



Sharing smiles

EXPLORING DIFFERENT AVAILABLE EXTRACTION TECHNIQUES TO GET AROMA PROFILES OF DIFFERENT KINDS OF CHEESE



Araceli LAGADEC MARQUEZ
Damien SALOU
Claire LECROC

5TH SBSE INTERNATIONAL MEETING

23 & 24 SEPTEMBRE 2019 - NOVOTEL PARIS-SUD

SBSE 
Technical Meeting



WE MAKE ICONIC HEALTHY SNACK BRANDS THAT PEOPLE LOVE

+30 brands including



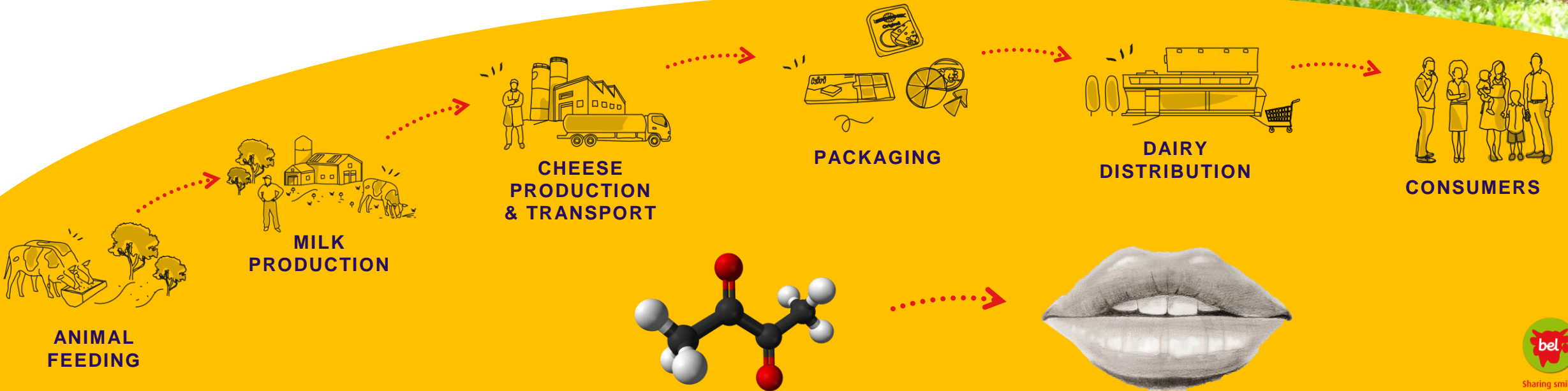
OUR MISSION IS ENGAGING



CHAMPION

HEALTHIER AND RESPONSIBLE

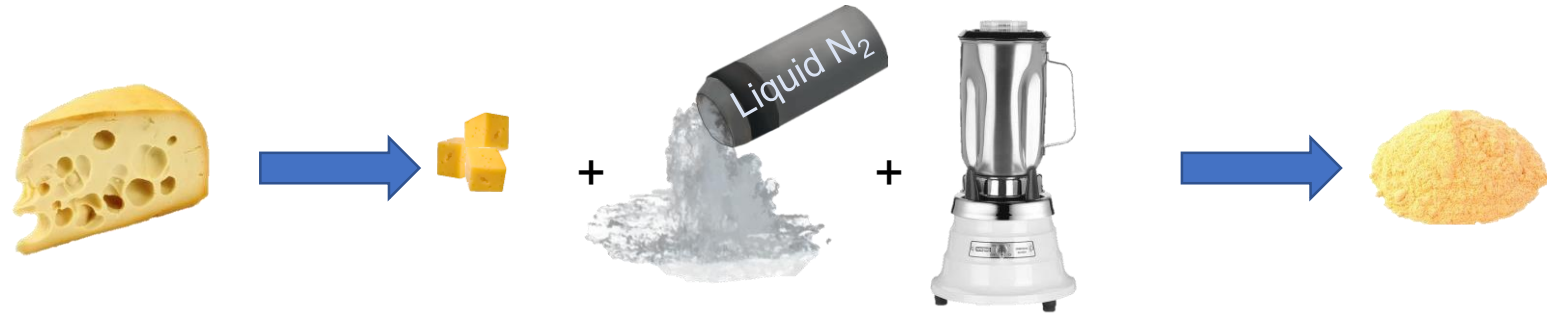
FOOD FOR ALL



Materials analyzed

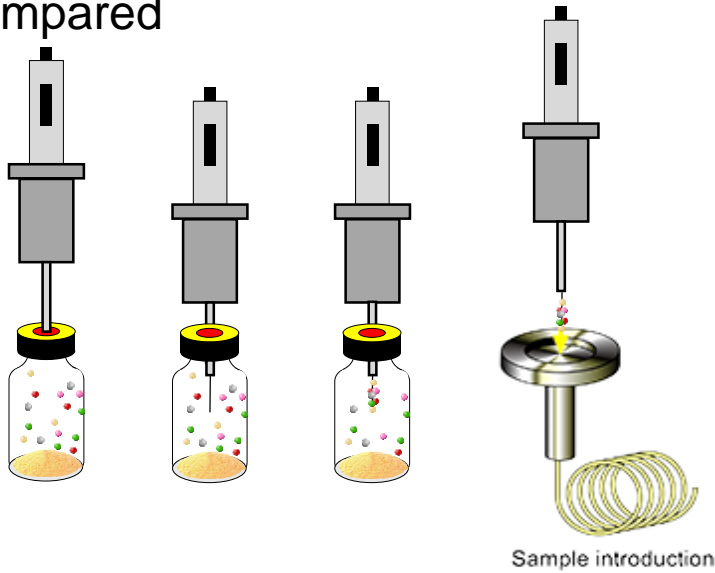


Product preparation

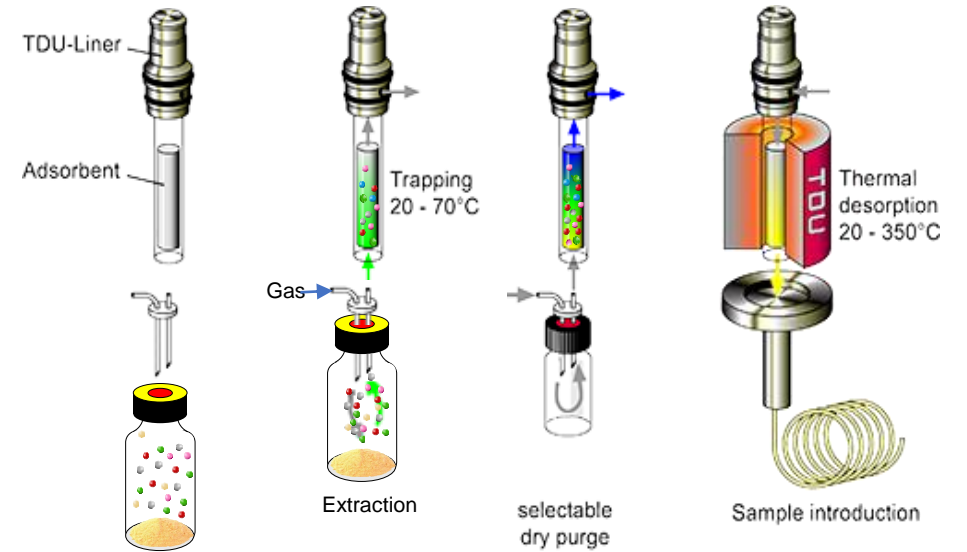


Methods Compared

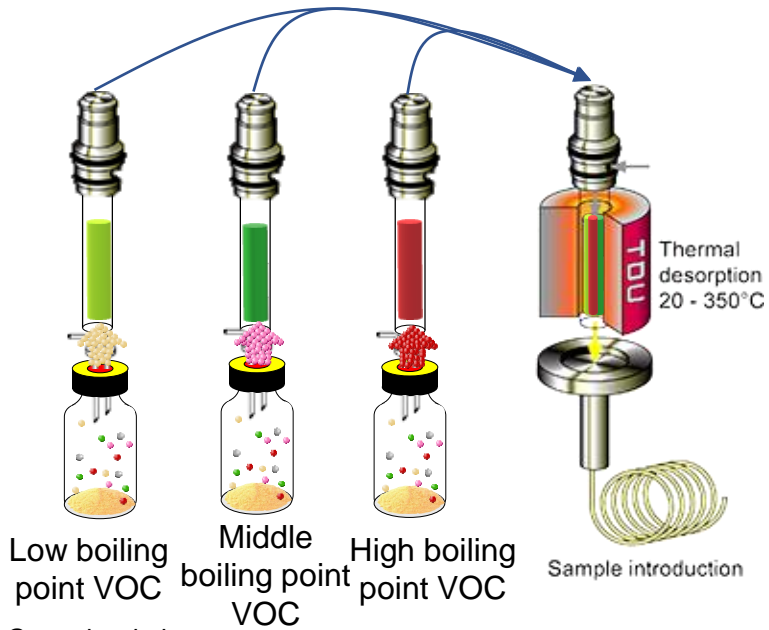
HS-SPME



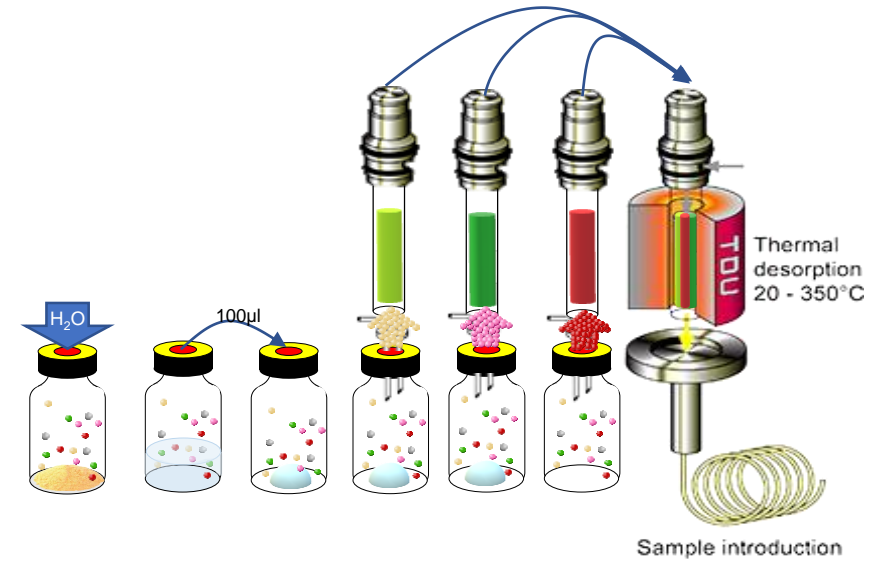
DHS¹



MVM²



MVM-FE



1: Adapted from the Gerstel website

2: Adapted from Ochiai, N., Tsunokawa, J., Sasamoto, K., Hoffmann, A. (2014) Multi-volatile method for aroma analysis using sequential dynamic headspace sampling with an application to brewed coffee. *Journal of Chromatography A*. 1371, 65-73

WHAT IS A GOOD EXTRACTION METHOD?



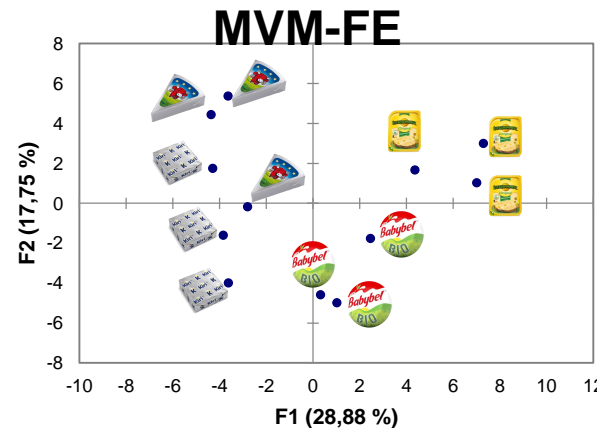
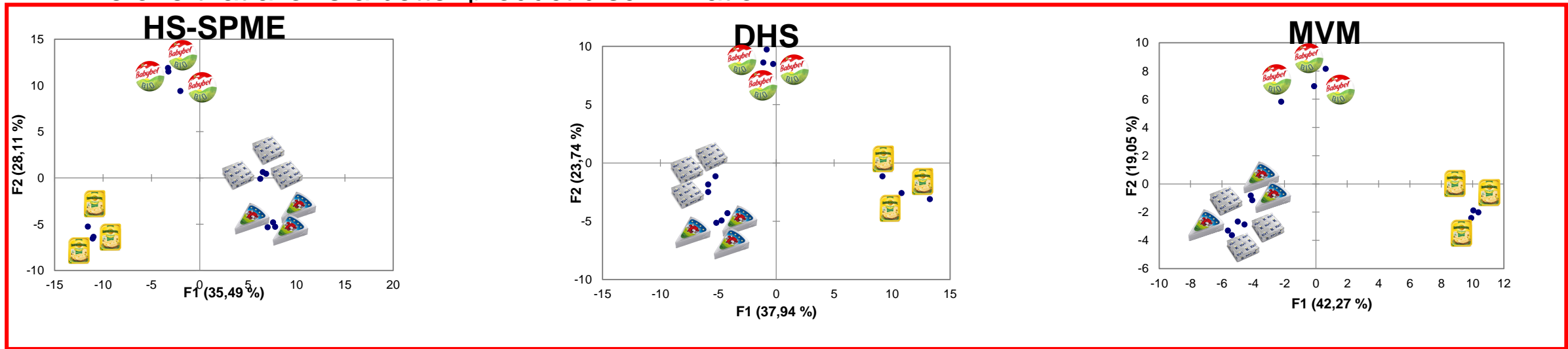
- The one that allows extracting more different compounds

Extraction	Number of different compounds
HS-SPME	164
DHS	119
MVM	89
MVM-FE	62

WHAT IS A GOOD EXTRACTION METHOD?



- The one that allows extracting more different compounds **HS-SPME**
- The one that allows a better product discrimination



WHAT IS A GOOD EXTRACTION METHOD?



- The one that allows extracting more different compounds
- The one that allows a better product discrimination
- The quickest or the one of easier utilisation

HS-SPME

HS-SPME, DHS, MVM

Extraction	Run time for a 5 samples sequence
HS-SPME	29 h
DHS	24 h
MVM	33 h
MVM-FE	48 h

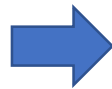
WHAT IS A GOOD EXTRACTION METHOD?



- The one that allows extracting more different compounds **HS-SPME**
- The one that allows a better product discrimination **HS-SPME, DHS, MVM**
- The quickest or the one of easier utilisation **HS-SPME, DHS, MVM**
- The one that allows extracting higher amounts of compounds

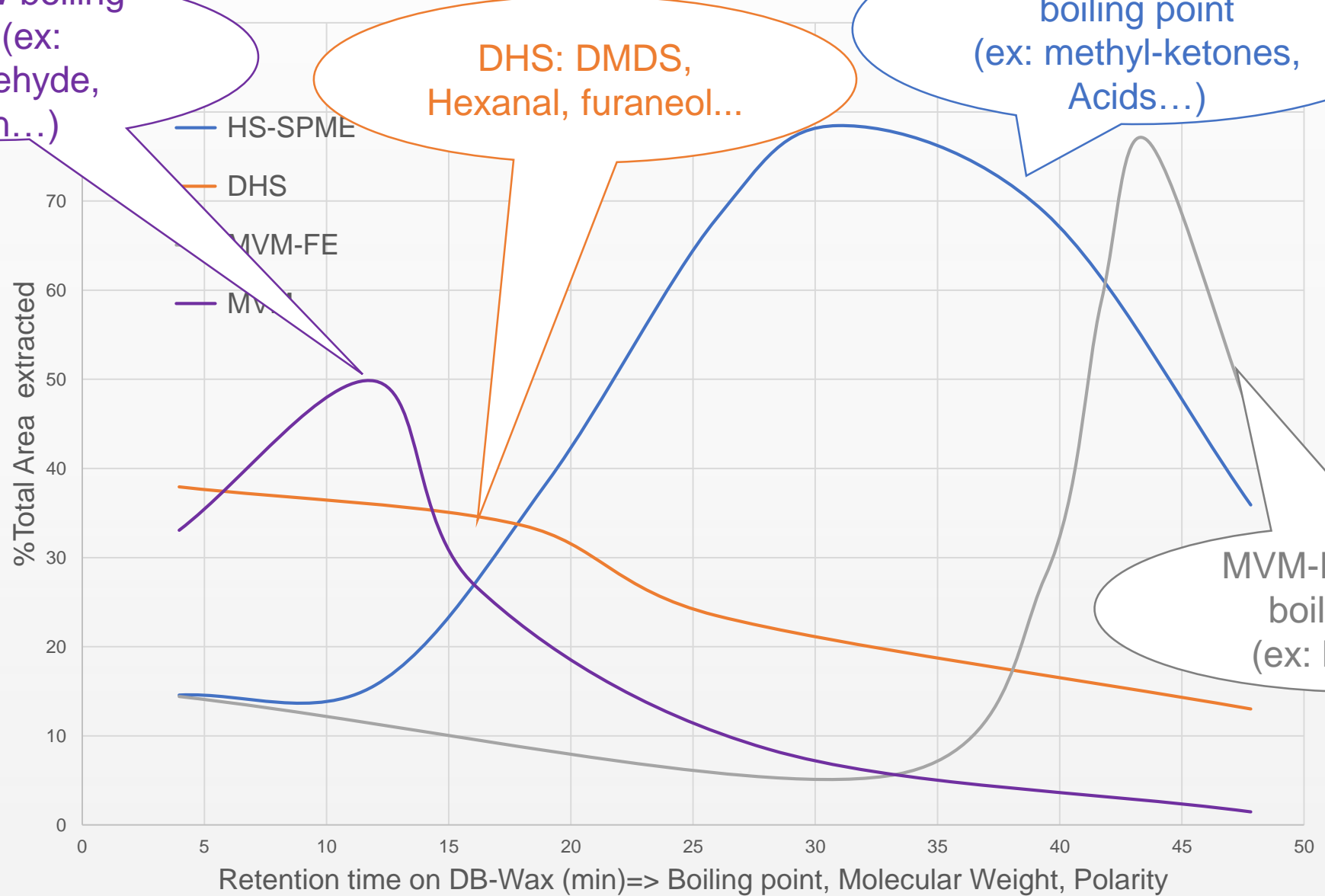
For each compound (ex: Dimethyl Sulfide):

Extraction	Mean peak area (AU)
HS-SPME	$3,8 \cdot 10^4$
DHS	$9,2 \cdot 10^4$
MVM	$3,1 \cdot 10^6$
MVM-FE	0
Sum of areas	$3,3 \cdot 10^6$



Extraction	% Total area extracted
HS-SPME	1
DHS	3
MVM	96
MVM-FE	0

% total area extracted depending on extraction technique



MVM: low boiling point (ex: acetaldehyde, Furan...)

DHS: DMDS, Hexanal, furaneol...

HS-SPME: Wider boiling point (ex: methyl-ketones, Acids...)

MVM-FE: Highest boiling point (ex: lactones..)

CONCLUSION:**WHICH IS THE BETTER EXTRACTION METHOD FOR THESE PRODUCTS?**

- The one that allows extracting more different compounds
- The one that allows a better product discrimination
- The quickest or the one of easier utilisation
- The one that allows extracting higher amounts of compounds

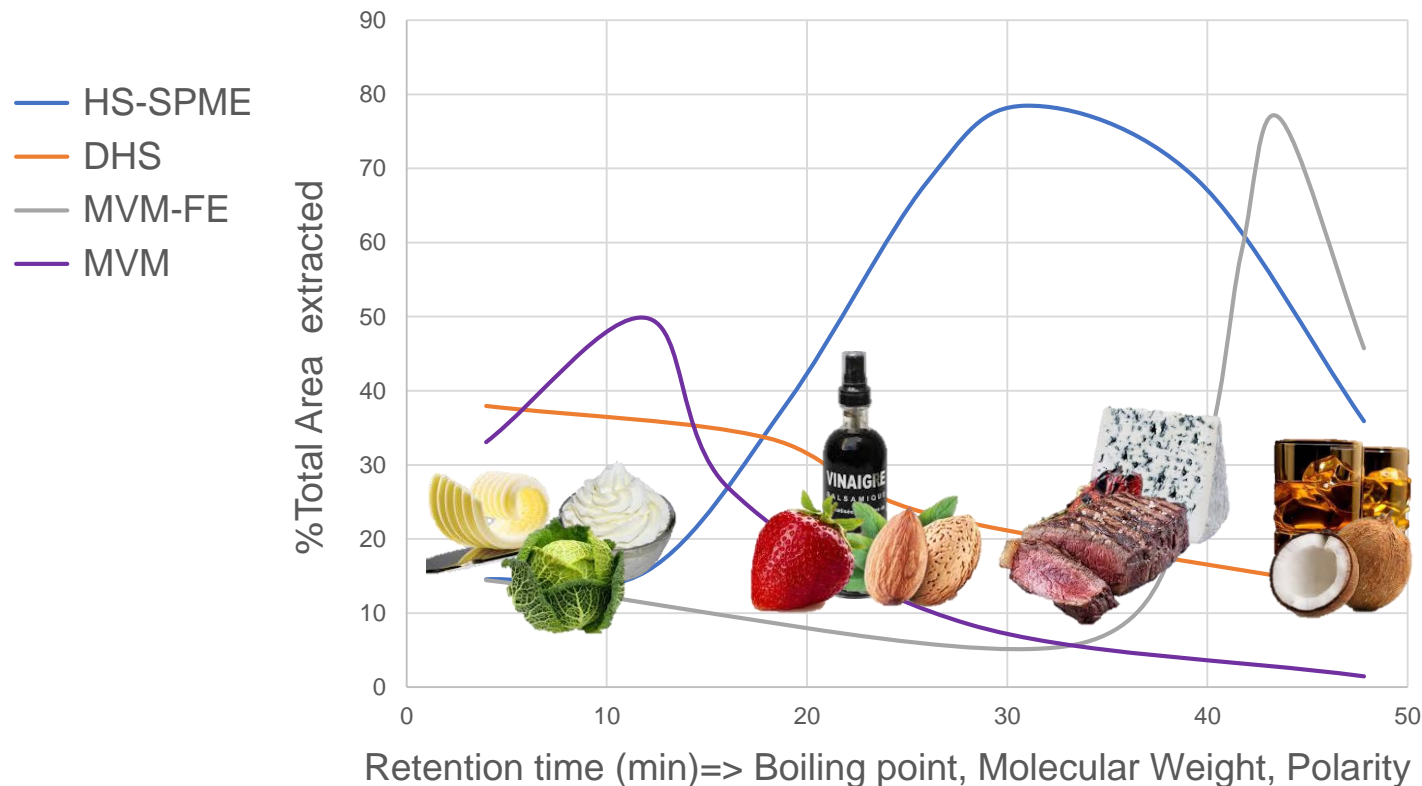
HS-SPME

HS-SPME, DHS, MVM

HS-SPME, DHS, MVM

Depending on which molecule you want to extract

% total area extracted depending on extraction technique



To have the best technical choice, define your goal!!!:

- HS-SPME: Wider range of different molecules
- MVM and DHS: More volatile molecules (MVM better results than DHS)
- MVM-FE: Less volatile molecules (ex: Lactones) but longer sequences and less discriminant

**PERSPECTIVES:
WHICH IS THE BETTER EXTRACTION METHOD FOR
THESE PRODUCTS?**



+ The more **Representative**: The one that allows producing extracts with aroma characteristics as close as possible to those of the corresponding product¹

HS-SPME

DHS

MVM

MVM-FE

Let's do sensory tests to choose the extraction technique allowing to study products sensory properties!!!



1: Pointot, P., Arvisenet, G., Grua-Priol, J., Fillonneau, C., & Prost, C. (2009). Use of an artificial mouth to study bread aroma. *Food Research International*, 42(5-6), 717–726.



Sharing smiles



THANK YOU
FOR
YOUR ATTENTION

