



Healthy Ingredients for Health and Fitness - Fiber & Protein

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Ingredion India Pvt Ltd.

Agenda

- Introduction to Ingredion
- Nutrition portfolio
 - Resistant starches (fiber)
 - Pulse proteins

We are **Ingredion**

We turn grains, fruits, vegetables and other plant materials into value-added ingredients and biomaterial solutions for the food, beverage, paper & corrugating, brewing and other industries.



100
serving customers in
more than **100 countries**

approximately
11,000
talented and experienced
employees

FORTUNE
500
company

Ingredion
idea labs 
IDEAS TO SOLUTIONS

a global network of
Ingredion Idea Labs™
innovation centers,
manufacturing facilities
and sales offices...presence
in 40 countries

\$5.7
billion
net sales in 2016



INGR
LISTED
NYSE

headquartered outside
Chicago, IL

More than 1,000 ingredient solutions

NATURE-BASED RAW MATERIALS

- Corn
-
- Tapioca
-
- Potato
-
- Stevia
-
- Rice
-
- Pulses
-
- Others

STARCHES

- Corn
- Rice
- Tapioca
- Waxy corn
- Potato
- Flours
- Functional native starches
- Modified starches
- Resistant starches
- Pre-gel
- Dextrin
- Gluten-free
- Blends
- Others



FRUIT & VEGETABLE PRODUCTS

- Fruit juice concentrates
- Vegetable juice concentrates
- Purees and puree concentrates
- Essences
- Distillates
- Pomace
- Whole, sliced, diced strawberries

OTHER

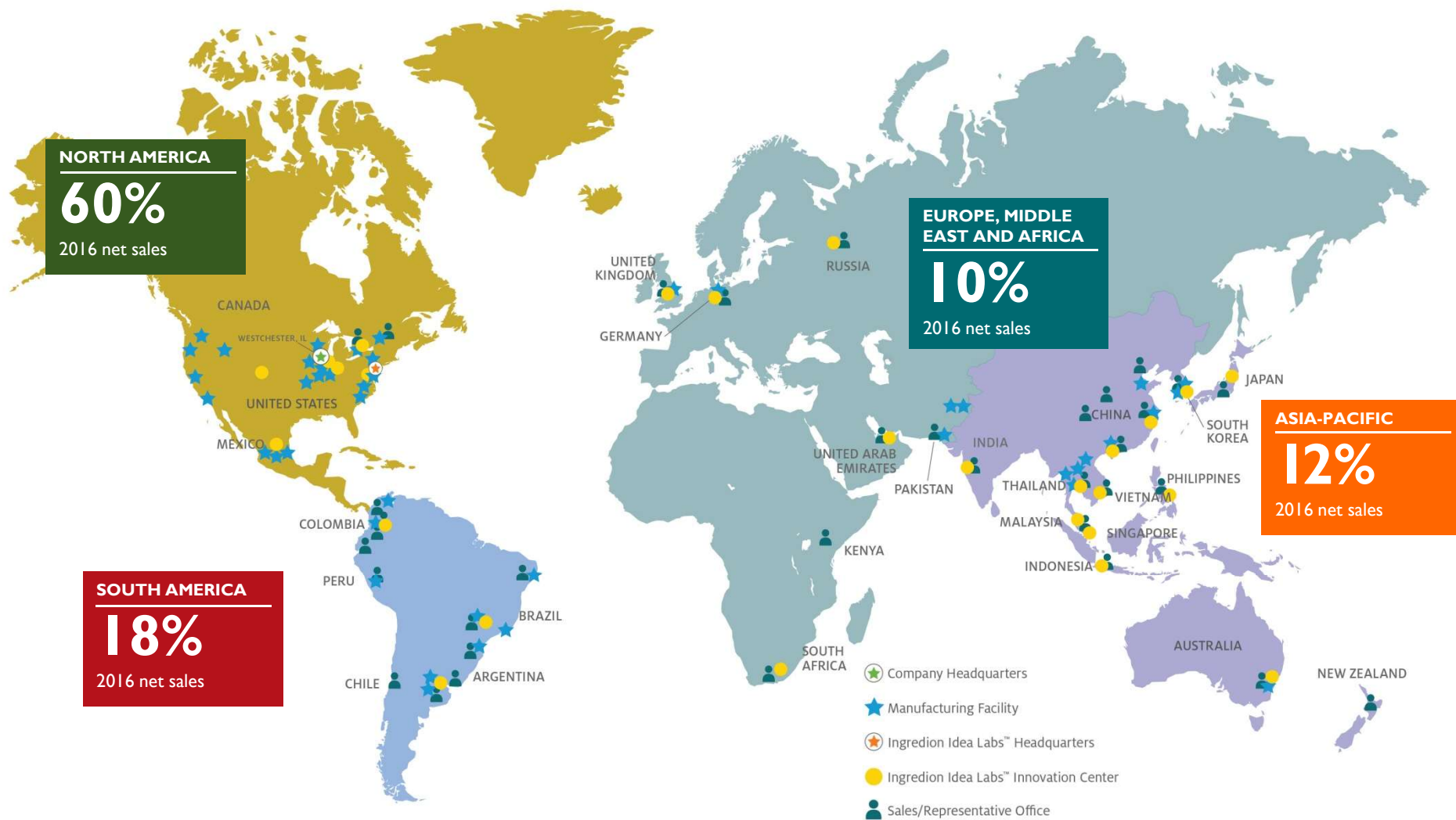
- Pulse proteins
- Corn gluten feed
- Corn gluten meal
- Crude corn oil
- Refined corn oil
- Hydrocolloids
- Tapioca fiber
- Prebiotic soluble fiber
- Biopolymers
- Others

SWEETENERS

- Stevia
- Glucose syrups
- Glucose solids
- HFCS
- Maltose syrups
- Maltodextrins
- Dextrose
- Polyols
- Non-GMO syrups
- Fructooligosaccharide
- Galactooligosaccharide
- Isomaltooligosaccharide
- Caramel color
- Fermentation products
- Blends



Our presence in both developed and emerging global markets




Ingredion's Customer Benefit Platforms


Key areas of focus and growth based on global consumer trends

CLEAN & SIMPLE™ 



- Natural & Simple Ingredients
- Free-From Ingredients
- Organic & Non-GMO

HEALTH & NUTRITION™ 



- Added Nutrition & Protein
- Reduced Sugar
- Fiber Enriched

AFFORDABILITY™ 



- Recipe Savings
- Reduced Manufacturing Costs

CONVENIENCE & PERFORMANCE™ 



- Convenient Foods & Beverages
- Processing Stability
- Extended Shelf Life

SENSORY EXPERIENCE™ 



- Crispy, Crunchy, Creamy, Sweet Foods
- Silky Creams & Lotions
- Fresh



Ingredion

Nutrition capabilities

Ingredion's broad portfolio of ingredients aligns with consumer demand and trends

We can help you develop on-trend, clinically proven products to address



Digestive health



Glycemic health



Weight wellness



Energy management



Protein intake



Immune health

Nutrition expertise to augment your team

Ingredion Idea Labs™ science-based problem solving can help you address nutrition trends with innovation and expertise, backed by research

•Nutrition Science and Clinical Program

- Clinical trials to identify and support health benefit claims
- Novel and proprietary ingredients backed by research
- Studies designed by our clinical nutritionists to help you differentiate your products
- Regulatory expertise to align your product with requirements



Ingredion's APAC Nutrition Portfolio

Insoluble fibers / resistant starches



The Vital Fibre

(Resistant starch type 2 - corn based)

NOVELOSE™

(Resistant starch type 4 – tapioca and wheat based options)

Soluble fibers / prebiotic fibers

BIOLIGO™

(Galacto-oligosaccharides, isomalto-oligosaccharides)

Proteins

VITESSENCE™

(Pulse proteins)



GLOBAL CONSUMER DEMAND FOR FIBER

91% Beneficial for gut health¹

68% Feel full longer¹

63% Lowers total daily calorie intake¹

94%

Consumers believe that fiber is important to a healthy diet¹



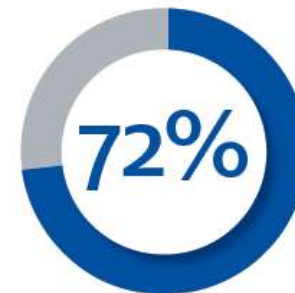
High consumer awareness of dietary fiber consumption



of consumers would buy a product if it could **help them manage their weight.**²



of consumers are seeking **long-lasting energy.**³



of consumers are looking for help with **managing blood sugar levels.**¹

Source: 1. HealthFocus International, 2014 2. HealthFocus International, 2015 3. Ingredient proprietary energy study, 2015

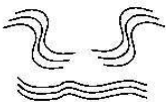
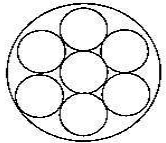
A NEW FRONTIER IN FIBER

There are 3 types of fiber:

- **INSOLUBLE**
- **SOLUBLE**
- **RESISTANT STARCHES**



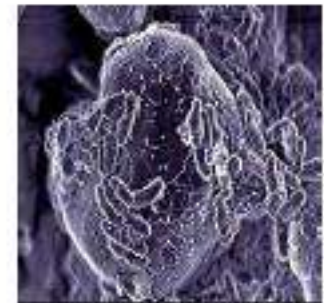
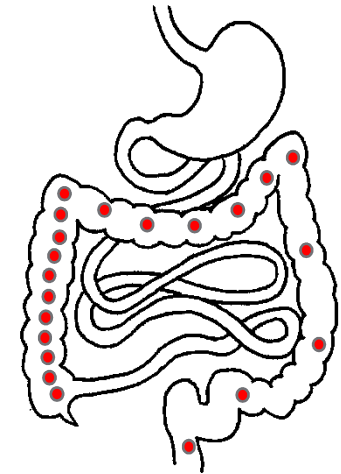
Type of RS	Food Sources
Physically inaccessible (RS1)	Whole grains, coarsely milled grains, seeds,
Resistant starch granules (RS2)	Raw potato, green banana, some legumes, high amylose maize starch (e.g. HI-MAIZE™) *
Retrograded or crystalline non-granular starch (RS3)	Cooked and cooled starchy foods ie.potato, bread and cornflakes
Chemically modified starch (RS4)	Commercially modified starches



Ingredient

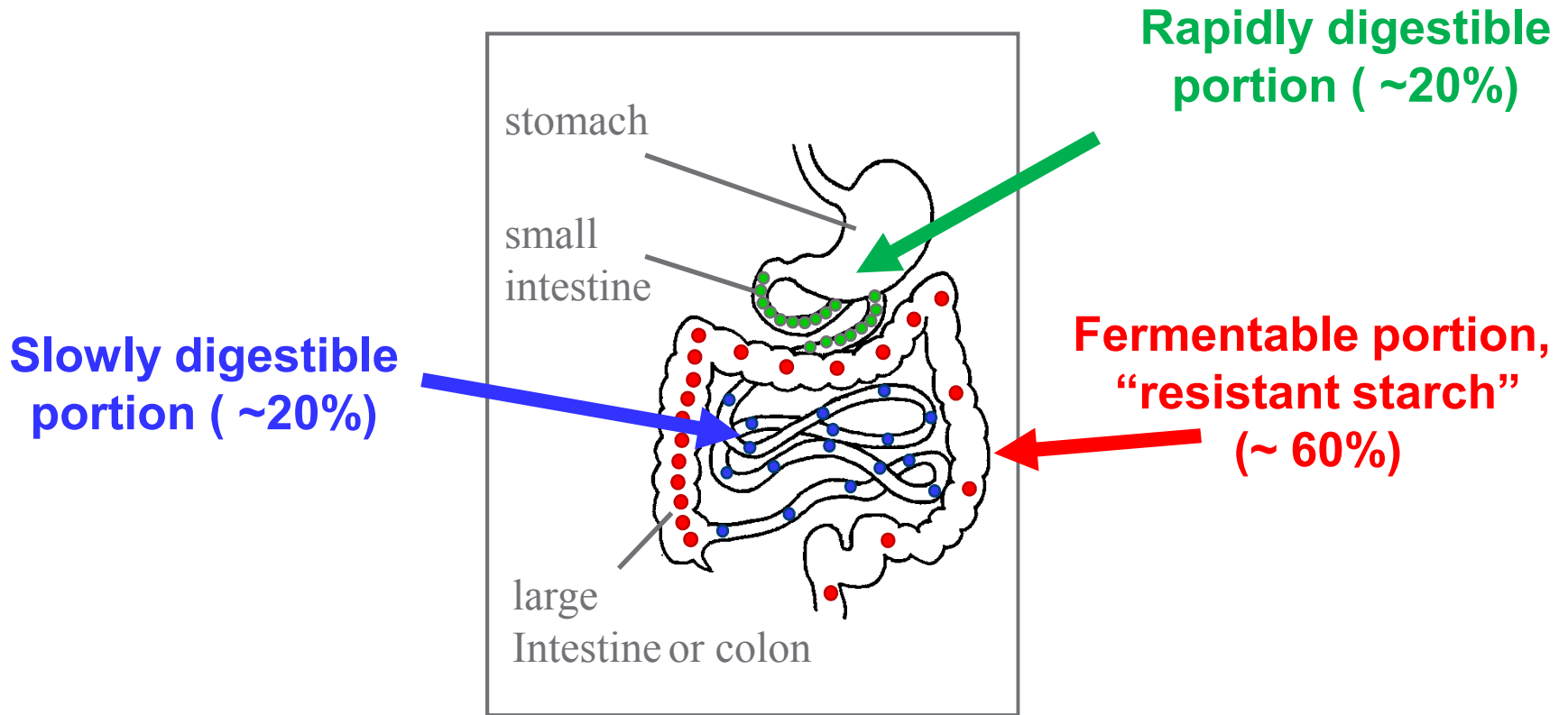
WHAT IS RESISTANT STARCH?

- Resists digestion in the small intestine
 - makes its way to the large intestine.
- Insoluble & slowly fermented in the large intestine by resident bacteria.
- Provides a mild laxative effect which promotes ‘regularity’.
 - Produces compounds called short chain fatty acids (in particular butyrate)
 - Lowers pH, acts as a fuel supply for beneficial digestive bacteria that optimise inner health



Bifidobacteria on high amylose corn RS2.
Brown et al, MA 1999.

Unique Digestive Profile of HI-MAIZE® High-Amylose Maize Starch



The slowly digestible and resistant starch portions both contribute to its effects on metabolism



Ingredion's Resistant Starch Portfolio



HI MAIZE® 260

– Natural & clean label

- High amylose Maize hybrid
- **60% fiber content**, 40% resistant starch
- Over **70 human clinical** trials backing health benefits such as blood sugar management, satiety etc.
- Manufactured in Australia
- Resistant starch type 2



NOVELOSE™ 3490

– Affordable fiber fortification

- High total dietary fiber – min **85% fiber content**
- Tapioca based
- **Process tolerant, easy handling**
- **No or minimal impact** to sensory experience
- Manufactured in Thailand
- Resistant starch type 4



NOVELOSE™ W



– Good replacement for wheat flour

- High total dietary fiber – min **85% fiber content**
- Wheat based
- Imparts **good textural properties** such as crispiness
- Manufactured in USA
- Resistant starch type 4

Key applications: Bread, noodles/pasta, biscuits, cereal & cereal bars

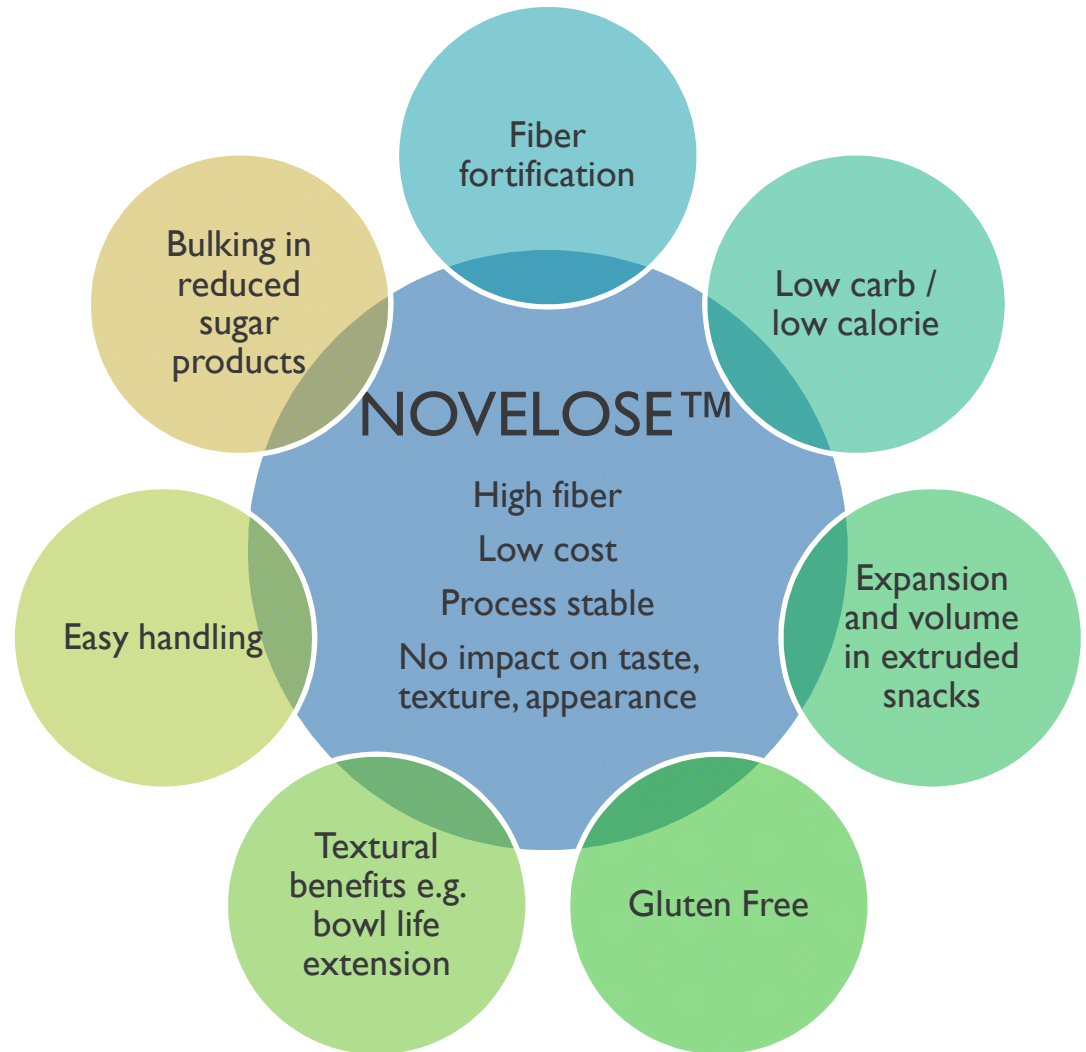
HI-MAIZE® - Global Health Claims



Country	Governing Institution	Claim type	Label claim
Australia and New Zealand	Food Standards Australia New Zealand (FSANZ)	General Level Health Claim	Resistant Starch 2 (RS2) helps to maintain/support a healthy digestive system when consumed as part of a healthy diet made up of a variety of foods.
EMEA (Europe, Middle East, Africa)	European Food Safety Authority (EFSA) 	General Function Health Claim	Replacing digestible starches with resistant starch in a meal contributes to a reduction in the blood glucose rise after that meal. <i>*Conditions for use: The claim may be used only for food in which digestible starch has been replaced by resistant starch so that the final content of resistant starch is at least 14% of total starch.</i>
USA	U.S Food and Drug Administration 	Qualified Health Claim	High-amylose maize resistant starch may reduce the risk of Type 2 diabetes. FDA has concluded that there is limited scientific evidence for this claim. High-amylose maize resistant starch, a type of fibre, may reduce the risk of Type 2 diabetes. FDA has concluded that there is limited scientific evidence for this claim. <i>*Conditions for use: The food must contain at least 10% or more of the RDI or the DR value for Vit A, Vit C, iron, calcium, protein OR fiber per reference amount customarily consumed (RACC) prior to any nutrient addition.</i>



NOVELOSE™ dietary fibers – beyond fiber fortification



Seize the Power of Pulses

Pulse Ingredient Capabilities



Types of pulses

Lentils



Green
Varieties: Laird, Estor, Richies, Queen Green



Red Whole and Split
Varieties: Felicit, Blaze, King Red



French Green
Other names: Dark Speckled

Chickpeas



Kabuli
Other names: Garbanzo beans



Desi
Other names: Kala Chana



Split Desi Chickpea
Other names: Chana dal

Beans



Navy
Other names: White pea, Albus chick



Romano
Other names: Cranberry, Speckled Sugar, Bedah



Pinto



Dark and Light Red Kidney



Faba



Black

Peas



Yellow



Green

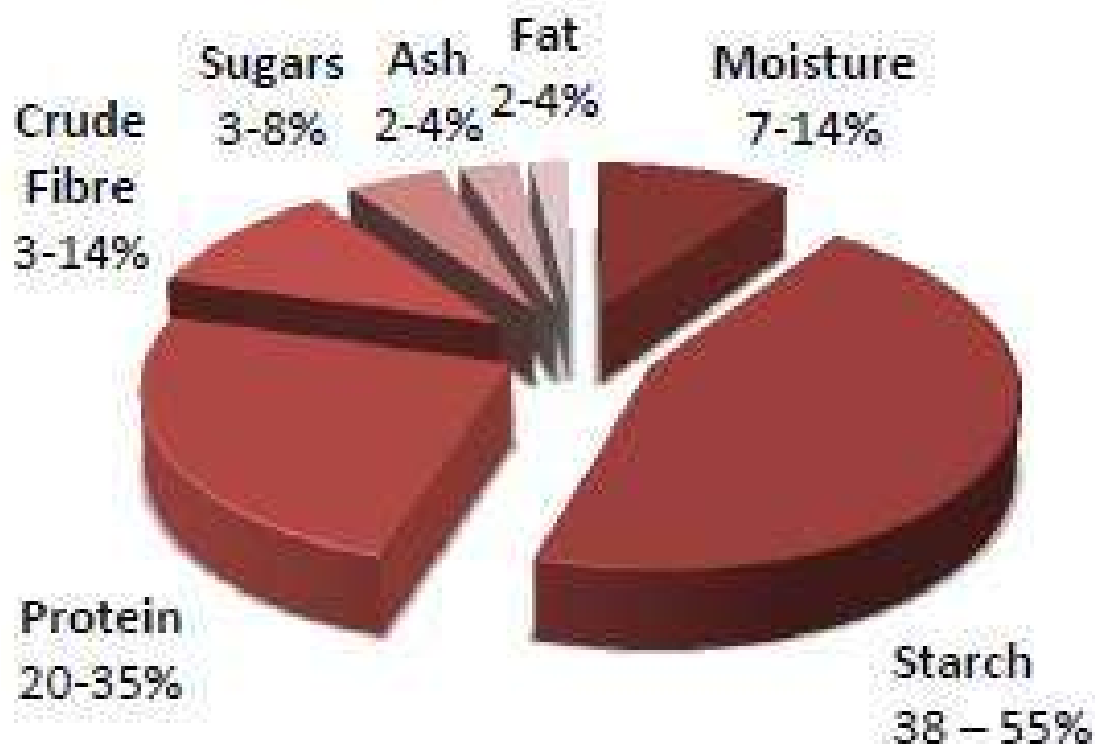


Split Yellow and Green



Ingredion

Composition of pulses



High protein

- High lysine (higher than cereals and oilseeds)

High dietary fibre

- Rich in insoluble fibre

Low fat

- Pea, lentils and faba beans: <3%
- Chickpeas: <7%

High micronutrients

- Folate, iron, zinc, selenium, potassium, magnesium, calcium and beta-carotene

Source: Pulse Foods - Processing, Quality and Nutraceutical Applications, 2011; Edited by: Brijesh K. Tiwari, Aoife Gowen and Brian McKenna

Pulses vs. Grains

Pulses (peas, lentils and chickpeas) are more nutritionally dense than most grains, packing a major protein and fiber punch. They're easy to store and as quick to prepare as pasta, making them ideal pantry staples.



	FOOD	CAL.	LOW FAT <i>less than 3g</i>	FIBER <i>10+ g</i>	PROTEIN <i>10+ g</i>	FOLATE <i>100+ mcg</i>	IRON <i>4+ mg</i>
Pulses	 Dry Peas	231	✓	✓	✓	✓	
	 Lentils	230	✓	✓	✓	✓	✓
	 Chickpeas	269	✓	✓	✓	✓	✓
Grains	 White Rice	206	✓				
	 Brown Rice	216	✓				
	 Oats	166					✓
	 Quinoa	223					
	 Amaranth	251					✓
	All Are Gluten-Free!						



For more information and recipes, visit www.cookingwithpulses.com

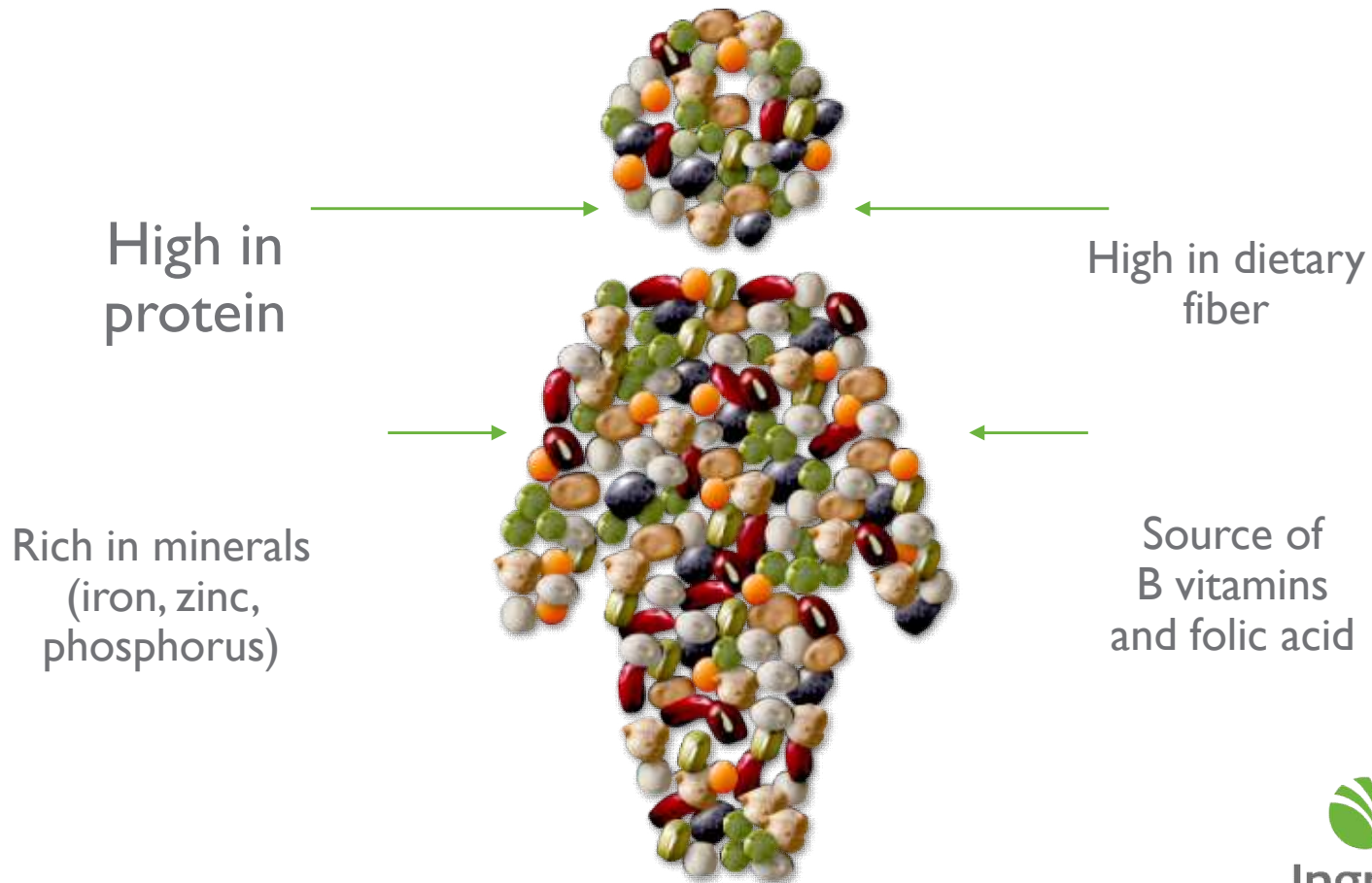
Food	Cal	Fat	Fiber	Protein	Folate	Iron	Carbs
Dry Peas	231	0.8g	6g	16g	127mcg	2.5mg	0g
Lentils	230	0.6g	16g	18g	358mcg	6.6mg	40g
Chickpeas	269	4.2g	12g	15g	282mcg	4.7mg	45g
White Rice	206	0.4g	0.6g	4.2g	31.6mcg	1.8mg	45g
Brown Rice	216	1.8g	3.5g	5g	7.8mcg	0.8mg	45g
Oats	166	3.6g	4g	6g	87.4mcg	7.4mg	28g
Quinoa	223	3.6g	5g	8g	77.7mcg	2.8mg	39g
Amaranth	251	4g	5g	8g	54.1mcg	2.8mg	46g

(FOR 1 CUP COOKED)



Ingredion's Pulse Proteins

Pulses are nutritional powerhouses





Pulses help meet many of the hottest trends in foods and beverages, including:



Nutrition and wellness



Clean label formulations



Growth of vegan diets



Sustainable sourcing



Interest in vegetable-based ingredients is skyrocketing



One in three consumers
prefers non-animal protein¹



Vegetable-based proteins experienced
61% growth from 2010 to 2014¹



Why Pulses?



Pulses are highly nutritious.



Pulses are economically accessible and contribute to food security at all levels.



Pulses have important health benefits.

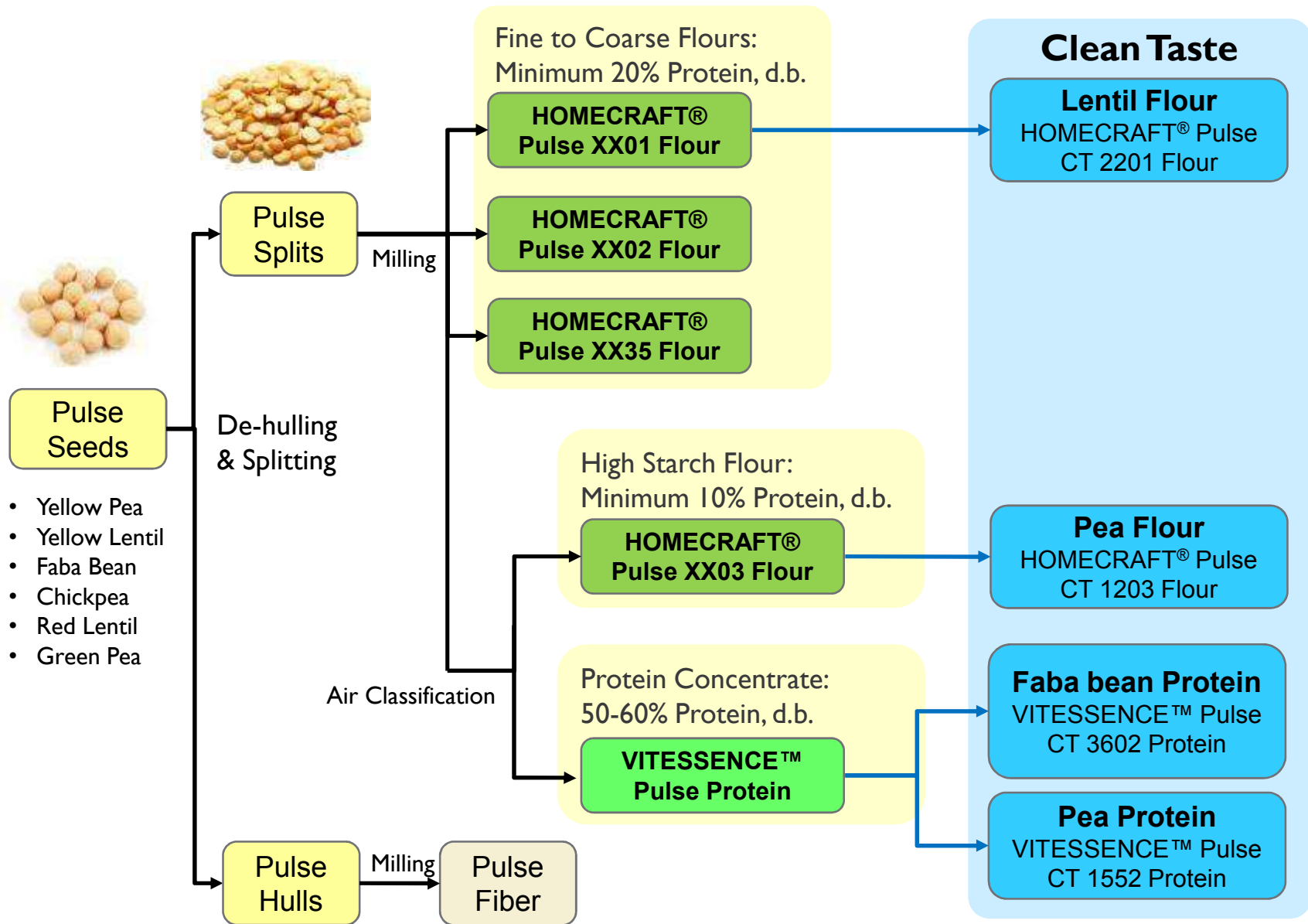


Pulses foster sustainable agriculture and contribute to climate change mitigation and adaptation.



Pulses promote biodiversity.





VITESSENCE™ Pulse proteins

Mechanically milled and air-classified portion of the de-hulled split flours

VITESSENCE™ Pulse 1550
Pea protein with 55% of protein*

VITESSENCE™ Pulse CT 1552
Clean Taste Pea protein with 55% of protein*

VITESSENCE™ Pulse 2550
Lentil protein with
55% of protein*

VITESSENCE™ Pulse 3600
Faba bean protein with 60% of protein*

VITESSENCE™ Pulse CT 3602
Clean Taste Faba bean protein with 60%
of protein*



- **Nutrition Plus**

- Increase protein content of different formulations, including beverages, bakery and snacks

- **Plant power**

- Eliminate and/or reduce other protein sources in the formula: dairy, soy, animal, eggs

- **Clean Tasting portfolio**

- Deflavoured for easier incorporation into a widespread variety of applications.



Ingredion



Ingredion

Create delicious nutrition
with Ingredion

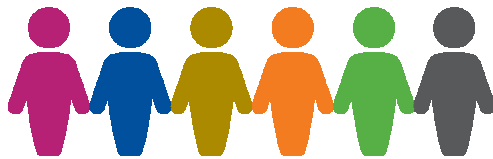
Stay ahead of trends **with us**

Collaborate with our scientists, nutritionists and regulatory experts at Ingredion Idea Labs™ innovation centers

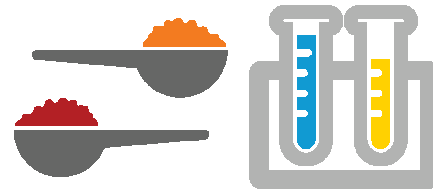


Stay ahead of trends **with us**

Benefit from four focus areas:



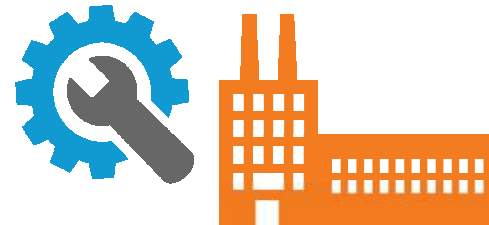
CONSUMER INSIGHTS



APPLIED RESEARCH



APPLICATIONS KNOWHOW



PROCESS TECHNOLOGY

Stay ahead of trends **with us**

Develop consumer-winning products with our:



CULINOLOGY®
expertise

CULINOLOGY®

Culinology® is a registered trademark of
Research Chefs Association.



Global sensory
capabilities

optimize
sensory



CONSUMER-CENTRICITY™ design

CONSUMER-
CENTRICITY™



Ingredion

Let's make nutrition
more delicious than ever





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Thank you.

For any query you can write to
shiva.prasad@ingredion.com

