Report of "Tar," Nicotine, and Carbon Monoxide of the Smoke of 1206 Varieties of Domestic Cigarettes For the Year 1994

This report contains data on the "tar," nicotine, and carbon monoxide yields of 1206 varieties of cigarettes manufactured and sold in the United States in 1994. The Federal Trade Commission (FTC) obtained the test results from the five largest cigarette manufacturers in the United States. These companies are: Brown & Williamson Tobacco Corporation; Liggett Group, Inc.; Lorillard, Inc.; Philip Morris, Inc.; and R. J. Reynolds Tobacco Company, Inc.[1]

The Tobacco Institute Testing Laboratory (TITL), a private laboratory operated by the cigarette industry, conducted most of the "tar," nicotine, and carbon monoxide tests for these varieties. The Commission collected the results of the TITL testing directly from the individual companies under compulsory process. Generic, private label, and other brands not widely available were not tested by TITL. The Commission obtained the information on these other brands directly from the manufacturers, pursuant to compulsory process. Results of such non-TITL testing are indicated by asterisks. The methodology, processes, and procedures that the five cigarette companies and TITL employ are identical to those the Commission, in its own testing lab, had followed in the past.[2] Harold Pillsbury, the former director of the FTC laboratory and

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[1] The number of major domestic cigarette manufacturers went from six to five in April 1995, when the Commission approved B.A.T Industries' acquisition of The American Tobacco Company after B.A.T, the parent company of Brown & Williamson, agreed to divest itself of certain assets it proposed to acquire from American Tobacco. In October 1996, the Commission approved B.A.T's application to divest six brands, a manufacturing plant, and certain related assets to Commonwealth Tobacco LLC.

[2] The Commission determined in early 1987 to close its laboratory. The

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currently a contractor to the Commission, had unrestricted access to the TITL laboratory to review TITL's testing methodology and protocols and to monitor the actual testing process. TITL provided the results to the respective cigarette companies, which then provided TITL's data regarding their own brands to the FTC in response to compulsory process.

The cigarettes were tested using the Cambridge Method. The FTC approved this methodology, and it has been the standard for cigarette testing since 1966. The testing was subjected to the conditions prescribed by the FTC in Federal Register, Volume 32, Number 147, Page 11,178, dated August 1, 1967. With regard to the testing of carbon monoxide yield, the conditions are specified in Federal Register, Volume 45, Number 134, Page 46,483, dated July 10, 1980. The conditions prescribed in the FTC's 1967 announcement are the following:

1. Smoke cigarettes to a 23mm. butt length, or to the length of the filter and overwrap plus 3mm. if in excess of 23mm.;
2. Base results on a test of 100 cigarettes per brand, or type;
3. Cigarettes to be tested will be selected on a random basis, as opposed to "weight selection";

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[2](...continued)
Commission found that closing the laboratory was necessary for several reasons, chiefly, the cost of the laboratory was significant, and the Commission would have had to commit significant additional funds to continue the program. The Commission was also persuaded that the information could be obtained from other sources, and other means were available to verify the accuracy of industry testing results.

4. Determine particulate matter on a "dry" basis employing the gas chromatography method published by C.H. Sloan and B.J. Sublett in Tobacco Science 9, page 70, 1965, as modified by F.J. Schultz' and A.W. Spears' report published in Tobacco Vol. 162, No. 24, page 32, dated June 17, 1966, to determine the moisture content;
5. Determine and report the "tar" yield after subtracting moisture and alkaloids (as nicotine) from particulate matter;
6. Report "tar" yield to the nearest whole milligram and nicotine yield to the nearest 1/10 milligram (32 Fed. Reg. 11,178 (1967)).

The 1980 FTC announcement contained specifications regarding a new testing methodology to determine the carbon monoxide (CO) and nicotine yield of cigarettes. These specifications are the following:

1. Determine CO concentration using a 20-port sequential smoking machine described by H.C. Pillsbury and G. Merfeld at the 32nd Tobacco Chemists Research Conference, October 1978;
2. The concentration of CO will be reported as milligrams per cigarette;
3. The present method for "tar" and nicotine determination will be modified to use the method described in an article entitled, "Gas Chromatographic Determination of Nicotine Contained on Cambridge Filter Pads," by John R. Wagner et al., as presented at

the annual meeting of the Association of Official Analytical Chemists, October 1978 (45 Fed. Reg. 46,483 (1980)).

TITL reported, and the FTC's contractor confirmed, that an independent company under contract to TITL obtained the tested cigarette samples. Under its contract, this company purchased two packages of every variety of cigarettes in 50 geographical locations throughout the United States. If not all varieties were available in every location, one or more additional packages of cigarettes were purchased in the areas where the respective varieties were available. This procedure of selecting cigarettes for testing replicates the one used by the FTC. Cigarettes used in the test represented cigarettes sold in the U.S. at the time of purchase in 1994.

The "tar" and carbon monoxide figures are rounded to the nearest milligram (mg.). Those figures with 0.5 mg. or greater are rounded up, while those with 0.4 mg. or less are rounded down. The nicotine figures are rounded to the nearest tenth of a milligram. Those with 0.05 mg. or greater are rounded up; those with 0.04 mg. or less are rounded down.

Cigarette varieties with assay results of "tar" below 0.5 mg. per cigarette and of nicotine below 0.05 mg. are recorded in the table as <0.5, and <0.05, respectively. The table does not differentiate, nor are actual ratings provided for these cigarettes, because the currently approved testing methodology is not sufficiently sensitive to report these components at lower levels.

The following varieties are the lowest in "tar" yield as tested by TITL:

BRAND-NAME	D E S C R I P T I O N	TAR	NIC	CO
CARLTON	KING F HP ULTRA-LT		<.5	.1
<.05				
NOW	KING F HP	<.5	.1	<.05
NOW	100 F HP	<.5	.1	<.05
CARLTON	KING F SP ULTRA-LT	1	.1	2
CARLTON	KING F SP ULTRA-LT MEN	1	.1	2
CARLTON	100 F HP ULTRA-LT		1	.1
1				
CARLTON	100 F HP LT MEN	1	.1	1
MERIT	KING F HP ULTIMA	1	.1	3
MERIT	KING F SP ULTIMA	1	.2	3
CAMBRIDGE	KING F SP LOWEST	1	.2	2
BRISTOL	KING F SP LOWEST	1	.1	1
NOW	KING F SP		1	.1
2				
NOW	KING F SP MEN	1	.1	

Those ranking the highest in "tar" yield are the following:

BRAND NAME	D E S C R I P T I O N	TAR	NIC	CO
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BRISTOL	KING NF SP	27	1.7	16
COMMANDER	KING NF SP	27	1.7	16
BASIC	KING NF SP	26	1.7	16
ENGLISH OVALS	KING NF HP	26	2.0	16
LUCKY STRIKE	REG NF SP		26	1.6
16				
OLD GOLD	KING NF SP STRAIGHT	26	1.8	18
PALL MALL	KING NF SP	26	1.7	18
TAREYTON HERBERT	KING NF SP	25	1.7	15
BEST BUY*	KING NF SP	24	1.6	NA
BRONSON*	KING NF SP	24	1.6	NA
GENERALS*	KING NF SP	24	1.6	NA
GENCO*	KING NF SP	24	1.6	NA
GPA*	KING NF SP	24	1.6	NA
GRIDLOCK*	KING NF SP	24	1.6	NA
PREMIUM BUY*	KING NF SP	24	1.6	NA
PRIME	KING NF SP	24	1.5	16
PRIVATE STOCK	KING NF SP	24	1.5	16
RALEIGH EXTRA	KING NF SP	24	1.4	15
SHENANDOAH*	KING F SP	24	1.6	NA
SUMMIT	KING NF SP	24	1.5	16
TOP CHOICE*	KING NF SP	24	1.6	NA

NOTE: K - King Size, F - Filter, HP - Hard Pack,
SP - Soft Pack LT - Light, MEN - Menthol

* indicates brand tested by the manufacturer rather than by TITL.

On April 13, 1983, the Commission announced it had determined that its then testing methodology for "tar," nicotine, and carbon monoxide understated the measured deliveries for Brown & Williamson's Barclay cigarettes. Therefore, Barclay cigarettes were removed from the Commission's reports for "tar," nicotine, and carbon monoxide until a new, accurate methodology could be tested and adopted. The Commission found that there is a significant likelihood that the same problem exists with two other Brown & Williamson varieties -- Kool Ultra and Kool Ultra 100's.

On July 25, 1986, the Commission informed Brown & Williamson that as a result of a review of data presented by Brown & Williamson regarding "tar" and nicotine rating for two varieties of Barclay cigarettes with a new filter, the Commission would authorize, under certain

Brown & Williamson also agreed to provide the Commission with data regarding "tar" and nicotine ratings to be used in advertising for Kool Ultra and Kool Ultra 100's. Until these data are presented, the ratings for these two varieties will not be included in Commission reports.

On July 20, 1994, the Commission asked the National Cancer Institute (NCI) to convene a consensus conference to address certain issues concerning the FTC cigarette testing methodology and ratings system. NCI, which shortly before had received a similar request from then-House Subcommittee Chairman Henry A. Waxman, convened the conference in December 1994. At the close of the conference, the conferees recommended, inter alia, that certain changes be made both in the method currently used to obtain cigarette tar, nicotine, and carbon monoxide yields and in the manner in which information about those yields is communicated to consumers. In October 1996, NCI published a report of the conference as the 7th monograph in its smoking and tobacco control series: "The FTC Cigarette Test Method for Determining Tar, Nicotine, and Carbon Monoxide Yields of U.S. Cigarettes: Report of the NCI Expert Committee." In light of the concerns raised by the NCI conferees about the current system, the Commission is giving careful consideration to possible changes in the test method.

This year's report includes a new table (Table 1) displaying the average tar and nicotine values, calculated on a sales-weighted basis, from 1968 through 1994. The Commission has added

[3] Several issues should be noted with regard to the collection and tabulation of the data in Table 1. First, the underlying tar and nicotine ratings were obtained using smoking machine parameters (puff frequency, puff volume, etc.) that have not changed since they were first adopted in 1967. Although this consistency allows for comparison of the data over time, it also means that the test has not been modified to reflect possible changes in the way people

TABLE 1

SALES WEIGHTED TAR AND NICOTINE YIELDS

1968-1994

YEAR	TAR (mg.)	NICOTINE (mg.)
1968	21.6	1.35
1969	20.7	1.38
1970	20.0	1.31
1971	20.2	1.32
1972	19.9	1.39
1973	19.3	1.32
1974	18.4	1.24
1975	18.6	1.21
1976	18.1	1.16
1977	16.8	1.12
1978	16.1	1.11
1979	15.1	1.07
1980	14.1	1.04
1981	13.2	0.92
1982	13.5	0.89
1983	13.4	0.88
1984	13.0	0.89
1985	13.0	0.95*
1986	13.4	0.93*
1987	13.3	0.94
1988	13.3	0.94
1989	13.1**	0.96*
1990	12.5	0.93
1991	12.6	0.94
1992	12.4	0.92
1993	12.4	0.90
1994	12.1	0.90

Entries marked with an asterisk differ by 0.01 milligram from information previously released by the Commission.

Entry marked with two asterisks differs by 0.1 milligram from information previously released by the Commission.