



Holistic and consumer-centric assessment of beer: A multi-measurement approach



Sara R. Jaeger^{a,*}, Armand V. Cardello^b, Sok L. Chheang^a, Michelle K. Beresford^a,
Duncan I. Hedderley^c, Benedicte Pineau^a

^a The New Zealand Institute for Plant & Food Research Limited, Mt Albert Research Centre, Private Bag 92169, Victoria Street West, Auckland 1142, New Zealand

^b A. V. Cardello Consulting and Editorial Services, Framingham, MA 01701, USA

^c The New Zealand Institute for Plant & Food Research Limited, Palmerston North Research Centre, Private Bag 11600, Palmerston North 4442, New Zealand

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ABSTRACT

Despite occupying a cornerstone position in consumer research and innovation, product liking/disliking provides only partial insight into consumer behaviour. By adopting a consumer-centric perspective and drawing on additional factors that underpin food-related consumer behaviour, a more complete product understanding is gained. The present research showcases this approach in a study with New Zealand beer (incl. pilsner, lager and ale categories). Implementation of a multi-variate approach with 128 regular beer drinkers provided assessments pertaining to liking and sensory novelty/complexity, situational appropriateness of consumption, as well as attitudes/perceptions and emotional associations. The 9 samples grouped into two clusters, where 4 of the beers were similar in being perceived as having less complex flavours, being appropriate for many uses and evoking stronger emotional associations of “relaxed/calm.” The 4 beers were perceived as “easy to drink”, and were, on average, most liked. One of the samples in this cluster was lighter in alcohol (2.5% ABV), but not inferior to beers with 4–5% ABV. The 5 beers in the second cluster were, on average, less liked and were associated with more negative emotions, e.g. “unhappy”, “jittery”, and “tense”. Additional insights were gained from segmentation which identified two groups of consumers, named ‘Lager Lovers’ and ‘Ale Aficionados’. Beers 1–4 were positively perceived by ‘Lager Lovers’ but less so by ‘Ale Aficionados’, and vice versa. The study was conducted under central location test conditions compatible with testing protocols often used in product research. The study protocol can be amended to include few/many consumer-centric measures and extended to product testing where packaging, brand, and other extrinsic information is available to consumers.

1. Introduction

1.1. Holistic and consumer-centric product characterisation/differentiation

Product developers and marketers seek ways for their food/beverage innovations to stand out from the crowd. Hedonic optimization, which for many years was a cornerstone activity in this regard, is no longer sufficient (Meiselman, 2013). Characterising products beyond their sensory and hedonic properties facilitates insightful and nuanced product differentiation that is aligned with product performance as experienced, and more importantly valued, by consumers (Thomson, 2010; van Trijp & van Kleef, 2008).

A prescriptive method to deliver such nuanced product characterisation and differentiation does not, and probably cannot exist. However, the necessary foundations for a methodological framework whereby these insights can be gained exist and are rooted in the

knowledge that food-related consumer behaviour is dynamic and complex, influenced by intrinsic and extrinsic factors, and not fully captured through a univariate approach (e.g., Jaeger, 2006; Rozin & Tuorila, 1993; Thomson, 2010). When translated with a view to empirical implementation it implies a tailored, product-focused and multi-variate approach that obtains holistic (i.e., integrated and more comprehensive) product understandings from consumers. A focused and pragmatic orientation is often called for since the amount of research required to acquire a fully comprehensive product understanding would likely be prohibitive in typical product development applications. Considering that central location/laboratory tests remain dominant in consumer research (Jaeger & Porcherot, 2017), working within the confines of these test settings while retaining a multi-variate approach will likely be required.

The purpose of the present research was to implement holistic and consumer-centric product characterisation and illustrate the nuanced

* Corresponding author.

E-mail address: sara.jaeger@plantandfood.co.nz (S.R. Jaeger).

product differentiation that is gained. Beer was chosen as the product category of interest as it has a long history of expanding/contracting degrees of product differentiation and its product landscape is currently undergoing many changes (see Section 1.2). Three types of product responses were obtained: attitudes/perceptions, situational appropriateness of consumption (IBU: item-by-use) and emotional associations. Each type of response adds value to product innovation efforts (e.g., Lundahl, 2012; Schutz & Jaeger, 2010) and is derived from well-established and well-known methods (see Section 2.3). Interested readers can refer to Cardello et al. (2016) for background knowledge regarding these three types of product responses and their relevance in multi-variate product research.

Additional product responses could have been chosen, some of which are considered in the Discussion section. This would have made the study more comprehensive, but their inclusion was not paramount to illustrate the holistic approach. The high degree of flexibility and ease of implementation in a central location setting additionally supported the choice of attitudinal/perceptual statements, situational appropriateness and emotional associations as the dependent measures in the present research. For example, Likert statements, one of the most frequently used metric approaches in attitudinal research, can be developed to capture any aspect of product attitudes/perceptions that is relevant to an investigation including health/wellbeing, sustainability, branding/packaging, value for money, food safety, etc. This is also true for statements about situational appropriateness, which, as illustrated by Schutz and Ortega (1974) in the case of wine, can cover time of day, occasion served, where served, how served, persons served, as well as physiological, psychological and physical uses. It was also a determining factor that the three sets of measures can be worded to tap into the same constructs. For example, if there was particular interest in understanding whether one or more beers were differentiated on their appeal to/relevance for men, it would be straightforward to include both Likert statements (e.g., “This beer is more suitable for men than women”) and IBU statements (e.g., “For men”, “For women”). The same principle can be applied to attitudinal and emotional product associations (e.g., “Beers like this one bore me” and “Dull/Blue”). The value of this strategy lies in the increased confidence that a result is robust if two or more samples are similarly discriminated by multiple variables (i.e., principle of triangulation in research).

At its core the present research is similar to other previous research on beer where multiple dimensions of product characteristics have been measured/uncovered in search of integrated and more comprehensive insights (e.g., Cardello et al., 2016; Giacalone, Bredie, & Frøst, 2013; Gómez-Corona, Escalona-Buendía, García, Chollet, & Valentin, 2016; Jaeger et al., 2017; Schouteten et al., 2015; Sester, Dacremont, Deroy, & Valentin, 2013; Silva et al., 2017), and the term ‘holistic’ is not unique to this research (e.g., Aoun & Tournois, 2015; Doets & Kremer, 2016; Kim, Van Hout, & Lee, 2015; Lundahl, 2012). We recognise and value the fact that the multi-variate and holistic perspective is becoming more common as a means for capturing product representations in consumers' minds and allowing consumption and behaviour practices to be better understood.

1.2. A case study with beer

Product differentiation in beer has a long and evolving history that can be traced back over 5000 years, where a variety of sweet, heavy, fragrant beers were made by the Sumerians (Kiefer, 2001). Much later, European monks and Colonial American farmers contributed innovations and product diversification (Bostwick, 2014), but it was not until the Industrial Revolution that beers of consistent quality became available. With this development also came a loss of product differentiation, which continued to modern times. In the closing years of the 20th Century and accelerating during the first years of the 21st Century, beer consumers began to eschew mass-produced beer and amidst this revolt, small “micro-breweries” began to evolve. They were driven by a

desire for better tasting beer that was enjoyable to drink, seeing an opportunity to profit from consumers' growing dissatisfaction (Acitelli, 2013). Recent estimates put the total percentage of such craft beers at 6% of the global beer market (Ascher, 2012) and growing rapidly.

With the current growth in the number of styles, types, and flavours of beer has come the problem for brewers of identifying beers and beer flavours that are new and different. The aim of the present research is to showcase how multi-variate/holistic product characterisation can assist in this effort and help to harness the growing consumer interest in exploring new beer styles and/or flavours and their accompanying willingness to pay higher prices (Ascher, 2012; Brager & Greco, 2011). To deepen the analysis and the insights gained from the multi-variate approach, consumer segmentation is performed. This is motivated by masking of heterogeneity in a consumer sample when performing aggregated analyses, and a possible negative on impact for innovation and understanding of food-related consumer behaviour. Segmentation is encouraged (Meiselman, 2013) and aligns with a central dogma in sensory and consumer research: the “average consumer” does not exist (Köster, 2009). Segments can be defined a priori and distinguish consumers on the basis of age, gender, income, household size, product involvement etc. (e.g., Ares & Gámbaro, 2007; Lockshin, Quester, & Spawton, 2001; Onwezen & Bartels, 2011) or be data-driven (e.g., Mueller & Rungie, 2009; Helgesen, Solheim, & Næs, 1997; Thybo, Kühn, & Martens, 2004). Both approaches are common, but with the latter segments based on differences in hedonic responses to samples can be identified. This is pertinent in the present research where product-specific insights are sought and with it an understanding of how the multi-variate approach extends “beyond liking.”

2. Materials & methods

2.1. Participants

One hundred and twenty eight (128) beer consumers (convenience sample) were recruited by a professional recruitment company from the greater Auckland (New Zealand) region. Consumers were 38% female, ranged in age from 20 to 66 years old, predominantly Caucasian (80%), and had diverse socio-economic backgrounds. Directed by the aims of the research, consumers who were eligible for participation: i) liked beer and consumed it at least once a fortnight, ii) were able to list at least three beer styles, and iii) had an interest in trying new beers.

The participants attended two 2-hour research sessions (one week apart during July of 2016) at the Plant & Food Research Sensory Facility in Auckland. Prior to each session, participants gave informed written consent to participate and were subjected to a breathalyser test for alcohol content (to ensure no measurable Blood Alcohol Concentration prior to start of the session). At the end of the each session, participants were compensated in cash and offered a voluntary breathalyser test before they left the facility. The study was approved by the Plant & Food Research Human Research Ethics Committee. Because almost all participants would travel to the research facility by car, it was a condition of the human ethics approval that participants consume less than one standard unit of alcohol during each research session.

2.2. Beer samples

Nine beers – lager and ale styles - were used (Table 1), and all were commercially available in New Zealand and purchased from local supermarkets and liquor stores.

Samples were presented in a glass (ISO Wine Tasting Glasses 21.5 cl) labelled with a 3-digit random code. The volume of each sample was restricted to 25 ml to ensure that the total intake of alcohol during the session was less than one New Zealand standard drink (< 10 g pure alcohol), the requirement determined by the study human ethics approval. All samples were served at ~10 °C.

Information about alcohol content was obtained from the product

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