Fibers for Life.

Dietary fibers and their impact on tortilla

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Oct 22-23, 2024
2024 TIA Europe Conference
Valencia, Spain

Agenda

- JRS - Company Introduction and Product Portfolio
- Fibers impact on Tortillas
- Nutri Score: Old vs. New

JRS Company Introduction and Product Portfolio

The Global JRS Network Concept.

Security, Proximity, Reliability:

Strategically Placed Production Sites in Europe, America, Asia for Short Distances and Reliable, Fail-safe Availability.

- More than **3500 Employees** at over **90 Production and Sales Locations** and a high level of **Regional Competence** ensure Direct Contact all over the world - with Qualified Advice and Perfect Services.

For continuous availability and perfect service.

Upcycling & Sustainability is in our DNA

Apple

Apple Pomace

VITACEL® Apple Fiber
~ 60% D.F. [d.s.]

Oat

Oat Husks

VITACEL® Oat Fiber
~ 90% D.F. [d.s.]

Wheat

Wheat Straw

VITACEL® Wheat Fiber
~ 97% D.F. [d.s.]

JRS Food Ingredients – Product Portfolio

Cereal Fibers

- VITACEL® Wheat Fiber
- VITACEL® Oat Fiber/Organic Oat Fiber
- VITACEL® Sugarcane fiber

Fruit / Vegetable Fibers

- VITACEL® Apple Fiber/Organic Apple Fiber
- VITACEL® Potato Fiber/Organic Potato Fiber
- VITACEL® Pea Fiber/Organic Pea Fiber
- VITACEL® Citrus Fiber

Plant Fiber / Celluloses

- VITACEL® Bamboo Fiber
- VITACEL® Powdered Cellulose

Soluble Fiber

- VITACEL® Psyllium

Fiber-Types – Fibrous Fibers

- Wheat, oat / organic oat, bamboo, sugar cane, powdered cellulose
- Extreme high dietary fiber content (up to 97%)
- Water insoluble
- Low extracted … high extracted types
- Milled into different fiber length (10 … 1.000µm)
- Over-lapping = stabiliziation (fiber enhanced structures)

  ⟶ Insoluble three-dimensional fiber network
- Colorless, white
- Neutral in taste, odorless, inert, no gastrointestinal discomfort

Cereal Fibers

VITACEL® WF

Wheat Fiber

Insoluble wheat stem fiber sustainably processed from local sources. Nutritional benefits are scientifically proven.

- Gluten-free
- Dietary fiber concentrate
- Fiber enrichment
- European quality
- Dust reduced grades available
- Particle sizes: 35 µm - 500 µm

VITACEL® HF

Oat Fiber

Insoluble dietary fiber concentrate from gently processed oat hull and plant with high nutritional added value.

- Organic grade available
- Fiber enrichment
- Dust reduced grades available
- Particle sizes: 35 µm - 500 µm
- Natural fiber concept

Plant fibers

VITACEL® BAF
Bamboo Fiber

Insoluble dietary fiber concentrate obtained from bamboo.

- Fiber enrichment
- Available in fine-fibrous powder or fiber form
- Dust reduced grade available
- Particle sizes: 50 µm - 500 µm

VITACEL® SF
Sugarcane Fiber

Insoluble dietary fiber concentrate obtained from sugarcane.

- Fiber enrichment
- Approved as novel food
- Specific food applications (EU)

Fiber-Types – Particle Fibers

- Dietary fiber content of approx. 65 %
- „Bunch“ of cell wall material
- Pea, potato, apple / organic apple, citrus fiber
- High water binding capacity
- little structuring effect (except activated citrus fiber)

Fruit fibers

VITACEL® AF

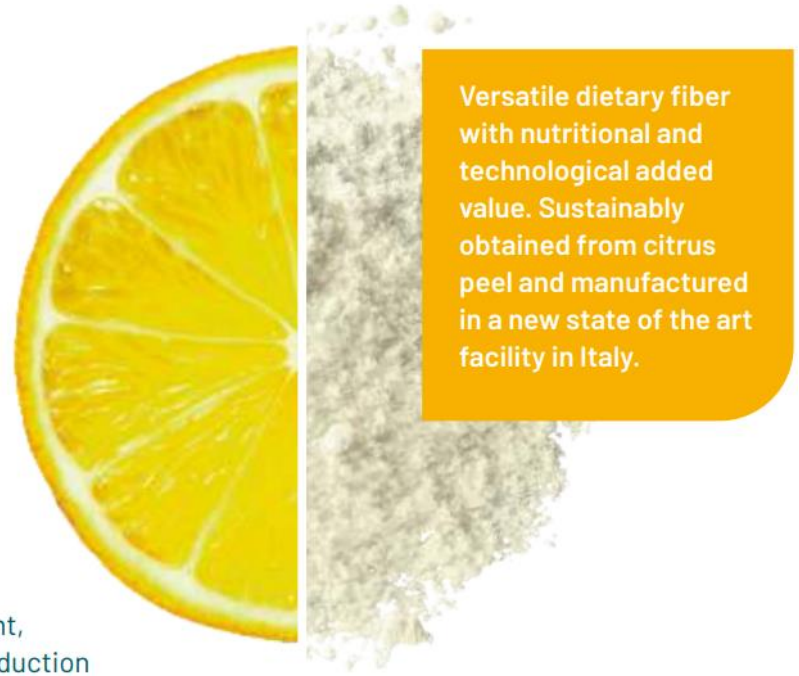
Apple Fiber

Natural dietary fiber gently recovered from dried apple pomace.

- Organic grade available
- Fiber enrichment
- With insoluble and soluble dietary fibers
- Brown color and slightly fruity flavor
- Natural fiber concept

VITACEL® CF

Citrus Fiber



Versatile dietary fiber with nutritional and technological added value. Sustainably obtained from citrus peel and manufactured in a new state of the art facility in Italy.

- Fiber enrichment, fat and sugar reduction
- High water binding capacity
- Improves viscosity and texture
- Supports emulsion stability

Vegetable fibers

VITACEL® KF

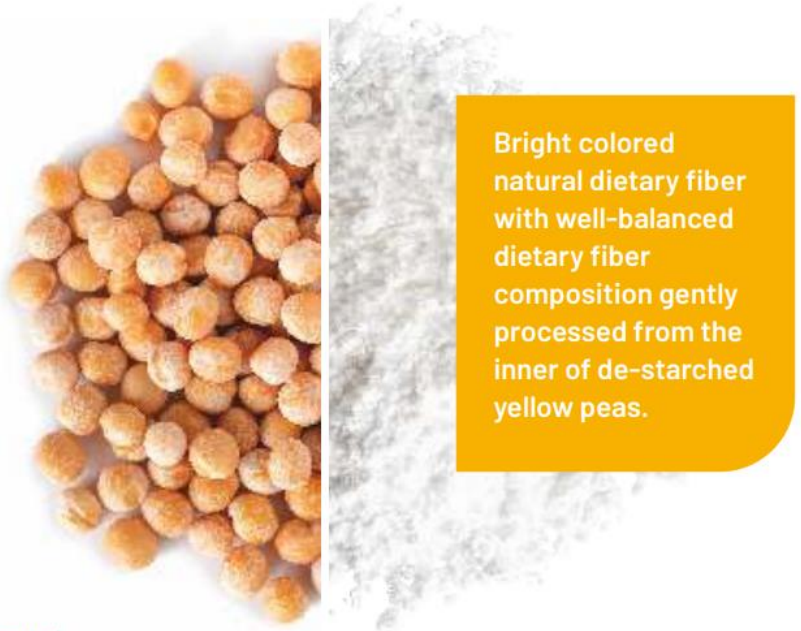
Potato Fiber

Natural fiber with well-balanced dietary fiber composition gently processed from de-starched potatoes.

› Fiber enrichment
› High water binding properties
› Natural composition

VITACEL® EF

Pea Fiber



Bright colored natural dietary fiber with well-balanced dietary fiber composition gently processed from the inner of de-starched yellow peas.

› Fiber enrichment
› Free-flowing agent
› Low in starch
› Particle sizes: 10 µm - 400 µm

Fiber-Types – Soluble Fibers

- Psyllium P 95 / P 99
- Increasing viscosity
- High water binding capacity

Part of stabilizing system for gluten-free applications.

Fiber impact on Tortillas

VITACEL® Dietary Fiber Enable …

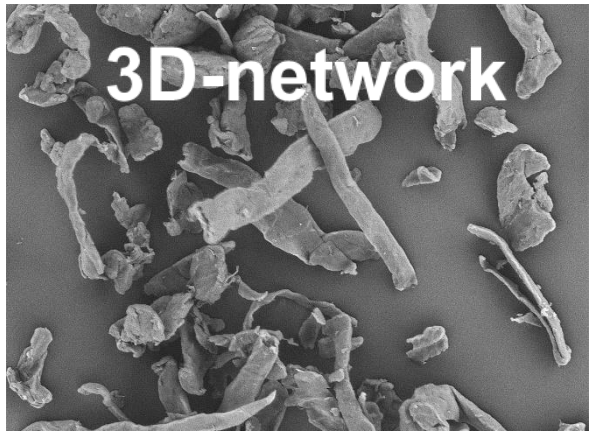
Nutritional Advantages

- Dietary fiber enrichment
- Calorie reduction, fat reduction

CAPILLARY EFFECT

Technological Advantages

- 3D - Network
- Capillary effect
- Texture and mouthfeel improvement of starchy crumbs
- Flour replacement in combination with resistant starches and wheat gluten



1. Nutritional Enhancement

1. Increased Fiber Content

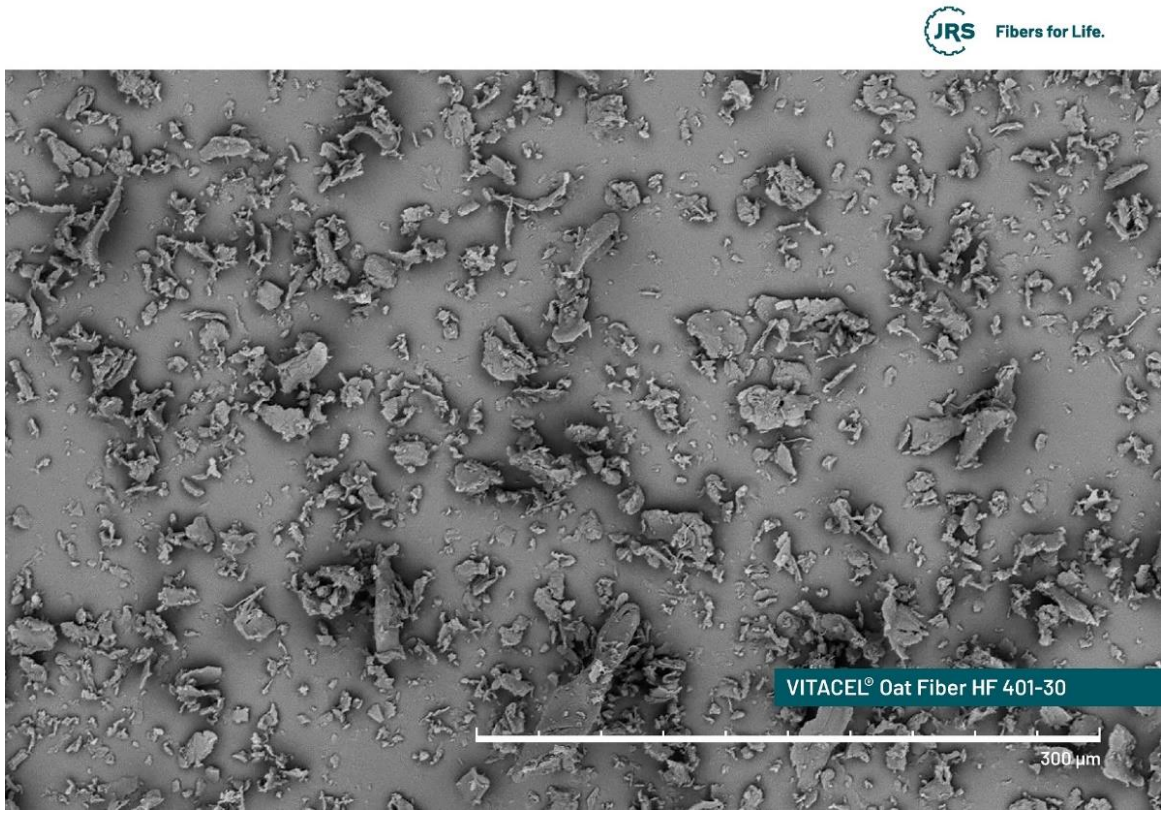
- Improves the nutritional profile
- Supports better digestion and regulates blood sugar
- Increases fullness, aiding in weight management

2. Caloric Density

- High fiber tortillas reduce the caloric density, as fiber is not fully digestible

→ Healthier option for consumers who are looking to reduce their calorie intake without sacrificing volume

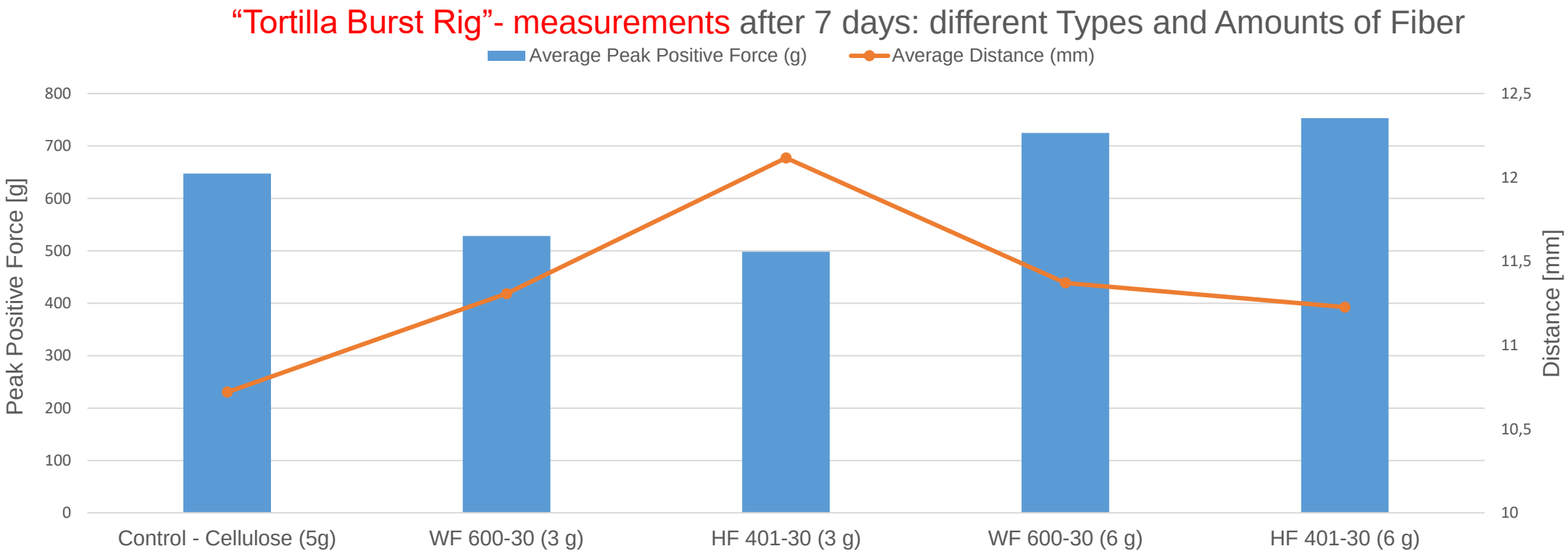
Nutritional Benefits – Fiber Enrichment



VITACEL®HF 401-**30**

VITACEL®WF 600-**30**

Clean label Fiber Enrichment



Peak Positive Force (g): Force required to rupture the tortilla
Distance (mm) : Rupture Distance

WF 600-30(6g) and the WF401-30 (6g) could be a good replacement for cellulose E 460 and provide a "high fiber" tortilla with good texture.

Ideal Fiber for Enrichment

- Low water absorption
- Less influence on original formulation
- High TDF- Content
- Neutral taste, odor and color
- No gastrointestinal discomfort – “unlimited” application

Ingredient	TDF-Content
Whole wheat flour	ca. 10%
Wheat Bran	ca. 40%
Apple Fiber	ca. 55%
Potato Fiber	ca. 65%
Pea Fiber	ca. 65%
Rice Fiber	ca. 90%
Oat Fiber	ca. 90%
Wheat Fiber	ca. 95%

How to reduce the Net carb content?

Recipe: control

Ingredients	Part	%
Wheat flour (type 550)	10	5,71
Water	10	5,71
Wheat flour (type 550)	90	51,43
Salt	2	1,14
Sugar	2	1,14
Butter (82% fat)	5	2,86
Milk powder	2	1,14
Yeast	4	2,29
Water	50	28,57
	175	**100,000**

minus 29 parts flour

plus 11 parts Gluten

plus 18 parts L 600-30

Recipe: modification

Ingredients	Part	%
Wheat flour (type 550)	10	5,25
Water	10	5,25
Wheat flour (type 550)	61	32,10
Salt	2	1,00
Sugar	2	1,00
Butter (82% fat)	5	2,70
Milk powder	2	1,00
Yeast	4	2,20
Gluten	11	5,80
Water	39	20,50
VITACEL L 600-30	18	9,50
Water adjustment	26	13,70
	190	**100,000**

	STD	Mod.
Energy	1251kJ	987kJ
	396kcal	235kcal
Fat	3.9g	3.8g
Saturated fat	2.1g	1.9g
Carbohydrate	49.5g	33.3g
Sugars	1.8g	2.0g
Dietary fiber	**2.9g**	**12.8g**
Protein	7.4g	10.5g
Salt	1.4g	1.3g

Fiber fortification vs.consumer preference

Texture Sensitivity

While many consumers seek out extra high-fiber tortillas for health benefits, some may not appreciate the changes in texture or flavor

→ **Balancing fiber content with texture, mouthfeel and taste is crucial to meeting diverse consumer preferences**

Ingredients	Baker's %[1]
Resistant Wheat Starch (Modified Wheat Starch),	45.00
Vital Wheat Gluten	35.00
Vitacel® Oat Fiber HF 600	20.00

Flour vs. „reconstituted flour“

High fiber wheat tortilla - 9g fiber / 100g tortilla

Ingredients	[%]
Wheat Flour	86,80
VITACEL® Oat Fiber	13,20
Baking Powder	1,30
Xanthan Gum	0,30
Guar Gum	0,30
Calcium Propionate	0,30
Monocalcium Phosphate	0,30
Salt	2,00
SSL	0,20
Vegetable Shortening	11,10
Water	65,20

Mixing time: 1.) 1 min slow
2.) 2 mins fast with fat
3.) add water (approx. 45°C)
4.) 9 – 11 mins fast

Very high fiber wheat tortilla – 29g fiber/100g tortilla

Mixing time: 3-4 min slow / **10-12** min fast (to full development)

Final dough temperature: approx. 28°C

70% net carb content reduction compared to standard wheat tortilla with no fiber added

Conventional tortilla (no fiber added)

Nutrition Facts	
servings per container	
Serving size	**(55g)**
Amount per serving	
Calories	**160**
	% Daily Value*
Total Fat 3.5g	**4%**
Saturated Fat 0.5g	**3%**
Trans Fat 0g	
Cholesterol 0mg	**0%**
Sodium 310mg	**13%**
Total Carbohydrate 28g	**10%**
Dietary Fiber 1g	**4%**
Total Sugars 0g	
Includes 0g Added Sugars	**0%**
Protein 5g	

8g net carbohydrate

Nutrition Facts	
servings per container	
Serving size	**(55g)**
Amount per serving	
Calories	**80**
	% Daily Value*
Total Fat 2.5g	**3%**
Saturated Fat 0.5g	**3%**
Trans Fat 0g	
Cholesterol 0mg	**0%**
Sodium 280mg	**12%**
Total Carbohydrate 24g	**9%**
Dietary Fiber 16g	**57%**
Total Sugars 0g	
Includes 0g Added Sugars	**0%**
Protein 5g	

2.) Taste and Flavor

Impact on Flavor

- Depending on the source of fiber (e.g. bran, insoluble fiber, psyllium), the added fiber can cause different flavors to tortillas
- While a subtle nutty or grainy taste can enhance the flavor profile, some fiber might cause bitterness or a change in taste

Mouthfeel

- Extra high fiber tortillas (e.g. with bran) could have a coarser texture than traditional tortillas

3.) Processing and production

Mixing and Rolling

- Fiber-enriched doughs require more water and longer mixing times to achieve the right consistency
- Fiber competes with gluten for water, could retard the manufacturing process and increasing production time/costs

Machinability

- High-fiber content can interfere with dough machinability during production

When to add the fiber?

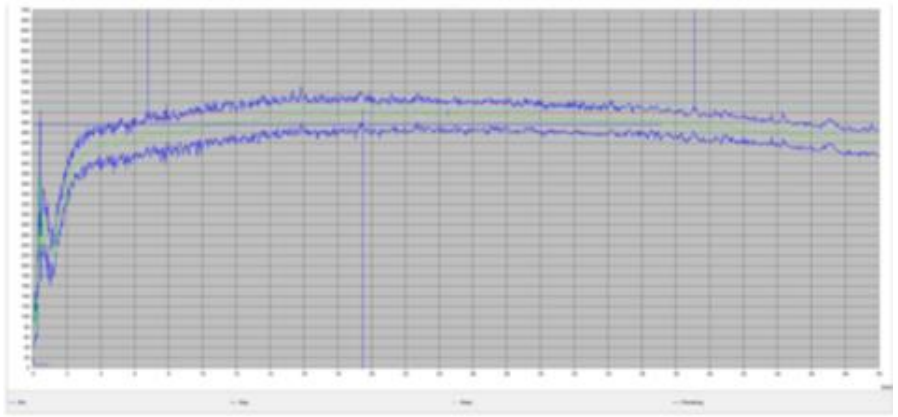
control

all in

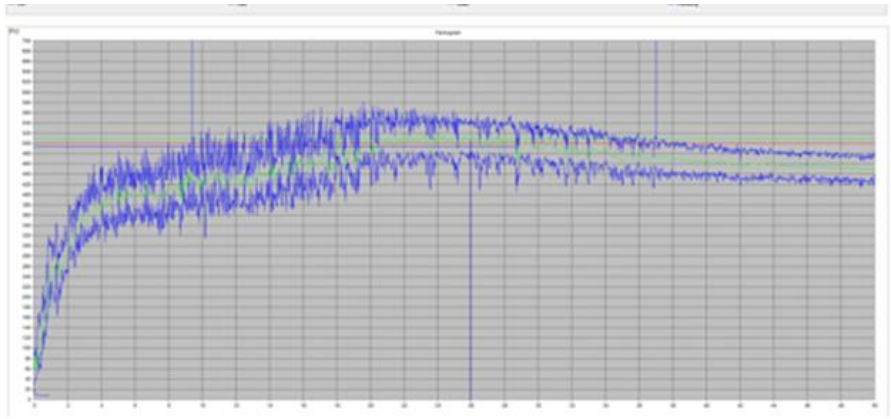
fiber added later

Fiber length impact on dough rheology (Brabender farinogram)

Fiber enriched wheat flour = 80% wheat flour + 20% insoluble fiber



- **Short** fiber
- Fast incorporation of fiber in dough
- Moderate water absorption
- Good dough stability



- **Long** fiber
- High water absorption
- Retarded incorporation in dough
- Dough stability is ok

4.) Shelf life and stability

Water Retention

- Fiber increase dough’s water-holding capacity, improving the moisture content of tortillas and prolonging shelf-stability
- High water retention prevents tortillas from drying out and becoming stale quickly

Conclusion :

„**There is no one fiber fits all**“ :

- water absorption
- fibrous fiber
- particle fiber
- fiber length

Clean label xanthan gum (E 415) replacement

VITACEL® WF 600

VITACEL® WF 200

Clean label – xanthan (E 415) replacement

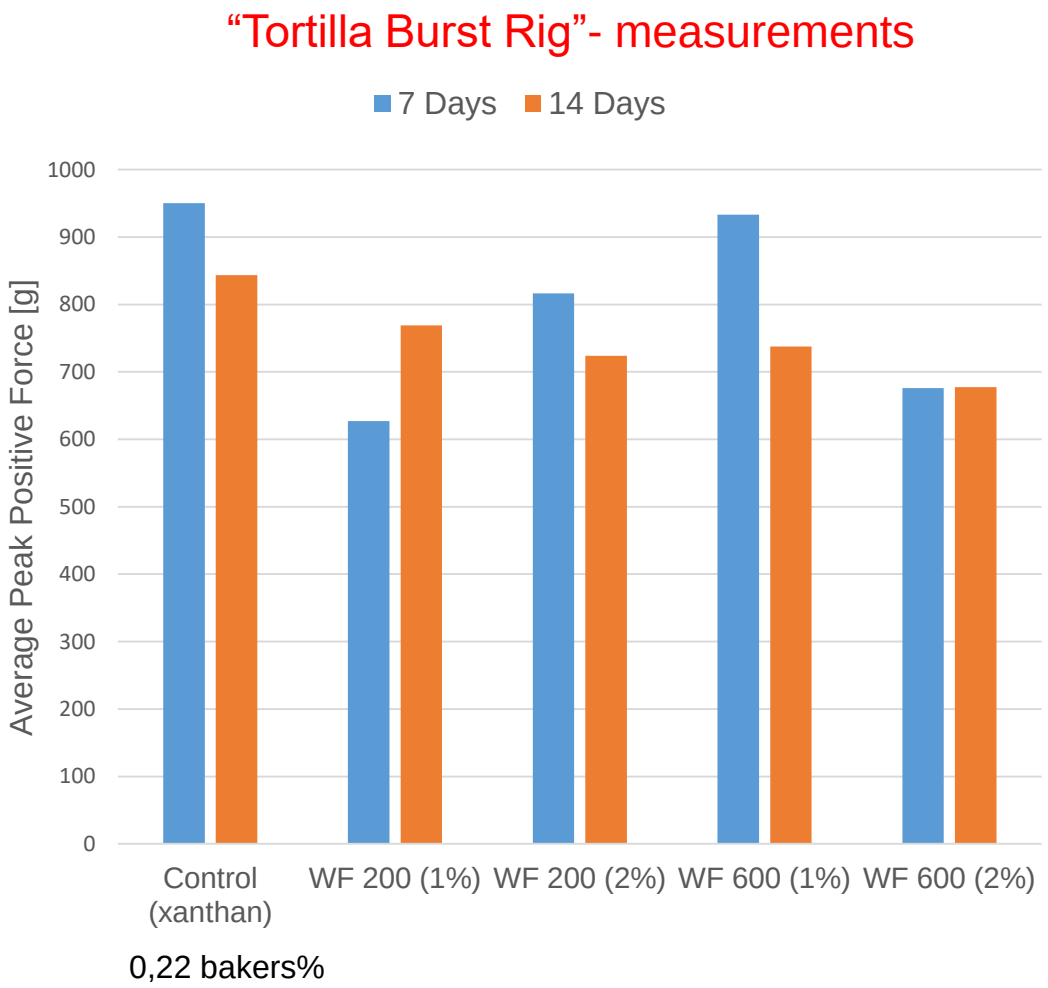
Xanthan Gum	WF 200	WF 200	WF 600	WF 600
0,22%	1,0%	2,0%	1,0%	2,0%

Control bake recipe :
Wheat Flour: = 900 g
Batch Pack (Xanthan Gum incl.) = 52 g
Shortening = 90 g
Glycerine = 29 g
Water = 430 g

VITACEL WF 200
With WF 200(1%) – water adjustment
With WF 200(2%) – water adjustment

Vitacel WF 600
With WF 600(1%) – water adjustment
With WF 600(2%) – water adjustment

Clean label – xanthan replacement (E 415) with VITACEL®WF 600



0,22 bakers%

WF 600 (1%) shows the closest profile to the control sample.

Nutri Score:
Old vs. New


New algorithm!
NUTRI-SCORE
A B C D E

Different Algorithms

Originally

- Solid foods
- Fats/ oils
- Cheese
- Beverages

Milk(-drinks) and yoghurt drinks (proportion of milk >80%) are calculated analogously to solid foods

New

- General foods
- Fats, oils, nuts and seeds
- Red meat and meat products
- Beverages

Milk, milk-based beverages, fermented milk-based beverages and plant-based beverages are calculated as beverages !

New spreadsheet – general foods – (Favorable nutrients)

New

Points	Fruits, vegetables, pulses, ~~nuts, rapeseed-, walnut- and olive oil~~ (%)*	Fiber (AOAC-method) (g/100g)	Fiber (AOAC-method) (g/100g) new	Protein (g/100g)	Protein (g/100g) new
0	≤40	≤0.9	≤3.0	≤1.6	≤2.4
1	>40	>0.9	>3.0	>1.6	>2.4
2	>60	>1.9	>4.1	>3.2	>4.8
3	-	>2.8	>5.2	>4.8	>7.2
4	-	>3.7	>6.3	>6.4	>9.6
5	>80	>4.7	>7.4	>8	>12
6					>14
7					>17

Instead of 1g fiber/100g tortilla, three times as much is needed for one point

New spreadsheet – general foods (Unfavorable nutrients)

New

Points	Energy (kJ/100g)	Saturated fats (g/100g)	Sugar (g/100g)	Sugar (g/100g) new	Sodium (mg/100g)*	Salt (g/100g) new
0	≤335	≤1	≤4.5	≤3.4	≤90	≤0.2
1	>335	>1	>4.5	>3.4	>90	>0.2
2	>670	>2	>9	>6.8	>180	>0.4
3	>1005	>3	>13.5	>10	>270	>0.6
4	>1340	>4	>18	>14	>360	>0.8
5	>1675	>5	>22.5	>17	>450	>1
6	>2010	>6	>27	>20	>540	>1.2
7	>2345	>7	>31	>24	>630	>1.6
8	>2680	>8	>36	>27	>720	>1.8
9	>3015	>9	>40	>31	>810	>2
10	>3350	>10	>45	>34	>900	>2.2
15				>51		>3
20						>4

New categorization

New

Original final nutritional score	New final nutritional score	Nutri-Score
-15 to -1	Min. to 0	A
0 to 2	1 to 2	B
3 to 10	3 to 10	C
11 to 18	11 to 18	D
19 – Max.	19 to Max.	E

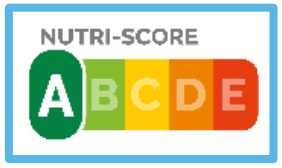
Tortillas

Nutri-Score (new calculation)

per 100g	Product 1		Product 2	
Energy	1330 kJ		1272 kJ	
	316 kcal		301 kcal	
Fat	8 g		4.9 g	
Saturated fat	1.4 g		1 g	
Carbohydrate	51 g		53 g	
Sugars	2.5 g		1.5 g	
Dietary fiber	3 g	+ 2.3	4.4 g	+ 0.9
Protein	8.2 g		9.1 g	
Salt	1.3 g	- 0.3	0.8 g	

new

new +
improved



Possibilities for improvement

- Fiber enrichment
- Salt reduction

!

Classification in the current and updated Nutri-Score for bread

Overall distribution (%)

Food group	Nutri-Score (%) Current algorithm					Nutri-Score (%) Updated algorithm				
	A	B	C	D	E	A	B	C	D	E
Belgium										
Whole grain bread	64	28	6	2	0	41	44	12	3	0
Mixed grain and refined grain bread	16	57	18	9	0	7	25	55	13	1
Other type of breads	7	20	28	45	1	3	9	35	51	4
France										
Whole grain bread	42	44	12	2	0	10	17	67	6	0
Mixed grain and refined grain bread	77	20	3	0	0	21	38	40	1	0
Other type of breads	27	55	15	3	0	5	8	78	8	1
The Netherlands										
Whole grain bread	98	1	1	0	0	89	8	2	1	0
Mixed grain and refined grain bread	51	40	9	1	0	14	25	57	3	0
Other type of breads	20	25	27	23	4	10	8	41	28	12

Nutri-Score

Modifications *(valid from 1 January 2024)*

- **Improved differentiation between foods based on salt or sugar content**
- **Improved differentiation between whole grain foods rich in fiber and refined foods**
- Better classification for fatty fish
- Better classification for oils with lower contents in saturates
- Better classification for poultry compared to red meat
- Better classification for sweetened and unsweetened dairy products

Better alignment with FBDGs*

Healthier food choices

*Food based dietary guidelines

EUROPE TECHNICAL CONFERENCE

JRS Fibers for Life.

Thanks for your attention!