In Situ Method for Collecting and Analyzing Fluoride in Saliva

S.L. Eversole
P&G, Mason, OH, USA

0840

ABSTRACT

Collection of saliva for assessment of F release from Oral Care products is difficult and often creates potentially non-hygienic situations in the laboratory. **Objective:** The objectives of this study were: 1) to evaluate a new procedure to efficiently collect saliva for monitoring fluoride release and clearance following tooth brushing; and: 2) to assess the ability of this method to provide useful data for comparative studies. **Methods:** Eight (8) human subjects brushed with their assigned dentifrice: a) 0ppm F; b) 250ppm F as NaF; or c) 1100ppm F as NaF for one (1) minute then rinsed with water for ten seconds. Subjects then placed a cylindrical shaped swab (Salivette, Sarstedt, Inc.) between the tongue and roof of the mouth, keeping their mouths closed for 1 minute collection periods at each time point of interest. Saliva samples were collected at baseline(0), 5, 15, 30 and 45 minutes post brushing. Each swab was expelled by the subject directly into an inner chamber of the Salivette container, capped and centrifuged. Saliva samples were removed from the containers, buffered appropriately and analyzed by ISE. The same procedure was repeated on each subject for each product. **Results:** Fluoride clearance profiles (AUC ± SE) for the three products tested were: a) 3.11 ± 4.95; b) 11.04 ± 2.90; and c) 31.33 ± 2.90. **Conclusion: Use of the Salivette device provided a clean, efficient and hygienic method for collecting saliva, and demonstration of a F dose response confirmed the usefulness of this method for comparing F release and salivary clearance patterns of oral care products.**

INTRODUCTION

The ability of a dentifrice to release fluoride is a measure of the product's potential efficacy. Salivary fluoride models are typically used to monitor fluoride release and clearance from new anti-caries products. The historical procedure for saliva sample collection is somewhat awkward for the panelist and relatively unpleasant for the analyst. Although the historical procedures produce results with reasonable repeatability and accuracy, study variation can be influenced by difficulties encountered by panelists pooling saliva for specific periods of time, then expectorating at precise time points.

PURPOSE

The paper describes a method for use of a Salivette, a commercially available saliva collection device, for conducting *in situ* evaluations of fluoride release from dentifrice under realistic conditions of product use.

MATERIALS AND METHODS

MATERIALS:



Salivettes: Saliva collection devices consisting of a centrifuge vial with a suspended insert containing a polyester swab.

PROCEDURE:

Centrifuge tubes are labeled and pre-weighed prior to study initiation.

Subjects place a cylindrical shaped swab between the tongue and roof of the mouth keeping their mouth closed for a one minute collection period.

The swab is expelled directly into the Salivette inner chamber and capped

The tubes are centrifuged allowing clear saliva to pass through to the bottom chamber. The inner chamber and swab are discarded and the tubes are reweighed

Samples are buffered, and analyzed by Fluoride ion specific electrode (Orion #9609BN).

RESULTS

Two graphs illustrate the data. The fluoride clearance profile is shown in Figure 1. Mean area under the curve (AUC) data is shown in Figure 2.

Figure 1

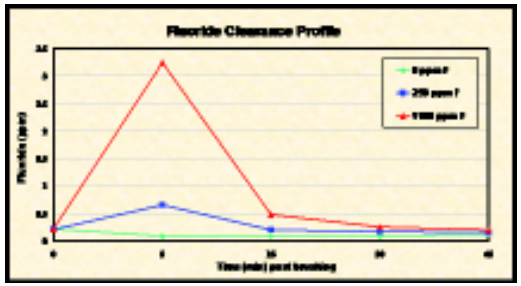
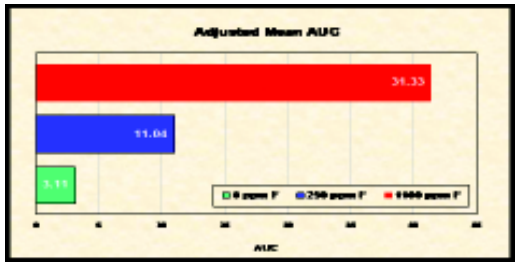


Figure 2



CONCLUSION

- Use of the Salivette device provided a clean, efficient and hygienic method for collecting saliva.
- Demonstration of a F dose response confirmed the usefulness of this method for comparing F release and salivary clearance patterns of oral care products.