

# Nicotine, TSNA and BaP in SNUS and MOIST SNUFF, compared to CORESTA reference product

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## Introduction

In 2008 CORESTA established the Smokeless Tobacco Sub-Group (CSTS). One of the initial objectives of the CSTS was to develop new smokeless tobacco reference materials which are fundamental in supporting both routine testing and research work.

Four CORESTA smokeless reference products (CRPs) were developed and are currently available: a Swedish-style snus (CRP1), an American-style loose moist snuff and dry snuff (CRP2 & CRP3), and an American-style loose leaf chewing tobacco (CRP4).

## Study objective

To determine how representative CRP1 and CRP2 are of commercially available snus and moist snuff products, based on their content of selected analytes (nicotine, TSNA and benzo[a]pyrene (BaP)).

## Methodology

Commercial snus and moist snuff products were sampled according to CORESTA recommended procedures over three years (2008-2010) from four different markets (Canada, Sweden, United States, Taiwan). Products were selected in order to cover the range of product styles available and the major manufacturers. CRP1 and CRP2 were measured in 2010.

The samples were analyzed for nicotine, TSNA and BaP content, and other constituents (not shown), at Ökolab, Vienna, Austria, using in-house methods. Data are presented on a wet-weight (ww) basis. The box plot notation used in this poster shows the median, the lower and the upper quartiles as a box, adjacent values as whiskers, and individual data points outside the adjacent values as dots.

Fig. 1 Measured nicotine, TSNA and BaP levels in CRP1 compared to commercially available Snus products

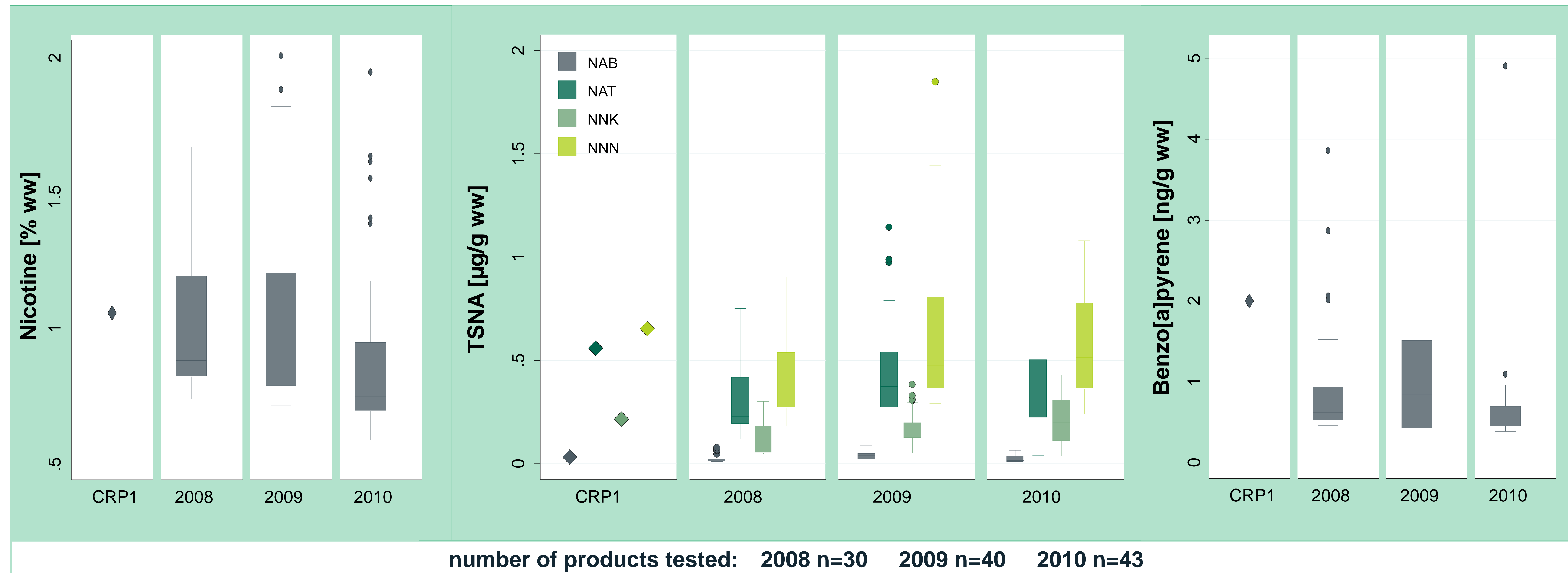
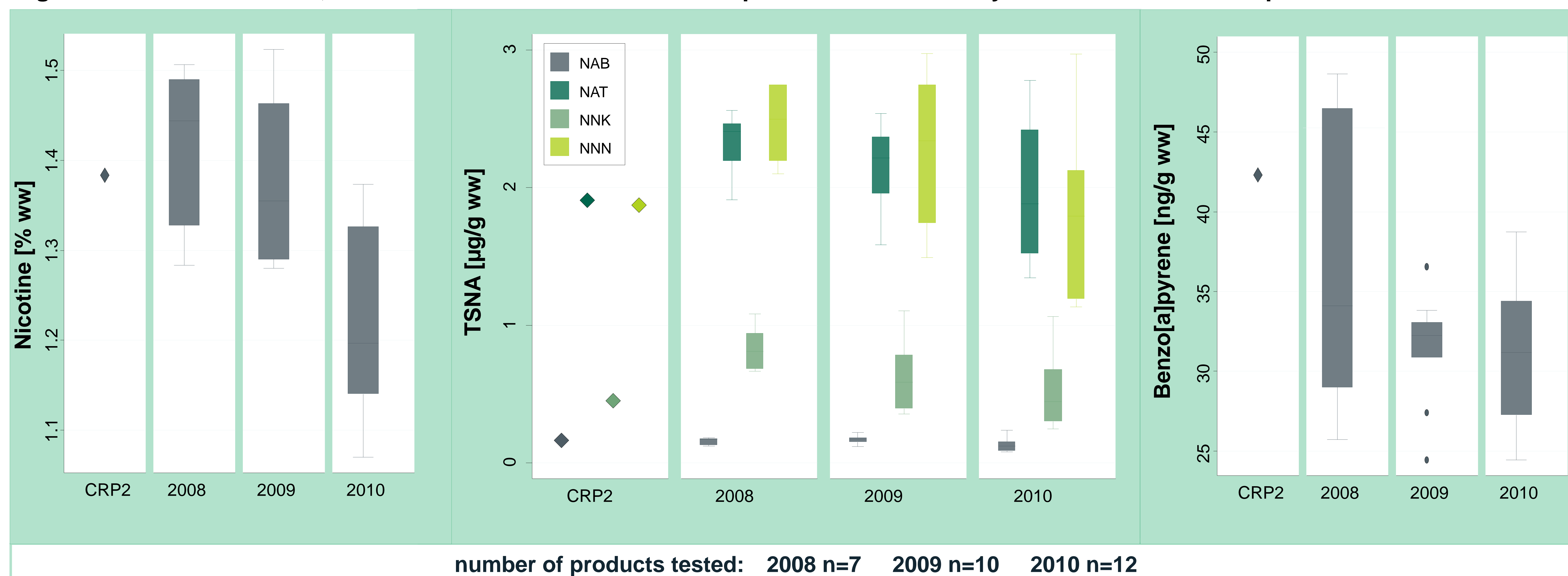


Fig. 2 Measured nicotine, TSNA and BaP levels in CRP2 compared to commercially available Moist Snuff products



## Results for CRP1 (Snus)

**Nicotine:** all yearly medians were slightly below CRP1. The levels in some commercial products sampled in 2009 and 2010 were almost double that of CRP1, reflecting the presence of higher nicotine content (Stark) products on the market at the time.

**TSNAs:** yearly medians were all below CRP1, except for NAB in 2009. A few market products exceed by 2.5 times the CRP1 level for NAT and NNN in 2009.

**BaP:** all yearly medians were below CRP1, with some outliers higher in 2008 and 2010. Note: range < 5 ppb.

## Results for CRP2 (Moist Snuff)

**Nicotine:** 2008 and 2009 medians were in the range of CRP2. Overall levels slightly decreased over the 3 years.

**TSNAs:** in 2008, NAT, NNK and NNN medians exceed levels in CRP2. As for nicotine, overall levels slightly decreased over the 3 years.

**BaP:** CRP2 level is outside the 2009 and 2010 range. The medians remain constant over the three years.

## Conclusion

Based on the selected analytes examined in this study, CRP1 and CRP2 levels are generally representative of products on the market between 2008 and 2010. The variability in data seen for commercial products reflects the variety of product styles and different manufacturers covered by the study. Future work will address the other constituents analyzed in order to provide a more detailed comparison of the constituent composition of CRP1 and CRP2 in comparison to the commercially available products sampled.