# Evaluating sweetpotato genotypes for utilization (poundability, fries, pasting properties) at the Sweetpotato Support Platform for West Africa

## (A preliminary study)

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# Brief background

- Breeding programmes result in the release of several varieties of sweetpotato including OFSP
  - Virus resistance
  - Yield
  - Nutrition (Beta-carotene)

- Understanding variation in quality for important forms of utilization will help us with breeding efforts: e.g., **non-sweet**, fries, pounding, puree?

# Brief background contd…

- Pounded roots and tubers are common in West Africa (Ghana)
  - Pounded yam
  - Pounded cassava
  - Sweetpotato

- *Mealiness* has been reported to be a key attribute in identifying which roots and tubers are poundable (Omonigho & Ikenebomeh, 2000)

# Brief background and problem

- In Ghana, sweetpotatoes are mostly fried when yams are either out of season and not as palatable (Danquah et al. 2000)

- Snacking has gained prominence over the years in Ghana

- Limited information on the end-uses of newly released sweetpotato varieties and genotypes from advanced trials of the CIP-breeding program

- Dearth of information on the use of sweetpotato as fries/*fufu* for local consumption

# Materials and Methods

# Materials

- Sweetpotato used were from the CIP fields in Fumesua, Ghana
- 21 genotypes were used for this experiment
- Experiments carried out at the CIP-Lab in Fumesua, Ghana

# Sweetpotato samples used for the experiments

**Table 1: white-fleshed varieties**

| Name | Flesh colour |
|---|---|
| DADANYUIE | white |
| NKO31A | white |
| OBARE | white |
| OGYEFO | white |

**Table 2: cream-fleshed varieties**

| Name | Flesh colour |
|---|---|
| AP3/A | deep cream |
| CIP440390 | pale cream |
| FAARA | pale cream |
| OKUMKOM | pale cream |

## Sweetpotato samples used contd…

**Table 3: orange-fleshed varieties**

| Name | Flesh colour |
|---|---|
| BF59xCip.4 | intermediate orange |
| BOHYE | pale-orange |
| Mother's delight | deep orange |
| Tiebele-2 | pale orange |
| Tu-orange | orange |

## Sweetpotato samples used contd…

**Table 4: Yellow-fleshed and purple – fleshed varieties**

| Name | Flesh colour |
|---|---|
| BLUEBLUE | deep yellow |
| CIP442162 | pale yellow |
| HI-STARCH | pale yellow |
| JITIHADA | pale yellow |
| LIGRI | pale yellow |
| OTOO | pale yellow |
| SANTOMPONA | pale yellow |
| SAUTI | deep yellow |
| TU-PURPLE | purple |

# Frying experiment

Washing

Peeling

Cutting
(1cmx1.5cmx5cm)

Frying
(180°C; 5min)

Sensory evaluation
8-member panel
(average appearance/taste score and average texture score)

colour, caramel, starch, sogginess, oily mouthcoat
Scale: 1 - 9

# Poundability experiment

Peeling, washing, size-reduction

Boiling (20 min)

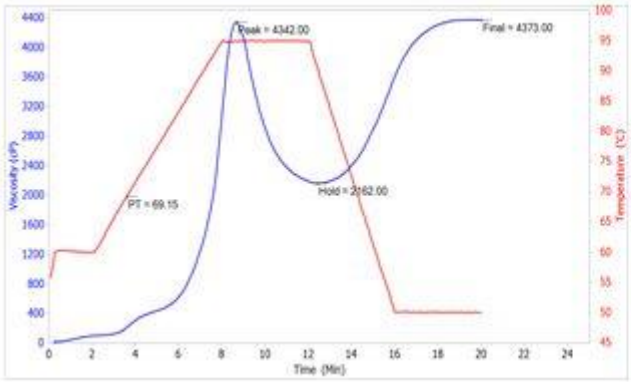
Pounding

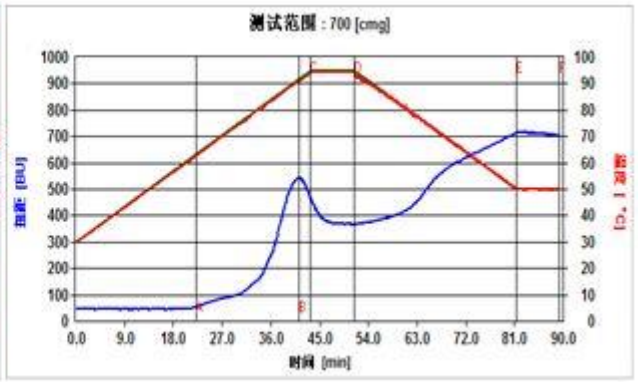
Sensory evaluation (mealiness)

Sensory evaluation

# Pasting properties

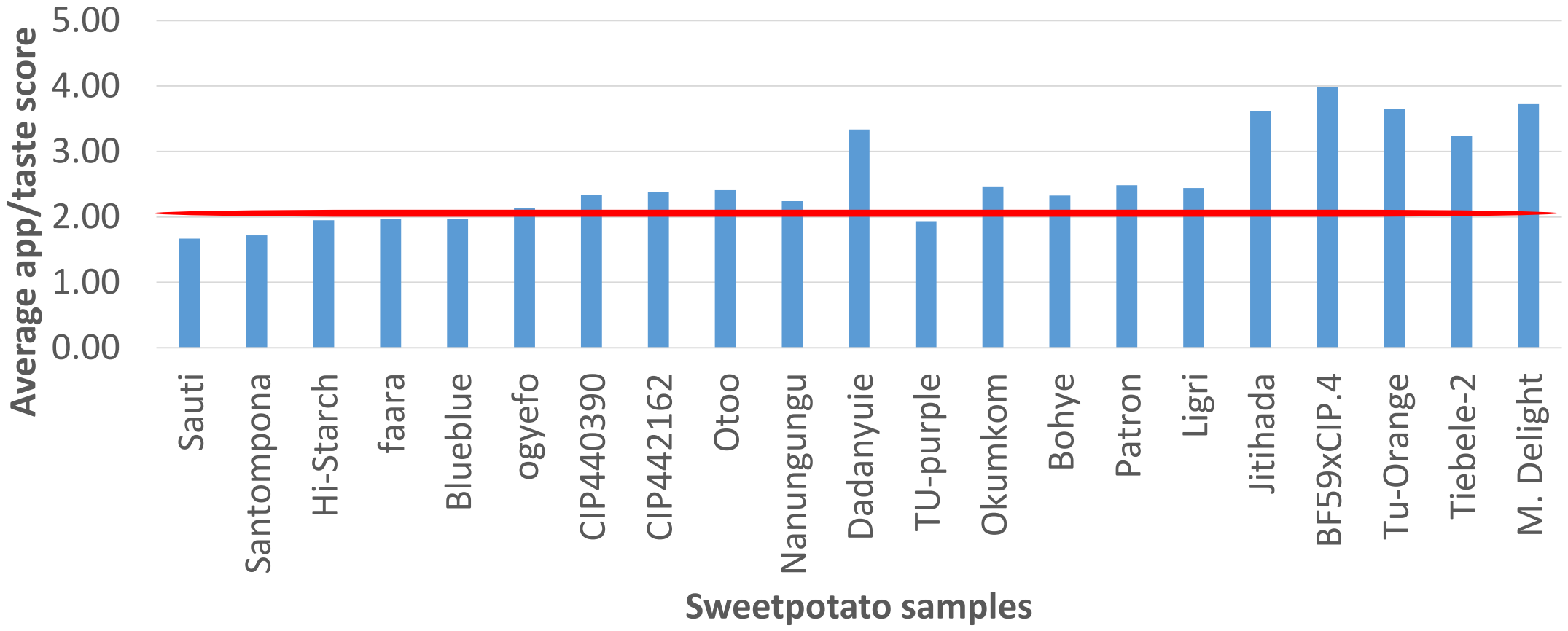
- Parten Rapid-Viscoamylograph equipment
  - Relating pasting properties with poundability
  - “Fast cooking” sweetpotatoes




# Findings from experiment

# Findings from the frying experiment

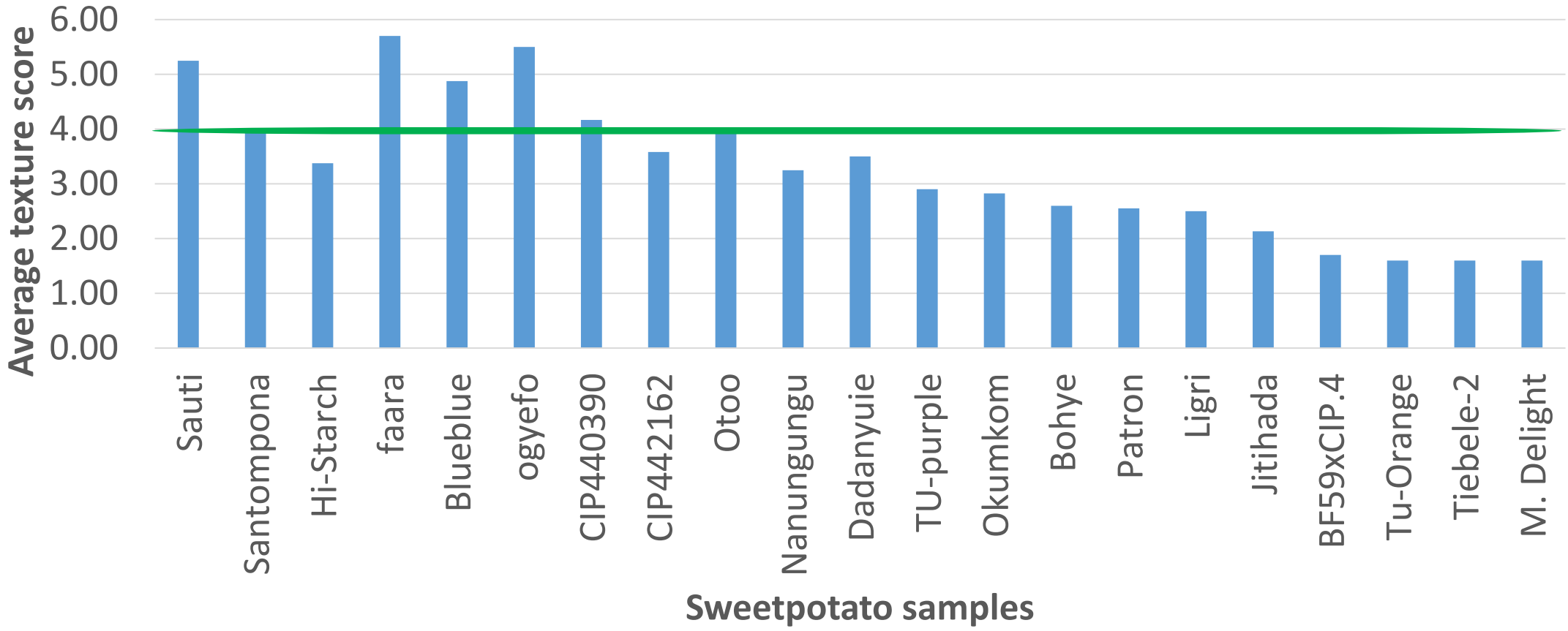



## Average Appearance/taste score: colour, caramel, starch, sogginess, oily mouthcoat and moistness

**Colour:** 1=no detection of browning, 9=dark brown (burnt)
**Sweetness**: 1=non-sweet, 9=very sweet
**Oily mouth coat**: 1=not detectable, 9=extremely detectable
**Sogginess (oiliness)**: 1=no oil detected, 9=very oily

**Moistness:** 1=dry, 9=very moist
**Caramel**: 1=no caramel sensation, 9=burnt
**Starch (rawness)**: 1=no detection of uncooked starch, 9=uncooked/floury

# Findings from the frying experiment contd…

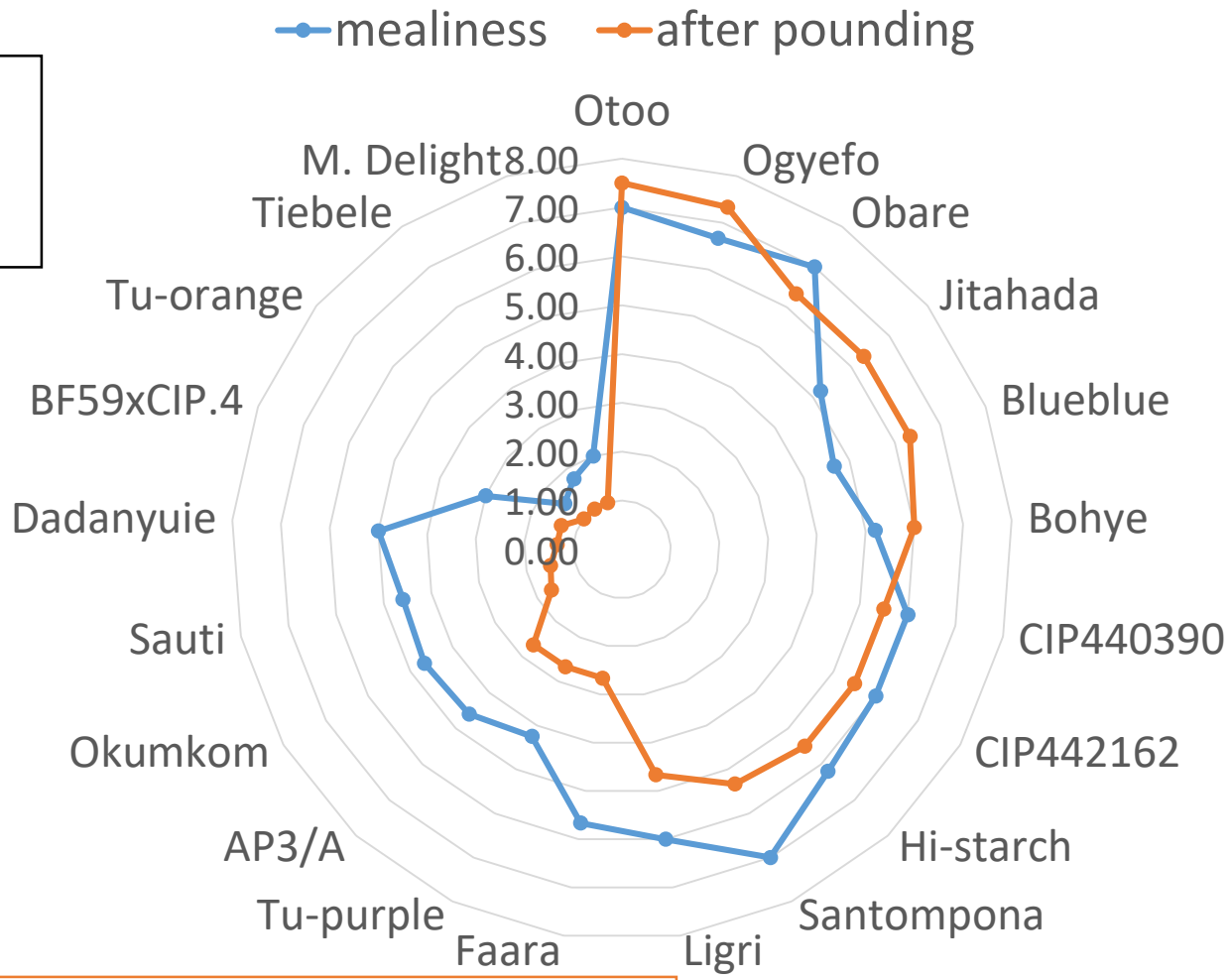



## Average texture score: crunchiness and hardness

**Crunchiness:** 1=soft, 9=very crunchy
**Hardness**: 1=soft, 9=extremely hard

# Findings from the poundability experiment

Correlation between mealiness and poundability = 0.788**




Scores of sensory evaluation were based on a 1 – 9 scale
**Mealiness**: 1=very pasty, 9=very mealy
**After pounding**: 1=not poundable, 9=very poundable

# Findings from pasting properties

- Not significant and weak correlation between pasting properties and mealiness/poundability

**Table 5: Pasting temperature and time of starches from selected roots**

| Pasting temp (°C) | Pasting time (min) |
|---|---|
| 74.18 | 6.40 |
| 78.70 | 7.00 |

# Conclusions made and way forward

- Otoo and Ogyefo were considered poundable; But we can use OFSP and other non-poundable types with cassava or yam for pounding

- Sauti, Santompona, Faara, Blueblue and Ogyefo were best out of the 21 for frying (when yam is considered ideal); But we need to recognize that OFSP fries are a hot food trend.

# Cassava *fufu* substituted with OFSP

# Conclusions made and way forward contd…

- Trying out other frying techniques – cooking may overcome genotypic limitations. So targeted breeding for specific uses needs to be considered very carefully

- And figuring out, articulating and implementing the non-sweet breeding objective is clearly a priority – Eric Dery thesis ongoing.

# Thank you