Participation at the 5th European Conference on Sensory and Consumer Research (EUROSENSE) in Bern, and viticultural academic visit to Rioja and Montpellier



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1. Executive summary

Sandra Olarte travelled to Bern, Switzerland to attend the 5th European Conference of Sensory and Consumer Research (EUROSENSE). During the conference she presented two posters "Berry Sensory Assessment (BSA)-Should frozen wine grape berries be used in sensory evaluations?" (Olarte *et al.* 2012a), and "Effect of rootstocks on Shiraz berry and wine sensory characteristics" (Olarte *et al*. 2012b). Participation at the 5th EUROSENSE gave Sandra the opportunity to make and renew contacts with sensory researchers that will facilitate future collaboration in sensory research. Attendance to the conference gave Sandra the opportunity to learn from sensory research in many fields.

A highlight from the EUROSENSE conference was learning about Temporal Dominance of Sensations (TDS). TDS is a methodology that evaluates the dominance of different sensory attributes in a product. TDS was mentioned in a presentation and is a method that Sandra has not used before.

Another highlight of the presentation was the explanation of new technologies that can be used to measure emotions. In different presentations results of sensory evaluations using technologies such as FaceReader™ and pupillometry were presented. These technologies can be used in wine and grape sensory research to evaluate consumers' behaviour towards different sensory characteristics.

Sandra also had the opportunity to visit Dr Jacques Rousseasu at the Institut Coopérative du Vin (ICV) in La Jasse de Maurin, France. There she was able to discuss some results from her Berry Sensory Assessment (BSA) PhD research and learn from Dr Rousseau's experience in BSA.

In addition, Sandra visited Dr Maria Paz Diago at the Universidad de La Rioja, in Spain. Dr Diago gave Sandra a tour of the University's viticulture and oenology research and teaching facilities. She discussed some of the projects that her group are conducting in the area of precision viticulture.

A final visit to the Winery Viña Ijalba in Logroño (Spain) was guided by the Winemaker Pedro Salguero. Pedro showed Sandra the winery facilities and discussed their involvement in a research project with La Universidad de La Rioja to recover and reintroduce native Rioja grape varieties for wine production.

2. Background

EUROSENS is an internationally renowned conference bringing together sensory researchers from many fields and countries, to share new sensory techniques and research results. This was a unique opportunity for me to present the results from my research to an international sensory community, to interact with renowned sensory researchers and to establish contacts that will hopefully lead to collaboration and/or further research in the viticultural/sensory field.

I also visited Professor Jacques Rousseau at the Institute Cooperative du Vin in France. Professor Jacques Rousseau pioneered the Berry Sensory Assessment technique and to visit him was a great honour and a great opportunity to further my research. I also visited Dr Maria Paz Diago, who conducts research in viticulture with renowned viticulturist Fernando Martinez de Toda and Javier Tardaguila at the University of Rioja. A last visit to the Winery Viña Ijalba in Logroño guided by Winemaker Pedro Salguero was conducted to see an example of wine production in Spain and the involvement of this winery in wine research.

3. Project objectives and performance targets

Objectives:

The objectives of this travel were to

- Present results of my PhD research project via two posters at the 5th European Conference on Sensory and Consumer Research (EUROSENSE) in Bern, 9th -12th,September 2012
- To obtain feedback and networks/collaborations from the international scientific community at the 5th European Conference on Sensory and Consumer Research in Bern, Switzerland.
- Meet eminent researchers and academics from different Universities and research institutions in Spain; Fernando Martinez de Toda and Javier Tardaguila from The Universidad de la Rioja and France; Jacques Rousseau from the Institut Cooperatif du Vin (ICV) and discuss their experience with Berry Sensory Assessment.
- To introduce a novel technique for grapevine berry sensory assessment and to obtain feedback from Spanish/French growers and researchers on the acceptability and applicability of this new technique.

Project outputs and performance targets:

Output	Performance Targets	Date
1.Two poster presentations and symposium proceedings paper publication	Paper publication in EUROSENSE conference proceedings	Completed September 2012
2. Grape grower & winemaker article	On Berry Sensory Assessment and visit to the Institute Cooperatif du Vin vineyard.	Delayed April 2013
3. Seminar at Waite campus to WIC co-located partners	On conference attendance and visit to ICV and Universidad de la Rioja	Delayed March 2013

4. 5th European Conference on Sensory and Consumer Research, Bern, Switzerland

In September 2012, Sandra Olarte (Figure 1) travelled to Switzerland to attend the 5th European Conference on Sensory and Consumer Research. The conference took place from the 9th until the 12th of September 2012 at the BERNEXPO exhibition centre (Berne Switzerland). Almost 500 international sensory academics, researchers and professionals were present. The conference covered ten sensory science key areas that brought together approximately 400 presentations (oral and poster) by sensory scientists from 50 different countries.

The ten key areas of sensory research that were focused on at the conference were;

i) How relevant is sensory and consumer science to health and nutrition behaviour?
ii) How can sensory and nutritional benefits be informed?
iii) How does the physiology of the senses influence perception?
iv) How can sensory science enhance consumer insights and explain consumer diversity?
v) How are risk assessment, legislation and ethical issues addressed in applied sensory science?
vi) How can sensory and nutritional benefits be communicated?
vii) How can faster, cheaper methods produce reliable results?
viii) How can the full consumer experience be explored?
ix) How do emotions impact liking?
x) How can the value of sensory science be improved with innovative methods?



Figure 1. Gala dinner-Kultur Casino. From R-L Sandra Olarte and Pauline Foster.

Summary of selected presentations

Sandra Olarte presented two research posters from her PhD project entitled; “Berry Sensory Assessment (BSA)-Should frozen wine grape berries be used in sensory evaluations?” (Olarte et al 2012a), and “Effect of rootstocks on Shiraz berry and wine sensory characteristics” (Olarte et al 2012b) Figure 2. Sandra was approached by other researchers to discuss the results presented in both posters and to send copies to other researchers.



Figure 2. Sandra Olarte during poster session

Some of the presentations at the EUROSENSE conference that caught the attention of Sandra Olarte and were relevant to the Australian wine industry included;

M. Sokolowsky and U. Fischer (Kompetenzzentrum Weinforschung, Germany) presented **Lingering of wine – a methodological approach to a complex sensory incidence in a connoisseur’s oral laboratory.** Bitterness, especially in white wines is a complex and sensitive mouthfeel characteristic often having a negative connotation within consumers. Commercial white with distinctive bitterness levels were selected to compare bitterness persistency and intensity and to evaluate correlations with other sensory and mouthfeel characteristics using three sensory methodologies (Descriptive Analysis (DA), Time Intensity (TI) and Temporal Dominance of Sensations (TDS). The three methodologies were able to differentiate levels of bitterness in the wines. However TI bitterness curves were influenced by alcohol content in wine and DA and TDS bitterness were related to residual sugar. The author

suggested that the use of the three methodologies in wine sensory evaluations could be complementary.

N. Martin et al (Nestlé Research Center, Switzerland) presented **How do sensory and behavioural sciences help us better understand the consumer?** Nestlé holistic approach in new product development includes evaluation of product perceptual dimensions before the product is consumed, such as packaging handling, visual, tactile and odour cues of the food/beverage on the plate or in the glass. Also the impact on product choice and liking of dynamics of food/beverage in mouth are evaluated including components such as portion size and chewing rate. Temporal Dominance of Sensations (TDS) is being used by Nestlé to evaluate product texture in mouth and the impact of texture on product liking. Behavioural observations were first used in Nestlé with babies as they could not self report product experiences, but now consumer's values, emotions and other unconscious processes are being measured.



Figure 3. Nathalie Martin during her oral presentation at EUROSENSE 2012

N. Mammase and P. Schlich (INRA, France) presented **Choosing the right size for a descriptive or for an hedonic sensory study based on knowledge gained from two sensory databases**. Choosing the right panel size in sensory evaluations has always been a controversial subject within sensory scientists. In this presentation a methodology to choose the right panel size to control the risk of incurring both type I and type II errors was presented. This methodology is based on data computation from two data bases. SensoBase is a data base consisted of 405 descriptive sensory studies and PreBase of 184 hedonic studies. This methodology caused controversy due to the small data base size.

It was also controversial because the criteria to determine panel size was “error type”. That is, to detect large product effects a minimum of 2 panellists could be sufficient and for small product effects a minimum of 55 panellists were required.

P. Schlich (INRA, France) presented **Innovation in acquisition, aggregation and analysis of sensory data.** Pascal focused his talk on discussing sensory methodologies such as Sorting Task and Projective Mapping where products are compared mutually by consumers. Temporal Dominance of Sensations (TDS) is a methodology based on the principle that sequence rather than intensity of attributes are important. TDS was first introduced by Pascal Schlich around 7 years ago but just now gaining more popularity within researchers. I have never used this methodology but I’m interested in using it in the future. The last methodology discussed was Polarized Sensory Positioning which proposes that attributes could be replaced by prototype products to which the other products of the study will be compared on a similarity scale.

Wi He et al (Wageningen UR, The Netherlands) presented **The effect of positive and negative food odours on human behavioural and physiological responses.** In his talk Wi presented results from a study with 26 participants that were exposed to one pleasant aroma (orange) and one unpleasant aroma (fish). Behavioural response was measured using FaceReader™ that range from neutral (orange) to sadness, disgust, anger (fish). Physiological responses such as skin conductance, heart rate and finger temperature were measured. Skin conductance was larger for the fish aroma, heart rate increased with fish aroma exposure and finger temperature decreased with fish aroma exposure. Results of this study showed how behavioural and physiological measurements could help in product development. I believe FaceReader™ and physiological measures could contribute a lot in wine industry sensory research.

I was particularly impressed by the new format introduced for oral presentations at the EUROSENSE 2012. The new format selected 16 posters to be presented in 10 minutes talk segments. This format allowed more researchers and PhD students to present their research. Another presentation session that I thought was innovative was the Sensometrics session moderated by Hal Mcfire. In this session three talks were presented: “Product landscaping the Bayesian way: Uncovering the evaluative dimensions of consumer dominance data” presented by M.A. Nestrud et al (In4mation insights, USA), “Are higher cost for visual simulations justified? The effect of the presentation format in choice

experiments on attention and choice" by S. Mueller Loose et al (Aarhaus University, Denmark) and "Positioning effect of the overall liking question in a central location test: The unconscious truth and the rational bias" presented by M. Kern (SAM Sensory and Marketing international, Germany). After each of the presentations random groups were formed to discuss the presentation, ask questions to the experts, discuss their experience with the methodologies. This was a good presentation format that allowed a lot of interaction among the different delegates.

5. Visit to the Institut Coopératif du Vin, La Jasse de Maurin, France.

On the 13th of September 2012 I visited the Institut Coopérative du Vin (ICV). This visit was planned due to the direct link of ICV with my research on Berry Sensory Assessment (BSA). Dr Jacques Rousseau (Figure 4) and his research team at the ICV were the first promoters internationally of Berry Sensory Assessment as a structured methodology. Originally a seminar presentation was proposed; unfortunately the offer was declined by Dr Rousseau due to the ICV researchers grape vintage commitments.



Figure 4

During my visit to the ICV Dr Jacques Rousseau offered a tour of the ICV research facilities. The ICV provides viticultural and oenological services to wineries, grape growers, wine merchants and wine marketing business from the French Mediterranean shoreline and the Rhône Valley (Figure 5) in seven oenological centres. The ICV services are grouped in five main specialties: Research and development, Quality assurance, Bottle closure research and quality control, Oenology and environment and extension services. Oenology students from different educative centres are able to perform their research at the ICV research facilities.



Figure 5. Dr Jacques Rousseau explaining the ICV serviced area

ICV coverage area is a very innovative wine region where over 70% of the wine that it is produced is out of the Denomination of Origen system (DO). Wine from many grape varieties that are not part of (DO) are produce in the ICV area. Some of these varieties are used to produce grape must for fresh consumption and is also an area where ICV is directing its research. Different aspects of cask wine including shelf life and packaging are part of the novel research from the ICV (Figure 6).



Figure 6. Cask wine samples received for different laboratory evaluations

French grape and wine producers are obliged to perform grape and wine analysis with certified laboratories. The ICV has seven laboratories in the region that are certified to perform this analysis. The laboratory that I visited at the ICV La Jasse de Maurin is one of these certified laboratories which receives samples across the year (Figure 7).



Figure 7. ICV La Jasse de Maurin wine and must samples reception area

After the tour, Dr Rousseau and I had a meeting were we discussed his experience with BSA. Dr Rousseau is a recognised viticulturist and as part of his role as a representative of the ICV viticultural services, is to visit vineyards and give technical assistance to the grape growers. He mentioned that during his visits he performs periodical BSA evaluations where he focuses just on certain attributes. The reason for just focussing on certain attributes is because he now knows the different vineyards. With his experience he knows what attributes he needs to look for to determine maturity for a particular wine style. But he highlighted that he is always alert to changes that may occur in the vineyard and can be expressed in the berries. Other reason to just focus on few attributes in the field is because normally during the day he has to visit many vineyards were he has to collect many samples. However, in the BSA training sessions that the ICV conducts every year the participants are trained to use all the attributes that are part of the methodology. Although he believes that with experience grape growers and winemakers should be able perform routine BSA in the vineyard focusing on specific berry attributes.

Another highlight from my meeting with Dr Rousseau was his interest in a new berry sensory attribute. He asked me if we had noticed in our BSA research in Australia differences in pulp density or concentration of flavour. He has noticed differences in pulp flavour concentration in his assessments and this is an attribute that he wants to explore more in his BSA research. We haven't evaluated this sensory attribute in our research group at Adelaide University but I think we certainly should evaluate it if pertinent in future BSA research.

I asked him about the procedure they use for BSA evaluations at their research facilities. I was particularly interested in knowing the reasons why they use a four point category scale for their research evaluations. Dr Rousseau explained that all their BSA research evaluations are recorded in paper as their sensory laboratory has neither sensory software nor computers for data collection. He said that they have considered the use of line scales for their BSA evaluations. However he is certain that with their limitations and the large number of sensory evaluations that they perform they will need to have a full time person to measure line scale BSA attributes scores.

6. Visit to La Universidad de la Rioja, Logroño Spain

On the 17th of September 2012 I visited the Universidad de la Rioja. This visit was planned as Professors Tardaguilla and Matínez de Toda are two researchers at the Universidad de la Rioja that have been working on grape maturity assessment in the vineyard with a methodology known as a VITUR score that I wanted to know more about. They have also been promoting the use of Berry Sensory Assessment. Unfortunately I received very short notice that they could not receive me or present a proposed seminar due to the Rioja festivities. However, Dr Maria Paz Diago who is a post Doctoral Fellow and work with Professor Javier Tardaguilla was able to receive me and give me a tour and introduce me to some other researchers that were around at the University. Luckily I was able to organize a visit to the winery Viña Ijalba in Logroño which had some interesting research with University of Rioja and will be reported later in section 7.

Dr Maria Paz Diago is part of the Vitur group at the Universidad de la Rioja. Vitur is the viticulture research group at the Universidad de la Rioja, which is constituted by academics and researchers and is part of the new Instituto de Ciencias de la Vid y el Vino (ICVV) in Rioja. Vitur research is focused on three main research areas: Ampelography, Precision viticulture and Grape quality in the vineyard.

The ampelography group was responsible for recovering grape varieties from Rioja that now are part of the D.O.Ca. Rioja. The new varieties that now can be planted as D.O. Ca Rioja are Maturana Tinta, Maturana Blanca, Tempranillo Blanco and Turruntés.

Their research in precision viticulture is focused at the moment on the effect of vineyard variability on fruit quality. To quantify vineyard variability they are using novel tools such as thermal and multispectral imagery. They are also using a fluorescence sensor called Multiplex® to track phenolics and anthocyanin on whole bunches in a rapid and non-destructive way (Figure 8).



Figure 8. Fluorescence sensor, Multiplex®

Dr Diago showed me the oenology research facilities that are also available for the undergraduate students at La Univesidad de la Rioja. The students during their degree have a subject where they have to develop a wine product. The development of this wine product starts from finding the grapes to and making their wine, through until the bottling, which includes designing a label. The students have at their disposition to make their wines a very modern temperature controlled micro fermenters (Figure 9).



Figure 9. Temperature controlled micro fermenters at La Universidad de La Rioja

7. Visit to winery Viña Ijalba, Logroño, Spain

My visit to Viña Ijalba was guided by the winemaker Pedro Salguero (Figure 10). Viña ijalba is a winery that started their vineyard plantations in 1975 with the aim to recover soils left over from the quarries. Viña ijalba produces wines from grapes that come only from organic vineyards. The varieties in their wine production include Tempranillo, Garnacha (Grenache), Viura, Malvasia and Graciano. But also they are producing varietal wines with Maturana Tinta and Turruntés, Rioja forgotten varieties that fifteen years ago were about to disappear. Viña Ijalba contributed to the Universidad de La Rioja with the germplasm recollection from their own vineyards. Now Viña Ijalba has a small varietal plot (Figure 11) with 100 different grape varieties that will help to preserve Rioja varieties. This wine industry and research collaboration helped the Rioja to improve their wines and prevented Rioja Varieties from becoming extinct due to the once-threatening introduction of foreign varieties such as Cabernet Sauvignon.



Figure 10. Pedro Salguero winemaker at Viña Ijalba



Figure 11. Rioja grape varieties experimental plot.

Pedro Salguero also showed me the wine production area where he showed me the underground white wine fermenters that help to keep the wines cool during fermentation (Figure 12). Also we had a walk in the vineyard where I was able to see the traditional Spanish vineyard planted in the “cup” system Figure 13.



Figure 12. Underground white wine fermenters al Viña Ijalba



Figure 13. Vineyard at Viña Ijalba planted in the traditional “cup” system

8. Conclusion

Attendance to the EUROSENSE conference provided an ideal opportunity for me to make and renew contacts that will facilitate future collaboration in sensory research. It also gave me the opportunity to show the results of my research to eminent sensory researchers. Finally it allowed me to learn from other kinds of sensory research in different sensory fields that can be applied to wine research.

My visit to the ICV in France gave me the opportunity to discuss my research with Dr Rousseau. It also gave me the opportunity to learn from his experience, particularly with respect to how BSA should be used at the industry level.

My visit to the University of Rioja gave me the opportunity to meet some researchers and to explore other research areas where potential future jobs could arise. Also the visit to the Winery Viña Ijalba gave the opportunity to see the results from an excellent collaboration between wine researchers and wine producers.

9. Acknowledgments

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