# Poster # 2 Determination of Optimal Time and Palate Cleanser

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Solae™ Innovation through Nature

## ABSTRACT

Sensory science involves use of a data-driven approach to establish evaluation protocols that control for (or minimize) non-test variables that may interfere with test outcomes. Allowing an appropriate amount of recovery time between samples is important for prevention of carry-over effects, obtaining accurate intensity measurements, as well as preventing panelist fatigue or adaptation. The purpose of this study is to a) determine how much "rest" time is needed between samples and b) if using an alternate palate cleanser will enable reduced waiting time. Results of the study will also be used to determine the maximum number of samples that can be tested during a single profiling session. The study utilizes three different food categories: Soymilk (Vanilla, Original, and Fat Free), Dry Blended Beverages (differing amounts of protein), and Food Bars (Mint Chocolate, Double Chocolate, and Chocolate). Each food category was tested at three different time intervals (15, 10, and 5 minutes) in triplicate to determine the optimal amount of "rest" time needed between samples. The second part of the test was to determine if use of cracker and water inter-stimulus rinsing agents would impact the amount of time needed between samples. The time intervals tested were 5 and 10 minutes. Panelists rated their degree of Readiness, (how ready each panelist felt to move on to the next sample) as well as perception of Mouth Cleanliness (how clean each panelist's mouth cavity felt, including lips, tongue, and inside mouth). The results showed that panelists have higher Readiness and have more mouth Cleanliness at 15 minutes, but the optimal time to wait between samples is 5-10 minutes as measured by Consistency of intensity ratings.

## INTRODUCTION

During sensory evaluation tests, common practice involves evaluation of more than one product within a session. This causes panelists to have to adapt to sample residuals left in the mouth cavity after expectoration. Perception of taste intensity in subsequent samples can also be affected. Therefore, it is desirable to have an interstimulus procedure to stabilize panelists baseline for sensory assessments. For example, a palate cleanser would minimize residuals and bring a subject's oral environment back to a baseline, allowing for accurate intensity ranges. There is no Universal Standard protocol for determining which palate cleanser is the best. There are a variety of recommendations found in the literature, including water, crackers, carrots, apples, chocolate, carbonated water, cream cheese, xanthan gum, melba toast, pectin, cucumber, and sour cream. The purpose of my Masters thesis[1] was to determine which palate cleanser is the more effective within representative food types. My study looked at different food categories (sweet, bitter, fatty, astringent, hot/spicy, cooling, and non-lingering) with different palate cleansers (water, table water crackers, pectin, warm water, chocolate, and whole milk) and found across all food categories that cracker followed by water was the best palate cleanser. Therefore, when evaluating samples with no interstimulus rest time, the best palate cleanser to use was found to be cracker followed by water. Based on these results, the next step was to determine how resting time would impact the palate cleanser needed.

[1] C. L. Lucak. 2008. Determination of Various Palate Cleanser Efficacies for Representative Food Types. IFT.

## OBJECTIVE

1) Determine how much time is needed between samples 15, 10, or 5 minutes.
2) Determine if using a cracker-water interstimulus will reduce the amount time.
3) Determine the maximum number of samples that can be tested during a single profiling session.

## MATERIALS & METHODS

**Products**

- Soymilk
  - Vanilla
  - Fat Free
  - Original
- Dry Blended Beverages
  - 10g protein/serving
  - 30g protein/serving
- Food Bars
  - Mint Chocolate
  - Double Chocolate
  - Chocolate

**Descriptive Profiling Panelists**

- Eleven highly trained Descriptive Profiling panelists rated each product category using a simplified flavor lexicon developed for that product using the Spectrum™ Method of Sensory Descriptive Analysis.
- Independent data entry

**Interstimulus Time Intervals**

- 15, 10, and 5 minutes

**Palate Cleansers**

- Water and Cracker-Water

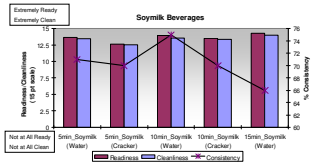
**Data Collection**

- Compusense® Electronic Data Collection Software
- Time Delays Managed by Computer for Consistency
- Evaluation Procedure:
  - Taste Sample
  - Rate attributes
    - 15 intensity point scale (0=none/not applicable to 15=strong/high)
  - Rinse 3 times with water or take a bite of cracker and rinse 3 times with water (dependent on study)
- Wait appropriate time interval 15, 10, or 5 minutes
- Evaluate Mouth Cleanliness
  - 15 point line scale ranging from Not Clean at All to Extremely Clean
- Evaluate Readiness
  - 15 point line scale ranging from Not at All Ready to Extremely Ready
- Process continued until all 9 samples were evaluated

Each product group was evaluated separately at each time interval and palate cleanser.

Each sample was evaluated in triplicate in randomized order.

Panelists Perceived Readiness and Cleanliness Versus Percentage Consistency




Even though panelists might feel ready or clean, their consistency declines if they wait 10 minutes with cracker-water rinse or 15 minutes with water.

## RESULTS & DISCUSSION

**Consistency**

Consistency was determined by plotting individual panelist's scores for each replicated evaluation (reps) in a Control Chart. This was done for every attribute. From there it was decided if the panelist's scores were consistent or inconsistent, and whether scores increased or decreased over the 3 reps per attribute. Tabulation by product category and by person-product determined percentage consistency.

- Panelist Consistency
  - Varied by time, product, and palate cleanser
  - Represented in the Table below
  - Information was used as Panelist Feedback

Panelist Consistency Over Time Per Palate Cleanser

| Panelist | Palate Cleanser | DBB | Soymilk | Bars |
|---|---|---|---|---|
| 3 | Water | | | |
| | Cracker | | | |
| 12 | Water | | | |
| | Cracker | | | |
| 13 | Water | | | |
| | Cracker | | | |
| 15 | Water | | | |
| | Cracker | | | |
| 19 | Water | | | |
| | Cracker | | | |
| 25 | Water | | | |
| | Cracker | | | |
| 26 | Water | | | |
| | Cracker | | | |
| 27 | Water | | | |
| | Cracker | | | |
| 34 | Water | | | |
| | Cracker | | | |
| 35 | Water | | | |
| | Cracker | | | |
| 36 | Water | | | |
| | Cracker | | | |

Legend: Above 65% Consistency; 51-65% Consistency; below 50% Consistency

- Product
  - Does Not Make a Difference in Consistency
- Time
  - Optimal time between samples is 5 to 10 minutes for higher Consistency
- Palate Cleanser
  - Does Not Make a Difference in Consistency

Panel Consistency Over Time Per Palate Cleanser

| Product | Palate Cleanser | Time 15 | Time 10 | Time 5 |
|---|---|---|---|---|
| DBB | Water | | | |
| | Cracker | | | |
| Soymilk | Water | | | |
| | Cracker | | | |
| Bars | Water | | | |
| | Cracker | | | |

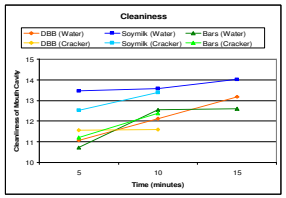
Legend: Above 65% Consistency; 51-65% Consistency; below 50% Consistency



## RESULTS & DISCUSSION

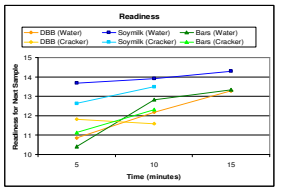
- Cleanliness
  - Panelists' Mouth Cavity felt more clean between samples at longer time intervals

Panelists' Perceived Mouth Cavity Cleanliness Over Time By Products and Palate Cleanser




- Readiness
  - Panelists were more ready for the next sample at longer time intervals

Panelist Readiness for Next Sample Over Time Per Palate Cleanser




Using a highly trained panel, interstimulus wait time impacts panelist consistency. This has implications for other sensory tests as well.

## CONCLUSIONS

➢Descriptive Profiling panelists are more ready for the next sample and have cleaner mouth cavities after the longer time interval (15 minutes), but were more consistent somewhere in the sweet spot between 5 and 10 minutes between samples.
➢Using a palate cleanser did not effect consistency
➢Maximum number of samples per profiling session is 12 which was determined based on the data.

**Acknowledgment:** Solae Descriptive Profiling Panelists

SOCIETY OF SENSORY PROFESSIONALS

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