RTBfoods Step 5: Finalisation of the Food Product Profile

Understanding the Drivers of Trait Preferences and the Development of Multi-user RTB Product Profiles, WP1

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This report has been written in the framework of RTBfoods project.

Ethics: The activities, which led to the production of this document, were assessed and approved by the CIRAD Ethics Committee (H2020 ethics self-assessment procedure). When relevant, samples were prepared according to good hygiene and manufacturing practices. When external participants were involved in an activity, they were priorly informed about the objective of the activity and explained that their participation was entirely voluntary, that they could stop the interview at any point and that their responses would be anonymous and securely stored by the research team for research purposes. Written consent (signature) was systematically sought from sensory panelists and from consumers participating in activities.

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CONTENTS

Table of Contents

List of tables

ABSTRACT

The objective of WP1 is to identify quality characteristics of RTB products for different user groups using robust, participatory, and interdisciplinary methods. This is achieved through a 5-step qualitative and quantitative methodology that cumulates in the WP1 Gendered Food Product Profile (FPP) (step 5) (Forsythe et al., 2022 DOI: doi.org/10.1111/ijfs.14680). The FPP is essentially a description of a high-quality food product from an evolving list of sensory, processing and agronomic characteristics.

As each step involves different research participants, methods, and research designs, the data cannot be aggregated quantitatively in an FPP at the sub-national level. Therefore, a subjective, qualitative interpretation of the data is required. For this reason, this document was developed to provide broad guidance on how to synthesize the key data relevant to the FPP, analyse the data through comparative analysis, and interpret the data, in the context of the project's development objectives, to develop the FPP. An overview of the FPP method is as follows: 1: Prepare the evidence; 2: Convene a multidisciplinary 'design team' meeting; 3: Apply the adapted G+ tool, and 4: Finalise the WP1 Food Product Profile.

The WP1 Gendered FPP method was developed by the FPP working group and was informed by Demand-Led Breeding, G+ Product Profile Tool, along with the RTBfoods Advisory Committee and Gender Working Group. Following WP1's development of the FPP, it will be refined by other RTBfoods WPs, most immediately by WP2.

Key Words: product profile, crop breeding, gender, quality characteristics, consumer studies, roots, tubers and bananas

1 INTRODUCTION

The objective of WP1 is to identify quality characteristics of RTB products for different user groups using robust, participatory, and interdisciplinary methods. This is achieved through a 5-step qualitative and quantitative methodology that cumulates in the WP1 Food Product Profile (FPP) (step 5). The FPP is essentially a description of a high-quality food product from an evolving list of sensory, processing and agronomic characteristics. The FPP is focused on the product in a specific sub-national region, for example, gari in South-East Nigeria as opposed to gari for West Africa,

As each step involves different research participants, methods, and research designs, the data cannot be aggregated quantitatively in an FPP. Therefore, a subjective, qualitative interpretation of the data is required. For this reason, this document was developed to provide broad guidance on how to 1) synthesize the key data relevant to the FPP, 2) analyse the data through comparative analysis, and 3) interpret the data, in the context of the project's development objectives, to develop the FPP.

Importantly, as the FPP reflects people's preferences, and those preferences may differ among the population, clear justification for decisions should be reflected in the FPP.

> *"When breeders prioritise traits to be included in a product, this involves making a choice about whose preferences take priority. A choice about a trait is also a choice about people"* (Ashby and Polar, 2021)

The WP1 FPP method was developed by the FPP working group and was informed by Demand-Led Breeding, G+ Product Profiles, along with the RTBfoods Advisory Committee and Gender Working Group. Following WP1's development of the FPP, it will be refined by other RTBfoods WPs, most immediately by WP2.

2 OVERVIEW OF THE FPP METHOD

Within the WP1 team, establish a FPP lead who will coordinate the following activities:

1: Prepare the evidence (1.5 days) in a report of summarised key data (copied/pasted) from each step (specified below), triangulate findings and complete the template.

2: Convene a multidisciplinary 'design team' meeting (1 day): with the WP1 research team, WP2 food scientists and breeders at the partner level, and agree on a first version of the FPP by updating the template.

3: Apply the Gender and livelihoods assessment (1 day): a social scientist trained in gender analysis should review the FPP with this tool to ensure positive gender impact.

4: Finalise the WP1 Food Product Profile (.25 day): using the results from the Gender and Livelihoods assessment, a smaller team finalise the FPP in an updated template and send to WP1 Coordinator for any required inputs from the Coordination Team.

3 PREPARE THE EVIDENCE

Extract or summarise relevant data from WP1 activities into an evidence report.

Section 1 - State of Knowledge review (step 1)

- agronomic, processing and sensory characteristics for the crop and product and their importance –*including disaggregated by gender and region*
- include any data and/or commentary on:
  - o importance of characteristics by gender, region or other social segments (e.g. ethnicity, wealth category), such as citations and rankings

- characteristics important for the quality of other food products or by products that are important for women, or another social segment
- characteristics that positively or negatively impact on women's drudgery (e.g. branching that impacts on weeding, rettability, cooking and sieving time)
- characteristics that may impact on a major activity for production, use or marketing which women rely on for their use (e.g. a reduction in peeling time could negatively impact women' paid to peel cassava)
- characteristics that positively or negatively impact on the quality and quantity of the product that would affect women's income from the sale of the product (e.g. taste, produce yield)
- characteristics that would positively or negatively impact on the use of resources (e.g. firewood), particularly on inputs with access constraints for women (including time)

Note any issues with the research design that may be important for interpreting the results (e.g. the coverage of region, rural/urban, producers/processors/ consumers, gender).

Section 2: Gender food mapping (step 2)

Include the first draft of the profile by gender and region already prepared by your team, which includes:

- important agronomic, processing and sensory 'high' and 'low' quality characteristics - a longer list - beyond the top five!
- indicators (how the characteristic is described e.g. how sour) and
- priority from ranking and/or citation
- varieties that are considered good and inferior
- comment on where the information is from (e.g. FGDs, II, sample size).
- include any data and/or commentary on:
  - importance of characteristics by gender, region or other social segments (e.g. ethnicity, wealth category), such as citations and rankings
  - characteristics important for the quality of other food products or by products that are important for women, or another social segment
  - characteristics that positively or negatively impact on women's drudgery (e.g. branching that impacts on weeding, rettability, cooking and sieving time)
  - characteristics that may impact on a major activity for production, use or marketing which women rely on for their use (e.g. a reduction in peeling time could negatively impact women' paid to peel cassava)
  - characteristics that positively or negatively impact on the quality and quantity of the product that would affect women's income from the sale of the product (e.g. taste, produce yield)
  - characteristics that would positively or negatively impact on the use of resources (e.g. firewood), particularly on inputs with access constraints for women (including time)

Section 3: Processing demonstrations and diagnostics (step 3)

- characteristics of the raw material important for high and low quality product (% citations)
- good and inferior varieties
- processing diagnostic measurements taken during the demonstration (e.g. yield, processing time, cooking time, etc)
- end product characteristics, high and low quality
- include any data and/or commentary on:
  - importance of characteristics by gender, region or other social segments (e.g. ethnicity, wealth category), such as citations and rankings
  - characteristics important for the quality of other food products or by products that are important for women, or another social segment
  - characteristics that positively or negatively impact on women's drudgery (e.g. branching that impacts on weeding, rettability, cooking and sieving time)

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- o characteristics that positively or negatively impact on the quality and quantity of the product that would affect women's income from the sale of the product (e.g. taste, produce yield)
- o characteristics that would positively or negatively impact on the use of resources (e.g. firewood), particularly on inputs with access constraints for women (including time)

Section 4: Consumer testing in rural and urban areas (step 4)

- List prioritised high quality characteristics based on the total citations (1= most important)
- List poor quality characteristics
- Using a Chi-square test, we can determine whether socioeconomic characteristics have a significant influencing on consumer liking (liking cluster), such as gender, location, PPI (poverty probability index), urban or rural consumers, education, frequency of consumption etc
- include tables by gender and region if statistically significant differences, if there are no significant differences please state
- information on varieties used to create maximal contrast between the food products

Section 5: Triangulation and summary table

- Contrast and compare the characteristics (agronomic, processing and sensory characteristics) from the different steps. Below is an example.
- Note where characteristics were more or less important by gender, region or another socio-demographic factor.

Table 1 An example from boiled yam in Benin (Adinsi and Akissoe, FSA-UAC)

High quality characteristics	Step 1 SoK	Step 2 Gendered food mapping	Step 3 Processing demonstrations
Processing	Ease to peel	Easy to peel	Thin or thick skin
	No oxidation during peeling	Thin peel	Skin does not stick to the flesh
	No change of colour druring peeling	Easy to slice with knife	Easy to peel with knife
	Tuber sticks to the fingers	Keep white or yellow colour	Keeping white or yellow flesh colour
	Firm parenchyma but not too hard	Friable/easy to break with fork (cooking)	No stickiness flesh to hand (low water content)
	Ease to slice	Cooking water consistency	Easy to break with knife
	Importance/amount of starch that sticks to the knife	Stickiness	No viscous washing water
	White to milky of water	Good odour of yam at end of cooking	Rough interior surface
	Cooking duration (low - middle)		Crumbly/easy to break with fork (cooking)
	Water absoprtion capacity (low-middle)		Good odour of yam at end of cooking
			Viscous cooking water

Create a rough draft WP1 Food Product Profile of a long list of characteristics (not only the top five!) using the template (appendix A).

In this draft version of the template, use the cells in the Profile table, or additional spaces, to include notes that will assist in decisions around prioritisation for example, in column G information on which steps that the characteristic was cited in, and were they prioritised using participatory rankings in step 2 or CATA scores in step 4.

**Ensure to indicate characteristics that are important or harmful to different social groups, and that affect drudgery, income generation, household food security, and resource sustainability.

Please circulate the evidence report to the WP1 Coordinator for quick feedback from the coordination team.

4 CONVENE A MULTIDISCIPLINARY 'DESIGN TEAM' TO AGREE ON THE PROFILE

The FPP Lead should convene a 'Design Team' to finalise the WP1 FFP. The design team will consist of a multidisciplinary expert panel who will review of the evidence report and update the template based on their discussion (Appendix A for template).

The design team should include the WP1 research team (food scientist, gender specialist and economist), WP2 and breeders (WP4) at the partner level. Other people from the WP1 or WP2 Coordination team or product champions can be invited if desired.

Once established circulate the evidence report and schedule a meeting to review the report and completed template, and agree on the next draft of the FPP in an updated template and indicate priorities for WP2.

Please keep all versions of the template so the change in the profiles can be tracked based on discussions.

The FPP lead should coordinate the social scientist (with others) to complete the gender and livelihoods assessment.

5 APPLY THE GENDER AND LIVELIHOODS ASSESSMENT

The Gender and Livelihoods assessment includes an examination of each characteristic included in the FPP for its gender and livelihoods impact and should determine if a characteristic is to be included and/or prioritised in the final FPP.

The assessment should be undertaken by a social scientist who is trained in gender analysis, ideally in conversation with a breeder and/or food scientist (i.e. a smaller group of the Design Team).

The guidance is provided in a separate document and is based on the G+ tools, which is accepted as global best practice for gender.

6 FINALISE THE WP1 FOOD PRODUCT PROFILE

Given the results of the Gender and Livelihoods Assessment, the finalisation of the FPP in an updated version of the template is to be agreed by only 1-3 people in the design team – a gender/socio-economist, food scientist and breeder.

Please ensure to include justification of the characteristics and their priority, linking the data from the different steps.

Share completed templates to the WP1 Coordinator for comments from the WP1 Coordination team, among others if preferred.

Following the completion of the Final FPP, it would also be insightful to present the table to farmer and processor representatives, and other experts such as agronomists, public health/nutritionists, gender specialists, climate change specialist, plant pathologists, entomologists.

7 APPENDICES

7.1 Annex A: RTBfoods WP1 food product profile template

1. Food Product Profile description	
Food Product Profile name	
County and geographical region(s)	
Date	
Draft version or final (please retain all copies)	

2. Food Product Profile design team members, indicate food product profile lead in the top row		
Person	Area of Expertise	Institution

3. Food Product Profile context	
Type of processing for the product (household-local, processing centre-local, industrial etc.)	
Alternative crop uses (fresh root sale, processed products)	
Consumer segments for the product 2–3 sentences on the consumer segments along the value chain that is relatively homogenous in their preferences, on which the completion of this document is based	
Market scale	

4. WP1 Food Product Profile

A	B	C	D	E	F	G	H	I	J	K
Characteristic category	High quality characteristics	Indicator of characteristic	Driver(s)	Customer group(s)	Preference group(s)	Priority	Gender impact scores (G+ tools)		Good, high quality varieties	Evidence
							Do no harm Score	*Positive benefits*		
1. Raw material characteristics (*agronomic, post-harvest*)										
2 Processing characteristics *of raw material for the product quality during processing (technological, physicochemical)*										
3 Characteristics of raw final product (to look at, touch, smell, taste, texture in mouth)										
4 Characteristics of cooked/ready to eat final product (to look at, touch, smell, taste, texture in mouth)										

Legend for the WP1 Food Product Profile		
A	**Category**	Characteristics category as explained
B	**High quality characteristics**	Characteristics that give a good, high quality product
C	**Indicator of characteristic**	How respondents assess (evaluate, feel) the characteristic
D	**Driver** (DlB)	Reason why the characteristic is important. It is likely to be different for different actors and may include: • Productivity – food and feed; • Fodder/forage – biomass of crop; • Crop management and harvesting; • Durability and cost; • Raw material quality specification; • Processability; • Processing quality specification; • consumption quality specification; • Market value and price*; • Post-harvest storage; • Sales and profit • Scalability and cost; • Variety identification** *Examples include: early harvest ahead of the main season where there is high customer demand but low supply, which results in higher prices for the farmer; higher grain density in cases where the farmer is paid based on grain weight rather than sack volume. ** (i) breeders can identify their varieties in the field and in markets and (ii) get better estimations for farmer adoption rather than relying on the memories of purchasers about the variety they bought; seed distributors will benefit from easy authentication of seed variety integrity and be able to identify piracy; retailers and consumers will know the variety advertised is the variety they are paying for. This is particularly relevant when varieties contain winning traits that justify higher prices, in that purchasers know what they are buying is what they are paying for.
E	**Customer** (DlB)	Value chain actor(s) who cited the characteristic - These are the people that the variety has been specifically designed to serve and may include one or more of the following: • Farmer • Transporter • Processor • Retailer • Consumer • Material producer • Seed distributors
F	**Preference group** (DlB)	A preference group is a subset of customer groups that the characteristic is very important for – a deal breaker. This could be supported by qualitative evidence of its vital importance, such as labour reduction, or there may be a <u>high citation and/or rank and/or high CATA scores.</u> Women (W) –preferred by women; Men (M) –preferred by men; Youth (Y) –preference by men and women under the age of 30; W+M+Y (All) – for all users
G	**Priority** (DlB) **1. "must have" 2. Niche opportunity 3. Added-value 4. Winning trait**	*Draft version:* include notes on the number of steps the characteristic was mentioned in; citations and rankings where applicable *Final version* to state one of the following: ***Essential/"must-have" trait:*** These traits are considered a prerequisite in variety design to ensure the variety will be used. Sometimes the traits are referred to as "must-have" traits. This may be because all popular varieties contain this trait and it is expected within the market, or it is an imperative of national release committees for variety approval. <u>This can be considered by the level of citation of the characteristic compared to others, along with high gender and livelihoods impact.</u> ***Niche opportunity trait:*** These are traits that provide a superior technical benefit for users over existing varieties and may command a price premium. However, the scale of users and market demand is likely to be limited due to the market being specialised or limited in some way, e.g. malting barley. ***Added-value trait:*** This is a trait that provides a special market quality over what is offered by alternative existing varieties. It provides additional value to either farmers or their buyers in the value chain. The trait provides recognized technical differentiation from what is currently available, e.g. production or processing benefits that have a monetary value. An added-value trait would enable a new variety to gain market share from existing varieties and may command a small price premium. ***Winning trait:*** A winning trait has similarities to an added-value trait in that it creates additional value. However, the value is significantly higher and provides more substantial economic or social benefit. A winning trait is one which enables a variety to be highly differentiated from alternative varieties. In most cases it would be expected to create high demand and take major market share from existing varieties. The significant value offered means that buyers are more likely to pay higher prices for the seeds or

		Legend for the WP1 Food Product Profile	
		crop produce. Winning traits are not discovered often and usually bring innovation. Their uniqueness may catalyse the emergence of new markets. A historical example is the semi-dwarf trait in wheat and rice that catalysed the Green Revolution. Seed for these varieties became highly sought after and new varieties commanded a distinctly higher price.	
H	**Gender impact: Do no harm** (Gender and Livelihoods assessment – adapted from G+ tools)	"Do no harm" analysis. An analysis of the possible harm that introducing a new trait might cause to women or any social category of customers identified for the analysis. The "do no harm" analysis is designed to minimize the risk of releasing a variety that could increase gender inequity. *See Annex II G+ tools*	
I	**Gender impact: Positive benefits** (Gender and Livelihoods assessment – adapted from G+ tools)	Positive benefit analysis. An analysis of the likelihood that a new trait will be beneficial to women and men or another social category of customer defined for the analysis. *See Annex II G+ tools*	
J	**Good, high quality varieties**	Scientific and local names of high quality varieties associated with the characteristic and product	
K	**Evidence**	Refer to the RTBfoods step (formerly referred to as activity) and method that the information was gathered from. E.g. Focus group discussions Step 2 (activity 3) report.	

Source: Adapted from Demand Led Breeding guidance:
https://www.demandledbreeding.org/sites/g/files/zhg1501/f/2020/08/16/_product_profile_guide_a4.pdf

5. Important diagnostic and measurement information	

6. Characteristics and varieties to avoid	
Characteristics to <u>strongly</u> avoid and why	
Poor quality characteristics to avoid	
Inferior varieties	

7. Justification	
Changes made as a result of the Gender and Livelihoods Assessment	
Key considerations and issues identified in the development of the food product profile	

8. Target crop producers and production system (WP1 may not have all information, please complete with crop breeders where possible)	
Number of farmers (min-max range)	
Production system	
Area of production system	
Growth habit	
Expected level of inputs: low, medium, high	
Typical yield range of target system	
Cropping system	
Mechanisation	
Agroecological zone(s)	
Total seed or vegetative propagation material market	

7.2 Annex B: Relevant data from each of the steps in the methodology.

Table 2 WP1 Methodology and relevant data for the WP1 Food Product Profile

Data	Step 1 State of Knowledge	Step 2 Gendered food mapping	Step 3 Processing demonstrations	Step 4 Consumer testing
Method	Key informant interviews & Lit review	Individual interviews ~80, FGD, KII	Demonstrations with processors with +/- varieties	Tasting products from +/- varieties
Agronomic characteristics (+/-)	X	X	X	
Processing characteristics (+/-)	X	X		
Sensory characteristics (+/-)	X	X	X	
Characteristics prioritisation		X		X CATA
Indicators		X	X	
Varieties (+/-)		X	X	X
Other		Contextual information	Diagnostic measurements	
Gender & Livelihood	?	X Disaggregated data – gender, region	X	X Disaggregated data – gender, region

* +/- high and poor quality

7.3 Annex C: Checklist of important data to consider for the RTBfoods WP1 food product profile

		Gender and Livelihoods checks (informed by G+ tools)
State of Knowledge data	☐ Important high and low quality agronomic, processing and sensory characteristics for crop and product ☐ Note any issues with the research design important for interpreting the results	☐ The importance of characteristics by gender, region or other social segments (e.g. ethnicity, wealth category), such as citations and rankings of characteristics
Gendered Food Mapping data	☐ Important high and low quality agronomic, processing and sensory characteristics for crop and product by gender and region ☐ Indicators of the characteristic – e.g. how is sour described, what is the 'right' amount of sour ☐ Priority of the characteristics from participatory ranking and/or citation – please ensure this is specified ☐ Varieties that are considered good and inferior ☐ Reference to what method the information is from (e.g. FGDs, II, sample size).	☐ Characteristics important for the quality of other food products or by products that are important for women, or another social segment ☐ Characteristics that positively or negatively impact on women's drudgery (e.g. branching that impacts on weeding, rettability, cooking and sieving time) ☐ Characteristics that may impact on a major activity for production, use or marketing that women rely on for their use (e.g. a reduction in peeling time could negatively impact women' paid to peel cassava)
Processing demonstrations data	☐ Characteristics of the raw material important for high and low quality product ☐ Good and inferior varieties ☐ Processing diagnostic measurements taken during the demonstration (e.g. yield, processing time, cooking time, etc) ☐ End product characteristics, high and low quality	☐ Characteristics that positively or negatively impact on the quality and quantity of the product that would affect women's income from the sale of the product (e.g. taste, produce yield) ☐ Characteristics that would positively or negatively impact on the use of resources (e.g. firewood), particularly on inputs with access constraints for women (including time)
Consumer testing data	☐ CATA scores for high and low quality characteristics, by gender and region if significant differences are found ☐ Information on varieties ☐ The clusters and correlations to characteristics such as gender, region, urban or rural etc.	

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