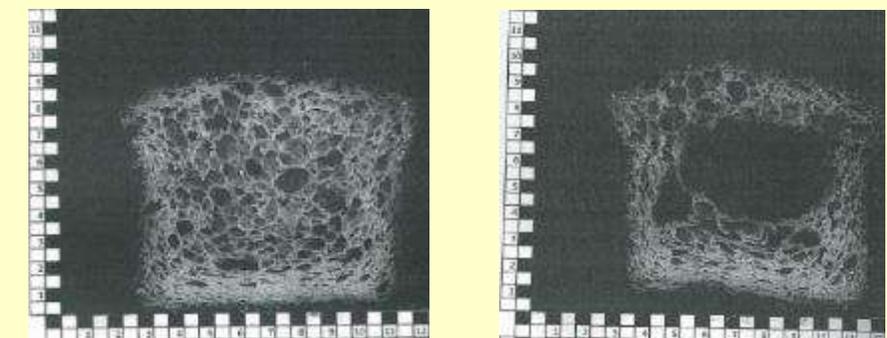
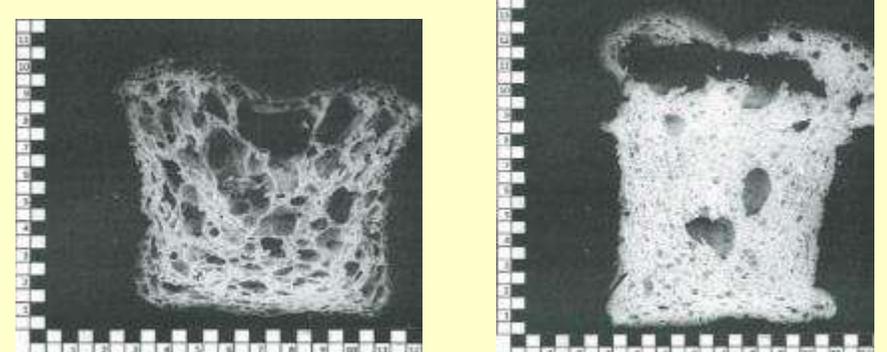
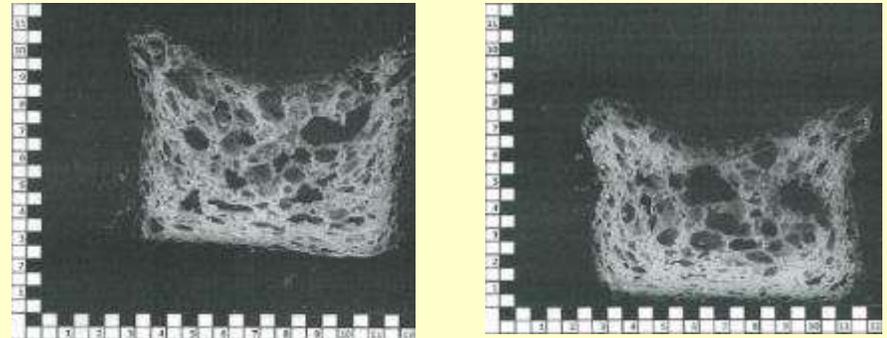
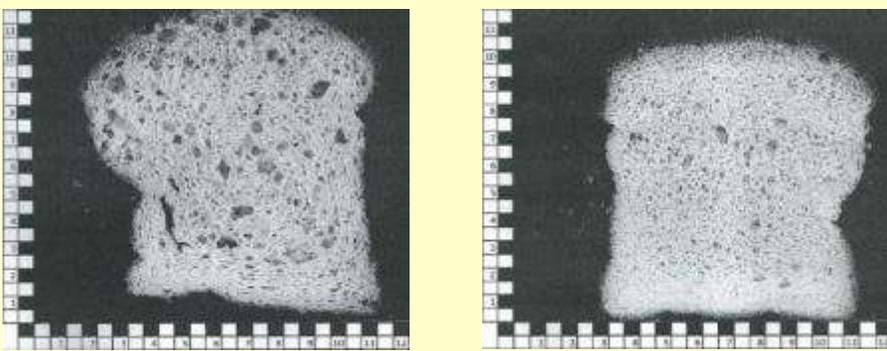
# Vary Protein Type

- 1.6% Potato **Solanic**®200 & 300

- 1.6% **Pea**: Pisane C9; Pisane F9, CoSucra

- **Whey**, Bipro - Davisco; **Egg White**, Nive

- Toasted **Lupin** flour & **Lupin** protein concentrate normalized, LA Frank



*Loaf Volume no indicator of  
crumb quality!*



# 3] Texture & Anti-Staling: Summary

- **Staling:** i) **Drying** – external but ii) **Retrogradation** internal
  - Keep water bound in starch matrix to maintain flexibility
- **Starch Blend:** Vary amylose / amylopectin ratio
  - e.g. Eliane 100 for Selectamyl D20 – *not improved*
- **Oil Level:** Issue: Reduces water content
  - e.g. 0.4%; 4% → 10 % but firmer at 1 week **Fat type!**
- **Emulsifiers:** Checked GMS & DATEM 0.1 & 0.25%
  - With **300** shows better **softness** and volume
- **Fibre:** Rice bran *Ener-G*; potato fibre *Paselli FP*, binds dough
  - Both introduce defects; rice bran more elastic, but costly
- **Staling prevention and elasticity are not the same dynamic !**



# 4] Product Type & Shelf-life

## Market Sector < – > Process Equipment

- Hierarchy: -
  - Bread mixes for Bread Machines
  - Bake-off [ambient or frozen]
  - Long-life [plastic wrap or frozen -? Microwave / Toaster]

Vs **Convenience Fresh** 7 -10 day shelf life [3 month?]

## Microbiological Spoilage prevention

- Atmosphere controlled packaging [omega-3]
- Encapsulated sorbic acid: intrinsic e.g. **Balchem Bakeshure**
- Or 'clean label' Ca<sup>2+</sup> propionate; fermented whey culture



**BALCHEM**<sup>®</sup>  
ENCAPSULATES

# 5] Nutrition

## Another Allergen: Poor Macro Nutrient Profile

- **Protein:** Wheat is ~10%: gluten-free typically ~5%
  - Functional protein helps crumb structure
  - *But why swap one allergen for another...*
  - Non-functional protein helps macro-nutrient profile
- **Fat:** In bread may be high >5% → up to 14+%!!!
  - Anti-staling attempt? Mouth feel. **But fat + egg = Cake**
- **Kcalories:** Wheat is ~ 240 / 100g: G-F can be +100 more !!!
- **Minerals & Vitamins:**
  - White bread flour is (UK) fortified to match 'whole meal' brown flour
- *Overall: Gluten free producers should account for this?*
  - Mostly not ... Because **quality** issues are greater...



# Production-eering Process Engineering Costings



# Gluten-Free Tortilla Manufacture



Left: Gluten-Free Dough



Right: Tortilla Line

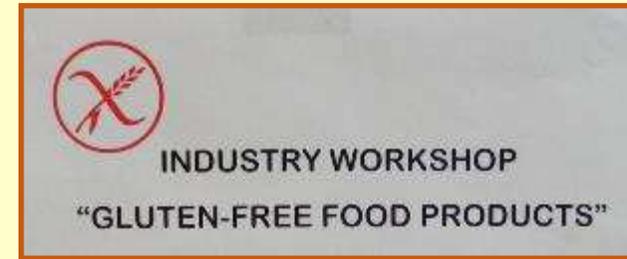
# Co\$ting\$

- University College Cork **Gluten-Free Food Products – Guidance for Industry Workshop** – December 2012
- **Why Gluten-Free sooo expensive?**

## *So what's behind the price difference?*

- *"In normal bread, you have four ingredients," explains Murphy. "There are about 16 ingredients in gluten-free bread, including things like apple fibre and pea protein.*
- *"We have to try to replicate the same structure as normal bread – so gluten-free bread is naturally going to be more expensive. I think pricing will improve, however," she said.*

06-04-14 <http://www.independent.ie/business/small-business/bfree-success-means-crumbly-old-glutenfree-bread-is-toast-30158252.html>



RISING TO THE CHALLENGE: Alex Murphy, managing director of BFree Foods, which has developed a range of gluten-free breads and wraps. Photo: David Conachy

# Costings: per Kg

- Wheat bread – **commodities**  
– internationally traded
- Gluten Free Bread – mix of specialities  
or £flavour\$ + **very long** inventory

**INGREDIENT  
COST IS 6X  
MORE**

Ingredients: 9	%	£/kg	p
Wheat Four	51.5	0.17	8.8
Water	43.25	0.02	0.9
Yeast	1	1	1.0
Salt	1	0.25	0.3
Vinegar	1	0.25	0.3
Vegetable oil	1	0.7	0.7
Soya Flour	1	0.8	0.8
Emuls. E473e	0.1	1.5	0.2
Ca-propionate	0.1	1.5	0.2
Ascorbic Acid	0.05	1.6	0.1
			13p

Ingredients: 21	%	£/kg	p
Water	40	0.02	0.8
Tapioca starch	7.3	0.85	6.2
Potato starch	3.6	0.65	2.3
Maize starch	26.8	0.55	14.7
Block yeast	2	1	2.0
Rapeseed oil	10	0.7	7.0
Pea Protein	1.5	3	4.5
Egg White	3.5	7	24.5
Xanthan Kel. F	0.9	7	6.3
Psyllium	1	3	3.0
Sugar	2	0.35	0.7
Sourdough Fl.	0.2	1	0.2
Salt	1	0.25	0.3
Emuls. DATEM	0.1	1.5	0.2
Ca propionate	0.1	1.5	0.2
+ Fruit extract; rice flour; glycerine; caramelised sugar; Nat. flavourings	100		72.8p

# Gluten-Free – Tortilla / Wraps

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## Ciani Food Science:

Chicago Consultancy – global Tortilla expertise

- Len Ciani - [ciafood@aol.com](mailto:ciafood@aol.com)

## USA Commercial Pre-Mix Vs Ciani Formula

- With **Pre-Mix**: A 2 part pre-blend: shortening (oil), glycerine & water added

- 1) Potato Starch, Tapioca Starch,
- 2) + Stabilisers, salts preservatives etc.



# Gluten-Free – Tortilla / Wraps

## Results:-

- Both with non-GM; trans-fat free shortening (IP Soy and Palm)
- Solanic®300 ~1.7% prior to bake [or 3.3% on flour]

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**Benefits:** Lamination; Improved strength, and rollability.

– Flavor seems cleaner also.

**Objectives:** Obtain desired flavor profile & optimise ingredient balance

- I: USA Commercial pre-mix; r Ciani formula + Solanic



## B'Free Fajita Kits

- As launched Free From Foods 2014 3-4 June, Brussels Expo.



# Recommendations

- **Challenge: G–F drops 10% functional protein** – all bakery production adapted to
- **Functional Protein 2 - 4% Solubility** → Foaming → Thermo-Gelation  
= Texturising benefit: *care with pH; chelating agents & ionic strength*
  - **Foaming:** Supports and stabilises gas cells ...
  - **Thermal Gelation:** Networking gives texture control on baking ...
  - **Maillard reaction:** Also helps browning – improved colour
- **Non-Functional bulk protein:** in ‘flours’ aids **Macro Nutrient profile**
  - **Water binding:** May help with thickening
- **‘Free From’** Alternatives exist allergens egg & whey: potato ...?
- **Create starch blend** from individual **starches** or **flours**
- **Convenience Bread:** most demanding application; **Tortilla** – easier

## Costs:

- **Production Line:** Regular equipment can be used with adjustment
- **Ingredients:** G-F mostly specialities – costs are 6x higher ...



Thanks for Your Attention!



- *LinkedIn: Gluten Free & Clean Label Innovation Network*  
<https://www.linkedin.com/groups/3927275>
- **Contact: [paul.m.hart@btinternet.com](mailto:paul.m.hart@btinternet.com) +44 07850 035922**

# Regulation: EUR-LEX ANNEX

Statements on the absence or reduced presence of gluten in food that are allowed to be made and conditions thereof

## A. General requirements

### GLUTEN-FREE

The statement ‘gluten-free’ may only be made where the [*prepacked*] food as sold to the final consumer contains no more than **20 mg/kg** of gluten.

### VERY LOW GLUTEN

The statement ‘very low gluten’ may only be made where the food, consisting of or containing one or more ingredients made from wheat, rye, barley, oats or their crossbred varieties which have been specially processed to reduce the gluten content, contains no more than **100 mg/kg** of gluten in the food as sold to the final consumer.

## B. Additional requirements for food containing oats

Oats contained in a food presented as gluten-free or very low gluten must have been specially produced, prepared and/or processed in a way to avoid contamination by wheat, rye, barley, or their crossbred varieties and the gluten content of such oats cannot exceed **20 mg/kg**.

# Santa Maria: 8 Plain Soft Flour Tortillas



Nutrition	Flour %
Protein	7.2
CHO	52
Fat	4.5
Fibre	? ?
Salt	2.3
Kcal	284

Typical values	Per 100g	Per 40g tortilla
Energy	284kcal	114 kcal
Fat	4.5g	1.8 g
- Saturates	0.4g	0.2 g
Carbohydrate	52g	21 g
- Sugars	1.5g	0.6 g
Protein	7.2g	2.9 g
Salt	2.3g	0.92 g

## Ingredients:

**WHEAT** Flour (69%) (with Calcium, Iron, Niacin, Thiamin), Water, Rapeseed Oil, Humectant (Glycerine), Salt, Emulsifier (Mono- and Diglycerides of Fatty Acids), Raising Agent (Sodium Bicarbonate), Acidity Regulator (Citric Acid), Stabiliser (Xanthan Gum)

<http://www.waitrose.com/shop/DisplayProductFlyout?productId=1371>

<https://www.santamariaworld.com/uk/products/plain-flour-soft-tortillas/>



# T2DM Rules for Eating

- Here are the simple rules for eating:
- If it says “light”, “low fat” or “fat free”, it stays in the grocery store. If they took the fat out, they put carbs and chemicals in it.
- EAT food—I mean real food. This is the single most important component of eating low carb. Real food does not come in boxes. You don’t have to be told food is natural; you should just know that by looking at it.
- Don’t eat anything you don’t like.
- Eat when you are hungry and don’t eat when you are not.
- No GPS—no grains, potatoes or sugar.
- <http://bjism.bmi.com/content/52/13/869>