

REGARDS CROISÉS SUR  
**LE GOÛT DU CHENIN**

*INTERDISCIPLINARY PERSPECTIVES ON*  
**THE TASTE OF CHENIN**



**David Biraud**  
Mandarin Oriental



**Sommelier**

**Hélène Nieuwoudt**  
Stellenbosch University



**Pascal Poupault**  
IFV



**Enology &  
Sensory analysis**

**Cathy Van Zyl**  
Platter's



**Wine critic**



**Wine producers**

**Patrick Baudoin**



**Ken Forester**



**Gabriel Lepousez**  
Institut Pasteur



**Neurosciences**



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**Neurosciences**

**POSTER  
SESSION**



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UNIVERSITY

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1918 · 2018

*forward together · saam vorentoe · masiye pbambili*

# Deciphering the general sensory profile of Chenin Blanc from a wine consumers approach

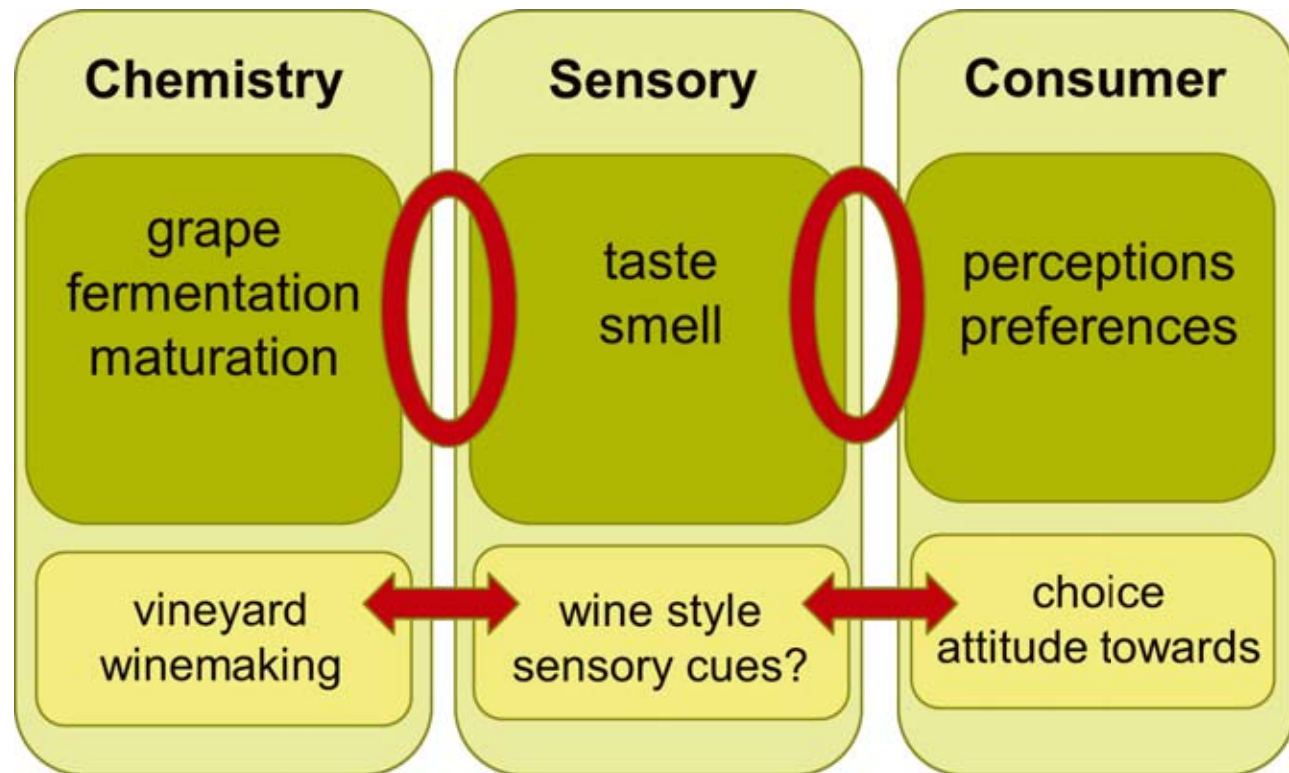
**Hélène Nieuwoudt**

Institute for Wine Biotechnology, Department Viticulture and Oenology,  
Stellenbosch University, South Africa

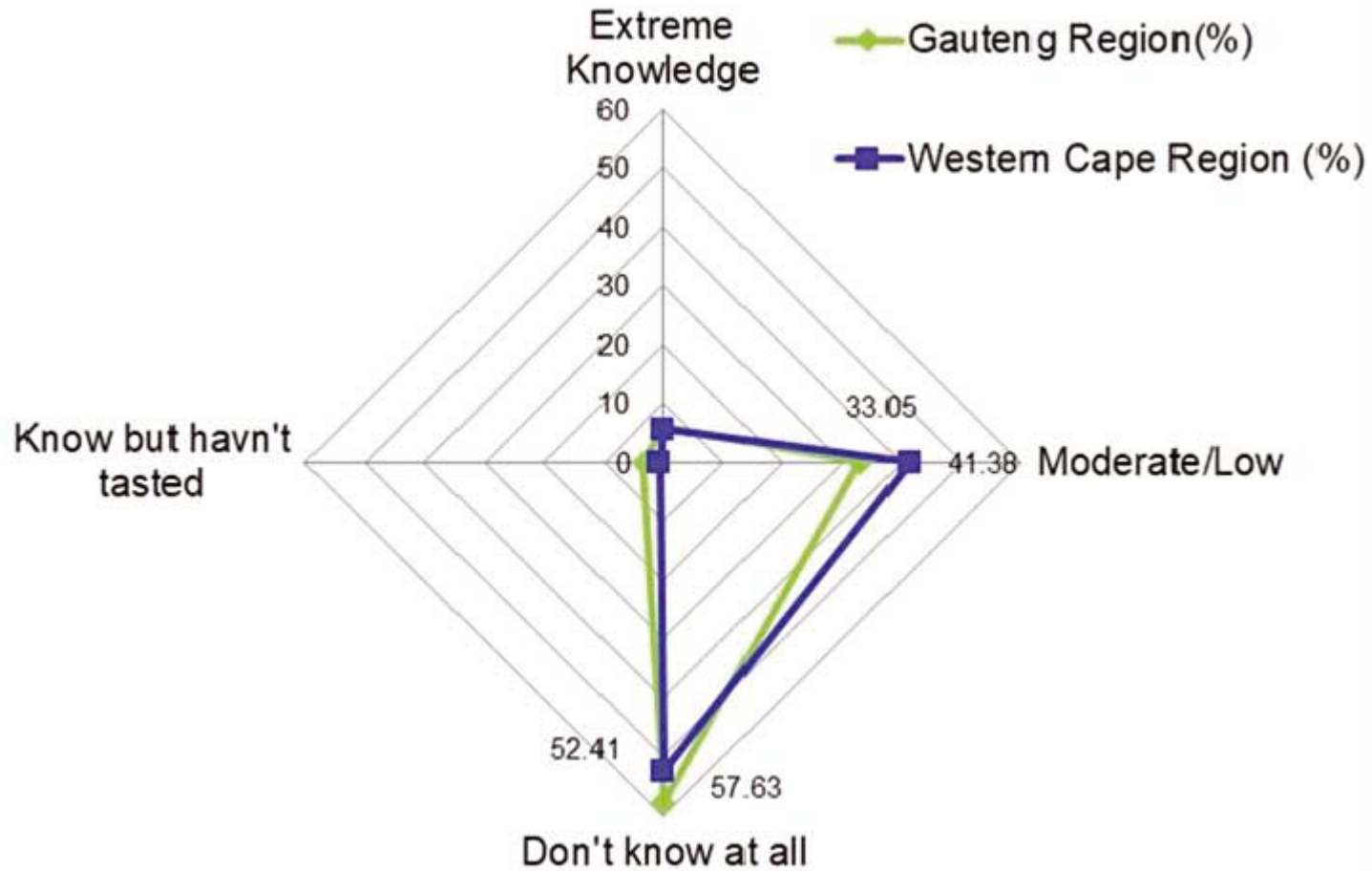
**CB** CHENIN BLANC 1, 2, 3 JULY 2019  
**IC** INTERNATIONAL CONGRESS ANGERS - FRANCE  
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# | Research programme



# | Consumer awareness .....



# | Through the lens of the consumer.....



Chenin Blanc...  
...yeah... let me  
think... it's sweet  
white wine....  
right?

Not sure.... I  
rather buy  
something  
that I know....



# | The task of research and industry .....



| What is required? ..insight into..



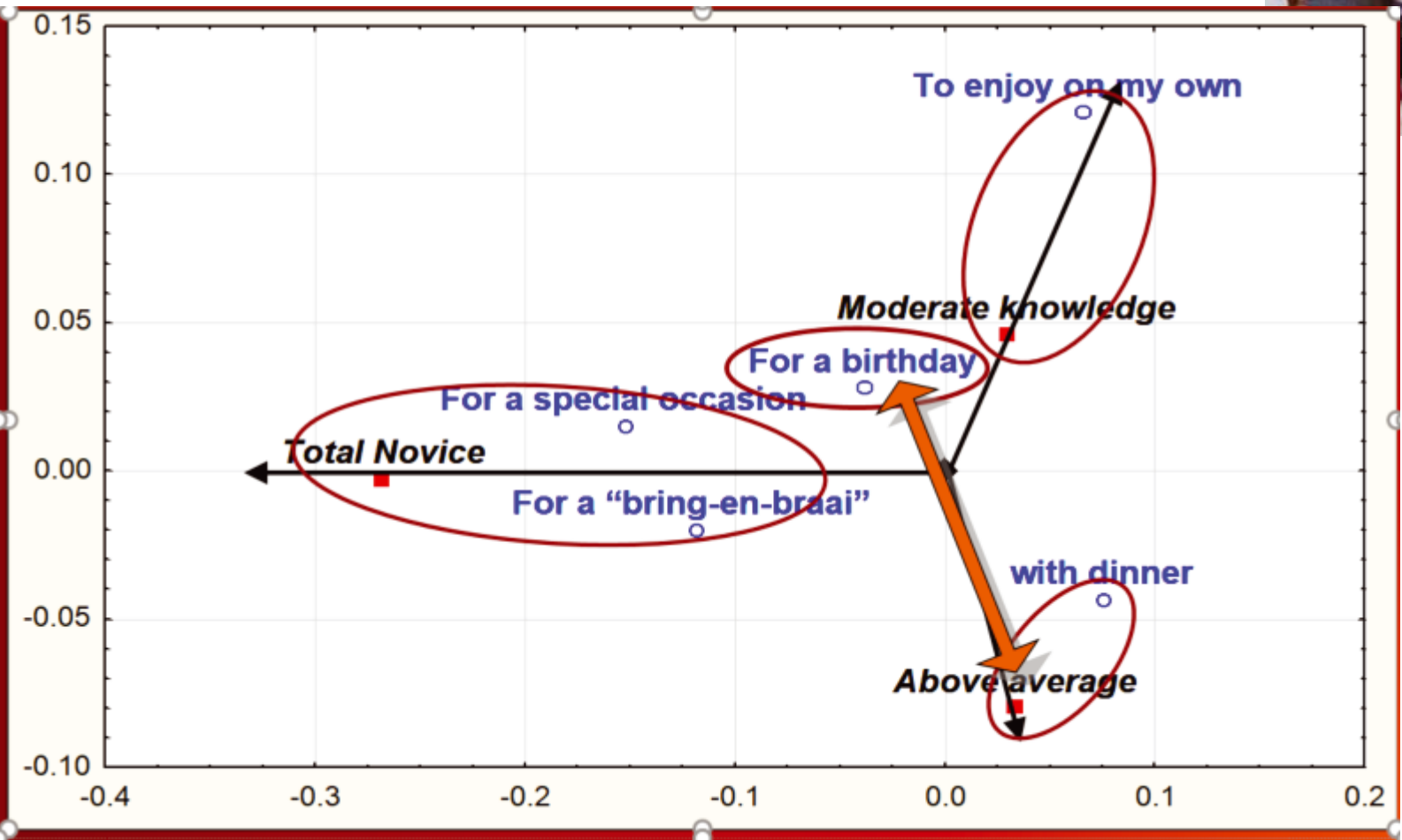
Consumers' **WINE PURCHASE BEHAVIOUR**

Consumers' perception of Chenin **TASTE**

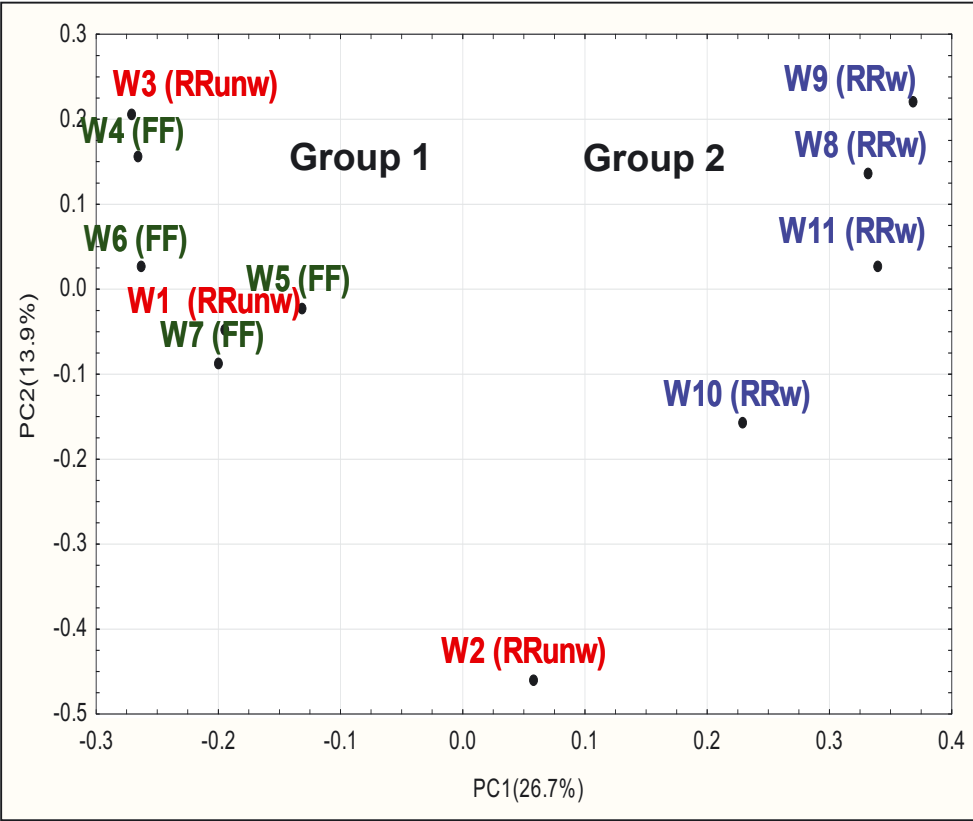
Chenin Blanc wine **SENSORY DOMAIN**

**MATCH EXPECTATIONS**

# Generation w-Y-ne...Purchase behaviour



# Generation w-Y-ne..... Taste perception of Chenin

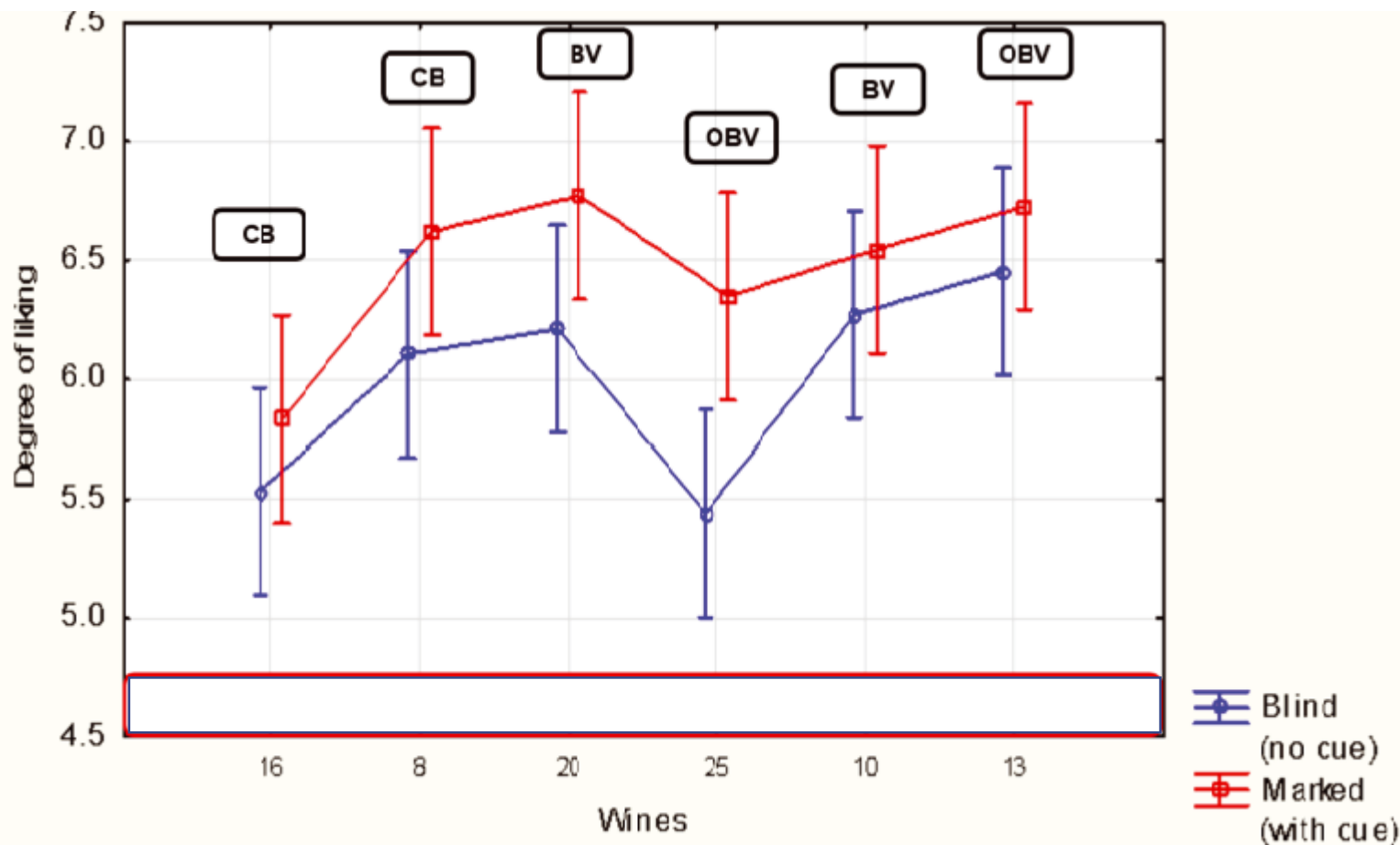


## Uninstructed sorting task

11 wines

3 styles

# | Impact of label cues.....



# | Chenin blanc sensory domain.....



**Mining of  
data**



- To better understand the diversity in Chenin Blanc
- To provide cues to the wine industry for future style developments

**Feedback to  
Research & industry  
sector**



**Interpret the  
data**

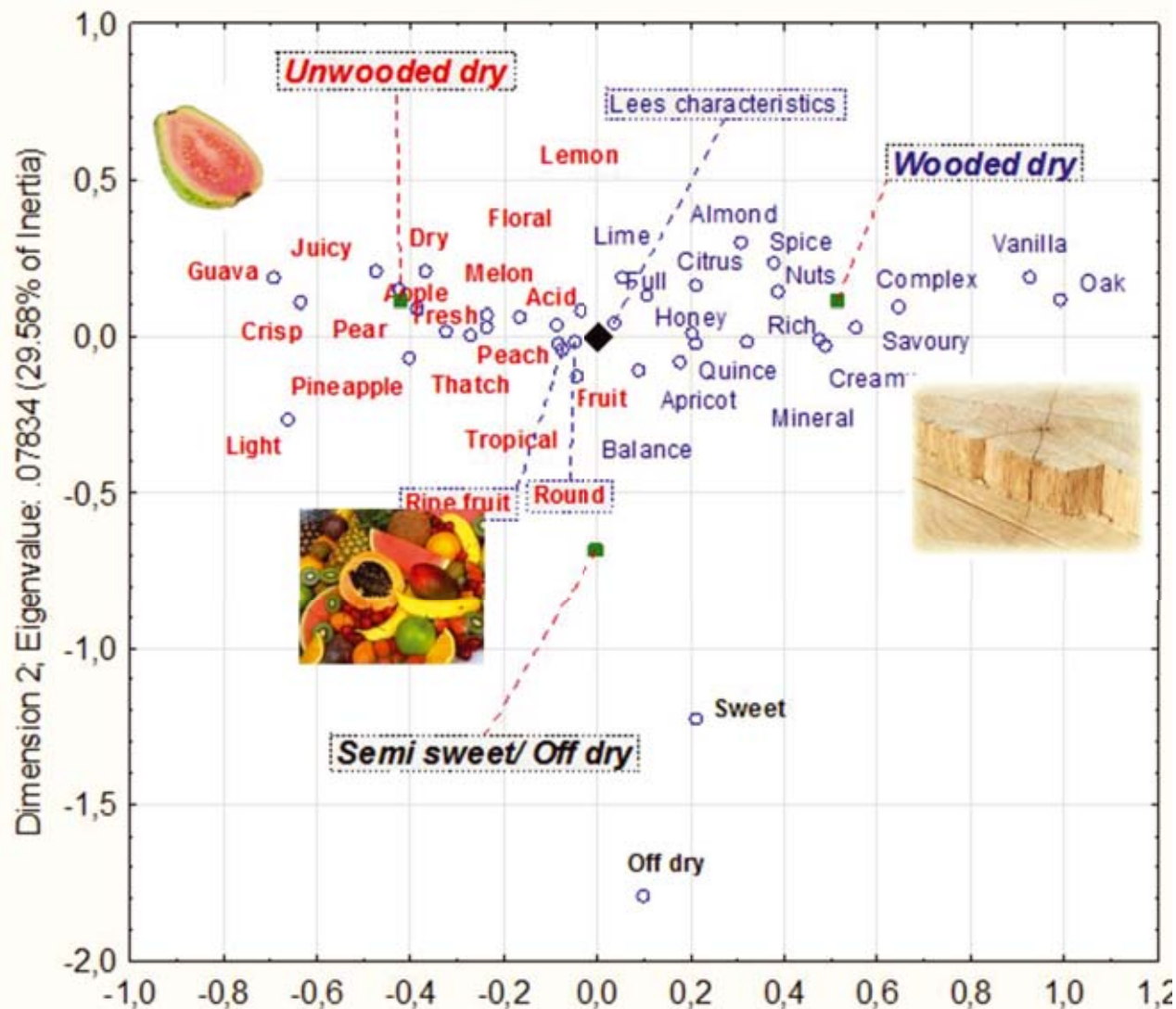
# | Our data \* .....



- Chenin blanc wines = **2,748**
  - **38,503** words
  - **266** sensory attributes
  - **39** words cited > 50 times

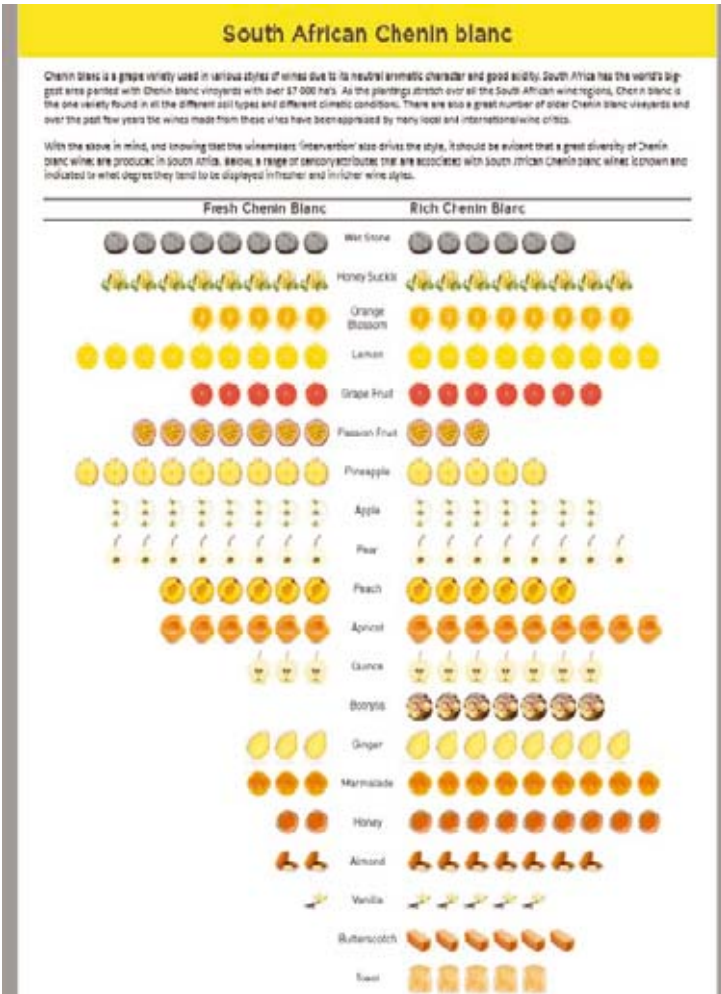
- \*Platter's 2008-2014

# | Visualizing Chenin sensory domain.....





# Chenin blanc sensory domain simplified.



# | Acknowledgements



- Funders
- CBA and Private Cellars
- Post Graduate students
- Colleagues from Stellenbosch University
- Information Science Bruce Watson, Fritz Venter



science  
& technology  
Department:  
Science and Technology  
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## Session 6 : Taste, tastes of the chenin

# Panel expert, méthode textuelle et marqueurs chimiques pour caractériser les composantes aromatiques du chenin du Val de Loire

*[pascal.poupault@vignevin.com](mailto:pascal.poupault@vignevin.com)*



# Axe 1



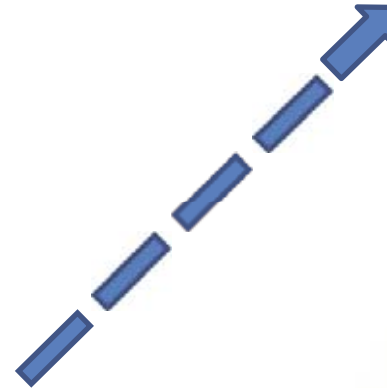
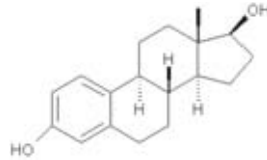
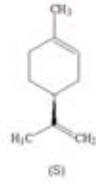
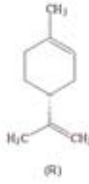
? Date de récolte

Maturité technologique

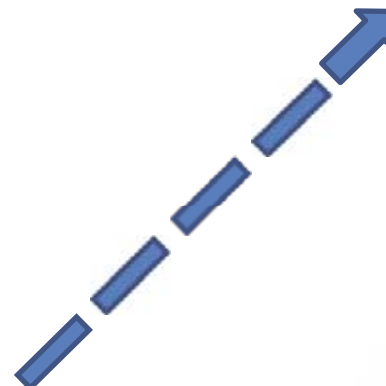
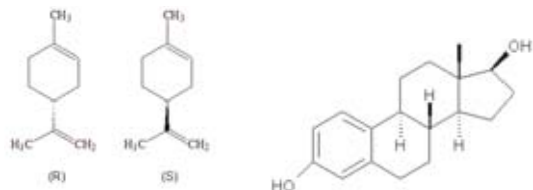
Maturité aromatique



# Axe 2



# Axe 2



## Mise en évidence des profils sensoriels du chenin sur 60 vins commerciaux (jury expert ESA)



Smell attribute		Aroma attribute	Description of the attribute
<b>Yellow fruits</b>		<b>Yellow fruits</b>	Peach, abricot, ...
<b>White fruits</b>		<b>White fruits</b>	Pear, banana, apple, quince
<b>Citrus</b>	<b>Citrus</b>	Grapefruit, lemon, ...	
<b>Exotic fruits</b>		<b>Exotic fruits</b>	Mango, pineapple
<b>Roasted</b>	<b>Roasted</b>	Roasted	
<b>Woody</b>	<b>Woody</b>	Woody	
<b>Spicy</b>	<b>Spicy</b>	Cinnamon, vanilla, clove	<i>great aromatic complexity</i>
<b>Caramel</b>	<b>Caramel</b>	Caramel	
<b>Honey</b>	<b>Honey</b>	Honey	
<b>Butter</b>	<b>Butter</b>	Butter	
<b>White flowers</b>		<b>White flowers</b>	Acacia, linden, lilac, jasmine
<b>Broom</b>	<b>Broom</b>	Broom	
<b>Cut grass</b>	<b>Cut grass</b>	Fresh vegetal, herbs, grass	
<b>Hay</b>	<b>Hay</b>	Dry vegetal, tabacoo	
<b>Flint</b>	<b>Flint</b>	Flint	
<b>Earty</b>	<b>Earty</b>	Earthy, musty	
<b>Cork</b>	<b>Cork</b>	Cork	
<b>Cabbage</b>	<b>Cabbage</b>	Cabbage	
<b>Animal</b>	<b>Animal</b>	Musk, leather, ...	
<b>Alcohol</b>	<b>Alcohol</b>	Alcohol	
<b>Nut</b>	<b>Nut</b>	Nut	



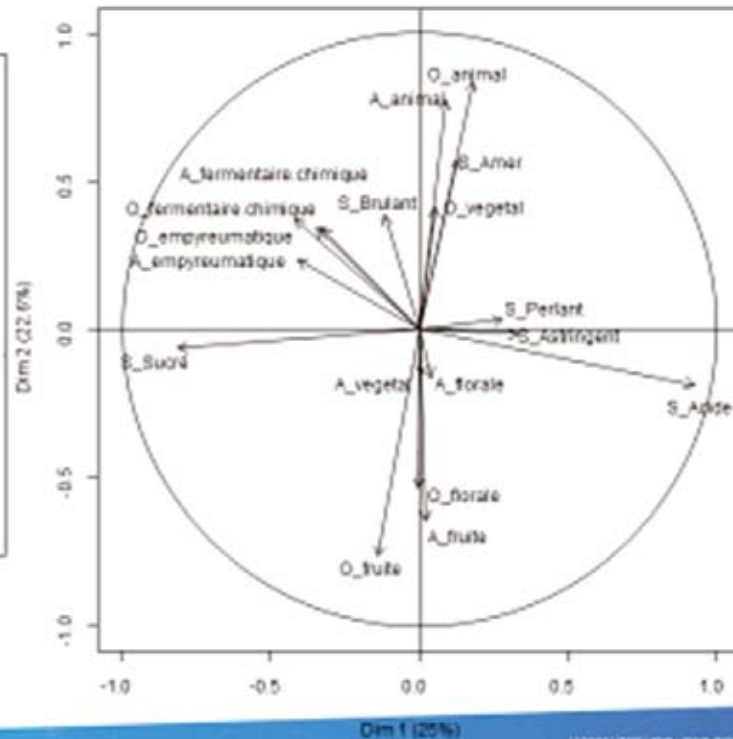
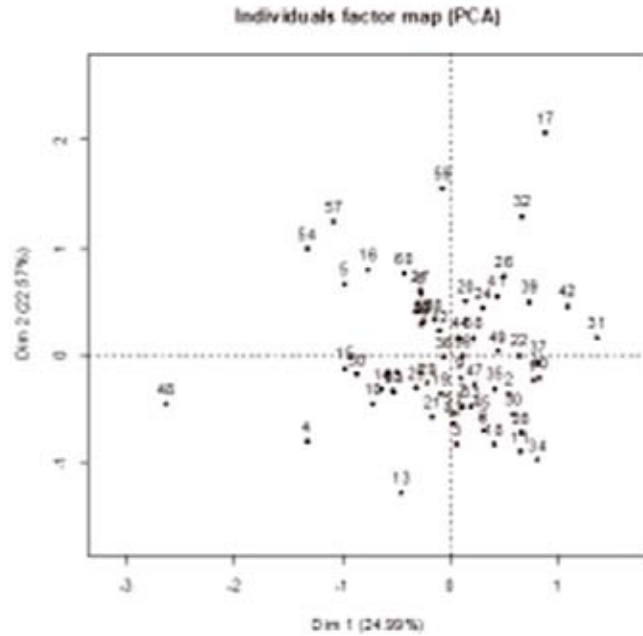


# Mise en évidence des profils sensoriels du chenin sur 60 vins commerciaux (jury expert ESA)



## Caractérisation sensorielle des vins Caractérisation générale des vins

	Dim.1	Dim.2	Dim.3	Dim.4	Dim.5
Variance	0.470	0.425	0.293	0.235	0.123
% of var	24.988	22.567	15.583	12.514	6.563
Cumulative of % var	24.988	47.555	63.138	75.652	82.215



## Mise en évidence des marqueurs aromatiques des différents profils sensoriels du chenin

Echantillons	Terpenes					Acetates					Alcools			Ethers			Alcadiols		Alcylphénols		Alcylphénols		Alcylphénols
	linalool	nerol	geraniol	citronellol	a-terpéneol	2-phenylethanol (rose, floral)	hexyl acetate	isoamyl acetate	2-phenylethyl acetate	ethyl decanoate	ethyl hexanoate (pomme verte)	ethyl octanoate (ananas)	ethyl butyrate (ananas)	2-hydroxypropanoate d'éthyle	3-hydroxybutanoate d'éthyle	2-méthylbutanoate d'éthyle	2-méthylpropanoate d'éthyle	2-hydroxyisocaproate d'éthyle	1,1,6-triméthyl-1,2-dihydronaphthalène	α-ionone	β-damascénone (coing)	β-ionone	3-mercaptoprohexan-1-ol (pamplemousse)
seuil perception (µg/L)	15	400	20	100	400	10000	700	2700	250	500	200	1100	20							1,00		60,0	
	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	
COR D1	2,9	1,4	0,6	0,6	2,3	53720	15	511	114	147	350	417	190	9312	140	38	327	136	0,6	nd	3,2	0,04	276
COR D2	3,4	1,4	2,2	1,1	2,0	46976	29	1171	292	284	480	529	261	7008	212	18	172	84	0,5	nd	3,3	0,01	377
BMO D1	3,0	0,9	0,8	0,7	2,3	62063	21	757	158	225	467	529	168	7229	161	31	280	106	0,4	nd	2,2	0,07	250
BMO D2	4,0	1,4	1,9	0,4	2,5	50590	38	3022	513	347	711	855	337	7207	294	15	173	79	0,3	nd	2,3	0,02	97
LAN D1	3,1	1,9	1,0	0,2	2,4	47857	18	1081	210	239	486	624	288	9588	261	24	216	114	0,5	0,015	2,5	0,03	332
LAN D2	4,0	1,7	1,4	0,8	2,5	51491	21	1281	293	248	434	613	245	9585	288	26	182	122	0,5	nd	4,1	0,02	262
MB D1	3,7	2,2	0,9	0,4	3,1	47891	18	839	165	61	307	333	199	13676	259	28	200	128	0,7	nd	3,4	0,03	260
MB D2	3,8	2,3	1,0	-0,1	3,2	45834	26	2508	567	339	535	745	365	15046	466	26	181	129	0,8	nd	3,7	0,02	369
FAY D1	5,2	1,9	0,9	1,2	2,2	38951	24	1730	316	291	525	659	312	8831	266	17	144	99	0,7	nd	3,1	0,02	472
FAY D2	6,1	2,2	1,5	1,6	2,6	42467	31	1538	299	260	501	598	271	8189	272	20	143	111	0,8	nd	4,5	0,03	492
CAD	4,3	1,4	2,3	1,3	2,5	42222	23	1417	227	194	581	577	291	8121	224	21	171	101	0,4	nd	2,5	0,04	363
D2M	4,4	2,3	0,9	0,2	3,6	40921	36	2993	375	315	692	832	316	9874	323	30	229	120	0,5	nd	2,0	0,03	135
PAS	3,5	1,7	0,9	0,9	2,4	34959	11	730	127	129	348	350	235	13407	236	40	304	145	0,6	nd	2,8	0,04	400
PUY	3,1	1,5	1,1	0,9	2,5	45411	18	957	168	250	552	584	228	8817	211	27	234	119	0,5	nd	2,1	0,03	384
RAB D1	4,0	1,7	2,1	1,2	2,0	41433	20	1944	193	90	667	614	326	9962	320	33	239	75	0,3	0,016	3,3	0,04	175
ROC	3,5	1,9	0,6	0,2	3,1	42901	21	860	154	87	375	373	202	11380	234	29	190	120	0,6	nd	2,6	0,04	111

# Mise en évidence des marqueurs aromatiques des différents profils sensoriels du chenin

## INTERACTION OF 3MH, ETHYL HEXANOATE, AND LINALOOL IN DEAROMATIZED CHENIN BLANC BY DESCRIPTIVE ANALYSIS

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### Background

The presence of thiols in South African Chenin Blanc wines was recently reported, which established the need to understand the sensory contribution of thiols to the aroma of these wines. To study the perception of thiols and their interactions with other volatile, an interaction study was performed. Different concentrations of a thiol (3-methylbut-2-yl sulfide), an ester (ethyl hexanoate) and a terpenol (linalool) were added into a dearomatized Chenin Blanc matrix and interactions were assessed by descriptive analysis (DA).

### Experimental Design

**3MH**    **ethyl hexanoate**    **linalool**

1 Train and test combinations    2 Train and test singles    3 Compare results

### Results

#### Singles

Figure 1. Single factor test

Figure 2. PCA of significant descriptors (n=28)

- 3MH was described as guava, tropical, red and citrusy, and negatively correlated with fresh.
- Ethyl hexanoate had a subtle contribution, and had medium intensities of base and guava.
- Linalool was described as fresh, peach, tea, orange, bergamot/lemon and orange blossom and negatively correlated with lemon, grapefruit, and peach.

#### Combinations

Figure 3. Combination split test

Figure 4. PCA of significant descriptors (n=28)

- 3MH was described as guava, tropical, citrusy, red, orange, peach, and negatively correlated with fresh.
- Ethyl hexanoate had guava, and ethyl ester, citrusy, orange, and was negatively correlated with fresh.
- Linalool was described as fresh, orange blossom, and bergamot/lemon and negatively correlated with guava, grapefruit, lemon, and tea.

### Conclusions

- Linalool and 3MH have an antagonistic relationship
- 3MH was better associated with guava and grapefruit, not passion fruit, which could be due to the levels chosen for the matrix used for spiking.
- Ethyl hexanoate influenced tropical and sweet aromas, only when in combination with other compounds.
- Linalool and 3MH were more aromatically powerful than ethyl hexanoate.

Acknowledgements: Prof. Marjolijn de Groot, Winetech

## THIOL LEVELS IN YOUNG SOUTH AFRICAN CHENIN BLANC WINE AND THEIR IMPACT ON SENSORY PERCEPTION

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Wines, Stellenbosch.ac.za

### Background

The attributes that thiols impart to the sensory aspects of wine are considered positive, and the winemakers want to preserve them for as long as possible. Since thiols are sensitive to degradation, it is important to see from which level these compounds start in young wines, and if the attributes associated to those levels play a role and make a difference in the young wine character. This means that (1) very young wines contain a higher amount of these compounds, that decreases with time; (2) the aroma attributes associated with these compounds will be at their highest in very young wines.

Young South African Chenin Blanc wines (not older than one month from bottling), commercially available, were selected based on the winemakers' recommendations and serving notes for attributes associated with thiols, such as 'guava', 'passion fruit', 'grapefruit', and 'grapefruit'. The wines were analyzed for thiols (GC-MS at Vinlab, Stellenbosch) and evaluated sensorially by a panel of 15 experts using CATS.

### What do consumers see?

Analysis of information given on back labels and tasting notes showed general attributes associated with Chenin Blanc fresh and fruity wines.

guava tropical  
aromatic fresh & fruity  
citrusy crisp acidity

### What does thiol analysis show?

3MH varied between 189-1649 ng/L (ave 664 ng/L) and 3MH between 29-936 ng/L (ave 288 ng/L). The values are especially high for 3MHA, which is more prone to degradation than 3MH.

Sample ID	3MH (ng/L)	3MHA (ng/L)	ratio
A	490	207	1.9
B	206	123	3.2
C	225	28	3.6
D	176	493	1.8
E	367	138	2.7
F	808	171	4.7
G	1309	576	2.4
H	180	241	2.4
I	504	472	2.7
J	152	206	1.9
K	390	526	1.8
L	1649	636	1.8
M	189	39	2.9
N	796	247	3.1
O	767	269	3.7

### What do experts say?

Some of the more prominent attributes are associated with thiols (guava, grapefruit, passion fruit, tropical) but they are present regardless of the level of measured thiols.

The overall attributes for the wines is very similar to the attributes for the wines with highest and lowest thiol levels. Even in very low concentrations, thiols can strongly influence wine aroma.

Differences based on thiol levels were not found to always reflect in the frequency of descriptors used by the assessors.

Sample L (highest thiol levels: 1649 ng/L 3MH, 936 ng/L 3MHA)

Sample M (lowest thiol levels: 189 ng/L 3MH, 29 ng/L 3MHA)

General descriptors for the sample set

Acknowledgements: Groot, Winetech

# Marqueurs aromatique du chenin, profil sensoriel des vins

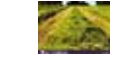
## formation d'un jury expert aux marqueurs aromatiques

Smell attribute	Aroma attribute	Description of the attribute
Yellow fruits	Yellow fruits	Peach, abricot, ...
White fruits	White fruits	Pear, banana, apple, quince
Citrus	Citrus	Grapefruit, lemon, ...
Exotic fruits	Exotic fruits	Mango, pineapple
Roasted	Roasted	Roasted
Woody	Woody	Woody
Spicy	Spicy	Cinnamon, vanilla, clove
Caramel	Caramel	Caramel
Honey	Honey	Honey
Butter	Butter	Butter
White flowers	White flowers	Acacia, linden, lilac, jasmine
Broom	Broom	Broom
Cut grass	Cut grass	Fresh vegetal, herbs, grass
Hay	Hay	Dry vegetal, tobacco
Flint	Flint	Flint
Earthy	Earthy	Earthy, musty
Cork	Cork	Cork
Cabbage	Cabbage	Cabbage
Animal	Animal	Musk, leather, ...
Alcohol	Alcohol	Alcohol
Nut	Nut	Nut

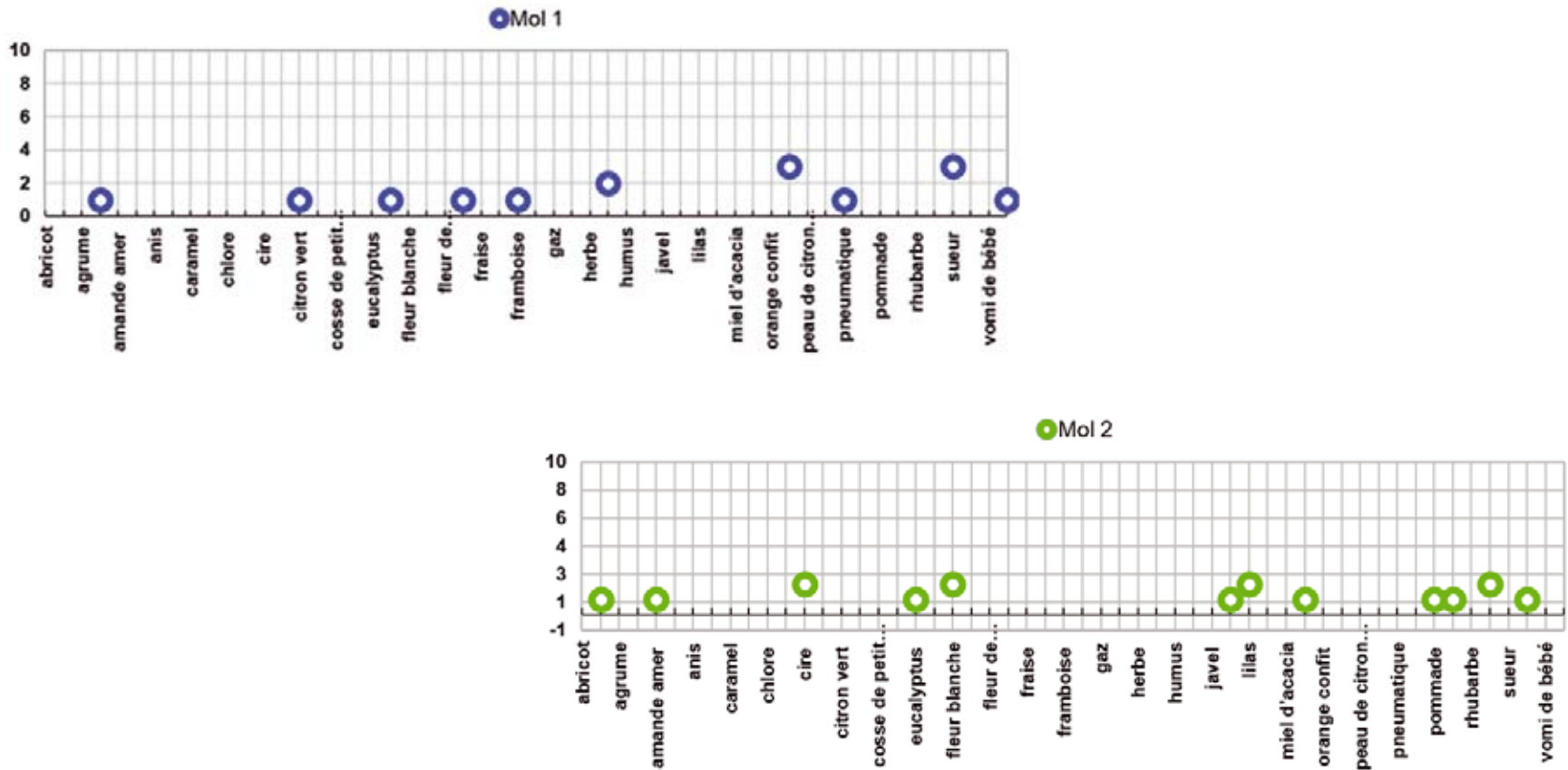


Attribute	Intensity	Quality	Quantity
Yellow fruits	++	++	++
White fruits	++	++	++
Citrus	++	++	++
Exotic fruits	++	++	++
Roasted	++	++	++
Woody	++	++	++
Spicy	++	++	++
Caramel	++	++	++
Honey	++	++	++
Butter	++	++	++
White flowers	++	++	++
Broom	++	++	++
Cut grass	++	++	++
Hay	++	++	++
Flint	++	++	++
Earthy	++	++	++
Cork	++	++	++
Cabbage	++	++	++
Animal	++	++	++
Alcohol	++	++	++
Nut	++	++	++

Composante	Molécule
Agrume	3-mercaptohexan-1-ol
Florale	2-phényléthanol
Fruité 1	Hexanoate d'éthyle
Fruité 2	Butanoate d'éthyle
Fruité 3	B-damascénone
Végétal	Cis-3-hexen-1-ol

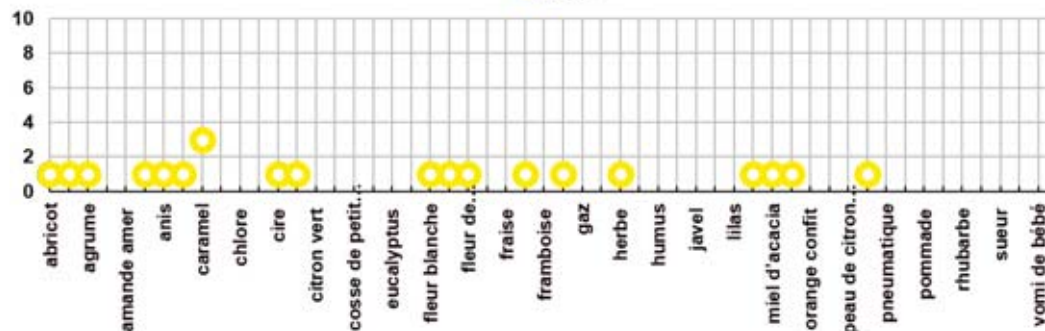


## Marqueurs aromatique du chenin, profil sensoriel des vins formation d'un jury expert aux marqueurs aromatiques

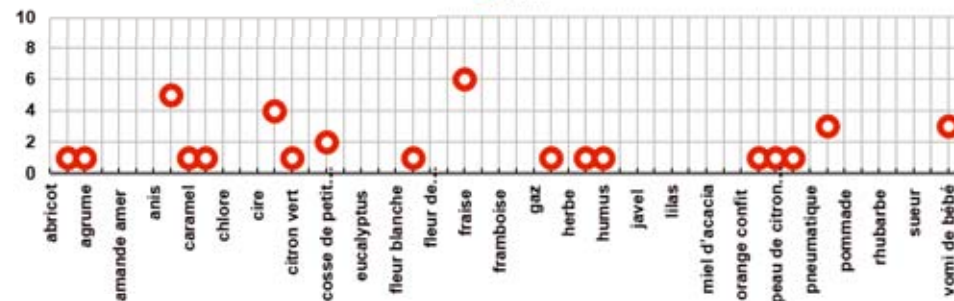


## Marqueurs aromatique du chenin, profil sensoriel des vins formation d'un jury expert aux marqueurs aromatiques

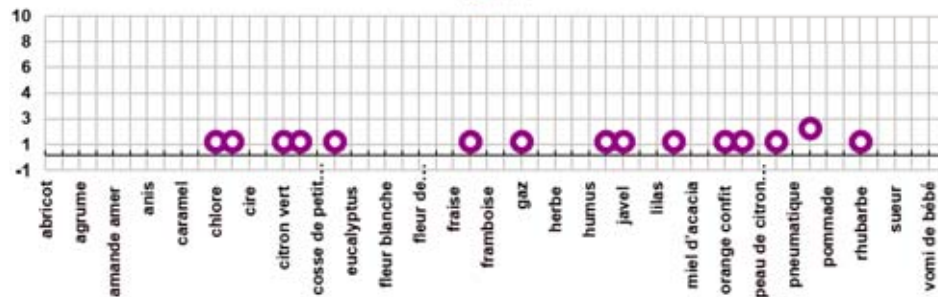
Mol 3



Mol 4



Mol 5

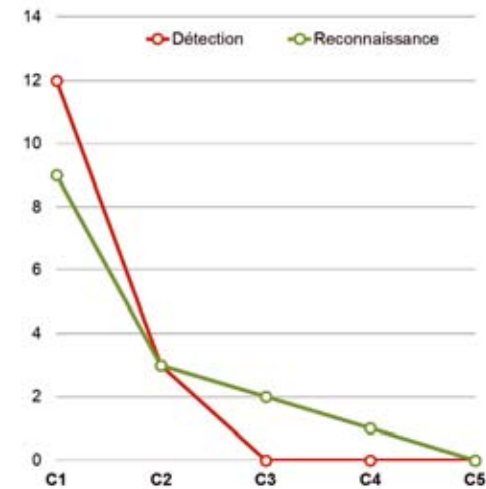


## Marqueurs aromatique du chenin, profil sensoriel des vins formation d'un jury expert aux marqueurs aromatiques

Tests de perception

Tests de reconnaissance

Tests de calage sur les descripteurs aromatiques



# Consensus

## Marqueurs aromatique du chenin, profil sensoriel des vins formation d'un jury expert aux marqueurs aromatiques

Composante	Descripteurs consensuels	Molécule
Agrume	pamplemousse, sueur	3-mercaptohexan-1-ol
Florale	lilas, rose	2-phényléthanol
Fruité 1	banane, poire	Hexanoate d'éthyle
Fruité 2	fraise	Butanoate d'éthyle
Fruité 3	Coing, poivre	B-damascénone
Végétal	Herbacé, Légumes verts	Cis-3-hexen-1-ol



## Caractérisation des vins de chenin par le jury formé

ECHANTILLON N° ...													
Sensoriel													
	Odeur	pas du tout	un peu	moyen	assez	beaucoup							
	<b>VÉGÉTAL</b>	O	O	O	O	O							
	Odeur	pas du tout	un peu	moyen	assez	beaucoup							
	<b>AGRUME</b>	O	O	O	O	O							
	<b>FLORAL</b>	O	O	O	O	O							
	<b>FRUITÉ AP</b>	O	O	O	O	O							
	<b>FRUITÉ F</b>	O	O	O	O	O							
	<b>FRUITÉ CP</b>	O	O	O	O	O							
	<b>ACIDE</b>	0	I-	-I-	-I-	-I-	-I-	-I-	-I-	-I-	-I-	-I-	10

## 2 – Marqueurs aromatique du chenin, profil sensoriel des vins

### 2-4 : caractérisation des vins issus des parcelles des 2 réseaux (consensus)

1	2	Pas du tout	Un peu	moyen	assez	beaucoup	Colonne 1
Sensoriel							0
	Végétal	1	4	6	4		15
	Agrume	1	1	8	5		15
	Floral	4	6	3	2		15
	Fruité AP	8	2	3	2		15
	Fruité FV	8	4		3		15
	Fruité CP	7	4	2	2		15
	Acide	5,07					5,066

1	2	Pas du tout	Un peu	moyen	assez	beaucoup	Colonne 1
Sensoriel							0
	Végétal	5	4	3	3		15
	Agrume	4	8	3			15
	Floral	11	3	1			15
	Fruité AP	8	6	1			15
	Fruité FV	3	3	3	5	1	15
	Fruité CP	8	2	3	2		15
	Acide	5,53					5,53

1	2	Pas du tout	Un peu	moyen	assez	beaucoup	Colonne 1
Sensoriel							0
	Végétal	7	4	1	3		15
	Agrume	6	7	1	1		15
	Floral	6	7		2		15
	Fruité AP	3	6	4	2		15
	Fruité FV	6	2	4	3		15
	Fruité CP	4	6	3	1	1	15
	Acide	4,33					4,33



## Session 6 : Taste, tastes of the chenin

**Panel expert, méthode textuelle et marqueurs chimiques pour caractériser les composantes aromatiques du chenin du Val de Loire**

*[pascal.poupault@vignevin.com](mailto:pascal.poupault@vignevin.com)*

**David Biraud**  
Mandarin Oriental



**Sommelier**

**Hélène Nieuwoudt**  
Stellenbosch University



**Pascal Poupault**  
IFV



**Enology &  
Sensory analysis**

**Cathy Van Zyl**  
Platter's



**Wine critic**



**Gabriel Lepousez**  
Institut Pasteur



**Neurosciences**

**Wine producers**

**Patrick Baudoin**



**Ken Forester**



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Patrick  
Baudoin



Ken  
Forester





Interdisciplinary perspectives on the taste of Chenin  
The Wine Judge: Cathy van Zyl MW



**CHENIN  
BLANC** 1, 2, 3 JULY 2019  
ANGERS - FRANCE  
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CONGRESS CONGRESS CENTRE  
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VAL DE LOIRE



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ASSOCIATION



# The taste of Chenin: The wine judge

- Tasting criteria
  - Dealing with diversity
  - Chenin versus other varieties
  - Common descriptors
- 





# The taste of Chenin: The wine judge



## Tasting criteria

- Balance
- Integration



# The taste of Chenin: The wine judge



## Tasting criteria

- Balance
- Integration
- Presence
- Freshness
- Length
- Vinosity
- Completeness
- Sense of identity



# The taste of Chenin: The wine judge



## Tasting criteria

- NOT excessive fruitfulness
- NOT complexity



# The taste of Chenin: The wine judge




## Dealing with diversity

- ▶ Do separate by country and region/appellation
- ▶ Do separate by sweetness level where it is linked to a well-known style, such as NLH.
- ▶ Don't separate by fermentation vessel – stainless steel, old oak, new oak, egg, amphora
- ▶ Interrogate your decision, have more detailed discussions



# The taste of Chenin: The wine judge



## Versus Sauvignon blanc and Chardonnay

- More emphasis on Chenin's acidity and the nature of that acidity
- Less tolerant of 'slipperiness' from barrel fermentation/battonage
- Less tolerant of 4MMP

# The taste of Chenin: The wine judge





# The taste of Chenin: The wine judge



## International Wine Challenge

- ▶ 44 Chenins
- ▶ 1 - Australia
- ▶ 10 – Loire, 1 oaked
- ▶ 33 - South Africa, 19 oaked

# The taste of Chenin: The wine judge

- ▶ International Wine Challenge:
- ▶ Loire descriptors

Fresh acidity	Citrus	Lemon
Bruised apples	Baked apples	Bramley apples
Apple crumble	Oyster shell	White flower
Iodine	Saline	Grass
Herbal	Sage	Hay
Orchard fruits	Williams pear	Quince
Almonds	Cucumber	Pineapple
Honey	Sweetness	Cheesecake
Chalky	Waxy	Tight



# The taste of Chenin: The wine judge

- ▶ International Wine Challenge:
- ▶ South African descriptors

Fresh acidity	Lanoline	Citrus	Spicey
Pink Grapefruit	Lemon	Lemon peel	Quince
Apples	Apple pie	Floral	Herby
Pear	Nutty	Pineapple	Wax
Honey	Stonefruit	Apricot	Peach
Nectarine	Tropical	Papaya	Melon
Candied fruit	Guava	Pepper	Flint
Lime	Cedar	Toasty	Smokey
Oaky	Vanilla	Pastry	Creamy
Mineral	Greengage	Alcohol	Savoury

# The taste of Chenin: The wine judge

Fresh acidity	Citrus	Lemon	Bruised apples	Baked apples
Bramley apples	Apple crumble	Grass	Hay	Iodine
Oyster shell	Saline	Herbal	Sage	White flower
Orchard fruits	Williams pear	Quince	Almonds	Cucumber
Pineapple	Honey	Sweetness	Cheesecake	Chalky
Waxy	Tight	Fresh acidity	Lanoline	Citrus
Pink Grapefruit	Lime	Lemon	Lemon peel	Quince
Apples	Apple pie	Floral	Herby	Pear
Nutty	Pineapple	Wax	Honey	Stonefruit
Apricot	Peach	Nectarine	Tropical	Papaya
Melon	Candied fruit	Guava	Pepper	Greengage
Spicy	Cedar	Toasty	Smokey	Oaky
Vanilla	Pastry	Creamy	Mineral	Flint
Alcohol	Savoury			



# The taste of Chenin: The wine judge



➤ International Wine Challenge:

➤ 10 shared descriptors

- Fresh acidity
- Citrus
- White flowers/floral
- Pears
- Quince
- Apples
- Pineapple
- Waxy
- Honey
- Nutty/Almonds
- Herbal/Herby



# The taste of Chenin: The wine judge

➤ Chenin Blanc Top 10 Challenge

➤ Professor Wessels du Toit: University of Stellenbosch

- 2016 – highest: well-defined aromas, good balance, good palate
- 2016 – lowest: one-dimensional, one descriptor being dominate
- 2017 – highest: variety of styles, more complex wines
- Most often cited was oak, pineapple, passion fruit, orange and mineral

# The taste of Chenin: The wine judge



# The taste of Chenin: The wine judge



# The taste of Chenin: The wine judge



# The taste of Chenin: The wine judge







# The taste of Chenin: The wine judge



## Minerality?

- 44 IWC wines – mentioned 1x
- Iodine, oystershell, flint
- Minerality and consumers?

THANK YOU



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**Wine producers**

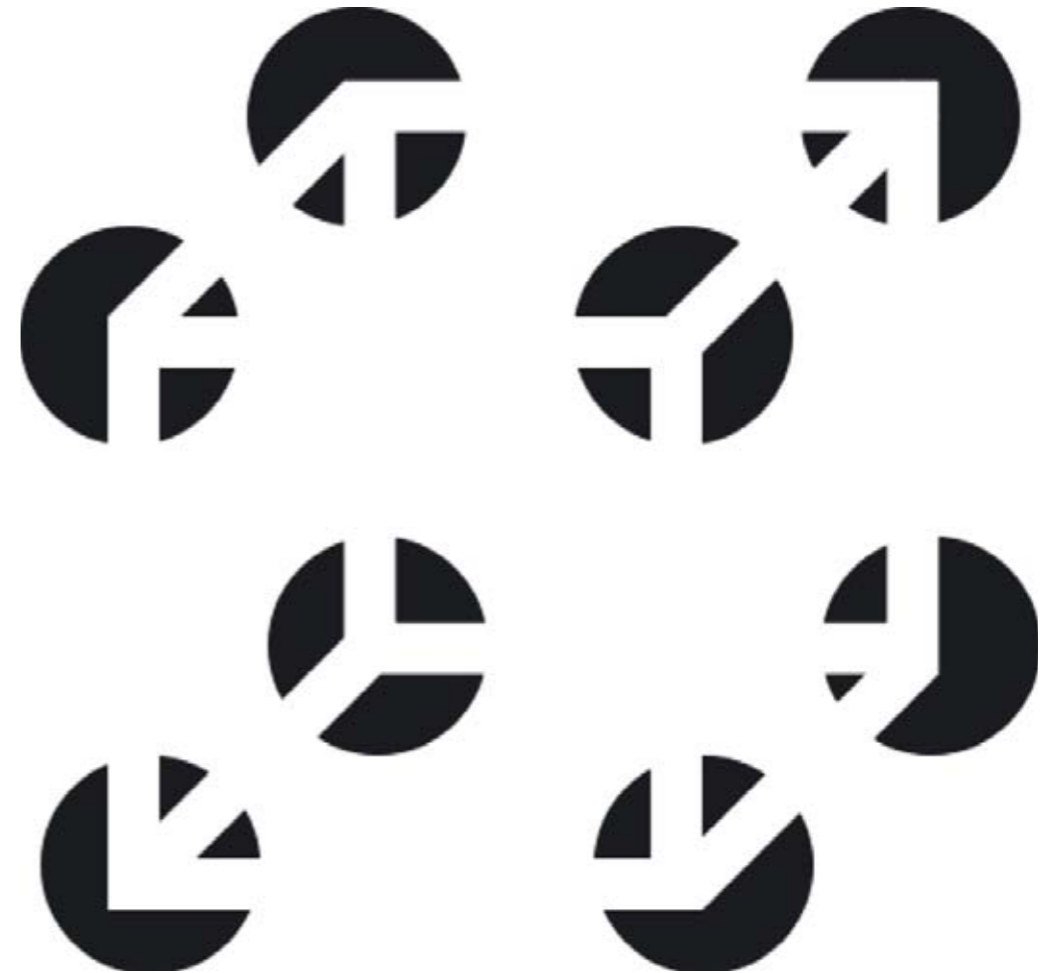
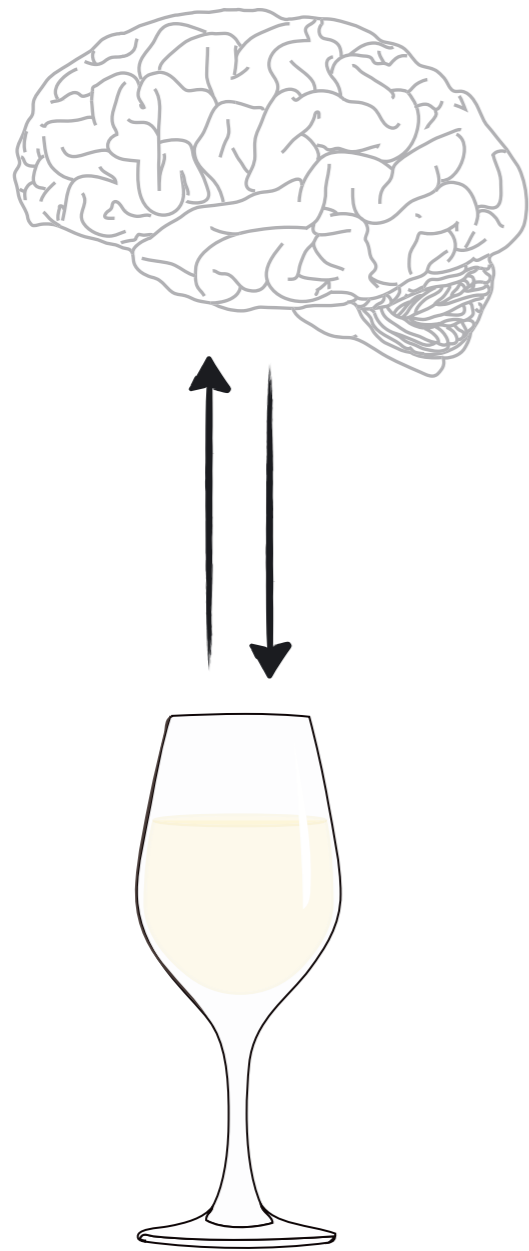
**Patrick Baudoin**



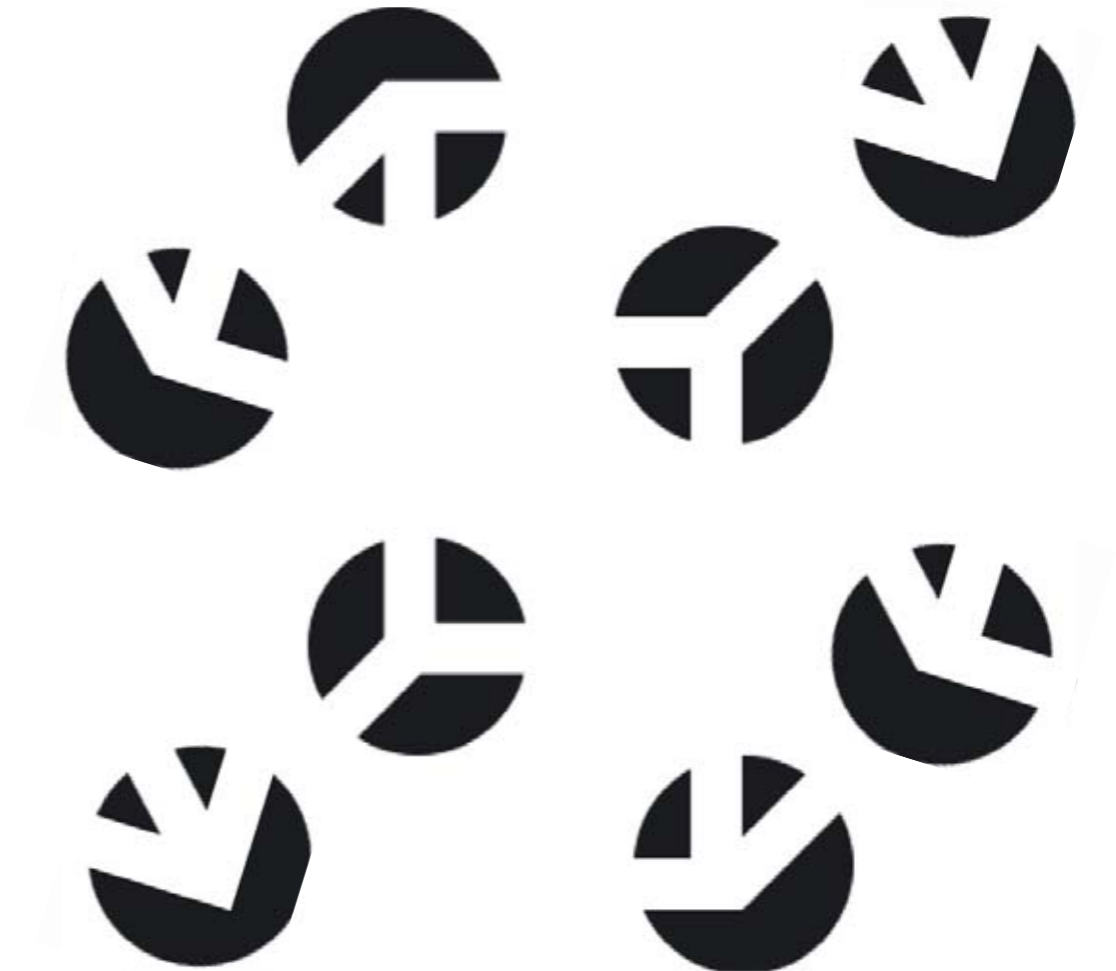
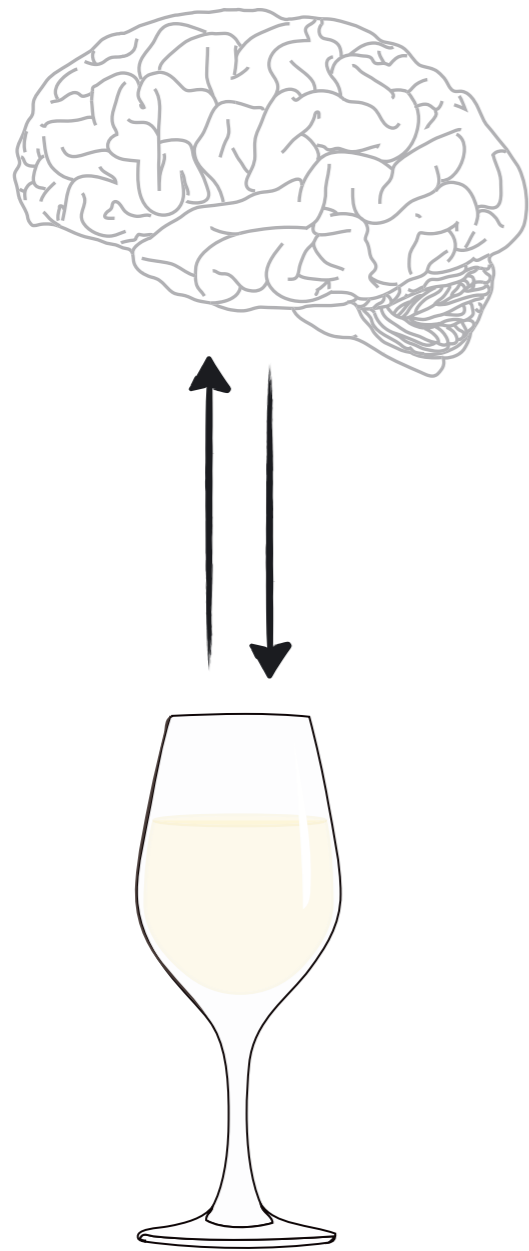
**Ken Forester**



# NEUROSCIENCE OF WINE TASTING



# NEUROSCIENCE OF WINE TASTING



GABRIEL LEPOUSEZ  
INSTITUT PASTEUR (PARIS)

# Wine tasting is a multi-sensory process



# “Minerality” in wine : a multi-sensory descriptor



**Odorants  
Aromas**



**Mouthfeel**

**Salinity**



**Acidity**



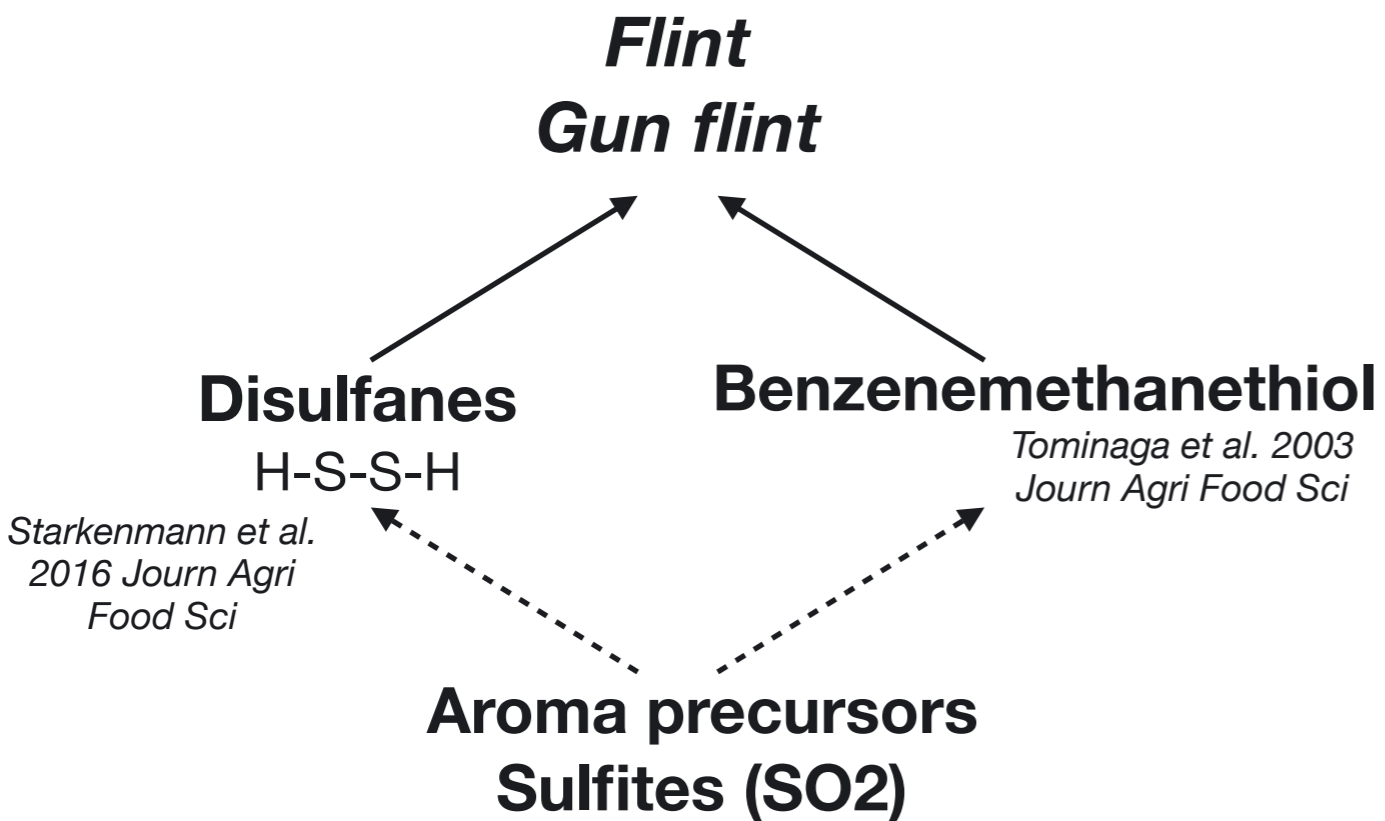
# Aromatic descriptors of “Minerality”



# Aromatic descriptors of “Minerality”



***Presence of “mineral”-associated aromas***



# Aromatic descriptors of “Minerality”

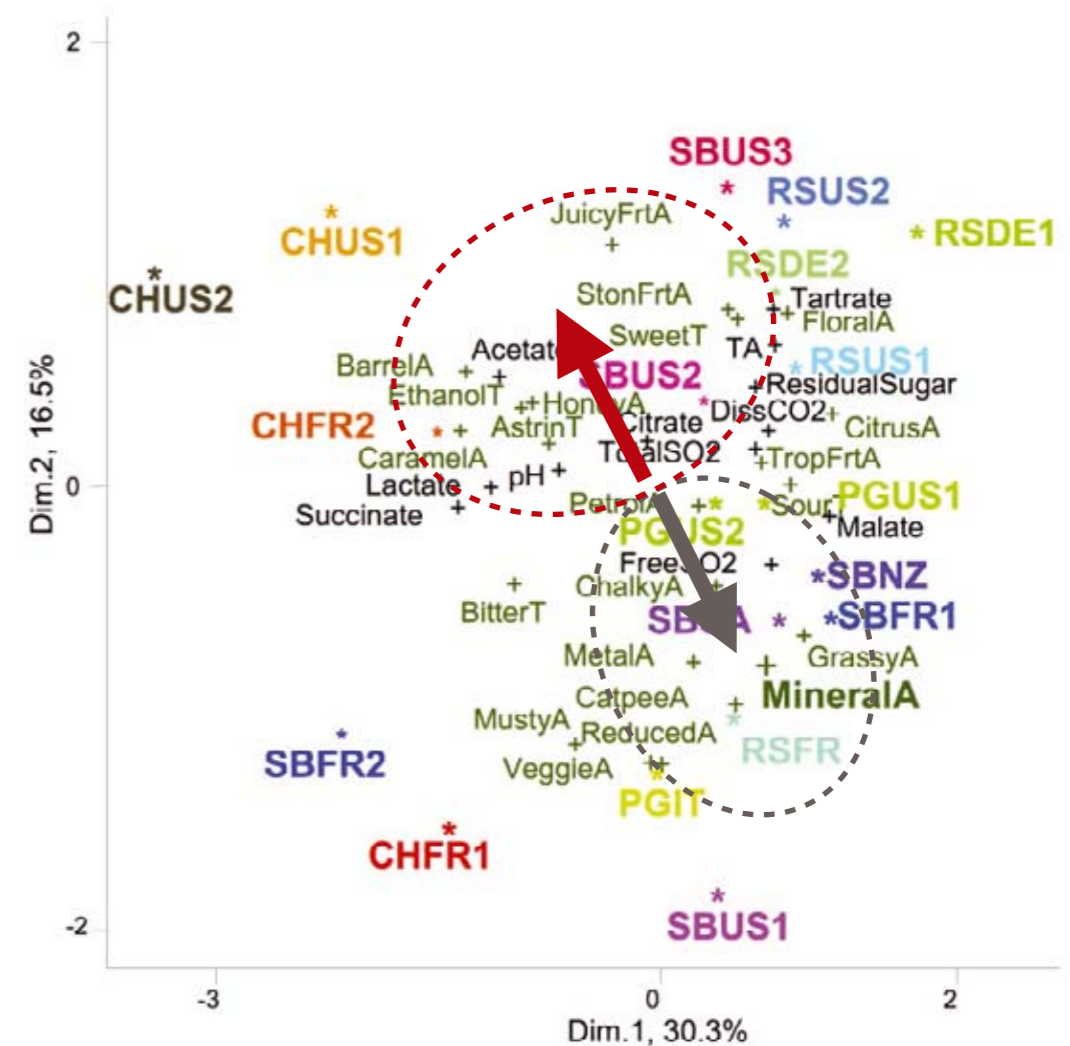
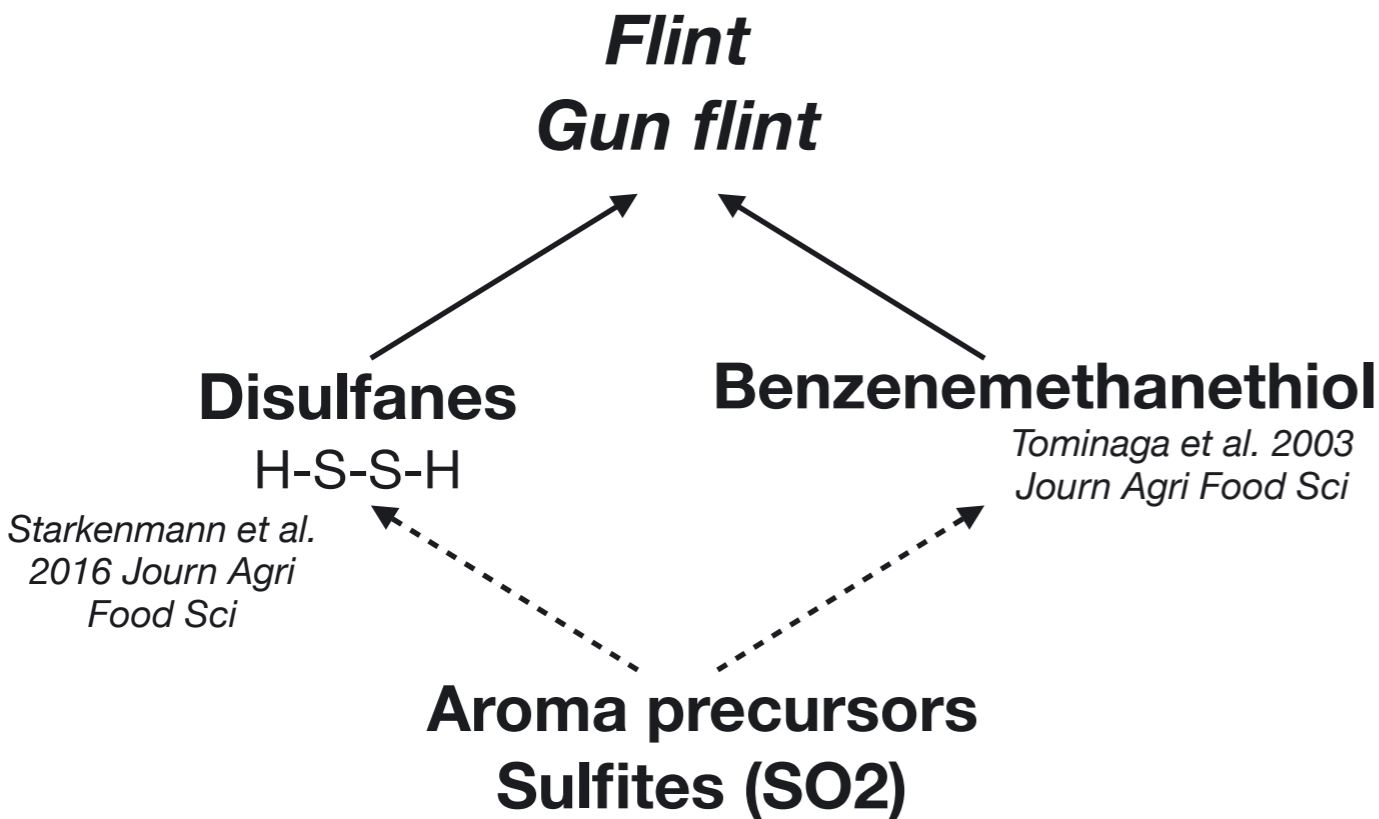


**Presence of “mineral”-associated aromas**



**Absence of fruity/sweet aromas**

*Parr et al., 2015 FQP  
Heymann et al., 2014 JSS*



# Olfaction versus Gustation



## Olfactory system

400 receptors

## Gustatory system



1 receptor for *acidic*

1 receptor for *sweet*

1 receptor for *salty*

1 receptor for *umami*

25 receptors for *bitter*

1 receptor for Calcium

2 receptors for fatty acids

# Olfaction versus Gustation



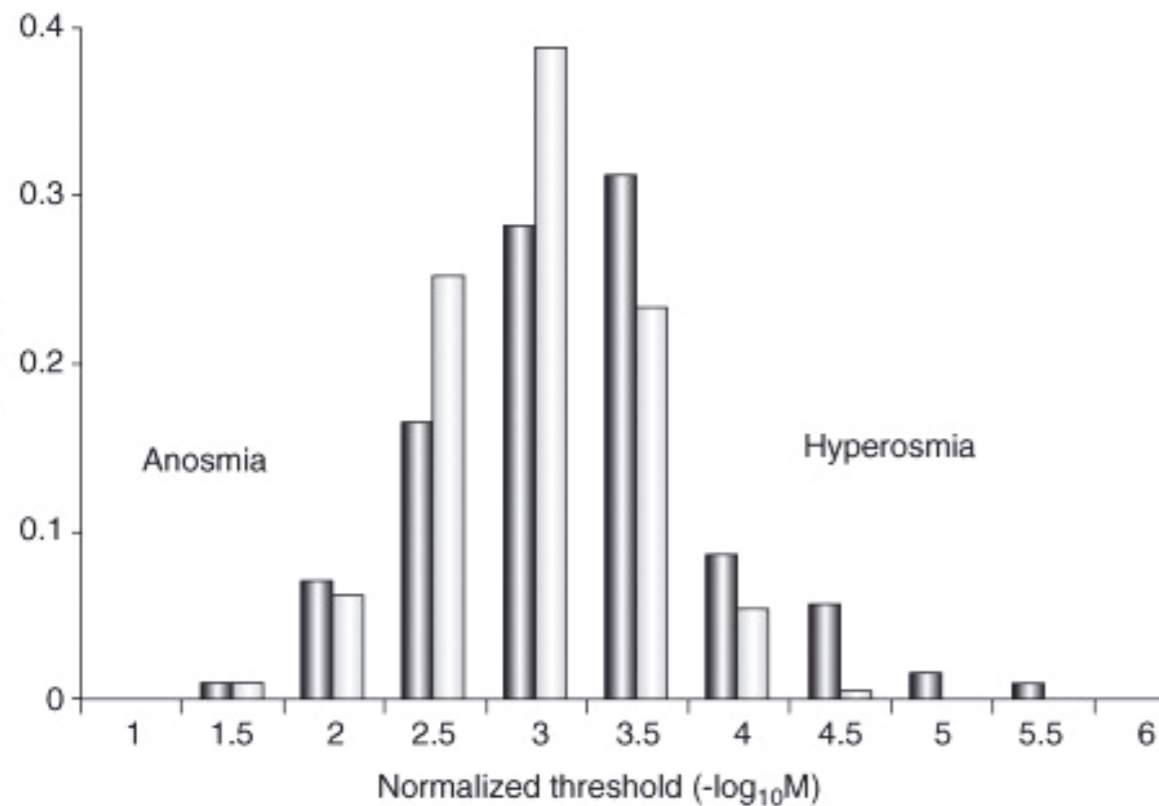
## Olfactory system

400 receptors



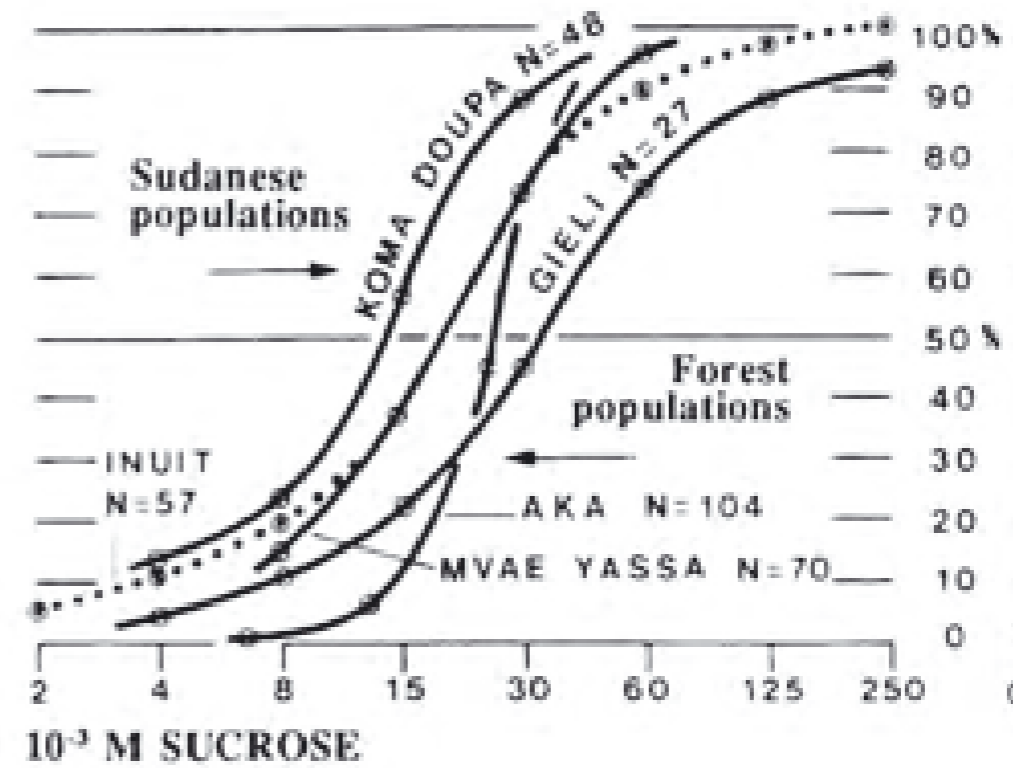
## Gustatory system

- 1 receptor for *acidic*
- 1 receptor for *sweet*
- 1 receptor for *salty*
- 1 receptor for *umami*
- 25 receptors for *bitter*
- 1 receptor for Calcium
- 2 receptors for fatty acids



← x10.000 →

*Variability*



← x5-10 →

# Innate *versus* Learned



**Control  
(normal)**



**Sweet**



**Sour**



**Bitter**

# Innate versus Learned



Control  
(normal)

Sweet

Sour

Bitter

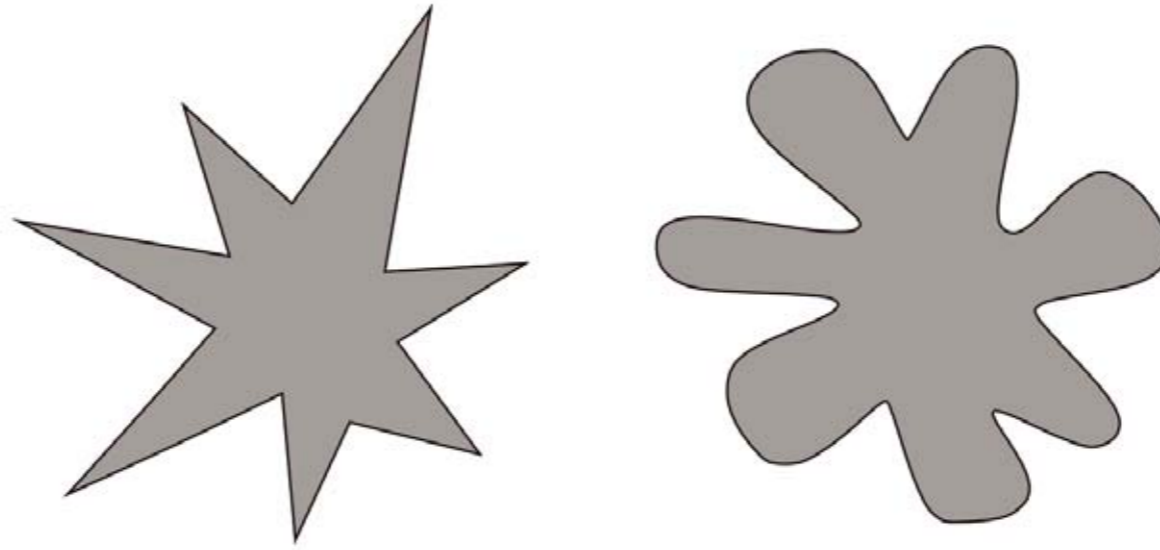
**Innate**  
***Emotional***



**Learned**  
***Rational***

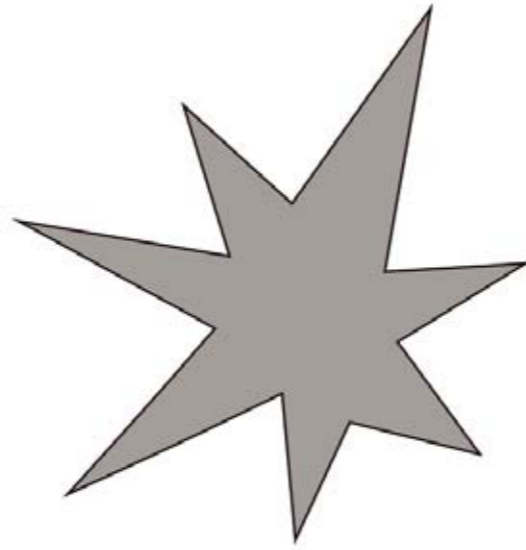
# Crossmodal sensory associations

# Crossmodal sensory associations

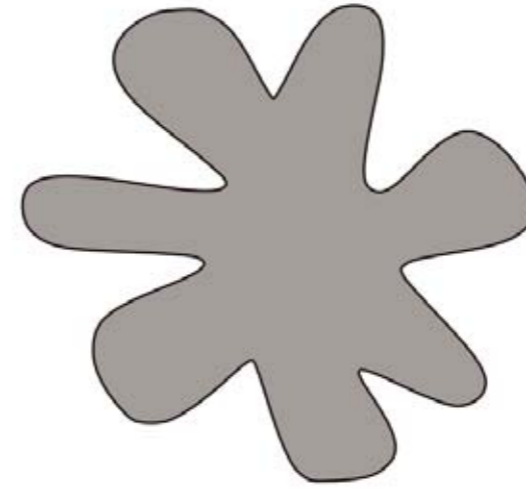




# Crossmodal sensory associations

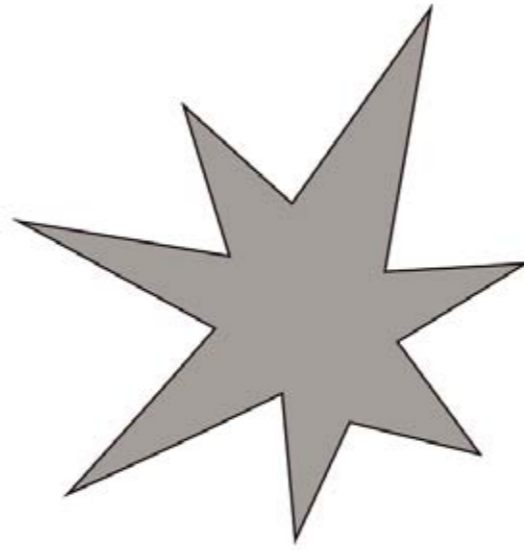


**Mineral**



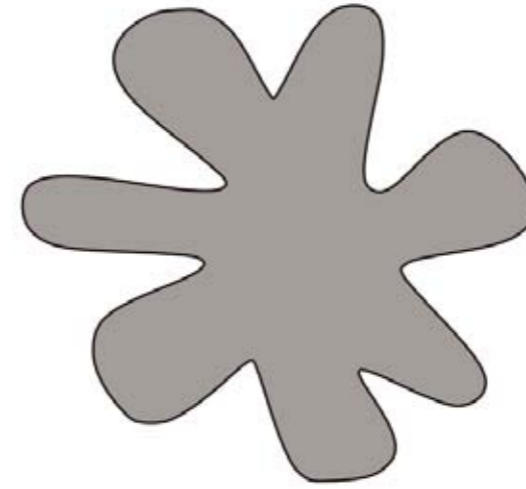
**Organic**

# Crossmodal sensory associations



**Mineral**

**“Kiki”**

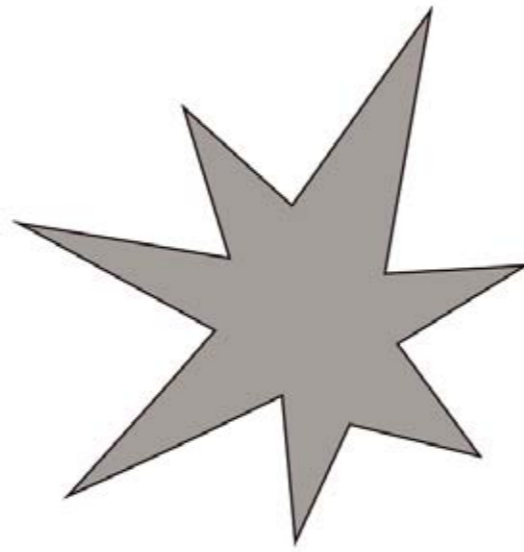


**Organic**

**“Bouba”**

Kohler 1929; Ramachandran and Hubbard 2001

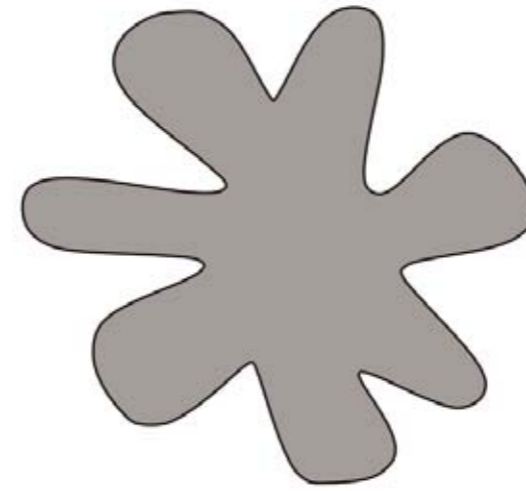
# Crossmodal sensory associations



**Mineral**

**“Kiki”**

**Acid**



**Organic**

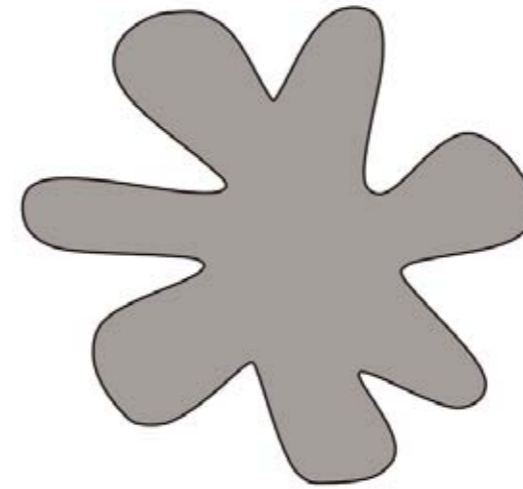
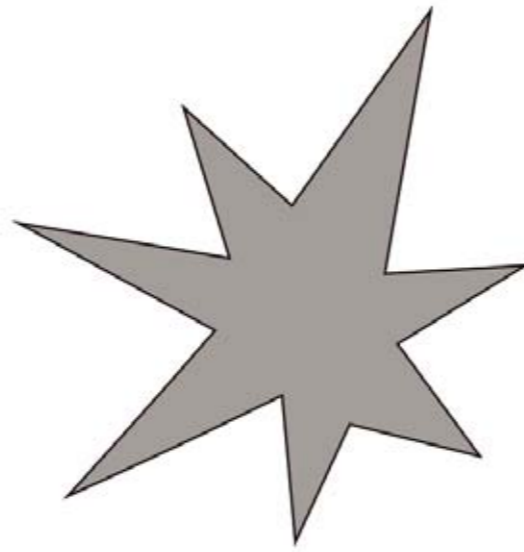
**“Bouba”**

**Sweet**

Kohler 1929; Ramachandran and Hubbard 2001

Velasco et al., 2016 Food Quality Pref

# Crossmodal sensory associations



**Mineral**

**Organic**

Kohler 1929; Ramachandran and Hubbard 2001

**“Kiki”**

**“Bouba”**

Velasco et al., 2016 Food Quality Pref

**Acid**

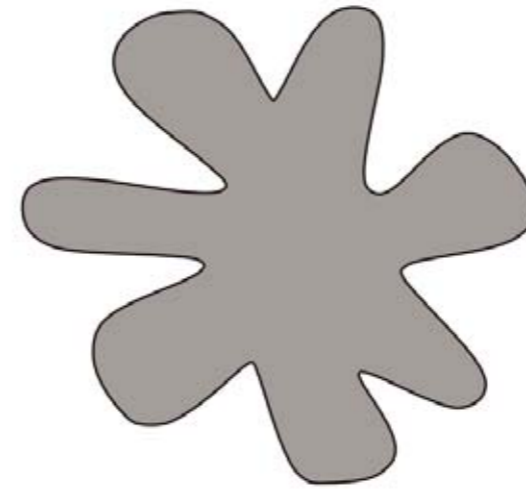
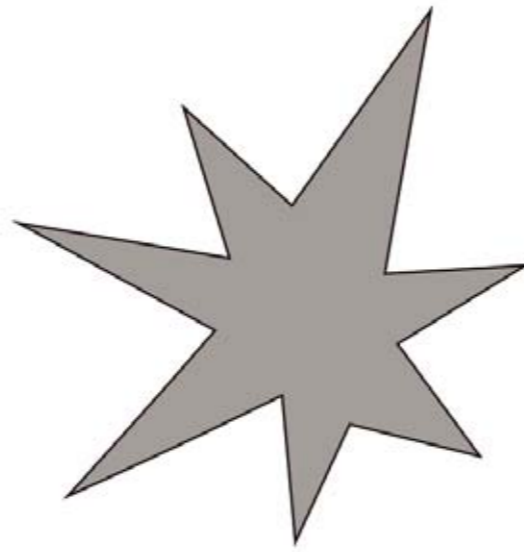
**Sweet**

Hanson-Vaux et al., 2013 Chem Senses

**Lemon  
Pepper**

**Vanilla  
Raspberry**

# Crossmodal sensory associations



**Mineral**

**Organic**

Kohler 1929; Ramachandran and Hubbard 2001

**“Kiki”**

**“Bouba”**

Velasco et al., 2016 Food Quality Pref

**Acid**

**Sweet**

Hanson-Vaux et al., 2013 Chem Senses

**Lemon  
Pepper**

**Vanilla  
Raspberry**



Acid



Sweet



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