

# **Making value chains work for food and nutrition security of vulnerable populations in East Africa**

***Ag2Nut Webinar***

***21 November, 2016***

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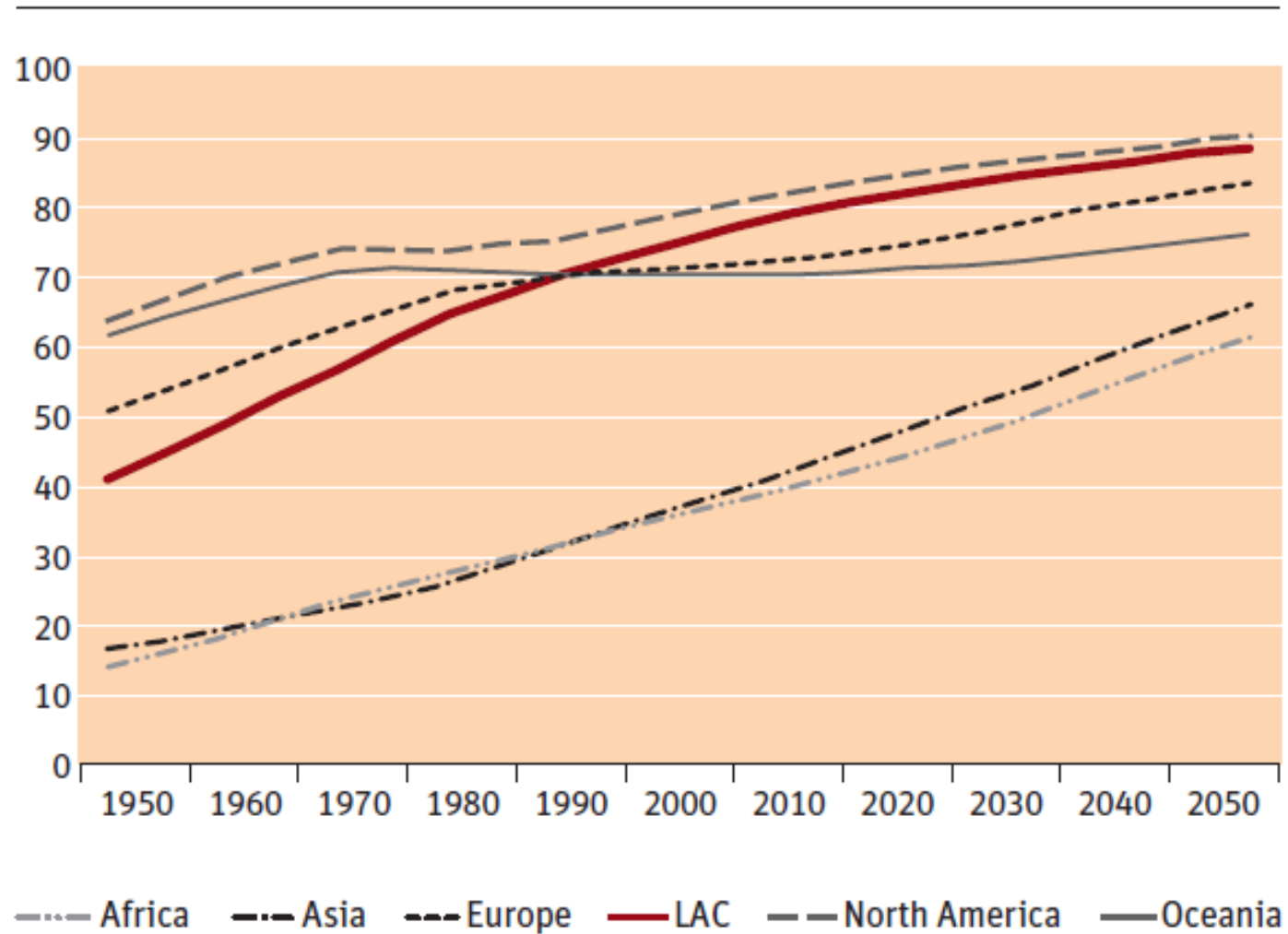


# Outline



1. Value chains for Nutrition (VCN):  
Introduction and background
2. BMZ Project: Making value chains work  
for food and nutrition security of  
vulnerable populations in East Africa
3. Market Assessment Study / Willingness  
to pay

**FIGURE 1**  
Percentage of Population Living in Urban Areas,  
by Region, 1950–2050



Source: United Nations (2008). Sustainable Food Systems - APR14

# Driving Dynamics of Urbanization



## HEALTH

Urban nutritional “double burden”

- Under-nutrition
- Overweight & obesity

Urban food safety

Increased consumption of energy dense cheap and processed food

# Background



- **African urbanization** is accompanied by **rapid growth in urban incomes** and by urban (and to a lesser extent rural) **diet diversification**. These trends are similar to those found in Asia, with Asia just somewhat ahead in the same trends.
- Urbanization combined with income increases and diet diversification provides **major opportunities as “motors of growth” for rural areas of Africa**. In Asia this major trend has been leveraged to meet the growth and poverty alleviation targets in rural areas.

- The **goal** of our nutrition sensitive value chain work at CIAT is **to improve the diets of vulnerable rural and urban consumers at the base of the pyramid (BoP), specifically women of reproductive age and children 6–59 months old.**
- **This will be achieved through increased consumption of more diverse, safe, and nutrient-dense foods sourced from multiple crops and delivered through market-based solutions, which improve the food and nutrition security, income, and livelihoods of actors along the value chain.**
- Current VC concepts and frameworks will be enriched by a **stronger consumer focus, particularly on nutrition and health.**
- CIAT's work on VCs for Nutrition will generate evidence by linking the activities of different stakeholders across the agricultural, nutrition, and health sectors within an integrated system.
- Solutions will be developed through public-private collaboration, aimed at enhancing chain efficiency while providing nutritious foods to vulnerable populations.

# Short/Long term strategy

## Short term:

- Closing the knowledge gap: **Assessment of supply and demand constraints** along the different stages of the value chain to access and utilization of nutrient dense, safe and diverse foods by vulnerable urban and peri-urban consumers (incl. nutrient leakages and physical losses, willingness to pay, consumer preferences, distribution etc.).

## Long term:

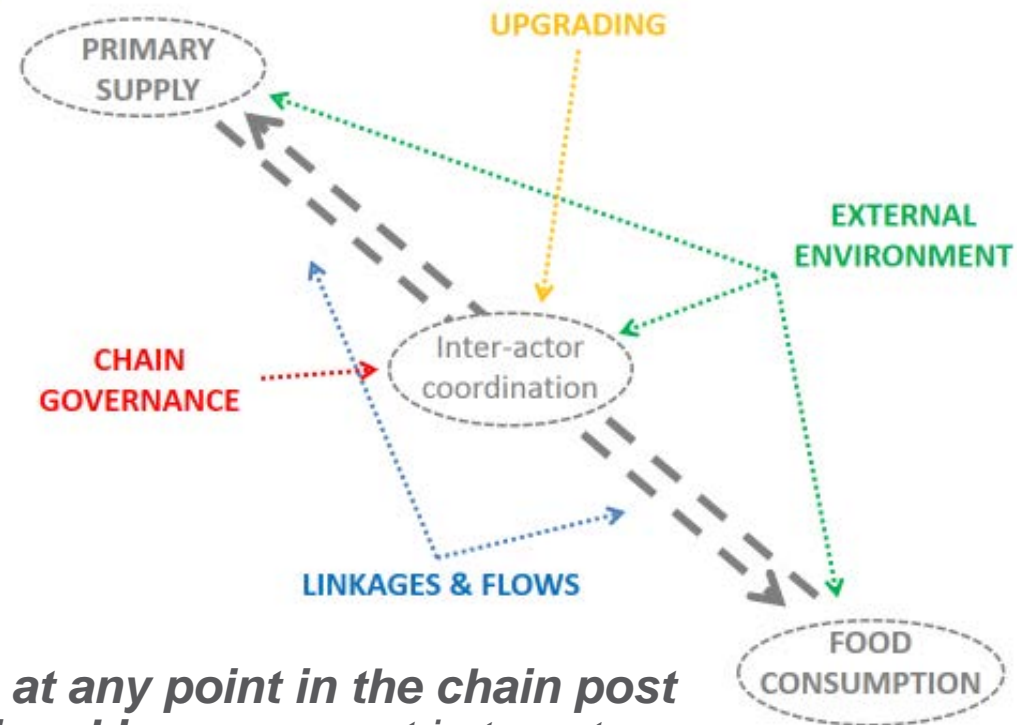
- Develop and test **solutions to upgrade target value chains** in order to increase the availability of affordable, safe and nutrient-dense food for target populations



# The nutrition-sensitive value chain

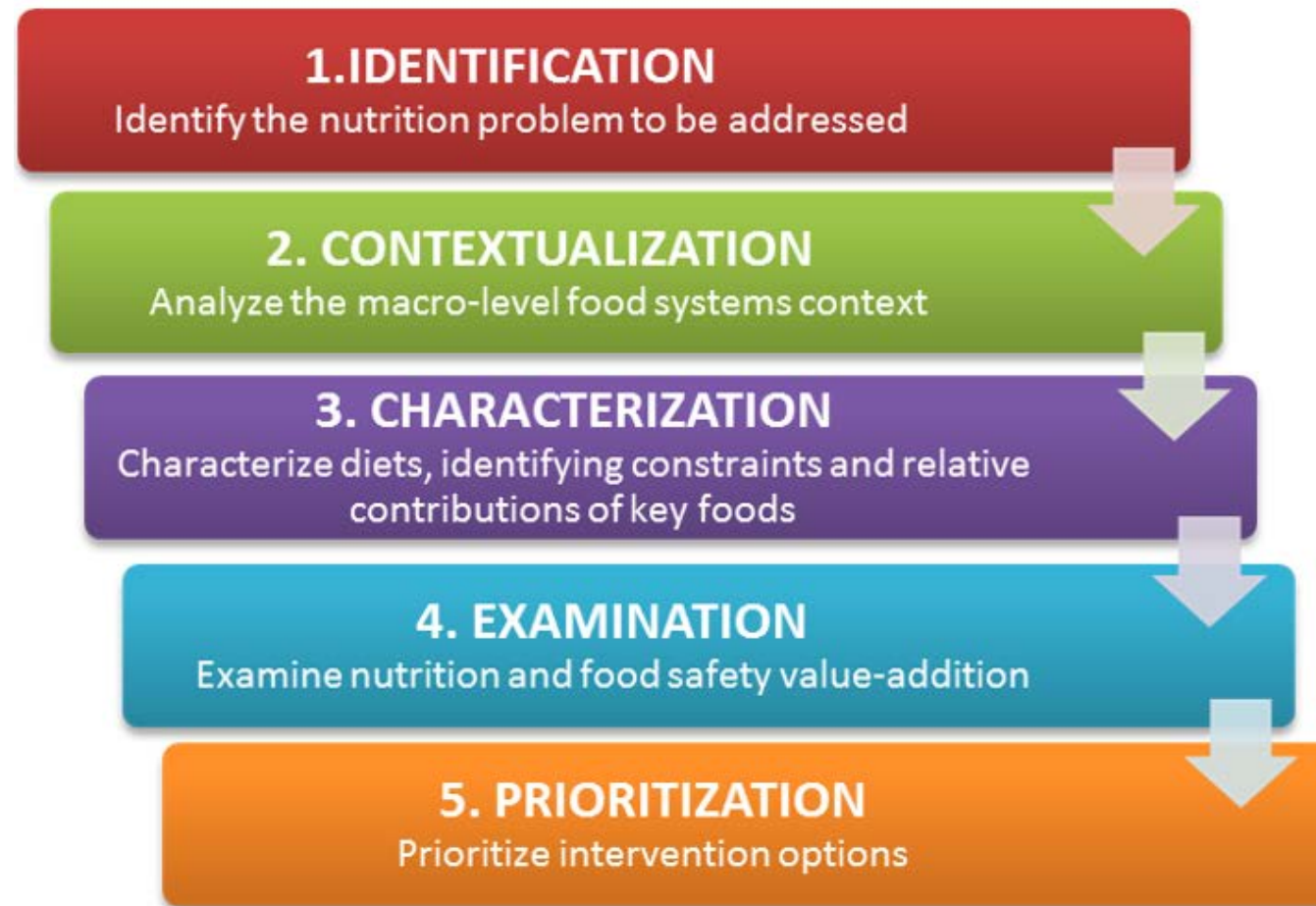
- The products, processes, people and policies which deliver valuable nutrients to vulnerable consumers

- *Innovations and interventions at any point in the chain post farm gate which address nutritional improvement in target population groups where there is evidence that the focal foods are consumed by the (rural and urban) poor*



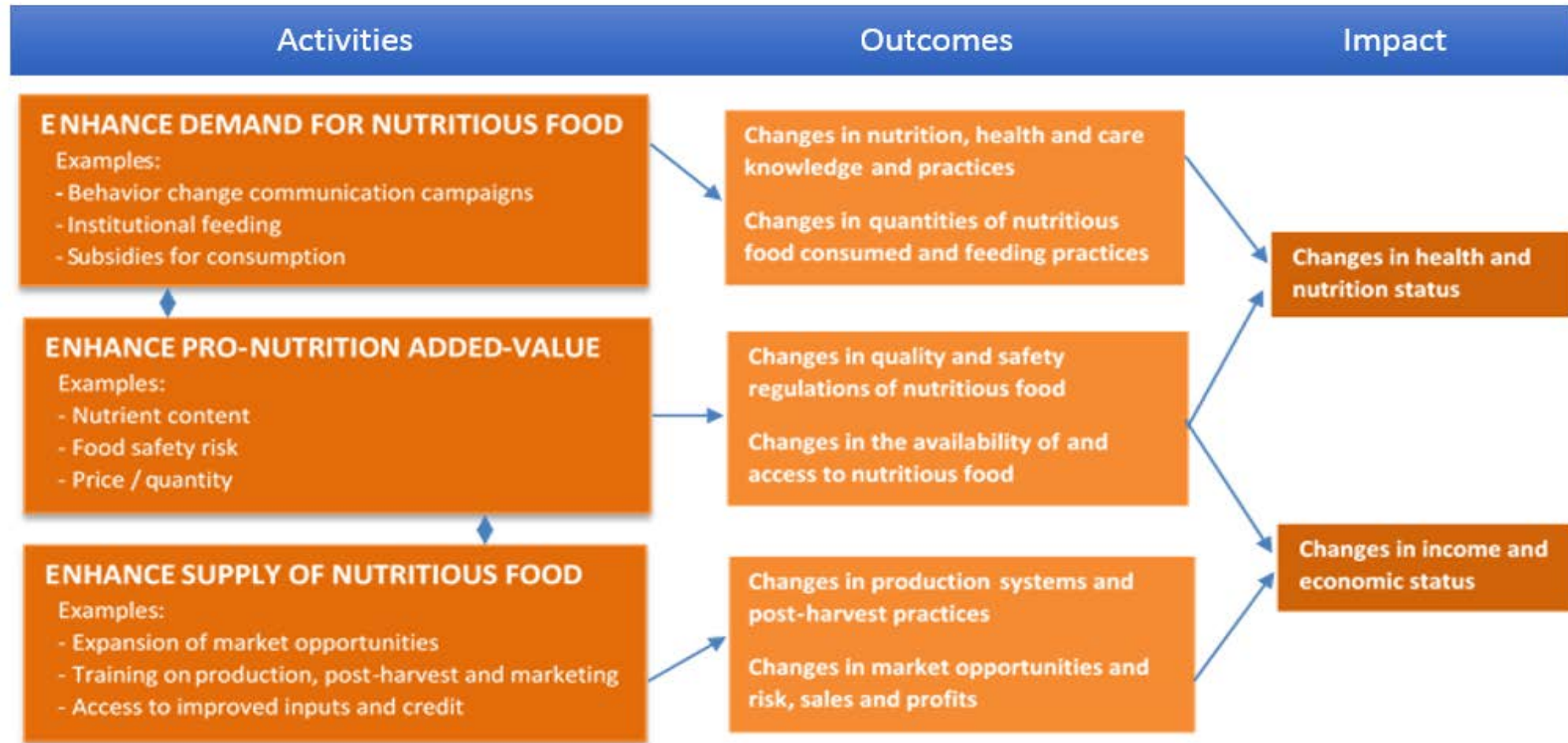


# Methodological steps of the VCN approach



Methodological steps of the VCN approach  
(based on IFPRI, 2015)

# Impact pathway of the VCN approach



*Impact pathway of the VCN approach (based on IFPRI, 2015)*



## Making value chains work for food and nutrition security of vulnerable populations in East Africa

- **Donor:** BMZ/GIZ and A4NH
- **Team:**
  - International Centre for Tropical Agriculture (CIAT)
  - Kenya Agricultural and Livestock Research Organization (KALRO)
  - Ugandan National Agricultural Research Organization (NARO)
  - University of Hohenheim, Germany
  - University of Goettingen , Germany
  - Nutreal & Azuri: Private processors in Kenya and Uganda (Small & medium enterprises)
  - Local Universities in Kenya and Uganda
  - Farmers





# Project Goal

- ✓ To **improve diets of vulnerable rural and urban consumers** at the base of the pyramid (BoP), especially women of reproductive age (15-49 years) and young children
- ✓ The project's goal will be achieved through:
  - **Increased consumption of more diverse, safe, and nutrient-dense foods** sourced from **multiple crops** and delivered through **market-based solutions**, which **improve the food and nutrition security, income, and livelihoods** of actors along the value chain.
  - Public- Private-Partnership (PPP)
- ✓ The first case study applying the IFPRI value chain for nutrition framework

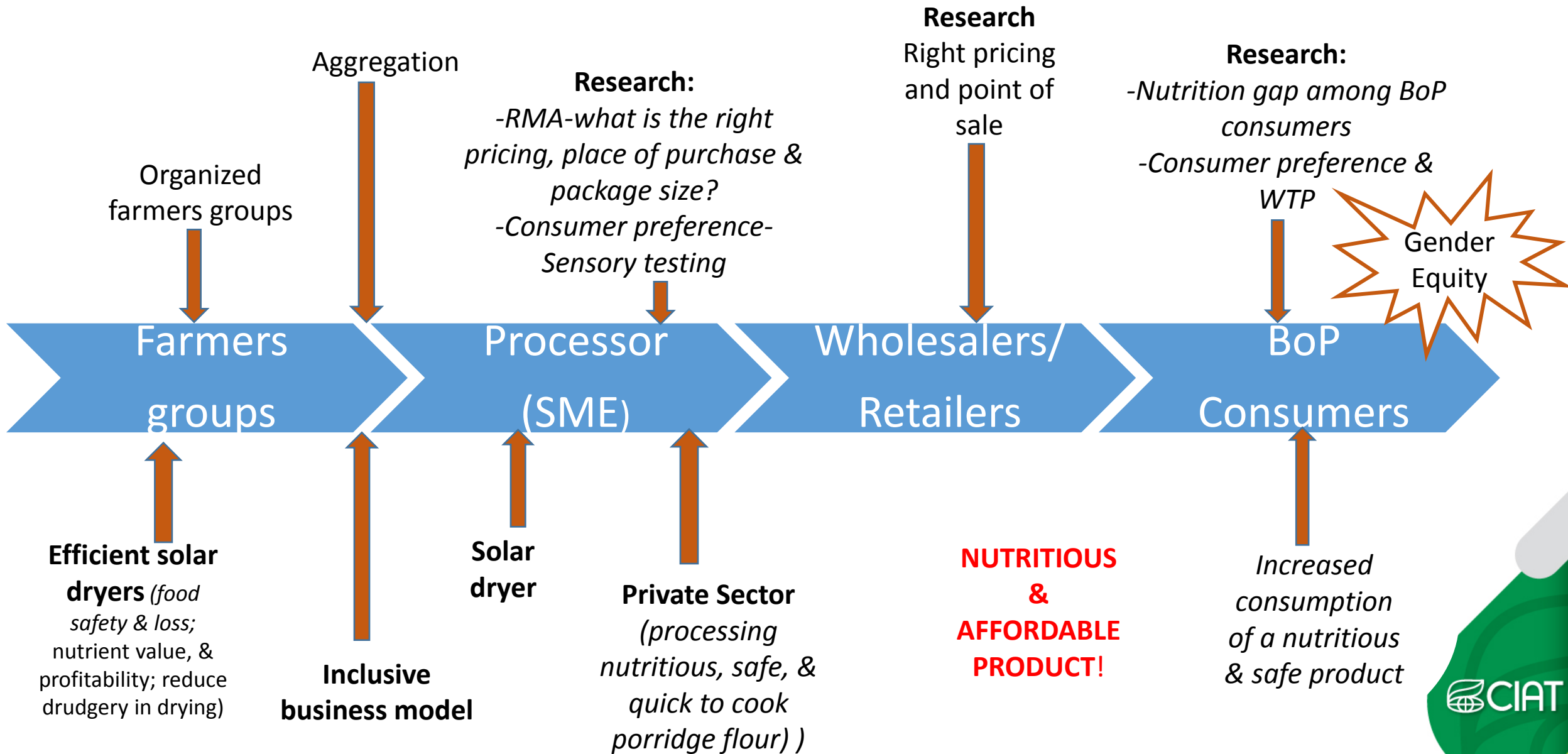


# Specific objectives

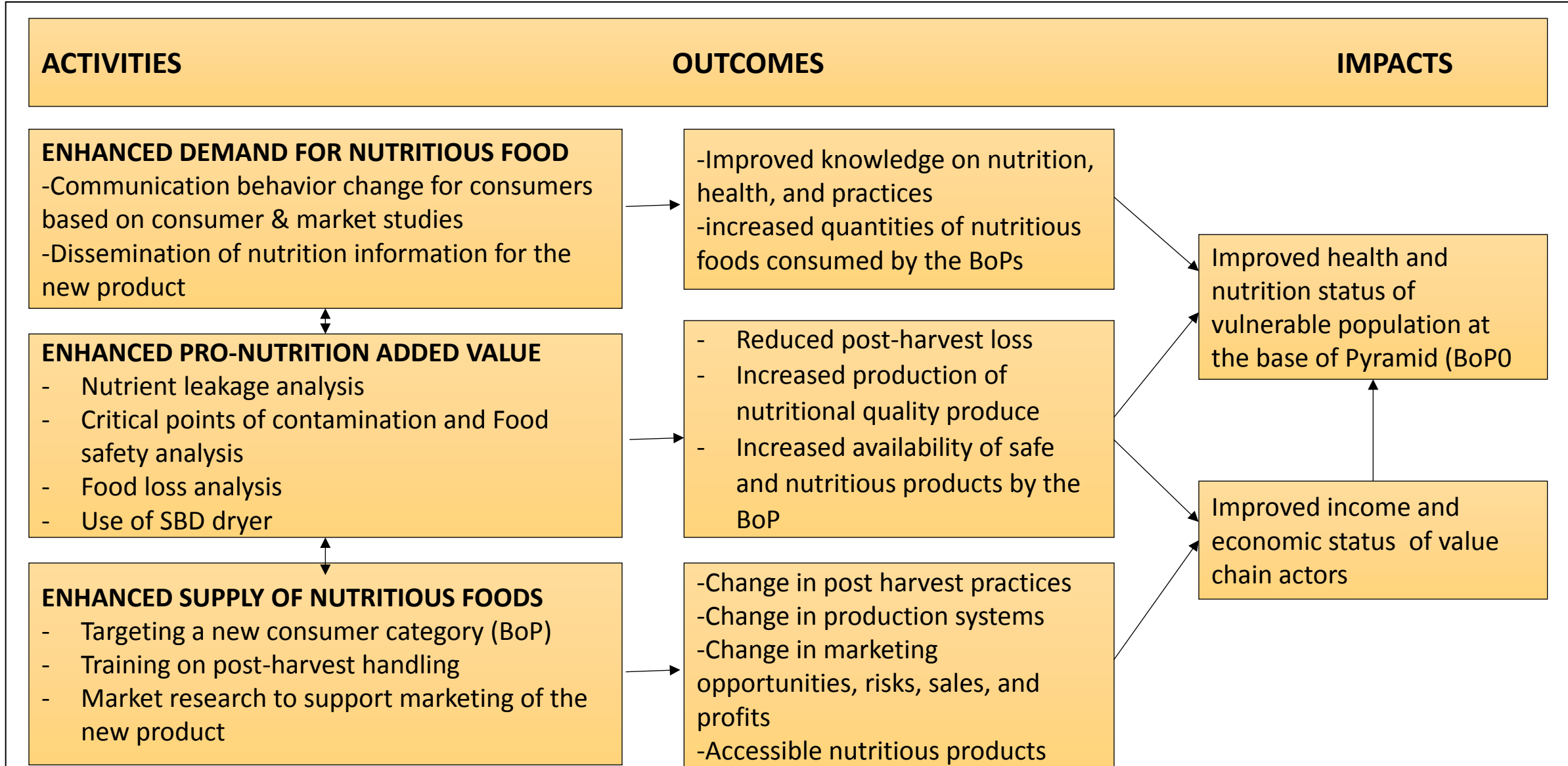
1. To improve the dietary quality especially for women and children.  
(**Indicator:** Dietary diversity scores; dietary micronutrient intake)
2. To enhance food safety and reduce nutrient loss in bean-based products
  - Indicator: Prevalence of contaminants in food crops dried using SBD versus traditional method (e.g. mycotoxins)
  - Indicator: Nutrient loss resulting from traditional drying process versus using SBD
    - Vitamin A, C, B1, B9-HPLC and other analysis
3. To improve economic returns in target value chains, through  
(**Indicator:** Change in farm income from sale of the target produce):
  1. Improved quality,
  2. Reduced costs and post-harvest loss,
  3. Increased output, sales, and profits along the value chain, leading to improved income and employment along the entire value chain
4. Women empowerment (**Indicator:** Level of women empowerment using Women Empowerment in Agriculture Index (WEAI) and “Longwe” framework)
5. To promote the consumption of nutritious bean-based products among different vulnerable consumer groups



# The project value chain model



# Impact pathways



*Impact pathway of the VCN approach (based on IFPRI, 2015)*



# Output 1

## **Knowledge base established to understand:**

- Why the target nutrient-dense foods are not consumed by specific vulnerable consumer groups
- Why foods cost what they do
- How nutrient quality, quantity, and safety of foods change along the value chain from production to final consumption.
  - Lab analysis to conduct nutrient leakages along the value chain
  - HACCP Analysis to identify the critical points of contamination
  - Lab analysis to identify level of contamination at the identified points

## Output 2

### **Characterization of diets & consumption patterns of target vulnerable populations**

- Identify specific micro- and macronutrient deficiencies (the nutrition problem)
- Identify opportunities for improving dietary quality by enhancing the supply of and demand for specific foods and identifying unmet market opportunities
- “Value propositions” for increasing consumer acceptability of nutrient-dense products
- “willingness to pay” and demand of the bean-based product

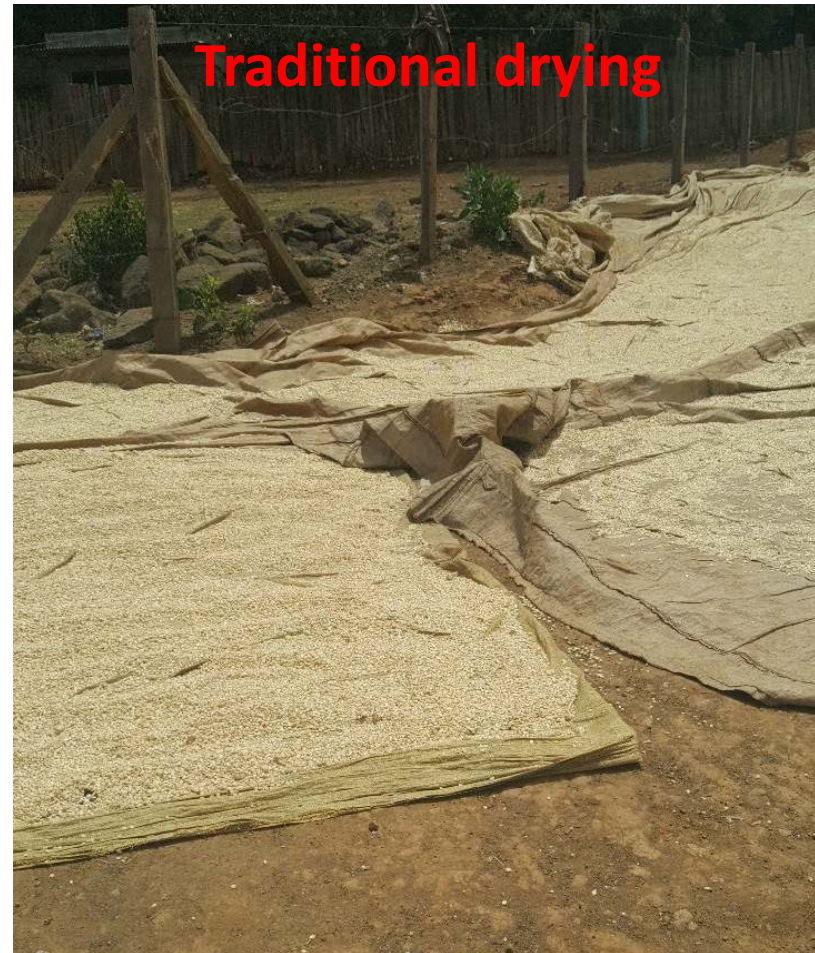
## Output 3

**Nutritional value enhanced along bean-based value chains through the introduction of energy-efficient, low-cost solar drying technology.**

*Advantages of the Solar Bubble Dryer (SBD) over traditional drying*

- Enhanced food safety
- Enhanced nutrient value
- Reduces postharvest losses
- Eliminates weather risk-during the wet season.

**-SBD dries grains approx. 2 times faster than open sun-drying**





# Solar drying technology (training and installation) at Azuri Ltd.



## Output 4

Support provided to private sector Small and Medium Enterprises (SMEs) for developing, testing, and launching in informal markets novel bean-based products that are nutritious, convenient, safe, and affordable.

- Development of the SME's strategic plan
- Market opportunity for the product
- Product definition
- Product prototype
- Consumer testing
- Product launch
- Scaling up

## Output 5

### **Using LINK methodology to link farmers with profitable market:**

Chain-wide collaboration enhanced through new partnerships and more inclusive business models linking smallholder farmers to promising informal market segments for nutrient-dense processed products.

Win – win situation for farmers and processors

## Output 6

**Capacity of project partners and key actors innovation platforms strengthened** through training and mutual learning for participatory design and large-scale implementation of solutions aimed at increasing the availability, affordability, safety, and quality of selected nutritious foods in bean corridors of Kenya and Uganda



# Target numbers to be reached

- Rural and urban consumers:
  - The project expect to reach an estimated 50,000 rural and urban consumers by end of the project
  - Reach 2 and 3 million consumers in Uganda and Kenya respectively, within three years after the project
  
- Smallholder farmers
  - Reach 7,000 in Uganda and 5,000 in Kenya

# Outline



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3. **Market Assessment Study / Willingness  
to pay**

# Purpose of the study

- To understand the Base of Pyramid (BoP) market, consumers and outlets:

## a.) BoP Consumers

- Type of porridge flour they consume
- Porridge flour attributes that are important to them
- Preferred point of purchase
- Preferred flour packaging size
- How much the BoP consumers are willing to pay for nutritious porridge flour
- Impact of nutrition information on consumer's willingness to pay for the porridge flour
- ...

# Purpose of the study ...

## b.) Outlets

- Is there market for the porridge flour, and how can it be characterized?
  - Product prices
  - Market size and trends:-traded volumes
  - Types of porridge flour in demand: varieties; packaging type
  - Packaging sizes
- Type of porridge flour in the market (composition-ingredients; fortified or not)
- Who are the competitors of flour suppliers (processors): local, suppliers from other regions

# Study sites

- Survey was conducted in urban of Nairobi, Kenya and Kampala, Uganda between July - September 2016
- Covered 4 informal settlements(Base of Pyramid) in each country
- Kenya:
  - Kibera, Mathare, Mukuru kwa Njenga, and Kawangware
- Uganda:
  - Bwaise, Kawempe, Kamwokya, and Kawaala

# Who was interviewed?

- 300 Consumers in each country
- Consumer survey was at household level
- 200 Outlets in each country
- Outlets targeted wholesale and retail shops
  - Kiosks,
  - Mom & pop shop
  - Supermarkets
  - Wholesalers



# Some key study results



# BoP Consumers

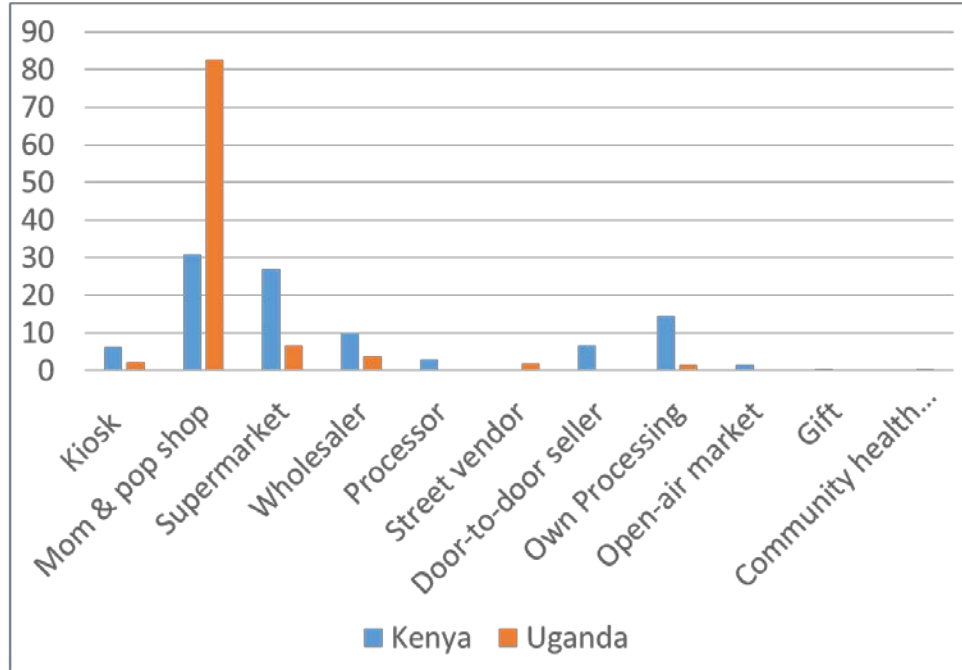


# Composition of porridge consumed

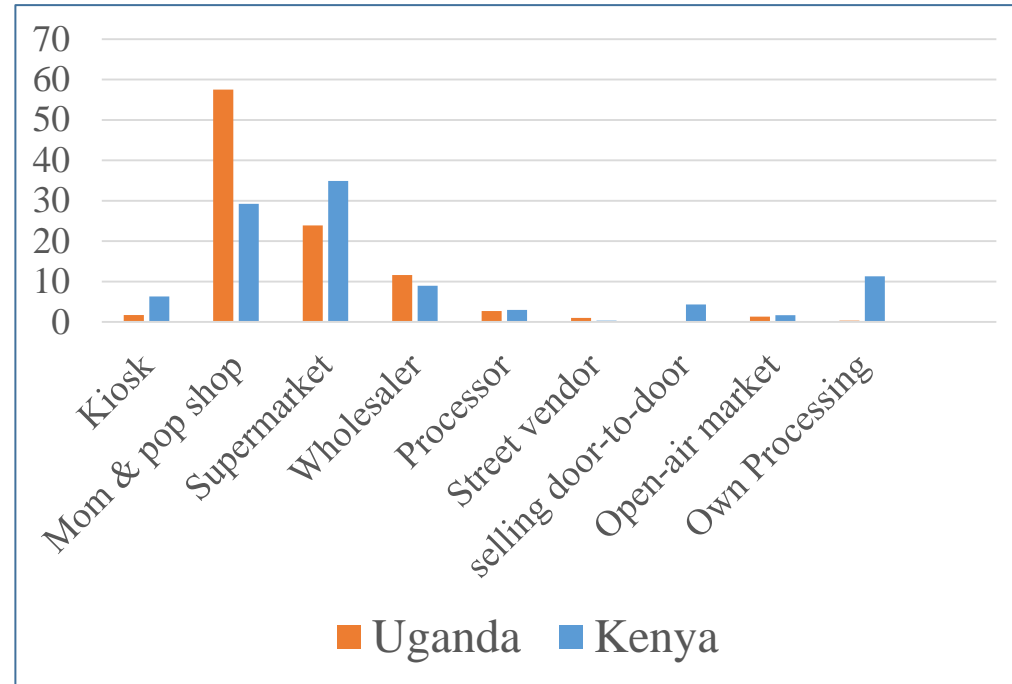
- Composition of porridge flour consumed by children (6-23 months), children (2-5 years), and women of reproductive age:
  - Kenya: Millet porridge flour is the most consumed
  - Uganda: Maize & millet; only maize; only millet flour
- Less than 10% of consumers use porridge flour with 4 or more ingredients
- Much less percentage when considering food groups

# Actual & preferred place of purchase

Actual place of purchase



Preferred place of purchase

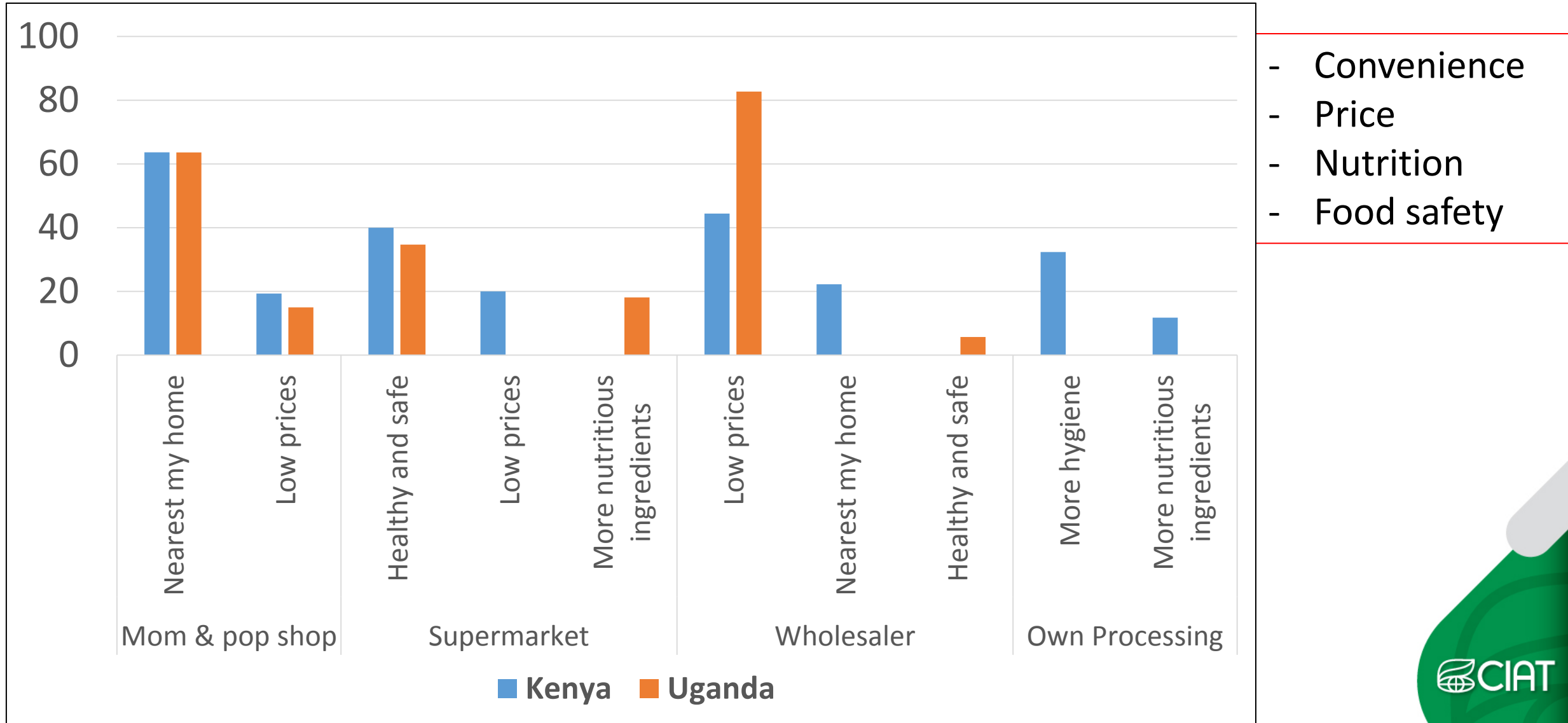


- Mom & Pop shops are the main point porridge flour purchase followed by supermarkets, own processing, and wholesalers

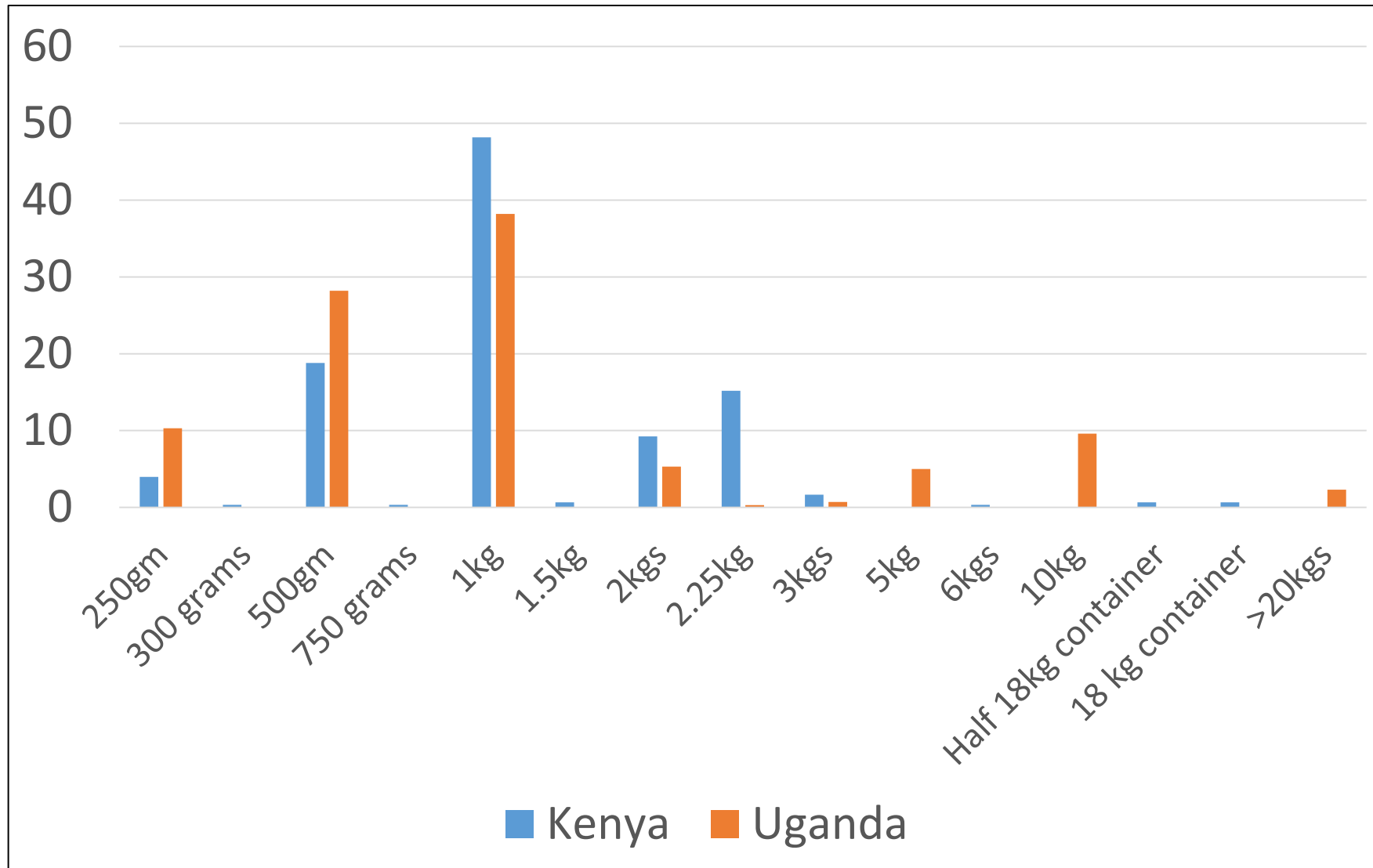
- A higher percentage of consumers would prefer to purchase their porridge flour from supermarket



# Top 2 main reasons for Preferred Place of purchase



# Preferred porridge flour package sizes



- 1kg and 500grams are most preferred



# Reason for Preferred package sizes- Ke, Ug

	<b>Reasons for preference</b>
250g	<b>Its affordable</b> Readily available
500g	<b>Its affordable</b> Avoid expiry
1kg	Lasts longer <b>Its affordable</b>
1.5kg	Lasts longer
2kgs	Lasts longer <b>Its affordable</b>
2.25 kg	Lasts longer <b>Its affordable</b>

- Affordability is Key!

# Porridge attributes important to BoP consumers

Porridge flour attribute	Kenya (%)	Uganda (%)	
Price (inexpensive)	76.2	44.2	
Price (expensive)	3.3	1.5	
Small packaging (<1kg)	18.2	7.8	
Large packaging (>=1kg)	36.0	3.8	
Only one ingredient	17.8	2.3	Nutrition
Two ingredients	9.2	20.3	
More than two ingredients	44.2	23.5	
Fortified flour	11.9	2.5	
Labelling (with expiry dates etc.)	25.1	12.2	Food safety
Long Shelf life	22.8	5.9	
Labelling Food safety (passed through food safety checks)	8.6	41.0	
Texture in the mouth (with debris)	3.5	27.5	Sensory characteristics
Sour	25.1	7.8	
Texture in the mouth (smooth)	38.6	28.1	
Tasty	58.8	49.7	
Appealing color (96% respondents-prefer brown porridge)	34.3	30.0	
Precooked/Fast cooking flour	2.3	17.0	
Not forming lumps during cooking	13.5	8.2	
Packaging that rodents/insects can't get in	9.9	5.5	



# Consumer willingness to pay (WTP) for improved flour Experiment

- Multi-composite porridge flour (Improved variety)
  - Kenya: 6 Ingredients
  - Uganda: 5 ingredients
- Conventional porridge flour:
  - Kenya: Millet flour
  - Uganda: - Millet flour  
- Maize flour
- Consumers were stratified into two:  
With and without nutrition information



# Consumer WTP for improved vs. conventional flour (1 kilogram of flour)

## KENYA

Study Site	Overall			No Nutrition information		With Nutrition information		Nutrition info. Effect
	Millet flour+	Improved flour++	Premium above millet (%)	Improved flour	Premium above millet (%)	Improved flour	Premium above millet (%)	Premium
	Mean (USD)	Mean (USD)	(%)	Mean (USD)	(%)	Mean (USD)	(%)	%
Kibera	0.99	1.72	73.4	1.64	65.1	1.76	77.3	12.2
Mukuru Kwa Njenga	0.91	1.42	56.4	1.46	61.0	1.47	61.3	0.3
Mathare	1.01	1.64	63.2	1.51	50.3	1.67	66.0	15.6
Kawangware	0.88	1.40	59.7	1.41	61.3	1.43	63.6	2.3
<b>Overall</b>	<b>0.94</b>	<b>1.55</b>	<b>64.1</b>	<b>1.51</b>	<b>60.2</b>	<b>1.58</b>	<b>67.3</b>	<b>7.0</b>

Notes: + Millet flour is made of millet only; ++ Improved flour is multi-composite flour made of 6 ingredients from 5 food groups

Overall, consumers are willing to pay 64% premium for improved flour above conventional flour

Effect of nutrition information is positive albeit small

# Consumer WTP for improved vs. conventional flour (1 kilogram of flour)

Overall, consumers are willing to pay 62% premium for improved flour above conventional flour (millet); >100% premium compared to maize flour

Effect of nutrition information is substantial (15-22% premium)

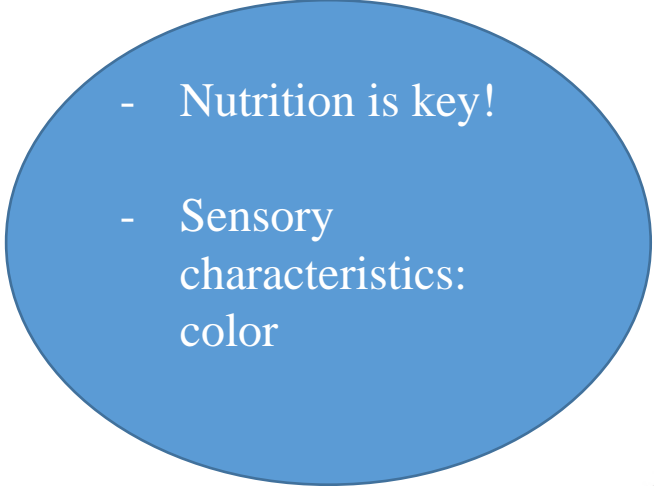
## UGANDA

Overall	No Nutrition information				With Nutrition information			Nutrition info. effect				
	Maize flour+	Millet flour++	Improved flour+++	Premium above millet (%)	Improved flour	Premium Above millet (%)	Premium Above maize (%)	Improved flour	Premium Above millet (%)	Premium Above maize (%)	Premium Above millet (%)	Premium Above maize (%)
Study sites	Mean (USD)	Mean (USD)	Mean (USD)	(%)	Mean (USD)	(%)	(%)	Mean (USD)	(%)	(%)	(%)	(%)
Bwaise 11	0.56	0.85	1.27	49.6	1.15	36.3	106.2	1.38	63.4	147.2	27.1	41.0
Kawempe 11	0.56	0.84	1.24	46.5	1.29	53.3	131.5	1.19	40.8	112.5	-12.6	-19.0
Kamwokya	0.59	0.77	1.32	72.4	1.24	62.3	110.3	1.40	82.2	136.2	19.9	25.8
Kawaala	0.58	0.80	1.42	77.3	1.30	63.1	126.6	1.50	87.9	161.1	24.9	34.6
<b>Overall</b>	<b>0.57</b>	<b>0.81</b>	<b>1.31</b>	<b>62.2</b>	<b>1.25</b>	<b>54.2</b>	<b>118.9</b>	<b>1.37</b>	<b>69.3</b>	<b>140.4</b>	<b>15.1</b>	<b>21.5</b>

Notes: + Maize flour is made of maize only; ++Millet flour is made of millet only; +++ Improved flour is multi-composite flour made of 5 ingredients from 4 food groups

## Factors considered when deciding the WTP for improved flour

- Over 80% of consumers were willing to pay more for the improved porridge flour because it has **multiple ingredients**
- More than 50% of the consumers explicitly indicated the new flour **is nutritious** hence reason why they are willing to pay more for it
- In Uganda, 20% of consumers cited **color** as one of the reasons why they would pay for it (they like the color)

- 
- Nutrition is key!
  - Sensory characteristics: color

*Thank you*