A cross-sectional clinical study of Velo

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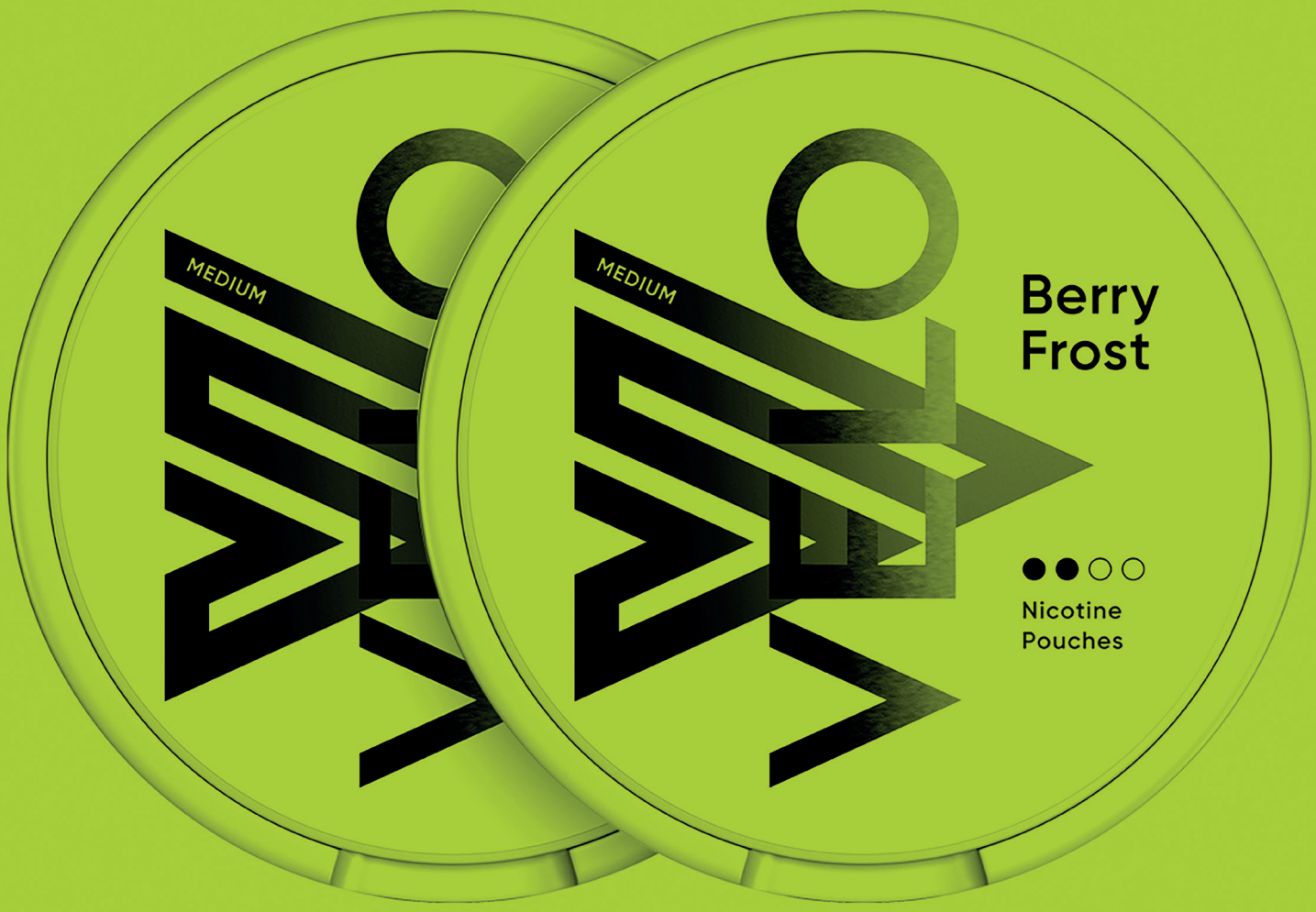


Introduction

BAT has completed an innovative cross-sectional clinical study of Velo[1], its flagship modern oral nicotine pouch product. This real-world study is the first of its kind and provides important new data and insights into the health impact of Velo use compared to smoking.

The results add to the extensive scientific evidence that already exists, which has been generated over 30 years, including epidemiological data, that supports traditional oral tobacco products as reduced-risk compared to conventional cigarettes† and expands the data supporting the newer, modern oral nicotine pouch category. This study provides further supportive evidence that using Velo can reduce the relative risk for certain smoking-related diseases in adult consumers compared with smoking, when switched to completely. *†

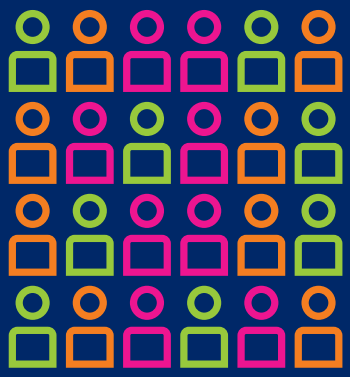
To-date, BAT has generated data demonstrating that Velo usage and consumption is generally lower than snus[2,3], (a type of traditional oral tobacco), and that Velo has significantly less toxicants[2,4]. BAT has also demonstrated that Velo has a similar toxicant profile to nicotine replacement therapy products.[2]

What is Velo?

Velo, BAT's flagship modern oral nicotine pouch product, is a tobacco-free alternative product that contains high purity nicotine, water, and other high-quality ingredients, including plant fibres, flavourings, and sweeteners. To use, a pouch is placed between the lip and gum so that nicotine can be absorbed through the gums. Without tobacco, combustion, smoke or inhalation, modern oral products* pose less risk to adult consumers than cigarettes.

* Based on the weight of evidence and assuming a complete switch from cigarette smoking. These products are not risk free and are addictive.
† Our products as sold in the US, including Vuse, Velo, Grizzly, Kodiak, and Camel Snus, are subject to Food and Drug Administration (FDA) regulation and no reduced-risk claims will be made as to these products without FDA clearance.

How was the study set-up?

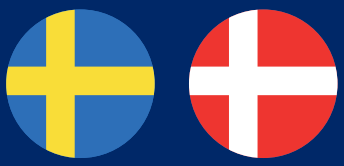


195

participants took part

4 different groups

exclusive Velo consumers for at least six months, current smokers who smoke over 10 cigarettes a day and had been smoking for at least one year, former smokers who had quit for at least six months and never smokers



Participants located

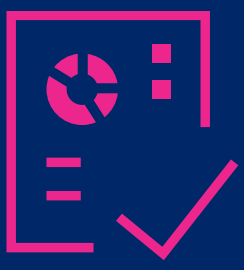
in Denmark and Sweden, aged between 19-55 years old, and in good health

After screening, participants made

a single clinic visit, where samples of blood, urine and other clinical measurements were collected

Scientists analysed the samples

and looked for biomarkers of exposure and potential harm relevant to smoking-related diseases



Results from landmark study

have been published in the peer-reviewed journal, Biomarkers

What did scientists test for?

Samples of blood, urine and other clinical measurements were collected and tested for biomarkers of exposure to certain toxicants and biomarkers of potential harm relevant to smoking-related diseases.

These biomarkers are thought to be linked to the development of diseases such as cancer and cardiovascular disease (CVD).

This table shows the biomarkers of potential harm used in the study and which diseases they are linked to:

Biomarker of Potential Harm	Indicator	Relevant disease
Primary Endpoints		
FeNO	Bronchodilation / vascular tone	Respiratory disease and CVD
8-epi-PGF $^{2\alpha}$	Oxidative stress	CVD, cancers, and COPD
COHb	Reduced oxygen carrying capacity	CVD
WBC	General inflammation	CVD, cancers, and COPD
sICAM	Endothelial dysfunction	CVD
HDL	Atheroprotective and cardioprotective	CVD
Secondary Endpoints		
11-dTX-B2	Platelet activation / coagulation	CVD

In addition, two physical assessments were performed: Carotid intima-media thickness (CIMT), to assess risk of atherosclerosis, and forced expiratory volume (FEV^1) was also measured to assess lung function.

Assessments of oral health, using the Oral Health Assessment Tool, and Quality of Life (QoL), using the RAND-36 questionnaire to evaluate eight domains (physical functioning, role limitations due to physical functioning, pain, general health, energy fatigue, social functioning, role limitations due to emotional problems and emotional wellbeing) were conducted.

What is a cross-sectional study?

This ground-breaking study of Velo followed a two-centre cross-sectional design and involved 195 volunteers from Denmark and Sweden. The design of the study differs from longitudinal studies in two major ways:

1. The samples, taken at a single timepoint, provide a snapshot of data that reflects the 'lived experience' of the adults in the study, whether using Velo, smoking or having quit smoking, rather than assessing impact and changes overtime.
2. The participants in the study of Velo had been using a product they had chosen in the way they wanted. Unlike certain longitudinal studies that take place over time.

The results

Based on the biomarkers measured, compared to smokers, Velo users who had been using the product exclusively showed:

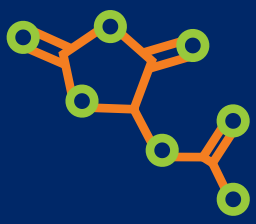
Significant favourable differences

in a biomarker of potential harm relevant to lung cancer risk (NNAL)

Significantly lower levels

in biomarkers of exposure to priority tobacco toxicants[5]

in a number of biomarkers of potential harm relevant to CVD (FeNO, COHb, WBC, 11-dTX-B2)



in a biomarker of potential harm relevant to general inflammation (WBC)

Similar levels

were observed between the Velo and former and never smoker groups, for biomarkers of potential harm that showed no significant difference between the Velo consumers and smokers

Why are these results important?

The study provides important new data and insights into the real health impact of Velo use compared to smoking, former smokers and never smokers that underscores the tobacco harm reduction potential of modern oral nicotine pouches. It is the first time that biomarkers of exposure and biomarkers of potential harm have been assessed in Velo consumers and modern oral products. The results showed that the levels of exposure biomarkers were substantially lower in Velo consumers compared with smokers, with the exception of nicotine. The data showed favourable differences between Velo consumers and smokers in the majority of the biomarkers of potential harm, with four achieving statistical significance, and for the others, similar levels were observed across the Velo consumers, former and never smoker groups. The study results add to the weight of evidence that supports our belief that Velo is a reduced-risk*† product for smokers who completely switch from cigarettes as compared to continued smoking.

* This document is not intended as a piece of promotional material for any products, very notably in the US where claims of a certain type are subject to FDA clearance. This update relates to new scientific data and is not aimed at a specific market. It is intended to provide further scientific evidence to underpin our products.

These results are very important for Velo and the modern oral nicotine product category. They build on the weight of evidence that supports our belief that Velo is a potentially reduced-risk*† product for smokers who completely switch from cigarettes compared to continued smoking, which aligns with the extensive scientific evidence, including epidemiological data, that already exists for oral tobacco products.

We have already generated data that shows Velo has a toxicant profile better than snus and comparable to Nicotine Replacement Therapy (NRT) products. These results add further evidence that supports the important contribution Velo can make to tobacco harm reduction.

Dr Sharon Goodall,
Group Head of Regulatory Science at BAT

[1] The study was conducted using Lyft, since re-branded as Velo.
[2] David Azzopardi, Chuan Liu & James Murphy (2021) Chemical characterization of tobacco-free "modern" oral nicotine pouches and their position on the toxicant and risk continuums, Drug and Chemical Toxicology, DOI: 10.1080/01480545.2021.1925691
[3] Prasad K, et al., 2022. Assessing consumer use and behaviour patterns of oral nicotine pouches in a multi-country study. Int J Sci Rep. 8(6):173-176
[4] Comparison based on an assessment of smoke from a scientific standard reference cigarette (approximately 9mg tar) and components released during use of a commercial Velo pouch, in terms of the average of the 9 harmful components the World Health Organisation recommends to reduce in cigarette smoke.
[5] These results are very important for Velo and the modern oral nicotine product category. They build on the weight of evidence that supports our belief that Velo is a potentially reduced-risk*† product for smokers who completely switch from cigarettes compared to continued smoking, which aligns with the extensive scientific evidence, including epidemiological data, that already exists for oral tobacco products.

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