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The U.S. Government's Global Hunger & Food Security Initiative



A city-retail outlet inventory of processed dairy and grain foods: Evidence from Mali

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Motivation

- Urban consumers are shifting away from traditional staples and moving toward processed rice and wheat-based products (Hollinger and Staatz 2015).
- Income increases are associated with growth in foods with high-income elasticities of demand (Zhou and Staatz 2016).
- Processed foods can play a central role in diet transformation (Tschirley et al. 2015) and retailing modernization (Reardon et al. 2015).

Objectives

- Examine the general trends in terms of diversity, availability, and prevalence of imports of processed grain and dairy products.
- Analyze key characteristics of processed grain and dairy products, including branding, packaging, labeling, primary ingredients, and pricing.



Couscous



Rice



Sterilized milk



Sweetened condensed milk

Processed food product

- “a retail item derived from a covered commodity that has undergone specific processing resulting in a change in the character of the covered commodity, or that has been combined with at least one other covered commodity or other substantive food component” (USDA 2017; 7 CFR § 65.220).

Methods

- Cities
 - Bamako, Sikasso, Kayes, and Segou
- Neighborhoods
 - Low, medium, and high-income
- Retail outlets
 - Grocery stores, traditional shops, neighborhood markets, central markets, and supermarkets.



Using tablets for data collection



Product information



Retail outlet

General trends

Processed dairy and grain products

Diversity of products

- 4,000 processed dairy and cereal food items observed in 100 retail outlets.
- A total of 36 and 15 different processed cereal and dairy product types = high repetition of products across retail outlets.
- Coexistence of modernity with tradition, but traditional products account for very few observations.



Monikourou



Breakfast cereals

Availability of products

- Most cheese, butter, and ice cream products are available in Bamako only.
- Limited access to dairy products in low income neighborhoods.
- More food items are available at the supermarkets than at other retail outlets.



Yogurt



Fresh cheese

Dependence on imports

- High dependence on imports.
 - 70% and 80% of inventoried processed grain and dairy products.
- More processing is occurring on foods that can be locally sourced.
 - Processed sorghum products are exclusively from Mali.
- Imports from Europe dominate in supermarkets.
 - 60% and 75% of inventoried processed grain and dairy products.



Imported butter

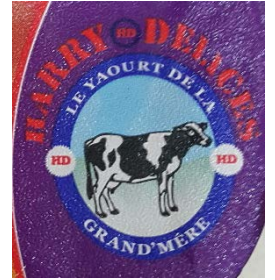


Locally processed fonio

Key characteristics

Branded sub-type products*

Branding

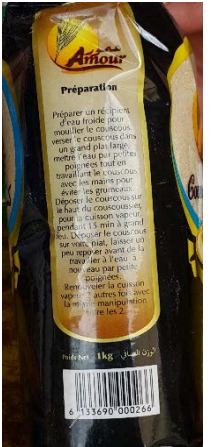


- There are many brands available in the retailing market
 - ~ 70 for pasta, ~40 for couscous and powdered milk, and 9 for monikourou
- There are 80 and 27 Malian firms manufacturing grain and dairy products
 - <30% of them have a presence in more than one city.
 - Only 3 of them have a presence in all four cities.



Packaging

- Plastic is the most common packaging material across retail outlets.
 - Products sold in non-plastic packages are mostly imported.
 - Locally processed products are almost entirely sold in plastic packages
- Locally processed foods do not have bar codes.
- Nearly all imported foods have expiration dates compared to <75% of local ones.



Bar code



Plastic wrap

Ingredients

- Nearly all provide a list of their primary ingredients.
- More than one-third and one-fifth of all branded sub-type products contain vegetable fats and sugar, as a top-three ingredient.
- Traditional grain and dairy products are less likely to include sugar and/or fat as their key ingredients.



List of ingredients

Pricing

- Hedonic pricing model to examine attributes of powdered milk.
- Product attributes are highly significant:
 - Size (-)
 - Plastic bag (-)
 - Bar codes (+)
 - Manufactured in Europe (+)
 - Brand, Nido (+)
 - Supermarkets (+)



Nestle Nido milk powder

Conclusions

- The transformation in the processing and retailing segments of the Malian agri-food system is still at an early stage.
- The expected benefits of lower prices and greater selection of processed products for the mass market from the expansion of modern retailing has not fully taken off.
- The ability of the local food processing segment to compete in modern retailing will depend on the country's ability to understand the ongoing changes and overcome market barriers.



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Product types

Processed grain foods		Processed dairy foods	
Maize semolina	Wheat flour	Butter	Yogurt
Maize breakfast cereals	Cake	Flavored milk	Ice cream
Maize flour	Bread	Pasteurized milk	Powdered milk
Maize-based cookies	Pasta	Milk-based beverages	Sterilized milk
Milled maize	Couscous	Fermented milk	Evaporated milk
Pop corn	Didegue	Fene	
Maize chips	Milled fonio	Sirime	
Bachi djalan	Pre-cooked fonio	Soft cheese	
Bendegue/ Degue	Rice-based cookies	Hard chesse	
Millet flour	Parboiled Rice	Fresh cheese	
Milled millet	Perfumed rice		
Monikourou	Broken rice		
Milled sorghum	Milled rice		
Sorghum semolina	Djouka		
Wheat-based cookies	Rice cereal breakfast		
Milled wheat	Rice vermicelli		
Wheat breakfast cereals	Rice toast		
Infant cereals	Rice pudding		

Sub-type products

Brand A
Brand B



Processed grain sub-type products		Processed dairy sub-type products	
Maize semolina- fine grind	Wheat flour	Salted butter	Plain sweetened yogurt
Maize semolina- medium grind	Wheat vermicelli	Unsalted butter	Plain unsweetened yogurt
Maize semolina- coarse grind	Cake	Flavored chocolate milk	Strawberry yogurt
Maize breakfast cereals	Bread	Flavored strawberry milk	Vanilla yogurt
Maize flour	Couscous	Flavored vanilla milk	Other flavored yogurt
Maize-based cookies	Pasta- spaghetti	Strawberry ice cream	Evaporated sweetened m
Milled maize	Pasta- farfelle	Chocolate ice cream	
Pop corn	Pasta- shells	Vanilla ice cream	Evaporated unsweetened
Maize chips	Pasta- penne	Pasteurized milk	Powdered milk
Bachi djalan	Pasta- elbow	Milk-based beverages	Sterilized milk
Bendegue	Pasta- spirali	Fene	
Degue djalan	Didegue	Sirime	Fermented sweetened mil
Degue mougou	Milled fonio	Fresh cheese	Fermented vanilla milk
Monikourou	Djouka	Soft plain cheese	
Millet flour	Pre-cooked fonio	Soft blue cheese	
Milled millet	Rice-based cookies	Hard “block” of cheese	
Sorghum semolina	Rice flour	Grated hard chesses	
Milled sorghum	Parboiled Rice		
Wheat-based egg cookies	Long grain rice		
Wheat-based cookies, orange flavor	Perfumed long grain rice		
Wheat-based cookies, butter flavor	Perfumed broken rice		
Wheat-based cookies, chocolate flavor	100% broken rice		
Wheat-based cookies, cream flavor	40% broken rice		
Wheat-based salty cookies	25% broken rice		
Milled wheat	Milled rice		
Wheat breakfast cereals, no fruit	Djouka		
Wheat breakfast cereals, with fruits	Rice cereal breakfast		
Infant cereals, plain	Rice pudding		
Infant cereals, fruits	Rice vermicelli		
Infant cereals, vanilla	Rice toast		