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Selected Constituents in the Smokes of Foreign Commercial Cigarettes: "Tar", Nicotine, Carbon Monoxide, and Carbon Dioxide

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OAK RIDGE NATIONAL LABORATORY

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SELECTED CONSTITUENTS IN THE SMOKES OF FOREIGN COMMERCIAL CIGARETTES: "TAR", NICOTINE, CARBON MONOXIDE, AND CARBON DIOXIDE

R. A. Jenkins, R. B. Quincy, and M. R. Guerin

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HIGHLIGHTS

The "tar", nicotine, carbon monoxide, and carbon dioxide contents of the smokes of 220 brands of foreign commercial cigarettes are reported. In some instances, filter cigarettes of certain brands were found to deliver as much or more smoke constituents than their non-filter counter parts. Also, data indicated that there can be a great variation in the "tar", nicotine, or carbon monoxide content of the smoke of samples of a given brand name of cigarettes, depending on the nation in which they are purchased.

INTRODUCTION

In an effort to compare the patterns of tobacco smoke related disease in the United States with those in the other countries, the Smoking and Health program (S&HP) of the National Cancer Institute has initiated an international epidemiologic study of the relationship between tobacco usage and health. To support this effort, we were requested to provide an initial chemical characterization of the smokes of selected foreign cigarettes. Over a 40-month period, the smokes of more than 200 brands of foreign cigarettes have been analyzed for both vapor and particulate phase constituents. This report summarizes the analyses of smokes of 220 brands of cigarettes from eleven nations for "tar", nicotine, carbon monoxide, and carbon dioxide. It is important to note that these smoke deliveries were determined from a fairly small sample of cigarettes, and are not necessarily representative of all lots of a particular brand sold in one location or country.

EXPERIMENTAL

Cigarettes

All cigarette brands were obtained through the Office of the Director of the NCI Smoking and Health Program, or NCI's prime contractor for the S&HP, Enviro Control, Inc. of Rockville, MD. Usually, one carton of

a brand was available for characterization. Cigarettes were stored frozen (-22°C) in double plastic bags until use. After thawing, bags were opened and the cigarettes were conditioned at least 48 hours at 60 ± 2% relative humidity and 74°F. Except for cigarettes from South Africa, Kenya, the United Kingdom, Sri Lanka and Malaysia, cigarettes were selected for smoking using NCI protocol procedures (1). That is, 200 cigarettes of each brand were weighed, and the resistance-to-draw (RTD) (2) of 100 cigarettes was measured with a Filtrona Pressure Drop tester (3). Samples were chosen which weighed within 20 mg of the mean and which had an RTD of within 10% of the mean. For cigarettes from the aforementioned nations, a slightly different selection procedure was employed. The conditioned cigarettes of a brand were individually mixed (prior to smoking). Then the cigarettes were visually chosen, eliminating grossly imperfect cigarettes. The chosen cigarettes from each brand were weighed and their resistance-to-draw measured. Any cigarettes that did not fall within the established average weight and resistance-to-draw of a majority of the previous selected cigarettes for a brand, i.e. (± 20 mg) and a (± 5 mm H₂0), respectively, were replaced with others that did meet these criteria. Previous experiments performed here have indicated that the weight and resistance-to-draw of the cigarettes selected for smoking by this procedure do approximate the mean weight and resistance-to-draw for the batch, and the composition and concentration of the constituents in the smoke generated from them are not altered.

Reference Cigarettes

Analytical procedures were periodically tested by application to the smoke generated by the 1R1 Kentucky Reference Cigarette (4). The deliver-

ies of specific smoke constituents by this cigarette have been measured and documented in previous work (1).

Smoking

Cigarettes were smoked, four to six per channel, through a standard Cambridge filter assembly (5) on a four port version of the Phipps and Bird Analytical Smoking Machine (6) (Philip Morris design produced by Phipps and Bird, Inc., Richmond, VA) under standard smoking conditions (7) of 35 ± 0.2 ml puff volume, 2 ± 0.2 second puff duration, and l puff/minute frequency to a 23 mm butt length for non-filter cigarettes or to within 3 mm of the filter overwrap for filter cigarettes.

Total Particulate Matter (TPM), Water, Nicotine, and "Tar"

TPM was determined (2) to be the increase in weight of the Cambridge filter pad following the smoking procedure. The particulate matter was extracted with dioxane, and an aliquot of the extract was analyzed (8) for water content by gas-solid chromatography. Nicotine was determined (9) on a separate aliquot of the extract by gas-liquid chromatography. "Tar" was taken to be the weight of TPM less the weight of water and nicotine thus determined.

Carbon Monoxide (CO) and Carbon Dioxide (CO₂)

During the analytical smoking procedure, the entire gas phase delivery of the cigarette was expelled into a Saran gas sampling bag attached to each exhaust channel of the Phipps and Bird smoking machine. Following smoking of the requisite cigarettes, six clearing puffs were taken by the machine to flush the contents of the machine dead volume into the Saran bag. An aliquot of the contents of the bag was then analyzed for carbon

monoxide and carbon dioxide concentrations by gas-solid chromatography (10).

RESULTS AND DISCUSSION

European Cigarettes

In Tables 1, 2, 3, and 4, the brand description and physical characteristics of cigarettes purchased in Austria, France, Italy, and the United Kingdom, respectively, are listed. In Tables 5-8 are compared the "tar", nicotine, carbon monoxide (CO), and carbon dioxide (CO2) deliveries of those brands, on a per cigarette basis. Several of the smokes analyzed are from cigarettes with American brand names. These will be discussed later in this report. Judging from the deliveries of the smoke constituents of the British cigarettes, the Benson and Hedges Special Filter which is manufactured for export is similar to its namesake produced for domestic consumption, whereas the exported State Express 555 appears to be different from its domestic version.

In Tables 9 and 10 are compared ORNL "Lar" and nicotine values with those appearing on the packages of the Austrian and French cigarettes. (Those on the Austrian cigarettes are supplied by the Austrian Tobacco Monopoly.) For the Austrian cigarettes, there are some interesting correlations. For the filter cigarettes, the ORNL "tar" values averaged 2.5 mg higher than the Austrian, whereas the "tar" values for the non-filter cigarettes average 2.5 mg lower. For the French filter cigarettes, the ORNL "tar" deliveries were higher, but both sets of average values for the non-filter cigarettes were the same. Presumably, the differences for the Austrian cigarettes could be due to the differences in standard smoking

conditions employed in that country (11,12). In Austria, the Tobacco Monopoly employs standard butt lengths of 15 mm for non-filter cigarettes, and 5 mm past the filter overwrap for filter cigarettes. This differs considerably from what is employed in the United States for non-filter cigarettes (See above). SIETA, the French Tobacco Monopoly, uses butt length conditions which are identical to those employed by the Federal Trade Commission and ORNL. Thus, observed differences and similarities of tar values for non- filter cigarettes can be explained by different smoking practices, but these practices do not appear to explain the differences observed for filter cigarettes.

African Cigarettes

In Tables 11 and 12 are listed the brand descriptions and physical characteristics of selected cigarettes purchased in Kenya and the Union of South Africa, respectively. Smoke constituent deliveries are listed in Tables 13 and 14. Several samples of cigarette brands were purchased at different locations in Nairobi, Kenya to determine if differences in cigarette distribution patterns existed. Judging from the "tar" and nicotine deliveries, there appears to be a considerable difference between the two samples of the Embassy Filter Kings. In fact, Embassy, State Express 555, and Sportsman purchased near Wayklosk University all had deliveries of nicotine which were significantly larger than that of those purchased at other locations. It is impossible to determine if these differences were due to large batch-to-batch variations in tobacco blends or filters or due to deliberate differences in marketing patterns. Brands produced in the United States tended to have lower constituent deliveries. Because the

first samples of smoke analyzed from the Nyota cigarettes contained more nicotine than those of any cigarette ever assayed by the ORNL Tobacco Research Program, a second set of smoke samples was generated. Analysis of this second set of samples yielded a much lower nicotine value.

The sample of South African brands was sufficiently large that several filter and non-filter brand pairs were present. It may be anticipated that, under standard smoking conditions, a filter cigarette would deliver less particulate phase constituents (e.g., "tar" and nicotine) than its non-filter counterpart. This assumption was found to be not necessarily correct. In Table 15 are compared the "tar", nicotine, and carbon monoxide deliveries of the ten South African filter - non-filter pairs available to us. For some brand pairs (such as the Lexington, Rembrandt, and Camel), the filtered variety delivered less "tar" and nicotine. most of the cases, the particulate phase deliveries of the filter cigarettes were about the same (or even larger) than those of the non-filtered cigarettes. Correction for the length of tobacco rod burned accounts for the substantial differences between pairs of particulate phase deliveries for only the Lucky Strike and Texan brands. That is, the differences in cigarette length and smoking protocol between filter and non-filter variants result in a longer length of tobacco rod being consumed for the filter cigarette (see Table 15). In many cases, even after accounting for the differences in rod length the delivery differences are either small or the filter cigarette still delivers more "tar"or nicotine. either the filters used are no more efficient at screening particulate matter than the tobacco rod in the butt, or the cigarette tobacco is

blended to deliver a fairly high level of particulates even after filtration.

Asian Cigarettes

In Tables 16, 17, and 18, the brand description and physical characteristics of selected cigarettes purchased in Hong Kong, the Philippines, Sri Lanka, and Malaysia are listed. In Tables 19-21, the "tar", nicotine, carbon monoxide and carbon dioxide contents of the smokes of those cigarettes are compared. The cigarettes purchased in Hong Kong represent cigarettes imported from both Japan and the People's Republic of China. The Chinese cigarettes have significantly higher "tar" deliveries, but it is not known if these samples are truly representative of cigarettes consumed in those two nations. The sixty-four brands of cigarettes purchased in the Philippines include "international" brands manufactured locally under licensing agreements, brands of domestic companies, and brands imported from Japan and the United States. The smokes had fairly high "tar" and nicotine contents, with no cigarette brand delivering less than about 24 mg "tar". It appears that the Seven Stars brand exported to the Philippines is different than that exported to Hong Kong. The Philippines version delivers considerably more "tar" and nicotine. Only two British brands comprised the cigarette samples from Sri Lanka and Malaysia. Malaysia samples - locally manufactured - had much larger nicotine deliveries than those exported from the U.K. to Sri Lanka.

Brazilian Cigarettes

In Tables 22 and 23 are listed the brand description, physical characteristics, and smoke constituent deliveries of four brands of Brazilian

cigarettes. The Galaxie filters were purchased in July 1976, the others in December 1975. Judging from the "tar" and nicotine deliveries, the Galaxie represents a tobacco blend and/or filtration system which is much different from the other brands sampled.

In Table 24 are compared "tar", nicotine, and carbon monoxide deliveries from cigarettes with the same brand designation purchased in different nations. While the sample is small and varied, some patterns are discernable. With the exception of cigarettes produced in Europe for consumption in Austria, most cigarettes (in our sample) with United Kingdom or United States brand names produced under license in smaller nations had much higher smoke constituent deliveries than their UK or USA counterparts. Cigarettes exported to smaller nations followed a mixed pattern. Based on "tar" or nicotine deliveries, some, such as Marlboro or Kent in Kenya, Lucky Strike in the Philippines, or Camel (Regular) in South Africa, appear to be very similar to those sold in the United States. Uthers, such as State Express 555, exported to Sr1 Lanka or the United States, Kool's in the Philippines, or Benson and Hedges in Kenya, appear to be different from the cigarettes produced for consumption in the "home" country.

SUMMARY.

The physical characteristics and "tar", nicotine, carbon monoxide and carbon dioxide deliveries of 220 brands of foreign commercial cigarettes have been presented. Différences in smoke deliveries for similar brand name cigarettes sold in different nations have been discussed.

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Table 1. Brand and Physical Characteristics of Cigarettes Purchased in Austria - October 1978

Brand	ORNL Code	Apparent Country of Manufacture	Cigarette Wt.,	Cigarette RTD mm H ₂ O	Number of Puffs
A3 (Nonfiltered)	136	*	861	52	7.3
Arktis (Filtered)	122	*	1088	138	10.1
Austria C (Nonfiltered)	135	*	885	46	. 7.2
Camel (Filtered)	118	*	1093	115	10.0
daCapol (Filtered)	133	*	1182	158	7.9
Danes (Filtered)	115	*	1089	125	9.9
Ernte 23 (Filtered)	120	West Germany	1080	135	9.6
Falk (Filtered)	124	*	991	141	8.1
Flirt (Filtered)	129	*	956	127	8.0
Flirt (Nonfiltered)	117	* .	1077	· 76	9.1
Golden Smart (Filtered)	111	*	1261	151	12.2
HB (Filtered)	121	West Germany	1100	120	10.1
Hobby (Filtered)	127	* .	1034	131	10.0
Johnny (Filtered)	116	*	1059	122	9.7
Johnny (Nonfiltered)	112	*	1102	61	10.5

=

Table 1 (Cont'd)

Brand	ORNL Code	Apparent Country of Manufacture	Cigarette Wt.,	Cigarette RTD mm H ₂ O	Number of Puffs
Kent (Filtered)	132	*	1046	128	9.5
L&M (Filtered)	114	*	1023	116	8.1
Lord Extra (Filtered)	134	*	1076	147	9.5
Marlboro (Fi?tered)	137	*	1054	112	9.2
Memphis (Filtered)	128	*	· 1092	156	11.0
Milde Sarte (Filtered)	123	*	1039	137	9.2
Pall Mall (Nonfiltered)	119	United Kingdom	1164	105	9.3
Parisienne Super (Filtered)	130	*	933	124	7.9
Peter Stuyvesant (Filtered)	131	*	1045	118	8.4
Smart (Filtered)	126	*	1011	118	8.4
Trend (Filtered)	125	*	1025	146	7.9
Winston (Filtered)	113	*	1028	119	9.6

^{*}Austria

Table 2. Brand and Physical Characteristics of Cicarettes Purchased in France - October 1978 (All brands apparently manufactured in France)

Brand	ORNL Code	Cigarette Wt.,	Cigarette RTD mm H ₂ O	Number of Puffs
Celtique-Nonfilter	· 106	1204	48	7.8
Disque Blue-Nonfilter	107	10€0	48	8.6
Francaise Grand Format-Nonfilter	105	1096	68	10.1
Gauloises-Filter Gauloises-Nonfilter	101 102	1051 1067	123 52	9.0 7.7
Gitanes Blanc-Nonfilter Gitanes Mais-Nonfilter Gitanes Bout-Filter	103 109 110	1051 1046 982	48 57 95	7.7 12.0 7.7
Royale Menthol-Filter Royale Regular-Filter	103 104	1148 1140	136 151	10.3 10.4

Table 3. Brand and Physical Characteristics of Cigarettes Purchased in Italy February 1978

(All brands apparently manufactured in Italy)

Brand	Cigarette wt, mg	Cigarette RTD mm H ₂ O	Number of Puffs
Alfa	956	61	8.2
Esportazione Esportazione Filtro Esportazione King Size Lungo Filtro	1051 974 1254	60 88 120	9.0 9.6 14.6
Gala Doppio Filtro	1150	111	11.5
Lido Doppio Filtro	1129	102	10.6
MS Blu Doppio Filtro Speciale MS King Size Filtro	1130 1018	122 112	11.2 9.5
Nazionali Nazionali Filtro	1134 1122	94 96	9.3 11.2
Stop King Size Stop King Size Filtro	1146 1064	63 110	10.1 11.0
Super (Con Filtro)	1083	92	11.4

Table 4. Brand and Physical Characteristics of Cigarettes Purchased in the United Kingdom - April 1978 (All brancs manufactured in the UK)

Brand	ORNL Code	Cigarette wt, mg	Cigarette RTD mmH ₂ O	Number of Puffs	Place of Purchase	
Benson & Hedges-King Size Special Filter	IV	1090	137	11.0	Aboard British Airways Flight New York to London	
Benson & Hedges-King Size Special Filter	II .	1079	130	10.2	London, United Kingdom	
Embassy-Filter King	III	1111	170	10.5	1	
Senior Service (Nonfilter)	I	1087	90	9.2	Aboard British - Airways Flight	14
State Express 555 Filter King	VI	1088	132	10.5	New York to London	
State Express 555 Filter King	٧	1067	140	9.8	Oxford, United Kingdom	

	05.44	Deliveries per Cigarette, Mean $(mg) \pm 0$ ne Standard Deviation (mg)				
Brand	ORNL <u>Code</u>	"Tar"	Nicotine	CO	CO ₂	
A3 (Nonfiltered)	136	21.6 ± 0.1	0.93 ± 0.03	20.0 ± 0.3	51.3 ± 0.6	
Arktis (Filtered)	122	19.3 ± 0.1	0.69 ± 0.02	19.2 ± 0.4	62.6 ± 0.8	
Austria C (Monfiltered)	135	20.9 ± 0.2	1.20 ± 0.03	14.5 ± 0.4	44.5 ± 0.6	
Camel (Filtered)	118	22.4 ± 0.1	0.92 ± 0.03	21.6 ± 0.3	70.7 ± 1.3	
daCapol (Filtered)	133	14.0 ± 0.1	0.49 ± 0.01	15.6 ± 1.7	48.3 ± 4.9	
Danes (Filtered)	115	18.5 ± 0.1	0.77 ± 0.03	15.1 ± 0.3	56.9 ± 0.9	
Ernte 23 (Filtered)	120	16.7 ± 0.2	0.98 ± 0.10	18.0 ± 0.4	58.4 ± 1.2	
Falk (Filtered)	124	11.2 ± 0.4	0.45 ± 0.06	14.1 ± 0.2	47.6 ± 0.5	
Flirt (Filtered)	129	19.3 ± 0.3	0.69 ± 0.04	16.6 ± 0.1	51.9 ± 0.5	
Flirt (Nonfiltered)	117	28.1 ± 0.1	1.26 ± 0.04	19.9 ± 0.3	60.3 ± 1.1	
Golden Smart (Filtered)	111	20.3 ± 0.9	1.18 ± 0.06	22.1 ± 0.7	72.0 ± 1.4	
HB (Filtered)	121	19.6 ± 0.4	1.18 ± 0.04	17.1 ± 0.4	59.2 ± 0.6	
Hobby (Filtered)	127	20.9 ± 0.1	0.91 ± 0.01	20.2 ± 0.5	65.5 ± 0.9	

Table 5. "Tar', Nicotine, Carbon Monoxide (CO), and Carbon Dioxide (CO2) Deliveries of Cigarettes Purchased in Austria

Table 5 (Cont'd)

		Deliveries per Cigarette, Mean $(mg) \pm 0$ ne Standard Deviation (mg)				
Brand	ORNL <u>Code</u>	"Tar"	Nicotine	CO	CO ₂	
Johnny (Filtered)	116	20.0 ± 0.4	1.02 ± 0.03	19.9 ± 0.3	63.7 ± 0.6	
Johnny (Nonfiltered)	112	35.7 ± 1.3	2.71 ± 0.08	19.0 ± 1.0	62.1 ± 2.1	
Kent (Filtered)	132	17.8 ± 0.2	0.85 ± 0.02	17.8 ± 0.4	60.9 ± 1.0	
L&M (Filtered)	114	18.6 ± 0.1	1.03 ± 0.03	18.0 ± 0.2	55.1 ± 0.8	
Lord Extra (Filtered)	134	15.9 ± 0.2	0.63 ± 0.01	18.1 ± 0.3	62.2 ± 0.5	
Marlboro (Filtered)	137	18.7 ± 0.1	1.05 ± 0.02	16.2 ± 0.3	60.6 ± 0.6	
Memphis (Filtered)	.128	16.6 ± 0.1	0.80 ± 0.02	14.9 ± 0.3	59.3 ± 0.6	
Milde Sarte (Filtered)	123	12.6 ± 0.2	0.41 ± 0.01	12.8 ± 0.3	51.4 ± 0.5	
Pall Mall (Nonfiltered)	119	24.9 ± 0.5	1.06 ± 0.05	17.3 ± 0.2	54.5 ± 0.6	
Parisienne Super (Filtered)	130	14.5 ± 0.1	0.61 ± 0.02	15.4 ± 0.5	52.5 ± 0.7	
Peter Stuyvesant (Filtered)	131	16.8 ± 0.2	0.86 ± 0.02	16.9 ± 0.4	56.5 ± 0.7	
Smart (Filtered)	126	18.5 ± 0.1	0.68 ± 0.02	16.1 ± 0.3	54.6 ± 0.7	
Trend (Filtered)	125	5.8 ± 0.1	0.17 ± 0.01	9.5 ± 0.2	40.1 ± 0.5	
Winston (Filtered)	113	19.3 ± 0.5	1.16 ± 0.12	18.3 ± 0.5	61.7 ± 1.2	

Table 6. "Tar", Nicotine, Carbon Monoxide (CO), and Carbon Dioxide (CO₂)
Deliveries of Cigarettes Purchased in France

	0544	Deliveries per Cigarette, Mean $(mg) \pm 0$ ne Standard Deviation (mg)				
Brand	ORNL <u>Code</u>	"Tar"	Nicotine	CO	CO2	
Celtique-Nonfilter	106	22.5 ± 0.1	1.44 ± 0.02	16.7 ± 0.4	55.5 ± 0.4	
Disque Blue-Nonfilter	107	24.0 ± 0.2	1.22 ± 0.02	16.9 ± 0.4	54.3 ± 0.7	
Francaise Grand Format- Nonfilter	105	23.1 ± 0.8	1.30 ± 0.04	19.6 ± 0.7	65.2 ± 0.9	
Gauloises-Filter Gualoises-Nonfilter	101 102	16.8 ± 0.1 24.4 ± 0.1	0.57 ± 0.01 1.30 ± 0.02	21.1 ± 0.3 15.8 ± 0.3	71.3 ± 0.5 58.1 ± 0.6	
Gitanes Blanc-Nonfilter Gitanes Mais-Nonfilter Gitanes Bout-Filter	108 109 110	24.5 ± 0.9 44.3 ± 0.4 15.1 ± 0.2	1.53 ± 0.03 2.24 ± 0.04 0.85 ± 0.02	$ 15.2 \pm 0.2 39.3 \pm 0.5 18.0 \pm 0.2 $	50.3 ± 0.4 84.8 ± 2.4 55.7 ± 0.2	
Royale Menthol-Filter Royale Regular-Filter	103 104	19.1 ± 0.3 18.5 ± 0.5	0.97 ± 0.10 1.48 ± 0.08	20.8 ± 1.3 18.1 ± 0.6	68.7 ± 3.4 67.7 ± 1.5	

Table 7. "Tar", Nicotine, Carbon Monoxide (CO), and Carbon Dioxide (CO₂)
Deliveries of Cigarettes Purchased in Italy

Duand	Deliveries per Cigarette, Mean (mg) ± One Standard Deviation (mg) "Tar" Nicotine CO CO2				
Brand		Nicotine	CO		
Alfa	25.0 ± 0.40	1.04 ± 0.03	20.6 ± 0.26	58.6 ± 0.62	
Esportazione	27.6 ± 0.35	1.12 ± 0.05	14.2 ± 0.23	53.6 ± 0.62	
Esportazione Filtro	20.4 ± 0.35	0.62 ± 0.01	23.6 ± 0.93	68.9 ± 1.23	
Esportazione King Size Lungo Filtro	23.0 ± 0.29	0.88 ± 0.02	14.4 ± 0.45	88.6 ± 0.77	
Gala Doppio Filtro	15.6 ± 0.08	0.44 ± 0.01	14.4 ± 0.45	66.5 ± 1.11	
Lido Doppio Filtro	22.4 ± 0.22	1.11 ± 0.03	19.7 ± 0.31	65.8 ± 0.73	
MS Blu Doppio Filtro Speciale	16.4 ± 0.22	0.73 ± 0.02	16.7 ± 0.25	65.1 ± 0.59	
MS King Size Filtro	22.8 ± 0.56	1.05 ± 0.02	21.1 ± 0.35	74.7 ± 0.74	
Nazionali	23.9 ± 0.31	0.70 ± 0.02	17.9 ± 0.58	59.4 ± 1.50	
Nazionali Filtro	22.9 ± 0.78	0.80 ± 0.02	20.9 ± 0.49	71.6 ± 0.76	
Stop King Size	36.3 ± 0.27	2.23 ± 0.04	22.5 ± 0.18	66.7 ± 0.21	
Stop King Size Filtro	27.5 ± 0.37	1.17 ± 0.05	21.5 ± 0.35	74.7 ± 0.74	
Super (Con Filtro)	25.2 ± 0.29	1.06 ± 0.03	24.4 ± 0.26	78.1 ± 0.33	

Table 8. "Tar", Nicotine, Carbon Monoxide (CO), and Carbon Dioxide (CO₂)
Deliveries of Cigarettes Purchased in the United Kingdom

	00411	Deliveries per Cigarette, Mean (mg) \pm One Standard Deviation (mg)						
Brand	ORNL Code	"Tar"	Nicotine	CO	CO2			
Benson & Hedges-King Size Special Filter (Export)	IV	16.9 ± 0.8	1.03 ± 0.08	16.3 ± 1.9	64.3 ± 1.5			
Benson & Hedges-King Size Special Filter	II	17.5 ± 0.2	0.98 ± 0.05	16.5 ± 0.4	62.0 ± 2.3			
Embassy-Filter King	III	18.9 ± 0.4	1.12 ± 0.03	24.4 ± 0.6	75.4 ± 2.6			
Senior Service (Nonfilter)	I	28.4 ± 1.4	1.84 ± 0.09	18.5 ± 1.2	56.9 ± 3.1			
State Express 555 Filter King (Export)	VI	27.8 ± 0.8	1.51 ± 0.07	23.0 ± 1.3	65.3 ± 1.3			
State Express 555 Filter King	٧	17.7 ± 1.1	0.94 ± 0.12	16.3 ± 2.1	52.8 ± 3.9			

Table 9. Comparison of "Tar" and Nicotine Delivery Values for Austrian Cigarettes
Austrian Tobacco Monopoly vs ORNL

Filter Cigarettes

	Austrian	ORNL	Austrian	ORNL
	"Tar"	"Tar"	Nicotine	Nicotine
Brand	(mg)	(mg)	(mg)	(mg)
Arktis	15.4	19.3	0.64	0.69
Came1	16.4	22.4	U.84	ܕ92
da Capol	12.8	14.0	0.46	0.49
Danes	14.2	18.5	0, 59	0.7 7
Ernte 23	14.4	16.7	0.82	0.98
Falk	10.4	11.2	0.41	0.45
Flirt .	17.0	19.3	0.78	0.69
Golden Smart	19.3	20.3	0.87	1.18
НВ	16.2	19.6	0.92	1.18
Hobby	16.3	20.9	0.80	0.91
Johnny	16.9	20.0	0.84	1.02
Kent	15.6	17.8	0.73	. 0.85
L&M	14.0	18.6	0.78	1.03
Lord Extra	13.7	15.9	0.58	0.63
Marlboro	16.0	18.7	0.83	1.05
Memphis	15.7	16.6	0.70	0.80
Milde Sarte	11.3	12.6	ܕ50	0.41
Parisienne Super	14.4	14.5	U• /U	0.80
Peter Stuyvesant	13.8	16.8	0.72	0.86
Smart	15.3	18.5	0.71	0.68
Trend	5.0	5.8	0.15	0.17
Winston	16.3	19.3	0.80	1.16
•				
·				
		Nor	Filter Cigarettes	
A3	26.2	21.6	1.51	0.93
Austria C	26.0	20.9	1.69	1.20
Flirt	30.0	28.1	1.34	1.26
Johnny	34.4	35.7	2.35	2.71
Pall Mall	27 . 1	24.9	1.35	1.06
(Will LINE)	L/ • 1	~ T • J	1.00	1.00

Table 10. Comparison of "Tar" and Nicotine Delivery Values for French Cigarettes
French Tobacco Monopoly (SIETA) vs ORNL

	Filter Cigarettes						
Brand	French "Tar" (mg)	ORNL "Tar" <u>(mg)</u>	French Nicotine (mg)	ORNL Nicotine (mg)			
Gauloises	15.0	16.8	1.00	0.57			
Gitanes Bout	14.0	15.1	1.20	0.85			
Royale Menthol	16.5	19.1	1.10	0.97			
Royale Regular	17.0	18.5	1.35	1.48			
		Non Filte	er Cigarettes				
Celtique	25.5	22.5	1.75	1.44			
Disque Blue	23.0	24.0	1.45	1.22			
Francaise Grand Format	23.0	23.1	1.10	1.30			
Gauloises	25.0	24.4	1.50	1.30			
Gitanes Blanc	23.0	24.5	1.60	1.53			

44.3

2.70

2.24

44.0

Gitanes Mais

Table 11. Brand and Physical Characteristics of Cigarettes Purchased in Nairobi, Kenya - April and May 1978

Brand	ORNL Code	Apparent Country of Manufacture	Cigarette Wt.,	Cigarette RTD mm H ₂ O	Number of Puffs	Place of Purchase	
Benson & Hedges-King Size Special Filter	XIII	Unit∋d Kingdom	1084	134	10.1	Didy's	
Benson & Hedges-King Size Special Filter	Ε	Unit∋d Kingdom	1088	- 132	10.7	Univ. Wayklosk	
Diplomat-Filter	X	*	1057	120	10.7	Cont. Store	
Embassy Filter King	IIX	*	1109	142	11.3	Goodfare Store	22
Embassy Filter King	В	* .	1093	142	12.0	Univ. Wayklosk	
Kent Filter	Н	United States	942	129	7.5	Univ. Wayklosk	
Kool Filter King	С	United States	995	117	8.5	Univ. Wayklosk	
Marlboro Filter	D	United States	947	113	8.0	Univ. Wayklosk	
Nyota-Long Size-Filter	IX	*	1004 1022 ^a	103 _a	9.9 10.6	Tobacco Whole- salers	
Sportsman King Size Filter	XV	*	1104	138	11.5	Goodfare Stores	

Table 11 (Cont'd)

Brand	ORNL Code	Apparent Country of Manufacture	Cigarette Wt.,	Cigarette RTD mm H ₂ O	Number of Puffs	Place of Purchase
Sportsman King Size Filter	А	*	1117	128	12.3	Univ. Wayklosk
State Express 555 Filter King	XIV	*	1089	104	10.8	Didy's
State Express 555 Filter King	F	*	1095	107	11.5	Univ. Wayklosk
Tencent (Nonfilter)	ΧI	*	841	149	7.9	Tobacco Whole- salers
Viceroy	G	United States	952	103	7.3	Univ. Wayklosk

^{*}Kenya

^aPhysical characteristics of cigarettes for second generation of smoke samples. See text.

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Table 12. Brand and Physical Characteristics of Cigarettes Purchased in South Africa - February 1978

Brand	ÜRNL Code	Apparent Country of Manufacture	Cigarette Wt., mg	Cigarette RTD mm H ₂ O	Number of Puffs
Albany	56	* 	1047	96	9.8
Bel Air Light Menthol-Filter	58	· *	1157	97	11.4
Belmont King Size-Filter	40	.	1136	103	11.6
Benson & Hedges Luxury Blend-Filter Benson & Hedges Special King Size-Filter Benson & Hedges Special Mild-Filter Benson & Hedges Super Virginia King Size-Plain	63 18 16 17	ት ተ ት	1250 1086 1156 1192	105 117 102 89	11.1 11.8 11.0 11.0
Camel Camel-Filter	9 10	United States United States	875 976	70 123	7.1 8.1
Cameo Elegante-Filter	53	ж	1312	112	12.9
Cavalla Kings-Filter	59	*	1134	115	11.7
Chesterfield-Filter Chesterfield-Plain	8 7	N	1052 1086	99 95	10.2 9.9
Craven A King Size-Filter Deluxe Craven A Original Menthol King Size-	24	*	1094	104	11.0
Filter Deluxe Craven A Original 120 Menthol Super Length-	25	76.	1101	123	11.0
Filter Craven A Original 120 Super Length-Filter	5 6	N N	1140 1140	165 166	13.2 13.1

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Table 12 (Cont'd)

Brand	ORNL Code	Apparent Country of Manufacture	Cigarette Wt., mg	Cigarette RTD mm H ₂ O	Number of Puffs
Courtleigh Gold Band Filter Tipped	49	*	1186	122	10.9
Courtleigh Special Mild Satin Leaf-King Size- Filter Tipped	45	*	967	135	9.4
Dunhill Int'l Luxury Length-Filter Dunhill King Size-Filter	46 67	*	1300 1131	112 112	13.6 12.1
El Cano Cigarillo-Filter	32	*	1058	113	10.3
Five Star-Filter	57	*	1030	92	9.4
Gauloises Caporal-Filter Gauloises Caporal-Plain	22 23	*	1043 1065	· 62 • 52	9.8 10.0
Gitane-Filter	44	*	1033	70	9.1
Gunston-Plain Gunston-Filter	2 1	Rhodesia Rhodesia	1115 1111	73 117	10.8 10.1
Gold Dollar King Size-Filter Gold Dollar King Size-Plain	69 60	*	1131 1231	92 87	11.0 11.4
HB Int'l Crown-Filter	36	*	1093	102	10.4
Hunter-Filter	68	*	1046	75	11.2
Idlewild Menthol Nild-Filter	30	*	1116	109	11.4
Kent (Micronite)-Filter	29	*	1094	121	10.2

Brand	ORNL Code	Apparent Country of Manufacture	Cigarette Wt., mg	Cigarette RTD mm H ₂ O	Number of Puffs
L&M Flavor Lights-Filter	21 20	*	1117	105	10.2
L&M Filter Kings	20	ŕ	1115	113	10.5
Lexington-Filter	4	*	1089	99	10.6
Lexington-Straight	3	* ,	1302	123	12.7
Life King Size-Filter	43	*	1130	107	11.6
Lucky Strike-Filter	26	*	1056	83	9.9
Lucky Strike-Plain	27	*	1133	63	10.9
Matinee King Size-Filter	65	Rhodesia	1091	121	10.3
Paul Revere-Filter	31	*	1185	131	12.0
Perilly's Private Blend-Filter	33	*	1131	115	10.8
Peter Stuyvesant Extra Mild Kirg Size-Filter	11	*	1135	120	12.0
Peter Stuyvesant King Size-Filter	13	* **	1111	126	11.0
Peter Stuyvesant Luxury Length 100-Filter	12	*	1334	112	14.0
Player No. 6 King Size-Filter	41	*	1132	128	10.1
President Giants-Filter Tipped	50	United Kingdom	1057	95	10.3
Ransom Select Mild Multi King Size-Filter	38	*	1139	117	10.2

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Table 12 (Cont'd)

Brand	ORNL Code	Apparent Country of Manufacture	Cigarette Wt., mg	Cigarette RTD mm H ₂ O	Number of Puffs
Rembrandt Int'l Luxury Length-Filter Rembrandt Superior Mild-Filter Rembrandt Van Rijn Filter Deluxe Rembrandt Van Rijn Untipped	54 34 64 55	* * *	1254 1134 1119 1271	115 134 110 112	12.2 11.2 12.5 13.1
Rothman's Consulate Filter Cork Tipped-Virginia Rothman's King Size-Filter Rothman's King Size-Untipped Rothman's Super Filter Mild Golden Virginia	52 39 61 70	* * *	969 1113 1253 1156	106 114 101 115	10.6 11.5 13.9 10.9
Santos' Dumont Super Length-Filter Senior Service King Size-Filter	28 66	*	1152 1160	170 125	15.1 13.1
State Express 555 Filter Kings State Express King Size-Filter	37 62	*	1094 1118	98 94	11.0 10.4
Texan-Filter Texan-Plain	15 14	Rhodesia Rhodesia	1130 1141	99 87	11.6 10.2
Vogue Satin Tipped King Size-Filter	48	*	1130	124	10.9
West 85-Filter Wills Embassy Filter Kings Wills Viceroy-Filter	42 35 47	* *	1092 1094 1030	111 126 103	11.1 10.4 10.2

^{*}South Africa

Table 13. Tar, Nicotine, Carbon Monoxide (CO), and Carbon Dioxide (CO $_2$) Deliveries of Cigarettes Purchased in Kenya

		Deliveries per Cigarette, Mean $(mg) \pm 0$ ne Standard Deviation (mg)					
Brand	ORNL Code	"Tar"	Nicotine_	CO	CO ₂		
Benson & Hedges-King Size Filter	XIII	22.3 ± 0.9	1.26 ± 0.13	20.3 ± 0.5	67.8 ± 1.4		
Benson & Hedges-King Size Filter	E	13.4 ± 0.5	1.40 ± 0.05	22.1 ± 0.4	65.3 ± 1.4		
Diplomat Filter	X	27.7 ± 0.1	1.04 ± 0.04	14.2 ± 0.3	62.4 ± 1.2		
Embassy Filter King	XII	20.8 ± 0.3	1.46 ± 0.06	20.5 ± 0.5	73.6 ± 0.6		
Embassy Filter King	В	28.5 ± 0.9	2.16 ± 0.04	22.0 ± 0.9	73.5 ± 3.3		
Kent Filter	Н	17.6 ± 1.5	0.96 ± 0.06	20.6 ± 0.3	56.3 ± 1.2		
Kool Filter King ^a	С	17.8 ± 0.6	1.35 ± 0.05	17.4 ± 0.3	53.6 ± 1.0		
Marlboro	D	19.4 ± 0.1	0.99 ± 0.06	14.8 ± 0.4	49.0 ± 0.9		
Nyota-Long Size-Filter	IX	28.7 ± 1.5 28.4 ± 0.2	3.36 ± 0.11 2.72 ± 0.06	21.6 ± 0.4	67.9 ± 0.2		
Sportsman King Size Filter	ΧV	24.0 ± 0.4	1.94 ± 0.07	17.5 ± 0.9	67.9 ± 1.3		
Sportsman King Size Filter	Α	28.8 ± 0.6	2.34 ± 0.06	21.1 ± 0.3	70.0 ± 0.6		

Table 13 (Cont'd)

	ODNI	<u>Deliveries</u> p	er Cigarette, Mean	(mg) ± One Standard	Deviation (mg)
Brand	ORNL Code	<u>"Tar"</u>	Nicotine	CO	<u> </u>
State Express 555 Filter King	XIV	31.3 ± 2.0	1.98 ± 0.13	25.7 ± 1.4	73.1 ± 3.4
State Express 555 Filter King	F	32.3 ± 0.4	2.21 ± 0.05	25.3 ± 0.8	72.7 ± 1.8
Tencent (Nonfilter)	XI	18.0 ± 0.2	1.88 ± 0.06	14.5 ± 0.4	48.2 ± 1.0
Viceroy Filter	G	16.2 ± 0.9	1.02 ± 0.04	22.5 ± 0.7	57.6 ± 1.1

^aMenthol Cigarette

Table 14. Tar, Nicotine, Carbon Monoxide (CO), and Carbon Dioxide (CO₂)
Deliveries of Cigarettes Purchased in South Africa

· .		Deliveries p	er Cigarette, Mean (mg) ± One Standard [Deviation (mg)
Brand	ORNL Code	"Tar"	Nicotine	CO	CO ₂
Albany	56	29.6 ± 0.1	1.49 ± 0.08	22.8 ± 0.4	64.8 ± 0.2
Bel Air Light Menthol-Filter	58	32.6 ± 1.3	1.62 ± 0.08	24.0 ± 1.4	78.2 ± 2.4
Belmont King Size-Filter	40	33.2 ± 1.0	1.91 ± 0.03	23.6 ± 0.3	72.5 ± 0.4
Benson & Hedges Luxury Blend- Filter	63	2 4. 5 ± 0.2	1.66 ± 0.05	20.6 ± 0.7	67.1 ± 2.1
Benson & Hedges Special King Size-Filter	18	31.1 ± 0.3	1.72 ± 0.05	26.1 ± 0.6	71.6 ± 1.0
Benson & Hedges Special Mild- Filter Benson & Hedges Super Virginia	16 a	24.1 ± 0.7	1.80 ± 0.05	22.1 ± 0.7	72.4 ± 1.5
King Size-Plain	17	33.8 ± 0.2	2.04 ± 0.06	21.3 ± 0.3	. 69.8 ± 0.7
Camel Camel-Filter	9 10	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1.60 ± 0.04 1.30 ± 0.04	$\begin{array}{c} 14.8 \pm 1.2 \\ 18.5 \pm 0.4 \end{array}$	46.4 ± 3.3 52.7 ± 0.8
Cameo Elegante-Filter	53	29.4 ± 0.1	1.48 ± 0.03	26.4 ± 0.4	76.2 ± 0.6
Cavalla Kings-Filter	59	27.4 ± 1.5	1.38 ± 0.04	29.2 ± 1.3	77.0 ± 1.1
Chesterfield-Filter Chesterfield-Plain	. 8 . 7	28.8 ± 0.8 26.1 ± 0.7	1.76 ± 0.01 1.37 ± 0.03	19.6 ± 0.9 14.2 ± 0.4	65.0 ± 2.6 55.0 ± 1.3

Table 14 (Cont'd)

	OFAU	Deliveries pe	r Cigarette, Mean (mg) ± One Standard D	eviation (mg)
Brand	OF.NL Code	"Tar"	Nicotine	CO	C02
Craven A King Size-Filter Deluxe	24	26.9 ± 0.9	1.85 ± 0.05	22.7 ± 0.5	66.6 ± 0.8
Craven A Original Menthol Kin Size-Filter Deluxe	25	26.2 ± 0.2	1.71 ± 0.03	23.0 ± 0.6	67.9 ± 1.0
Craven A Original 120 Menthol Super Length-Filter	5	22.0 ± 1.3	1.36 ± 0.03	20.9 ± 0.8	65.0 ± 1.5
Craven A Original 120 Super Length-Filter	. 6	23.3 ± 1.7	1.47 ± 0.05	23.5 ± 0.3	69.6 ± 2.8
Courtleigh Gold Band Filter Tipped Courtleigh Special Satin Leaf	4 9	24.3 ± 0.4	1.43 ± 0.03	27.6 ± 0.5	77.6 ± 2.0
King Size-Filter Tipped	45	12.3 ± 0.4	0.52 ± 0.05	16.0 ± 0.5	53.2 ± 0.9
Cunhill Int'l Luxury Length- Filter Dunhill King Size-Filter	46 67	34.6 ± 1.2 32.3 ± 0.4	1.98 ± 0.03 1.72 ± 0.05	28.7 ± 1.8 25.6 ± 1.2	85.8 ± 6.0 69.7 ± 2.0
El Cano Cigarillo-Filter	32	38.4 ± 1.0	2.28 ± 0.06	57.7 ± 1.4	95.3 ± 1.9
Five Star-Filter	57	27.7 ± 1.6	1.87 ± 0.06	28.3 ± 2.2	66.3 ± 3.7
Gauloises Caporal-Filter Gauloises Caporal-Plain	22 23	24.3 ± 1.6 21.4 ± 0.8	1.11 ± 0.05 1.11 ± 0.02	16.0 ± 0.5 12.4 ± 0.6	61.0 ± 0.9 56.3 ± 0.9
Gitane-Filter	44	24.1 ± 0.8	1.24 ± 0.03	17.5 ± 2.6	62.1 ± 6.6

		Deliveries per Cigarette, Mean (mg) ± One Standard Deviat				
Brand	ORNL Code	"Tar"	Nicotine	CO	CO ₂	
Gunston-Plain Gunston-Filter	2 1	28.4 ± 0.2 28.4 ± 0.3	1.96 ± 0.05 1.86 ± 0.03	19.3 ± 0.5 15.8 ± 0.6	70.7 ± 1.2 60.2 ± 2.0	
old Dollar King Size-Filter old Dollar King Size-Plain	69 60	31.8 ± 0.7 34.1 ± 1.2	2.32 ± 0.07 1.92 ± 0.05	22.1 ± 0.4 25.2 ± 0.6	65.7 ± 1.1 73.7 ± 2.4	
B Int'l Crown-Filter	36	22.5 ± 0.3	1.30 ± 0.05	12.4 ± 0.8	48.1 ± 1.4	
unter-Filter	68	35.5 ± 0.4	1.89 ± 0.07	22.9 ± 0.9	71.3 ± 1.3	
dlewild Menthol Mild-Filter	30	29.0 ± 0.3	1.64 ± 0.07	22.9 ± 0.9	71.3 ± 1.3	
ent (Micronite)-Filter	29	31.0 ± 0.3	1.65 ± 0.07	21.1 ± 0.5	73.6 ± 0.8	
&M Flavor Lights-Filter &M Filter Kings	21 20	20.0 ± 0.3 25.7 ± 1.6	1.04 ± 0.03 1.62 ± 0.04	14.6 ± 0.8 19.7 ± 1.6	57.2 ± 1.4 68.9 ± 4.7	
exington-Filter exington-Straight	4 3	31.4 ± 1.0 35.3 ± 1.1	1.83 ± 0.06 2.16 ± 0.06	20.2 ± 0.5 23.9 ± 1.2	68.0 ± 2.0 80.9 ± 3.0	
ife King Size-Filter	43	34.2 ± 0.3	1.48 ± 0.05	22.3 ± 1.0	78.7 ± 1.4	
ucky Strike-Filter ucky Strike-Plain	26 27	32.7 \pm 1.7 28.5 \pm 0.4	1.93 ± 0.04 1.76 ± 0.03	20.9 ± 0.9 13.4 ± 0.5	65.9 ± 2.0 52.3 ± 4.1	
atinee King Size-Filter	55	23.5 ± 0.8	1.11 ± 0.05	28.4 ± 1.8	73.5 ± 3.4	
aul Revere-Filter	31	28.5 ± 0.3	1.87 ± 0.06	23.2 ± 0.7	79.8 ± 1.5	

Table 14 (Cont'd)

	08111	Deliveries per	Cigarette, Mean (mo	j) ± One Standard D	eviation (mg)
Brand	ORNL Code	"Tar"	Nicotine	CO	CO ₂
Perilly's Private Blend- Filter	33	26.8 ± 0.8	1.72 ± 0.04	22.6 ± 0.3	63.8 ± 1.2
Peter Stuyvesant Extra Mild King Size-Filter	11	29.0 ± 0.9	1.77 ± 0.04	. 22.6 ± 0.3	63.8 ± 1.2
Peter Stuyvesant King Size- Filter	13	29.4 ± 1.4	1.72 ± 0.03	30.1 ± 0.8	73.8 ± 2.1
Peter Stuyvesant Luxury Length 100-Filter	12	5.4 ± 0.4	2.35 ± 0.09	32.0 ± 0.5	91.0 ± 1.2
Player No. 6 King Size-Filter	41	28.4 ± 0.4	2.05 ± 0.05	25.9 ± 0.5	75.8 ± 1.2
President Giants-Filter Tipped	50	32.7 ± 2.0	1.90 ± 0.07	21.5 ± 1.4	66.7 ± 2.7
Ransom Select Mild Multi King Size-Filter	38	23.2 ± 0.12	1.36 ± 0.03	20.5 ± 1.4	62.3 ± 2.4
Rembrandt Int'l Luxury Length-Filter Rembrandt Superior Mild-	54	28.0 ± 0.6	1.66 ± 0.04	26.5 ± 1.3	78.3 ± 3.7
Filter	34	23.2 ± 0.8	1.50 ± 0.03	20.9 ± 0.9	70.8 ± 1.0
Rembrandt Var Rijn Filter Deluxe Rembrandt Van Rijn Untipped	64 55	29.7 ± 0.4 37.0 ± 0.3	1.79 ± 0.03 2.40 ± 0.08	28.8 ± 0.5 26.5 ± 0.4	81.1 ± 1.6 78.0 ± 0.8

Table 14 (Cont'd)

	ODM	Deliveries per	Cigarette, Mean (mg) ± One Standard D	eviation (mg)
Brand	ORNL Code	"Tar"	<u> Nicotine</u>	CO	CO ₂
Rothman's Consulate Filter Cork Tipped-Virginia Rothman's King Size-Filter Rothman's King Size-Untipped Rothman's Super Filter Mild Golden Virginia	52 39 61	33.1 ± 0.5 31.2 ± 0.9 38.5 ± 0.6 22.3 ± 0.5	1.67 ± 0.03 1.76 ± 0.05 1.72 ± 0.08 1.46 ± 0.03	25.7 ± 0.8 20.9 ± 0.9 28.5 ± 1.3 19.6 ± 0.3	72.4 ± 1.7 62.9 ± 1.6 83.2 ± 3.4 64.7 ± 0.6
Santos' Dumont Super Length- Filter	28	32.4 ± 0.2	2.21 ± 0.05	31.3 ± 0.5	84.8 ± 1.9
Senior Service King Size- Filter	66	33.2 ± 0.4	2.15 ± C.03	26.4 ± 0.6	84.1 ± 1.3
State Express 555 Filter Kings State Express King Size- Filter	37 62	33.4 ± 0.8 27.9 ± 0.8	1.72 ± 0.10 1.31 ± 0.05	26.6 ± 0.6 25.0 ± 0.5	76.6 ± 1.5 64.3 ± 0.2
Texan-Filter Texan-Plain	15 14	22.3 ± 1.4 24.6 ± 1.3	1.32 ± 0.04 1.44 ± 0.03	20.5 ± 0.6 15.4 ± 0.6	76.3 ± 1.4 58.9 ± 1.1
Vogue Satin Tipped King Size- Filter	- 48	23.6 ± 0.8	1.28 ± 0.03	20.8 ± 0.5	67.8 ± 0.8
West 85-Filter	42	30.5 ± 0.3	1.53 ± 0.05	25.5 ± 0.9	74.1 ± 2.0
Wills Embassy Filter Kings Wills Viceroy-Filter	35 47	26.0 ± 0.9 33.7 ± 0.8	$\begin{array}{ccc} \textbf{1.33} & \pm \ \textbf{0.03} \\ \textbf{1.44} & \pm \ \textbf{0.05} \end{array}$	21.9 ± 2.1 26.4 ± 1.1	65.6 ± 3.8 72.6 ± 2.0

Table 15. Comparison of Smoke Constituent Deliveries Filter-Nonfilter Pairs of Cigarettes Purchased in South Africa

Brand	ORNL Code	Length of Tobacco Rod Burned	Deliveries "Tar"	per Cigarette, Nicotine	(mg) _CO
Camel Regular	9	47	26.1	1.60	14.8
Camel Filter	10	57	20.0	1.30	18.5
Chesterfield Regular	7	47	26.1	1.37	14.2
Chesterfield Filter	8	59	28.8	1.76	19.6
Lucky Strike Regular	27	4 7	28.5	1.76	13.4
Lucky Strike Filter	26	58	32.7	1.93	20.9
Rembrandt Van Rijn Regular	55	62	37.0	2.40	26.5
Rembrandt Van Rijn Filter	64	60	29.7	1.79	28.8
Gauloises Regular	23	47	21.4	1.11	12.4
Gauloises Filter	22	52	24.3	1.11	16.0
Texan Regular	14	47	24.6	1.44	15.4
Texan Filter	15	58	22.3	1.32	20.5
Gold Dollar Regular	60	62	34.1	1.92	25.2
Gold Dollar Filter	69	59	31.8	2.32	22.1
Gunston Regular	1 2	57	28.4	1.96	19.3
Gunston Filter		59	28.4	1.86	15.8
Lexington Regular	3	57	35.3	2.16	23.9
Lexington Filter	4	59	31.4	1.83	20.2
Rothman's Untipped	61	62	38.5	1.72	28.5
Rothman's Filter	39	61	31.2	1.76	20.9

Table 16. Brand and Physical Characteristics of Cigarettes Purchased in Hong Kong

Set I - August 1975

Brand	Apparent Country of Manufacture	Cigarette Wt., mg	Cigarette RTD mm H ₂ O	Number of Puffs
Cherry	Japan	940	127	8.6
Current	и.	938	120	9.1
Echo	, 11	882	98	8.5
Green Leaf	II	971	119	9.4
Hi Lite	11	977	134	9.1
Норе	II	941	83	8.6
Peace	11	1074	114	10.8
Seven Stars	u	1027	149	8.6
	Set :	II - Jun e 197	76	
Ascot	Republic	1019	112	10.7
Capstan	· 11	1001	107	10.3
Double Happiness	u	1126	106	11.9
Globe	11 .	1037	96	10.6
Good Companion	II	1036	97	9.7
Great Wall	u	1013	85	10.0
Knight	11	1086	104	11.3
Marvels	11	1992	113	9.9
Mild Million	II.	986	94	9.8

Table 17. Brand and Physical Characteristics of Cigarettes Purchased in the Philippines -

Brand	Apparent Country of Manufacture	Cigarette _Wt., mg	Cigarette RTD mm H ₂ O	Number of Puffs
	Set I - Sep	otember 1975		
Alhamba Regalix	*	1043	72	12.7
Bataan Matamis	*	1038	50	11.1
Champion Mild Menthol	*	1157	85	12.7
Champion Mild Menthol 100s	*	1336	87	15.7
Chesterfield-Filter	*	1155	77	12.2
Empress	*	1324	92	15.8
Empress Imperial-Filter 100s	*	1261 ¹	721	13.1 ¹
Fortune Menthol King-Filter	*	1166	74	12.6
Fortune 100s	*	1447	90	16.9
Fortune Red-Filter	*	1209	84	14.6
Golden Coin 100s	*	1442	91	16.7
Kent International	*	1132	80	14.0
Kent Menthol King-Filter	*	1304	81	14.8
Kent Short	*	952	74	10.9
Kool Short Special-Filter	United States	943	61	9.9
Kool Long Mild Menthol-Filter	United States	1104	76	12.6
Kool Super King-Filter	United States	1286	86	14.6

Brand	Apparent Country of <u>Manufacture</u>	Cigarette Wt., mg	Cigarette RTD mm_H ₂ O	Number of Puffs			
Set I - September 1975							
L&M Short-Filter	*	992	71	10.7			
Lucky Strike-Filter	United States	938	88	10.6			
Lucky Strike-Straight	United States	999	57	9.7			
Marlboro Short-Filter	*	1003	111	10.2			
Marlboro King	*	1152	122	11.5			
Marlboro Gold 100s	*	1301	125	11.8			
Mr. Slim Red	*	1104	126	12.3			
Mr. Slim 100s	, *	1143	121	13.3			
Newport Deluxe	. *	1138	84	13.8			
Newport Deluxe Prem. 100s		1306	85	15.8			
Old Gold	*	1032	60	11.2			
Pall Mall Menthol Pall Mall Menthol	United States	939	86	9.6			
	United States	1252	120	13.5			
Philip Morris-Straight	*	1061	67	9.5			
Philip Morris Gold 100s	*	1281	120	11.3			
Philip Morris Menthol 100s	*	1328	127	12.7			
Salem Menthol Fresh	* *	1053	110	11.3			
Salem Menthol Premium Length		1223	115 -	12.4			

ၾ

Table 17 (Cont'd)

Brand	Apparent Country of Manufacture	Cigarette Wt., mg	Cigarette RTD mm H ₂ O	Number of Puffs
	Set I - Sep	otember 1975		
Varsity Menthol Varsity Menthol "88" Extra Long	* *	1154 1229 ²	78 85 ²	12.1 14.0 ²
Venture Menthol 100s	*	1346	89	14.9
Winston King-Filter	*	1043	90	11.7
	Set II - A	August 1977		
Brooks Special Filter King	*	1165	100	13.2
Boss Super King Menthol Filter	*	1314	84	15.6
Bowling Green Menthol	*	1226	135	13.1
Hope Menthol Filter 100s Hope Menthol Filter King	* *	1326 1062	137 109	14.2 11.4
Jackpot Premium Menthol Filter 100s	*	1421	83	14.7
Kingford Filter	*	1083	105	11.8
New Gold King Size	*	1193	76	12.8
Seven Stars Filter King Size	Japan	1051	107	11.3

Table 17 (Cont'd)

Brand	Apparent Country of Manufacture	Cigarette Wt., mg	Cigarette RTD mm H ₂ O	Number of Puffs
	Set II - /	August 1977		•
Sportsman Menthol Filter	*	1241	94	14.5
Sure Menthol	*	1240	129	12.7
Union Menthol Long Filter 100s	*	1284	79	14.1
•	Set III - G	January 1978		
Best Menthol Filter 100s	. *	1346	97	14.5
Cannon Menthol Filter 100s	*	1306	116	12.9
Elite Menthol Filter 100s	*	1366	96	`18•1
Insular Cigarelet Filter 100s	*	1203	82	11.8
Mi Amor Filter 120s Mi Amor Menthol Filter 120s	* * *	1174 1201	181 144	18.6 18.5
More Menthol Filter 120s	* *	1143	185	18.6
Most Menthol Filter 100s	*	1227	102	12.2

Table 17 (Cont'd)

Brand	Apparent Country of <u>Manufacture</u>	Cigarette _Wt•, mg	Cigarette RTD mm H ₂ O	Number of Puffs
	Set III - G	January 1978		
Saratoga Menthol Filter 120s	*	1113	151	13.0
Seaport Menthol Filter King	*	1133	91	11.9
T∽ust International Style Filter Short Trust International Style	*	1006	102	10.6
Filter King	*	1147	104	11.7
Valenzuela Mentholated	*	1200	95	12.9

^{*}Philippine Islands lonly 10 percent of the 200 available cigarttes are in weight range. 20nly 40 cigarettes submitted for characterization.

Table 18. Brand and Physical Characteristics of Cigarettes Purchased in Sri Lanka and Malaysia - April 1978

Brand	ORNL Code	Apparent Country of Manufacture	Cigarette Wt., mg	Cigarette RTD mm H ₂ O	Number of Puffs	PLace of Purchase
Benson & Hedges King Size Special Filter	VII	*	1086	115	11.0	Klang, Malaysia
Benson & Hedges King Size Special Filter	XVIII	United Kingdom	1078	132	10.0	Colombo, Sri Lanka
State Express 555 Filter King	VIII	*	1080	128	11.6	Klang, Malaysia
State Express 555 Filter King	XVII	United Kingdom	1084	120	10.6	Colombo, Sri Lanka

^{*}Malaysia

Table 19. Tar, Nicotine, Carbon Monoxide (CO), and Carbon Dioxide (CO₂)
Deliveries of Cigarettes Purchased in Hong Kong

Delivery per Cigarette, Mean $(mg) \pm Standard Deviation (mg)$ $C0_2$ CO Brand "Tar" Nicotine Set I - Imported from Japan Cherry $16.8 \pm 0.8 \quad 1.28 \pm 0.10 \quad 19.0 \pm 1.0$ 55.9 ± 2.5 13.9 ± 0.3 0.81 ± 0.14 13.9 ± 0.6 45.6 ± 0.2 Current $18.2 \pm 0.2 \quad 0.99 \pm 0.05$ $20.2 \pm 1.6 \quad 60.3 \pm 3.6$ Echo 17.7 ± 0.9 1.25 ± 0.06 22.8 ± 1.0 64.1 ± 1.3 Green Leaf $18.5 \pm 1.8 \quad 1.11 \pm 0.04$ 20.8 ± 1.3 59.8 ± 3.0 Hi Lite 23.6 ± 0.8 $1.54 \pm 0.06 \quad 22.7 \pm 1.1$ 61.6 ± 1.2 Hope 26.5 ± 0.2 2.58 ± 0.03 26.6 ± 0.4 74.7 ± 2.0 Peace $15.5 \pm 1.2 \quad 1.05 \pm 0.03 \quad 20.8 \pm 2.0 \quad 57.1 \pm 1.0$ Seven Stars Set II - Imported from China $29.4 \pm 1.1 \quad 1.66 \pm 0.15 \quad 30.3 \pm 1.9 \quad 69.0 \pm 4.7$ Ascot 31.6 ± 0.9 1.81 ± 0.03 28.7 ± 0.6 66.4 ± 1.4 Capstan 1.66 ± 0.04 26.3 ± 0.8 Double Happiness 27.4 ± 0.7 67.2 ± 1.2 Globe $24.8 \pm 0.6 \quad 1.36 \pm 0.03 \quad 20.6 \pm 0.8$ 63.8 ± 2.2 Good Companion 22.1 ± 0.6 1.03 ± 0.10 17.6 ± 0.3 56.8 ± 1.0 1.35 ± 0.03 24.9 ± 1.1 66.2 ± 1.4 Great Wall 24.0 ± 0.8 1.80 ± 0.05 19.1 ± 0.6 57.2 ± 0.6 27.4 ± 0.5 Knight 1.04 ± 0.03 26.8 ± 0.4 Marvels 21.8 ± 0.7 3.3 ± 1.2

 $24.1 \pm 1.4 + 1.15 \pm 0.02 + 18.4 \pm 0.3$

 56.9 ± 1.4

Mild Million

Table 20. Tar, Nicotine, Carbon Monoxide (CO), and Carbon Dioxide (CO $_2$) Deliveries of Cigarettes Purchased in the Philippines

•	Mean	(mg) \pm Standard	Deviation	(mg)
Brand	"Tar"	Nicotine	CO	CO ₂
Alhamba Regalix*	44.0 ± 4.0	1.14 ± 0.14	ND	ND
Bataan Matamis	31.1 ± 1.6	1.33 ± 0.02	ND	ND
Champion Mild Menthol	32.1 ± 0.2	1.47 ± 0.12	ND	ND
Champion Mild Menthol 100s	39.6 + 1.4	2.04 ± 0.02	ND	ND
Chesterfield-Filter	30.9 ± 1.6	1.12 ± 0.09	ND	ND
Empress	35.7 ± 1.3	1.58 ± 0.03	ND	ND
Empress Imperial 100s-Filter	30.9 ± 0.9	1.55 ± 0.02	ND	ND
Fortune Menthol King- Filter Fortune 100s Fortune Red-Filter	32.2 ± 0.9 38.3 ± 0.6 34.8 ± 1.7	0.92 ± 0.04 1.38 ± 0.06 0.96 ± 0.02	ND ND ND	ND ND ND
Golden Coin 100s	39.2 ± 0.7	1.18 ± 0.05	ND	ND
Kent International Kent Menthol King-	32.9 ± 0.6	1.32 ± .0.07	ND	ND
Filter Kent Short	39.1 ± 0.2 27.4 ± 1.0	1.50 ± 0.02 1.00 ± 0.03	ND ND	ND ND
Kool Short Special- Filter Kool Long Mild	28.0 ± 0.8	0.79 ± 0.02	ND	ND
Menthol-Filter Kool Super King	33.6 ± 1.6 35.2 ± 1.9	1.26 ± 0.07 1.40 ± 0.06	ND ND	ND ND
L&M Short-Filter	27.6 ± 0.6	1.13 ± 0.03	ND	ND
Lucky Strike-Filter Lucky Strike-Straight	27.4 ± 0.5 28.6 ± 1.5	1.38 ± 0.01 1.19 ± 0.03	ND ND	ND ND
Marlboro Short-Filter Marlboro King Marlboro Gold 100s	25.0 ± 1.2 26.1 ± 1.2 24.6 ± 0.7	0.84 ± 0.03 1.41 ± 0.04 1.34 ± 0.03	ND ND ND	ND ND ND

Table 20 (Cont'd)

	riedit (mg) = ocalidata bevitacion (mg)			
Brand	"Tar"	Nicotine	CO	C0 ₂
Mr. Slim Red Mr. Slim 100s		0.77 ± 0.07 0.93 ± 0.03	ND ND	ND ND
Newport Deluxe Newport Deluxe	33.6 ± 0.3	1.32 ± 0.05	ND	ND
Premium 100s	40.6 ± 0.8	1.48 ± 0.02	ND	ND
Old Gold	30.0 ± 0.6	1.14 ± 0.04	ND	ND
Pall Mall Menthol Pall Mall Menthol**		1.12 ± 0.02 1.31 ± 0.23	ND ND	ND ND
Philip Morris- Straights Philip Morris Gold	26.7 ± 1.3	1.24 ± 0.13	ND	ND
100s Philip Morris	24.0 ± 1.2	1.38 ± 0.03	ND	ND
Menthol 100s	26.2 ± 1.0	1.46 ± 0.00	ND	ND
Salem Menthol Fresh Salem Menthol Pre-	25.6 ± 0.4	1.20 ± 0.03	ND	ND
mium Length	23.8 ± 0.8	1.84 ± 0.03	ND	ND
Varsity Menthol	31.6 ± 1.3	1.14 ± 0.10	ND	ND
Varsity Menthol "88" Extra Long	36.7 ± 0.7	1.45 ± 0.01	ND	ND .
Venture Menthol 100s	36.2 ± 1.1	1.54 ± 0.04	ND	ND
Winston King Size- Filter	25.4 ± 0.2	1.59 ± 0.06	ND	ND
Brooks Special Filter King	32.6 ± 2.7	1.60 ± 0.03	23.6 ± 2.5	77.8 ± 5.7
Boss Super King Menthol Filter	39.2 ± 2.3	2.05 ± 0.05	23.2 ± 0.8	84.7 ± 1.8
Bowling Green Menthol	26.6 ± 0.5	1.61 ± 0.02	22.0 ± 1.3	78.1 ± 2.6

Table 20 (Cont'd)

	mean (mg) ± Standard Deviation (mg)			
Brand	<u>"Tar"</u>	Nicotine	CO	C02
Hope Menthol Filter 100s Hope Menthol Filter King	26.9 ± 0.7 26.9 ± 0.9	1.76 ± 0.06 1.43 ± 0.03		
Jack Pot Premium Menthol Filter 100s	37.5 ± 0.6	1.39 ± 0.07	22.9 ± 0.6	84.5 ± 4.7
Kingford Filter	26.2 ± 0.8	1.30 ± 0.02	18.4 ± 0.1	71.1 ± 0.6
New Gold King Size	35.0 ± 1.0	1.22 ± 0.03	20.8 ± 3.0	71.3 ± 5.0
Seven Stars Filter King Size	29.1 ± 0.4	1.62 ± 0.06	23.3 ± 0.4	72.2 ± 1.2
Sportsman Menthol Filter	32.2 ± 1.8	0.88 ± 0.14	24.1 ± 0.9	86.1 ± 3.0
Sure Menthol	25.1 ± 0.3	1.50 ± 0.06	18.8 ± 1.4	70.7 ± 1.7
Union Menthol Long Filter 100s	32.0 ± 0.4	0.97 ± 0.05	20.9 ± 1.1	78.5 ± 1.2
Best Menthol Filter 100s	42.5 ± 0.1	1.55 ± 0.02	31.5 ± 0.6	90.1 ± 0.6
Cannon Menthol Filter 100s	25.0 ± 0.3	1.51 ± 0.05	24.6 ± 0.2	80.0 ± 0.5
Elite Menthol Filter 100s	42.2 ± 0.6	1.86 ± 0.03	40.1 ± 0.6	120.4 ± 5.4
Insular Cigarlet Filter 100s	35.2 ± 0.7	1.70 ± 0.04	30.3 ± 0.6	84.2 ± 1.2
	40.8 ± 0.5	2.34 ± 0.26	43.1 ± 0.4	109.2 ± 1.8
Mi Amor Menthol Filter 120s	40.8 ± 2.6	2.05 _{.±} 0.06	42.1 ± 0.7	105.0 ± 1.1
More Menthol Filter 120s	34.7 ± 0.2	2.00 ± 0.03	35.5 ± 0.6	94.7 ± 1.3

Table 20 (Cont'd)

	mean (mg) = Standard Deviation (mg)			
Brand .	"Tar"	Nicotine	CO	C02
Most Menthol Filter 100s	28.5 ± 0.2	1.29 ± 0.02	25.5 ± 0.4	79.9 ± 1.0
Sratoga Menthol Fil- ter 120s	22.4 ± 0.2	1.66 ± 0.04	22.3 ± 0.6	75.6 ± 1.5
Seaport Menthol Fil- ter King	34.4 ± 0.2	1.42 ± 0.04	29.2 ± 0.5	79.6 ± 0.8
Trust International Style Filter Short Trust International Style Filter King		1.31 ± 0.03 1.40 ± 0.04		
Valenzuela Mentho- lated Filter	35.4 ± 0.2	1.01 ± 0.04	31.7 ± 0.2	93.5 ± 0.7

ND - Not Determined

^{*}Cigarette not round, "tar" and nicotine difficult to collect.

**Cigarettes leak during smoking where the tobacco rod connects to the filter.

Table 21. Tar, Nicotine, Carbon Monoxide (CO), and Carbon Dioxide (CO₂)
Deliveries of Cigarettes Purchased in Sri Lanka and Malaysia

	0 1 6	Deliveries per Cigarette, Mean (mg) ± One Standard Devia				
Brand	Country of Purchase	<u>"Tar"</u>	Nicotine	co	C0 ₂	
Benson & Hedges King Size Special Filter	Malaysia	29.7 ± 0.4	2.45 ± 0.20	22.4 ± 0.3	71.1 ± 0.9	
Benson & Hedges King Size Special Filter	Sri Lanka	22.6 ± 1.2	1.09 ± 0.06	20.3 ± 0.6	63.3 ± 1.5	
State Express 555 Filter King	Malaysia	28.5 ± 0.6	2.24 ± 0.10	22.3 ± 0.4	79.5 ± 0.9	
State Express 555 Filter King	Sri Lanka	29.8 ± 0.4	1.29 ± 0.04	22.3 ± 0.4	73.1 ± 1.0	

Table 22. Brand and Physical Characteristics of Cigarettes Purchased in Brazil (All brands manufactured in Brazil)

Brand	Cigarette Wt., mg	Cigarette RTD mm H ₂ O	Number of Puffs
Arizona-Filter	798	88.5	7.7
Continental-Filter	1024	109.3	9.7
Galaxie-Filter	989	114.8	8.1
Hollywood-Filter	994	93.0	9.3

Table 23. Tar, Nicotine, Carbon Monoxide (CO), and Carbon Dioxice (CO₂)
Deliveries of Cigarettes Purchased in Brazil

Brand	"Tar"	Nicotine	CO	C02
Arizona-Filter	23.4 ± 1.2	2.11 ± 0.02	17.8 ± 0.9	54.7 ± 1.8
Continental-Filter	22.9 ± 0.6	1.71 ± 0.07	19.9 ± 0.4	60.3 ± 0.6
Galaxie-Filter	15.0 ± 1.2	0.72 ± 0.03	13.8 ± 0.5	46.2 ± 2.6
Hollywood-Filter	23.9 ± 0.6	1.74 ± 0.02	18.2 ± 0.6	54.4 ± 1.6

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Table 24. Comparison of Smoke Constituent Deliveries as a Function of Purchase Point for Selected Cigarette Brands

constituent	Delivery,	mg/clgarette		
Tan	Nicotino	CO		

Cigarette Brand	Country of Purchase (ORNL Code)	<u>Tar</u>	Nicotine	<u></u>
Benson & Hedges Special Filter	United States-Domestic ^b United Kingdom-Domestic Kenya-Imported from UK (XIII) Kenya-Imported from UK (E) Sri Lanka-Imported from UK Malaysia-Domestic South Africa-Domestic	17 17.4 22.3 18.4 22.6 29.7 31.1	1.2 0.98 1.26 1.40 1.09 2.45	ND 16.5 20.3 22.1 20.3 22.4 26.1
Camel-Filter	United States-Domestic ^a South Africa-Imported from US Austria-Domestic	22.0 20.0 22.4	1.69 1.30 0.92	17.8 18.5 21.6
Camel-Nonfilter	United States-Domestic ^a South Africa-Imported from US	28.0 26.1	1.69 1.60	17.8 14.8
Chesterfield-Filter	United States-Domestic ^C Philippines-Domestic South Africa-Domestic	19.1 30.9 28.8	1.13 1.12 1.76	ND ND 19.6
Embassy-Filter King	United States-Imported from UK Kenya-Domestic (XII) Kenya-Domestic (B) South Africa-Domestic	18.9 20.8 28.6 26.0	1.12 1.46 2.16 1.33	24.4 20.5 22.0 21.9
Kent-Filter	United States-Domestic ^a Kenya-Imported from US Austria-Domestic	17.7 17.6 17.8	1.00 0.96 0.85	20.3 20.6 17.8

Constituent Delivery, mg/cigarette

			0,5	3	
Cigarette Brand	Country of Purchase (ORNL Code)	<u>Tar</u>	Nicotine	<u></u>	
Kool-85 mm Filter	United States-Domestic ^a . Philippines-Imported from US	17.2 28.0	1.35 0.79	ND ND	
Kool Long Mild	United States-Domestic ^C Philippines-Imported from US	13.9 33.6	0.91 1.26	ND ND	
Kool Super King (100 mm)	United States-Domestic ^c	18.2	1.32	ND	
	Philippines-Imported from US	35.2	1.40	ND	
L&M Filter King	United States-Domestic ^a	17.6	0.89	17.7	
	Austria-Domestic	18.6	1.03	18.0	
	South Africa-Domestic	25.7	1.62	19.7	
L&M Flavor Lights	United States-Domestica	9.0	0.68	5.7	
	South Africa-Domestic	20.0	1.04	14.6	
Lucky Strike-Nonfilter	United States-Domestica	26.9	1.46	16.1	
	South Africa-Domestic	28.5	1.76	13.4	
	Philippines-Imported from US	28.6	1.19	ND	
Lucky Strike-Filter	United States-Donestic ^C	26.2	1.64	ND	
	South Africa-Domestic	32.7	1.93	20.9	
	Philippines-Imported from US	27.4	1.19	ND	
Marlboro-Filter Kings	United States-Domestica	19.0	1.04	14.8	
	Austria-Domestic	18.7	1.05	16.2	
	Kenya-Imported from US	19.4	0.99	14.8	
	Philippines-Domestic	26.1	1.41	ND	

G

Constituent Delivery, mg/cigarette

Cigarette Brand	Country of Purchase (ORNL Code)	Tar	<u>Nicotine</u>	CO	
Pall Mall Nonfilter	United States-Domestic ^a Austria-Domestic	28.2 24.9	1.66 1.06	17.1 17.3	
Saratoga-120 mm, menthol	United States-Domestic ^C Philippines-Domestic	16 22 .4 .	1.0 1.66	ND 22.3	
State Express 555 Filter King	United States-Imported from UK (VI) United Kingdom-Domestic Sri Lanka-Imported from UK Kenya-Domestic (XIV) Malaysia-Domestic South Africa-Domestic	27.8 17.7 29.8 31.3 28.5 33.4	1.51 0.94 1.29 1.98 2.24 1.72	23.0 16.3 22.3 25.7 22.3 26.6	Ö
Winston-King Size	United States-Domestic ^a Philippines-Domestic Austria-Domestic	20.8 25.4 19.3	1.55 1.59 1.16	19.7 ND 18.3	

ND: Not Determined

aData taken from ORNL/TM-, Reference
bData taken from May, 1978 FTC Report, Reference
cData taken from December, 1976 FTC Report, Reference

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Internal Distribution

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