

June 19, 1996

Jack,

Here are the data you requested for the urea et al and the DAP analyses. I am including a second copy for Dr. Spears.

At Marty's suggestion, I am writing another memo which will include all these tables. This memo should be out this week, but I thought you would need the information for your next conversation with Dr. Spears.

Jennifer

*vs. urea et al*

*1 copy of each of the DAP*

*11/11/1*

*1 copy of plane*

*copy of DAP*

*Findings - DAP*  
*1 copy = 1 copy*

SMOKING LAB  
CIGARETTES WITH FILTER REMOVED

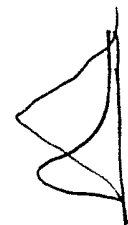
NICOTINE

Mean	2.499
Standard Error	0.02153
Median	2.489
Mode	2.361
Standard Deviation	0.170887
Variance	0.029202
Kurtosis	-0.94417
Skewness	0.138346
Range	0.741
Minimum	2.142
Maximum	2.883
Sum	157.437
Count	63
Confidence Level(0.950000)	0.042198

*Handwritten: P = 0.05 = 95%*

*Handwritten: P = 0.1 = 90%*

*Handwritten: P = 0.2 = 80%*



CPM/PUFF

Mean	0.297667
Standard Error	0.002029
Median	0.296
Mode	NA
Standard Deviation	0.016105
Variance	0.000259
Kurtosis	-0.58237
Skewness	0.30924
Range	0.065521
Minimum	0.266186
Maximum	0.331707
Sum	18.75301
Count	63
Confidence Level(0.950000)	0.003977

PUFF COUNT

Mean	8.3939523809524
Standard Error	0.040403402520882
Median	8.343
Mode	8
Standard Deviation	0.32069206557328
Variance	0.10284340092166
Kurtosis	-0.50576042077598
Skewness	0.64242578469444
Range	1.136
Minimum	7.943
Maximum	9.079
Sum	528.819
Count	63
Confidence Level(0.950000)	0.079189214118558

CPM

Mean	30.014746031746
Standard Error	0.18390153391773
Median	30.012
Mode	NA
Standard Deviation	1.4596731734089
Variance	2.1306457731695
Kurtosis	-0.29814819728012
Skewness	0.56580508269383
Range	6.424
Minimum	27.431
Maximum	33.855
Sum	1890.929
Count	63
Confidence Level(0.950000)	0.36044038465858

CPM/PUFF

Mean	3.5771064786476
Standard Error	0.01837977327754
Median	3.5683445313361
Mode	NA
Standard Deviation	0.14588492773836
Variance	0.021282412141228
Kurtosis	0.61316821267864
Skewness	0.24991086320701
Range	0.701643040121
Minimum	3.2418630751964
Maximum	3.9435061153174
Sum	225.3577081548
Count	63
Confidence Level(0.950000)	0.036023693815723

CPM/NIC/PUFF

Mean	1.4374111780853
Standard Error	0.013314693623786
Median	1.4431600069304
Mode	NA
Standard Deviation	0.10568210433467
Variance	0.011168707176603
Kurtosis	-1.0484792623505
Skewness	-0.18880703891504
Range	0.38900540900865
Minimum	1.2367142628956
Maximum	1.6257196719042
Sum	90.556904219376
Count	63
Confidence Level(0.950000)	0.026096320074827

CPM/NIC

Mean	12.04213
Standard Error	0.08242
Median	12.12175
Mode	NA
Standard Deviation	0.654187
Variance	0.42796
Kurtosis	-0.69067
Skewness	-0.09195
Range	2.803782
Minimum	10.68417
Maximum	13.48795
Sum	758.6539
Count	63
Confidence Level(0.950000)	0.16154

94412383

**4**

*Handwritten:* DESCRIPTIVE STATISTICS  
*Handwritten:* what is observed  
*Handwritten:* what is expected  
*Handwritten:* what is the difference between the two

*Handwritten:* X

*Handwritten:* N/A

SMOKING LAB NO FILTER NICOTINE FOR ZERO VALUES. THE AVERAGE VALUE WAS SUBSTITUTED

	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200	1201
1	2.306	2.397	2.536	2.426	2.586	2.321	2.454	2.517	2.361	2.780	2.641	2.615	2.787
2	2.283	2.271	2.331	2.396	2.582	2.226	2.383	2.537	2.388	2.646	2.419	2.446	2.534
3	2.390	2.142	2.657	2.418	2.709	2.274	2.528	2.720	2.415	2.700	2.600	2.361	2.731
4	2.277	2.334	2.650	2.330	2.724	2.243	2.497	2.566	2.556	2.678	2.703	2.489	2.883
5	2.419	2.312		2.313		2.368	2.477	2.699	2.362	2.708	2.631	2.642	2.762

	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200	1201
1	8.142	8.342	9.009	8.400	9.000	8.000	8.343	8.438	8.110	8.400	8.240	8.310	9.000
2	8.485	8.409	8.569	8.209	8.937	8.000	8.383	8.176	8.000	8.751	8.040	8.319	8.910
3	8.409	8.047	8.961	8.343	8.919	8.000	8.518	8.200	8.017	8.200	8.220	8.486	9.071
4	8.175	8.209	8.585	8.209	8.827	7.943	8.485	8.208	8.008	8.200	8.300	8.552	9.079
5	8.351	8.000		8.110		8.000	8.352	8.558	7.976	8.600	8.550	8.486	8.743

	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200	1201
1	29.264	31.331	32.102	30.256	30.084	28.465	30.923	28.793	28.302	29.702	28.413	28.452	33.387
2	30.793	27.431	28.300	30.174	30.603	28.710	29.268	28.972	28.527	30.443	28.422	29.935	28.885
3	31.321	28.022	33.055	29.425	31.654	28.085	28.588	31.838	29.431	31.914	32.233	30.012	30.637
4	29.313	30.049	33.855	28.539	31.920	28.622	30.268	29.086	28.813	30.542	31.615	30.719	32.397
5	31.357	28.476		29.122		29.070	30.921	30.640	28.484	29.493	30.365	30.694	30.417

	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200	1201
1	0.2832	0.2873	0.2815	0.2888	0.2873	0.2901	0.2941	0.2983	0.2911	0.3310	0.3205	0.3147	0.3097
2	0.2691	0.2701	0.2720	0.2919	0.2889	0.2783	0.2843	0.3103	0.2985	0.3024	0.3009	0.2940	0.2844
3	0.2842	0.2662	0.2965	0.2898	0.3037	0.2843	0.2968	0.3317	0.3012	0.3293	0.3163	0.2782	0.3011
4	0.2785	0.2843	0.3087	0.2838	0.3086	0.2824	0.2943	0.3126	0.3192	0.3266	0.3257	0.2910	0.3175
5	0.2897	0.2890		0.2852		0.2960	0.2966	0.3154	0.2961	0.3149	0.3077	0.3113	0.3159

	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200	1201
1	3.594	3.756	3.563	3.602	3.343	3.558	3.706	3.412	3.490	3.536	3.448	3.424	3.710
2	3.629	3.262	3.303	3.676	3.424	3.589	3.491	3.544	3.566	3.479	3.535	3.598	3.242
3	3.725	3.482	3.689	3.527	3.549	3.511	3.356	3.883	3.671	3.892	3.921	3.537	3.377
4	3.586	3.660	3.944	3.477	3.616	3.603	3.567	3.544	3.598	3.725	3.809	3.592	3.568
5	3.755	3.560		3.591		3.634	3.702	3.580	3.571	3.429	3.551	3.617	3.479

	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200	1201
1	12.690	13.071	12.659	12.472	11.633	12.264	12.601	11.439	11.987	10.684	10.758	10.880	11.980
2	13.488	12.079	12.141	12.593	11.852	12.898	12.282	11.420	11.946	11.505	11.749	12.238	11.399
3	13.105	13.082	12.441	12.169	11.685	12.350	11.309	11.705	12.187	11.820	12.397	12.712	11.218
4	12.874	12.874	12.775	12.248	11.718	12.761	12.122	11.335	11.273	11.405	11.696	12.342	11.237
5	12.963	12.317		12.591		12.276	12.483	11.352	12.059	10.891	11.541	11.618	11.013

	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200	1201
1	1.559	1.567	1.405	1.485	1.293	1.533	1.510	1.356	1.478	1.272	1.306	1.309	1.331
2	1.590	1.436	1.417	1.534	1.326	1.612	1.465	1.397	1.493	1.315	1.461	1.471	1.279
3	1.558	1.626	1.388	1.459	1.310	1.544	1.328	1.427	1.520	1.441	1.508	1.498	1.237
4	1.575	1.568	1.488	1.492	1.328	1.607	1.429	1.381	1.408	1.391	1.409	1.443	1.238
5	1.552	1.540		1.552		1.535	1.495	1.327	1.512	1.266	1.350	1.369	1.260

94412384

2 3

t-test results for Samples 1190-1201 as compared to Sample 1189

cpm/nic cpm/nic/puff

Additive	ID #	Nic (mg/cig) Filter	Nic (mg/cig) No Filter	Nic/Puff Filter	Nic/Puff No Filter	Nic/CPM Filter	Nic/CPM No Filter	Nic/CPM /Puff No Filter
0.5% Urea	1190	0	0	0	0	0	0	0
1.0% Urea	1191	0	D(2.8%)	0	0	0	D	D
1.5% Urea	1192	0	0	0	0	0	D	D
2.0% Urea	1193	+	D	0	D	0	D	D
0.5% AC	1194	0	0	0	0	+	D	D
1.0% AC	1195	+	D	+	D	+	D	D
1.5% AC	1196	+	+	+	+	+	+	+
2.0% AC	1197	0	0	0	D	+	D	D
0.5% ABC	1198	+	+	+	+	+	+	+
1.0% ABC	1199	+	+	+	+	+	+	+
1.5% ABC	1200	+	D	+	D	+	D	D
2.0% ABC	1201	+	D	0	D	+	D	D

ND = not different  
D = different

Diff (+ or -)

Missing (zero) values were replaced with mean values prior to t and F tests.

Indy

58E21446

ADDITIVE	PERCENT ADDITIVE	ID#	LEAF %NICOTINE	SMOKE NICOTINE (MG/CIG) NO FILTR.	SMOKE WT (G/CIG) NO FILTR.	SMOKE %NIC/WT	%TR
CONTROL	0.0%	1189	2.29	2.47	0.841	0.294	12.8
UREA	0.5%	1190	2.33	2.42	0.837	0.289	12.4
UREA	1.0%	1191	2.29	2.65	0.846	0.313	13.7
UREA	1.5%	1192	2.18	2.51	0.848	0.296	13.6
UREA	2.0%	1193	2.30	2.80	0.854	0.328	14.3
AMM.CARB	0.5%	1194	2.17	2.29	0.853	0.268	12.4
AMM.CARB	1.0%	1195	2.33	2.61	0.844	0.309	13.3
AMM.CARB	1.5%	1196	2.27	2.72	0.838	0.325	14.3
AMM.CARB	2.0%	1197	2.21	2.55	0.833	0.306	13.9
AMM. BICAR.	0.5%	1198	2.43	2.70	0.851	0.317	13.1
AMM. BICAR.	1.0%	1199	2.26	2.60	0.849	0.306	13.6
AMM. BICAR.	1.5%	1200	2.32	2.65	0.848	0.313	13.5
AMM. BICAR.	2.0%	1201	2.32	2.89	0.853	0.339	14.6

DAP	0.4	1346	2.05	2.28	0.840		
"	1.0	1341	2.02	2.17	0.844		
"	2.0	1342	2.03	2.27	0.846		
"	3.0	1343	1.99	2.56	0.836		

\* D.F. Construction

$$\frac{\text{nic in smoke mg/cig}}{\text{nic in leaf g/g} * \text{tobacco g/cig}} = \frac{2.47 \text{ mg/cig}}{0.0229 * 0.841 \text{ g/cig}} * \frac{g}{1000 \text{ mg}} * 100\%$$

$$= 12.8\%$$

**Table 1A Leaf Lab Data - Before Cutting and Drying**

ADDITIVE	PERCENT ADDITIVE	ID#	%NITROGEN	%TVB	%NICOTINE	VOLUME	%ASH	%TRS	pH	%LOD
CONTROL	0.0%	1189	3.20	0.69	2.45	-	14.7	6.1	5.39	19.04
UREA	0.5%	1190	3.65	0.70	2.53	-	15.2	5.7	5.47	19.46
UREA	1.0%	1191	3.82	0.72	2.29	-	15.6	5.9	5.47	23.02
UREA	1.5%	1192	3.86	0.71	2.11	-	15.3	6.3	5.36	21.44
UREA	2.0%	1193	4.39	0.81	2.33	-	15.0	5.7	5.45	25.49
AMM.CARB	0.5%	1194	3.42	0.83	2.31	-	15.4	5.2	5.85	23.92
AMM.CARB	1.0%	1195	3.44	0.92	2.28	-	15.1	6.2	6.16	23.42
AMM.CARB	1.5%	1196	3.51	1.03	2.42	-	14.7	6.5	6.34	23.19
AMM.CARB	2.0%	1197	3.55	1.07	2.12	-	15.5	5.8	6.43	23.98
AMM. BICAR.	0.5%	1198	3.23	0.70	2.02	-	14.7	6.5	5.55	22.02
AMM. BICAR.	1.0%	1199	3.32	0.84	2.27	-	15.4	5.8	6.00	24.30
AMM. BICAR.	1.5%	1200	3.37	0.91	2.19	-	15.3	5.7	6.21	23.51
AMM. BICAR.	2.0%	1201	3.60	1.02	2.44	-	14.8	6.1	6.18	21.35

**Table 2A Leaf Lab Data - After Cutting and Drying**

ADDITIVE	PERCENT ADDITIVE	ID#	%NITROGEN	%TVB	%NICOTINE	VOLUME	%ASH	%TRS	pH	%LOD
CONTROL	0.0%	1189	3.21	0.63	2.35	206	15.4	6.0	5.42	13.92
UREA	0.5%	1190	3.40	0.64	2.29	202	15.3	6.4	5.40	13.83
UREA	1.0%	1191	3.65	0.69	2.37	201	15.2	6.2	5.43	14.15
UREA	1.5%	1192	3.78	0.71	2.16	205	15.4	6.2	5.47	14.18
UREA	2.0%	1193	4.13	0.75	2.30	199	15.0	6.1	5.48	14.51
AMM.CARB	0.5%	1194	3.41	0.79	2.23	207	15.6	5.7	5.91	14.18
AMM.CARB	1.0%	1195	3.38	0.89	2.34	208	15.1	6.0	6.15	14.96
AMM.CARB	1.5%	1196	3.48	0.99	2.29	188	15.1	6.0	6.30	15.02
AMM.CARB	2.0%	1197	3.43	1.06	2.22	191	15.5	6.1	6.44	14.09
AMM. BICAR.	0.5%	1198	3.31	0.75	2.36	200	15.3	6.1	5.70	13.94
AMM. BICAR.	1.0%	1199	3.36	0.82	2.24	203	15.2	6.1	5.97	14.06
AMM. BICAR.	1.5%	1200	3.55	0.89	2.32	210	15.2	5.8	6.15	14.14
AMM. BICAR.	2.0%	1201	3.45	0.95	2.37	198	15.1	4.8	6.26	14.60

**Table 3A Leaf Lab Data - After Cutting and Drying with PT added (Final Blend)**

ADDITIVE	PERCENT ADDITIVE	ID#	%NITROGEN	%TVB	%NICOTINE	VOLUME	%ASH	%TRS	pH	%LOD
CONTROL	0.0%	1189	3.18	0.64	2.29	227	14.9	7.5	5.47	14.05
UREA	0.5%	1190	3.33	0.63	2.33	219	14.7	7.5	5.40	14.17
UREA	1.0%	1191	3.52	0.68	2.29	218	14.7	7.4	5.47	14.17
UREA	1.5%	1192	3.64	0.68	2.18	220	14.9	7.3	5.53	14.35
UREA	2.0%	1193	3.95	0.71	2.30	221	14.6	7.2	5.46	15.00
AMM.CARB	0.5%	1194	3.20	0.74	2.17	212	15.6	6.9	5.85	14.03
AMM.CARB	1.0%	1195	3.34	0.86	2.33	215	14.9	7.5	6.05	14.54
AMM.CARB	1.5%	1196	3.37	0.89	2.27	211	15.0	7.5	6.22	15.09
AMM.CARB	2.0%	1197	3.35	0.96	2.21	221	15.0	7.2	6.37	14.20
AMM. BICAR.	0.5%	1198	3.33	0.73	2.43	205	14.8	7.2	5.63	14.08
AMM. BICAR.	1.0%	1199	3.20	0.79	2.26	207	15.0	7.3	5.99	14.11
AMM. BICAR.	1.5%	1200	3.34	0.84	2.32	213	15.3	6.9	6.10	14.02
AMM. BICAR.	2.0%	1201	3.24	0.89	2.32	217	14.9	7.3	6.12	14.24
DAP CONTROL	0.4%	1340	2.81	0.56	2.05	195	14.3	9.15	5.36	-
DAP	1.0%	1341	2.95	0.62	2.02	188	14.2	8.85	5.51	-
DAP	2.0%	1342	2.97	0.76	2.03	198	14.2	8.95	5.57	-
DAP	3.0%	1343	3.21	0.96	1.99	196	14.4	8.55	5.73	-

NOTE 1: SAMPLES 1189-1201 MADE WITH A OLD GOLD 85 CONSTRUCTION  
 NOTE 2: SAMPLES 1340-1343 MADE WITH A NEWPORT 85 CONSTRUCTION  
 NOTE 3: FOR SAMPLES 1340-1343, 0.4% DAP WAS IN RL IN BLEND BEFORE ADDTL DAP WAS ADDED

94412387

**Table 4A Smoking Lab Data - Filtered Cigarettes**

**Filtered Cigarettes made with Final Blend**

ADDITIVE	PERCENT ADDITIVE	ID#	WATER (MG/CIG)	DPM (MG/CIG)	NICOTINE (MG/CIG)	CPM (MG/CIG)	CO (MG/CIG)	PUFF COUNT
CONTROL	0.0%	1189	3.1	16.8	1.33	15.5	16.8	8.3
UREA	0.5%	1190	2.8	16.7	1.38	15.3	16.2	8.2
UREA	1.0%	1191	2.5	16.6	1.38	14.9	14.9	8.8
UREA	1.5%	1192	2.9	16.7	1.37	15.4	16.7	8.4
UREA	2.0%	1193	3.3	17.3	1.45	15.8	16.3	8.9
AMM.CARB	0.5%	1194	2.3	15.8	1.30	14.5	15.6	8.0
AMM.CARB	1.0%	1195	4.0	17.7	1.52	16.2	16.3	8.6
AMM.CARB	1.5%	1196	3.2	17.5	1.55	16.0	16.0	8.5
AMM.CARB	2.0%	1197	2.9	15.9	1.38	14.5	16.1	8.1
AMM. BICAR.	0.5%	1198	3.5	17.5	1.52	16.0	16.4	8.6
AMM. BICAR.	1.0%	1199	3.3	16.6	1.42	15.2	17.0	8.3
AMM. BICAR.	1.5%	1200	2.8	17.0	1.53	15.5	16.3	8.7
AMM. BICAR.	2.0%	1201	3.8	17.2	1.54	15.7	16.2	9.1
DAP CONTROL	0.4%	1340	5.7	20.0	1.42	18.8	16.1	8.4
DAP	1.0%	1341	5.8	20.9	1.50	19.4	16.4	8.8
DAP	2.0%	1342	6.0	21.7	1.60	20.1	16.8	9.0
DAP	3.0%	1343	5.5	22.6	1.64	21.0	15.8	9.3

**Table 5A Smoking Lab Data - Per Puff Calculations**

**Filtered Cigarettes made with Final Blend**

ADDITIVE	PERCENT ADDITIVE	ID#	DPM PER PUFF	NICOTINE PER PUFF	CPM PER PUFF	CO PER PUFF
CONTROL	0.0%	1189	2.0	0.16	1.87	2.02
UREA	0.5%	1190	2.0	0.17	1.87	1.98
UREA	1.0%	1191	1.9	0.16	1.69	1.69
UREA	1.5%	1192	2.0	0.16	1.83	1.99
UREA	2.0%	1193	1.9	0.16	1.78	1.83
AMM.CARB	0.5%	1194	2.0	0.16	1.81	1.95
AMM.CARB	1.0%	1195	2.1	0.18	1.88	1.90
AMM.CARB	1.5%	1196	2.1	0.18	1.88	1.88
AMM.CARB	2.0%	1197	2.0	0.17	1.79	1.99
AMM. BICAR.	0.5%	1198	2.0	0.18	1.86	1.91
AMM. BICAR.	1.0%	1199	2.0	0.17	1.83	2.05
AMM. BICAR.	1.5%	1200	2.0	0.18	1.78	1.87
AMM. BICAR.	2.0%	1201	1.9	0.17	1.73	1.78
DAP CONTROL	0.4%	1340	2.4	0.17	2.24	1.92
DAP	1.0%	1341	2.4	0.17	2.20	1.86
DAP	2.0%	1342	2.4	0.18	2.23	1.87
DAP	3.0%	1343	2.4	0.18	2.26	1.70

**Table 6A Smoking Lab Data - Per CPM Calculations**

**Filtered Cigarettes made with Final Blend**

ADDITIVE	PERCENT ADDITIVE	ID#	NICOTINE/CPM	CO/CPM
CONTROL	0.0%	1189	0.0858	1.084
UREA	0.5%	1190	0.0902	1.059
UREA	1.0%	1191	0.0926	1.000
UREA	1.5%	1192	0.0890	1.084
UREA	2.0%	1193	0.0918	1.032
AMM.CARB	0.5%	1194	0.0897	1.076
AMM.CARB	1.0%	1195	0.0938	1.006
AMM.CARB	1.5%	1196	0.0969	1.000
AMM.CARB	2.0%	1197	0.0952	1.110
AMM. BICAR.	0.5%	1198	0.0950	1.025
AMM. BICAR.	1.0%	1199	0.0934	1.118
AMM. BICAR.	1.5%	1200	0.0987	1.052
AMM. BICAR.	2.0%	1201	0.0981	1.032
DAP CONTROL	0.4%	1340	0.0755	0.856
DAP	1.0%	1341	0.0773	0.845
DAP	2.0%	1342	0.0796	0.836
DAP	3.0%	1343	0.0781	0.752

**Table 7A Smoking Lab Data - Per DPM Calculations**

**Filtered Cigarettes made with Final Blend**

ADDITIVE	PERCENT ADDITIVE	ID#	NICOTINE/DPM	CO/DPM
CONTROL	0.0%	1189	0.0792	1.000
UREA	0.5%	1190	0.0826	0.970
UREA	1.0%	1191	0.0831	0.898
UREA	1.5%	1192	0.0820	1.000
UREA	2.0%	1193	0.0838	0.942
AMM.CARB	0.5%	1194	0.0823	0.987
AMM.CARB	1.0%	1195	0.0859	0.921
AMM.CARB	1.5%	1196	0.0886	0.914
AMM.CARB	2.0%	1197	0.0868	1.013
AMM. BICAR.	0.5%	1198	0.0869	0.937
AMM. BICAR.	1.0%	1199	0.0855	1.024
AMM. BICAR.	1.5%	1200	0.0900	0.959
AMM. BICAR.	2.0%	1201	0.0895	0.942
DAP CONTROL	0.4%	1340	0.0710	0.805
DAP	1.0%	1341	0.0718	0.785
DAP	2.0%	1342	0.0737	0.774
DAP	3.0%	1343	0.0726	0.699

94412388

**Table 4B Smoking Lab Data - Cigarettes with Filters Removed**

Cigarettes made with Final Blend - Filters Removed

ADDITIVE	PERCENT ADDITIVE	ID#	WATER (MG/CIG)	DPM (MG/CIG)	NICOTINE (MG/CIG)	CPM (MG/CIG)	CO (MG/CIG)	PUFF COUNT
CONTROL	0.0%	1189	11.5	32.1	2.47	29.7	17.0	8.3
UREA	0.5%	1190	9.9	30.8	2.42	28.4	15.9	8.2
UREA	1.0%	1191	11.5	34.1	2.65	31.8	16.2	8.8
UREA	1.5%	1192	10.7	31.3	2.51	28.8	16.5	8.3
UREA	2.0%	1193	10.7	33.1	2.80	30.4	16.4	8.9
AMM.CARB	0.5%	1194	9.0	30.9	2.29	28.6	15.7	8.0
AMM.CARB	1.0%	1195	11.1	31.9	2.61	29.3	16.3	8.4
AMM.CARB	1.5%	1196	10.2	31.1	2.72	28.3	15.5	8.3
AMM.CARB	2.0%	1197	9.6	30.6	2.55	28.1	15.9	8.0
AMM. BICAR.	0.5%	1198	11.5	32.6	2.70	30.0	17.0	8.4
AMM. BICAR.	1.0%	1199	11.0	32.3	2.60	29.7	16.5	8.3
AMM. BICAR.	1.5%	1200	10.3	31.9	2.65	29.3	16.1	8.4
AMM. BICAR.	2.0%	1201	11.9	33.3	2.89	30.4	16.5	9.0
DAP CONTROL	0.4%	1340	12.7	33.5	2.28	31.3	16.2	8.6
DAP	1.0%	1341	11.3	33.6	2.17	31.4	15.9	8.5
DAP	2.0%	1342	12.2	35.4	2.27	33.1	16.7	8.9
DAP	3.0%	1343	12.7	36.6	2.56	34.0	15.9	9.3

**Table 5B Smoking Lab Data - Per Puff Calculations**

Cigarettes made with Final Blend - Filters Removed

ADDITIVE	PERCENT ADDITIVE	ID#	DPM PER PUFF	NICOTINE PER PUFF	CPM PER PUFF	CO PER PUFF
CONTROL	0.0%	1189	3.9	0.30	3.58	2.05
UREA	0.5%	1190	3.8	0.30	3.46	1.94
UREA	1.0%	1191	3.9	0.30	3.61	1.84
UREA	1.5%	1192	3.8	0.30	3.47	1.99
UREA	2.0%	1193	3.7	0.31	3.42	1.84
AMM.CARB	0.5%	1194	3.9	0.29	3.58	1.96
AMM.CARB	1.0%	1195	3.8	0.31	3.49	1.94
AMM.CARB	1.5%	1196	3.7	0.33	3.41	1.87
AMM.CARB	2.0%	1197	3.8	0.32	3.51	1.99
AMM. BICAR.	0.5%	1198	3.9	0.32	3.57	2.02
AMM. BICAR.	1.0%	1199	3.9	0.31	3.58	1.99
AMM. BICAR.	1.5%	1200	3.8	0.32	3.49	1.92
AMM. BICAR.	2.0%	1201	3.7	0.32	3.38	1.83
DAP CONTROL	0.4%	1340	3.9	0.27	3.64	1.88
DAP	1.0%	1341	4.0	0.26	3.69	1.87
DAP	2.0%	1342	4.0	0.26	3.72	1.88
DAP	3.0%	1343	3.9	0.28	3.66	1.71

**Table 6B Smoking Lab Data - Per CPM Calculations**

Cigarettes made with Final Blend - Filters Removed

ADDITIVE	PERCENT ADDITIVE	ID#	NICOTINE/CPM	CO/CPM
CONTROL	0.0%	1189	0.0832	0.572
UREA	0.5%	1190	0.0852	0.560
UREA	1.0%	1191	0.0833	0.509
UREA	1.5%	1192	0.0872	0.573
UREA	2.0%	1193	0.0921	0.539
AMM.CARB	0.5%	1194	0.0801	0.549
AMM.CARB	1.0%	1195	0.0891	0.556
AMM.CARB	1.5%	1196	0.0961	0.548
AMM.CARB	2.0%	1197	0.0907	0.566
AMM. BICAR.	0.5%	1198	0.0900	0.567
AMM. BICAR.	1.0%	1199	0.0875	0.556
AMM. BICAR.	1.5%	1200	0.0904	0.549
AMM. BICAR.	2.0%	1201	0.0951	0.543
DAP CONTROL	0.4%	1340	0.0728	0.518
DAP	1.0%	1341	0.0891	0.506
DAP	2.0%	1342	0.0686	0.505
DAP	3.0%	1343	0.0753	0.468

**Table 7B Smoking Lab Data - Per DPM Calculations**

Cigarettes made with Final Blend - Filters Removed

ADDITIVE	PERCENT ADDITIVE	ID#	NICOTINE/DPM	CO/DPM
CONTROL	0.0%	1189	0.0769	0.530
UREA	0.5%	1190	0.0786	0.516
UREA	1.0%	1191	0.0777	0.475
UREA	1.5%	1192	0.0802	0.527
UREA	2.0%	1193	0.0846	0.495
AMM.CARB	0.5%	1194	0.0741	0.508
AMM.CARB	1.0%	1195	0.0818	0.511
AMM.CARB	1.5%	1196	0.0875	0.498
AMM.CARB	2.0%	1197	0.0833	0.520
AMM. BICAR.	0.5%	1198	0.0828	0.521
AMM. BICAR.	1.0%	1199	0.0805	0.511
AMM. BICAR.	1.5%	1200	0.0831	0.505
AMM. BICAR.	2.0%	1201	0.0868	0.495
DAP CONTROL	0.4%	1340	0.0681	0.484
DAP	1.0%	1341	0.0646	0.473
DAP	2.0%	1342	0.0641	0.472
DAP	3.0%	1343	0.0699	0.434

94412389



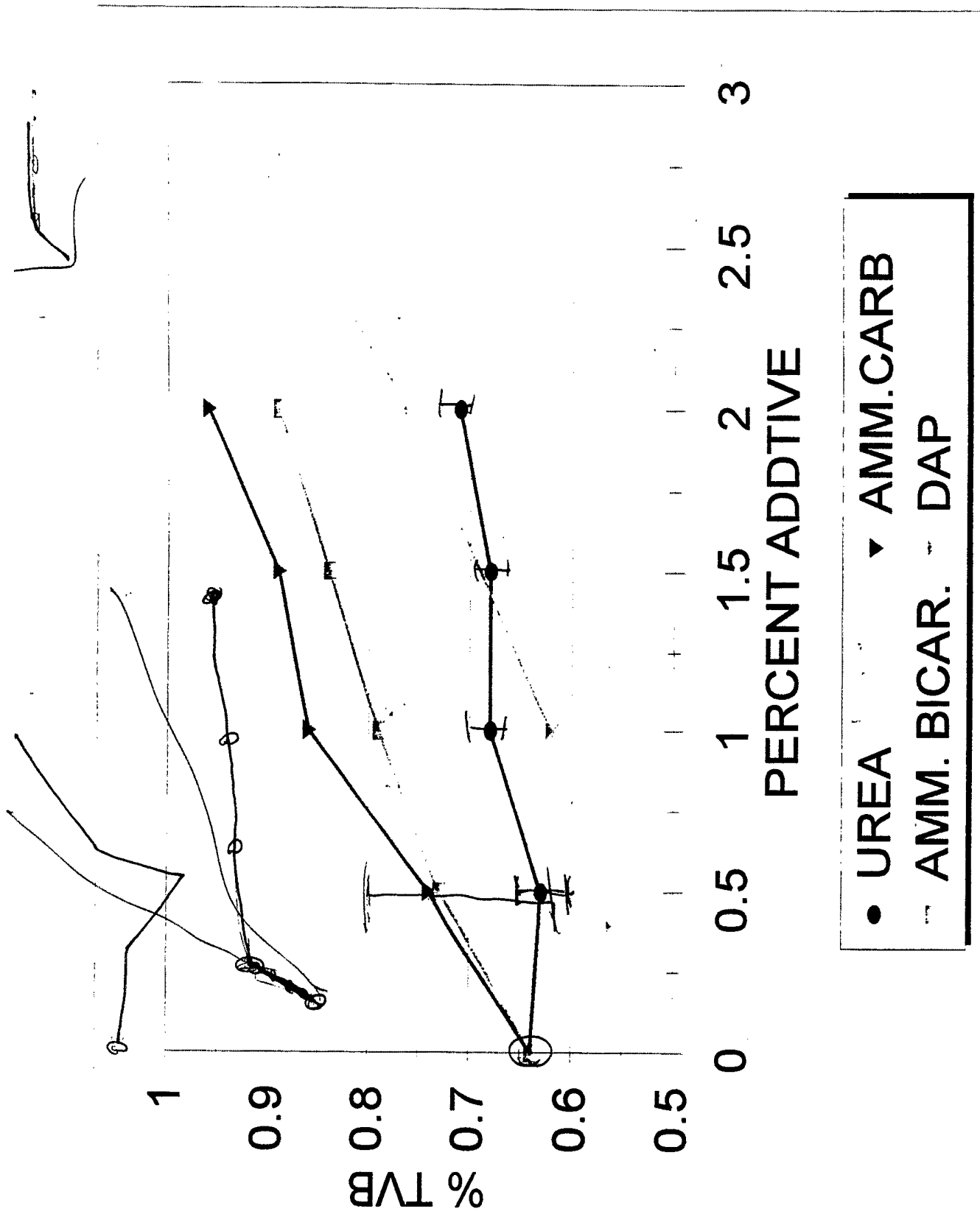
**Table 8A Smoke pH Data**

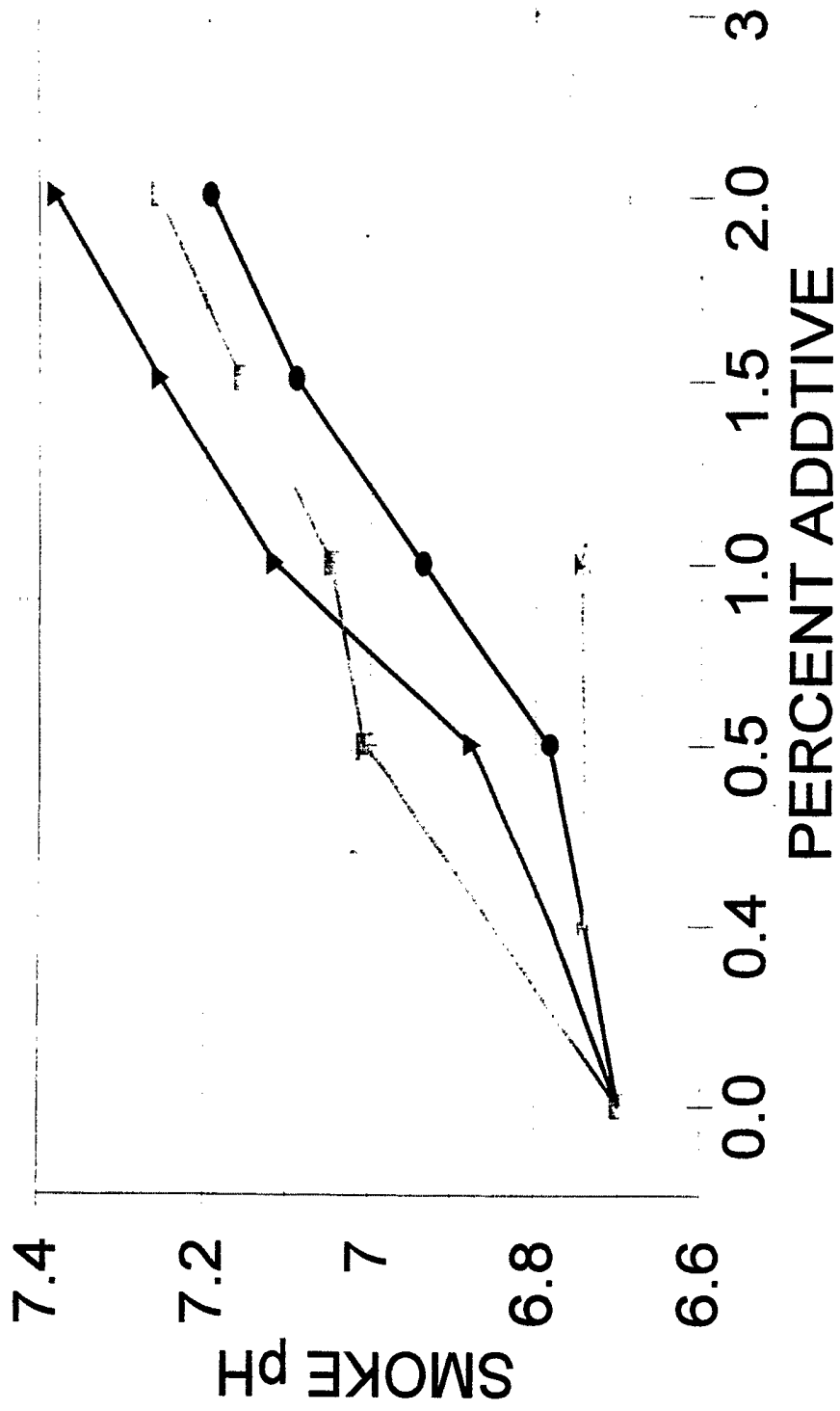
ADDITIVE	PERCENT ADDITIVE	ID#	pH			pH AVG	Calculated	Calculated *
			# 1	# 2	# 3		% Unprotonated (or free) nicotine	% Protonated nicotine
CONTROL	0.0%	1189	6.66	6.66	6.78	6.70	4.6	95.4
UREA	0.5%	1190	6.75	6.80	6.80	6.78	5.5	94.5
UREA	1.0%	1191	6.95	6.91	6.95	6.94	7.6	92.4
UREA	1.5%	1192	7.09	7.07	7.11	7.09	10.5	89.5
UREA	2.0%	1193	7.20	7.16	7.22	7.19	13.0	87.0
AMM.CARB	0.5%	1194	6.87	6.87	6.89	6.88	6.7	93.3
AMM.CARB	1.0%	1195	7.13	7.18	7.04	7.12	11.1	88.9
AMM.CARB	1.5%	1196	7.25	7.23	7.29	7.26	14.7	85.3
AMM.CARB	2.0%	1197	7.38	7.38	7.38	7.38	18.6	81.4
AMM. BICAR.	0.5%	1198	7.02	6.98	7.02	7.01	8.8	91.2
AMM. BICAR.	1.0%	1199	7.07	7.05	7.02	7.05	9.6	90.4
AMM. BICAR.	1.5%	1200	7.09	7.20	7.18	7.16	12.0	88.0
AMM. BICAR.	2.0%	1201	7.18	7.34	7.25	7.26	14.7	85.3
Blank - Pad Only			8.46	8.51		8.49		
DAP CONTROL	0.4%	1340	6.76	6.72		6.74	5.0	-95.0
DAP	1.0%	1341	6.73	6.76		6.75	5.0	95.0
DAP	2.0%	1342	6.63	6.73		6.68	4.4	95.6
DAP	3.0%	1343	6.74	6.84		6.79	5.6	94.4

**Table 9A Smoke pH vs. Calculated Unprotonated and Protonated \* Nicotine**

Smoke pH	Calculated % Unprotonated (or free) nicotine	Calculated * % Protonated nicotine
6.60	3.66	96.34
6.80	5.68	94.32
7.00	8.72	91.28
7.20	13.15	86.85
7.40	19.35	80.65
7.60	27.55	72.45
7.80	37.60	62.40
8.00	48.85	51.15

NOTE \*: protonated nicotine equals the sum of both monoprotonated and diprotonated nicotine





● UREA    ▲ AMM.CARB  
 --- AMM. BICAR.    ▲ DAP