Whole Grains Summit 2012
Minneapolis, May 20-22, 2012

Whole grain products in (Southern) Europe: consumer trends and technological implications

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Open Fields srl - Italy
The whole grain’s value

HEALTH BENEFIT CONTRIBUTIONS

- Heart disease (ischemic stroke)
- Cancer (colon, stomach, esophagus, lung)
- Type 2 diabetes
- Weight management (obesity and fat distribution)

NUTRITIONAL PROPERTIES

- Fibre (insoluble and soluble)
- Essential fat acids
- Vitamins
- Minerals
- Phytochemicals (phenolic compounds, lignans, antioxidants, phytoestrogens, alkylresorcinols, betaine)

Quantity ➔ not only fibre but also others biologically active micronutrients
and
Quality ➔ synergistic effects of the dietary fibre and micronutrients

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Whole grain in Europe

• Absence of a commonly agreed official definition of whole grain

• Lack of dedicated whole grain consumption statistics

...when talking about whole grain food products, trends and consumers, Europe cannot be regarded to as a whole!
Legal definitions of whole grain in Southern Europe

**ITALY**

Law n. 580 of 1967 - adjournment on 2001 (DPR n° 187)
- Wheat flour and semolina only
- Level of proteins (12.0 % for common wheat; 11.5% for durum wheat)
- Ashes (1.30 -1.70 for common wheat; 1.40 -1.80 for durum wheat)
- Whole grain flour/semolina must be obtained at the mill

**SPAIN**

Law 2484 of 1967 - adjournment on 26/04/2012
- 3.20.10. Wholegrain flour - the product resulting from cereal grinding, subject to cleaning and conditioning, without removing any part of the cereal. The packaging should be labelled as «wholegrain flour» followed by the name of the cereal from which it is produced.

**FRANCE**

Decree of 20 July 1963
- Ashes (>1.4 % for all whole grain flours except rye T150; >1.50 for whole rye flour T170)

**GREECE**

Food Code Index 106, section 12

Whole grain semolina
- Ashes (1.60 d.m. max)
- Acidity (0.15 % max)
- Level of bran (18.0 % max)
- Impurities (0.03 % max)
- Granulation size

- DIN Standard 10355 of 1992 and adjournments
- Whole grain flour and whole grain meal must contain the entire constituents of the cleaned grain, including the germ. It is permissible for the outer pericarp (grain shell) to be removed from the grain before processing.
Other international definition sources

- USA (AACC, American Association Cereal Chemists, 1999; Food and Drug Administration, 2006)
- Canada
- UK
- Denmark
- Germany

The European HEALTHGRAIN consortium (2008) to assess a harmonized and comprehensive definition of whole grain in Europe.

HEALTHGRAIN definition of whole grains (2010)

“Whole grains shall consist of the intact, ground, cracked or flaked kernel after the removal of inedible parts such as the hull and husk. The principal anatomical components (the starchy endosperm, germ and bran) are present in the same relative proportions as they exist in the intact kernel. Small losses of components (i.e. less than 2% of the grain and 10% of the bran) that occur through processing methods consistent with safety and quality are allowed.”

See www.healthgrain.org/webfm_send/44 for the extended definition which includes the list of cereal grains included and milling and processing aspects.
**US DIETARY GOALS AND PRACTICE**
- **Whole grains** intake: 15% of goal
- **Refined** grains intake: 100% above limit

**EUROPE OVER-ALL PICTURE**
Similar to USA although for Europe there is not a comprehensive picture of WG consumption
A whole grain case: the bread

CURRENT WHOLE GRAIN INTAKE IS BELOW RECOMMENDATIONS: FOR EXAMPLE, THE EUROPEAN CONSUMERS PREFER WHITE BREAD, MADE WITH REFINED FLOURS.

White bread is not only dominant in the UK and in southern Europe, but also in countries with traditions of whole grain products like Germany, where the share of whole grain breads is stable at 10%. (1)

Although In the Nordic countries, whole grain breads have a larger share of the market, the white bread is dominant and the whole grain intake is still below recommended levels. (2)

In the Netherlands, wholegrain, brown (50% wholegrain) and white bread have about 25% of the market each, with white bread dominating the luxury and small bread market. The remainder is multigrain (white flour with some added grains) also popular in Germany and Austria.

- Newsletter VDM, 2011 - presenting results of GfK, major market research agency.
- Kyrø et al. 2011.
### High Fibre market size in Europe: bread

- Whole grain is included in the High Fibre category

<table>
<thead>
<tr>
<th>Categories</th>
<th>Geographies</th>
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*Source: ©Euromonitor International; courtesy of Barilla G. e R. F.lli SpA*
High Fibre market size in Europe: biscuit and breakfast cereals

- Whole grain is included in the High Fibre category

<table>
<thead>
<tr>
<th>Market Sizes</th>
<th>Historic/Forecast (F)</th>
<th>Geographies</th>
<th>Retail volumes (*1000 tonnes)</th>
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Source: ©Euromonitor International; courtesy of Barilla G. e R. F.lli SpA
• Whole grain is included in the High Fibre category

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For Italy: Euromonitor data were corrected with data from the major Pasta Industries

Source: ©Euromonitor International; courtesy of Barilla G. e R. F.lli SpA
Whole grain consumption issues

- **Pleasantness** in comparison with the refined products: taste, texture and appearance (color)

- Manufactures’ **advertising** policies

- **Pricing** (wholemeal flours more expensive than the refined ones)

- Consumers’ **expectation** on whole grain products availability, selection and quality

- Consumers’ **habit variability** (gender, age, education, social class, race, ethnicity, health level)

- Consumer’s **mindset** and **reluctance to change**

- **Eating out**

- Misleading / confusing **messages / labels** (whole grain, high in fibre)

- Very complex **food categories scenario** (functional, nutraceutical, free-from, better-for-you, good-for-you...)

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Whole grains: healthiness and likelihood of buying

Whole grain product are rated more favorably than the refined ones on healthy attributes.

Source: Shepherd R., 2011.
Whole grain: likelihood of buying

- Sensory features
  (bitter taste, sandy texture and dark appearance)
- Strong culinary tradition
- Mediterranean diet = Healthy diet
- Price

The awareness of the health benefits of WG is not enough if good WG products cannot be found on the shelves and tailor-made recipes are not suggested.
Source: Arvola et al., 2007.
CONSUMER SEGMENTS, CROSS-NATIONALLY BASED

- **Grain positive**: Evaluated both whole grain and refined grain products positively.
- **Grain favoring**: Evaluated whole grain positively only.
- **Grain neutral**: Neutral attitude towards whole grain and refined products.

Source: from Arvola et al., 2007.
Are WG products healthier and more pleasant than corresponding white flour products?

Source: from Arvola et al., 2007.
WG products and consumers’ behaviour - Europe

CROSS-NATIONAL RESULTS

**Finnish** consumers are the most favorable to the whole grains

A lack in the differentiation between whole grain and refined product is also perceivable for **British** consumers

**Italians** shown lowest rate on whole grain’s healthiness expectation and less appreciation of the taste as well

- Consumers in **Finland, Italy** and **UK** are aware of that whole grain products are healthy but that does no appear sufficient for a behavioral change.
- All cereal products, whole grain or refined, are apperceived positively for the health.
- **Italians** perception/approach on whole grain products should probably be evaluated taking into account the existing strong culinary tradition (i.e. Mediterranean diet).
- The grain positive and grain neutral consumer segments appears to be the most challenging group to promote whole grains products.
- Information on WG product benefits may not be the right strategy to promote WG consumption, but providing new WG options and making them widely available.
Boosting whole grain consumption

GOAL

- Increase the proportion of whole grain consumers
- Increase the average intakes

• Deepening food companies understanding on what product-related attributes negatively affect whole grain products perception and adopting appropriated technological tools.

• Developing a wider range of whole grain products (new launches) as affordable alternative to the refined ones.

• Food marketing evolution to attract consumers to whole grain products:
  - more focused and effective massages (i.e. for grain positive and grain neutral consumers);
  - improve the evidence of the relation of whole grain and health.

• Solve the issue of the whole grain products identity by a shared European definition.

• Lowering the price

• Harmonize the health claims usage

• Increase the sensory appeal:
  - advances in milling technology and new food technologies;
  - use of new / suitable ingredient as flavors, ancient cereals or seeds;

• Promoting whole grain products use in the school lunches

FLABEL - European project
State-of-art of the consumers’ behaviour, and nutritional label, will provide guidelines for research, industry and policy-makers.
Technological tools on whole grain products design (I)

**GRAIN MILLING**

- **Food safety** guaranteed (chemicals residues, mycotoxins, heavy metals)
- **Reduction** of WG flour **impact** on food making processes (size, structure, color)

**DEBRANING/PEELING + PEARLING**

(Dexter et al., 1996; 2001)

**CRYO MILLING**

(Hemery et al., 2001)

**LASER ABLATION**

(Martelli et al., 2009; Panchev et al., 2011)

**PHYSICAL FRACTIONATION**

(Hemery et al., 2007)

**ELECTROSTATIC FRACTIONATION**

(Hemery et al., 2011)

**WHITE WHEAT VARIETIES**

- Clearer appearance
- Safe, selected and concentrate WG components (i.e. aleurone layer)
- Increased availability of the cellular components
Technological tools on whole grain products design (II)

GRAIN PRODUCT PROCESS

• **Reduction** of WG flour **impact** on food making processes
• **Increase bioavailability** of the WG components

GERMINATION

(Biqiang et al., 2010; Sharma et al., 2010; Katina et al., 2007; Kaukovirta-Norja et al., 2004)

- Cereal functionality by nutrients content variation (starch, free sugars, amino acid, acid phytic)

FERMENTATION

( Delcour et al. 2012; Katina et al., 2007; Eklund-Jonsson et al., 2006)

- Positively acts on bread volume and crumb softness
- Prebiotic effect (AXOS)
- Nutrients content variation

EXTRUSION COOKING

(Robin et al., 2012; Stojceska et al., 2008)

- Breaking of TDF polysaccharides with partial solubilization
- Versatility
Food launches with WG claim across Southern Europe

**TOP 4 CATEGORIES IN 2011**

- Bakery (178)
- Breakfast cereals (107)
- Side dishes (50)
- Snacks (6)

**COUNTRIES**
- France
- Italy
- Spain
- Portugal
- Greece

Source: Mintel/GNPD courtesy of Kampffmeyer Food Innovation GmbH
Food launches with WG claim across Southern Europe

Source: Mintel/GNPD courtesy of Kampffmeyer Food Innovation GmbH
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Source: Mintel/GNPD courtesy of Kampffmeyer Food Innovation GmbH
Whole Grains Summit 2012
Food launches with WG claim across Southern Europe

PORTUGAL

GREECE

Source: Mintel/GNPD courtesy of Kampffmeyer Food Innovation GmbH
Whole Grains Summit 2012
Successful / new whole grain products

NEW WHOLE GRAIN PASTA CONCEPT

(Product of the Year in France, 2007 and in Italy, 2008)

Made 100 % whole grain semolina.

Brown rice pasta
Riso Scotti (Italy, 2012)

Exclusive recipe 100% wholegrain rice (Brown Rice Spaghetti) is a source of fibre ideal for gluten-free diets.

Pizza with 5 cereals
Buitoni (Italy, 2011)

Frozen pizza, with claim of “source of fibre”.
Successful / new whole grain products

**Breakfast Honey & Nuts Wholegrain**
*Belvita (UK, 2011)*
Rich in cereals, a good source of fibre, & contains added vitamins and minerals.

**All-Bran Cereal**
*Kellogg's (Greece, 2006)*
Crispy wholegrain flakes with fig and apple. It is said to be enriched with six vitamins and iron.

**Biscuits with wheat fibre**
*Barilla (Italy, 2011)*
The wholemeal flour is enriched with fibre. The steam-cooking process allows to reach a new and light texture.

**Caramel & Chocolate Breakfast Cereal**
*Nestlé (Spain, 2012)*
30% wholegrain, eight vitamins, iron and calcium. Crispy roasted cereal with whole wheat, rice, caramel and chocolate.
Successful / new whole grain products

Savoury snack with whole grain/multigrain ingredients. Launches in Europe: Even in 2010 they remain a nice category (3% of savoury snack)

<table>
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<th>Year</th>
<th>Launches</th>
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<td>2009</td>
<td>40</td>
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<tr>
<td>2010</td>
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Source: Mintel

Sunbites
Pepsico (UK, 2007)
67% whole grain

Country Chips
Lorenz Snack- World (Germany, 2009)
Made 55% whole grain

Cipster
Danone (Italy, 2010)
83% whole grain
It is necessary to release a **common definition** of whole grain in Europe. Healthgrain Consortium (now Forum [http://www.healthgrain.org](http://www.healthgrain.org)) is taking care of it and has started the sharing of this definition since 2008.

It is necessary to know exactly how much is the whole grain **consumption** in each European country. Healthgrain Forum has just taken an action in this respect.

A promoting WG consumption strategy for Europeans could be **in providing a wide range of WG end product options and making them widely available**, relying on the overall positive health image of cereal products. This can be reached using suitable **raw materials** and **processes** that make the WG product sensory (taste, texture and appearance) similar to that of the refined ones.

Convincing consumers to **adopt whole grain** food seems still to be a **pre-competitive sector** where **companies** and **research institutions** can share common **strategies**.


EFSA. Scientific Opinion on the substantiation of health claims related to whole grain (ID 831, 832, 833, 1126, 1268, 1269, 1290) pursuant to Article 13(1) of Regulation (EC) No 1924/2006. EFSA Journal 2010, 8(10), 1766.


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The European Flour Millers. Note on the promotion for bread on the internal market. Brussels, January 2011.


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www.datamonitor.it

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www.flaobel.org.

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References

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Thanks for your attention

www.openfields.it