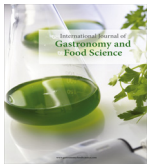

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Scientific Paper

Consumer perception of food–beverage pairings: The influence of unity in variety and balance

Morten T. Paulsen[a,c,*], Guro H. Rognså[b], Margrethe Hersleth[a,c]

[a]*Nofima—Norwegian Institute of Food, Fisheries and Aquaculture Research, PB 210, N-1431 Aas, Norway*
[b]*The Culinary Institute of Norway (Gastronomisk Institutt), Richard Johnsensgate 4, 4021 Stavanger, Norway*
[c]*Department of Chemistry, Biotechnology and Food Science, Norwegian University of Life Sciences, NMBU, P.O. Box 5003, NO-1432 Aas, Norway*

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Abstract

Good pairing recommendations may be crucial for the success of foods and beverages, both in the retail and hospitality sector. Food–beverage pairings are often presented by culinary professionals such as chefs or sommeliers, however little focus has been given to consumer perception of such pairings. The main objective of this study was to investigate consumer perception of overall percepts of food–beverage pairings. Combinations of soup and craft beer were used as model pairings. Soups were developed by a chef according to an experimental design with the basic tastes as factors. Craft beer types were selected according to sensory profile, popularity in the market and culinary recommendations. Results from the consumer study demonstrated significant effects of beer type on liking. Relative-to-ideal ratings for balance demonstrated that dominance of either of the components significantly reduced liking and harmony, while dominance of soup significantly reduced perceived complexity. Results also demonstrated that perceived sensory complexity was highly correlated with liking of pairings when perceived sensory harmony also was rated as high. This study introduces the use of a "just about balanced" (JAB) scale for rating the relative balance of intensity between two products. Some of the challenges with combining culinary creativity with experimental product development are also discussed.

Keywords: Consumer; Sensory; Culinary; Pairings; Complexity

Introduction

Good pairing recommendations may be crucial for the success of foods and beverages, both in the retail and hospitality sector. Due to the complex nature of the sensory interactions between food and beverages it is difficult to determine universal guidelines for creating good pairings. Systematic studies of the overall perception of food–beverages pairings may contribute to explain why certain pairings are perceived as more sensory appealing than other. In this study, craft beer was used as the model beverage. While wine and food pairings is an established concept, the relationship between beer and food is less defined, more depending on the occasion (Pettigrew and Charters, 2006). Popularity of craft beer has been growing among young consumers in general and female consumers in particular the last five years (Brewery Business 2012, http://www.sbdcnet.org). Consumers born after 1980, often referred to as Millenials, are reported to be the largest consumer segment for craft beer (Pew Research Center, 2010; The Nielsen Company, 2014). Guides and online resources, such as the "Beer Sommelier" developed by beer experts such as beer judge Eric McKay, Brooklyn Brewery brewmaster Garrett Oliver and beer writer Michael Jackson, offers automated beer suggestions based on selection of main ingredient and dish type (Great Brewers, 2014). While this provides a quick and user-friendly service for consumers and

*Corresponding author.
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food service professionals, it offers no systematic explanations for the suitability of the suggested pairings. In addition, such guides provides limited information regarding pairings with novel dishes and ingredients.

There is an abundance of theories in culinary literature for pairing food and beverages however most approaches are subjective in nature and difficult to test objectively. A review of relevant books on the subject (see Appendix A) showed that balance of flavor intensity was among the most frequently cited principles regarding successful pairings. In addition, the importance of sweet–sour balance between the products was frequently cited. While most pairing theories have been developed with wine in focus they should also be relevant for beer as the products has many of the same sensory dimensions. Integrated terms such as "harmony" and "complexity" are often used to describe the overall perception of food pairings in culinary literature, related to how well the tastes and flavors go together and the sensory variation in the pairing. Such terms can be viewed in relationship with the arousal potential of the pairings. Berlyne (Levy et al., 2006) described a group of collative properties which influence the arousal potential of objects, such as e.g. novelty, familiarity and perceived complexity. According to his arousal theory there is an inverted U-shaped relationship between perceived complexity and liking; everyone have an individual optimum level of complexity and if the perceived complexity is too low or too high, the liking is reduced. Harmony and complexity can also be related to the more general concept of "unity in variety" which states that people prefer objects with a high variety or complexity while the object maintains a maximum of perceived unity or harmony (Hekkert and Leder, 2008).

There have been relatively few published studies on food–beverage pairings and most of these studies have focused on wine as the beverage for the pairings. Nygren et al. (2001, 2002, 2003a, 2003b), investigated sensory interactions between white wine and food components such as sauce and cheese using trained panelists, while Madrigal-Galan and Heymann (2006) investigated the sensory interactions between red wine and cheese. The results from these studies demonstrated that the food components generally had a bigger impact on the sensory profile of the wine, than vice versa. King and Cliff (2005), investigated the ideal pairing of wine and cheese assessed by culinary professionals. While they found that white wine in general scored closer to ideal pairing with the cheeses compared to red and specialty wines, they also observed large individual differences between the experts. Harrington and Hammond (2005, 2006) investigated the impact of specific sensory properties of cheese, wine and additional food elements on perceived match between cheese and wine pairings using trained panelists and wine experts. In addition, Harrington et al. (2010) explored the impact of flavor and body match on overall match perception. Results from these studies demonstrated some significant effects related to specific sensory properties on match perception. Also, large individual differences among panelists regarding perceived match perceptions were observed. Koones et al. (2014) explored the impact of sweetness, acidity and tannin levels in wines and the level of wine expertise among consumers, on the level of perceived match between wine and different foods. In addition to significant effects related to the investigated properties on match perception, results demonstrated that the level of knowledge influenced general match perception. Bastian et al. (2009) investigated match perceptions between consumers and experts of ideal wine and cheese pairings. They found a high consensus between the consumers and the experts regarding mathing of pairings, which indicated that the underlying principles used by the culinary professionals for selecting the pairings were valid. Bastian et al. (2010) investigated both the sensory interactions and match perception among consumers of food and wine pairings. Significant sensory interactions between the pairings could be determined, however results from the consumer ratings revealed that match perception were mainly related to the overall preference for the wine. In addition to the studies focusing on wine, some studies have also investigated the use of beer in food–beverage pairings. Donadini et al. (2008) compared how culinary experts and regular consumers perceived suitability of pairings of popular Italian dishes and conventional beers. Differences between experts and consumers regarding in the perceived suitability of the pairings were observed even though pairings generally were rated as poor. Harrington et al. (2008) investigated match perception between beer types such as lager, ale and stout, with spicy and non-spicy pizza among novice and experienced beer drinkers. Results from this study indicated that the choice of beer with non-spicy pizza was mainly related to beer preference, while beer with more flavor and fuller body tended to be selected with spicy pizza.

Food and beverage pairings are complex stimuli which can be challenging to rate in a consistent manner both by experts and naïve consumers. Previous pairing studies have demonstrated both agreement and disagreement between consumers and experts, and between the experts themselves, regarding match perception of food and beverage pairings (Bastian et al., 2009, Donadini et al., 2008; King and Cliff, 2005; Koones et al., 2014). Chollet and Valentin (2001) found that while experts were better than untrained consumers to use precise terms to describe beer, their performances were similar regarding a matching task. This suggests that untrained subjects may provide equally accurate information regarding general aspects such as overall perceptions of product quality as experts or trained subjects. Different scales have also been applied for the assessment of match perception of food and beverage pairings in these studies. Some studies have applied Likert scales with various ranges for rating overall food and beverage match, ranging from no match in one end of the scale to ideal match in the other end (Donadini et al., 2008; Harrington and Hammond, 2005; Koones et al., 2014) while other studies have used JAR scales to explore various deviation-from-ideal ratings of the match between the food and the beverage (Bastian et al., 2009, 2010; Harrington and Hammond, 2006; Harrington et al., 2008, 2010; King and Cliff, 2005).

The main aim of this study is to investigate consumer perception of overall percepts of food and beverage pairings, using craft beer as the beverage. Measured responses were liking, using 9 point hedonic scales, and perceived sensory