

# Assessment of fonio (*Digitaria exilis*) as a dietary intervention in Northern Ghana



**By**

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# INTRODUCTION

- Fonio (*Digitaria Exilis* and *Digitaria iburua*) is an important cereal in the West Africa Sub – Region and elsewhere. It originated from West Africa and spread to East and Central Africa. Its cultivation is thought to date back to 5000 B.C. (Purseglove, 1988)
- Family: Poacea
- Sub-family: Panicoideae
- Sub-tribe: Digitariinae
- Genera: *Digitaria*

# INTRODUCTION CONT...

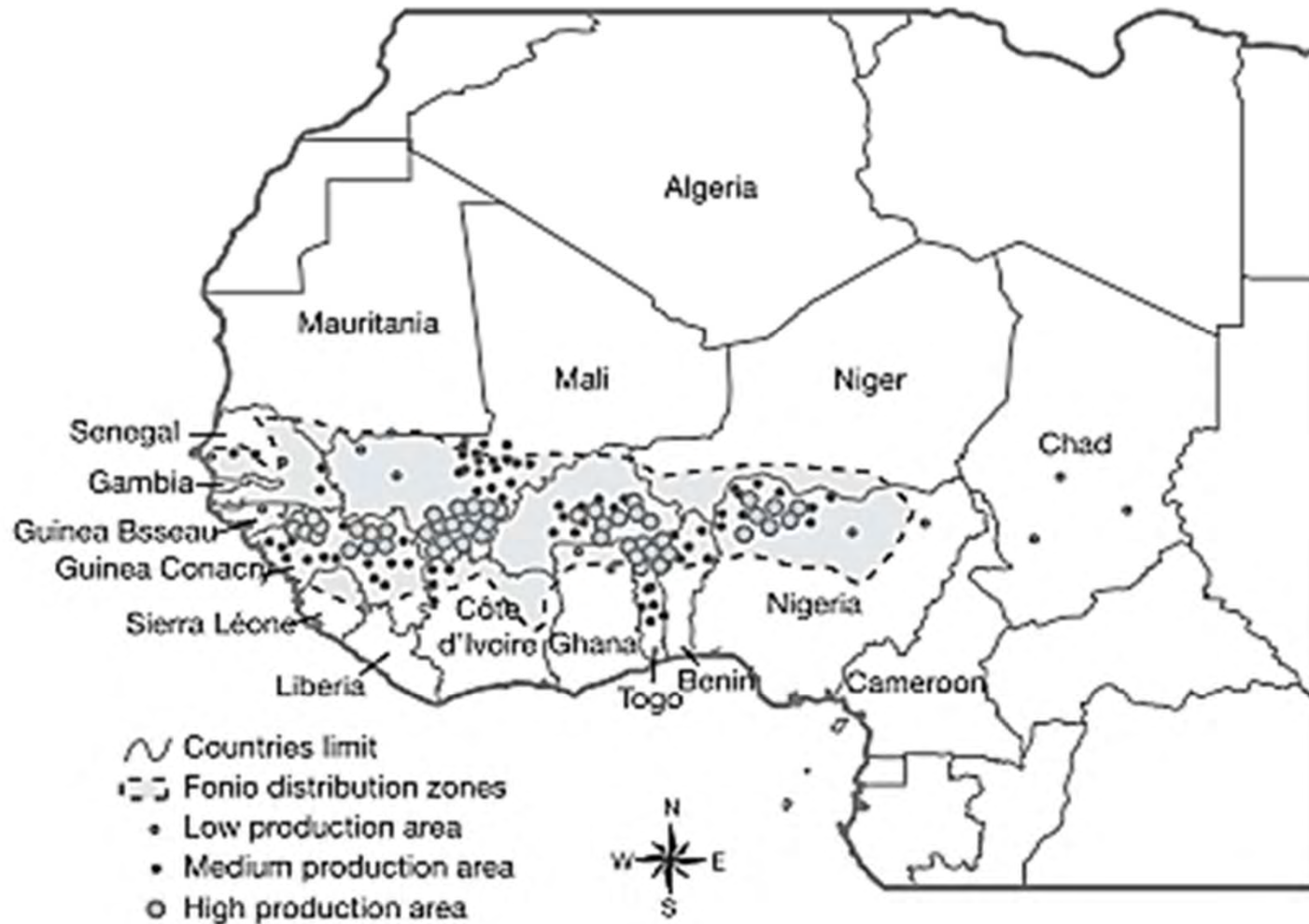


Figure 1: Fonio production areas in West Africa



# INTRODUCTION CONT...

Fonio crop growing on the field





# INTRODUCTION CONT...



polished fonio (A) and unpolished fonio (B)

# IMPORTANCE OF FONIO

- ➡ Fonio is believed to be among the world's tastiest and most nutritive cereal (National Research Council, 1996).
- ➡ It does well in poor marginal soils and matures earlier than the major known cereals hence the name – hungry rice.
- ➡ Fonio provide food to about 4 million people in Africa.
- ➡ Asides digestible carbohydrate, the grain contains essential protein : methionine, cystine, lysine, which are missing in major cereals and highly recommended for expectant mothers and malnourished children.  
( CIRD news file, 2009)



# SCALE OF PRODUCTION

COUNTRY	AREA (ha)	PRODUCTION (TONNES)
GUINEA	200,000	222,000
NIGERIA	162,000	80,000
MALI	45,000	26,000
COTE D'IVOIRE	13,000	14,000
BURKINA FASO	13,000	9,500
GUINEA BISSAU	3,500	2,000
NIGER	5,000	2,000
SENEGAL	3,000	1,500
GHANA	2,000	500
OTHERS	1,000	500
TOTAL	451,000	360,000

Source : J F Cruz, 2008



# NUTRITIONAL VALUE OF FONIO

Cereal	Protein (%)		Lipid (%)		Minerals (%)		Carbohydrate (%)	
	whole	polished	whole	polished	whole	polished	whole	polished
Fonio	9 – 11	7 – 9	3.3 - 3.8	0.8 – 1	1 – 1.1	0.3 – 0.6	84 – 86	89 – 91
Sorghum	11	10	3.5	1.2	1.2	0.5	84	88
Millet	12	11	4	1.2	1.2	1.2	83	87
Maize	11	10	4.5	1	1.3	1	83	88
Rice	–	8	–	0.9	–	0.5	–	90

# USES OF FONIO

- ➔ The grain can be processed to prepare jollof, or eaten with stew used to prepare porridge, tuo zaafi, bread biscuit etc. (De lumen *et al.*, 1986)
- ➔ Both the grain and straw are used to feed monogastrics.
- ➔ Fonio is fermented to brew a special beer called “tchakpalo”
- ➔ The straw is also chopped and mixed with clay for construction of farm houses and walls
- ➔ Serves as traditional medicine for diabetic patients.



# USES OF FONIO CONT...

## Dishes prepared from Fonio



FONIO GRAIN



FONIO JOLLOF



# USES OF FONIO CONT...



Bread prepared from fonio flour



# PROBLEM STATEMENT

Hunger, which afflicts one in five of the developing world's people for that matter Africa, is a profound impediment to the advancement of individuals and societies. Without proper intervention, undernutrition and the death and disease it causes are repeated with each generation.

# JUSTIFICATION

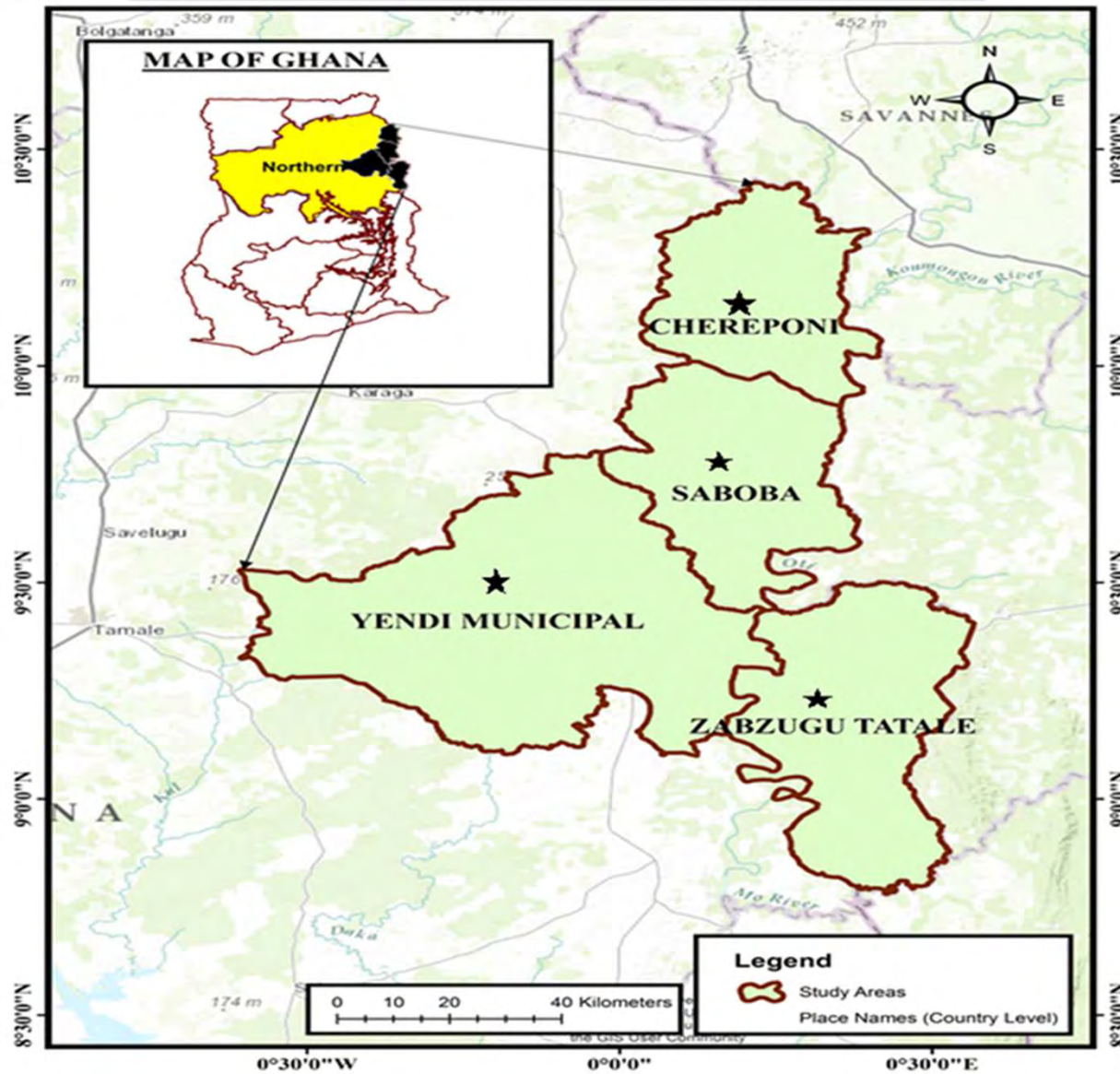
To overcome the challenges of malnutrition in Ghana, there is a need to explore indigenous crops of outstanding nutritional qualities. Although the nutritional composition of fonio, has long been established, this vital information has not been effectively communicated to the indigenes . This research seeks to educate farmers about the need to produce and consume more fonio as a dietary intervention towards reducing malnutrition by 50% in 2015.



# OBJECTIVE

To analyse the food and nutrition situation in the enclave where fonio is produced in Ghana to highlight current knowledge and experiences with value added fonio products to improving nutritional status; to identify gaps; and to address the major issues and challenges that influence food systems in these Districts and the long-term development of the Region.

# STUDY SITE





# MATERIALS AND METHODS

## □ Anthropometric Data:

- Height
- Weight
- Presence or absence of edema
- MUAC

## Demographic data to collection

- Age
- Sex

## Household Dietary Diversity (HDD)



# FONIO AS A DIETARY INTERVENTION





Cont..



# Results and discussion

- Food availability in Chereponi Ditric

Food group	Types	Availability in the year
Cereals	Maize, rice, millet, sorghum, fonio	9/12
Root and tubers	Yam, potato, cassava	12/12
Legumes	Cow pea, bambara, soya, ground nut	10/12
Vegetables	Tomato, okra, onion green leave, pepper	7/12
Fruits	Mango, orange, tangerine	3/12
Meat/poultry	Beef, goat, pork , chicken, duck	12/12
Fish	Mudfish, tilapia	8/12
Dairy/egg	Cow milk, yoghurt, cheese, egg	12/12
Oil and fat	Palm oil, soya oil, peanut oil, shea butter	12/12
Spices	Ginger, garlic maggi cube	10/12



# Results and discussion...

## Fonio consumption among households

Fonio product	Period/month	Number of household
Fonio porridge	4	25
Plain fonio	6	52
Fonio with beans	3	23
<b>TOTAL</b>	<b>13</b>	<b>100</b>

# Results and discussion...

## Mean daily macronutrient intake of households

	Mean nutrient intake			
	Mean	SD	Range	%kcl
Energy (kcl)	2054.0	715.5	527- 4152	
Protein (g)	57.7	24.4	12.6 – 136.0	11
Animal protein (g)	20.1	20.0	1 - 7.5	4.6
Plant protein (g)	38.7	21.2	9.3 - 107.4	8.8
Total carbohydrate (g)	315.2	111.6	105.6 – 604.7	57
Total fat	75.3	32.4	1.8 - 179	32
Fonio consumption individual portion				
Size of fonio (g)	150.4	33.6	114 – 208	
Energy intake from fonio (g)	322.5	72.6	238.4 – 438.9	



# Results and discussion...

## Acceptability of fonio as a dietary intervention

Perception about fonio	Number of household	percentage
Fonio is a good food	78	78%
Fonio cures diabetes	11	11%
Fonio is tasty	62	62%
Fonio is not available all year round	55	55%
I don't know how to prepare fonio	26	26%
Fonio is tedious to process and cook	73	73%
TOTAL		

# FONIO AS A DIETARY INTERVENTION





# Cont...





# The manual husking process





# The fonio husking machine



# CONCLUSIONS

- The result obtained so far suggest a strong correlation between the intake of fonio products and improved health condition of women and children.
- Attempts has been made to involve the local Health post and the Senior High School (SHS) in the final phase of the research.



# POLICY RECOMMENDATIONS

- ❑ Government of Ghana should adopt research in NUS in order to avoid the over dependence on the traditional crops as a mean of livelihood and trade.
- ❑ The government should lend support to farmers as well as researchers in fonio in the form of inputs simple machinery and logistics to place Ghana in the league of fonio producing nations in the sub-region.



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# THANK YOU ALL

