Should Bambara Groundnut Remain Underutilised?

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Cereals and Legumes Biopolymer Research for Food Security

Presented at the AgriFood Innovation Symposium, CPUT, 17 September 2014
The Agenda

Our Mission

Our Motivation

Bambara Groundnut Value Chain

Our Success Stories

Conclusion

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Our Mission

To be at the heart of innovation, be most successful and respected in area of value-addition to cereals and legumes in Africa. In particular, we focus on design, modeling and optimization of food processes. Our main focus is to train the next generation of scientists while creating an environment that is conducive to learning and testing new skills.
“Africa has the greatest challenge of food security today but Africa also has the potential not only to feed itself but also the world tomorrow . . .”

—Dr. Namanga Ngongi, President, Alliance for a Green Revolution in Africa (AGRA)
Bambara Groundnut Value Chain

Bambara Groundnut (BGN) Varieties

Black-eye  Red

Brown-eye  Brown

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Figure 1. Node size proportional to in-degree statistics

- A network is a set of nodes connected by a set of ties.
- Harel-Koren Fast Multiscale method
- In-degree is the number of connections that point inward at a node or the number of relationships in which a particular node is the target.
- High in-degree is associated with the functional and therapeutic use of BGN.
- Hence, the usefulness of BGN is more targeted to functional food and therapeutic uses.
Figure 2. Node size proportional to out-degree statistics

- Out-degree is the number of relationships in which a particular node is the source.
- Hence, the BGN seeds and flour are the source of functional food and therapeutic uses.
Figure 2. Node size proportional to betweenness centrality statistics

- Centrality helps to determine the key players or most prominent member of a network.
- Betweenness centrality is a measure of the number of times a node falls along the shortest path between two other nodes and it’s also a measure of the control of a network.
- BGN seeds, flour, therapeutic value, functional food and its protein control the value of BGN.
Bambara Groundnut Value Chain

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Bambara Groundnut Flour In Emulsion

- Optimal vinegar
- Citric acid
- Sodium chloride

Our Success Stories

- High processability
- Good pourability
- High spreadability
- Good chewability
- Good stability

Rheological properties

- Thixotropic fluid
- Non-Newtonian
- Pseudoplastic
- High viscoelastic fluid
- Thick viscous fluid
- Yield stress

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Our Success Stories

Bambara Groundnut Milk

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Bambara Groundnut Probiotic Beverage

- Proteins: 30.0%
- Total fat: 5.5%
- Total dietary fibre: 9.0%
- Carbohydrates: 29.1%
- Ash: 22.3%

High Antioxidative activity
**BGN Insoluble Fibre Swelling & Water Retention Capacity**

- Higher swelling capacity compared to commercial fibres
- High phenolic content (6.14-15.56 mg/g GAE)

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Insoluble Dietary Fibre

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BGN Insoluble Fibres in White Bread

- BGNIF brown-eye enriched bread comparable to the control white bread.
- Some comments- “very nice, sweet and soft/fresh”, “typical bread aroma”, this one was the best” and “taste like normal bread”
BGN Soluble Dietary Fibre

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BGN Soluble Fibre in Orange Beverage Emulsion

6% oil + 30% BGNSF
Patents


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