Sensory experiment on dietary intervention for health

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Abstract

This sensory exercise is aimed at understanding whether flavour preferences can be acquired to increase intake of foods with greater health benefits. The strategy is to create alternate product formulations using ingredients selected for health, and training the palate for an equal or enhanced flavour experience. The exercise also includes an interview questionnaire to assess whether the exercise of cooking influenced preferences, and by extension whether home-cooking may be intervention leading to sustainable success of personal health goals.

Background

The definition of good health is living a more productive and longer life and not only avoiding disease conditions (Bircher 2005). Individuals have varied interpretations of good health including; better athletic performance(Maughan 2002), weight loss (Maughan 2002; “ACP Journals” n.d.), amelioration of chronic diseases(Keller and Layer 2005). Exercise and diet are among several recommended practices to achieving good health (Bircher 2005). Regarding the foods to consume, there are guides based on recommended daily allowance of macronutrients and essential nutrients. The mediterranean diet is a surrogate for functional health nutrients, (Singh 2002), however there are no published guidelines for consumption. The need for dietary intervention cannot be overstated, since there is a vast body of research that clearly indicates the negative health impact of foods produced from yield-focussed agriculture and animal husbandry and other industrialised processes (Cordain et al. 2005). Accordingly while there might be certain diets prescribed for a limited period and a specific outcome, a comparatively ‘regular’ health-oriented diet should consider the long term adherence possibilities (Wadden 1993).

McCrickerd and Forde propose that the success of a diet is more likely if it has sensory appeal to the consumer (McCrickerd and Forde 2016) . Sensory strategies include techniques such as taste-aroma congruence for reduced intake of salt (Hoppu et al. 2017) and sugar (Small et al. 2004) . A suggested intervention in early childhood to address later fussiness and neophobia, used experiential learning and taste exposure strategies(Nekitsing, Hetherington, and Blundell-Birtill 2018). Another study also shows the role of parental actions as a predictor of later fussiness or neophobia, for example parent encouraged variety in vegetable consumption has negative correlation

(Galloway, Lee, and Birch 2003). School gardens are further evidence that experiential learning addresses obesity besides increasing acceptance of healthy foods.(Davis, Spaniol, and Somerset 2015; Evans et al. 2016). Studies have shown the effectiveness of home cooking towards weight loss (Wolfson and Bleich 2015; Wolfson, Leung, and Richardson 2020).
As part of the sensory exercise , we include a questionnaire to address the role of home-cooking as an intervention since it allows the opportunity for control over inclusion or exclusion of certain ingredients. The design of the exercise includes hands-on work in preparing one of the food samples. The recipe is selected to provide visual resemblance to a purchased product-sample so as to not cause any early bias.

Sensory Exercise

The sensory experience includes a tasting exercise designed to appreciate organoleptic properties and relate them to the ingredients. It then goes on to address home-cooking as an intervention. The home-made sample was intentional to give the participants a recent experience, to relate to for the questionnaire.
The food samples for this exercise are two variants of banana-nut bread. The participants will make one product at home and purchase a similar product from a global brand like Starbucks(“Starbucks®”). The home-made recipe is devised to visually resemble the purchased product. The technique of taste-aroma congruence is used to reduce the sugar by utilising ingredients like vanilla and banana whose aromas create the perception of increased sweetness.
The recipe is here. We do not know the recipe for the purchased product , but we refer to the manufacturer provided information on the ingredients. The ingredient substitutes compared to the standard are :

- Brown rice flour and almond meal instead of regular flour.
- Banana, Vanilla, Walnuts and Chocolate for flavour and texture. The purchased product includes a ‘natural’ flavour but exact details are not provided, nor is the amount of bananas.
- Olive oil instead of a non-specific vegetable oil.
- Coconut sugar instead of white sugar.
- Yogurt is used in the home-made version. There is no exact equivalent in the purchased product.

The participants will be given the recipe along with a video demonstration. This is to ensure that the self-made products are as similar as possible. There will also be a written recipe that explains the chemistry and the culinary behaviour of the ingredients. This recipe is not suitable for participants that are allergic to nuts. The purchased

sample may be a gluten-free version depending on gluten sensitivity, however the intent of the exercise is not to focus on gluten-free foods.

The participants will be divided into 2 groups. One group will get the nutrition comparison before tasting and the other will get it after tasting. This variation checks whether knowledge of nutrition influences tasting experience. The tasting exercise will be approximately 20 minutes with 9 questions. This will be followed by the interview questionnaire which will take approximately 15 minutes.

A final report will be provided with the results and any analysis.

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