Presentation to Life Science Research Office Expert Panel - October 3, 2007

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Overview of presentation

Consumer data (Chris Proctor)

- Consumption survey in Sweden
- Risk perception survey in South Africa

Product data (Delcio Sandi)

- Chemical content of various smokeless tobaccos
- Storage condition and TSNAs formation over time in Swedish-style snus

BAT view on the association between snus use and health

- Snus use is not a cause of either lung cancer or COPD.
- While the use of some types of oral tobacco is associated with a significant increase in the risk of oral cancer, evidence to date suggests that snus use is not.
- While the data currently are insufficient to determine that snus use is a cause of pancreatic cancer, the possibility should not be dismissed.
- If there are cardiovascular risks associated with snus use these seem to be less than those associated with cigarette smoking, though, associated with exposure to nicotine, snus may increase risks for those with pre-existing cardiovascular diseases.
- The use of snus, as with the use of any nicotine containing product, may be associated with adverse outcomes during pregnancy.
- It is generally accepted that snus is associated with dependence similar to cigarette smoking.
- Snus use has been shown to be substantially less harmful than cigarette smoking.

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Consumption survey in Sweden

Objective and Methods

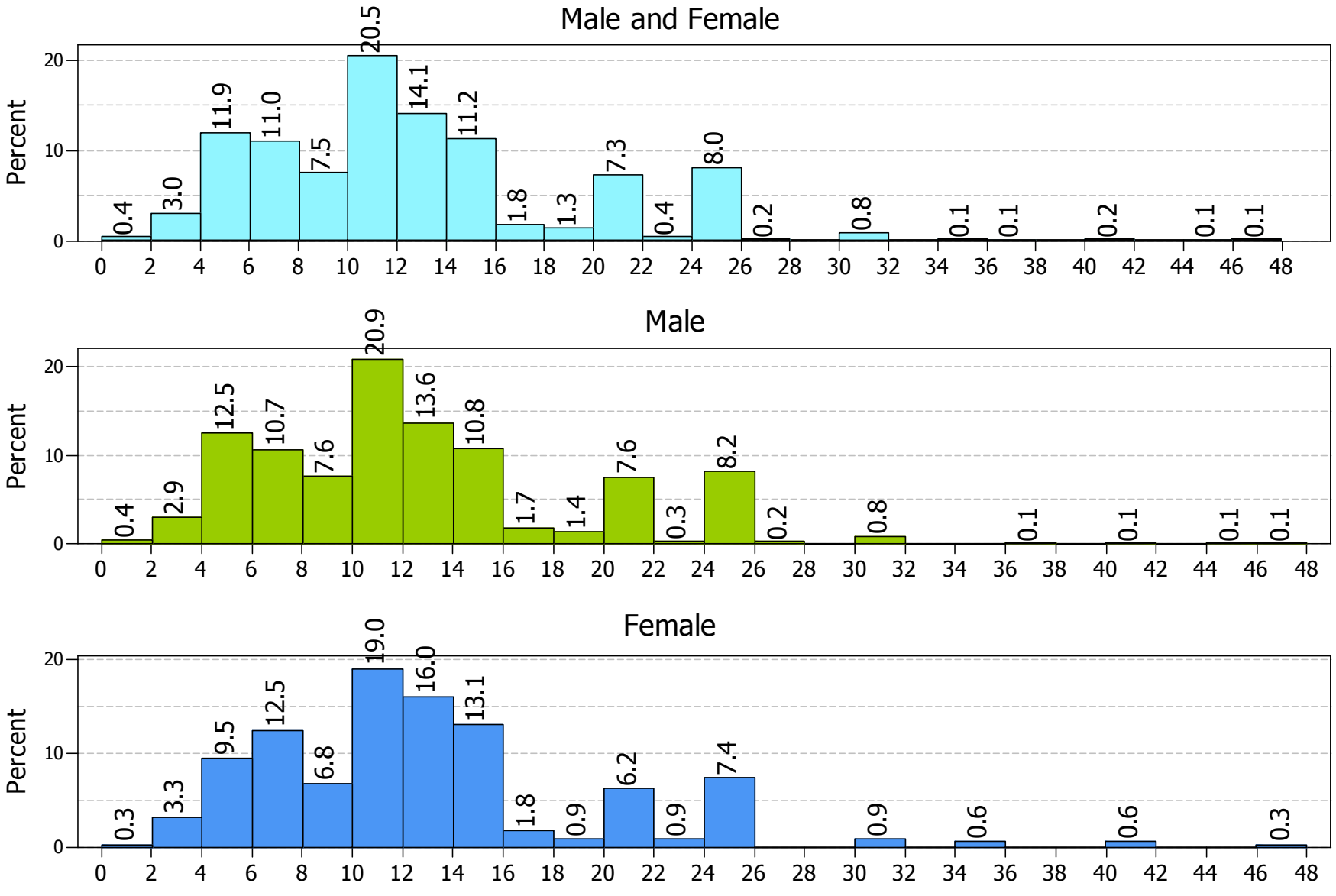
- To understand the snus consumption behaviour of a group of snus users in Sweden
- Around 3000 adult snus users – 2555 males and 359 females
- Telephone survey (March and April 2007) using a questionnaire comprising 54 questions
- Resurvey on exposure time with portion snus users (1019 people) in August 2007

Objective and Methods

Questions on, for example:

- Consumption of snus (pouches per day)
- Exposure time in mouth
- Swallow the pouch or juice
- Position in mouth
- Multiple tobacco use
- How long using snus
- Dependence on snus:
  - How soon after waking users take snus
  - Using snus to stop smoking

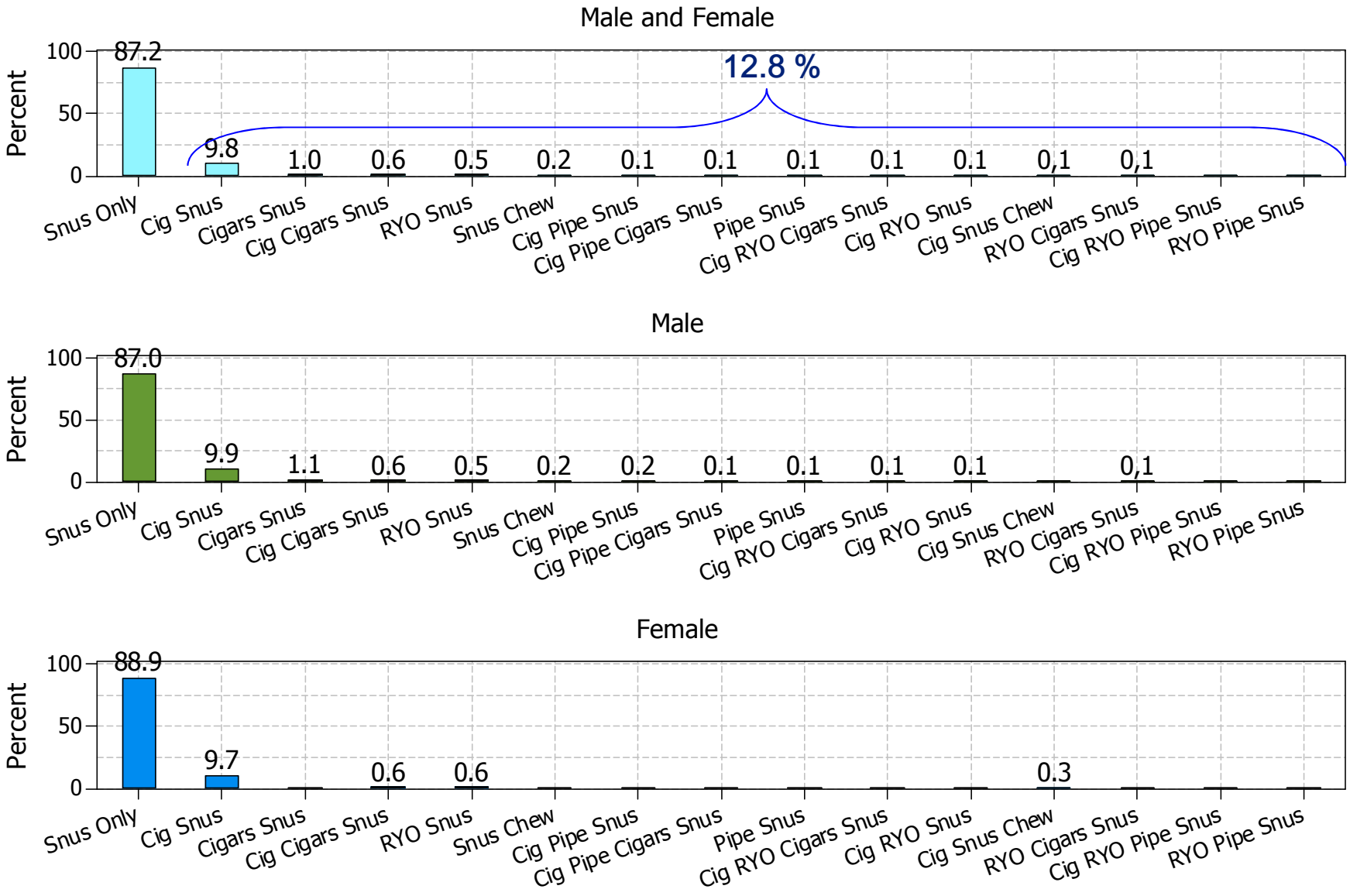
Consumption in pouches per day



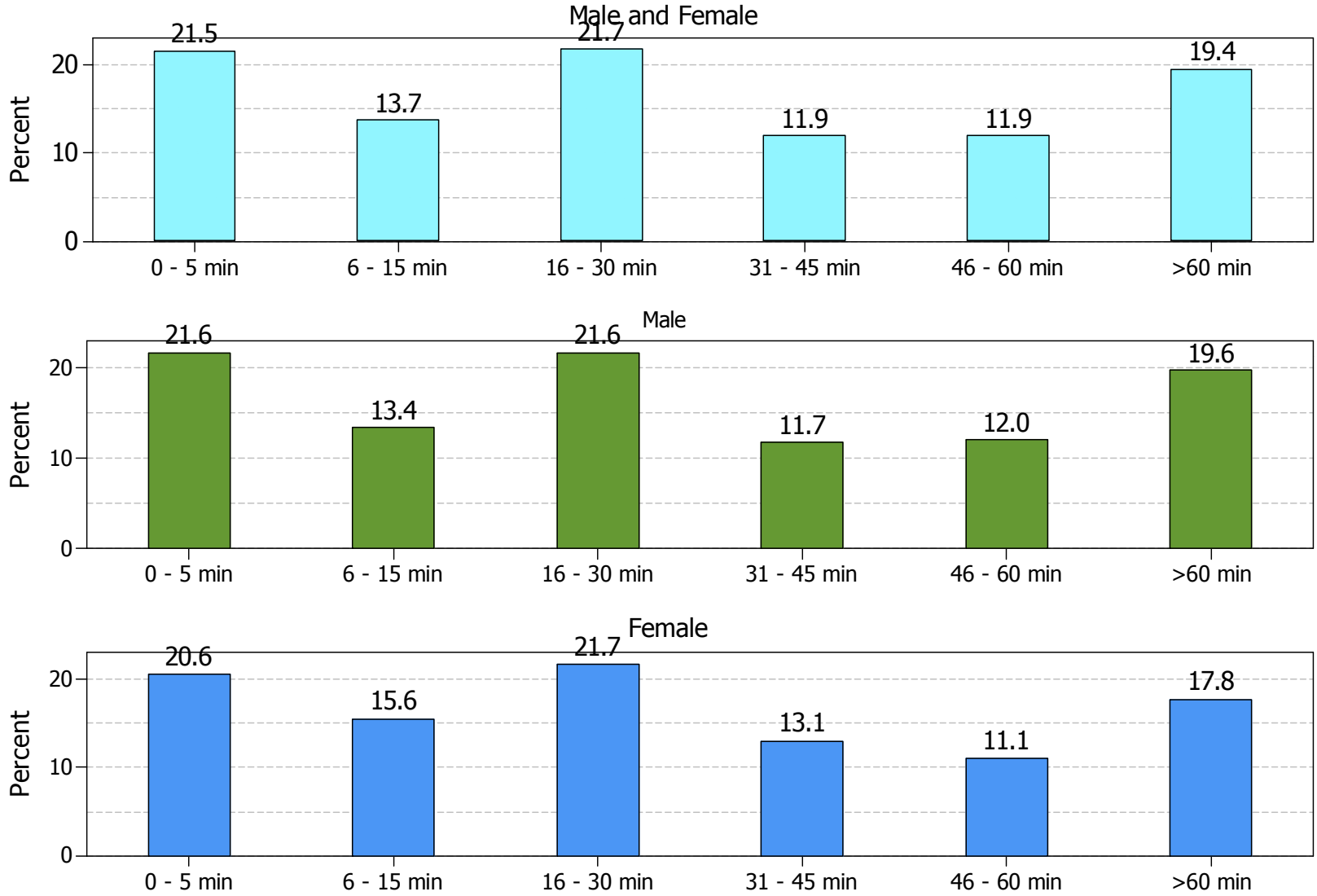
Consumption in pouches per day - Summary

Gender	N	Mean	Median	Min	Max	75Q	80Q	85Q	90Q	95Q
		(Number of pouches)								
Male & Female	1713	11.70	10	1	60	15	15	20	22	24
Male	1380	12.01	10	1	60	15	17	20	24	24
Female	333	10.39	10	1	30	12	14	15	20	24

Multiple tobacco use?



How soon after waking do users take snus?



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Risk perception survey in South Africa

Risk perception survey in South Africa

- Snus, unknown in South Africa, available in limited outlets around Johannesburg
- At launch, cans required to carry the warning “Tobacco causes cancer”
- Three waves of quantitative interview data collected:
  - Wave one, 8 weeks
  - Wave two, 32 weeks
  - Wave three, 56 weeks
- Total of 270 interviews from 125 venues

Data from those trying snus

Snus v cigarettes	1st Wave	2nd Wave	3rd Wave
More Harmful	19%	33%	25%
Equally Harmful	38%	30%	43%
Equally or More Harmful	57%	63%	68%
Less Harmful	10%	10%	11%
Not sure	32%	28%	18%

Data from those who would not try snus

Snus versus cigarettes	1st wave	2nd wave	3rd wave
Equally or more harmful	63%	70%	79%

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Chemical content of various smokeless tobaccos

Chemical content of various smokeless tobaccos

- Study of thirty four smokeless tobacco products available in the North American, Swedish, British and Canadian markets in 2006

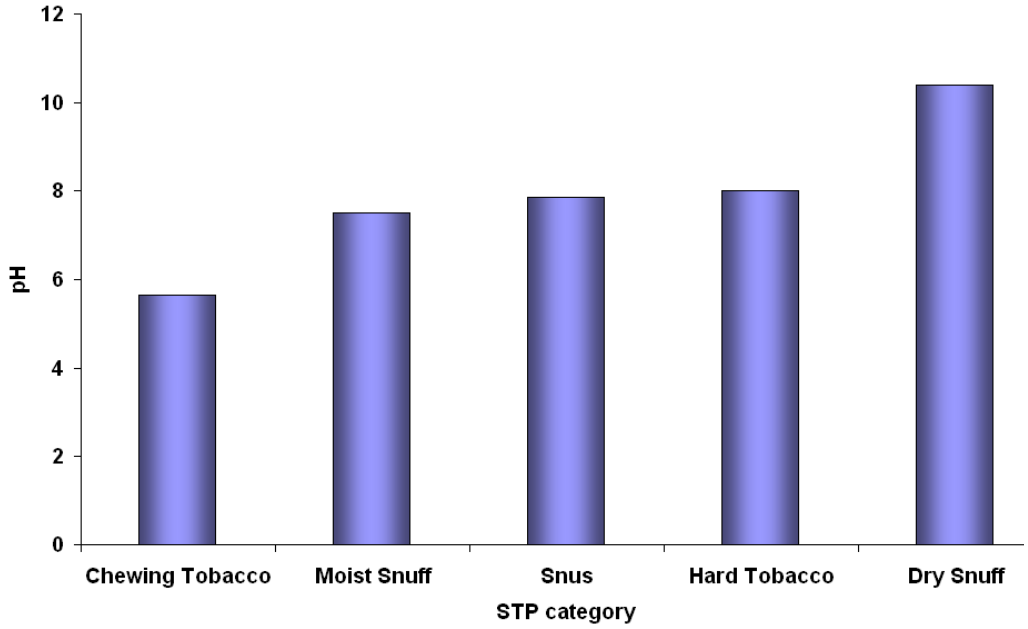
Category	Country	Number of products
Chewing Tobacco	USA	2
Dry Snuff	UK	1
Hard Tobacco	USA	1
Moist Snuff	USA Canada	10 2
Snus	USA Sweden	3 15

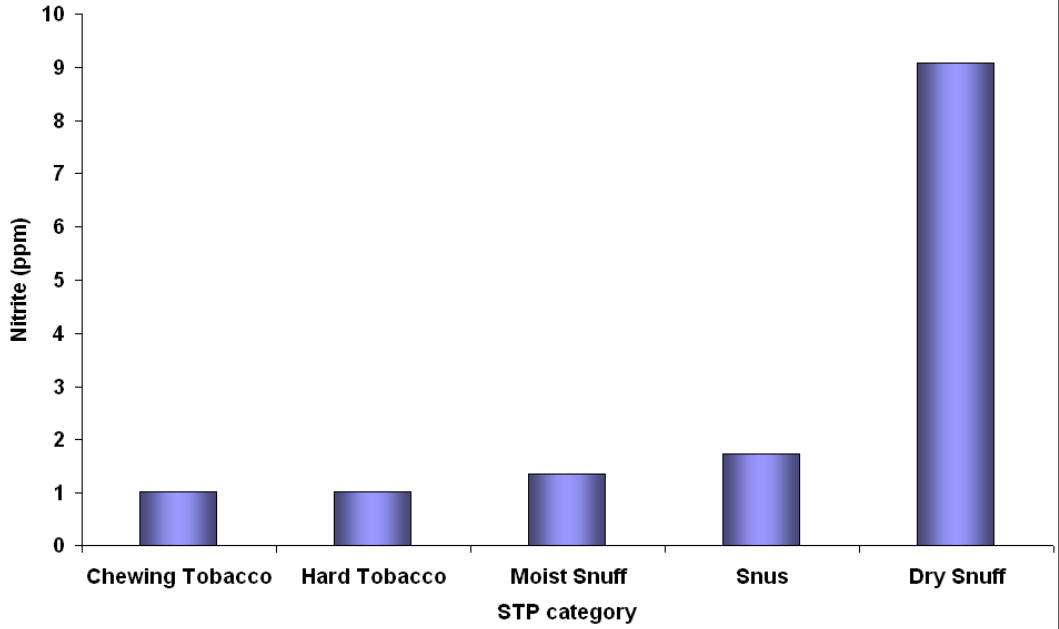
- Analysis: pH, nicotine (total alkaloids), nitrite, B(a)P, dimethyl nitrosamine (DMNA), TSNAs, arsenic, cadmium, chromium, lead and nickel (data reported on a dry weight basis)

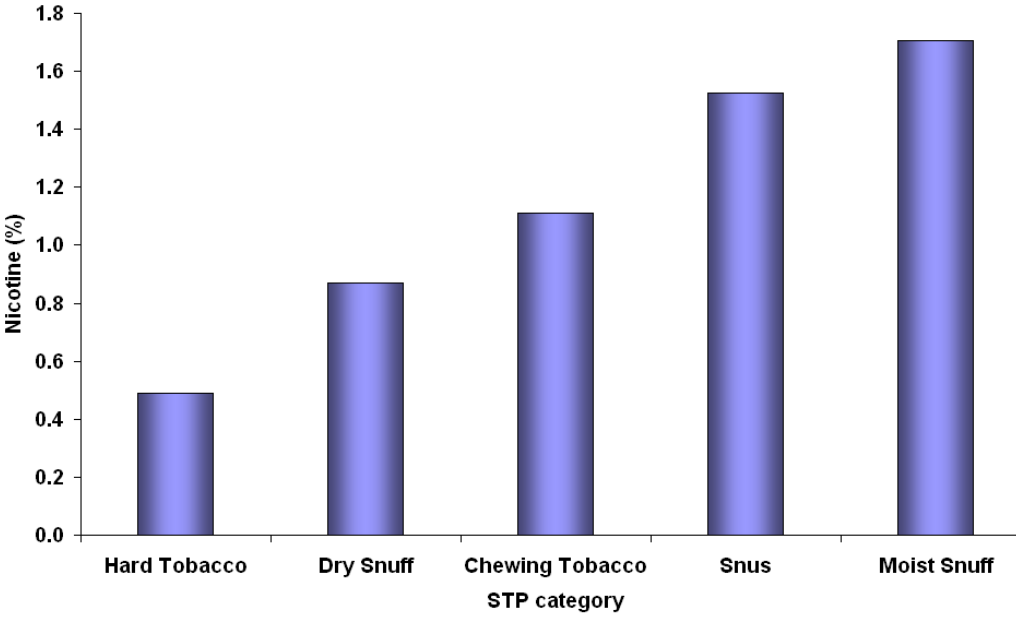
How different are these products?

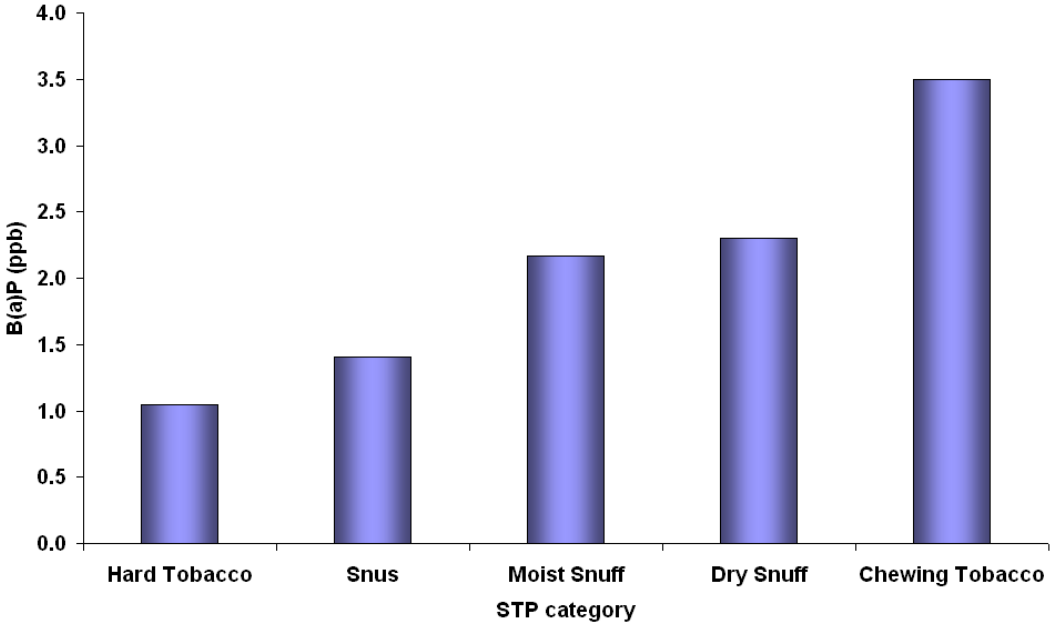
	Range	Variation (%)
pH	5.5 – 10.4	89.1 %
Nicotine (%)	0.4 - 2.64	560 %
Nitrite (ppm)	1.02 - 8009	785096 %
TSNAs (ppm)	0.21 – 62.4	29614 %
B(a)P (ppb)	0.43 – 206.3	47876 %
DMNA (ppm)	0.16 – 9.02	5537 %
Arsenic (ppm)	0.08 – 0.42	425 %
Cadmium (ppm)	0.03 – 1.88	6166 %
Chromium (ppm)	0.1 – 3.4	3300 %
Lead (ppm)	0.01 – 2.20	21900 %
Nickel (ppm)	0.20 – 2.63	1215 %

Results by STP category - pH, nicotine, Nitrite, B(a)P

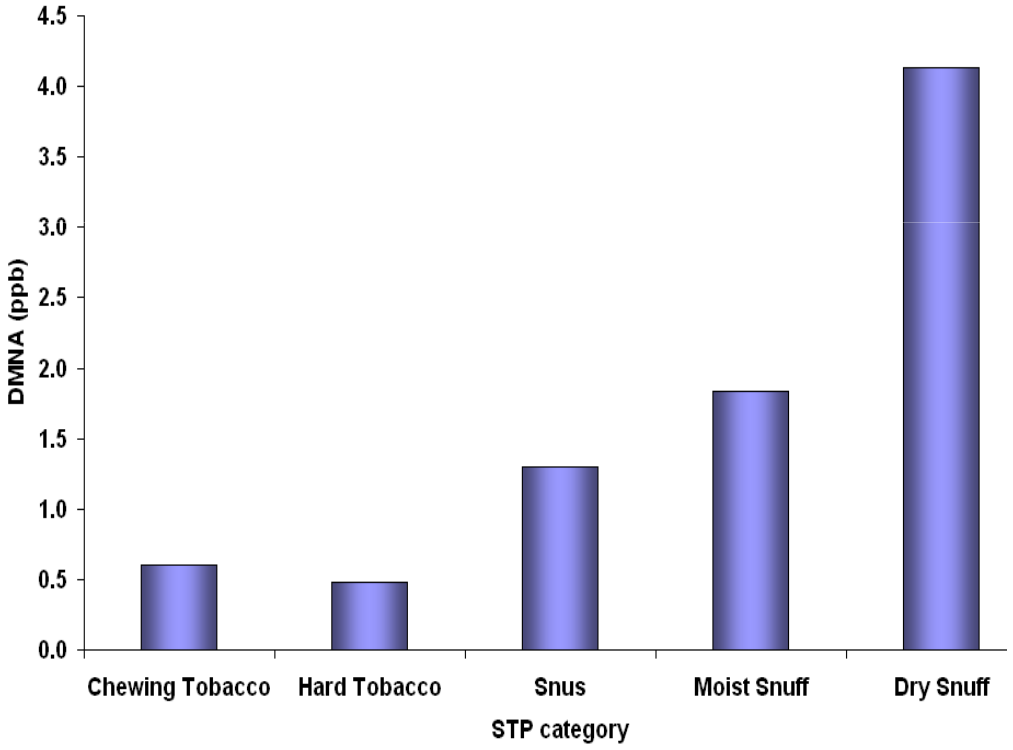


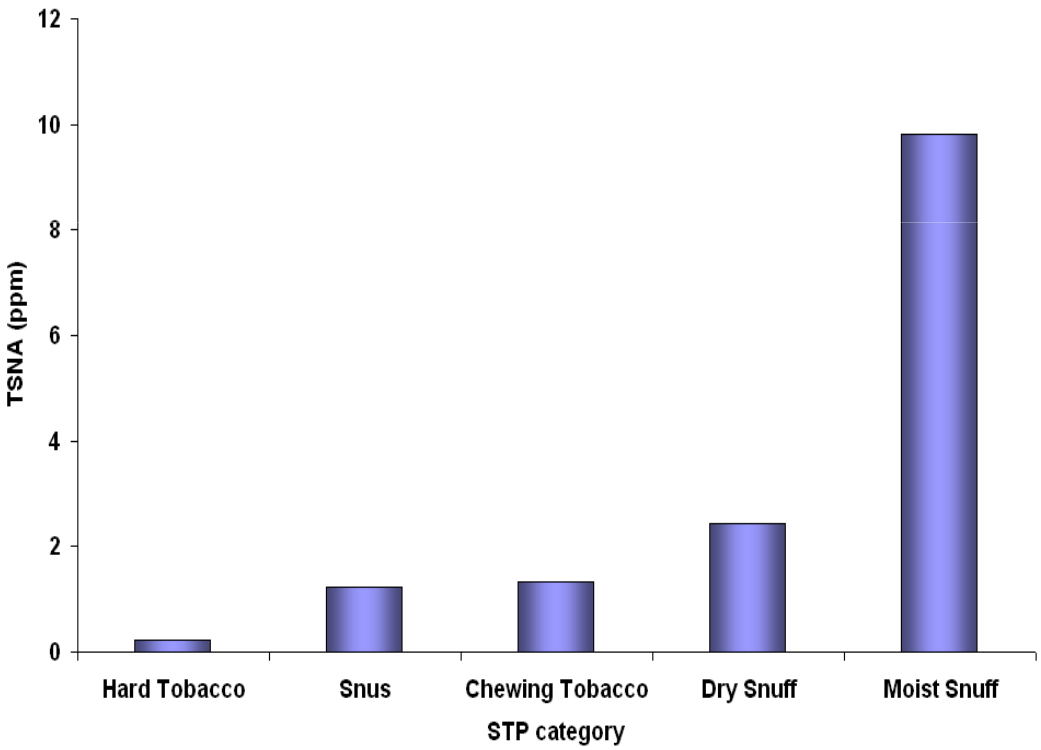




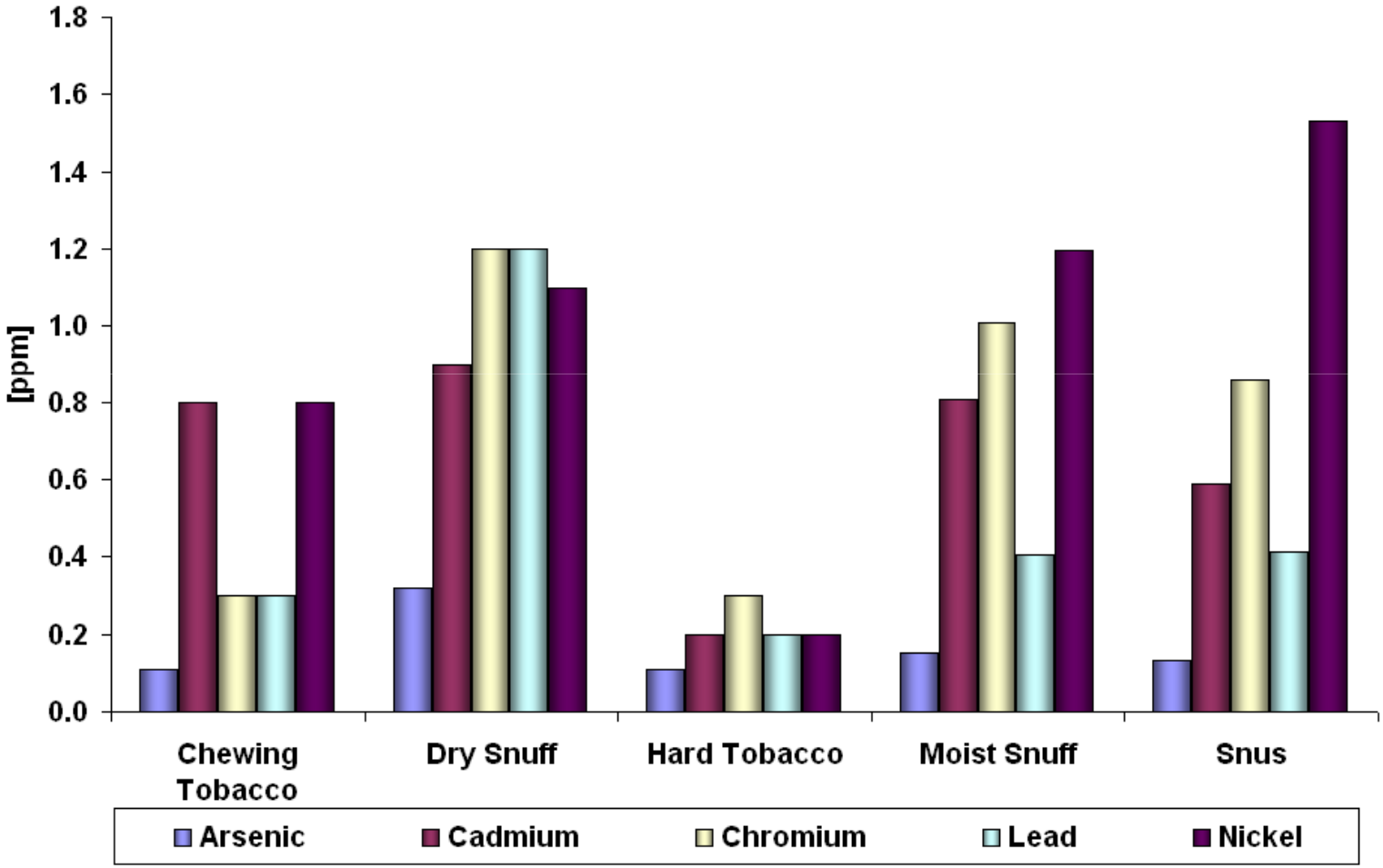


Results by STP category – DMNA, TSNA





Results by STP category - Metals



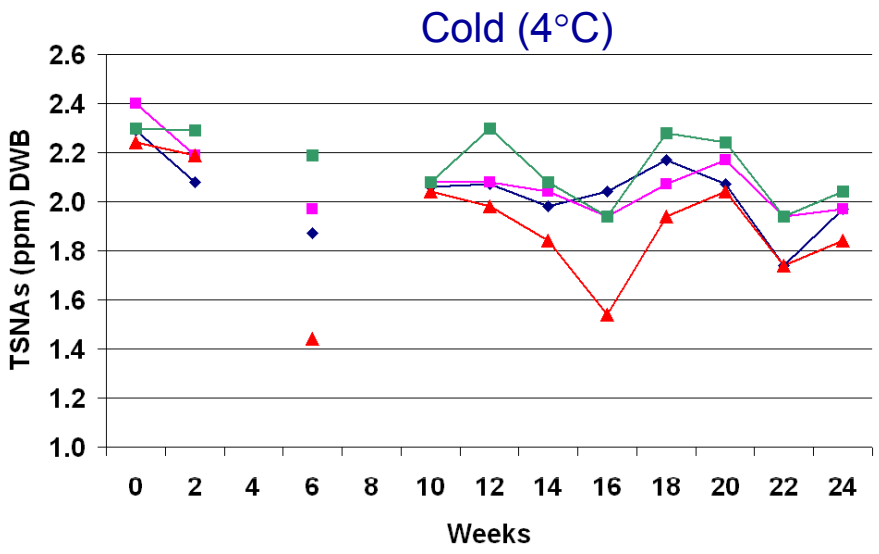
Storage condition and TSNAs formation over time in Swedish-style snus

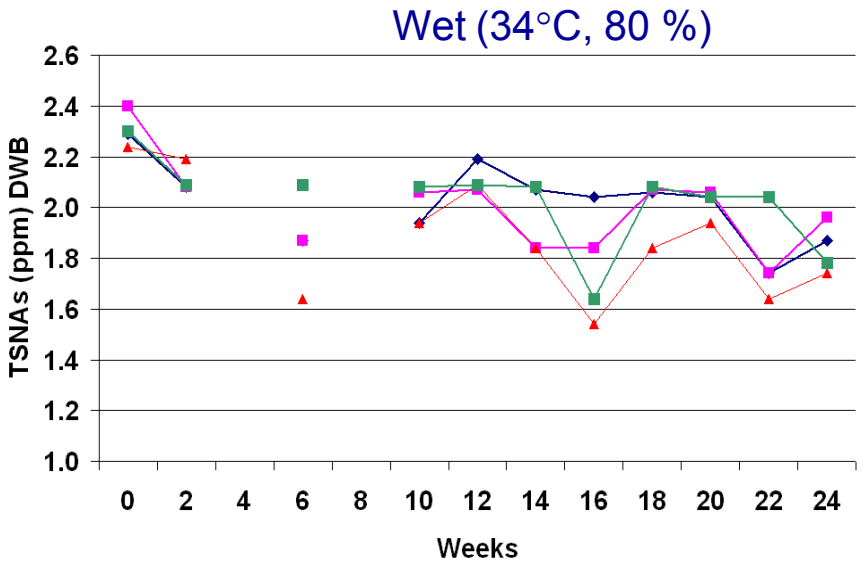
Storage condition and TSNAs formation over time in Swedish-style snus

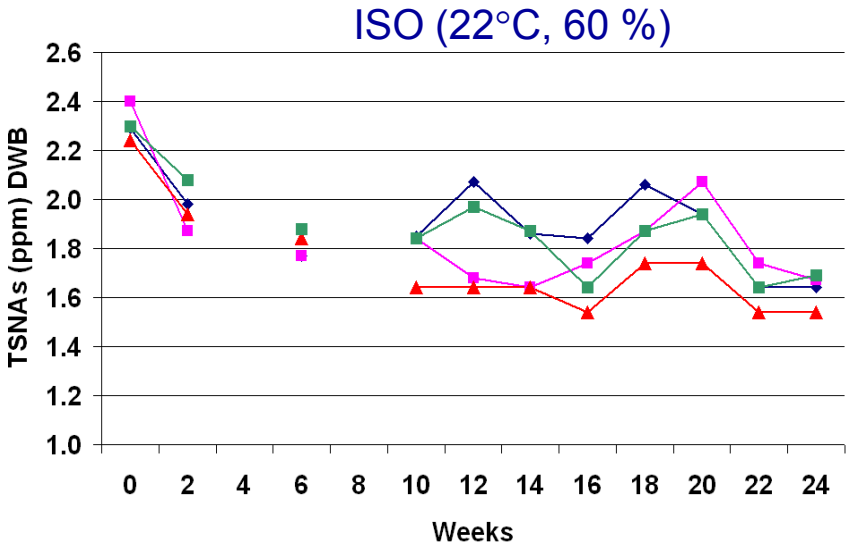
- To verify the influence of the storage conditions on the formation of TSNAs in different snus brands
- Analysis: NNN, NNK, NAT and NAB measured separately and totalled to be reported (data reported in DWB)
- Period: 24 weeks – analysed every two weeks
- Storage conditions:

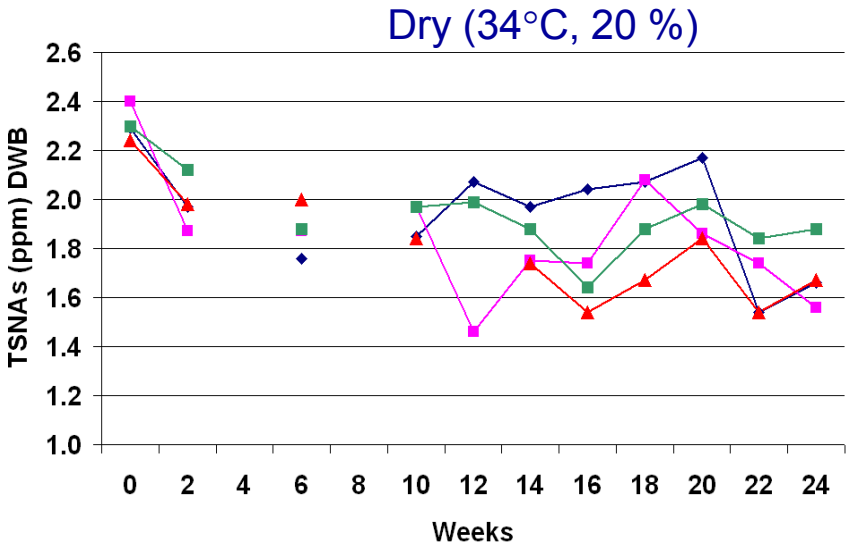
Condition	Temperature (°C)	Relative Humidity (%)
Cold	4	-
ISO	22	60
Dry	34	20
Wet	34	80

Results


Cold (4°C)
TSNAs (ppm) DWB
2.6
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0 2 4 6 8 10 12 14 16 18 20 22 24
Weeks


Wet (34°C, 80 %)
TSNAs (ppm) DWB
2.6
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0 2 4 6 8 10 12 14 16 18 20 22 24
Weeks


ISO (22°C, 60 %)
TSNAs (ppm) DWB
2.6
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0 2 4 6 8 10 12 14 16 18 20 22 24
Weeks


Dry (34°C, 20 %)
TSNAs (ppm) DWB
2.6
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0 2 4 6 8 10 12 14 16 18 20 22 24
Weeks

Snus storage trials

- No increase in the TSNAs levels over time
- Slight trend to decreasing levels over time (in spite of high variability)
- The majority of the results for NAT were below the limit of quantification (data not shown)
- Similar results for all brands and all storage conditions

Summary conclusions

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Consumer data

- Consumption patterns vary widely and can be quite different from cigarette smoking
- Consumer perception can assume snus is more harmful than cigarette smoking

Product data

- Chemical composition of smokeless tobaccos varies widely
- Long-term storage of snus does not seem to increase tobacco-specific nitrosamine