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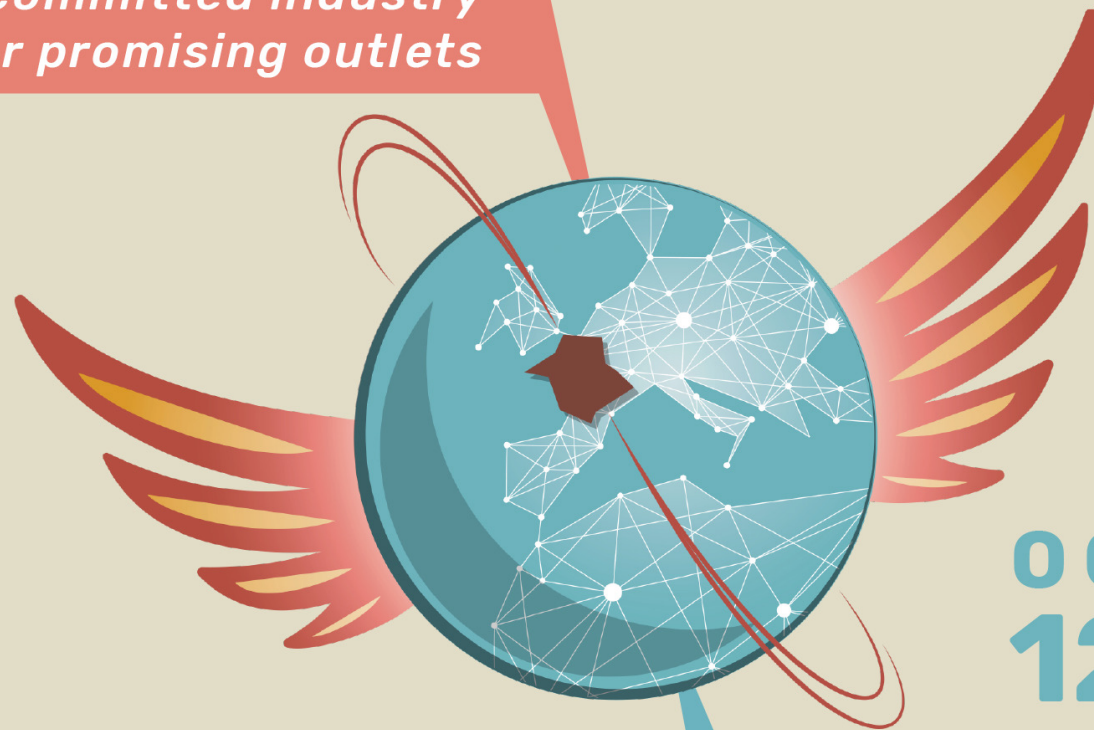


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# 3<sup>RD</sup> EUROPEAN SORGHUM CONGRESS

## THE SORGHUM

*A committed industry  
for promising outlets*



OCTOBER  
12<sup>TH</sup> & 13<sup>TH</sup>

TOULOUSE

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# **100% Sorghum pasta: an innovation in the gluten-free market and a new frontier of healthy nutrition**



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# Monia Caramma

I study gluten-free cereals and their gelatinization processes. I create healthy foods with attention to intolerances to the main allergens but also to nickel. Since 2019 I am Co-Founder and Chief R&D Officer of Macaronicus based in Lugano, Switzerland, and Milan, Italy.

The first batch of 100% Sorghum pasta produced with my recipe was released to the market in 2016.

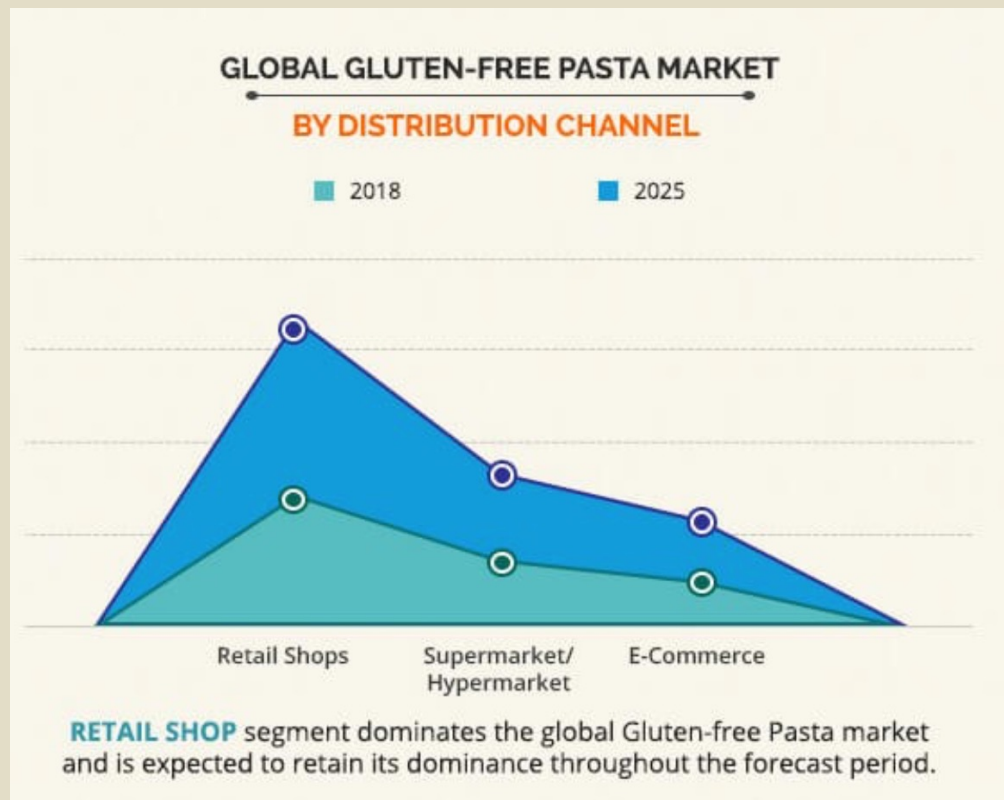


# Market

## Gluten free growth

70 million Europeans suffer from wheat intolerance and look for food with no gluten content. This is one of the reasons why the global gluten-free pasta market is projected to reach \$13 billion by 2025.

The best seller in the market is currently brown rice followed by yellow corn.



Fonte Alliedmarketresearch

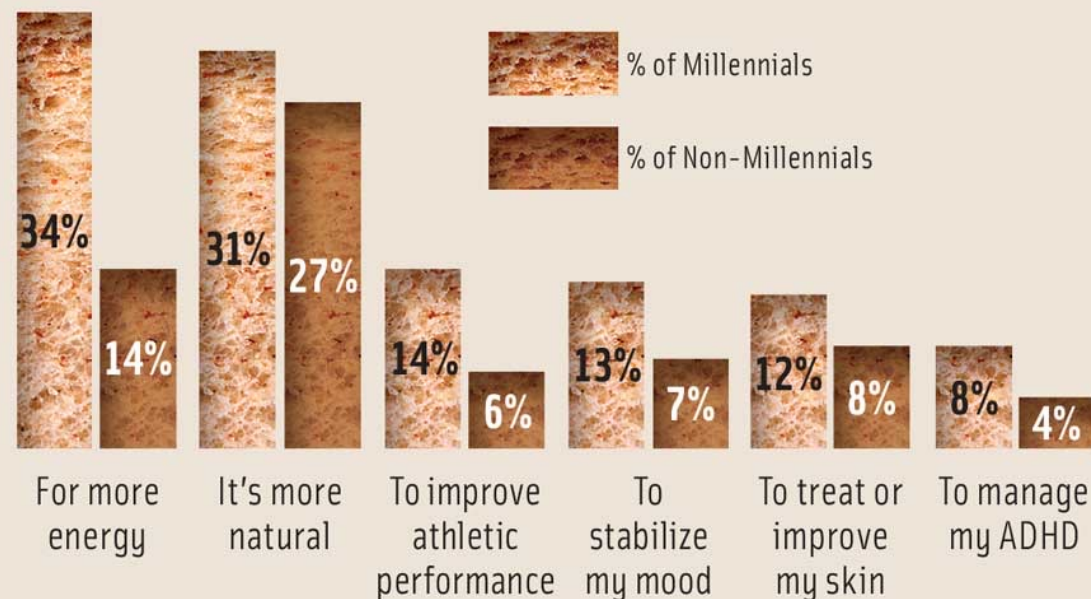
# Wheat intolerant

## A huge growth

Gluten sensitivity is a great concern in Europe because healthy departments estimated that around 135 million Europeans avoid wheat or self-diagnose as intolerant.

Another market with important growth is that of conscious consumers: they have no intolerance but they have personally verified the benefits of eating gluten-free and do it when the product is of high quality.

### Reasons for Choosing Gluten-Free Products



Fonte IFT.org

# Why Sorghum

## A healthy choice

Consumers who are intolerant or allergic to gluten and those who are aware of it have specific reasons for choosing gluten-free products.

Given these characteristics, Sorghum is the best candidate to meet the demand for healthy products

### Sorghum

- does not cause inflammation,
- is rich in iron, and antioxidants,
- provides fiber
- is 100% sustainable even in crops.



Fonte IFT.org

# Differences

## Sorghum – Corn - Brown sugar

	<b>Corn</b>	<b>Brown rice</b>	<b>Sorghum</b>
Carbohydrates	75g	77g	70g
of which sugars	2,5g	1g	0,2g
Fiber	2g	1,8g	6,7g
Protein	9,2g	2,6g	11g
Iron	2,4mg	0,4mg	2,7mg

The superiority of sorghum over corn and brown rice is evident in the contribution of macronutrients but also of minerals.

The well-known importance of iron in celiac disease and of low glycemic index in the diet of diabetic consumers underline why sorghum is a better choice.

# Comparison

## Sorghum – Corn - Brown sugar

- **Pasta senza glutine a base di riso integrale e mais**
- **Trafilata al bronzo**
- **Prodotto in Italia; no OGM**
- **Ingredienti: Riso integrale, mais giallo, mais crudo, riso, fecola di patate, emulsionante: mono e digliceridi degli acidi grassi di origine vegetale; PUÒ CONTENERE TRACCE di SOIA e LUPINI**

Example of an Italian gluten free pasta sold in supermarket and gluten free stores.

Ingredients: brown rice, corn, raw corn, starch, mono and diglycerides of fatty acids

Gluten-free foods contain gums, thickeners and flavors that are often not specified. Furthermore, the ingredients are mainly two, repetitive: corn and rice even in their starchy forms.

Rice and yellow corn are two crops that present various sustainability problems related to the use of pesticides, to the large amount of water they need to grow. Furthermore, several studies are focusing on rice that have also shown a high content of arsenic.



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# Sorghum

## Bontasana Sorghum pasta nutritional value

Valori nutrizionali medi per Average Nutritional Values per	100 g	porzione portion 60 g	AR* RI* 60 g
Energia / Energy	1.621 kJ 383 kcal	973 kJ 229 kcal	12%
Grassi / Fat	2,7 g	1,6 g	2%
di cui acidi grassi saturi / of which saturates	0,4 g	0,2 g	1%
Carboidrati / Carbohydrates	77,0 g	46,0 g	16%
di cui zuccheri / of which sugars	0,0 g	0,0 g	0%
Fibre / Fibre	5,7 g	3,4 g	14%
Proteine / Protein	9,8 g	5,9 g	12%
Sale / Salt	0,0 mg	0,0 mg	0%

\* Assunzioni di Riferimento di un adulto medio (8400 kJ / 2000 Kcal)

\* Reference intake of an average adult (8400 kJ / 2000 Kcal)

Circa 4 porzioni per confezione / About 4 portions per package

Da consumarsi preferibilmente entro il: vedi il fondo della scatola  
Best before: see bottom of the box

Sorghum pasta is highly digestible and easily assimilated, as well as containing important mineral salts such as iron, calcium, potassium and vitamins such as niacin (Vitamin B3) and vitamin E (the same contained in walnuts for example).

It also contains natural antioxidants such as phytosterols and flavonoids that help lower the incidence of cancer, diabetes and cardiovascular disease.







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# Inclusive food

## Bontasana Sorghum pasta



The increasing share of intolerant and health-conscious consumers is also changing the catering industry. The need to serve inclusive pasta, which adapts to the needs of all diners, without compromising on taste, is on the rise.

The Kosher and Halal certification standards are recognized all over the world as a guarantee of quality and food safety also in the control of contamination.





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## Roadmap

# Sorghum pasta

Pasta can be produced with 100% of sorghum . Pasta has a high water absorption.

Its Glycemic index is low, below 65.

2015

non-gelatinized flour



The first pasta was a disaster. The dough, the extrusion and drying at 42 ° C were correct but as soon as pasta was boiled, it melted.

2017

gelatinized flour



The first test was carried out with a temperature between 60 and 67 °C.  
Result: consistent paste but easy to break

2019

gelatinized flour



We stabilized the gelatinization using variable temperatures in relation to the amount of amylose

2020

the result



The pasta keeps cooking perfectly, supports bronze dies with traditional thickness



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# Production

Sorghum grains are milled and transformed into flour with significant granulometry, which results in less water absorption. Molino e Riseria Martini in Castelforte, Mantova, Italy, is our trusted partner in transforming Sorghum into flour.

The result is a solid dough which, drawn in bronze, keeps the shape of the dough without breaking.



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# Pasta shapes

100% Sorghum



Mezze maniche is our top seller.

Bronze extruded, dried at 40°C for about 20 hours. 12% humidity

Mezze maniche is the gourmet version of our sorghum pastas. Because sorghum is a great source of fibre and antioxidants and our pasta contains no sugar, this selection is perfect for athletes and anyone who wants to live a balanced lifestyle. Nutty, porous and tender texture



Casarecce.

Bronze extruded, dried at low temp about 20 hours. 12% humidity. With its rugged surface, the casarecce acts as a sponge, making it perfect for heavier coating sauces.



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# Study

## A healthy choice



Sorghum flour samples were used to obtain pasta with high protein ( $\approx 170$  g  $\text{kg}^{-1}$ ), dietary fiber ( $\approx 80$  g  $\text{kg}^{-1}$ ), polyphenols (2.6 g GA  $\text{kg}$  pasta), and antioxidant activity. This sorghum pasta showed slower starch in vitro digestion than the other gluten-free pasta, with a high level of protein hydrolysis (76%). The highest eGI was observed in a rice sample (69.8) followed by a corn-based pasta (66.4). White and brown sorghum gluten-free pasta showed 2.9 and 2.4 times, respectively, higher potentially bioaccessible polyphenol content compared to that in cooked pasta. No significant variation in antioxidant activity was found in sorghum pasta after digestion and around 48% and 36% of activity was detected in dialysate.

Palavecino et al: Gluten-free sorghum pasta: starch digestibility and antioxidant capacity compared with commercial products. J. Of Science food enad Agriculture 9/08/18



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# Why Sorghum pasta

A healthy choice



- 0 g of sugars ( detected by analysys on cooked pasta)
- No other cereal or emulsifier added
- High digestibility
- Traditional production technique
- Innovative gelatinization and milling process
- Nutty and delicate taste
- It doesn't overcook
- Porous texture
- Organic, Kosher Halal Certified
- Horeca and Consumers



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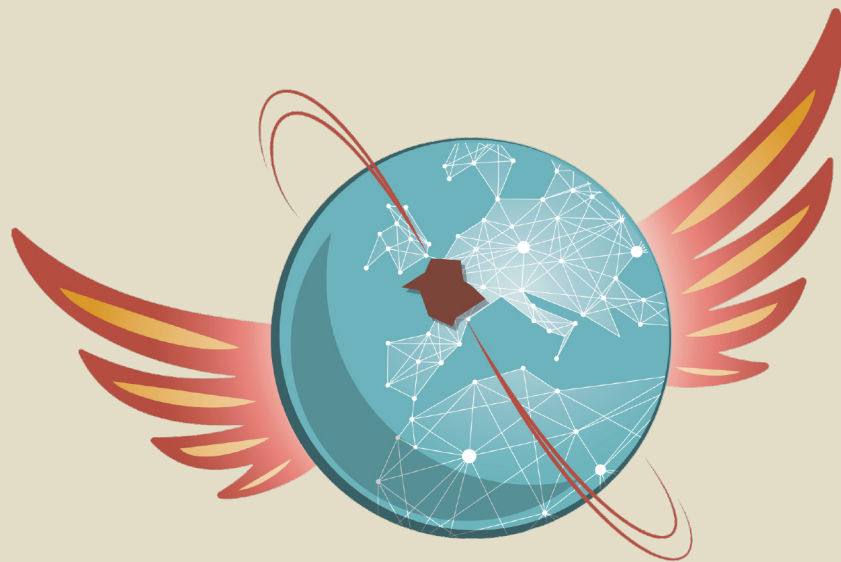
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# Thank you

## Partners



**FNPSMS**  
**maiz'EUROP'**



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