



Acceptability Thresholds: Strategies for their Evaluation

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Acceptability Thresholds: Strategies for their Evaluation

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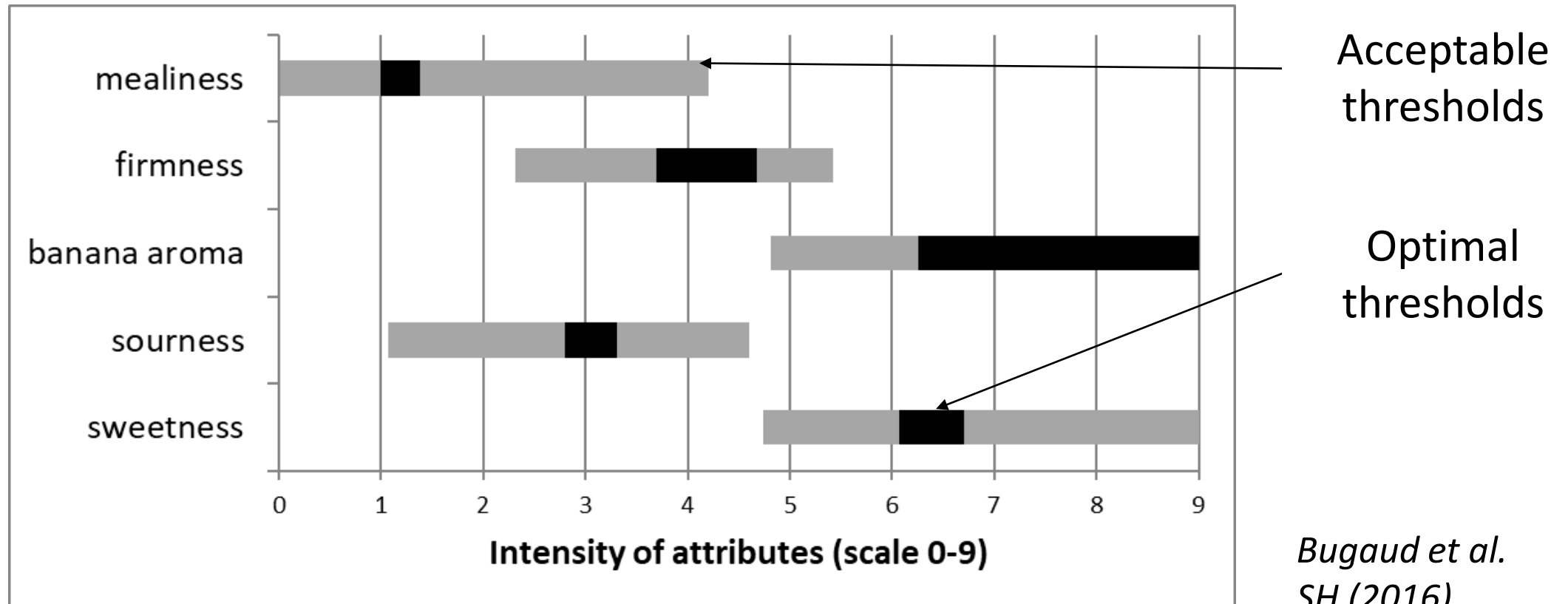
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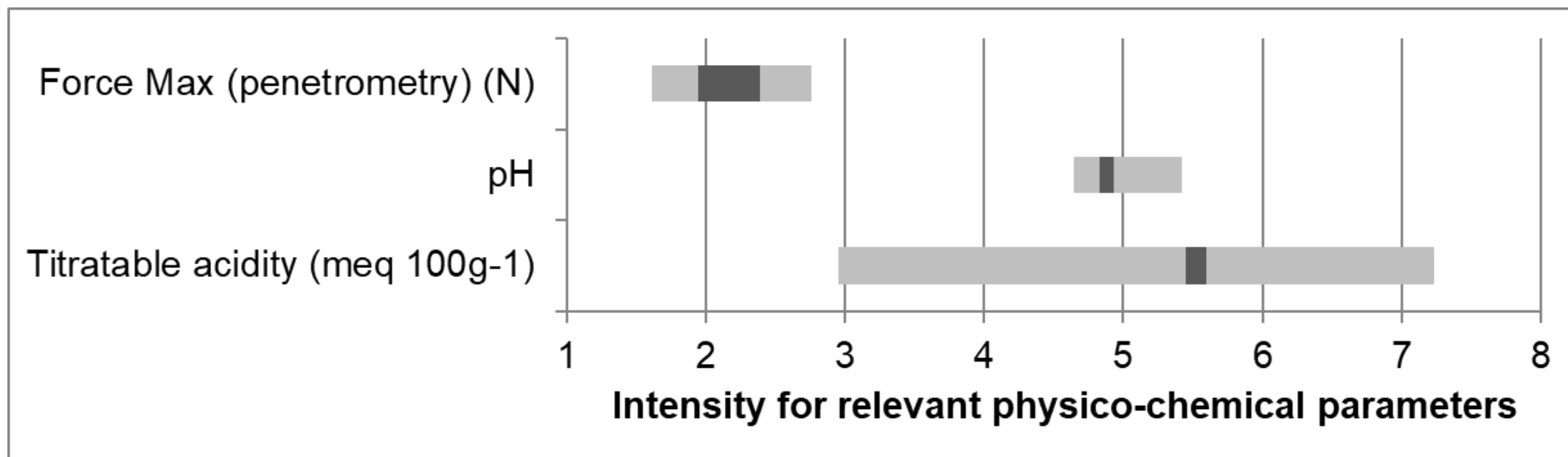
Acceptability thresholds : what is it?

Lower bound < Consumers' preference < upper bound



*Bugaud et al.
SH (2016)*

Acceptability thresholds : what is it?



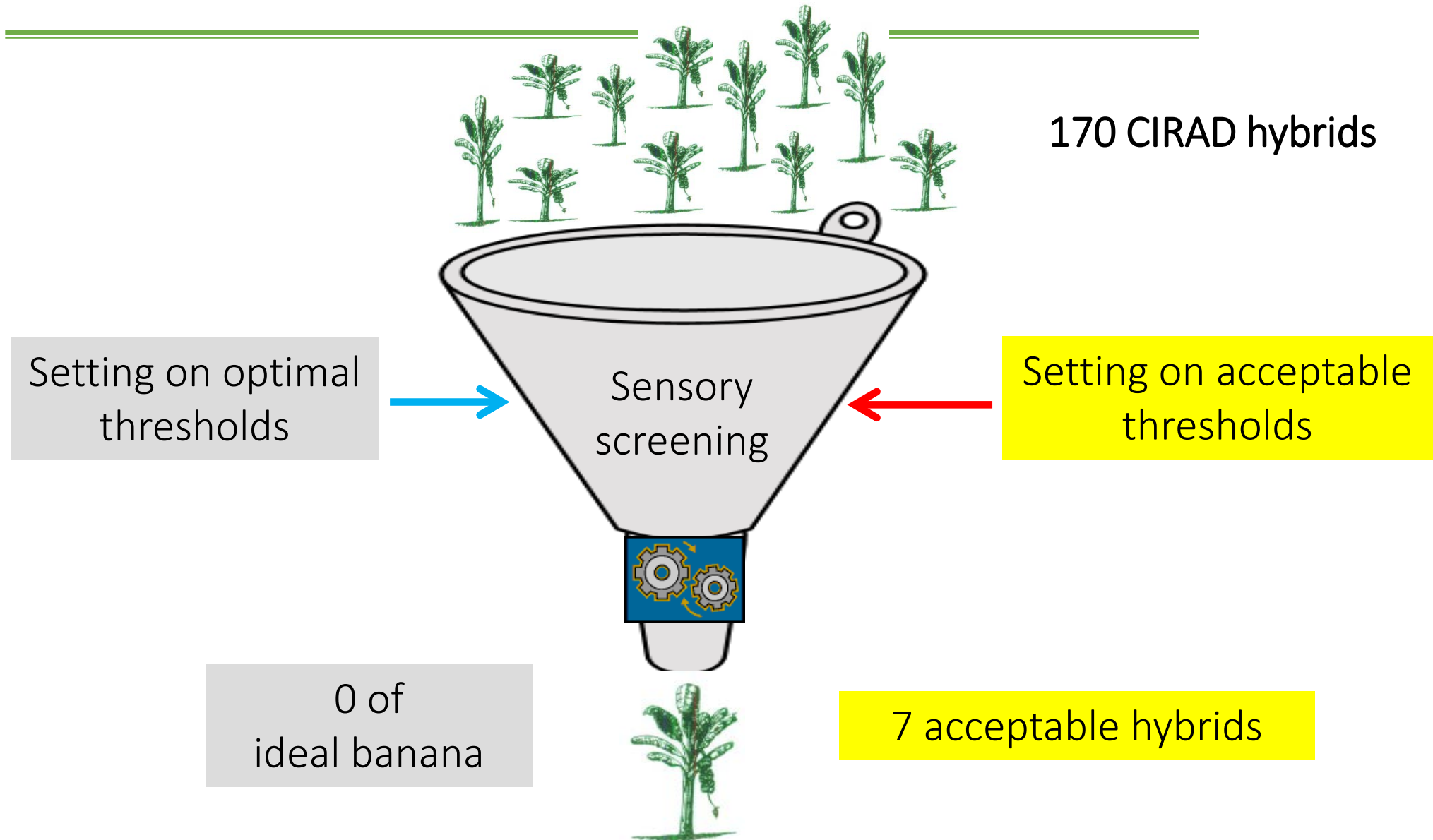
For banana dessert:

1,9 N < optimal firmness < 2,4 N

1,6 N < acceptable firmness < 2,8 N

*Bugaud et al.
SH (2016)*

Acceptability thresholds: a tool for integrating preference into breeding programs



Hedonic and descriptive analyzes useful for identifying acceptability thresholds

Hedonic analyzes (WP1): identify consumer preferences

- Overall liking (OL): preference scale 0 – 10
- JAR test: Not enough / just-about-right – too much
- CATA test: select the better attributes corresponding to the products

Descriptive analyzes (WP2): characterize sensory traits of the products

- Quantitative Descriptive Analysis (QDA) : products assessed by trained panelists on a 0 – 10 scale
- Biophysical analyzes (texture, chemical components,): instrumental measurements in raw and cooked products

How to assess acceptability thresholds?



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Optimal and acceptable levels of sweetness, sourness, firmness, mealiness and banana aroma in dessert banana (*Musa* sp.)



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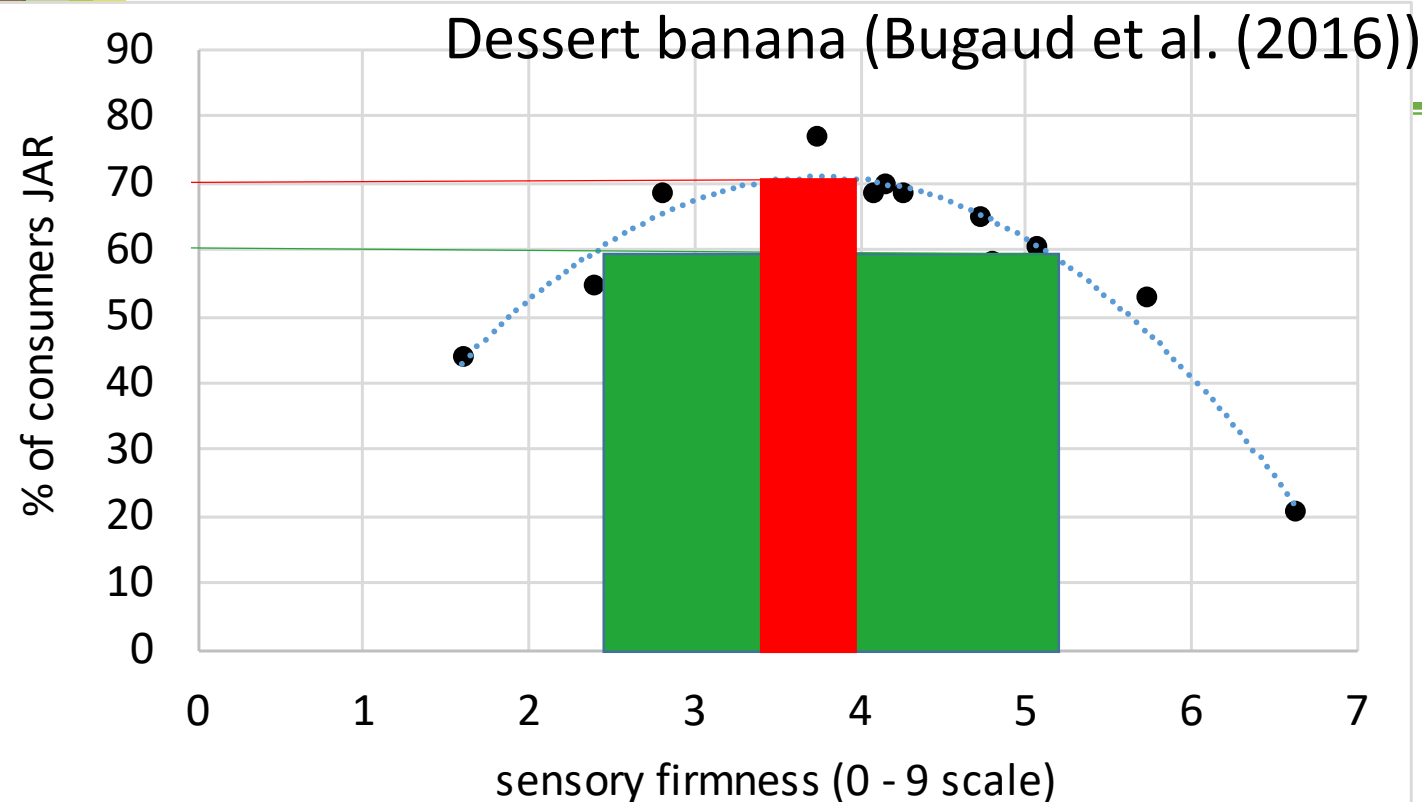
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How to assess acceptability thresholds?



- Need common attributes JAR / QDA
- Need consistent relationship between QDA or instrumental parameters (X-axis) and JAR (Y-axis) results (n>7-8 samples)
- Similar products between both tests
- % of satisfied consumers arbitrary chosen for building thresholds

Optimal thresholds (> 70% consumers satisfied): $3.5 < \text{firmness} < 4$ (on a 0-9 scale)

or $2 \text{ N} < \text{puncture force} < 2.5 \text{ N}$

Acceptable thresholds (> 60% consumers satisfied): $2.3 < \text{firmness} < 5.2$ (on a 0-9 scale)

or $1.7 \text{ N} < \text{puncture force} < 2.8 \text{ N}$

Current situation in RTBfoods project: challenges / limitations



Cultivars used for consumers tests (WP1):

- 4 to 7 cultivars assessed per product
- Cultivars assessed in different areas not all the same
- Cultivars not always contrasted in terms of acceptability
- Not systematically assessed by QDA (WP2) : often < 3
- Are the products processed under the same conditions for both tests?

Study case on RTBfoods: acceptability thresholds for sweetpotato (CIP)

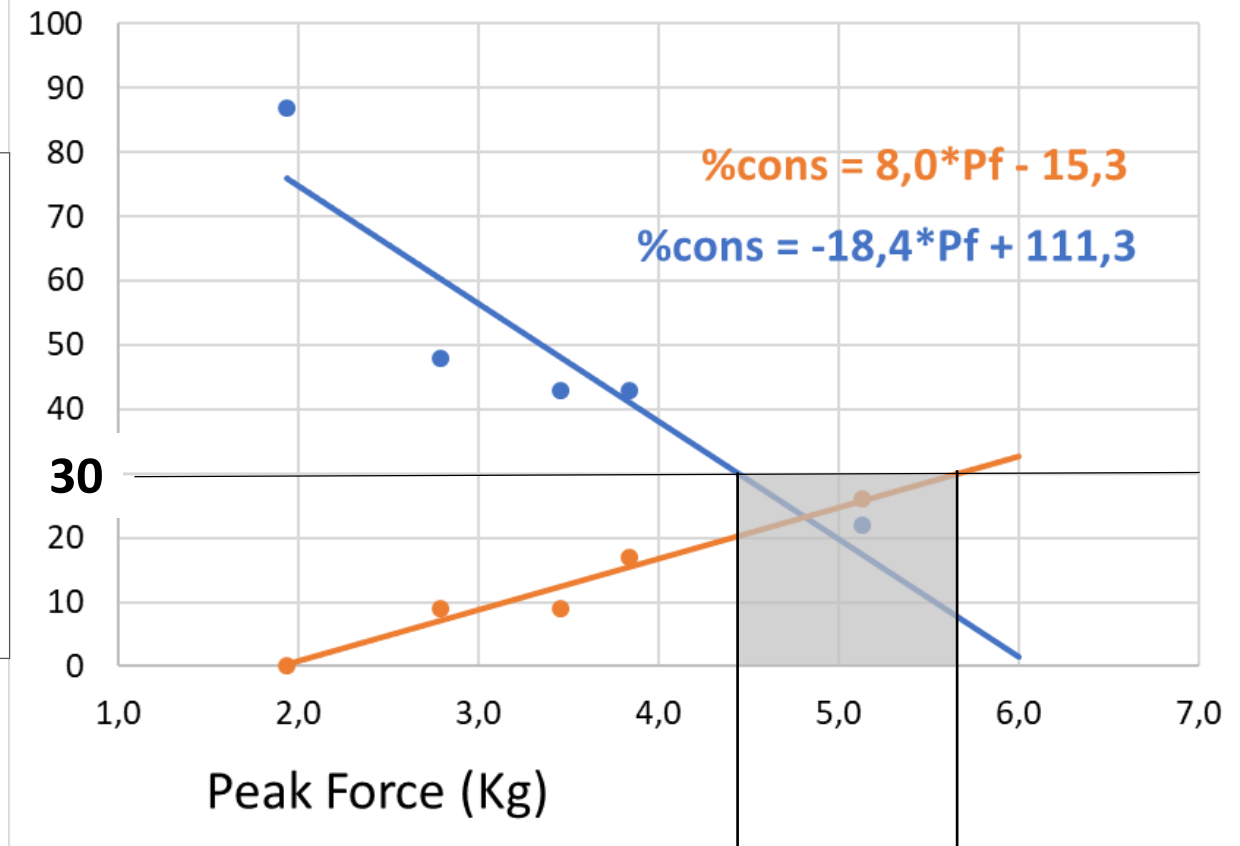


% of consumers
who judged

Not enough
hard

or

Too much hard



4,4 kg

5,6 kg

Acceptability thresholds for hardness

Implementations conditions

- JAR test with 23 consumers
- Only 5 samples but quite contrasted
- JAR and instrumental texture on the same products
- % of insatisfied consumers arbitrary fixed at 30%

Study case on RTBfoods: acceptability thresholds for boiled yam (UAC/FSA)



	QDA white colour	CATA white colour	not enough	JAR	too much
Laboko	6,3	116	2	97	1
Gnidou	4,0	76	2	72	26
Kpètè	3,1	2	1	9	90

Acceptable white colour > 6,0

	QDA sticky	CATA sticky in hand	not enough	JAR	too much
Laboko	8,7	191	4	82	14
Gnidou	2,6	45	8	89	2
Kpètè	2,2	65	21	63	17

No acceptable stickiness found

	QDA hard to break	CATA easy to break	not enough	JAR	too much
Laboko	2,6	266	4	92	4
Gnidou	6,5	224	6	67	27
Kpètè	4,8	53	8	16	76

No acceptable hardness found with QDA

But acceptable hardness found with CATA

Recommendations:

- Relationships between QDA and JAR results need to be consistent
- Increase the number of products (> 3)
- Possibility to use CATA results instead QDA but difficult to convert into unit usable by breeders

Study case on RTBfoods: acceptability thresholds for Matooke (NARL)



	KIBUZI	Narita 2	Narita 21	
Consumer test (WP1)				
Overall liking (0-10)	7,7	4,7	2,0	
QDA test (WP2)				R
Sensory attributes (0-10 scale)				OL / QDA
Yellow	8,8	5,8	6,4	0,59
Homogeneity of colour	9,3	6,4	8,3	0,14
Firmness M	1,7	7,3	4,3	0,25
Moisture M	7,7	3,3	6,0	0,16
Smoothness M	8,8	3,6	6,3	0,26
hardness T	1,6	7,8	4,7	0,28
Moldability T	8,9	2,5	7,3	0,07
Stickiness T	5,3	2,9	5,6	0,00
Sweetness	4,2	2,5	2,7	0,68
Astringency	1,4	1,0	1,8	0,17
Matooke aroma	7,8	4,5	5,8	0,39
DMC (Raw)	22,8	28,0	22,1	0,01
Hardness (N)	2,3	4,4	1,6	0,04

Links between OL and QDA

- Yellow and sweetness correlated with OL (but $p > 0,05$)
- Acceptable yellow ~ 8/9
- Acceptable sweetness ~ 4

Recommendations:

- Relationships between QDA and OL results need to be consistent
- Increase the number of samples (> 3)
- More difficult to set lower and upper bounds

What we should do now for assessing acceptability thresholds?



- ☐ Focus on the Priority Quality Traits (PQT): less than 4/5
- ☐ Minimum 7 common cultivars which are contrasted in terms of PQT
- ☐ Using the same raw material and processes for hedonic (JAR) and descriptive (QDA, biophysical) tests
- ☐ JAR test only on PQT, minimum 100 consumers in one location
- ☐ QDA only on PQT + biophysical parameters if correlated with sensory traits

Conclusions:

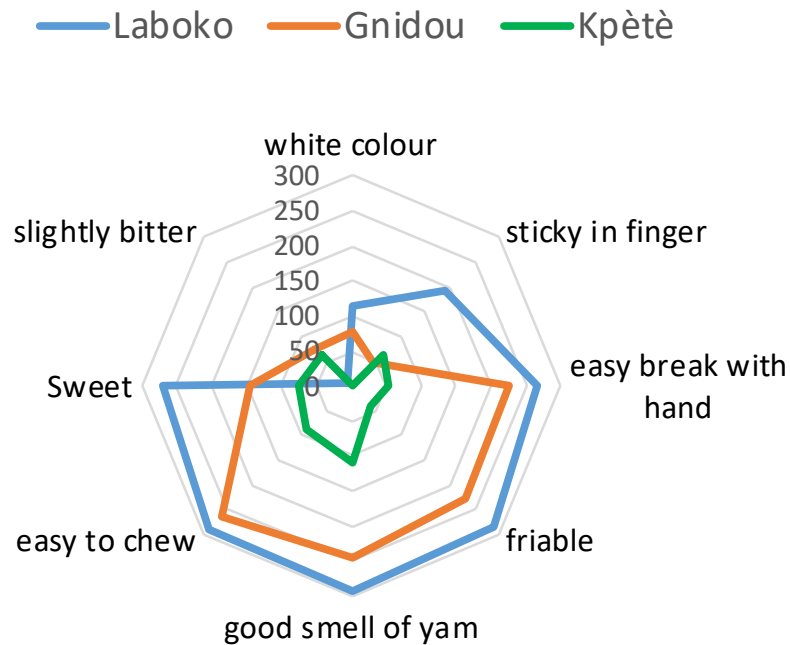
- The best method for identifying Acceptability Thresholds: linking JAR and descriptive tests
- The building or validation of these acceptability thresholds will be done in WP5
- The acceptability thresholds for some attributes could be difficult to identify

Thank you

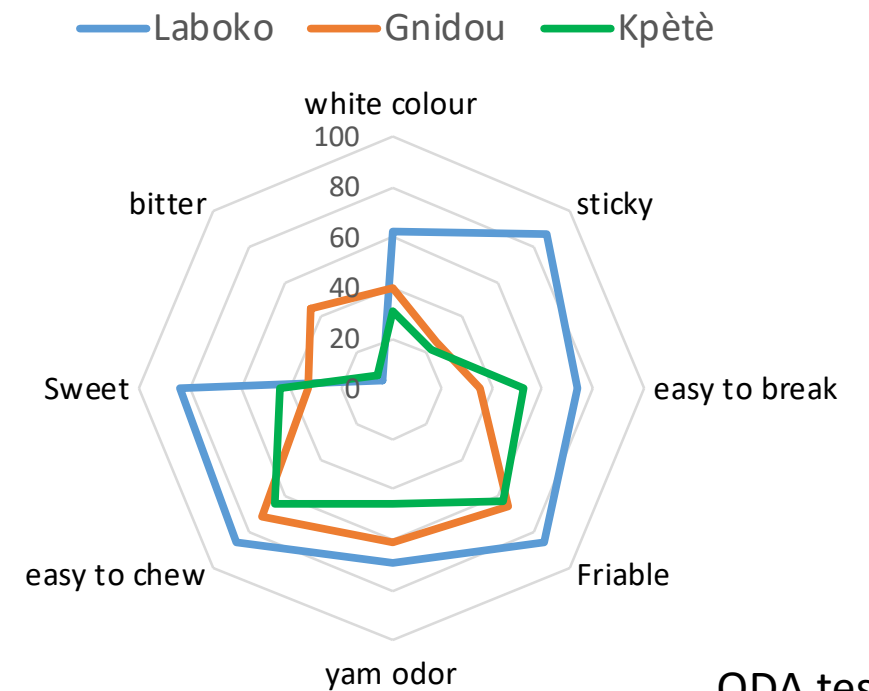
Merci

How to be sure that samples used for consumer and descriptive tests are sensorially similar?

Compare results of CATA tests and QDA : boiled yam (UAC-FSA)



CATA test



QDA test

Similar radar charts between CATA and QDA tests for each cultivar: we can link results between them.

Possibility to compare biophysical characteristics on the products used for consumers and descriptive tests

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