

# 8th Summit Tobacco Harm Reduction

Novel products, Research & Policy

by **SOHRE**

30 SEPTEMBER - 1 OCTOBER 2025 | ATHENS  
Basil & Elise Goulandris Foundation

#NoSmokeSummit25  
[www.nosmokesummit.org](http://www.nosmokesummit.org)

ORAL  
PRESENTATION

09

## Toxicant and in-vitro toxicological assessment of oral nicotine pouches (ONPs): comparative quantitative analysis with Swedish snus and cigarette smoke

Simone Hadley,<sup>1</sup> Belinda Zonnestein,<sup>1</sup> Jana Jeffery,<sup>1</sup> Yen Nguyen,<sup>1</sup> Kevin McAdam,<sup>2</sup> Helena Digard,<sup>1</sup> Stuart Meredith,<sup>1</sup> Fabio Miazzi,<sup>1</sup> Lydia Doherty,<sup>1</sup> Olivia Chester,<sup>1</sup> David Smart,<sup>1</sup> Chris Junker<sup>1</sup>

<sup>1</sup>Research and Development, British American Tobacco (Investments) Ltd, Regent's Park Road, Southampton SO15 8TL, UK

<sup>2</sup>McAdam Scientific Ltd., River Bank House, Hampshire, SO50 6BF

# FOR DISCUSSION PURPOSES ONLY

PRESENTATIONS ARE INTENDED FOR INFORMATIONAL PURPOSES ONLY. STATEMENTS OF FACT AND OPINIONS EXPRESSED ARE THOSE OF THE PRESENTER ONLY, AND ARE NOT NECESSARILY THE OPINIONS, POSITIONS OR POLICIES OF BRITISH AMERICAN TOBACCO (INVESTMENTS) LIMITED OR ITS AFFILIATES (“BAT”). BAT DOES NOT ENDORSE OR APPROVE, AND ASSUMES NO RESPONSIBILITY FOR THE CONTENT, ACCURACY OR COMPLETENESS OF THE INFORMATION PRESENTED. THESE MATERIALS MAY PRESENT CONCEPTS, EXECUTIONS, IDEAS AND THEMES THAT ARE NOT LEGALLY PERMISSIBLE (EITHER IN WHOLE OR IN PART) OR ACCEPTABLE IN CERTAIN JURISDICTIONS, OR WHICH MAY INFRINGE THIRD-PARTY RIGHTS. THIS PRESENTATION MAY CONTAIN REFERENCES TO LAWS AND REGULATIONS THAT MAY CHANGE OVER TIME AND SHOULD BE INTERPRETED IN THAT CONTEXT.

THIS PRESENTATION IS INTENDED FOR SCIENTISTS AND POLICYMAKERS. WE ENCOURAGE PERSONS INTERESTED IN TOBACCO HARM REDUCTION TO CONSIDER ALL POINTS OF VIEW AND SOURCES OF INFORMATION. BAT DOES NOT MAKE HEALTH CLAIMS REGARDING ITS BRANDS. NOTHING CONTAINED HERE SHOULD BE MISCONSTRUED TO THE CONTRARY. TO THE EXTENT THAT THIRD-PARTY SOURCES ARE REFERENCED, NEITHER THE PRESENTER NOR BAT IS RESPONSIBLE FOR THE CONTENT OF REFERENCED SOURCES AND THE VIEWS EXPRESSED MAY NOT REPRESENT THE VIEWS OF THE PRESENTER OR BAT. NO TOBACCO PRODUCT IS SAFE, ALL TOBACCO PRODUCTS CONTAINING NICOTINE ARE ADDICTIVE. YOUTH SHOULD NEVER USE TOBACCO. SMOKERS WHO ARE CONCERNED ABOUT THEIR HEALTH SHOULD QUIT.

THE TOPICS, CONCEPTS AND OTHER INFORMATION DISCUSSED HEREIN ARE NOT FINAL, ARE SUBJECT TO CHANGE AND/OR CANCELLATION AND MAY BE FOR ILLUSTRATIVE OR THEORETICAL PURPOSES ONLY. NO DEFINITIVE PLANS OR COMMITMENTS SHOULD BE INFERRED FROM THESE MATERIALS AND ANY PROPOSED PLANS OR COMMITMENTS ARE SUBJECT IN ALL RESPECTS TO APPLICABLE INTERNAL REVIEW AND GOVERNANCE REQUIREMENTS AND LAWS AND REGULATIONS IN RESPECTIVE JURISDICTIONS.

# ORAL NICOTINE POUCHES

## USE



Consumers place the pouch between their gum and upper lip

## COMPOSITION



FLAVOURINGS



PLANT-BASED MATERIALS



NICOTINE



SWEETENERS



WATER

ONPs mainly contains water, plant-based materials, flavourings, sweeteners and nicotine. All prepacked in small pouches

## COMPLEXITY



>7,500

individual chemicals present<sup>1</sup>

100s of

individual chemicals present



10s of

individual chemicals present

No external heating or tobacco makes Oral Nicotine Pouches BAT's **simplest Smokeless Product**

NO TOBACCO

NO COMBUSTION

NO SMOKE

NO TAR

# STUDY DESIGN SUMMARY



## SAMPLES



## TOXICANTS

129\* analytes selected from established lists:



List of harmful and potentially harmful constituents (HPHCs) in tobacco products and tobacco smoke

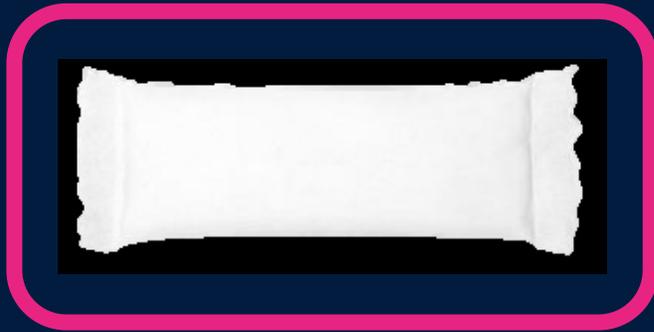
### International Agency for Research on Cancer



IARC Monographs on the Evaluation of Carcinogenic Risks to Humans Volume 89 Smokeless Tobacco and Some Tobacco-specific N-Nitrosamines

\*excluding water, mass & pH

# SAMPLE GENERATION



Data generated on a 'as is' per pouch basis

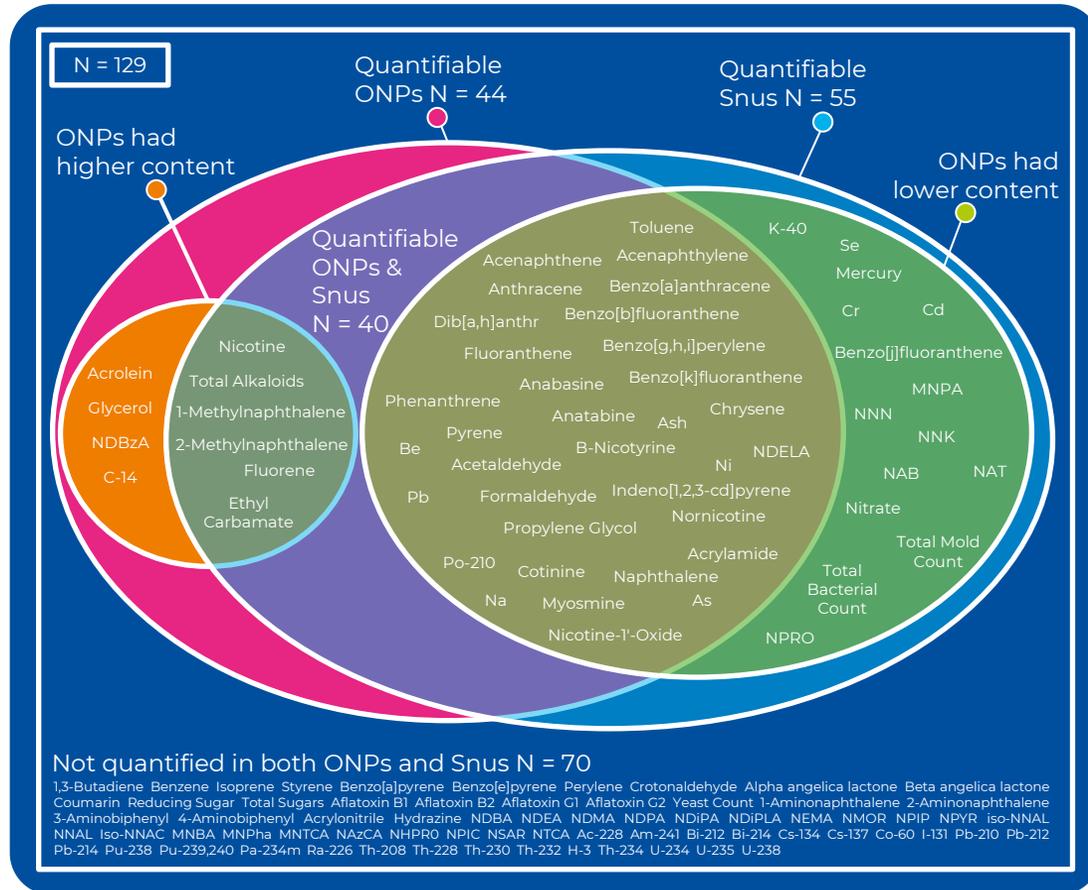
- ONPs were analysed as a combined sample of fleece material and pouch contents.
- Assumption that the pouch is fully exhausted during use

- One or more pouches per replicate (depending upon weight, 1g required for testing)
- Five replicates in total, one replicate per can
- Due to no aerosol emissions, CO, NO, NOx were not measured

# ONPs TOXICANT PROFILE



## Data Summary



## TobReg 9 reference product comparison<sup>1</sup>



Oral Nicotine Pouches\* had

**>99 – 99.8%**

less toxicants compared to 1R6F  
reference cigarette 30-day average

\*11 products tested



BAT ONPs\*\* had

**42 – 92%**

less toxicants compared to  
Snus reference product

\*\*9 products tested



All samples were lower than the  
GothiaTek® standard for analytes tested



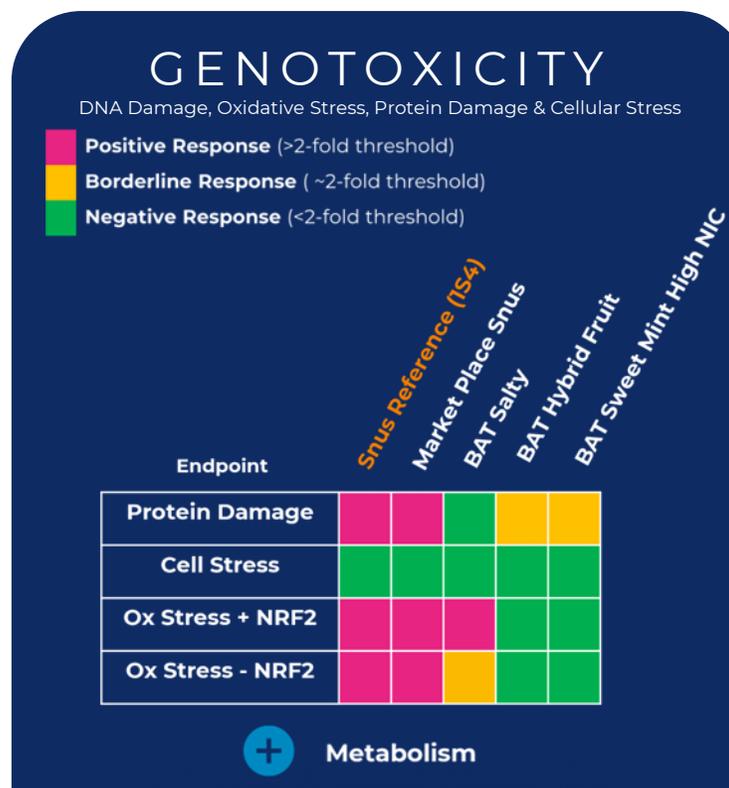
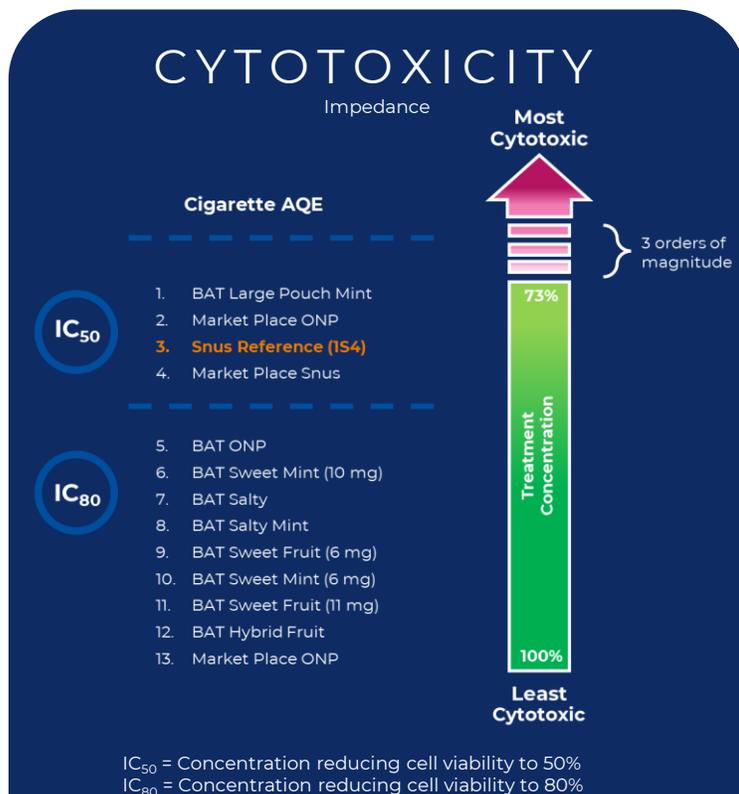
30 SEPTEMBER - 1 OCTOBER 2025 | ATHENS  
Basil & Elise Goulandris Foundation

[www.nosmokesummit.org](http://www.nosmokesummit.org)

<sup>1</sup> Hadley, S., et al., Toxicant contents of oral nicotine pouches: comparative quantitative analysis with Swedish snus and cigarette smoke. [Unpublished Manuscript]. British American Tobacco (BAT), 2025

# IN VITRO TOXICOLOGICAL ACTIVITY OF ONPs

ONP nicotine levels range from 6 mg/pouch to 20 mg/pouch



1. None of the BAT ONPs showed more overall in vitro toxicity than the **snus reference (1S4)**
2. Data suggests nicotine and flavours **are not** drivers of ONP in vitro cytotoxicity
3. Differences in cytotoxicity between ONP SKUs appear to be due to osmotic stress
4. Use of Contemporary Tox supports a lower genotoxicity profile associated with ONP as compared to snus



# COMPARATIVE SUMMARY



ONPs tested  
contain **no tobacco**

Creates a **simpler  
matrix than snus**

NO TOBACCO



None of the ONPs  
showed more *in vitro*  
toxicity than Snus  
Data suggests **nicotine**  
and **flavours** are **not**  
**drivers of *in vitro***  
**cytotoxicity**

NO COMBUSTION



Fewer analytes  
quantified in ONPs  
compared to Snus

**In most cases  
ONPs contained  
>90% lower levels  
than snus**

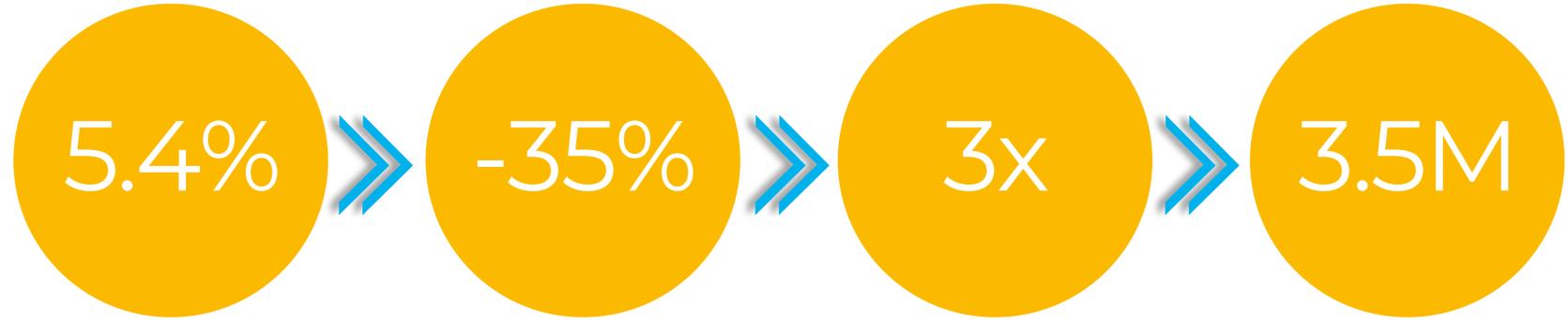
NO SMOKE

NO TAR

# THE SWEDISH EXPERIENCE



\* Age-Standardized Rate (ASR) per 100,000 in 2022 for lip, oral cavity, trachea, bronchus and lung cancer, dataset inc both sexes



Smoking prevalence in Sweden is approaching the **WHO's definition of a non-smoking nation** ( $\leq 5\%$ )

Statistics Sweden, ages 16 - 84 years. Folkhälsomyndigheten, Tobacco and nicotine use (self-reported) by age, sex and year. Percentage. (Accessed: 29 July 2024)

Swedish mortality rate\* (21 per 100,000) is **35% lower than the EU average** (32.8 per 100,000)

WHO & IARC. Available at: <https://gco.iarc.who.int/today/en> (Accessed: 04APR2025)

Swedish epidemiological data shows switching from cigarette smoking to Snus use are at **3x lower risk** for oral cancer

Schildt EB, et al. 1998. Oral snuff, smoking habits and alcohol consumption in relation to oral cancer in a Swedish case-control study. Int. J. Cancer 77, 341-346.

Estimated that if Swedish tobacco-related mortality rates could be applied in other countries, **more than 3.5M lives could be saved** in the EU over the next 10 years

[www.smokefreesweden.org](http://www.smokefreesweden.org) (Report: SAVING LIVES LIKE SWEDEN 02082023 WEB & Report: The Swedish Experience EN)

**THANK YOU FOR YOUR TIME**



**Online**



**On social  
media**

[www.asmokelessworld.com](http://www.asmokelessworld.com)

[@smokelessworld](https://twitter.com/smokelessworld)

Correspondence: [Simone\\_Hadley@bat.com](mailto:Simone_Hadley@bat.com)

