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# Tar, nicotine figures on package not telling whole story, tests show

Tar and nicotine yields, printed on Canadian cigarette packages, do not reflect actual dosages that individual smokers receive, according to tests done for Price Watch by the laboratory that tests cigarette smoke for the federal government.

The tests indicate many smokers are getting twice the tar and nicotine from regular filter-tip cigarettes that is listed on packages and some who smoke so-called "light" or "ultra-light" cigarettes with vented filters may be getting 10 to 15 times the dosages the packages list.

In addition, the tests suggest cigarette smoke may be delivering significantly more carbon monoxide than indicated by federal government tests, anywhere from two to 23 times as much.

The tests, covering eight popular Canadian brands, were commissioned by The Star following release in January of a major report on the health consequences of smoking by the surgeon general of the United States. One of the key findings of the report was that testing methods (using laboratory smoking-machines) employed in both Canada and the United States for cigarette tar and nicotine yields "do not correspond to the dosages that the individual smokers receive" and that in some cases "they may seriously underestimate these dosages."

## Smoking habits

Taking up the challenge of the U.S. surgeon general's report, The Star tests were designed to more accurately reflect how people really smoke as opposed to how laboratory smoking-machines have traditionally been programmed to consume cigarettes.

The results demonstrate that even small changes in traditional testing procedures, to conform more closely to human smoking habits, have marked and not readily predictable effects on cigarette yields of tar, nicotine and carbon monoxide.

"Under the conditions of this study, all yields increased a minimum of about two-fold; thus many current smokers are consuming twice as much... as they might anticipate based on the numbers on the packages," the laboratory reported.

"Imagine the outcry if individuals were found to be getting twice the label dosage of any other legal drug," the report noted. "After all, cigarettes are primarily a very efficient vehicle for delivering the drug nicotine and as such, the smoker has the right to a realistic estimate of the potential dose which each cigarette represents."

The eight brands we chose for our tests, representing four manufacturers, were: PLAYERS, regular filter, by John Player & Sons, a division of Imperial Tobacco Ltd., Montreal; DU MAURIER, king size



Up in smoke: W. S. Rickert, president of Labstat Inc. of Kitchener, tests smoke of cigarettes.

filter, by Imperial; MATINEE, king size, "Extra Mild", by Imperial; CRAVEN A, king size, "Special Mild" and CRAVEN A, king size, "Ultra Light", by House of Craven Ltd., Toronto; EXPORT A, regular filter, "Lights" and EXPORT A, king size filter, "Lights", by RJR MacDonald Inc., Montreal; VISCOUNT No. 1, king size filter, "Ultra Light", by Benson & Hedges (Canada) Ltd., Montreal.

Smoking-machines in Canada are programmed to take a two-second puff of 35 ml every 58 seconds until a fixed butt length of 30 mm is reached.

These conditions were selected based on observations of average smoking behavior from investigations almost two decades ago. More current studies indicate that they

do not reflect current smoking characteristics. In addition, the type of cigarette generally smoked today is substantially different with respect to length, paper porosity, tar and nicotine content and concentration of carbon monoxide.

The choice of a 30 mm butt length, for example, means that in regular cigarettes with short filters, as much as 20 per cent of the tobacco is not smoked during the testing procedure used to produce the tar and nicotine values printed on Canadian cigarette packages.

In order to reflect today's smoking habits more accurately, our laboratory altered the traditional smoking-machine parameters to take a 2.4 second puff (instead of two-second puff) of 47.5 ml (instead of 35 ml) every 44 seconds (instead



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Price Watch

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of every 58 seconds) until a butt length of 23 mm (instead of 30 mm) was reached.

The eight brands we tested, using modified testing procedures, represented two filter types — vented and non-vented — and tar levels as published on the cigarette packages ranging from one to 17 mg.

In effect, the following changes were made in the smoking-machine parameters: puff volume was increased by 34 per cent, puff interval was decreased by 32 per cent and the amount of tobacco smoked in regular cigarettes was increased by 14 per cent. For the ventilated cigarettes, we blocked the vents to simulate the maximum hazard these cigarettes present.

## Toxic chemicals

As shown in the accompanying table, the yields of tar, nicotine and carbon monoxide recorded for the four non-vented brands increased two-fold. This means that for smokers of these brands, the exposure to toxic chemicals and the resulting risk of smoking related diseases is twice that expected, based on the numbers printed on the packages.

For the ventilated brands, the results are far more spectacular. For example, the two brands which yield 1 mg of tar under standard smoking-machine conditions increase at least ten-fold under modified conditions for both tar and nicotine, but carbon monoxide yields increased as much as 23-fold.

"The more pronounced effect with respect to carbon monoxide is due to the fact that this gas can only be reduced by air dilution and filtration," the laboratory report said. "Hole blocking ensures that most of the carbon monoxide produced by combustion passes through to the smoker."

The effect of changing the butt length standard, from 30 mm to 23 mm, is best illustrated by a comparison of the two types of Export A "Lights." Under standard conditions, both cigarettes have the same tar yield, but using the modified protocol, the regular "short" cigarette delivers about 5 mg of tar and 0.2 mg of nicotine MORE than the longer king size cigarette. This difference is equivalent to about five standard Craven A Ultra Light or Viscount No. 1 cigarettes.

BRAND	STANDARD VALUES (1)					MODIFIED VALUES (2)				
	FILTER (mm)	PUFFS (ml)	TAR (mg)	CO (mg)	NIC (mg)	PUFFS (ml)	TAR (mg)	CO (mg)	NIC (mg)	
Players RF	18	7.8	17	17	1.2	10.6	35	30	2.4	
DuMaurier KSF	21	9.2	17	21	1.1	11.3	33	35	2.1	
Export A Lights RF	19	7.1	12	13	0.9	10.4	27	25	1.7	
Export A Lights KSF	25	9.1	12	17	0.9	10.9	22	25	1.5	
Craven A Special Mild KSF	30	11.4	4	4	0.4	10.6	18	26	1.3	
Matinee Extra Mild KSF	30	9.8	4	4	0.4	9.3	18	25	1.3	
Viscount No. 1 Extra Light KSF	30	9.4	1	1	.07	9.0	12	23	0.6	
Craven A Ultra Light KSF	30	10.9	1	1	0.1	10.6	15	20	1.2	

Abbreviations: R, regular size; K, king size; F, filter;  
 (1) Conditions: Puff volume, 35 ml; puff interval, 58 sec; puff duration, 2 sec; butt length, 30 mm;  
 (2) Conditions: Puff volume, 47 ml; puff interval, 44 sec; puff duration, 2.4 sec; butt length, filter plus 3 mm;  
 \* Cigarettes with vents were tested with the vents blocked in estimating potential yields to smokers (modified values).