

Advances in Capability Building for Value-Added Food Processing in Northern Ghana in the Past Decade (1998-2008)

By

Richard L.K.Glover

Department of Applied Biology

Faculty of Applied Sciences

University for Development Studies

P.O.Box 24

Navrongo, Upper East Region, Ghana

PRESENTATION FORMAT

- ❖ INTRODUCTION
- ❖ INVESTIGATED NORTHERN GHANA FERMENTED PRODUCTS:
 - * *PITO*
 - * *KANTONG*
 - * *TUBAANI AND TUO ZAAFI*
 - * *KINKANA-DAA*
 - * *FURA AND NUNU*
- ❖ CONCLUSION AND THE WAY FORWARD

INTRODUCTION-1

- **Nearly two-thirds of the staple food intake of the peoples is some form of fermented produce**
- **From cereals like sorghum (guinea-corn) and millet, as well as seeds of indigenous trees.**
- **Cereal-based products include *tubani, tuo zaafi (TZ), masa, kose, hausa koko, fura, pito, and brukutu***

INTRODUCTION-2

- **Products from fermented seeds include *kinkana-daa, kantong* and *zanchewuta***
- **Fermented milk products include *nunu* and soyabean khebab**
- **Most are produced on semi-commercial scale**

INTRODUCTION-3

ENRECA PROJECT

- **Commenced 1998**
- **Spanned three phases so far**
- **1 PhD and 1 M.Phil completed**
- **2 M.Phil/PhDs in progress**
- **Several undergraduate Project works undertaken**
- **All geared towards value addition to processing of fermented foods of northern Ghana**

DAGARTI *PITO*

- A mildly alcoholic beverage produced from lactic souring and yeast fermentation of sorghum wort
- *Saccharomyces cerevisiae* found to be exclusively responsible for fermentation
- Large population of strains involved all over Ghana
- Desirable technological properties for starter culture development to produce Dagarti *pito* of consistent quality anywhere in Ghana
- Commercially viable product (Glover *et al.*, 2005)

KANTONG

- **Condiment produced from fermentation of seeds of *Ceiba pentandra* (Silk Cotton Tree)**
- **Lactic acid bacteria found to predominate (Kpikpi, 2006)**
- ***Lactobacillus plantarum*, *Lactobacillus fermentum*, *Lactobacillus brevis*, *Pediococcus acidilactici*, *Leuconostoc mesenteroides* identified in decreasing quantities**
- **Believed to improve organoleptic quality and texture of product (Wood and Holzappel, 1995)**

TUBANI AND TUO ZAAFI (TZ)

- ***Tubani*-- a steam-cooked bean-cake.**
- **Preliminary morphological studies indicate co-involvement of lactic acid bacteria and yeast in mild souring and fermentation of bean flour during processing**
- ***Tuo zaafi*-- a corn/millet based semi-solid porridge**
- **Lactic acid bacteria, *Bacillus* spp. and yeast identified as jointly associated with processing**

FURA AND NUNU-1

- ***Fura--* a millet-based traditional fermented food drink**
- **Preliminarily found to be associated with lactic acid bacteria and yeast**
- ***Nunu--* a fermented milk drink**
- **Usually enjoyed together as a fermented milk-cereal mix called *fura-de-nunu*.**

FURA AND NUNU-2

M.Phil/PhD studies currently in progress to:

- ✓ **Survey and identify associated microorganisms to the species level**
- ✓ **Characterize them morphologically and biochemically**
- ✓ **Molecularly type identified species**

FURA AND NUNU-3

✓ **Determine**

i. Bioactive peptides

ii. Phytase activity

iii. Microbial interactions/communication in the food system and effects on food quality (health benefits, probiotics, bacteriocin production, etc),

iv. Antimicrobial activity of lactic acid bacteria against pathogens such as *Mycobacterium tuberculosis*, *Staphylococci* etc.

CONCLUSION AND WAY FORWARD

- ❑ Ten-year research has chalked modest gains in capability building for value added processing of fermented foods peculiar to northern Ghana.**
- ❑ Selection and development of starter cultures from large array of beneficial microorganisms for pilot commercial scale production of foods with more consistent organoleptic quality and customer appeal.**
- ❑ Marketing initiatives for such products should result in sustainable livelihoods for the producers while ensuring food and nutrition security.**