



Contraband Cigarettes: Tobacco Smoke Analysis



Key Messages

- Smoking contraband cigarettes poses the same risk of harmful health effects as smoking legal cigarettes.
- The smoke from contraband cigarettes contains the same chemicals as the smoke from legal cigarettes sold in Canada.

Background

Contraband cigarettes raise several questions, mainly with regard to differences in ingredient composition and harmful health effects when compared to cigarettes that are sold legally in Canada.

Contraband cigarettes are often sold in non-conventional packages, such as plastic bags. The cigarette packaging does not provide information required by current regulations, including:

- illustrated health warnings;
- toxic emissions information;
- stamp or tear tape indicating that the manufacturer has paid applicable taxes and duties;
- name and address or license number of the manufacturer.

Contraband cigarettes also pose an additional problem: since they cost less, they are more affordable and their availability has increased.

Because exposure to the chemicals in tobacco smoke is responsible for causing harmful health effects, Health Canada analyzed and compared the tobacco smoke of contraband and legal cigarettes. The Department selected four samples of contraband cigarettes from products seized in 2006 by the Canadian Border Services Agency. The cigarettes had been packaged in transparent plastic bags

containing approximately 200 units each. These were analyzed according to methods described in the *Tobacco Reporting Regulations*.

Results

Table 1 compares the tobacco smoke of contraband and legal cigarettes (see the Appendix).

The same chemical substances are present in the smoke of both contraband and legal cigarettes. There was no notable difference in the quantity of most of these chemicals found in the smoke of either contraband or legal cigarettes.

Tobacco smoke contains over 4,000 different chemicals that are formed when tobacco is burned. At least 70 of these chemicals are known to cause, trigger, or promote cancer. The minor differences in quantity seen for some of the chemicals would have relatively little impact on the risk of harmful health effects for those exposed to cigarette smoke.

Smoke composition depends on several factors, including growing conditions (fertilizer, water, lighting), the geographical environment where the tobacco was cultivated, type of tobacco, and the combination of different tobacco varieties. These

factors account for any differences observed in smoke composition between contraband and legal cigarettes. The differences are mainly seen in the nitrosamines that are specific to tobacco (NNN, NAT, NNK), 1-aminonaphthalene, 2-aminonaphthalene, 3-aminobiphenyl, ammonia and isoprene. However, by way of comparison, the quantities of these chemicals in contraband cigarette smoke are similar to those found in the smoke of cigarettes sold in other countries.

Conclusion

The smoke composition of contraband and legal cigarettes is very similar. Health Canada considers that smoking contraband cigarettes poses the same risk of harmful health effects as smoking legal cigarettes sold in Canada.

References

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3. Health Canada, *Tobacco Products Information Regulations*, SOR/2000-272, P.C. 2000-1039, Ottawa, June 2000.
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Appendix

Table 1: Chemical composition of cigarette smoke for contraband cigarettes, for legal cigarettes sold in Canada, and for an American cigarette.

Chemicals	Quantity in the smoke						
	Mean ± Standard deviation						
		Contraband cigarette		Legal cigarette sold in Canada		American cigarette – Kentucky 2R4F	
Tar	(mg/cig)	17.0	± 0.5	14.4	± 0.6	9.11	± 0.37
		36.3	± 1.4	36.1	± 1.5	28.2	± 1.4
Nicotine	(mg/cig)	1.36	± 0.05	1.26	± 0.05	0.77	± 0.03
		2.82	± 0.10	2.75	± 0.16	1.95	± 0.09
Carbon monoxide (CO)	(mg/cig)	16.0	± 0.5	15.4	± 0.8	12.0	± 0.6
		29.9	± 0.8	30.8	± 1.0	32.7	± 1.1
NNN	(ng/cig)	53.8	± 4.3	7.7	± 3.6	163	± 5
		98.9	± 8.4	16	± 4	340	± 23
NAT	(ng/cig)	77.1	± 4.7	15.1	± 5.2	146	± 9
		127	± 7	29.0	± 5.3	286	± 16
NNK	(ng/cig)	52.9	± 5.2	14.1	± 2.4	144	± 8
		97.1	± 9.1	30	± 3	298	± 20

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Chemicals	Quantity in the smoke						
	Mean ± Standard deviation						
		Contraband cigarette		Legal cigarette sold in Canada		American cigarette – Kentucky 2R4F	
Benzo[a]pyrene	(ng/cig)	16.2	± 0.4	10.3	± 4.7	6.11	± 0.50
		27.6	± 3.8	22	± 5	16.2	± 1.3
1-aminonaphthalene	(ng/cig)	24.0	± 1.9	11.7	± 4.2	15.7	± 1.3
		36.6	± 1.6	21	± 4	27.7	± 3.7
2-aminonaphthalene	(ng/cig)	15.7	± 1.0	7.2	± 2.4	11.3	± 1.2
		24.2	± 0.9	13	± 2	18.9	± 2.2
3-aminobiphenyl	(ng/cig)	3.01	± 0.20	1.9	± 0.6	2.76	± 0.38
		5.17	± 0.40	3.7	± 0.6	5.46	± 0.24
4-aminobiphenyl	(ng/cig)	2.26	± 0.16	1.5	± 0.5	2.04	± 0.16
		3.96	± 0.24	3.0	± 0.5	3.96	± 0.12
Ammonia	(µg/cig)	17.8	± 1.7	10.2	± 3.6	11.4	± 0.8
		33.3	± 2.7	27	± 4	31.3	± 1.6
Hydrogen cyanide	(µg/cig)	194	± 18	146	± 45	120	± 7
		348	± 19	376	± 46	412	± 31
Formaldehyde	(µg/cig)	64.0	± 2.2	76	± 32	26.1	± 1.2
		120	± 16	204	± 32	84.7	± 6.1
Acetaldehyde	(µg/cig)	691	± 38	641	± 205	511	± 33
		1333	± 89	1453	± 208	1367	± 61
Acetone	(µg/cig)	377	± 119	374	± 120	258	± 9
		691	± 31	830	± 122	727	± 25
Acrolein	(µg/cig)	83.1	± 4.5	81	± 26	52.5	± 3.1
		153	± 4	196	± 27	163	± 7
Propionaldehyde	(µg/cig)	65.0	± 2.7	58	± 19	43.1	± 2.8
		120	± 6	135	± 20	125	± 5
Crotonaldehyde	(µg/cig)	27.0	± 1.7	28	± 10	12.2	± 0.9
		62.2	± 2.9	73	± 10	56.4	± 3.0
Butyraldehyde	(µg/cig)	48.7	± 4.1	42	± 15	33.9	± 4.1
		91.3	± 7.6	98	± 16	89.9	± 3.9
1,3-Butadiene	(µg/cig)	56.8	± 4.8	54	± 20	35.9	± 1.5
		108	± 4	125	± 20	96.8	± 8.8
Isoprene	(µg/cig)	551	± 30	319	± 129	344	± 10
		1015	± 32	708	± 132	927	± 87
Acrylonitrile	(µg/cig)	14.8	± 1.2	10.4	± 4.5	8.70	± 0.55
		26.5	± 3.2	24	± 5	26.9	± 2.9
Benzene	(µg/cig)	53.3	± 2.3	47	± 18	38.3	± 1.3
		95.4	± 4.5	100	± 18	90.7	± 4.5
Toluene	(µg/cig)	93.1	± 6.0	78	± 27	66.9	± 4.3
		188	± 5	171	± 27	176	± 9
pH		5.94	± 0.07	5.97	± 0.18	6.06	± 0.07
		5.79	± 0.06	5.64	± 0.18	5.85	± 0.05

List of abbreviations used in the table

NNN: N-nitrosornicotine

NAT: N-nitrosoanatabine

NNK: 4-(N-nitrosomethylamino)-1-(3-pyridyl)-1-butanone

Data collected under ISO smoking conditions

Data collected under Health Canada modified smoking conditions