Effect of Pulse Flours on the Physiochemical Characteristics and Sensory Acceptance of Baked Crackers.

Kim Millar  
*Technological University Dublin*, kim.millar@tudublin.ie

Catherine Barry-Ryan  
*Technological University Dublin*, Catherine.Barryryan@tudublin.ie

Róisín Burke  
*Technological University Dublin*, roisin.burke@tudublin.ie

See next page for additional authors

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Authors
Kim Millar, Catherine Barry-Ryan, Róisín Burke, Sinead McCarthy, and Eimear Gallagher

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Application of Molecular Gastronomy principles in the design of pulse based functional foods

Kim A. Millar
Dublin Institute of Technology
Teagasc Food Research Centre

Eimear Gallagher
Róisín Burke
Sinéad McCarthy
Catherine Barry-Ryan
Overview

- Ingredients - *why pulses?*
- Molecular Gastronomy principles
- Current study
- Observations
  - Sensory attributes
  - Nutritional value
- Further work
Why pulses?

Nutritional:
- High protein
- High fibre
- Phytonutrients
- Low fat
- Low sugar

Sustainable:
- Robust
- Nitrogen fixing
- Cost efficient

Challenges:
- Flavour
- Protein & Fibre
- Physiochemical properties
Holistic food design

Ingredients & Processing

Molecular Gastronomy Principles

Sensory experience

Nutritional value
Methodology

Formulation & Processing
- Bake trials
  - 40% flour
  - 21m & 31m
  - Prepared in triplicate

Physical & Chemical Analysis
- Dough TPA
- Colour & texture properties
- Protein & fibre
- Antioxidant activity

Sensory Analysis
- 9-point hedonics
- Appearance, colour & texture
- Anova ($p<0.05$)
Appearance & Colour

Control 31m

FB 21m
YP 21m
GP 21m

YP 31m
FB 31m
GP 31m

C 31m

Overall Appearance

Colour

P < 0.05
Colour: Instrumental vs Sensory

- **a* value**
- **b* value**
- **Colour acceptance**

**P < 0.05**

- **L* value**
- **Colour acceptance**

**P < 0.05**
Hardness & Mouthfeel

Control  FB 21m  FB 31m  YP 21m  YP 31m  GP 21m  GP 31m

Hardness (N)  Hardness: Consumer acceptance

P < 0.05
Nutritional value

![Bar charts showing protein and fibre content for different flour types and bake times.](image_url)
Antioxidant activity

**TPC mg GAE/100G**

Flour type & bake time

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**DPPH mg AAE/100g**

Flour type & bake time

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Future work in this area

• Optimisation of baking conditions
  • Nutritional and sensory

• Continued application of MG principles
  • Flavour profiling during processing
  • Flavour optimisation: the sensory experiences

• Further application of pulse flours
Acknowledgements

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How will you celebrate?