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Title:

Sensory interactions in sweet food: preliminary insights in normal- and over- weight adolescents

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The adolescence is recognized as a susceptibility phase in terms of dietary behavior and decision-making process. It is well known that the high consumption of sweet foods is directly related to the phenomenon of weight gain. A promising innovative strategy to reduce sugar consumption in adolescents is to take into account the cross-modal interactions, namely the ability of our senses to interact with each other, for the development of new food formulations.

The aims of the present study were to investigate gustatory function and cross-modal interactions in normal- and over- weight adolescents to increase desirable sensory characteristics in a sweet model (vanilla pudding).

A total of fifty adolescents were involved. Twenty-five subjects were over-weight (BMI= 28 ± 0.2 kg/m²) and twenty-five normal-weight (BMI= 20 kg/m² ± 0.3 kg/m²), according to WHO reference values. Gustatory function was measured through 'Taste Strips' methodology and subjects rated liking and intensity of selected attributes (sweet, vanilla and butter flavor, creaminess) in pudding samples obtained by adding vanilla aroma (0.1%; 0.3%) to a base formulation.

Results showed that over-weight adolescents were found to have a significant ($p < 0.001$) worst ability to correctly identify all tastes (sweet, sour, salty and bitter) compared to the normal-weight subjects. As regards cross modal sensory perception, only over-weight adolescents perceived a significant increase ($p < 0.05$) in sweet taste perception with increasing amount of vanilla aroma. Furthermore, a significant sample effect ($p < 0.0001$) on liking scores was found in both group of subjects with higher scores provided to the sample added with the highest aroma amount.

In conclusion, understanding cross-modal interactions in specific consumers' target is worth of interest to develop innovative food formulations with a reduced sugar amount leading to a potential decrease in caloric intake and tackle the obesity epidemic.