

## Introduction

Smoking compensation, defined as a modification of smoking behaviour, i.e. increase in puffing intensity, has been studied extensively. It has often been stated that compensation generally occurs following a switch to a lower tar and nicotine yielding cigarette and an assumption that compensation is driven by the smokers' wish to regulate their nicotine intake to a constant value. Cigarette smoking constitutes a complex series of behavioural events which occur each time a puff is taken and inhaled. This poster describes how individual smokers react to these changes in cigarette properties, both in the course of smoking a single cigarette and when smoking different products.

## 1 Step Change Experiment\*

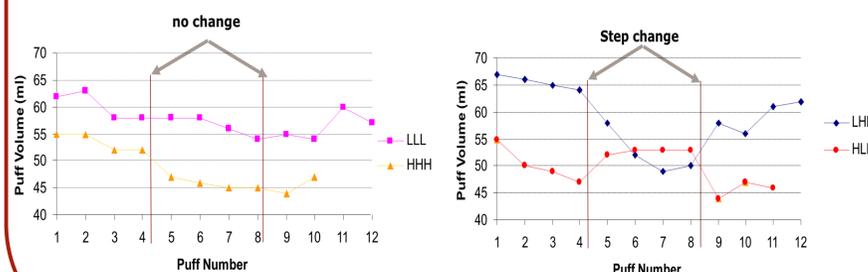
\*Purkis et al. Regulatory Toxicology and Pharmacology 58 (2010) 501-515

The vents can be open or blocked and changed during the course of smoking



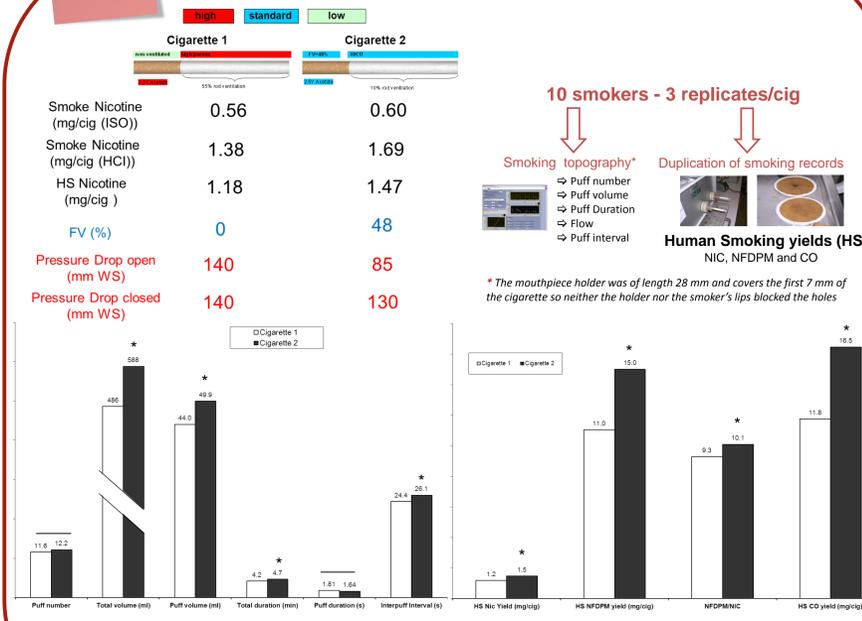
	Open (L)	Blocked (H)
Ventilation (%)	48	5
PD (mm WG)	111	141
Nicotine (mg)	0.71	0.95
NFDPM (mg)	6.9	10.6

3 smokers (4 replicates) → Puff volume



Major changes in the puffing act occur within a puff due to sensory feedback

## 2 Different Human Puffing Topography with Cigarette of the Same Nic Yield



Pressure Drop and/or tip ventilation are the main factors for changes in human puffing topography

## 3 Pressure Drop or Filter Ventilation

Cigarette	NFDPM (mg)	Nic (mg)	FV (%)	PD (mm WG)	Human Puff Volume (ml)	Mean flow (ml/sec)
A	12.2	1.2	0	171	46	21
B	12.7	1.4	50	57	56	32
C	12.7	1.4	50	171	44	19

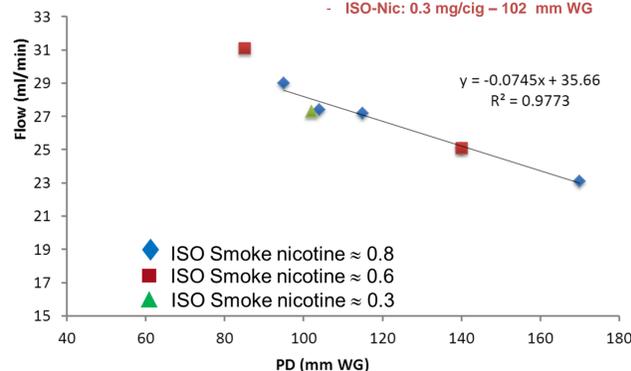
- For cig C the pressure drop of ventilated cig B was restored to cig A level (using pressure drop holder)
- Human smokers had similar mean flows for type A and C.

Tip ventilation are not the key factor for changes in mean flow  
Pressure Drop seems to be significant for mean flow changes

## 4 Mean Flow Versus Pressure Drop

10 smokers - 3 replicates/cig

8 cigarettes:  
 - ISO-Nic: 0.8 mg/cig – 95, 104, 115, 140 and 170 mm WG  
 - ISO-Nic: 0.6 mg/cig – 85 and 140 mm WG  
 - ISO-Nic: 0.3 mg/cig – 102 mm WG

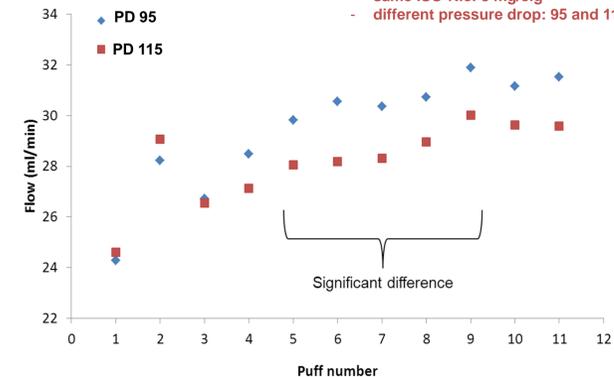


Pressure Drop is the driving factor for the flow changes

## 5 Flow Versus Puff Number

10 smokers - 3 replicates/cig

2 cigarettes:  
 - same ISO-Nic: 8 mg/cig  
 - different pressure drop: 95 and 115 mm WG

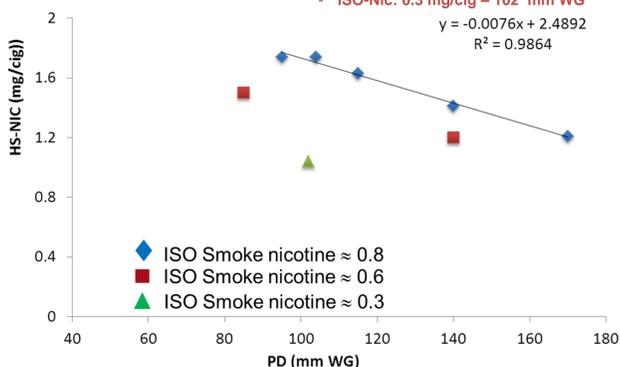


Smokers modify their behaviour over the course of smoking a cigarette in response to pressure drop

## 6 HS Nicotine Yield Versus Pressure Drop

10 smokers - 3 replicates/cig

8 cigarettes:  
 - ISO-Nic: 0.8 mg/cig – 95, 104, 115, 140 and 170 mm WG  
 - ISO-Nic: 0.6 mg/cig – 85 and 140 mm WG  
 - ISO-Nic: 0.3 mg/cig – 102 mm WG



Pressure Drop is the driving factor for the flow changes

## Conclusion

Our results suggest that the influence of the pressure drop of the cigarette is an important factor in modifying smoking topography. Since pressure drop is, in general, linked to the level of ventilation into the cigarette filter and this, in turn, influences smoke yield, changes in a smoker's puffing regime can be misinterpreted as purely a response to a change in smoke yield and invalid conclusions drawn.