Some Quality Attributes of Jam and a Non-alcoholic Beverage from Orange-fleshed Sweetpotato

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Outline

- Introduction
- Materials and Methods
- Results & Discussion
- Conclusion

Introduction

- Orange-fleshed sweetpotato (OFSP) is a biofortified crop rich in beta-carotene, a provitamin A compound
- Other nutritional benefits of sweetpotato; carbohydrates (low glycemic index), vitamins, minerals, dietary fibre, etc.
- Nutritional potential of OFSP not fully exploited due to-
  - Limited awareness
  - Limited availability
  - Seasonality and price fluctuations
  - High perishability
  - Limited storage technology
  - Limited processed products

- Nigeria is one of the leading producers of Sweetpotato in Africa

  (3.78 MMT) (FAOSTAT, 2014)

- OFSP varieties –many across Africa (Tumwegamire et al., 2014)

- Nigeria-2 varieties officially released in 2012
  - Mothers' Delight (UMUSP0/3)– Intense orange colour, low dry matter
  - King J(UMUSP0/1) – Light orange colour, high dry matter

Processing of OFSP Root & Product Development

- What is processing about?

Transformation/conversion of a commodity (agro-based) into more valuable forms (products) through the application of scientific principles (technology)

- What are the benefits of processing?

  -address the limitations highlighted

  -value addition, product innovation

  -creates demand and encourages root production

  -generating employment, increase incomes, improve livelihoods

- What are the processing options & products?

  -Domestic processing (recipes & dishes)

  -Industrial processing(Drying -chips-flour-baked, fried, etc.

  (Extraction-starch-syrup-sweetners, etc.)

  (Pureeing-baked, beverages, etc.)

  (Frying-chips/crisps)

  (Etc.)

- What are the opportunities for OFSP processing?

  –Agronomic-Short-cycle, high yield, low agricultural input requirements

  -Nutrition –Rich in pro-vitamin A

  -Income

OFSP processing & product development is very important in order to exploit its opportunities and take advantage of the benefits

OFSP Products – Non-Alcoholic beverage & Jam

- Beverages -early morning tea, coffee and anything which we drink apart from water either to bring satisfaction to the body, aid digestion after meal or quenching of thirst
- Some beverages serve as substitute in filling human nutritional deficit because of the nutrients they contain while some are consumed as source of stimulant (Food & Beverages Services, 2006).
- Non-alcoholic beverages are mainly made up of water (Osuntogun *et al.,* 2004) which hydrates the body and depending on initial raw materials, they may provide essential minerals, vitamins and dietary fibre to the body (E.F.S.A 2009).
- Raw materials include fruits, vegetables, milk, cocoa, herbs and cereals.

JUSTIFICATION

- the Non-Alcoholic Beverage (NAB) industry is constantly in demand for new/varied trendy products

Thus,

- processing of OFSP into a NAB could be a viable option
- use of OFSP will give additional health benefits to consumer because of its high nutritional benefit such as beta-carotene content

OFSP Products – Non-Alcoholic beverage & Jam

- Jam can be defined as a jelly-like product with a soluble solid content of 45° Brix and consist of at least 40% fruit content
- Jam production is a form of (fruit) preservation, hence it is generally categorized as ‘fruit preserve’
- Whether in the home kitchen or in modern food processing plant, the procedures are essentially the same
- Fruits are chopped and cooked with sugar and pectin until a gel is formed. The gel is packed into sterilized jars. Sugar or high fructose corn syrup, or a combination of the two is added to the fruit to sweeten it
- Pectin, which allows fruit to gel, is present in varying degrees in all fruits
- Apples, blackberries, cherries, citrus fruits, grapes, quinces, and cranberries have the best natural gelling properties
- Presently, countries like Portugal and India, Madagascar produce jam from sweetpotatoes

JUSTIFICATION

- jam production using OFSP (packed with beta-carotene) as the raw material could serve as a good vehicle for increased consumption of vitamin A and the other nutrients inherent in OFSP

Production of OFSP Non-Alcoholic beverage

Materials

OFSP roots-Two varieties (Mother's Delight, King J)

- Yellow-fleshed variety (Ex-Igbariam)

- Maize malt

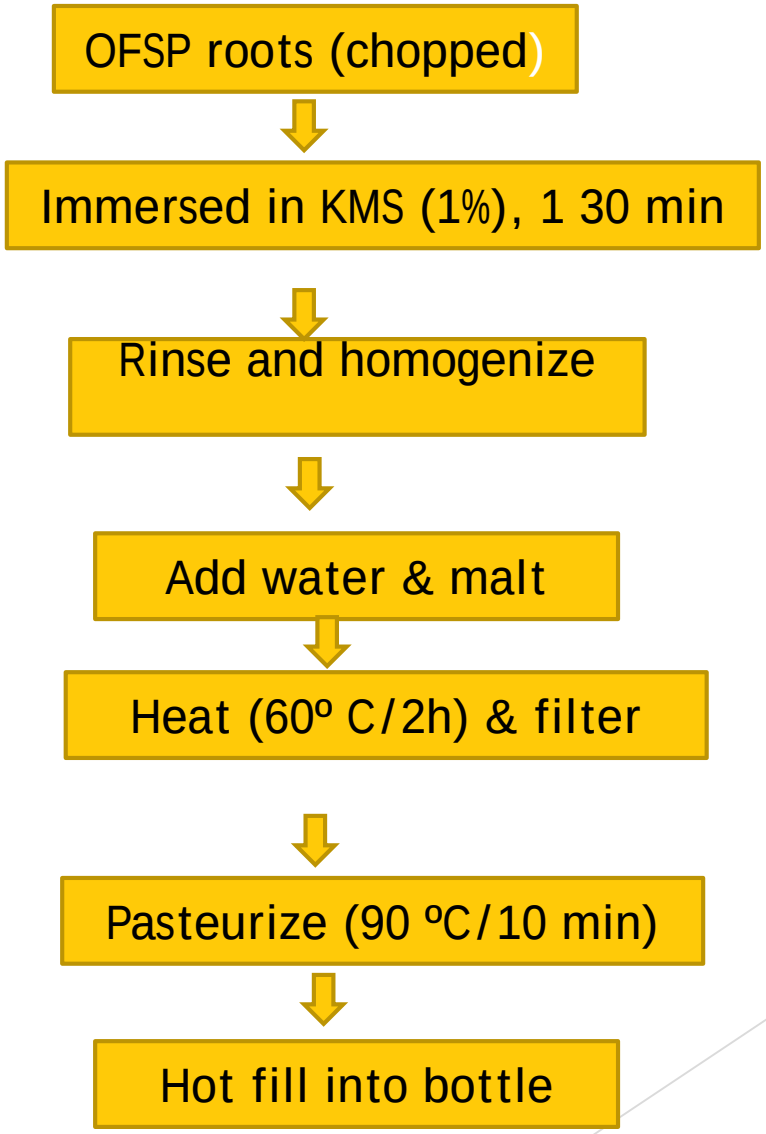
- maize grains

-steeped for 24 hours

- sprouted for 3-4 days

- dried at 50˚C for 2days

- milled to get maize malt



Production of OFSP Jam

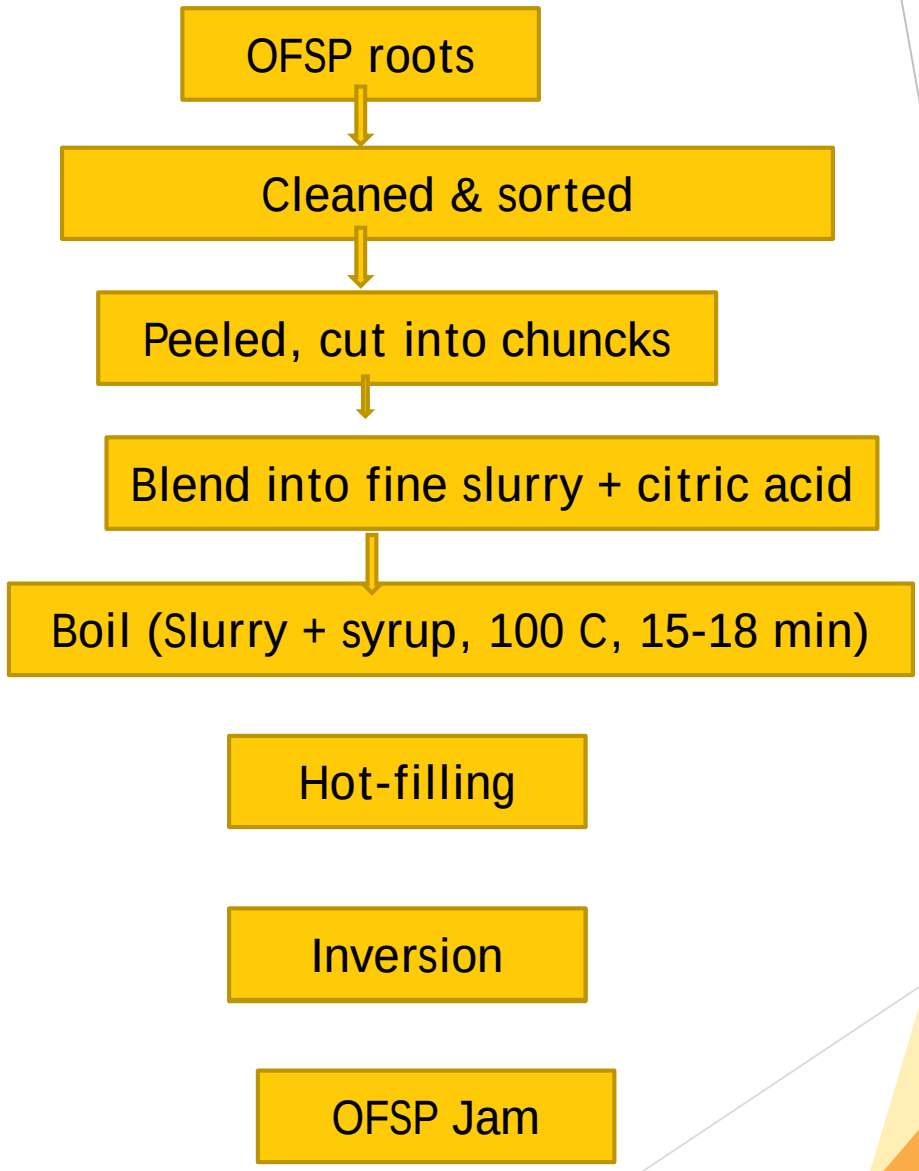
Materials

OFSP roots-Two varieties (Mother's Delight, King J)

- Yellow-fleshed variety (Ex-Igbariam)

Citric acid

Sugar syrup



OFSP Non-Alcoholic beverage & Jam : Analysis of some quality attributes

Physico-chemical & Chemical properties

- pH
- Total Soluble Solids
- Titratable Acidity
- Vitamin C
- Total Carotenoids
- Total Sugars

Sensory attributes & Consumer acceptability

OFSP Non-Alcoholic beverage & Jam : Results & Discussion

Table 1: Physico-chemical and chemical properties of OFSP Non-alcoholic beverage

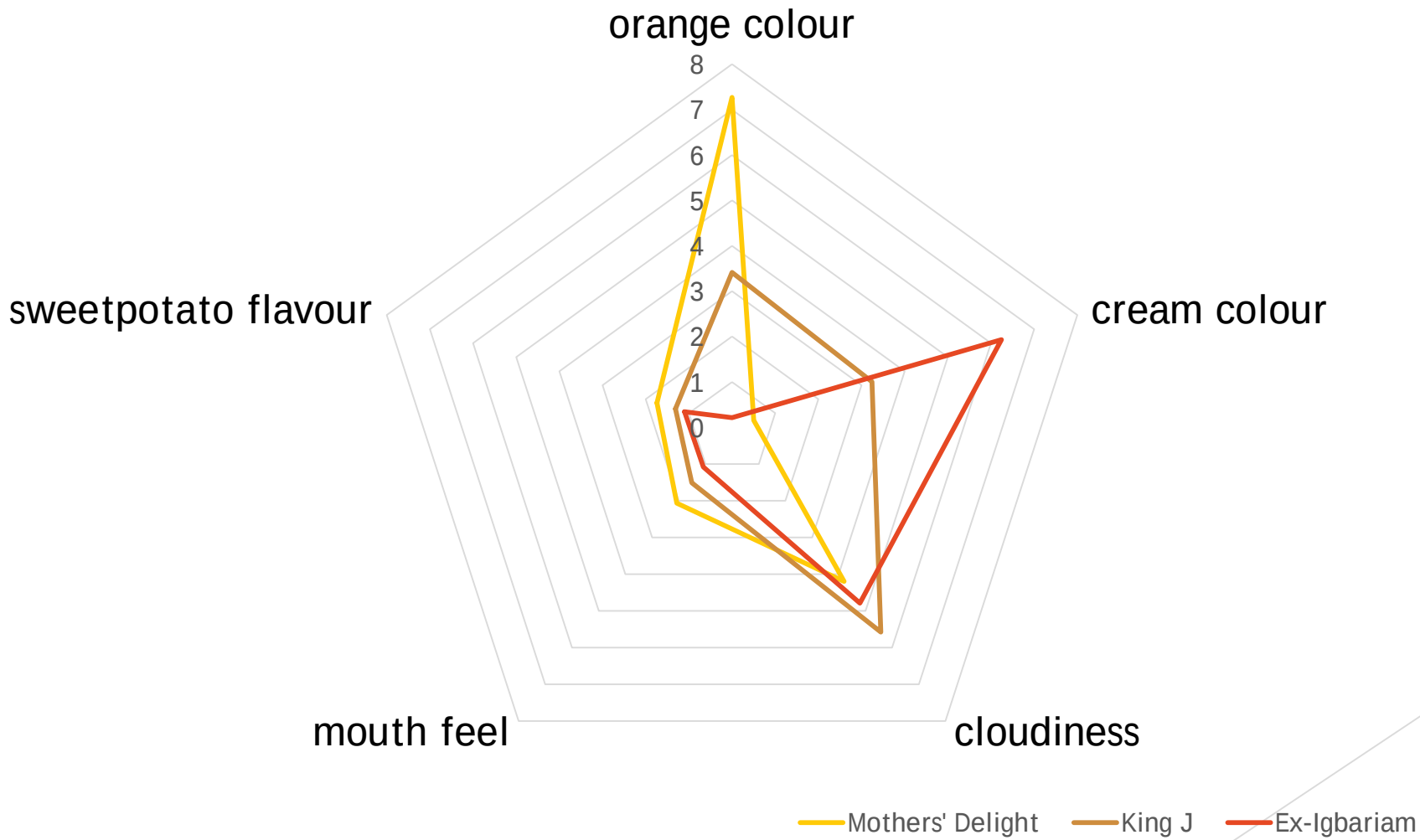
Sample	pH	Total soluble solids	Total titratable acidity (%)	Vitamin C (mg/kg)	Total sugar (%)	B-carotene (mg/kg)
Mothers' Delight	4.92	2.15^{b}	2.60^{a}	12.33^{c}	0.07	0.08^{c}
King J	4.90	1.80^{a}	3.10^{a}	1.91^{a}	0.05	0.01^{a}
Ex-Igbariam	4.64	2.60^{c}	5.60^{b}	10.39^{b}	0.06	0.01^{a}

Values are means of replicate determinations

Mean values followed by different letters are significantly different ($p<0.05$)

OFSP Non-Alcoholic beverage & Jam : Results & Discussion

Figure 1:Descriptive sensory attributes of sweetpotato OFSP Non-alcoholic beverage



OFSP Non-Alcoholic beverage & Jam : Results & Discussion

Table 2: Consumer acceptability scores for OFSP Non -alcoholic beverage

Sample	colour	flavour	mouth feel	overall acceptability
Mothers' Delight	6.79c	4.36c	4.32c	4.91c
King J	5.06a	2.99b	3.66b	3.49a
Ex- Igbariam	5.46b	2.49a	3.39a	3.61b

OFSP Non-Alcoholic beverage & Jam : Results & Discussion

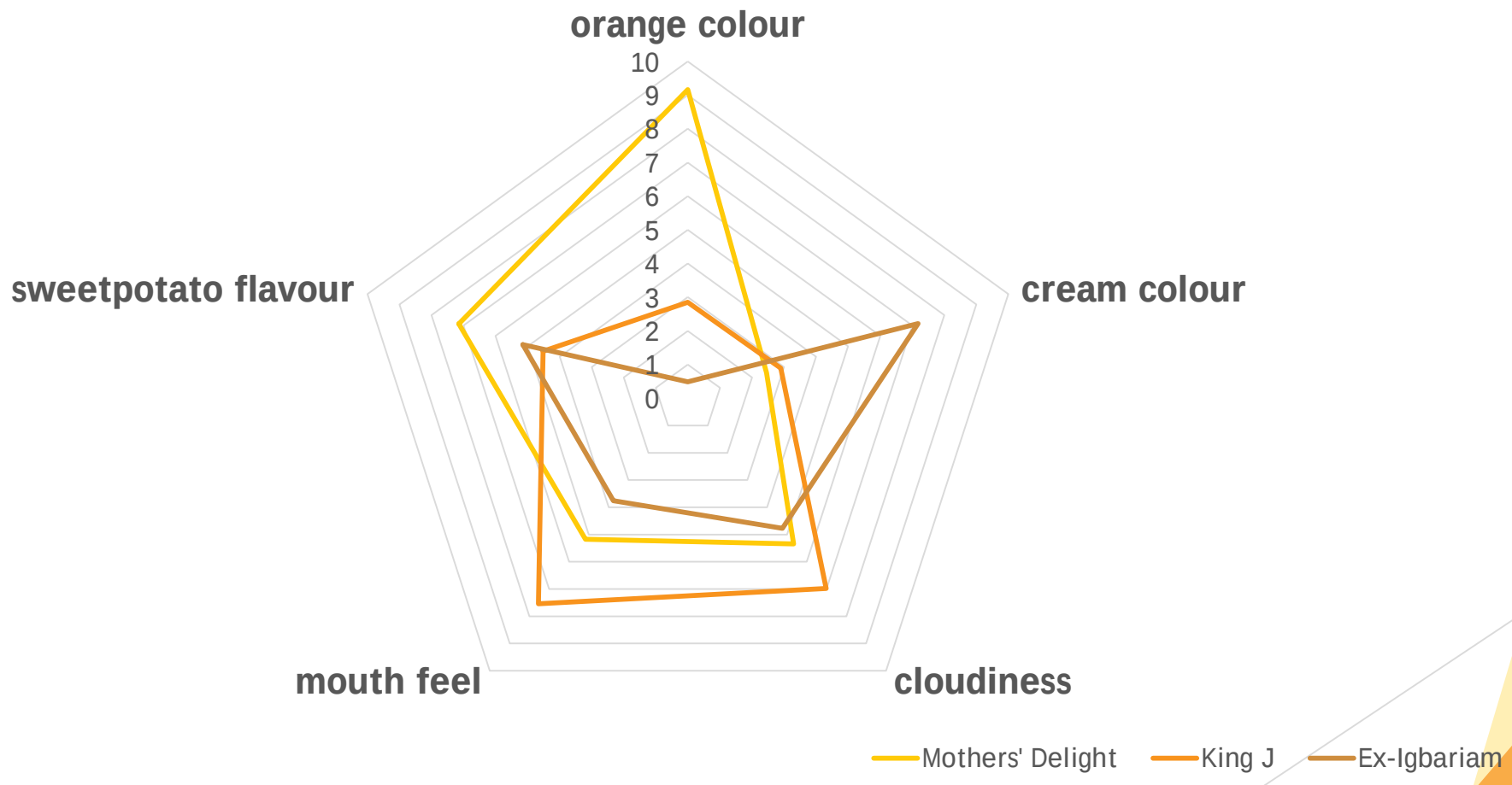
Table 3: Physico-chemical and chemical properties of OFSP jam

Sample	pH	Total solids	Total titratable acidity (%)	Vitamin C (mg/kg)	Total sugar (%)	B-carotene (mg/kg)
Mothers' Delight	6.05	18.1	3.90	38.93	36.0	1.34
King J	6.00	17.2	1.97	31.73	36.0	0.47
Ex-Igbariam	6.10	17.9	1.92	39.74	45.0	0.05

Values are means of replicate determinations
Mean values followed by different letters are significantly different ($p<0.05$)

OFSP Non-Alcoholic beverage & Jam : Results & Discussion

Figure 2:Descriptive sensory attributes of sweetpotato OFSP Jam



OFSP Non-Alcoholic beverage & Jam : Results & Discussion

Table 4: Consumer acceptability scores for OFSP Jam

Sample	colour	flavour	mouth feel	overall acceptability
Mothers' Delight	6.8a	6.74ab	6.64a	6.86a
King J	7.4b	6.6a	7.01a	7.26ab
Ex- Igbariam	7.1ab	7.18b	7.58b	7.46b

Values are means of replicate determinations
Mean values followed by different letters are significantly different ($p<0.05$)

General Conclusion

Jam and non-alcoholic beverage from OFSP roots has quality attributes that could be exploited for commercial production

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Thank you for listening