



EU-FRESHBAKE



EU-FRESHBAKE

DO YOU LIKE FRESH BREAD ?

EU-FRESHBAKE project

8th JULY 2010





EU-FRESHBAKE

PROJECT

NUTRITION

ENERGY

SOTA

OUTLOOK

BREAD IS A STAPLE FOOD

EUROPEAN MARKET OF BREAD



- Bread = 32.1 m tons (83% of BVP) in 2006 – EU-27
- Fresh products = 72% of Bread-Viennoiserie-Pastries (BVP)
- INDUSTRY vs CRAFT BAKER : 50/50 MARKET SHARE
- FROZEN BREADS = 2% OF EU-27 TONNAGE (2006)
- GROWTH OF FROZEN BREAD : 10 to 20% / YEAR



- The BAKE OFF TECHNOLOGY BRINGS SOLUTIONS:**
- SHELF LIFE IMPROVEMENT
 - FRESHLY BAKED ALL DAY LONG
 - CONVENIENCE : CONSUMER, RETAIL SHOPS ...
 - ENLARGED CHOICE FOR THE CONSUMER ...
 - PREPARATION AT HOME ...





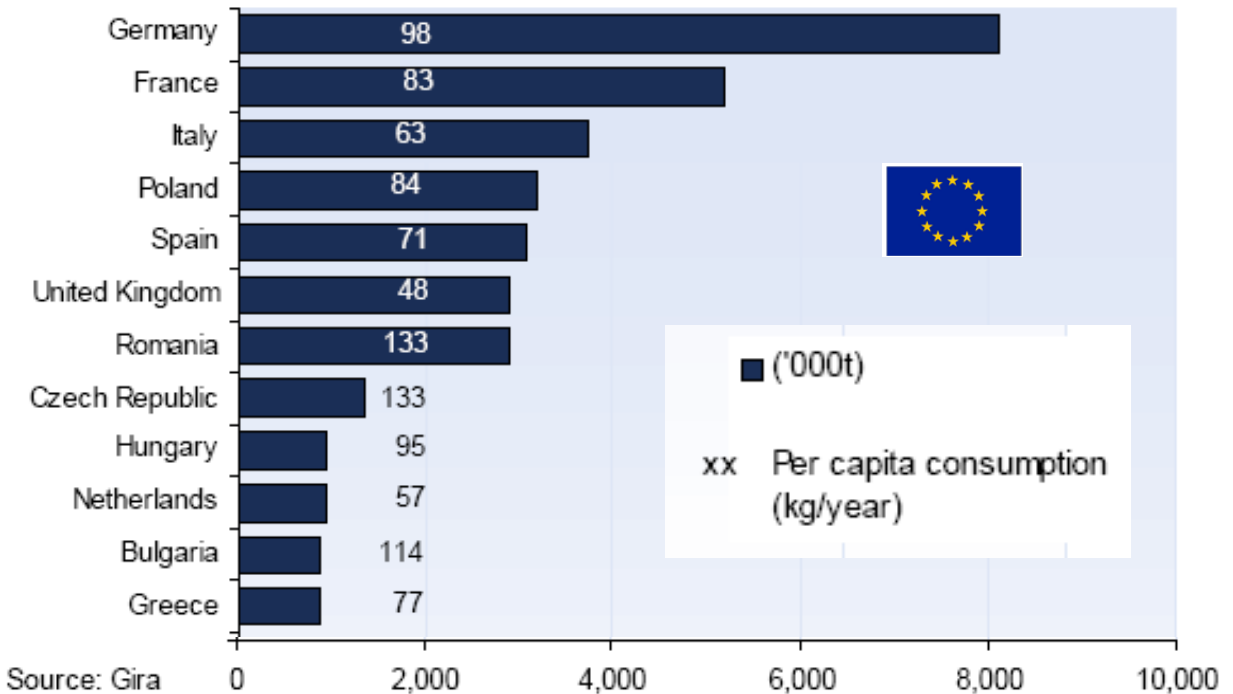
EUROPEAN MARKET OF BREAD vs. Viennoiserie and Patisserie

- Bread = 17 million tons (86% of BVP) in 2004 – EU-15
- Bread = 32.1 million tons (83% of BVP) in 2006 – EU-27
- 72% of BVP products are fresh product (vs. long life and part- baked – frozen)

-INDUSTRY vs CRAFT BAKER : 50/50 MARKET SHARE
 -FROZEN BREADS = 2% OF EU-27 TONNAGE (2006)

-GROWTH OF FROZEN BREAD : 10 to 20% / YEAR

BVP consumption - EU 27 - 2006
 Total : 38,7 million tons in 2006
 Source: www.gira.com





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(Oct. 06-Nov. 09)

"Freshly baked breads with improvement of nutritional quality and low energy demanding for the benefit of the consumer and of the environment"

12 Partners (2 INDUS - 3 SME)
2 M€ funding



EU-FRESHBAKE



EU-FRESHBAKE FOCUS :

- NUTRITIONNAL PROPERTY OF BREAD
- QUALITY OF BREAD
- ENERGY DEMAND FOR BREAD BAKING

EU-FRESHBAKE DOMAINS :

- CONVENTIONAL BREAD
- ORGANIC BREAD
- GLUTEN FREE BREAD
- BAKING EQUIPMENTS

Web site : <http://eu-freshbake.eu/eufreshbake/>



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BREAD ATTRACTS THE MEDIAS !!



« THE BREAD OF THE FUTURE »
FUTURIS BROADCAST : JAN 2008



http://www.youtube.com/watch?v=HcGrhJj_PBk



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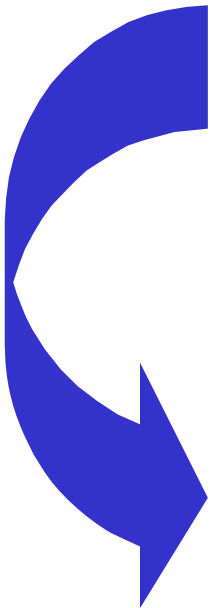
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(FROZEN) PARTIALLY BAKED BREAD EUROPE : 60-70% of Frozen bakery market



EASY TO DO
- READY in 1 HOUR
- NO BAKING SKILL NEEDED

QUALITY ISSUES
- CRUST FLAKING
- AROMA ...

ENERGY - PROCESSING
- 2 BAKINGS
- FREEZING
- FROZEN STORAGE
- FROZEN TRANSPORT ...

NUTRITION ISSUES
- PLAIN FORMULATION
- NO STATE OF THE ART ...



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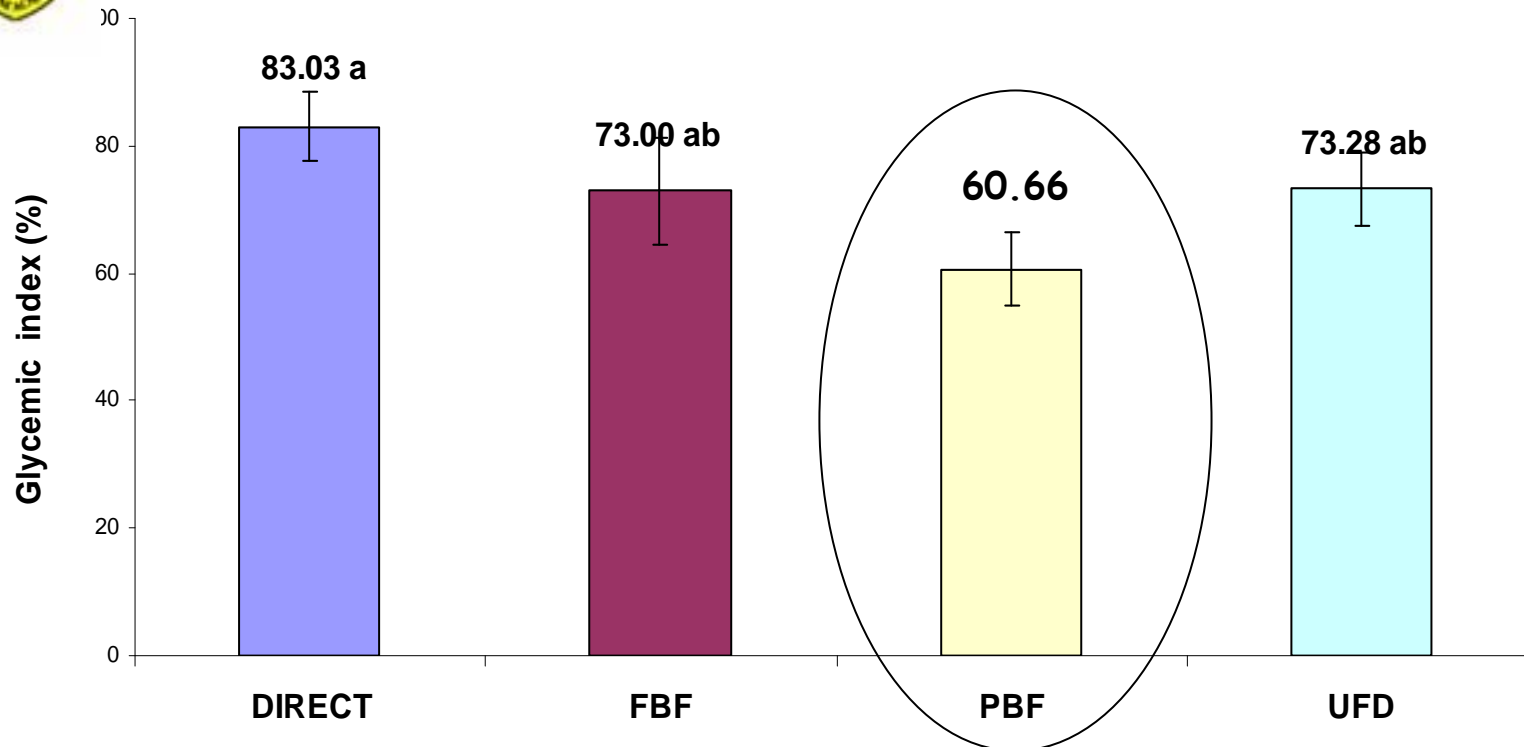
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OUTLOOK

GLYCEMIC INDEX of Partially baked frozen GLUTEN BREADS (Krakow University)



GI : DIRECT, FBF (Fully Baked Frozen), PBF (Part Baked Frozen), UFD (Unfermented Frozen Dough)



Borczak B., Pisulewski P., Sikora M. and Krawontka J., (2008) *Comparison of glycemic responses to frozen and non-frozen wheat rolls in human volunteers - a short report. Polish Journal of Food and*

Nutrition Sciences 58(3): 377-380



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Brussels, 8 July 2010



FOOD QUALITY
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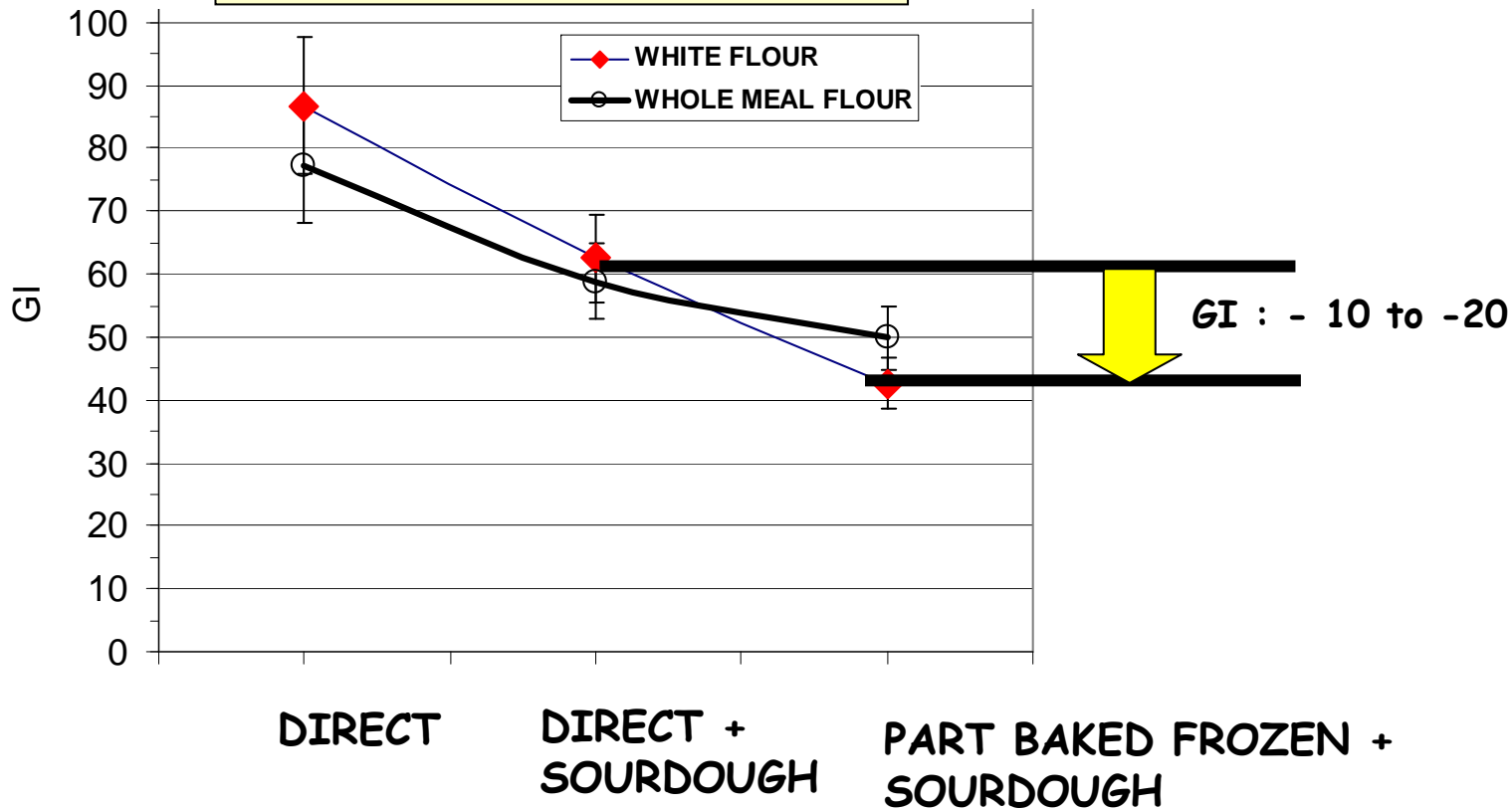
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GI Results: SOURDOUGH + FREEZING



WHITE FLOUR : SOURDOUGH POWDER (Medea, Puratos, Belgium)
 WHOLE MEAL FLOUR : FRESH SOURDOUGH (PL1 Pallazo, Germany)



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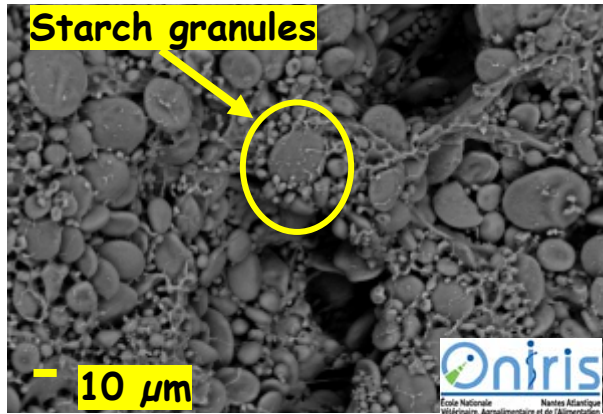
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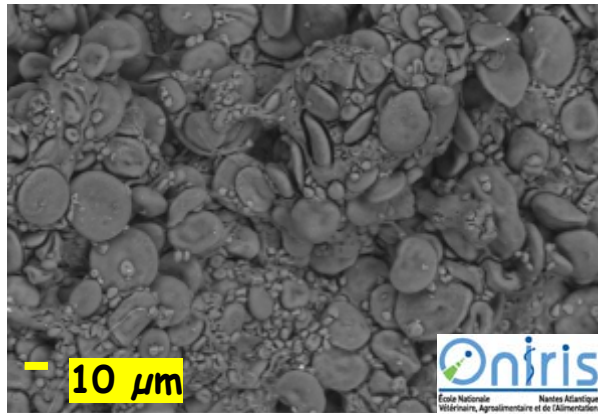
OUTLOOK

DEGREE BAKING vs. STARCH SWELLING

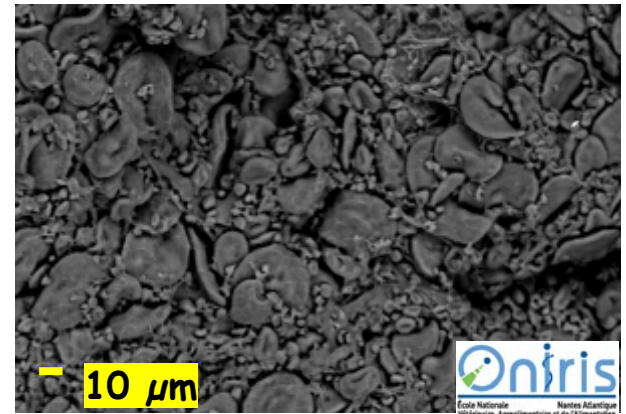
SEM Pictures : crumb baked at selected temperatures



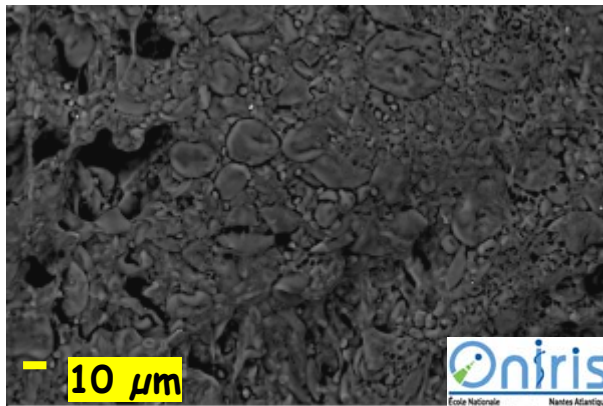
BAKING 70°C - 0' PLATEAU



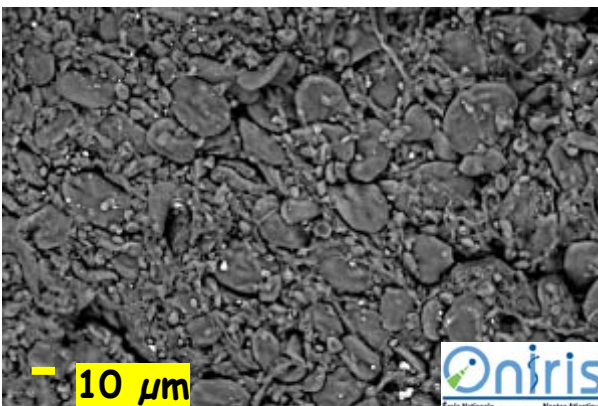
BAKING 80°C - 0' PLATEAU



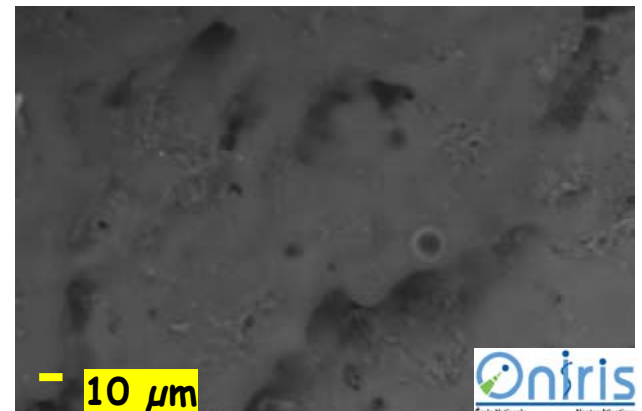
BAKING 90°C - 0' PLATEAU



BAKING 98°C - 0' PLATEAU



BAKING 98°C - 5' PLATEAU



BAKING 98°C - 10' PLATEAU



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BREAD MAKING : AN ENERGY DEMANDING PROCESS

FOOD PROCESSES & ENERGY

Cordis Focus News Letter - 13July2006 n° 268: « Energy efficiency is a priority »

ENERGY IN BREAD BAKING vs. OTHER PROCESSES :

AIR CHILLING OF MEAT : ..0.10-0.12 MJ/kg(Dinçer, 1997)

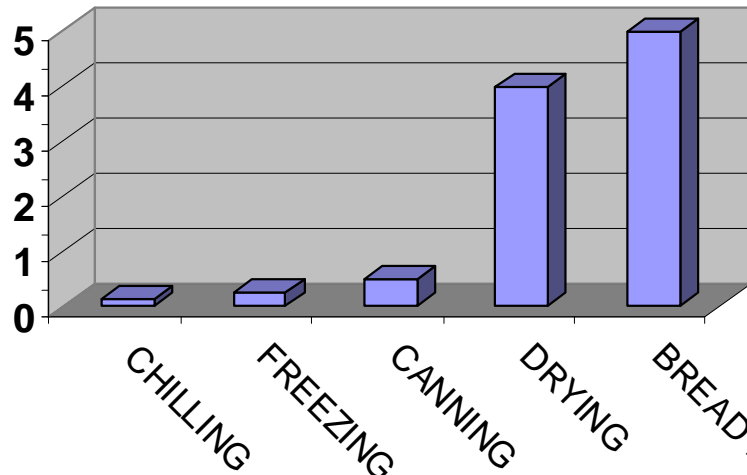
FREEZING : 0.20-0.25 MJ/kg (Dinçer, 1997)

CANNING : 0.5 MJ/kg (Dinçer, 1997)

AIR DRYING : 2.50-4 MJ/kg (Dinçer, 1997)

BREAD BAKING : 4.5-6.5 MJ/kg of food (Fellows, 1996)

MJ/Kg





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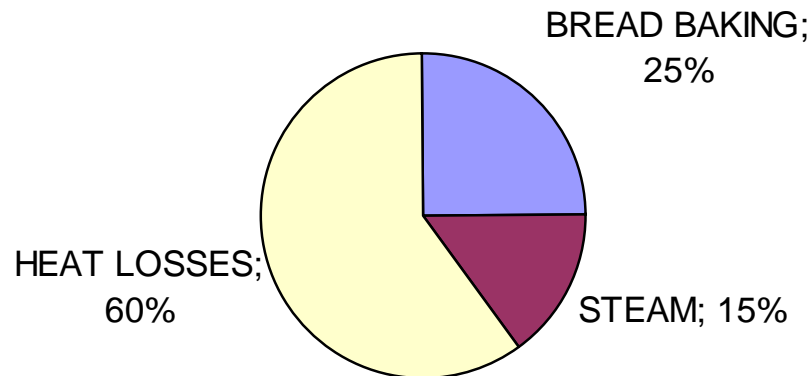
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BREAD BAKING:

- HIGH TEMPERATURE
- LOW OCCUPATION RATIO IN OVEN
- ... POOR EFFICIENCY ...

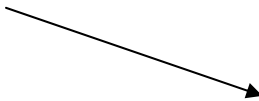


EU-FRESHBAKE & ENERGY

ENERGY COUNTING



DETERMINATION OF TARGETS TO REDUCE ENERGY



ACTIONS:

- PROCESSING CONDITIONS
- NEW TECHNOLOGIES (BAKING, FREEZING)
- « LOW ENERGY » FORMULATIONS



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EU-FRESHBAKE → LOW ENERGY INFRA RED OVEN CONCEPT

- ENERGY REDUCTION BY 35 - 40% (NOT CONSIDERING STEAMING ENERGY)
- HEAT UP TIME REDUCED BY 70% (WITH INSTALLED POWER X 3)

→ PATENT CNRS JULY 2009 + PCT EXTENSION - JULY 2010

→ INDUSTRY TRIALS - LICENSING UNDER NEGOTIATION





EU-FRESHBAKE → OTHER SOLUTIONS TO REDUCE ENERGY DEMAND

- Vacuum baking : expected up to 50% energy saving vs conventional oven
- AMG enzyme for crust formation: up to 15% energy saving during baking
- Prefermented frozen : one freezing + one baking
- Control of freezing conditions : up to 50% (and more) energy saving

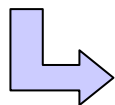
LOW PRESSURE BAKING:

BAKING BREAD AT 100°C - 130°C

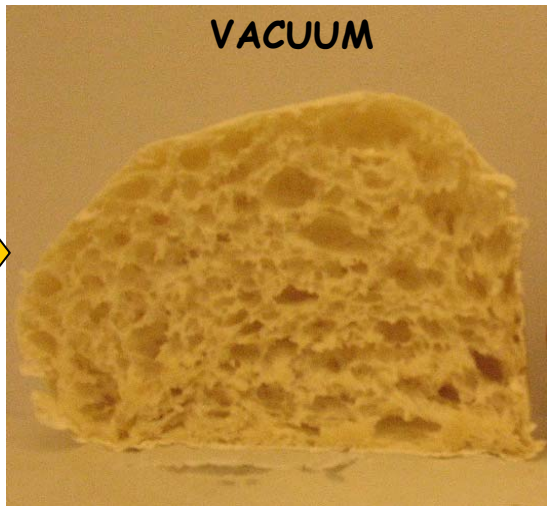
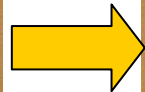
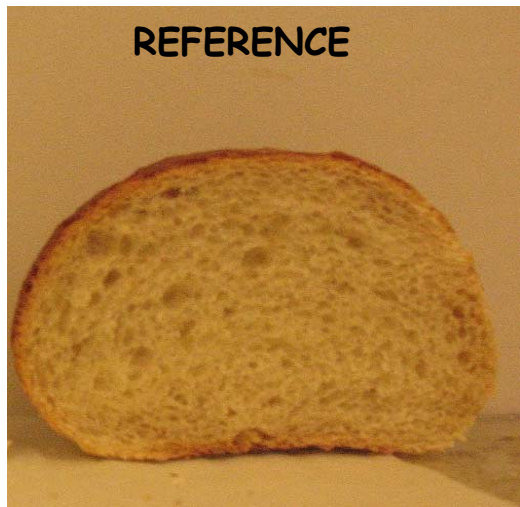
↘↘ ENERGY (-50%)

↘↘ MOISTURE LOSS (-30 to -50%)

↗↗ OVEN RISE (+30%)



ONGOING RESEARCH WITH EU-FRESHBAKE PARTNERS





→ IMPACT OF PROCESS NUTRITIONNAL PROPERTIES OF BREAD

- GLYCAEMIC INDEX ISSUE
- DOUGH FREEZING : ↗ MINERALS

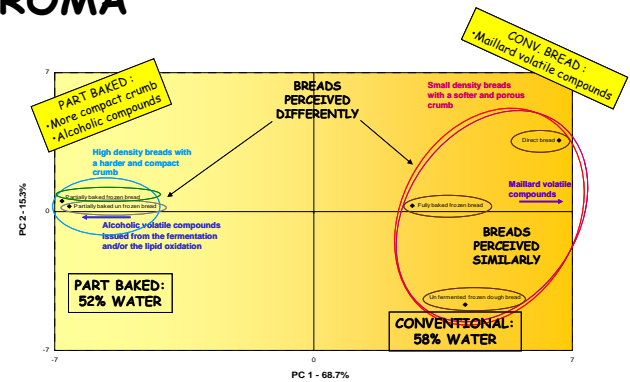
→ CONCEPT OF BAKING / PARTIAL BAKING

- QUALITY : BREAD CONTRACTION & DEGREE OF BAKING



→ IMPACT OF PROCESS & FORMULATION ON BREAD AROMA

- FREEZING HAS A MINIMAL EFFECT
- PROCESS HAS AN EFFECT (PART BAKED vs CONVENTIONNAL)



→ BETTER OVER VIEW OF THE ENERGY IN BAKING

- FROZEN PART BAKED ~ 2.2 x MORE ENERGY THAN DIRECT BAKING
- NON FROZEN PART BAKED ~ 1.4 x MORE ENERGY THAN DIRECT BAKING



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PART BAKED BREAD AT HOME ; A GROWING MARKET
 → MODIFIED ATMOSPHERE - UNFROZEN : ↘ ENERGY vs. PACKAGING ...
 → CONVENIENCE
 → SPECIALITIES (GLUTEN FREE)






BAKING INGREDIENTS
→ WORLD COVERAGE



PART BAKED BREADS

GLUTEN FREE BREAD: FRESH AT HOME :
 → OPTIMIZED FROZEN PART BAKED
 → BAKING; ↗↗ VOLUME WITH LOW PRESSURE BAKING
 → ↗↗ NUTRITION PARAMETERS and ORGANOLEPTIC



LOW ENERGY EQUIPMENT :
 → INFRA RED OVEN → 
 → LOW FREEZING ENERGY → 
 → MICRO WAVE BAKING
 → VACUUM BAKING : ONGOING → 



PART BAKED BRIOCHES

BREAD LABELLING ?? :
 → BREAD IN BAKERY : NO LABELLING !
 → BREADS DEVELOPED IN EU-FRESHBAKE :
 SOURCE OF FIBERS,
 SOURCE OF PROTEINS,
 HIGH FIBRE,
 LOW GI ...





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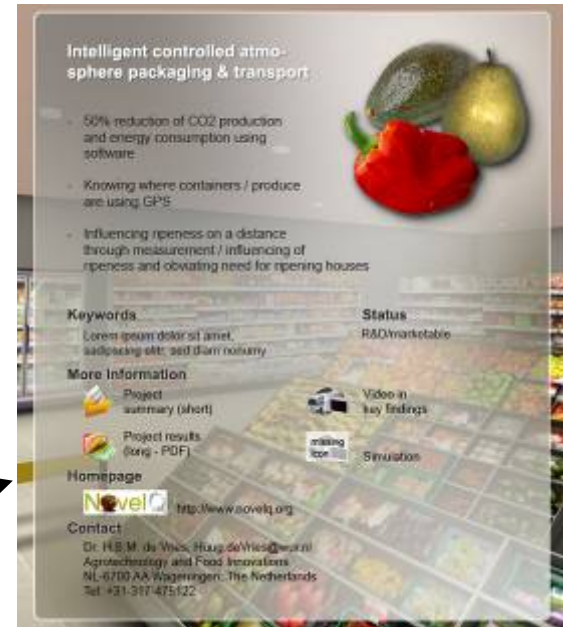
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OUTLOOK

AGRIFOODRESULTS (CSA - 2009-2011) :

→ TRANSFER OF RESULTS TOWARDS SME

→ 11 EU PROJECTS, 8 NATIONAL PROJECTS



MAJOR OUTCOMES:

- VIRTUAL SUPERMARKET
- EUROPEAN ROAD SHOW (8 EVENTS)
- GUIDE BEST PRACTICE ;
- COMMUNICATION TOWARDS SME, CONSUMERS, POLICY MAKERS ...

http://www.euroqualityfrance.com/Agrifoodresults_private/
www.agrifoodresearch.net

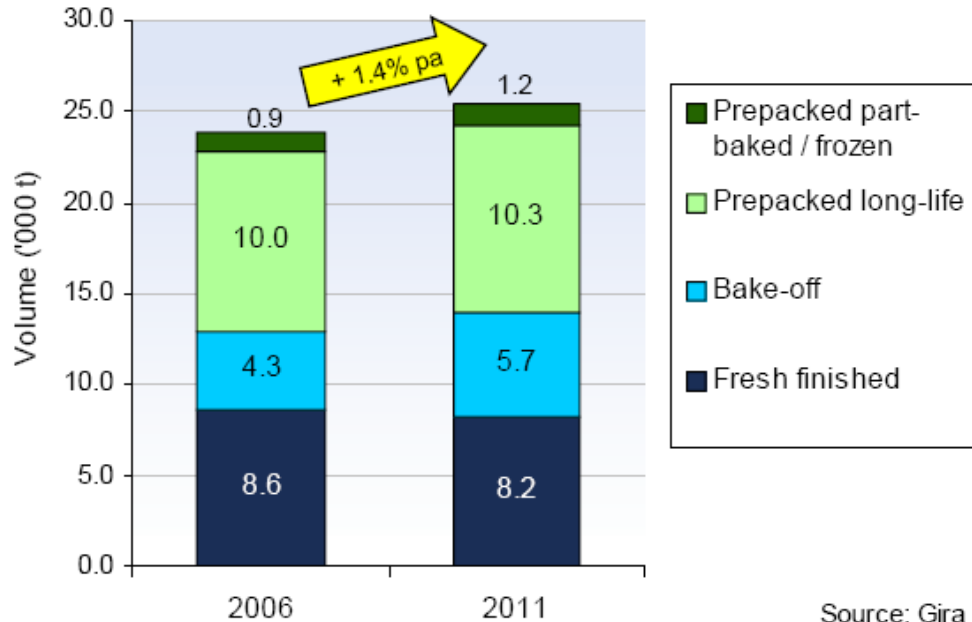
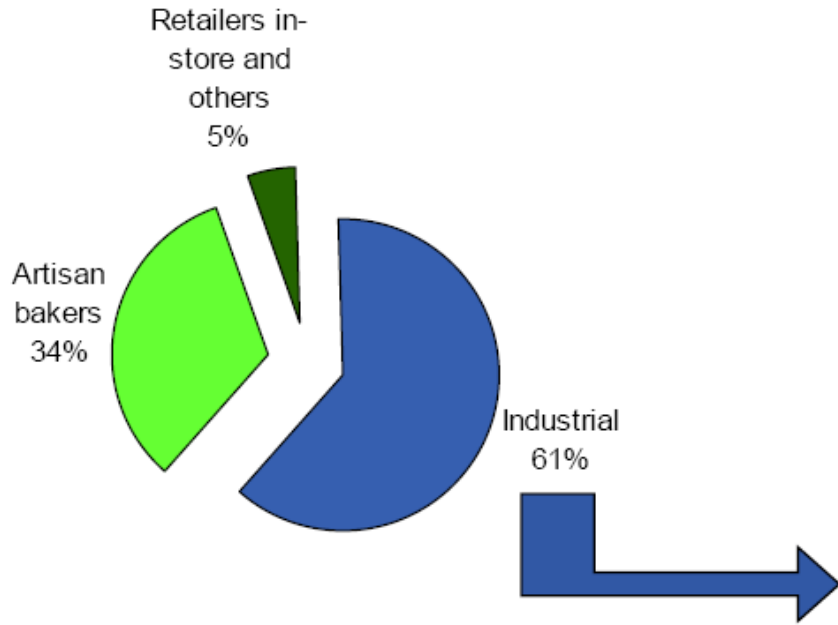
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Oniris
Cemagref
INRA
CSIC
PBF
tzt
MIWE
Puratos
Biofournil
BEZGLUTEN
DR. SCHÄR



EUROPEAN BREAD MARKET : OUTLOOK ...



Source: Gira

EUROPE 27 : 2006 → 2011

Evolution of the industrial BVP market between (www.Gira.com)

➔ Prepacked Part baked, part baked frozen and Bake Off Technologies

➘ Fresh finished



ENVIRONMENTAL IMPACT OF CONVENTIONAL vs BAKE OFF TECHNOLOGY ?

- BREAD DENSITY IN A TRUCK : ~120 kg/m³ → ~90% OF AIR IS TRANSPORTED !!
- BAKE OFF TECHNOLOGY = LESS WASTED BREAD
- GLOBAL LIFE CYCLE ASSESSMENT IS NEEDED → ADDED VALUE TO UNSOLD BREAD ?

GERMANY : UNSOLD BREAD MUST BE RETURNED TO BAKERY
 -ANIMAL FEED ? : DIFFICULT (SAFETY ISSUE)
 -METHANE PRODUCTION (FERMENTATION) ? : LIFE CYCLE ??

Caterpillar at work on the bread mountain !!!

PROCESS	Percentage
AGRICULTURE	41%
PROCESS	37%
TRANSPORT	22%

CO₂ – BREAD
 Total : 0.95 kg CO₂ / kg SIK (1999)

From TU Berlin – Pr MEUSER + Adapted from a presentation of Dr. S. Reimelt

TUB-GV 1807/09



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ANTI STICK COATING MANAGEMENT In the BAKING INDUSTRY

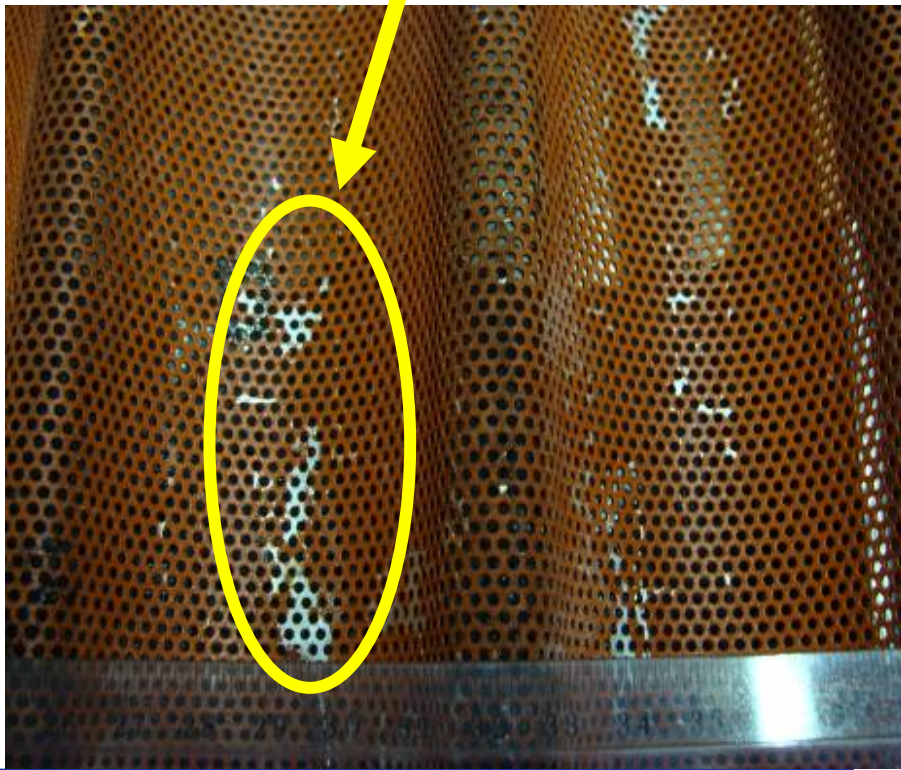
avec le soutien de :



WORNED BAKING SUPPORT ...
DECISION FOR REFURBISHING
IS IN THE HAND OF THE INDUSTRY,
NO REGULATION !!

BAKING SUPPORT:

- No adapted Food Contact Material tests
- Anti Stick oils : technological aid (not in recipe)
- No end of life point detection



RISK ASSESSMENT:

- Whorst froreseable contamination ?
- Facts about transmission in the body ?



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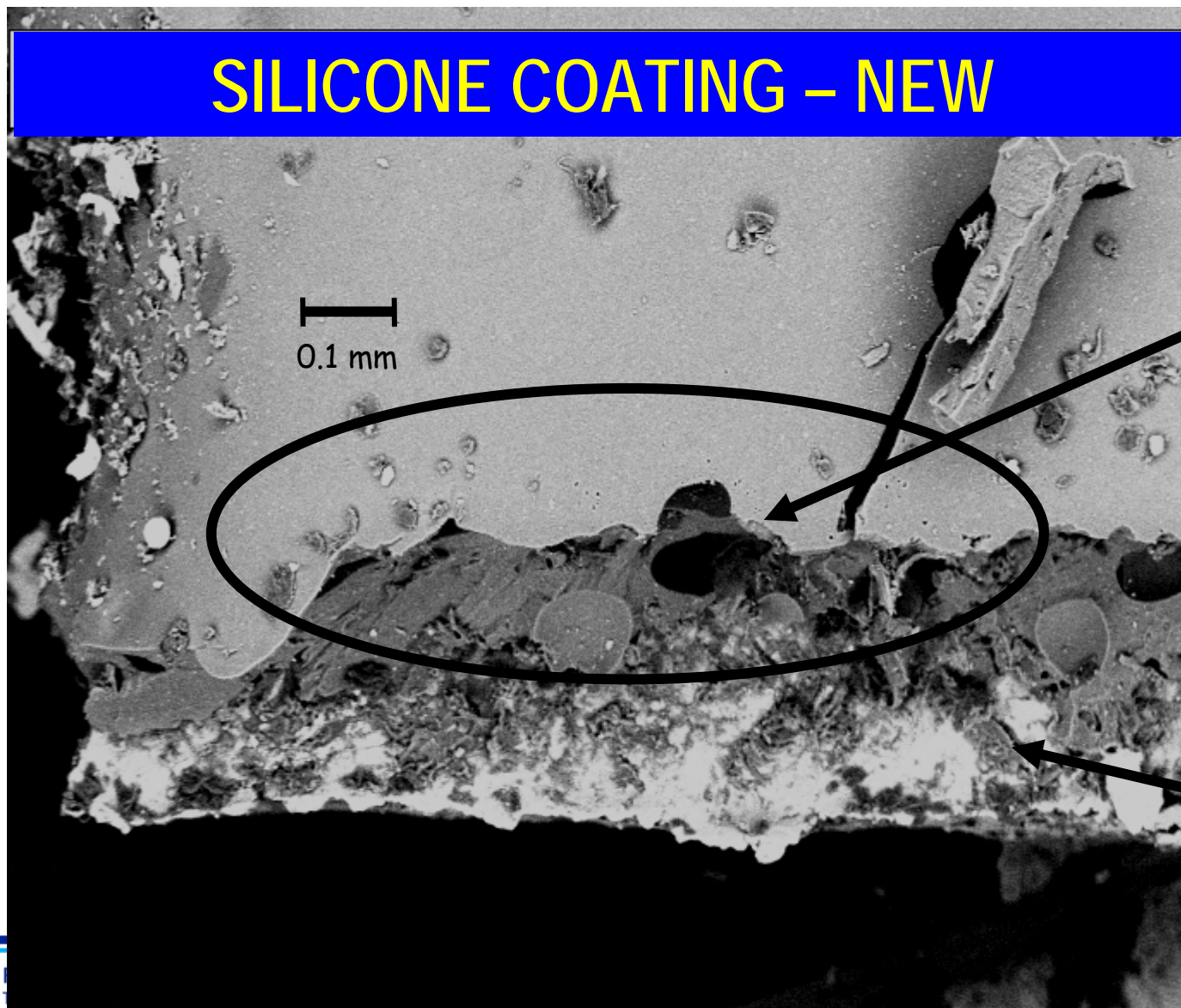
OUTLOOK

ANTI STICK COATING : PFC vs SILICONE

avec le soutien de :



SILICONE COATING - NEW



0.1 mm

SILICONE (POROSITY)

ALUMINIUM SUPPORT



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avec le soutien de :



ANTI STICK COATING MANAGEMENT In the BAKING INDUSTRY

PERFLUORINATED ANTI STICK COATING

- * chromosomal breaks *in vivo* & *in vitro*
- * genotoxic (mutagenic)
- * ↗ cancer in rats dose: 1-2 mg/kg bw/day
- * PFOS Affects fecondity
- * Half life time in human body: 4 Years

PFOA & PFOS ARE UNDER THE SCRUTINY OF THE MEDIAS



SANTÉ Présent dans les poêles anti-adhésives, le PFOA est soupçonné de provoquer une baisse de la fertilité masculine.

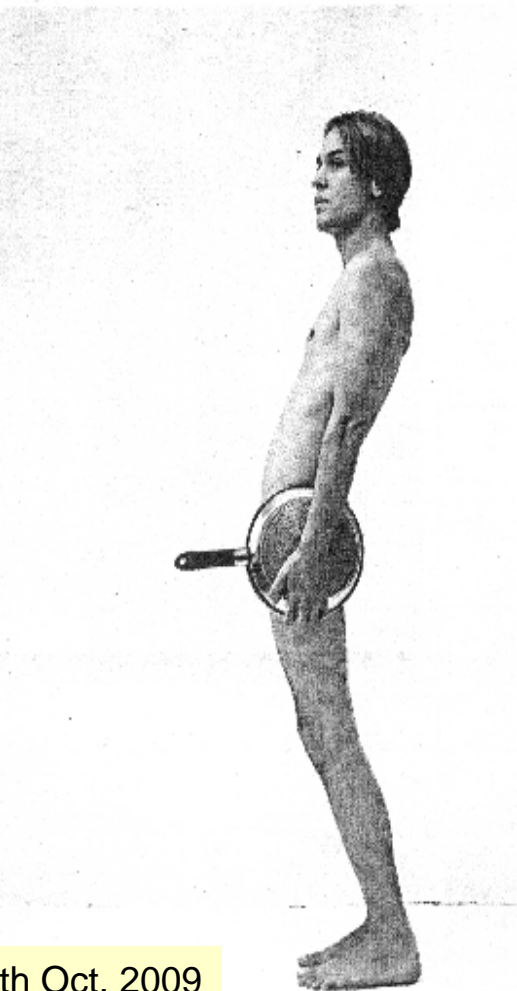
Friture sur les spermatos

Par ÉLIANE PATRIARCA

Les poêles anti-adhésives sont de nouveau sur le grill. Et c'est elles, les emballages de pop-over ou de pizza qu'on utilise pour les frites à micro-onde. Lors d'un confinement de l'ordre de millions de tonnes - le PFOA - qui, mêlé à d'autres substances chimiques similaires, provoque une baisse de la qualité du sperme et donc de la fertilité masculine.

Le soupçon n'est pas nouveau, mais de nouvelles études scientifiques ont redonné la visibilité pour l'instant de

ce composé qui perturbe le système hormonal, affirme André Collin, médecin, et porte parole du Réseau environnement santé (RES). Ce réseau, qui regroupe des ONG, des professionnels de la santé, des scientifiques et des citoyens, demande que le PFOA soit interdit, pas seulement de tout ce qui est en contact avec les aliments. En attendant, il recommande de privilégier les poêles en matière d'inox ou d'aluminium (sans revêtement).



Ref: Libération – France 6th Oct. 2009



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Biofournil



BEZGLUTEN



Dr. SCHÄR



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QUESTIONS ?



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<http://www.eu-freshbake.eu>



HUNGARY



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