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## Designing a food model to study the impact of food liking on food intake: characterization of isocaloric apple purees varying in texture

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# Designing a food model to study the impact of food liking on food intake: characterization of isocaloric apple purees varying in texture

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## Context of the study

### Aim

Design a range of food products

Contrasted hedonic ratings

Isocaloric Same nutritional composition

### Strategy

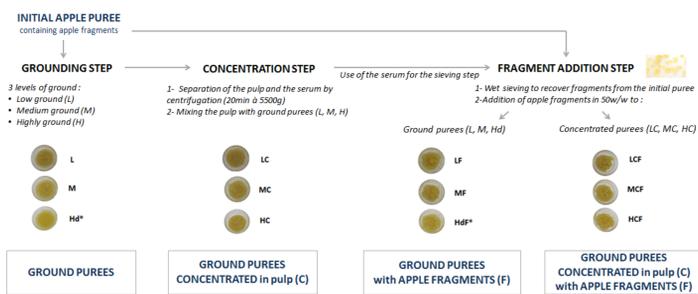
To develop apple purees **only varying in texture**  
 Relationship between rheological, structural and sensory properties permits us to control the texture<sup>(1)</sup>. By using **reverse processing methodology**, we wanted to :  
 - point out textures and therefore structures that are important to generate large individual differences in palatability  
 - adapt process from laboratory to large-scale production

## Methodology and Results

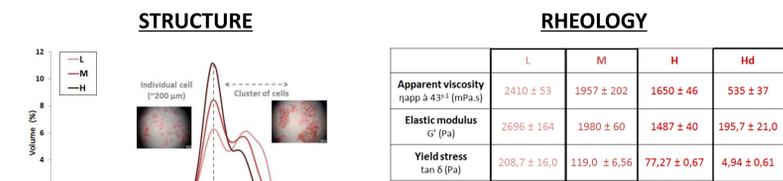
Results presented concern the range of final products

### PRODUCT

- Apple puree is a suspension of particules
- Texture was modified by using 3 structural dimensions : **pulp content, particle size and apple fragments addition**



- They are characterized by instrumental measurements:  
 Example of low (L), medium (M), highly (H) and highly diluted (Hd) ground purees



\*NB : H and Hd  
 A product with a low apparent viscosity had to be developed according to the hedonic purpose.  
 Then, H was diluted by 10% with serum (from the centrifugation) to obtain Hd. Only Hd was kept in the range of final products

### TEXTURE

Sensory and functional manifestation of the structural, mechanical and surface properties of foods detected through the senses of vision, hearing, touch and kinesthetics<sup>(2)</sup>

### SENSORY

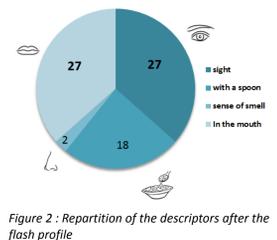
#### METHODOLOGY : FLASH PROFILE

10 experts

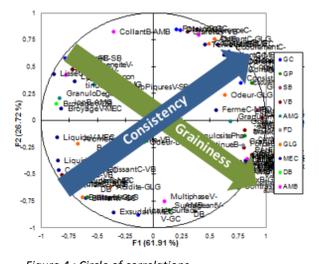
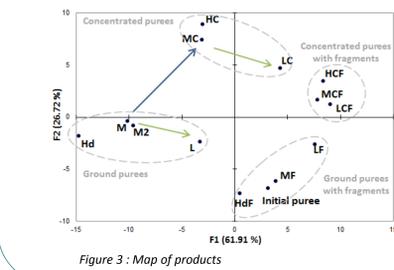
12 apple purees + the initial puree + 1 repetition (M)

#### RESULTS

- 78% of the descriptors are relative to texture
- The sight is as important as the mouth's sensation to describe texture
- Textures are described through two dimensions, **consistency and graininess**, linked to structural modifications (namely pulp content and particle size)  
 Adding apple fragments widens the graininess' dimension



#### Statistical analysis : Generalised Procrustes Analysis



### HEDONIC

#### METHODOLOGY :



60 people  
 36 women, 24 men  
 Age : 24 ± 4,14 yrs  
 BMI : 21,6 ± 2,39 kg/m<sup>2</sup>



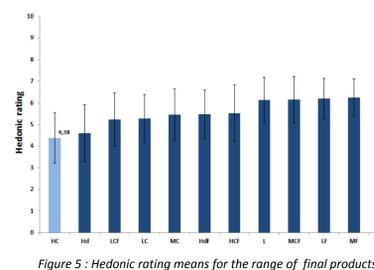
Initial puree + 12 apple purees  
 = warm-up Monadically presented



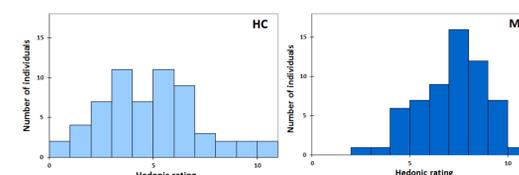
After lunch  
 Context of a meal: puree as a dessert  
 Individual table

#### RESULTS

- For 85% of the participants, it was possible to select at least **one disliked and one liked product** (namely, one product scoring below 3 and one product scoring above 7)



- Products have different patterns of appreciation



Previous hedonic tests have highlighted textures. Some parameters of the process have been changed.

## Conclusion and perspectives

Reverse processing methodology makes it possible to design range of textures in apple purees which lead to contrasted appreciations for each individual. This isocaloric food model could be used further to study the influence of palatability on food intake.

## References

- <sup>(1)</sup> Espinosa-Muñoz, L. et al « The significance of structural properties for the development of innovative apple puree textures ». *LWT - Food Science and Technology* 49, n° 2 (December 2012): 221-228  
<sup>(2)</sup> Szczesniak, A. S. « Texture is a sensory property ». *Food Quality and Preference* 13, n° 4 (June 2002): 215-225.

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Métaprogramme DID'IT  
 Diet Impact and Determinants :  
 Interactions and Transitions

