

Food and wine matching - a new approach

14 Oct 2008 by Peter Klose

We have great pleasure in publishing a summary of Dutchman Peter Klose's revolutionary approach to matching wine and food, based on a new theory of flavour and texture. His work has been widely adopted in Holland but his books are so far available only in Dutch. He can be contacted at p.klose@echoput.nl

- Have you ever found yourself in the situation of having prepared a tasty dish only to find that it ruins the taste of a perfect wine?
- Have you ever wondered why a particular dish or wine tastes good in summer, yet fails the taste test in winter?
- Have you ever noticed that wines produced by different wine growers in a particular region, and made from the same grape varieties, do not taste the same?
- Have you ever asked yourself why communicating about taste and flavour needs to be so difficult?

Chances are you have, and this, in turn, may have led you to determine that taste is a matter of personal preference. As the old saying goes, there is no accounting for taste. This being the case, you may consider efforts to address the dynamics of food and wine to be somewhat frivolous, and you certainly wouldn't be the only one to think so. I, however, beg to differ. About 10 years ago, I came to the realisation that what we needed was a new approach that would give us the answers we need in order to understand the essence of flavour and the practice of pairing food and wines. In developing this new approach it became clear to me that we have traditionally looked at the issue from the wrong perspective. The new insights I have gleaned will help us to understand the complex world of flavour in general, and offer exciting possibilities to the wide world of food preparation in all of its many guises. They constitute a part of what we now refer to as 'flavour theory.'

New concepts

The new approach demands new concepts. A central concept of the new flavour theory is the 'flavour profile.' In order to understand what this is, we must first define what we mean by 'flavour,' and that, in turn, can only be understood in relation to 'taste'. Taste is one of the five senses with which humans are endowed. People have the capacity to taste the flavour of foods and drinks. As one of the five senses, taste is profoundly linked to the other senses. Our tongue, nose and eyes are all involved in the act of tasting, thus taste is inextricably bound up with the senses of touch, smell and sight. Once we have placed 'taste' into this human context, we can move on to say that 'flavour' is the counterpart of taste. Where taste belongs to the taster, if you will, flavour is exclusively associated with the food products themselves. All foods and drinks have flavour. Flavour can be broken down into a number of separate elements: the gustatory element, the olfactory element and the tactile element. This definition of flavour is broader than that supplied to us by most standard dictionaries, and while this may seem confusing to some, to me it is a natural consequence of looking at the matter closely.

A conscious awareness of the distinction between taste and flavour is very useful. Taste, being linked to humans, is by definition a subjective concept. People have different capacities, experience and culture and they experience taste in their particular environments. This will necessarily influence the registration of flavour, but it certainly doesn't influence the nature of the flavour itself. Compare this to the idea of colour. The colour of a given object will remain steadfast, even though it may be experienced differently by individuals with varying degrees of visual ability. In fact, flavour is objective. Any trained professional will acknowledge that. To avoid subjectivity when defining a flavour, the tasting of the food item in question must be undertaken by a team of tasters.

Once all of this has been established, we need descriptors: parameters or rather concepts that can be used to describe flavour. In the field of physics, frequency (hertz) and intensity (decibels) are the parameters used to describe the phenomenon of sound. In the field of flavour, 'mouthfeel' and 'flavour richness' are the parameters we use to help us define flavours.

Mouthfeel

Humans are, from birth, highly sensitive with regard to mouthfeel. There is no flavour without mouthfeel. It can be defined as: the human perception of the texture of food or beverage in the mouth. Mouthfeel covers all tactile experiences, including texture, thermal effects and chemical influences of acids, salts, minerals, metals and irritants. Mouthfeel is

closely related to food appreciation. Toasted bread that has lost its crispness will have lost much of its appeal as well. In the process of winemaking, wine growers will traditionally counterbalance a highly acidic wine by adding alcohol or residual sugar; otherwise it will develop into an unappealing wine. As a tool to aid us in describing particular flavours, mouthfeel can be subdivided into two categories: contracting mouthfeel and coating mouthfeel.

First subcategory: contracting mouthfeel

Acidity and saltiness play an important part in the composition of many foods, and trigger a contracting response in the mouth. The papillae on the tongue register the presence of acidity and saltiness; this is experienced as tactile 'tingling' or 'stinging' impressions. The acidic wine will have a 'contracting' mouthfeel, as will the freshness of a green salad, citrus fruit, apples, and pickles. No wonder such wines go well with salads and other fresh foods. Frozen substances such as can be found in ice cream also trigger a fresh and tingling oral sensation. They have a rinsing, refreshing influence in the mouth. In fact, the pores located in the mouth contract to bring about this effect. The more extreme tactile reactions produced by CO₂, menthol, raw onion, mustard, ginger, horseradish and some peppers are similar to the reactions triggered by milder foodstuffs, but they are very different from a chemical and physiological point of view. The common denominator is that all of these food substances trigger a contracting, prickling or stinging feeling.

In addition to the effect just noted, contracting mouthfeel may also be characterised by dryness in the mouth. Foodstuffs that easily absorb saliva can cause this: a dry biscuit, a crispy, fresh crust of bread, potato chips, some meats and nuts. The drying (roughing, puckering) effect in the mouth caused by tannins (red wine) and other bitter tasting elements (as in coffee, tea or unsweetened chocolate) is also characteristic of contracting mouthfeel.

Second subcategory: coating mouthfeel

Creamy, fatty substances and those containing a significant amount of dissolved sugars coat the mouth. In other words, they leave a layer of fat or sugar behind. These substances also influence saliva by making it thicker. In beverages, alcohol and sugars are viscous, coating elements. They coat the mouth, and this coating may influence the way in which the mouth perceives the next mouthful of food it encounters. Proteins also produce a coating mouthfeel, especially amino acids and some chemical substitutions like gelatin.

Contracting mouthfeel and coating mouthfeel are capable of neutralising each other. Oil (coating) and vinegar (contracting) are mixed together to get a well-balanced vinaigrette. Alcohol and/or residual sugar (coating) balances/neutralises the acidity (contracting) of wines. A dry slice of toast (contracting) will neutralise a slice of smoked salmon (coating). The fattiness of that smoked salmon may also be neutralised by teaming it up with lemon, raw onion or horseradish, all of which trigger a contracting mouthfeel.

Flavour richness

The decibel and the lux are units of measure used to plot sound and light intensity, respectively. Flavour richness is their counterpart in the field of flavour. As with contracting mouthfeel and coating mouthfeel, flavour richness can be scaled from low to high. The level of flavour richness can be classified by regarding the flavour type. Flavours that are characterised by the fresh, fruity, acidic tones of lemons, apples and menthol are called fresh. Such flavours are easily associated with spring and summer. Primary fruit flavours in general are often fresh, as are herbs such as chives, parsley, chervil and mint. Fennel, leek, raw onion and raw peppers are examples of vegetables that bring freshness to dishes.

As flavour richness increases, ripe flavour tones are likely to increase. Consider the changes that occur in the flavour profile of a potato depending on whether it is boiled, pan fried or deep fried. Frying or grilling meat or fish shows how flavour intensity rises, while the flavour type changes to ripe. This is also true of onions and peppers that are roasted in the oven. Other examples of food ingredients with ripe flavour tones are mushrooms, caramel and vanilla. In winemaking, the process known as barrel ageing will bring about differences in flavour style, giving such wines a ripe character, just as ageing does. In many cases flavour intensity and ripe flavour tones rise with the level of preparation, leading to higher levels of flavour richness. Pure and non-prepared foods are likely to be lower in flavour richness.

Flavour profile

Foods and drinks can be classified with the three above-mentioned parameters. Contracting mouthfeel, coating mouthfeel and flavour richness can all be scaled from low to high. The three-dimensional model below is called the flavour styles cube.

The world of flavour is a cube. Classified products find their place somewhere in this world based on their perceived objective properties. This basic structure can easily be subdivided into eight categories: the flavour styles.



	contracting	coating mouthfeel	flavour richness
	mouthfeel		

1. neutral	Low	Low	Low
2. round	Low	High	Low

3. balance fresh	High	High	Low
4. fresh	High	Low	Low

5. powerful/dry	Low	Low	High
6. rich	Low	High	High

7. balance ripe	High	High	High
8. pungent	High	Low	High

Practical use

The empirical model of the new flavour theory is scientifically validated in my academic thesis 'The concept of flavor styles in the classification of flavors', for which I received my PhD in 2004. Unfortunately, the consumer version *Het Proefboek, de essentie van smaak* is at the moment(see [here](#)) available only in Dutch. This book is widely used by food professionals and educators in the Netherlands. It was touted as best book for food professionals by World Gourmand Cookbook Awards 2004. In Holland, Belgium and Denmark the theory has been widely adopted.

New gastronomic guidelines

Since space is limited, instead of elaborating on the flavour styles, allow me to address some of the advantages of this new flavour theory. Indeed, it has proven to be very useful in daily practice. A big advantage of the new flavour theory is that it is a universal language that is easy to comprehend. In our courses we do not need much time to get people to understand how a flavour profile can be determined. Consequently the guidelines for wine and food pairing have proven to be very useful and relatively easy to apply. Flavour is what wines and food have in common. Thus, the same descriptors can be used. This leads to new guidelines for the pairing of food and wine. Basically, good combinations are found if the flavour profile of wines and foods resemble one another. In other words:

- Contracting wines go well with contracting foods
- Coating wines go well with coating foods
- The flavour richness of wines and foods should be about the same
- The rule of thumb when composing a menu is to progress from contracting to coating foods and wines, and from lower levels of flavour richness to higher levels.

In this new flavour theory the colour of the wine, grape varieties, region and year are not important; this is evidence of the fact that the new theory goes beyond traditional emphases on wine labels and menu descriptions of food. Instead new roads are opened, roads that were previously considered to be closed or even non-existent. Creativity in gastronomy is enhanced when it grows from a solid base.

Furthermore it becomes clear that small changes in preparation will lead to big changes in flavour. Amounts of salt and various herbs, acidity, the thickness of a sauce, will all, in their own way, change the flavour profile. The same applies to wines: such things as the use of a particular yeast strain, a change in the length of the vinification period, variation of temperature during fermentation and the use of wooden barrels will influence the flavour profile of wine. This explains why wines do not all taste the same even though they come from the same region, year and grape variety.

Culinary success factors

Another interesting application of the new flavour theory is the formulation of culinary success factors. We searched for factors that determine palatability, which we define as flavours that are pleasing to the palate. The term 'palatable' is easily confused with 'liking', which is defined as the human response to a certain flavour. As such, 'liking' is a subjective concept. Palatability, on the other hand, is product-related, and can be considered to be a successful combination of product characteristics. In order for a restaurant dish to be considered palatable, it must exhibit all of the following six characteristics:

- the name and presentation must fit the expectation
- the aroma should be appetising and appropriate to the food
- there should be a good balance of flavour components in relation to the food
- the savoury, 'deliciousness' factor, umami (also called the fifth basic taste), must be present
- the mouthfeel of the dish should offer a mix of hard and soft textures
- it must be characterised by high flavour richness

It is interesting to note that one hospital in Denmark has evaluated and changed all of its recipes based on these factors. Patient satisfaction with regard to food has risen so much that the method is currently being applied in 14 other hospitals.

To conclude

If my good friend Jan Bartelsman had come to me 10 years ago and asked me to write a chapter on my new flavour theory for his book, I would have hesitated. At that time I had just presented the new ideas, and nobody could foresee the impact it would have. In the Netherlands, today, terms like 'coating mouthfeel', 'contracting mouthfeel' and 'flavour richness' are bandied about very casually in restaurants, wine shops and magazines. Supermarket magazines, several food industries and many journalists have also adopted the new flavour-language. The new theory is implemented in educational programmes on various levels. The sommelier training in the Netherlands is based on the theory and many chefs use it to their advantage. Most recently, Wageningen University, one of the leading European universities in the field of Life Sciences, has begun to develop a new Master of Science programme for Gastronomy.

All these activities will hopefully lead to a wider adoption of the flavour styles theory.

Cheers,

Peter Klosse, PhD

About the author

Peter Klosse was born on 3 Feb 1956, the birth very nearly taking place in his parents' newly opened restaurant, De Echoput. The restaurant quickly gained a national reputation, and was awarded its first Michelin star in 1967. After finishing high school, Peter spent a year in California as a foreign exchange student. Between 1975 and 1979 he studied Business Administration and graduated from the Rotterdam School of Management.

Following in his father's footsteps was not a predisposed option. Running a restaurant not only requires management capability, but also a love of food and wine and a supportive partner. After meeting his spouse and working for a period of two years in all kinds of learning positions in famous two and three star restaurants in Europe, Peter satisfied all of the requirements, and took over his parents' restaurant in 1983.

In 1991, he founded the Academy for Gastronomy. It offers professional courses in wine and food pairing. Peter continued his research, which gradually led to his development of a comprehensive empirical theory on flavour. He has published several commercially successful books on this subject, currently available only in Dutch: in 1998 *Smaak* and in 2000 *Smaakstijlen*. In 2001 Peter began researching the material that would eventually become his doctoral thesis. The new findings were included in a book for food professionals, *Het Proefboek*. Further works include four recipe books, and a complete book on wine with a detailed description of all the wine regions in the world. In 2008, in collaboration with photographer Jan Bartelsman, he published *Chef en Sommelier*. It shows how some of the best chefs and sommeliers in the Netherlands work and apply the new flavour theory.

Meanwhile his restaurant, De Echoput, continues to be successful. In 2004, it closed its doors for a time, reopening in 2007 at the same location, together with a five-star luxury design hotel. The restaurant was chosen as best new luxury restaurant in 2008 by the IRHA (International Restaurant and Hotel Awards).

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