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

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

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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

2016 International Year of Pulses
Holistic food design

Ingredients & Processing

Sensory experience

Nutritional value

Molecular Gastronomy Principles
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

FB 31m  YP 31m  GP 31m

Overall Appearance

P < 0.05
Colour: Instrumental vs Sensory

- a* value
- b* value
- Colour acceptance

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

L* value

P < 0.05
Nutritional value

Protein %

Flour type & bake time

C 31m  FB 21m  FB 31m  YP 21m  YP 31m  GP 21m  GP 31m
8.86  12.76  14.25  12.14  13.17  11.6  12.21

Fibre %

Flour type & bake time

C 31m  FB 21m  FB 31m  YP 21m  YP 31m  GP 21m  GP 31m
5.26  10.63  5.49  9.4  5.12  8.11  4.78
Antioxidant activity

TPC mg GAE/100G

Flour type & bake time

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

DPPH mg AAE/100g

Flour type & bake time

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

P < 0.05

P < 0.05
Consumer value

Overall Appearance

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

P < 0.05
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
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How will you celebrate?