Research in Hospitality Management 2015, 5(2): 225–227
Printed in The Netherlands — All rights reserved

Copyright © NISC (Pty) Ltd
RHM
ISSN 2224-3534
http://dx.doi.org/10.2989/RHM.2015.5.2.15.1288

The cheeseboard in Dutch fine dining restaurants, III: Using the FSC model in finding good cheese-wine combinations: A pilot study with red bacteria cheeses

Jan A. Schulp*, Rebecca Rive and Melissa Leeman

International Hospitality Management, Stenden University of Applied Science, Leeuwarden, The Netherlands
**Corresponding author email: j.a.schulp@wxs.nl*

The authors selected four wines that, according to their restaurant experience, matched well with red bacteria cheeses. Subsequently, an expert panel created flavour profiles of these four wines and of four red bacteria cheeses, using the FSC model by Klosse (2004, 2014). The cheeses and the wines demonstrated great similarities in flavour profile: high flavour richness, a more coating than contracting mouthfeel and a dominance of ripe flavour tones over fresh tones. These results give further support to Klosse's rules about matching food and beverages.

Keywords: flavour profiles, flavour style

Introduction

In fine dining restaurants in the Netherlands, a cheeseboard is often part of the dessert. Usually, it consists of four to six different cheeses of a widely and wildly different flavour profile, from e.g. fresh goat's milk cheese with a very low flavour intensity, fresh tones and mainly contracting, up to a Stilton with a very high flavour intensity, more coating than contracting and high in ripe tones. It is impossible to find one appropriate wine with a cheeseboard like that (see our first paper in this series: "Practices and opinions of restaurant professionals"). One wine for a more restricted sample of cheeses seems more realistic.

From their professional practice and from literature, the authors of the present paper had ideas about appropriate cheese-wine combinations. In the present pilot study, we subjected a selection of red bacteria cheeses and matching wines to the judgment of a professional panel. The research question was: "Do cheeses and wines that match well demonstrate related flavour profiles?" Profiles are made using the FSC model of Klosse (2004, 2014) combined with the presence of ripe and fresh flavour tones

Literature review

In the first of these three papers on the cheeseboard, "Practices and opinions of restaurant professionals", Schulp, Küper et al. (2015) give a literature review about wine-cheese combinations as they were recommended to the general public in the Netherlands in the period 1940–2005. Most authors advised red wines, many of them very rich in tannin, with a variety of cheese. White wines and sweet wines were advised to a much lesser extent, with the exception of port. In literature from the turn of the century, increasingly white wines and sweet wines came up as accompaniment to cheese. Klosse (1998), for example recommends with soft red bacteria cheese a Gewurztraminer or old cream sherry; with blue mould cheese a Botrytis sweet wine or a *vin doux naturel*. This is in line with international literature from the first years of the 21st century. Beckett (2009, 2012) pleads for a balance between cheese and beverage. Other beverages than wine can be taken, all in accordance with the flavour profile of the cheese: sparkling wines, port, sherry, cider, pommeau, apple brandies, beer, whiskey, rum, grappa, gin, jenever, sake, tea, sodas and juices fit all well with a specific cheese. Werlyn (2003) gives also detailed suggestions for cheese – beverage combinations. A few examples: light wines light cheeses; acidic white wines with acidic cheeses, sweet dessert wines with salty, strong cheese – such as blue-veined cheeses.

Harrington (2008) comes up with suggestions that are much in the same line as those by Werlyn. Additionally, he gives suggestions for beer and non-alcoholic beverages. With a varied cheeseboard he advises wines that are generally cheese-friendly, like wines made from pinot noir (red) or an off-dry Riesling (white). On the other hand, hard cheeses can cope, according to him, with almost any wine.

When finishing the wine accompanying the main dish with the cheeseboard, the match between wine and cheese may not be what one would wish. Also, cheese with low flavour richness after a main dish with high flavour richness is not attractive either. Schulp, Gerritsen and de Leeuw (2015) approach this problem in the previous paper, "Integration of the cheese course into the menu".

The work of Klosse (1998, 2004, 2014.) on flavour resulted in the model flavour style cube (FSC), briefly presented in the preceding paper. Two important elements of a flavour profile, ripe and fresh tones, were also introduced.

In red bacteria cheeses and other cheeses, after moulding the cheese, growth of red bacteria on the rind is stimulated, either by washing with brine or alcoholic beverage (e.g. Limburger, Herve, Époisses) or by smearing with a suspension of red bacteria (e.g. Port Salut, Munster). Several species of red bacteria can be involved in the making of these cheeses: *Corynebacterium casei*, *Corynebacterium variabile*,

Arthrobacter arilaitensis, *Arthrobacter* spp., *Microbacterium gubbeenense*, *Agrococcus* sp. nov., *Brevibacterium linens*, *Staphylococcus epidermidis*, *Staphylococcus equorum*, *Staphylococcus saprophyticus*, *Micrococcus luteus*, *Halomonas venusta*, *Vibrio* spp., and *Bacillus* spp. (Fox, 1999). According to Knox, Viljoen, and Lourens-Hattingh (2005), *Brevibacterium linens* is the most important microorganism in red bacteria cheese preparation. The bacteria grow on the outside of the cheeses, and therefore, the ripening process proceeds from outside to inside. Ripening involves proteolytic activity that results in more coating characteristics of the milk proteins and in the formation of free amino acids, small peptides and volatile compounds, imparting the strong odours of most red bacteria cheeses. This is in line with Zhang (2013), because results showed that cheese flavouring agents made by using ripening strains in combination with enzymes had more volatile flavour compounds than those that used only ripening bacterium or just two enzymes.

Methodology

Panel members were confronted with four different red bacteria cheeses and four wines that were deemed appropriate by the authors to accompany red bacteria cheeses. They were asked to create for each item a flavour profile with the dimensions flavour richness, coating, contracting, ripe and fresh.

The panel consisted of 10 food service professionals, seven of them connected to restaurants with one or two Michelin stars, or almost that level, two hospitality management students with special interest in food and beverages and one manager of a prominent cheese business. Due to agenda problems, the researchers visited the individual panel members with the wines and the cheeses. This approach was time consuming for the researchers, and good care had to be taken that the wines and cheeses remained in good condition. Due to this approach, the panel members could not influence each other; this can be considered as a positive methodological spin-off of the otherwise difficult organisation of the panel.

The panel members received a brief instruction in making a flavour profile. They assigned a value for each of the five elements (flavour richness, coating, contracting, ripe, fresh) to each of the wines and the cheeses. After finishing the panel, the average values for each wine and cheese were calculated with the standard deviation.

Some characteristics of the cheeses and the wines used in this research are summarised in Tables 1 and 2, respectively.

Results

The results of the panel are given in Table 3 for the cheeses, and in Table 4 for the wines. These are the taste profiles of the cheeses and the wines as calculated from the panel judgments.

About the cheeses, it can be concluded the red bacteria cheeses have a moderate to very high flavour richness; that coating characteristics are dominant over contracting characteristics and that ripe tones are dominant over fresh tones. The standard deviations are low, indicating a high level of agreement between the panel members.

Likewise, about the wines, it can be concluded that the wines selected have a moderate to very high flavour richness; that coating characteristics are dominant over contracting characteristics and that ripe tones are dominant over fresh tones. Just as in the cheeses, the standard deviations are low, indicating a high level of agreement between the panel members.

Table 1: Some characteristics of the cheeses used

	Taleggio	Marroiles	Reblochon	Époisses
Structure	Half-hard	Half-hard	Soft	Soft
Type of milk	Cow	Cow	Cow	Cow
Percentage of fat	48%	45%	45%	50%
Affinage	5–6 weeks	5 weeks	3–4 weeks	4 weeks
Season	Whole year	Whole year	Summer	Whole year
Origin	Italy (Lombardy region)	France (Picardie)	France (Rhône-Alpes)	France (Bourgogne)

Table 2: Some characteristics of the wines used

	Wairau River	Dr. Crusius	Louis Jadot	Chainier & Fils
Country	New Zealand	Germany	France	France
Region/ Appellation	Marlborough County	Nahe, Traisen Erste Lage	Burgundy AC Côteaux Bourguignons	Pineau des Charentes
Grape varieties	100 % Pinot Gris	60 % Weissburgunder, 20 % Auxerrois, 10 % Grauburgunder 10 % Chardonnay	Pinot Noir / Gamay	St. Emilion de Charentes; Colombard 50 % each
Year	2012	2011	2011	
Production techniques	Partly tank, partly oak fermentation; ripening on lees	Fermentation in steel tanks; cooled. Ripening in large oak vessel	Not specified.	According to Pineau des Charentes: must with 170 g sugar minimal; brandy added. One year ripening on lees in Limousin oak

Table 3: Taste profiles of the cheeses used

Cheese	Flavour richness		Contracting		Coating		Fresh		Ripe	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Reblochon	5.3	0.64	4.5	1.20	6.5	1.36	4.5	0.81	5.9	0.70
Époisses	8.1	0.70	5.8	1.33	7.8	0.75	5.1	1.37	7.7	0.56
Maroilles	8.6	0.49	6.2	1.40	7.2	0.98	4.6	1.02	7.8	0.60
Taleggio	7.8	0.75	6.3	0.64	7.4	0.49	6.2	1.33	7.7	0.46

Table 4: Taste profiles of the wines used

Wine	Flavour richness		Contracting		Coating		Fresh		Ripe	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Wairau River N.Z. 100 % Pinot gris	5.4	0.80	4.6	1.36	6.1	1.70	4.7	1.10	5.7	0.90
Dr. Crusius, Nahe, Germany, Cuvée	7.9	0.70	5.8	1.33	7.7	0.78	5.2	1.25	7.7	0.46
Côteaux Bourguignons, cuvee Pinot noir/Gamay	8.4	0.66	6.0	1.55	7.0	0.77	4.5	1.12	7.7	0.64
Pineau des Charente	7.8	0.75	6.5	0.81	7.4	0.49	6.2	1.33	7.6	0.49

Discussion

From the panel results, the research question: "Do cheeses and wines that match well demonstrate related flavour profiles?" can be answered with a firm "Yes!" Both the four red bacteria cheeses and the four wines selected demonstrated a flavour profile of high flavour richness and a dominance of coating and ripe characteristics over contracting. The level of agreement within the panel was high.

These results give a further support to the thesis of Klosse. In his chapter "New guidelines" for the matching of foods and beverages, he gives the following rules:

- Mouthfeel needs to match: that is, contracting fits contracting, coating fits coating
- Flavour intensity needs to match
- Flavour style needs to match: fresh fits fresh, ripe fits ripe. (Klosse, 2014, p. 235).

In the present research, we started with wines that in general matched well with red bacteria cheeses, and the panel members established the flavour profiles that turned out both for the cheeses and the wine to be matching.

However, generalising the data obtained to all wine and cheese combinations would go too far. Other combinations of different groups of cheeses and wines should be tested before general rules for wine-cheese matching could be formulated. On the other hand, the results obtained illustrate that everyday restaurant experience in combining cheese and wine is confirmed by the systematic establishing of the flavour profiles, and that a high level of consensus among restaurant experts exists.

Recommendations

For further research, more cheese and wine combinations need to be tested in order to find out if the "harmony rules" of Klosse apply universally or if in certain cases wine-cheese matching follows different rules.

For restaurant practice, the flavour profiles, academic as they may seem, are nonetheless a useful tool for matching cheese and wine, and other dishes and wine. When wines arrive in the cellar, let kitchen staff and restaurant staff establish the flavour profile of the wine, and matching of wine and food will become more effective both in designing dishes in the kitchen and in giving advice to customers in the restaurant.

References

Bastian, S., C. Payne, B. Perrenoud, V. Joscelyne, & T. Johnson. (2009). Comparisons between Australian consumers' and industry experts' perceptions of ideal wine and cheese combinations. *Australian Journal of Grape and Wine Research, 15,* 175–184.

Beckett, F. (2009). *Cheese course: Styles, wine, pairing, plates & boards*. London: Ryland Peters & Small.

Beckett, F. (2012). *Alles over kaas*. Utrecht: Spectrum.

Fox, Patrick. (1999). *Cheese: Chemistry, physics and microbiology*. New York: Springer.

Harrington, R. J. (2008) *Food and wine pairing: A sensory experience.* Hoboken, NJ: John Wiley & Sons.

Klosse, P. R. (1998) *Smaak.* Baarn: Tirion.

Klosse, Peter (2004) *The concepts of flavor styles to classify flavors*. Hoog Soeren: Academie voor Gastronomie. ISBN 90-9017 885-6.

Klosse, P. R. (2014). *The essence of gastronomy: Understanding the flavour of foods and beverages.* Boca Raton, CRC Press.

Knox. A. M., B. C. Viljoen, & A. Lourens-Hattingh. (2005) Inhibition of *Brevibacterium linens* by probiotics from dairy products. http://hrcak.srce.hr/file/162987

Schulp, J. A., A. Küpers, J.-P. Nijboer, E. Rozendal and C. Westerhuis. (2015). The cheeseboard in Dutch fine dining restaurants, I: Practices and opinions of restaurant professionals. *Research in Hospitality Management*, *5*(1), 215–220.

Schulp. J. A., S. Gerritsen, & J. de Leeuw. (2015). The cheeseboard in Dutch fine dining restaurants, II: Integration of the cheese course into the menu. *Research in Hospitality Management*, *5*(1), 221–224.

Werlyn, L. (2003). *The All-American Cheese and Wine: Pairings, Profiles & Recipes.* New York: Stewart, Tabori and Chang.

Zhang. T., H. Liu, & C. Cao. (2013). Comparison of the flavor of different cheese flavouring agents produced by using surface ripening bacterium and/or enzymes [abstract]. *Advanced Journal of Food Science & Technology, 5*(10). http://www.maxwellsci.com/jp/abstract.php?jid=AJFST&no=363&abs=22