

**BOOTSTRAPPING PENALTY ANALYSIS IN SENSORY EVALUATION OF  
PIZZA PRODUCTS**

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## ABSTRACT

Penalty Analysis is a popular method used to evaluate data from sensory evaluation using the Just About Right Scale and the Hedonic Scale. Although the test estimates the mean drops for the "Too Little" and "Too Much" categories of each product attributes, penalty analysis does not provide information that can be used to test the effect of each attribute on the overall liking score. Bootstrap resampling method when used together with penalty analysis estimates the standard error of the mean drops and allows to test for the significance. This method is used in product testing of pizza products.