



From consumer to product innovation : Which process for a more successful innovation?

Maitre Isabelle, Pierre Picouet, Chloé Thomas, Ronan Symoneaux



Around 30 collaborators : 22 permanent – 12 non permanent (6 PhD stdt – 4 Post doc)

Fresh and Processed Fruit and Veg, Wine and Cider Products

Physico Chemical, Nutritional, Functional, Sensorial and Environmental Quality

Methods and multicriteria
evaluation of food systems
with differentiated quality

Co-design of products
in relation to technical and
technological itineraries and their
environmental performance





80% of new products are not launched on the food market

(Maison et al., 2016)

40–50% of new product introductions are out of retailers' shelves within a year

(Ernst & Young Global Client Consulting, 1999)

Imitative (“Me-too”) products launched in Europe fail 18% more often than line extensions and about 24% more than truly new products

(Ernst & Young Global Client Consulting, 1999)

Consumer Led Developpement is a key of success for innovation

(Costa et al., 2006, O’Sullivan, 2016)

80% french food company = technology push

(Weill & Broyé, 2014, 1^{er} baromètre innovation)

**both technical knowledge
and market information
are necessary to run effective
product development processes**



STRENGTHS

High nutritional qualities

The richest fruit in vitamin C
Rich in iron, fiber
Rich in antioxidants (including Vit C)

High functionality

Strong aromatic power
Strong coloring power

Many possible food applications

2 x kiwi
4 x orange



WEAKNESSES

Berry not very present on the market

Sensorial specificity

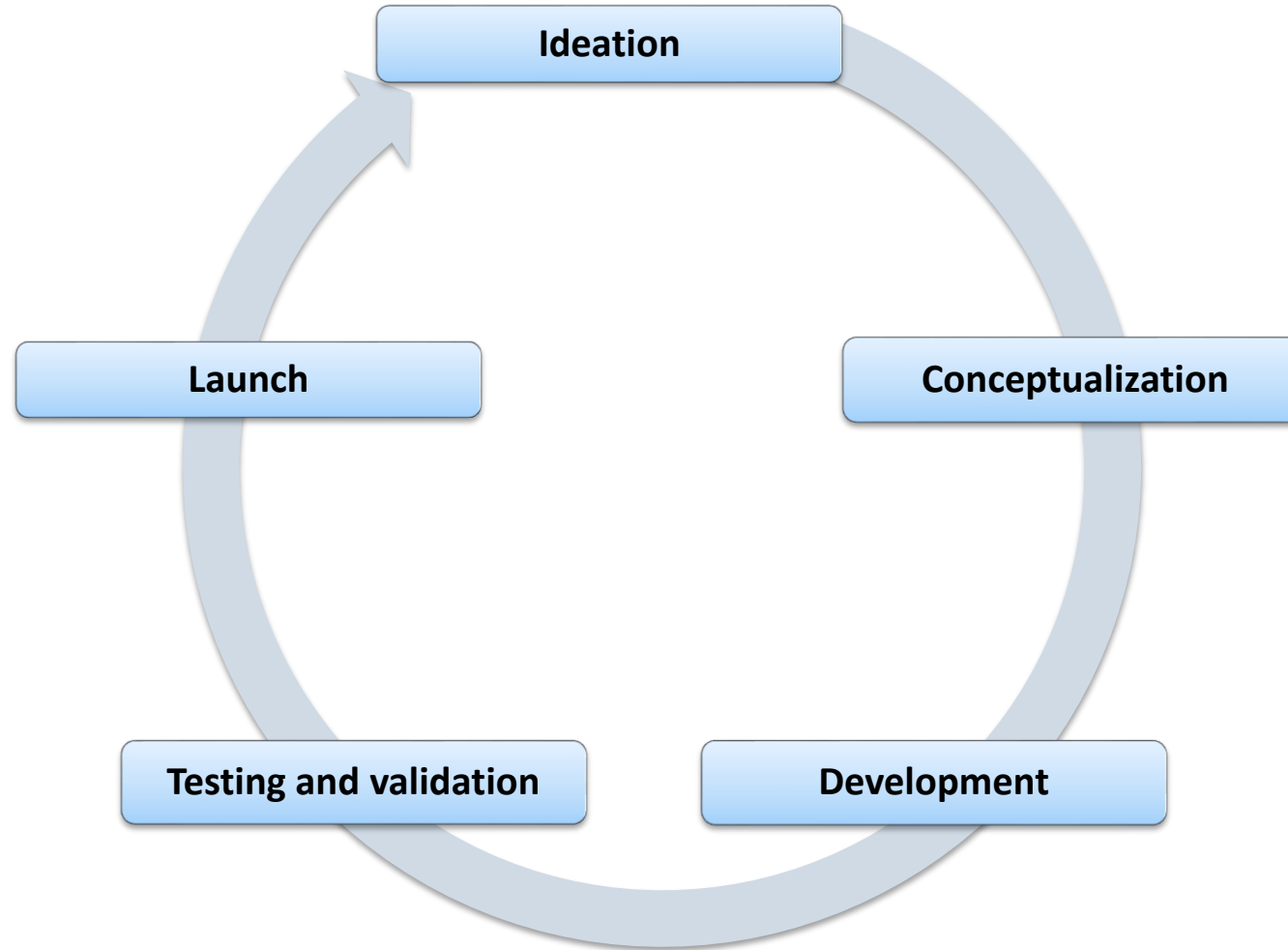
A strong acidity
A typical aroma : segmenting product

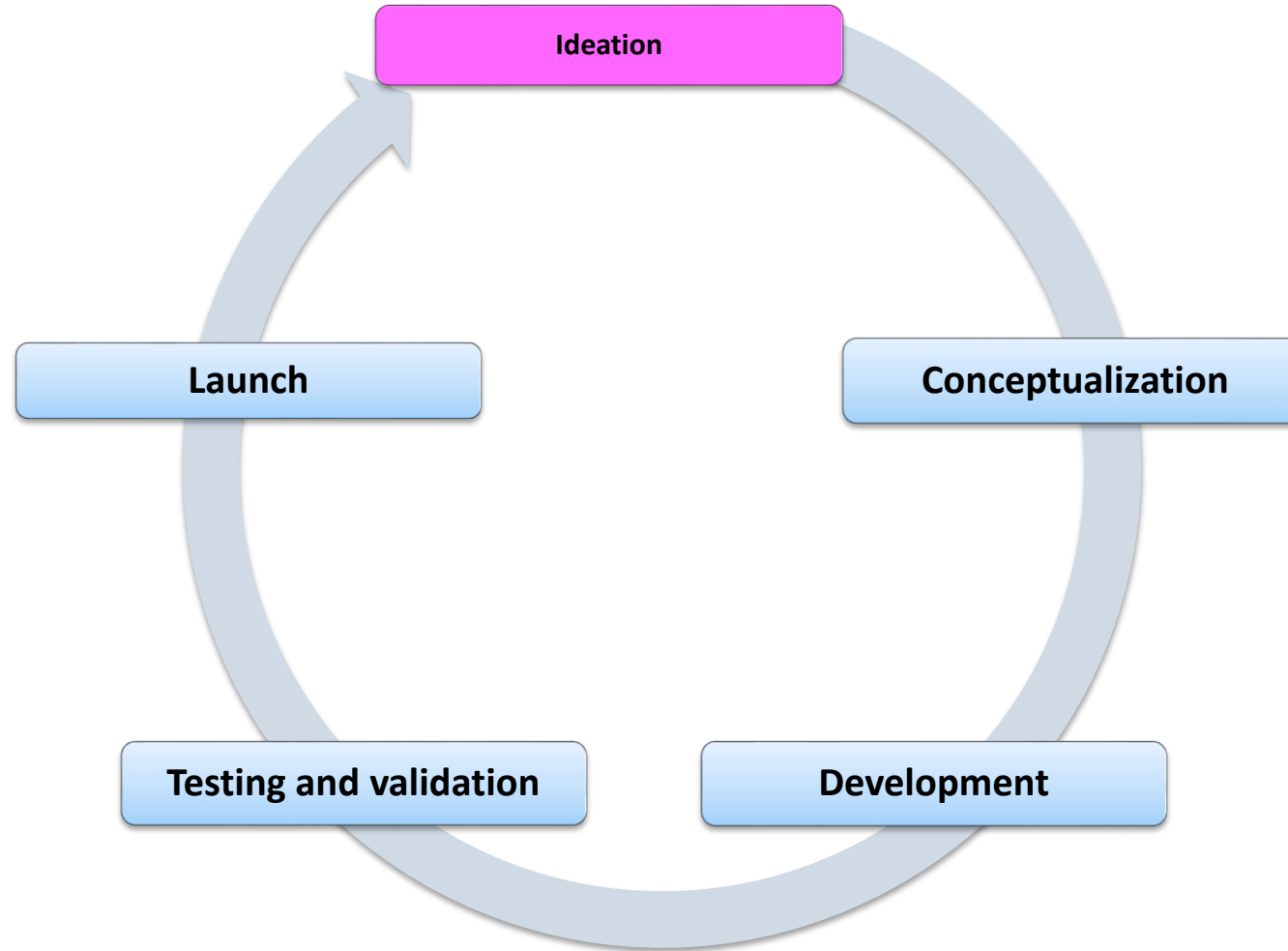
Consumer perception and image

A blurred image
an old-fashioned fruit image



The different steps of an innovation process with some examples in relation to berries, blackcurrant and others... and few focus on elderly people





Information from the market

- Benchmark (could be sensory benchmark)
- Sensory preferences
- Consumer insights

Advantages of the raw material

- Health
- Sensory
- Technological

Technological opportunities

- Technology innovations
- Patents



Sorting ideas according to
attractiveness and feasibility

Selection of ideas



STEP 1 : IDEATION

KNOWING MORE ABOUT CONSUMER PERCEPTIONS

Consumers' Perceptions of Fruits and (products with) Dried Fruits:

Health and Convenience (Siet J. Sijtsema, Katarzyna Jesionkowska, Ronan Symoneaux, Dorota Konopacka, Harriëtte Snoek, 2008)



On-line questionnaire

Polish, French and Dutch respondents (1,092)



- Fresh fruits were perceived to be healthier and less convenient than dried fruits or products with dried fruits.
- Consumers have more positive feelings about the consumption of fresh fruits compared to dried fruits (products).
- The more that the respondents were willing to sacrifice for their health, the more positive they felt about the health aspects of both fresh and dried fruits (products), as well as most perceptions of convenience regarding both fresh and dried fruits.

STEP 1 : IDEATION

FOCUS ON THE ELDERLY PEOPLE FRUIT PREFERENCES

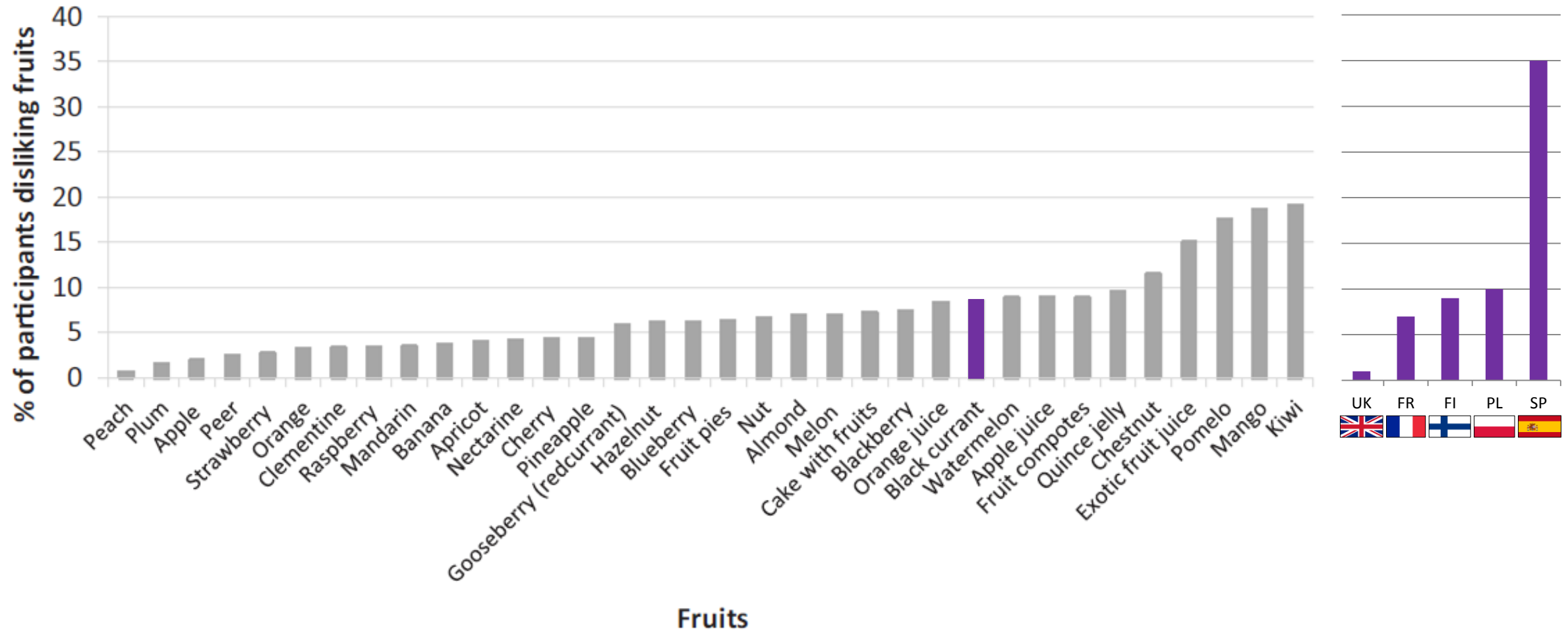


Fig. 2. Percentages of participants disliking fruits (n = 392).

(Mingioni, 2016)

“I eat cranberry which is a super fruit but it bothers me because it is not produced in France”

STEP 1 : IDEATION
CONSUMERS INSIGHTS

STEP 1 : IDEATION CREATIVE SESSION

Explored fields

Mixed blackcurrant	Pharmaceutical
Accessories	Cosmetic
nutritional	Children, babies
Pastry	Water, drinks
Confectionery	2nd, 3rd, 4th Gamme
Condiments, spices	

Potential consumer targets

Sport
Healthy diets
Boost effect
Women

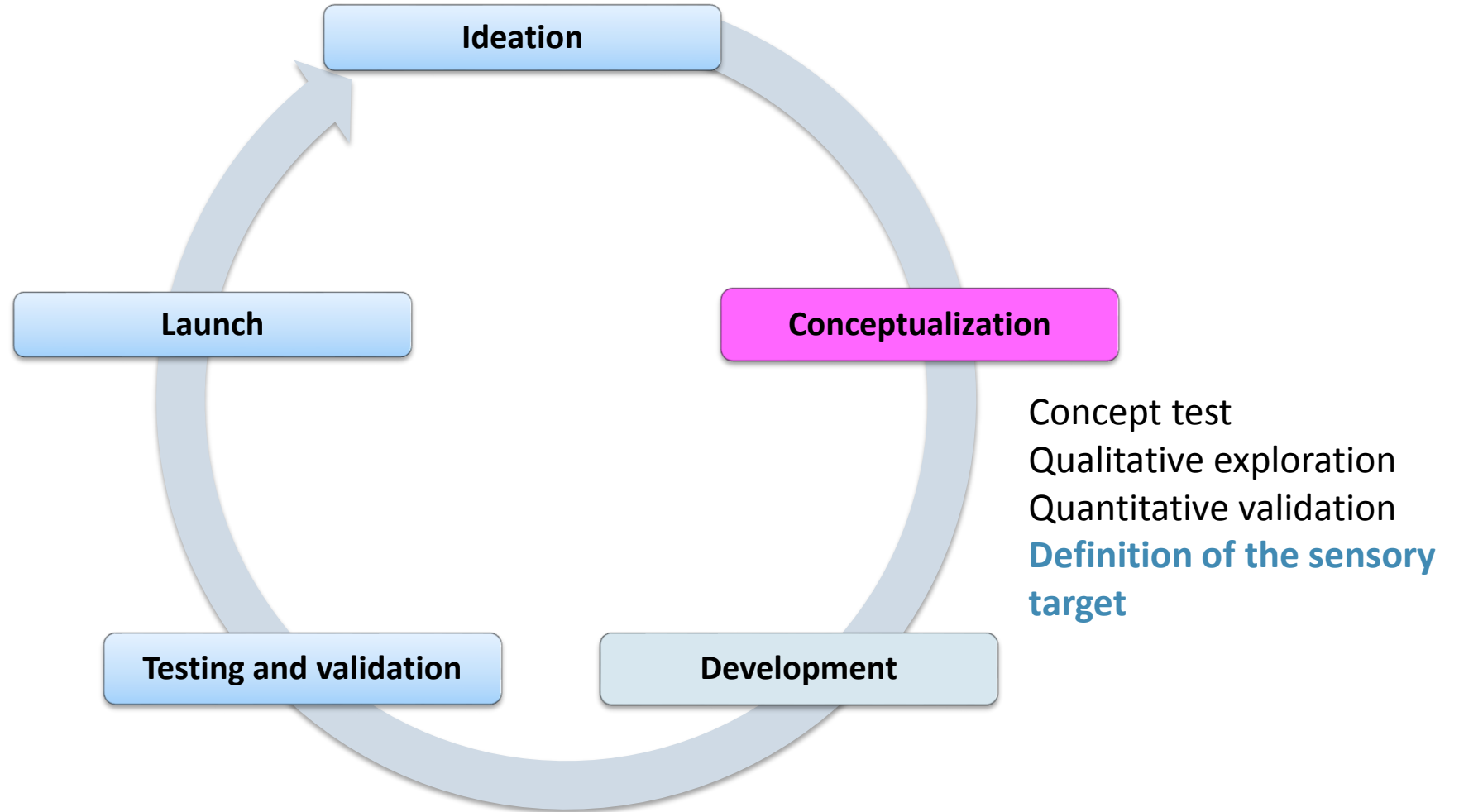
CONCEPTS

Sensory potential

In association
with chocolate, lemon, apple,
pear, vanilla, mint, coconut,
hazelnut, almond, caramel,
praline, brown sugar, honey,
cream

Products ideas

Compote	Pie / tartlets
Cold soup	Clafoutis
Purée	Stuffed Genoise
Sauce	Stuffed Brioche
Pastry kit	
Dairy products	



STEP 2 : CONCEPTUALIZATION CONSUMER SENSORY PREFERENCES

Which balance of sweetness and sourness for blackcurrant nectar consumers ?

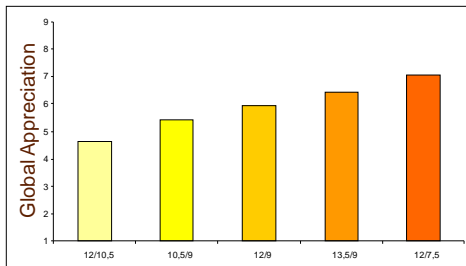
TA ° Brix \	7,5	9	10,5
10,5		S/A = 0.86 Sw/So = 0.51	
12	S/A = 0.63 Sw/So = 1.3	S/A = 0.75 Sw/So = 0.88	S/A = 0.88 Sw/So = 0.51
13,5		S/A = 0.67 Sw/So = 1.06	

211 fruit juice consumers in France and Poland

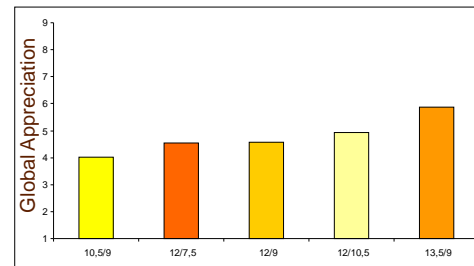
106 Polish and 105 French consumers



Consumers very sensitive to the Sweetness / Sourness ratio and in particular to sourness
29%

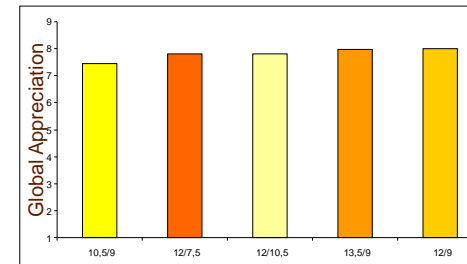


Consumers who prefer the sweetest nectar
27%



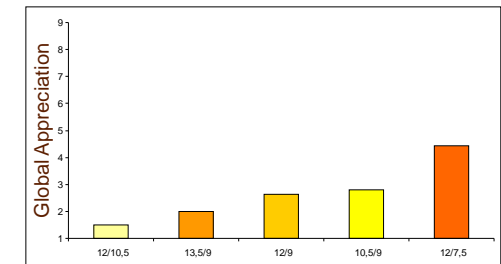
40% of the French consumers are in this cluster

Consumers who like all products
37%



Most of the Polish consumers (54%) are in this cluster.

Consumers who dislike all products but with a better appreciation of 12/7,5 nectar
27%



130 autonomous elderly people

- Age range: 65-83
- Mean age: 71 (± 5)



n=69

- Living at home



n=61

96 dependent elderly people

- Age range: 65-98
- Mean age: 85 (± 7)



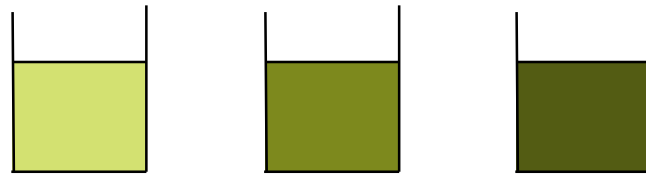
n=36

- Living in nursing homes



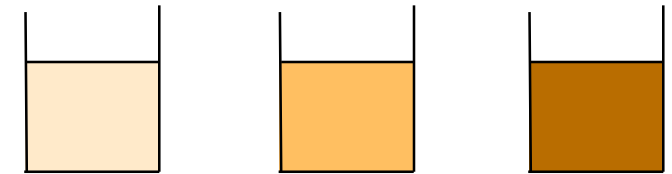
n=60

3 sweet samples



	S1	S2	S3
Sugar (g/100g)	20	22	28
Acid (g/kg)	4.71	4.71	4.71

3 acidic samples

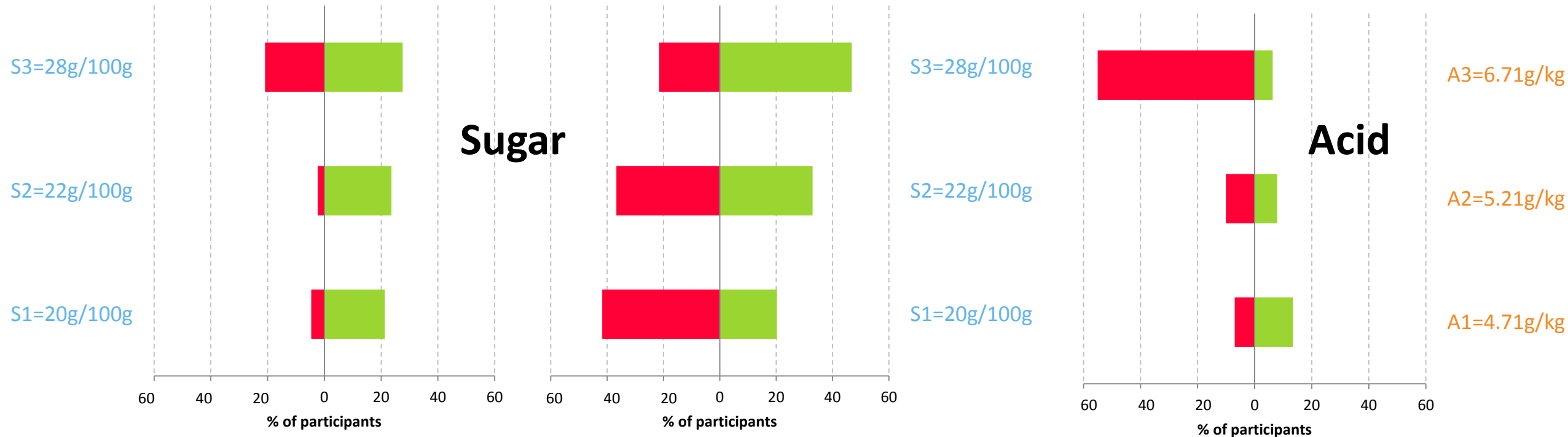


	A1	A2	A3
Sugar (g/100g)	16	16	16
Acid (g/kg)	4.71	5.21	6.71

Among all samples, which one is:

"...the **worst** for you" "...the **best** for you" "...the **worst** for you" "...the **best** for you"

"...the **worst** for you" "...the **best** for you"



Autonomous elderly

Dependent elderly

Autonomous elderly

Identification

of

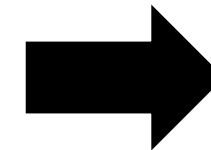
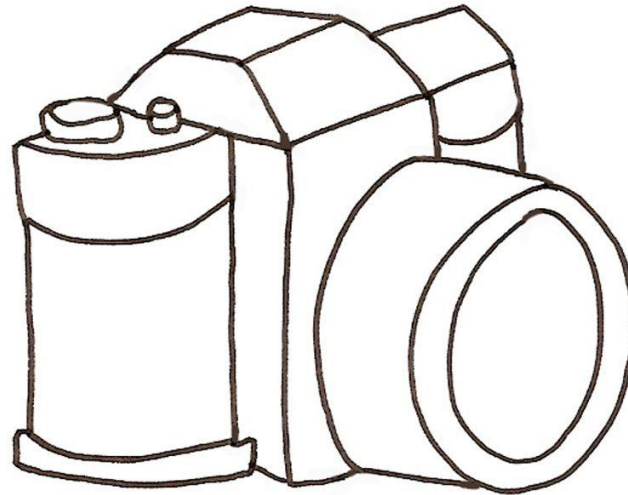
what is liked by consumers
(products and prototypes)



Description

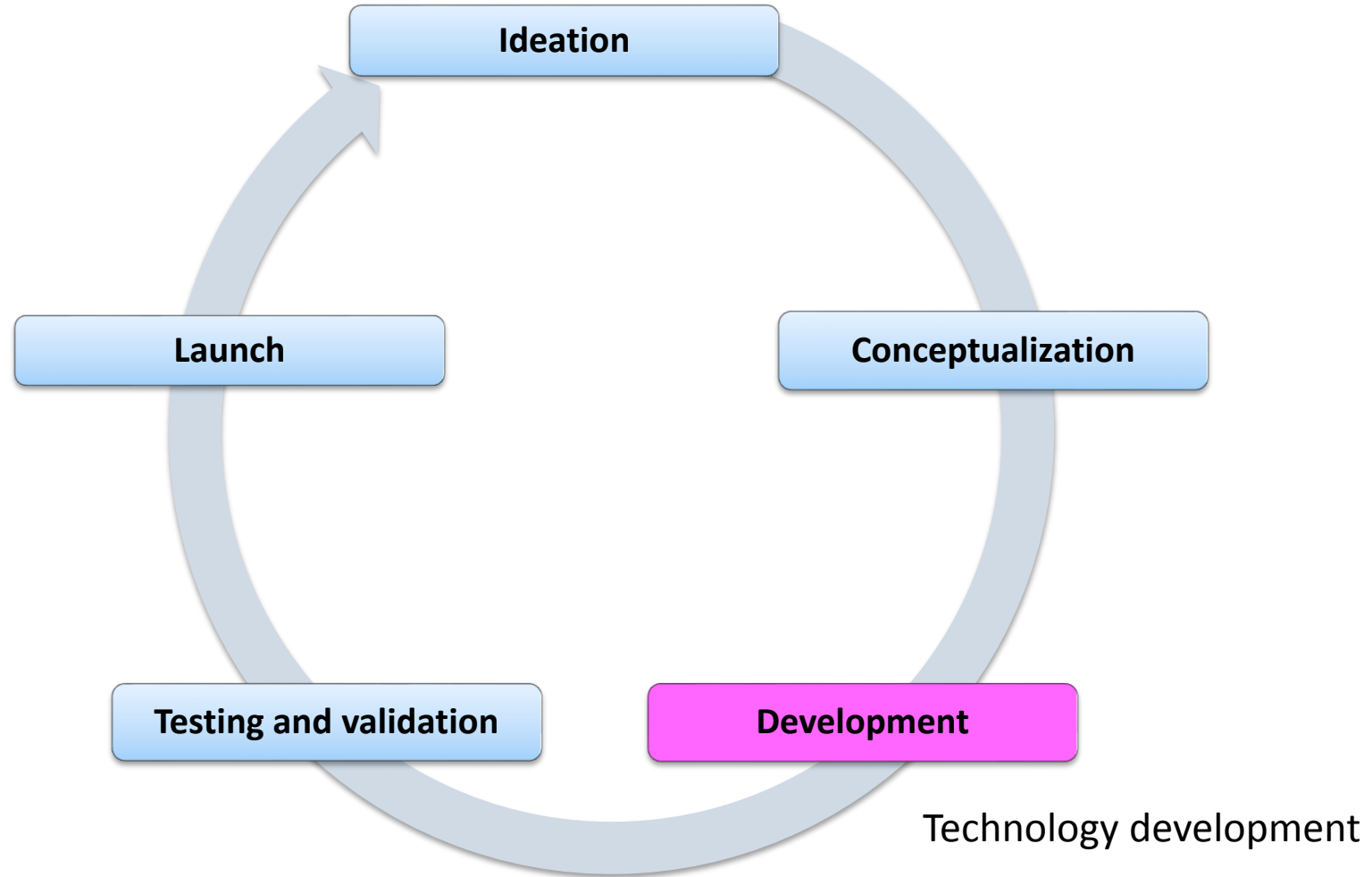
of

what is liked by
consumers



**Sensory
specifications**

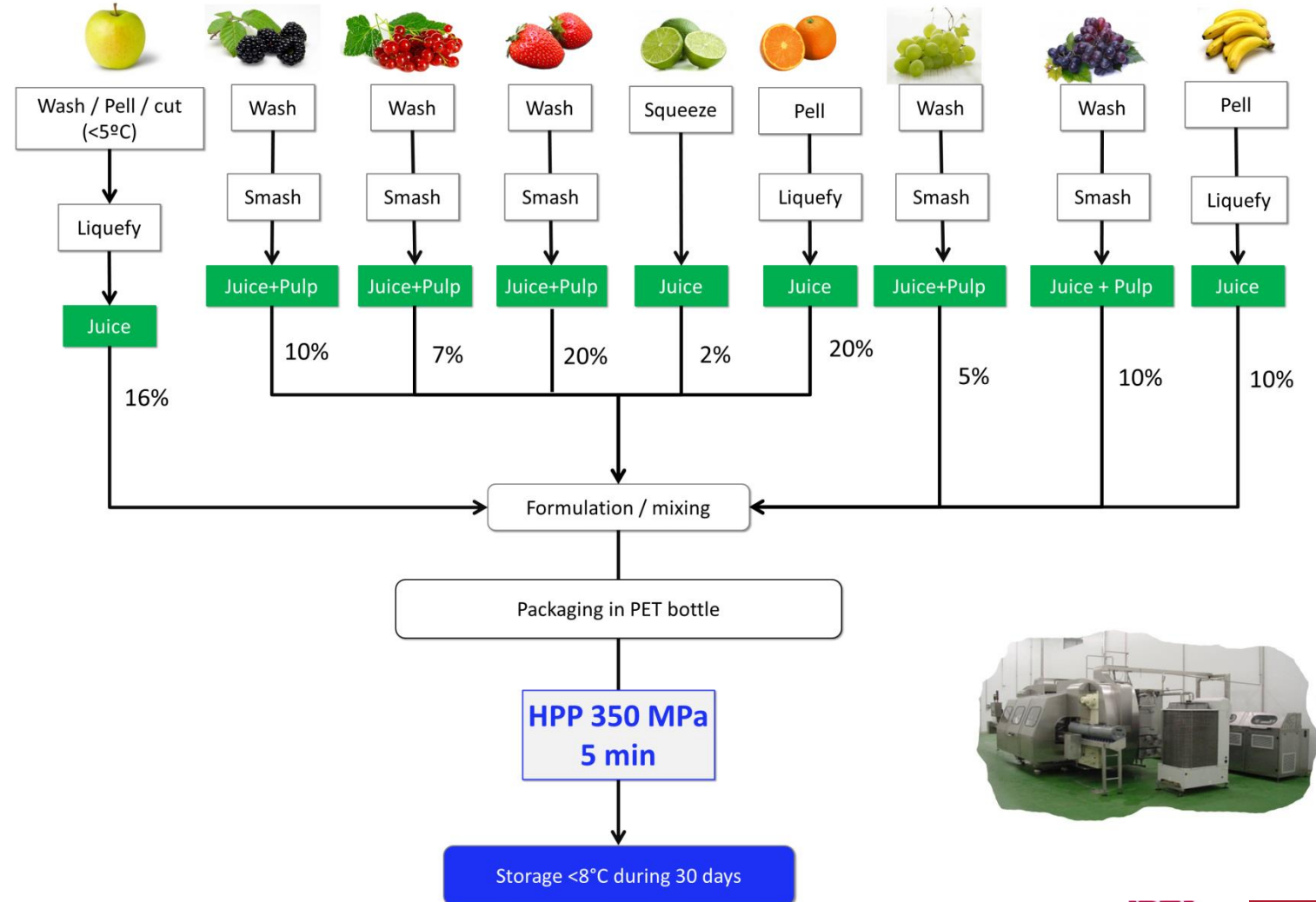
Step 3 - Development step : an opportunity to test new technologies and prototypes



Red smoothie: Formulation & Processing

Objective:
Non-thermal pasteurisation of
Red-fruits based smoothies with a

CLEAN LABEL approach





Microbial assessment

Log CFU/g

	AMB	Y&M	Psy.
Raw	3.5±0.3	3,3±0,1	2,5±0,4
HPP- day 1	1.8±0.9	1,5±0,1	<0,1
HPP- day 7	1.1±0.4	1,4±0,2	0,5±0,8
HPP- day 14	0.9±0.2	0,9±0,1	0,2±0,4
HPP- day 21	0.8±0.3	0,9±0,2	<0,1
HPP- day 28	0.6±0.3	0,4±0,2	0,2±0,3

AMB: Aerobic mesophilic bacteria
Psy.: Psychrotrophic bacteria
Y&M: Yeasts and Moulds

Physico-chemical



Stabilization of the red smoothie for 28 days

Raw 3.55±0.03 1.56±0.10 67±1



No physico-chemical changes over 28 storage period

HPP- day 14 3.63±0.01 1.64±0.02 67±2 HPP- day 1 94 ± 2 98 ± 3



Enzyme and antioxidant activities are maintained

HPP- day 21 98 ± 3 111 ± 5

HPP- day 28 101 ± 3 105 ± 2 6.3±0.3 23.9±1.3

Fructose in mg,L-1

Enzyme & Antioxidant status

FRAP DPPH

7.1±0.4 20.1±0.4

7.0±0.3 21.0±0.4

6.2±0.5 19.5±0.3

6.3±0.3 22.7±1.4

6.1±0.2 24.0±0.5

POD (Peroxidase) in % relative activity

PPO (polyphenol oxidase) in % relative activity

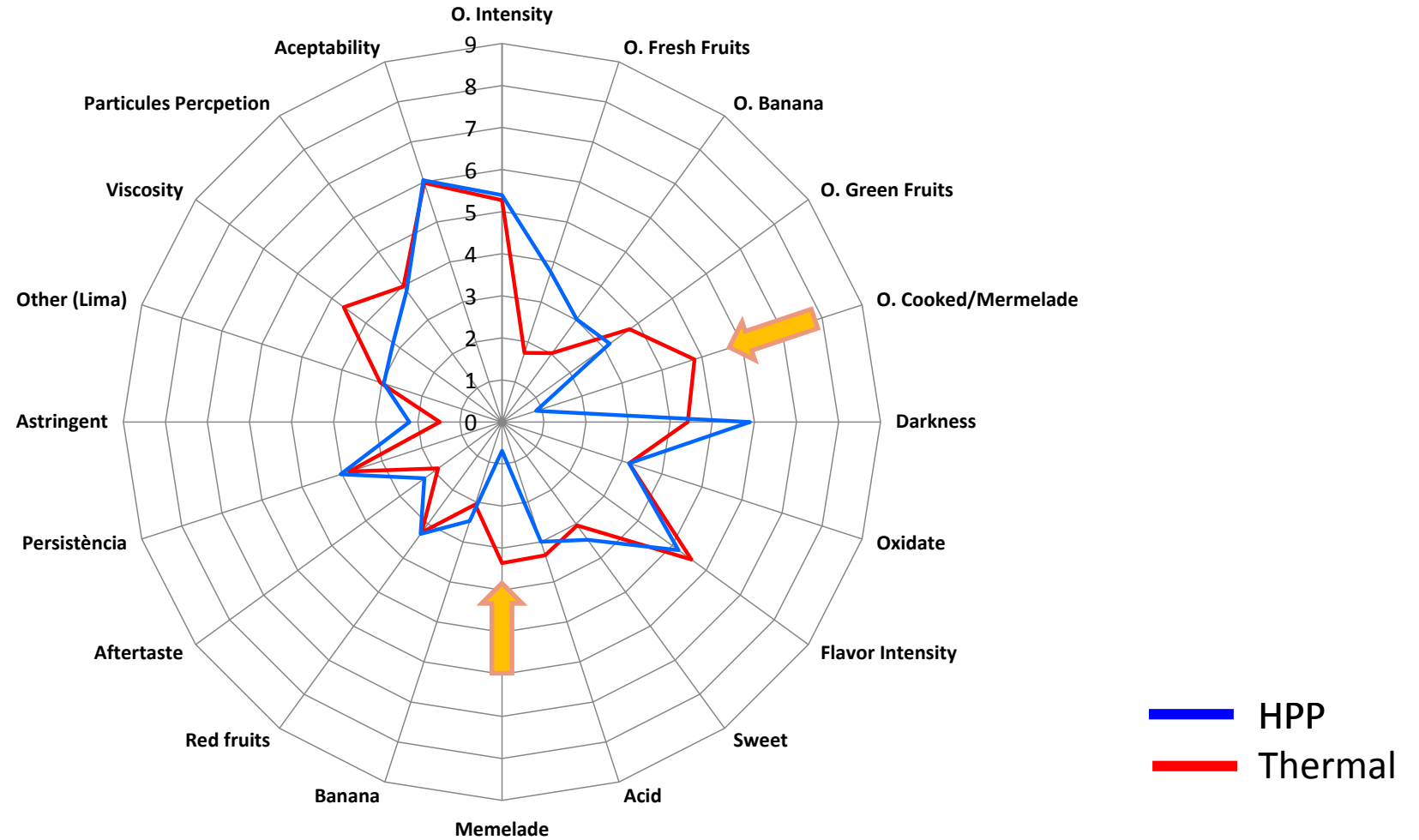
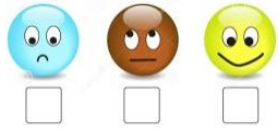
FRAP (ferric ion-reducing antioxidant power) in mmol Fe²⁺·L⁻¹

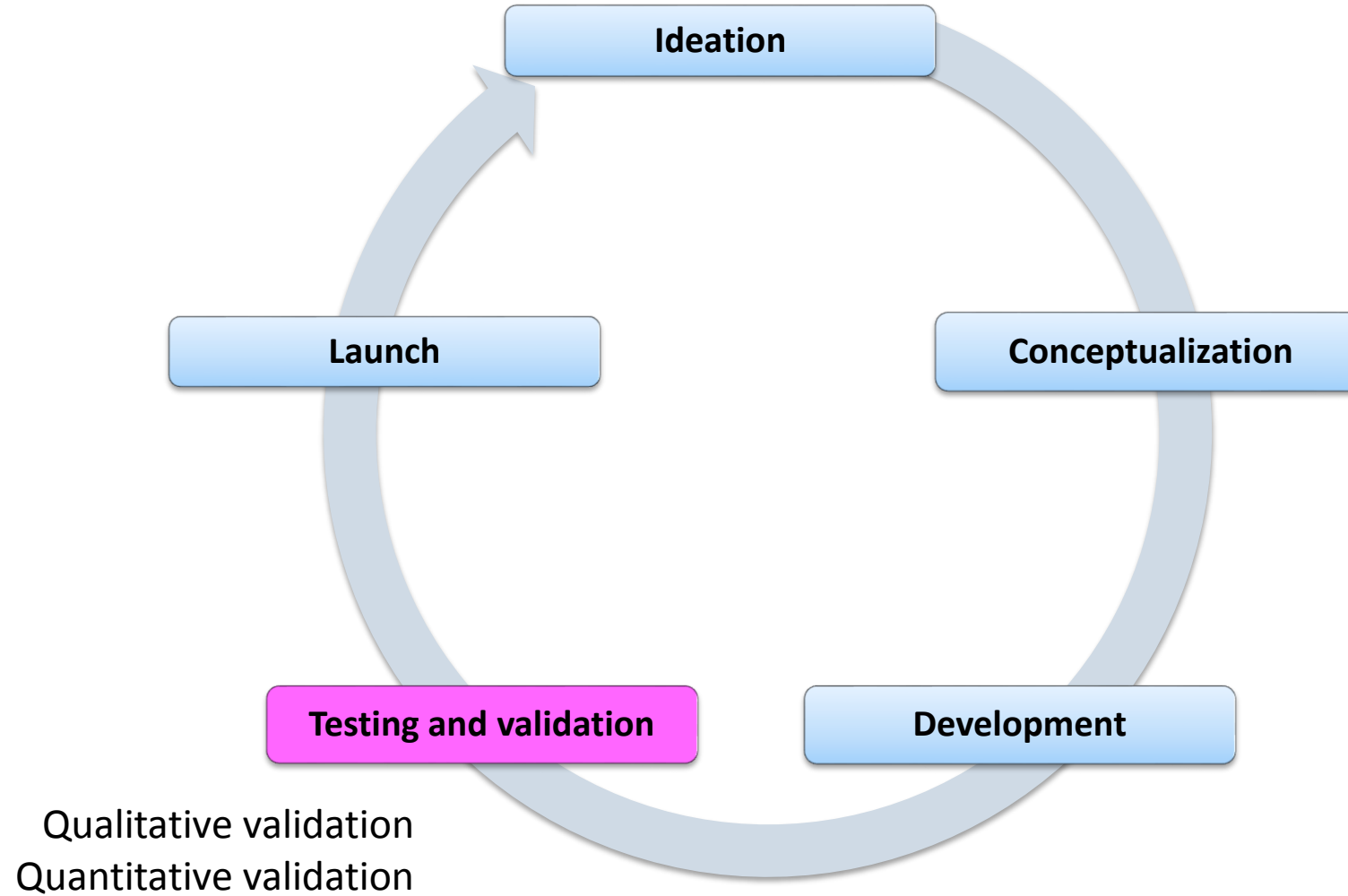
DPPH (2,2-diphenyl-1-picrylhydrazyl).

Free radical scavenging using DPPH method in IC₅₀

Day 21

Sensory description



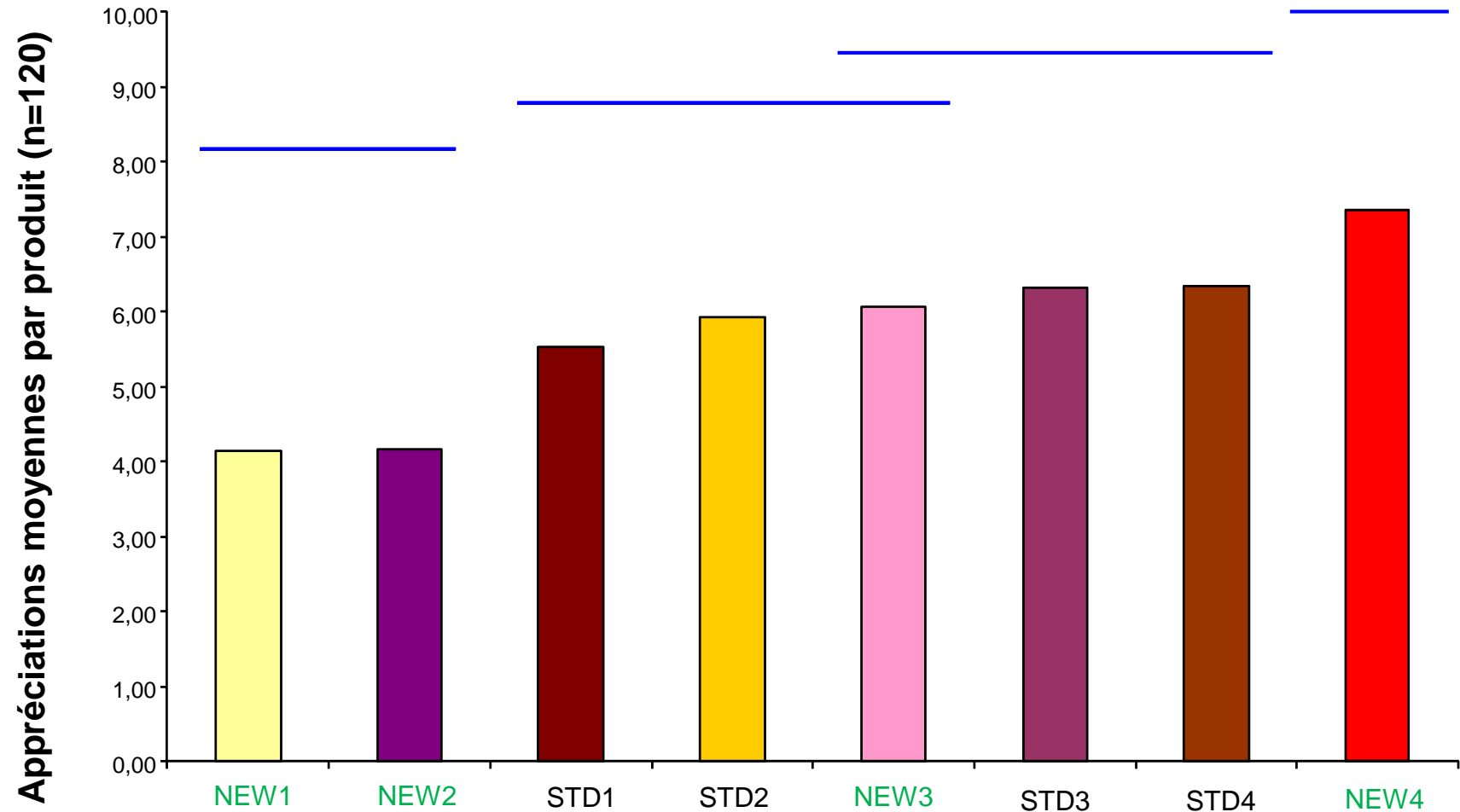


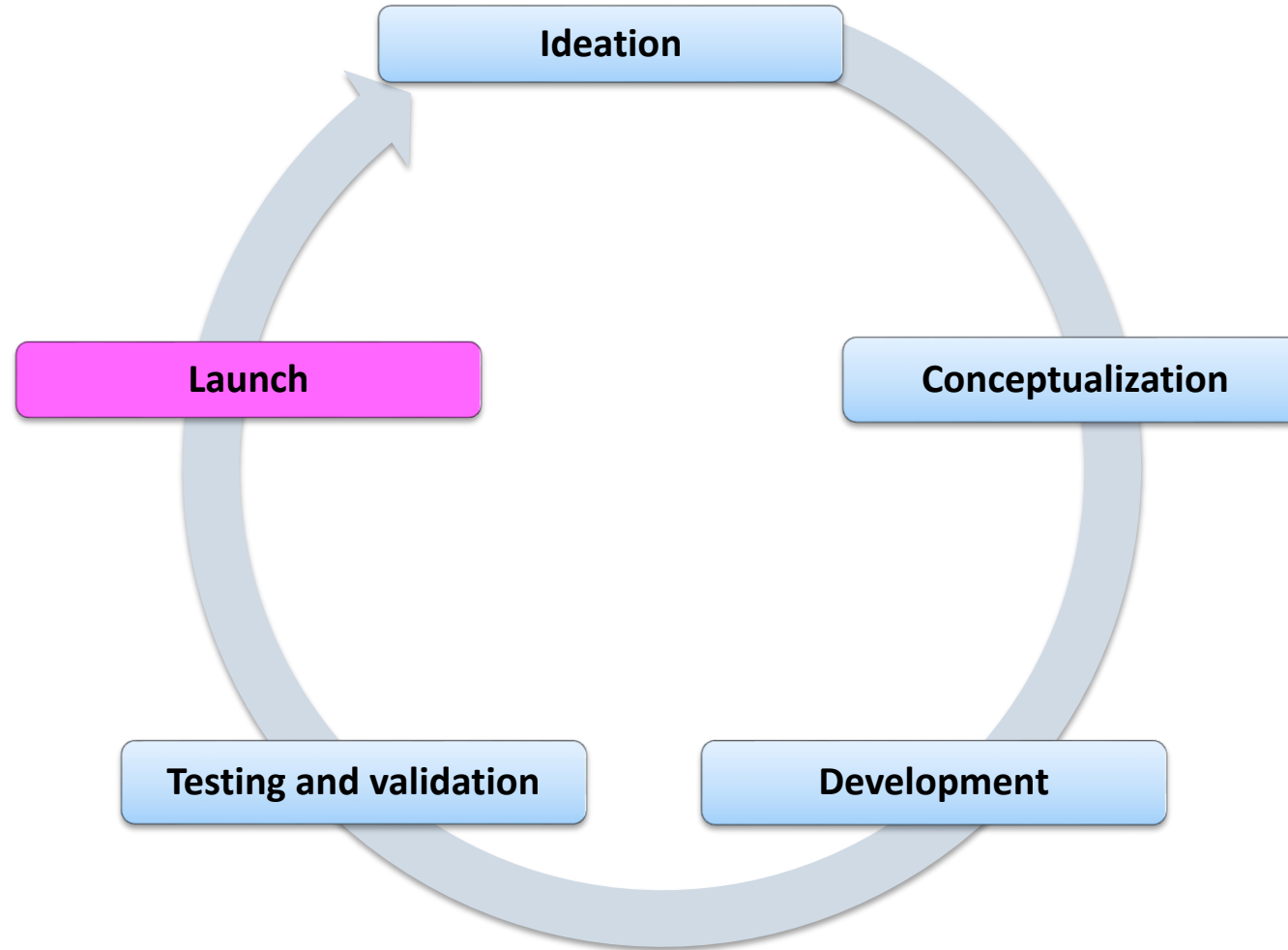


Juices with New Grape Cultivars

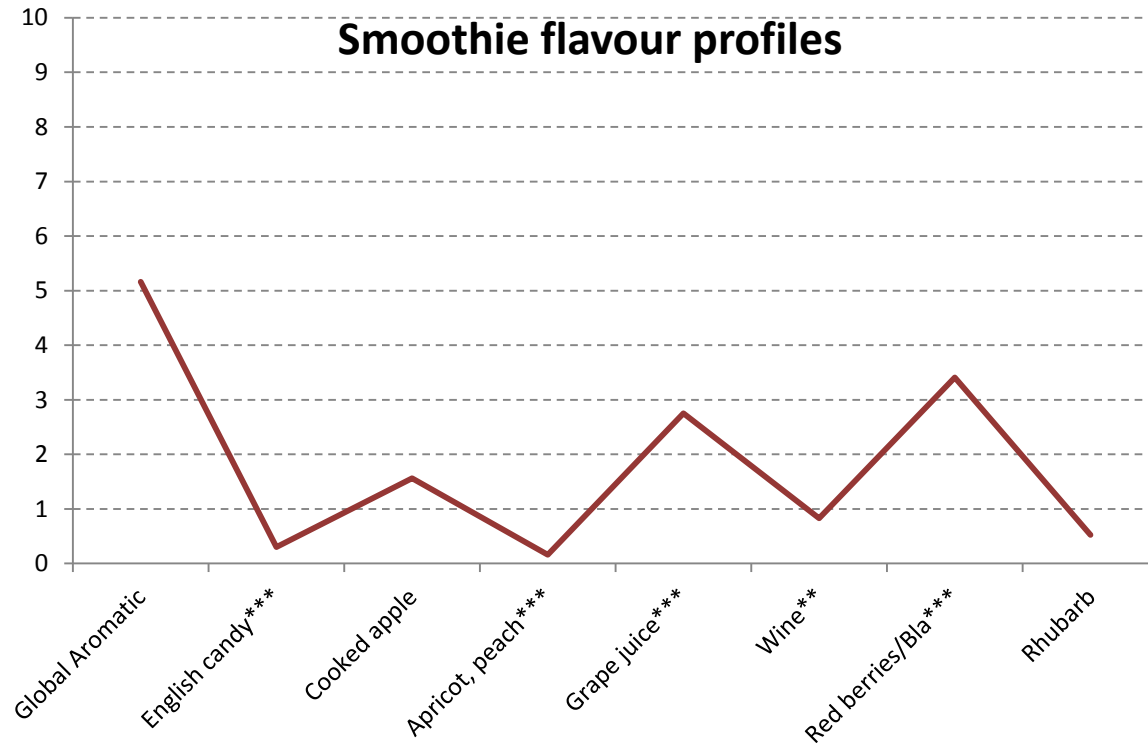


Hedonic test with 120
french Consumers



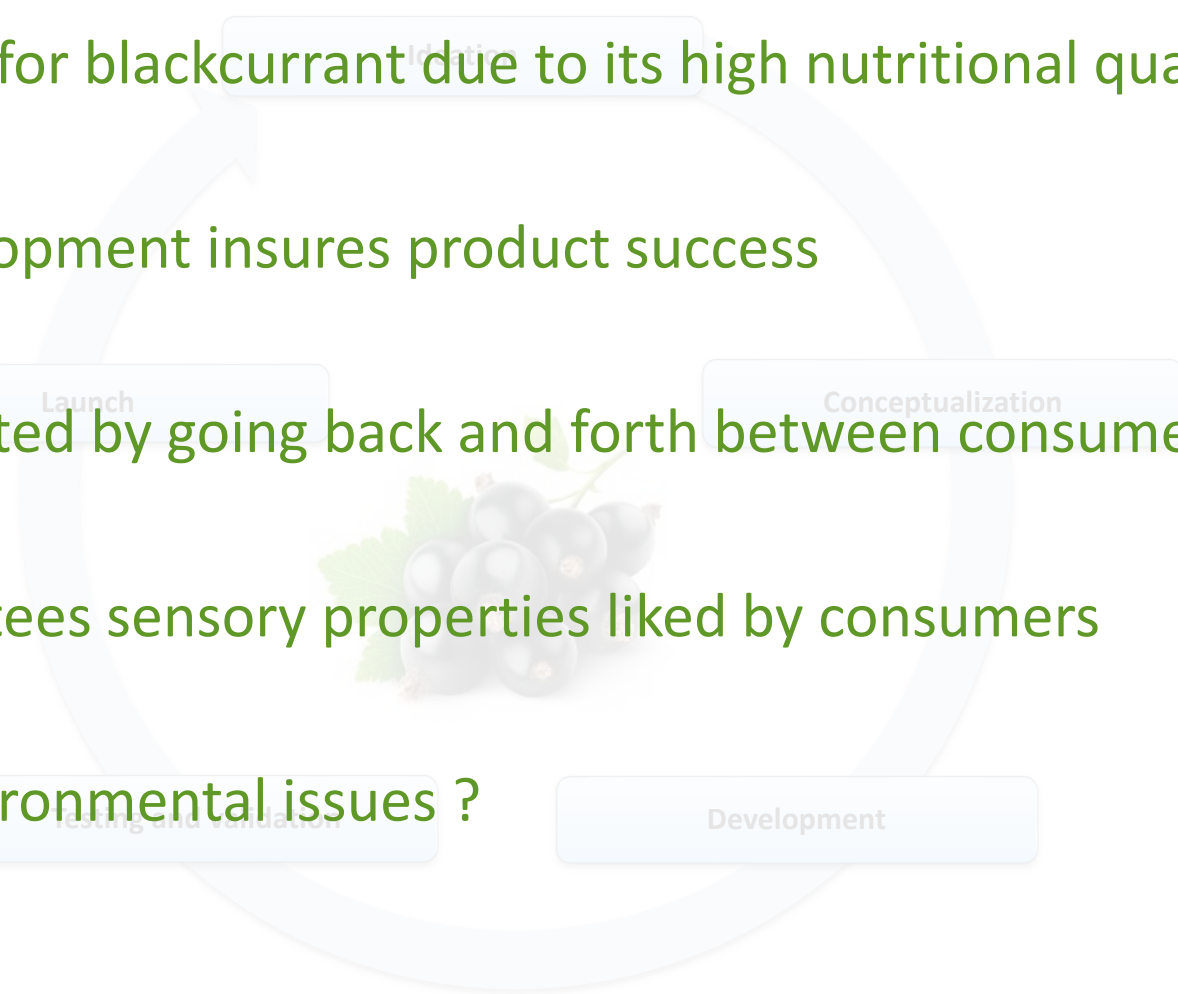


Final recipe
industrial production



The sensory profile helps to control any further sensory deviation

- Large opportunities for blackcurrant due to its high nutritional qualities
- Consumer led development insures product success
- Innovation is facilitated by going back and forth between consumers and R & D
- This process guarantees sensory properties liked by consumers
- But what about environmental issues ?





Eco-Design + Consumer Led Development = Consumer Led **Eco** - Development



Any Questions





From consumer to product innovation : Which process for a more successful innovation?

Maitre Isabelle, Pierre Picouet, Chloé Thomas, Ronan Symoneaux