

Title:

Differences in salivary protein composition are related with inter-individual variation in bread sensory ratings

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Saliva is being recognized as participating in oral sensory perception. This fluid contacts with food, at the same time that constitutes the surrounding environment of sensory receptors in the mouth. As such, saliva modulates perception both by interacting with food constituents and/or by changing the ability for signal induction by stimuli. In the particular case of bread, salivary amylase is known to participate in perception, due to its amylolytic activity. But saliva is composed by other proteins, besides amylase, which can be also involved in sensory perception. How these explain why different individuals sense differently the same product was what we intended to answer in this work.

First, we did test 64 individuals (16 male; 48 female) for the changes in salivary protein profile induced by a commercial refined bread mastication. This first experiment allowed the assessment of the composition of saliva that is contact with bread during mastication. Only the protein band containing polymeric Ig receptor was significantly changed, suggesting a decrease in salivary IgA with bread in-mouth stimulation. In the second part, 22 of these individuals (11 male, 11 female) were tested for the sensory rating of the same type of bread. Salivary protein profile and amylase enzymatic activity of the fluid collected after tasting was correlated with results from sensory analysis. Sweetness ratings were positively correlated with flow rate and prolactin-induced protein expression levels, being negatively correlated with amylase enzymatic activity and expression levels. Saltiness was positively correlated with carbonic anhydrase VI and negatively with amylase, whereas roughness correlated positively with this last protein and negatively with S-type cystatins. In conclusion, not only salivary amylase, but also the composition in other salivary proteins contribute to inter-individual differences in the sensory perception of starch-based foods. This highlights the importance of knowing saliva composition to understand food acceptance.