Investigation of New Zealand Sauvignon Blanc Wine Using Trained Sensory Panels

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ABSTRACT

A core tool of sensory science is the use of trained descriptive panels. This research describes an investigation into the role of motivation in the performance of trained panels and the use of a trained panel to develop a better understanding of the perception of Sauvignon blanc wines.

Substantial investment in time and money is directed towards ensuring trained panels perform optimally. Having selected a panel, the panel leader needs to ensure that panellists provide accurate, reliable data. Panellist motivation is also an important factor to consider. While performance psychology, education and sport science fields have researched motivation extensively, knowledge about panellist motivation within sensory science is limited. However, findings from existing research in these other areas - which suggest an important role for autonomy, competence and relatedness - can be applied to sensory panels in order to increase intrinsic motivation.

The initial part of the research investigated the fundamental factors that affect and influence panellists' motivation and participation. A survey (n=74) revealed that extra income and a general interest in food were the key drivers in inspiring people to become panellists, whilst enjoyment in being a panellist, interest in food, and extra income were key drivers for people to remain panellists. In a second survey, the intrinsic motivation of seven trained panels from four countries (n=108) was assessed. External panels were found to be more intrinsically motivated than internal panels. Experienced panellists had an increased perception of competence, which is a key factor for people to be intrinsically motivated. Understanding motivational frameworks currently used in other research fields and integrating them into existing panel training protocols may enhance and sustain panellists' intrinsic motivation.

A trained panel (n=14) was then used in the second part of the thesis to identify key flavours in Sauvignon blanc wines from Australia, France, New Zealand, Spain, South Africa and USA. Sixteen characteristics were identified and measured, including sweet sweaty passionfruit, capsicum, passionfruit skin/stalk, boxwood/cat's urine, grassy, mineral/flinty, citrus, bourbon, apple lolly/candy, tropical, mint, fresh asparagus, canned asparagus, stonefruit, apple and snowpea. Principal component analysis was used to describe differences between regions and countries.

Sauvignon blanc wines from Marlborough, New Zealand (NZ), were described by tropical and sweet sweaty passionfruit characteristics, while French and South African Sauvignon blanc wines were described as having flinty/mineral and bourbon-like flavors. Chemical analyses of these wines also showed that Marlborough, NZ wines had more methoxypyrazine and thiol compounds. A consumer study (n=109) showed that New Zealanders significantly prefer New Zealand style Sauvignon blanc.

The final part of this research focused on using trained panellists to explore the interactions between volatile and non-volatile wine compounds and their effects on the aroma profile of New Zealand Sauvignon blanc wine. Four volatile aroma compounds that are important in New Zealand Sauvignon blanc wine were studied (isobutyl methoxypyrazine [MIBP], 3-mercaptohexanol [3MH], 3-mercaptohexanol acetate [3MHA], and ethyl decanoate). Each of these four aroma compounds were assessed in combination with three non-volatile polyphenolic compounds commonly found in Sauvignon blanc wine: catechin, caffeic acid and quercetin. Results showed each polyphenol had a unique effect when blended with a specific aroma compound, either suppressing, accentuating, or showing little effect on the perception of the aroma compounds. The perception of MIBP, 3MH, and ethyl decanoate were largely suppressed by the added polyphenols, with a few exceptions. The perception of 3MH was accentuated with the addition of caffeic acid, and the perception of 3MHA was accentuated with the addition of catechin. The interactive effects of aroma compounds with polyphenols likely reflect non-covalent associations in the wine solution that reduce the volatility of the aroma compounds. With an understanding of the interactive effects of volatile and non-volatile compounds in wine, winemakers might optimize the impact of selected volatile compounds by managing polyphenol levels, supporting their efforts to attain desirable wine aroma profiles.

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