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SHORT COMMUNICATION

Drawn to Drink: A Double-blind Randomised Cross-over Trial of the Effects of Magnets on the Taste of Cheap Red Wine

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Abstract *Several products claim to use weak magnetic fields to improve the palatability of wine. In a double-blind randomised cross-over trial we tested the efficacy of one such device. Four bottles of the same wine were purchased and two were 'magnetised' using The Perfect Sommelier™. Sixty participants were then asked to taste a sample of both magnetised and non-magnetised wines under double-blind conditions and state which they preferred. Twenty-nine preferred the magnetised wine and 31 the non-magnetised wine ($\chi^2 = 0.07$, degrees of freedom = 1, $p = 0.80$). We were therefore unable to verify the claims made by the manufacturers of The Perfect Sommelier™ regarding their product's efficacy.*

Introduction

Several commercially available products exist which are supposedly able to improve the taste of cheap wine using weak magnetic fields. These products consist of a coaster upon which a bottle can be placed, and a stopper or ring which can be placed on top of the bottle. Both coaster and stopper contain magnets which are said to produce large improvements in the flavour of wine after about 30 min of exposure. The mechanism by which these devices work is unclear, but the websites of the various retailers and manufacturers suggest that they "promote accelerated breathing allowing oxygen to bond more efficiently resulting in a much smoother rounder taste", provide the same effect as "years of cellaring ... greatly enhancing the elegance" of a wine and make wines "show softer tannins and rounder fruit, as if [they] had been aged for several years".

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Evidence for the effectiveness of these products comes from anecdotal accounts available on the retailers' websites. These include positive evaluations from various individuals including the head of purchasing for the wine department of a large high street retailer, a science professor at an unnamed university and 'Susan' from the Pentagon (Anon., 2003). The retailers themselves are also confident about their products and most offer money-back guarantees. As one retailer states, "we challenge you to try it yourself—you won't believe the difference it can make". A review of Medline, PsychInfo, Cinahl, Embase, Amed and the Web of Science using the search term 'wine and magnets' suggested that, as yet, no scientists have taken up this challenge. In this study, we aimed to rectify that oversight by using a double-blind randomised cross-over trial to test the hypothesis that people would be more likely to prefer a magnetised sample of wine to a non-magnetised sample of the same wine.

Methods

Design

We conducted a double-blind randomised cross-over trial in which participants were asked to taste a sample of magnetised and non-magnetised wine and report which they preferred.

Participants

The participants were volunteers drawn from the staff and students of King's College London. Participants were excluded if under 18 years of age or unwilling to drink two small samples of red wine.

Materials

The magnetic device we tested was The Perfect Sommelier™ (LK Manufacturing Corp., Huntington Station, USA), which consists of a magnetic coaster and a magnetic bottle stopper. According to the retailers, this product produces the most noticeable improvements in flavour when used on cheap red wines with a high tannin content. The effects of the device are said to be noticeable after 15–30 min of exposure and last for between 30 and 60 min.

This device was tested using four bottles of Bulgarian cabernet sauvignon from the Thracian Valley region (Domaine Boyar, Silven, Bulgaria), a relatively cheap wine (£2.99 per 75 cl) described by its label as 'full bodied' and 'fruity'.

Wine Preparation, Randomisation and Blinding

Testing was conducted over 2 days, with the same randomisation procedure applied on each day. Two identical bottles of wine, labelled A and B, were delivered by one of the authors (GJR) to a senior member of our department who was otherwise independent of the research team. Both bottles were opened and a sample of each was tasted to ensure that they were subjectively indistinguishable. GJR then left the room. A random numbers table was then used to select one of the bottles to be magnetised. This bottle was placed on the magnetic coaster and the magnetic stopper placed in its opening. The other bottle had a non-magnetic stopper placed in its opening and was put to one side. After 30 min the stoppers were removed and the bottles returned

to the research team, who began testing with them immediately. All members of the research team were therefore blind as to which bottle had been magnetised.

The order in which the two samples of wine were tasted by each participant was randomised by the researchers conducting the testing. This order was determined for each participant after their enrolment into the trial using a computerised random numbers generator.

Procedure

Testing took place between 5 and 6 p.m. on two consecutive afternoons in August 2004, in the lobbies of two university buildings. Potential volunteers were asked if they would like to participate in a double-blind wine tasting and the rationale of the experiment was explained to them. The age and sex of those individuals who provided verbal consent were recorded and three additional questions, adapted from previous research (Hughson and Boakes, 2001), were asked as an indicator of their proficiency in wine tasting. These questions were: how often do you drink wine (every day, at least once a week, once or more a month or less than monthly); how much have you read about wine (three or more books, one or two books, articles only or part of a book, only labels or nothing); and have you ever had any formal training in wine tasting (yes or no). Participants were categorised as 'proficient wine tasters' if they had received formal training in wine tasting, if they had read three or more books on wine or if they drank wine every day.

After answering the questions, participants were given 20 ml of wine A or wine B to drink. After swallowing, they were asked to refresh their palette using a glass of mineral water and to drink 20 ml of the other wine. Participants were then asked whether there was any difference between the wines (did not notice a difference, noticed a small difference or noticed a large difference) and which wine they preferred (the first wine or the second wine). Even when participants could not detect any difference between the two samples, they were still asked to state which they would prefer to drink again, if they had to.

Analyses

Our hypothesis was tested using a one-sample χ^2 test. Given that money-back guarantees are offered on The Perfect Sommelier™, we based our power calculation on the assumption of a relatively large effect. We therefore calculated how many participants would be required for us to detect a proportion of 0.70 or more expressing a preference for the magnetised wine as significant at the 5% level and with 80% power. According to this calculation, 47 participants would be needed. In practice, however, we decided to continue testing beyond this point, until we ran out of wine.

Results

Sixty people (22 men and 38 women) with a mean age of 36.0 (standard deviation = 9.1) approached us and gave verbal consent for the study. All completed the testing in full and according to the study protocol. Of these, 26 tasted the magnetised wine first and 34 the non-magnetised wine. There was no significant difference between the number of participants who expressed a preference for the magnetised wine (29 participants, 48.3%) and the non-magnetised wine (31 participants, 51.7%) ($\chi^2 = 0.07$, degrees of freedom (d.f.) = 1, $p = 0.80$).

Twenty-seven participants reported detecting a large difference between the two samples. Of these, 10 (37.0%) preferred the magnetised wine, and 17 (63.0%) the non-magnetised wine, a non-significant result ($\chi^2 = 1.8$, d.f. $= 1$, $p = 0.18$).

Finally, 19 participants were categorised as being proficient at wine tasting. Of these, 10 (52.6%) preferred the magnetised wine and 9 (47.4%) the non-magnetised wine. This effect was also not statistically significant ($\chi^2 = 0.05$, d.f. $= 1$, $p = 0.82$).

Discussion

Principal Findings

No evidence was found to suggest that The Perfect Sommelier™ improves the palatability of cheap red wine. It is possible that the effects of this device are not apparent to everyone, however, and that a more select sample of participants would have noticed a difference. Some people may be biologically more sensitive to the flavour of magnetised wine, for instance, or a certain expertise in wine tasting may be required before subtle differences between two samples can be detected (Hughson and Boakes, 2001). Our two subgroup analyses were designed to test for these effects, but again failed to find any evidence to support the efficacy of The Perfect Sommelier™. If anything, a non-significant trend in the opposite direction was noticed, with the majority of those who thought they could detect a difference between the two samples preferring the non-magnetised wine.

Of course, it is always possible that some aspect of our study design prevented us from observing a genuine effect of The Perfect Sommelier™. For example, pre-existing variations between bottles in terms of the flavour of the wine may have masked any effects of magnetisation. It should be noted, however, that samples from each bottle were tasted by two researchers prior to magnetisation and that no major differences between them could be detected. Furthermore, although more subtle inter-bottle differences may have existed, these should not have masked the efficacy of The Perfect Sommelier™ unless its effects were themselves relatively subtle, and in this case we are unsure how much benefit the typical wine consumer would derive from the product. Nevertheless, future attempts to replicate our work should remove this potential difficulty by decanting wine from a single bottle into two half-bottles before randomising one of these to be magnetised.

Conclusions

Practitioners of unconventional interventions often cite cost as a reason for not carrying out rigorous assessments of the effectiveness of their products. This double-blind randomised cross-over trial cost under £70 to conduct and took 1 week to design, run and analyse. Its simplicity is shown by the fact that it was run by two 16-year-old work experience students (EA and RI). As questions continue to be raised about the future of the randomised controlled trial, it is good to be reminded that such studies can often be the quickest, cheapest and best way to test claims of efficacy.

Unfortunately, our research leaves us no nearer to an understanding of how to improve the quality of cheap wine and more research into this area is now called for as a matter of urgency. In the meantime, we tentatively suggest that anyone considering buying a magnetic wine improver should also consider alternative options, such as spending their money on better-quality wine.

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