What happens to the product when consumers don't follow preparation instructions? An example of a descriptive sensory tolerance test for cooked porridge

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Introduction

- Products must be tolerant to many conditions, particularly when those products are prepared by consumers.
- Consumers may not follow the food preparation instructions; they may add or leave out ingredients specified in recipes, or change cooking and holding times for foods.[1]
- Fortified blended food (FBFs) were used as a source of nutrition for disaster or famine relief in developing countries.[2]
- Porridge products are the most common dishes prepared as FBFs with a wide range of solids contents and cooking times [3] and variations in added ingredient such as sugar and fruit.

Objective

To evaluate the tolerance to common preparation variations for a porridge product made as FBFs intended for food aid

Materials and Methods

- Whole Sorghum Soy Blend (WSSB), a fortified, extruded, ground cooked "cereal" was selected as the FBFs for this study.
- 5 different studies of variations in ingredients and cooking procedures were selected
  - **Solids content (added water – dilution)**
  - **Added oil content**
  - **Addition of Fruit(Banana)**
  - **Cooking time**
  - **Holding time/Serving temperature**
- Descriptive sensory analysis was performed to evaluate the tolerance of porridge made from variations in ingredients and cooking procedures

Table1. List of ingredient and cooking procedures for each study

Study	WSSB(% w/w)	Oil(% of WSSB)	Banana (% of WSSB)	Cooking time (min.)	Serving temperature (°C)
Solid content	10	-	-	5	45
	15	-	-	5	45
	20	-	-	5	45
	25	-	-	5	45
	30	-	-	5	45
Oil content	15	0	-	5	45
	15	10	-	5	45
	15	20	-	5	45
	15	30	-	5	45
	15	40	-	5	45
Fruit content	15	-	0	5	45
	15	-	10	5	45
	15	-	20	5	45
	15	-	30	5	45
	15	-	40	5	45
Cooking time	15	-	-	2	45
	15	-	-	5	45
	15	-	-	10	45
	15	-	-	20	45
	15	-	-	30	45
Serving temperature	15	-	-	5	30
	15	-	-	5	45
	15	-	-	5	70

Results and Conclusions

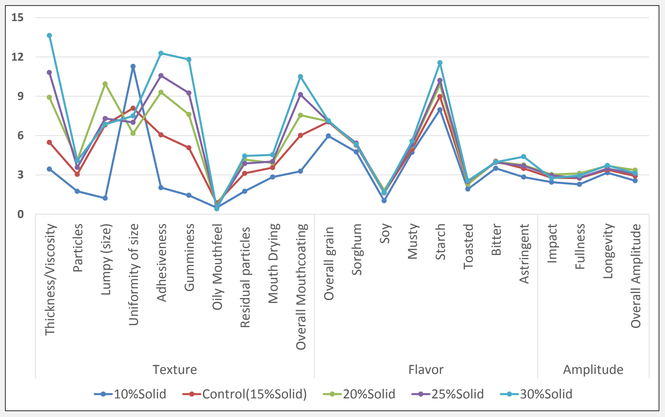

Figure 1. Significantly different attributes across samples for the study of variations in solid amount

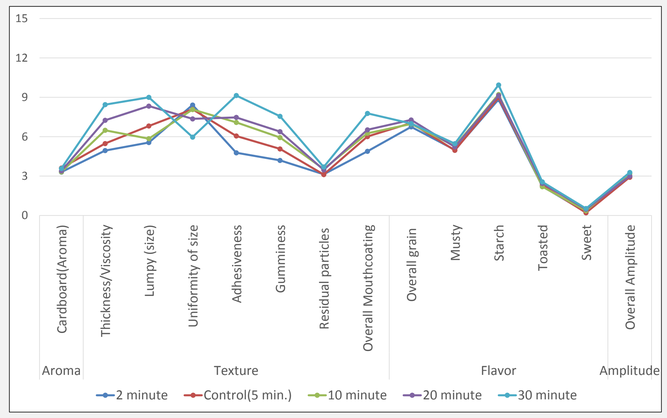

Figure 4. Significantly different attributes across samples for the study of variations in cooking time

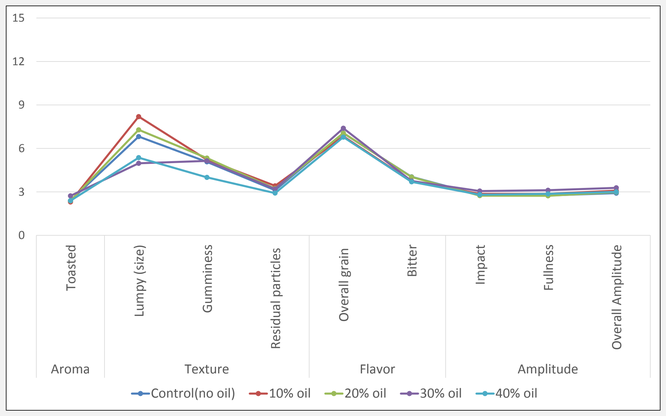

Figure 2. Significantly different attributes across samples for the study of variation in oil

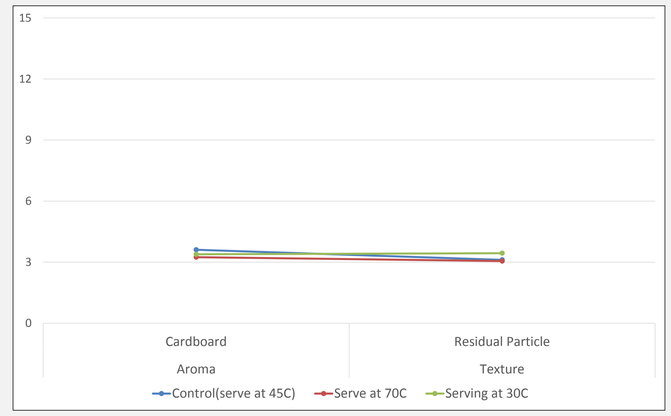

Figure 5. Significantly different attributes across samples for the study of variations in serving temperature

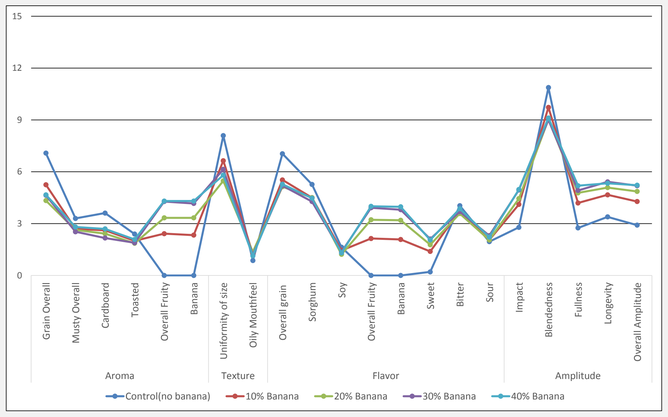

Figure 3. Significantly different attributes across samples for the study of variation in fruit

- **Porridge made from WSSB had high tolerance to variations in cooking procedures and can be modified during preparation by consumers without having a major impact on most sensory properties.**
- Most sensory properties were only marginally affected by variations in ingredients or procedures – a good finding in terms of product use.
- Variations in solid content caused a major impact on texture especially on thickness which could impact ability to swallow the product by young children.
- Addition of fruit changed flavor as expected, but little else indicating that the acceptable fruits could be added with little problem.

References

[1]Levis, P.A, Chambers, E. IV, Chambers, D.H., and Hollingsworth, M.G. 1996. Consumer use of package directions for familiar and unfamiliar products. In. Gelinas, A.D. (Ed.) "Sensory techniques used in conducting packaging research with consumers" STP 1316, ASTM, West Conshohocken, PA pp 16-24

[2]Pérez-Expósito AB, Klein BP. 2009. Impact of fortified blended food aid products on nutritional status of infants and young children in developing countries. Nutr.Rev. 67(12):706-18.

[3]Rowe JP, Brodegard WC, Pike OA, Steele FM, Dunn ML. 2008. Storage, preparation, and usage of fortified food
aid among Guatemalan, Ugandan, and Malawian beneficiaries: A field study report. Food Nutr. Bull, vol.29, no.3:213-220.

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