An Update on the Food Safety and Nutrition Quality of Gari

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**Gari** represents ≈70%, while industrial products are only 10%.

- **Gari**
  - By far largest demand segment, with demand throughout the country in urban and rural markets

- **Other Processed**
  - Includes Fufu (largest segment), Kpoo, Akpu, Abacha, and Lafun
  - Segments driven by geographic and socioeconomic taste preferences

- **Industrial**
  - Includes Starch, High Quality Cassava Flour (HQCF), Sweeteners, Ethanol and Dried Chips
  - Significant growth opportunity driven by economic growth (starch) and government initiatives (HQCF)

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1. Source: Context Network analysis based on field research, farmer interviews, and published source analysis
2. Garri: “CTA Presentation”, October 2014
Classification of *Gari*

There are different types of *gari*, depending on how it is processed, its grain size and the region of Africa where it is produced.

The Standards Organization of Nigeria classifies *gari* into:

- **Extra Fine Grain Gari** - where more than 80% of the particles pass through a sieve of less than 350 micro meter aperture.

- **Fine Grain Gari** - More than 80% of the particles pass through a sieve of less than 1000 micro meter aperture.

- **Coarse Grain gari** - Not less than 80% of particles pass through a sieve of 1400 micro meter or less than 20% of weight passes through a sieve of 1000 micro meter.

- **Extra Coarse Grain Gari** - Not less than 20% of grain is retained on a sieve of 1400 micro meter aperture.
Classification of *gari*

*Gari* can also be classified based on fermentation length (days and extent) as well as whether palm oil is added to make it yellow or not. Such classifications includes:

- **Red Gari**: This is the type of *gari* commonly found in the Mid-Western part of Nigeria. It is also called Bendel *gari*. It is made exactly the way described above, but for the addition of red palm oil after grating the cassava and the *gari* is allowed to ferment for two to three days also.

- **White Gari**: same as Bendel *gari*, left to ferment for two to three days as well, but red palm oil is not added during processing.

- **Ijebu Gari**: Ijebu *gari* is made same way too, but allowed to ferment for up to seven days. No palm oil is added. It is also fried to become much crisped. It characteristically has a very sharp taste and less starchy.
Food quality

- Food quality is the totality of features and characteristics that bear on its ability to meet/satisfy stated or implied needs/ expectations - International Standard Organisation

- Properties considered:
  a) Organoleptic and sensory attributes
  b) Safety
  c) Nutritional value including bioavailability
  d) Functional properties
  e) Stability during storage
Food safety

- Food safety is defined as assurance that food will not cause harm to the consumer when it is prepared and/or eaten according to its intended use - FAO/WHO 1997

- Food safety is concerned with handling, preparation and storage of foods in ways that prevent food borne illness
Food Safety and Quality

- There is no such thing as absolute safety

- Food is only considered to be safe if it meets quality specifications or expectations stated by standard organizations or regulatory bodies who control the quality of foods by determining the permissible levels of toxins or hazardous substance a food product can contain.

- Quality specifications can also be set by consumers.
Cyanogenic potential of cassava roots must be reduced to minimum during processing in order to prevent poisoning.

Processing should not introduce hazards or contaminants to the finished product.

Due to its hygroscopic nature, it can have the tendency to absorb moisture from the atmosphere if not properly stored and packaged thus resulting in microbial activity and mould growth.
Impact of chronic consumption of low levels of CNP

Acute effects - Konzo

Several other sub lethal effects – liver damage, malnutrition, cognitive degeneration, etc.

Tropical Ataxic Neuropathy – loss of coordination
Quality characteristics of the raw material
Quality characteristics of the raw material
Nutritional Value of Gari

- Gari is rich in starch. It also has very high fibre content. Also contains proteins and some essential vitamins.

- The high fibre content makes it very filling, and also makes this good in preventing or at least reduces likelihood of constipation and bowel diseases.

- Improving nutritional quality of gari is possible through food-to-food fortification (protein improvement) and fortification (micronutrient improvement)
Nutritional Improvement of gari

Protein content of plain gari and gari fortified with soybean residue at different levels
Total carotenoids concentration at different steps of processing cassava storage roots to *gari*.
Design improved processing methods for maximum nutrient retention

Effect of roasting the fermented cassava at reduced temperature (165°C) for 5-20 min on BC retention

Gari initially was prepared by roasting fermented cassava (01/1371) for 20 min at 195°C. This resulted in the loss of 90% of total BC. Total BC decreased 37% after roasting at the lower temperature for 5 min.
Packaging for food safety, branding and marketing
Human Health, Safety and Environment
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