



**Tobacco and Tobacco Products
Analytes Sub-Group**

Technical Report

**CORESTA Nicotine Pouch
Reference Products
Homogeneity Assessment**

February 2025

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1. Introduction

At the virtual CORESTA Tobacco and Tobacco Products Analytes Sub-group (TTPA) meeting held on October 14, 2021, a small group was established to collaborate on the development of nicotine pouch reference products. The primary objectives of this group were to propose specific product characteristics and identify suitable manufacturers and a distributor for the reference products. The group also proposed assessing the homogeneity of the production runs.

The group proposed two different reference products: a dry granulated powder product (NP1) and a high moisture fiber-based product (NP2). NP2 was produced by British American Tobacco (BAT) in January 2024, and NP1 was produced by Swedish Match in May 2024. These reference products were produced using commercial manufacturing practices and are similar to commercial nicotine pouch products except they only contain the ingredients necessary for the product style.

To ensure the quality and consistency of the reference products, the manufacturers conducted homogeneity testing on the finished products after pouching and canning. This testing involved evaluating several parameters, including nicotine content, pH levels, moisture content (oven volatiles, OV), and pouch weight. The University of Kentucky conducted a statistical analysis of the production data to assess the homogeneity of the products across the manufacturing runs. Additionally, the University developed Reference Material Data Sheets for each product, which provide initial reference values based on the production sample to be used by laboratories in testing and as an informational sheet to meet material data sheet requirements which are required by some governments prior to shipping.

2. Study Design

The manufacturers followed their normal manufacturing quality processes for producing the reference products and conducted postproduction homogeneity testing to characterize the finished product (after pouching and canning). Samples for homogeneity testing were collected across each pouching head. Three cans were pulled from each pouching head every 15 minutes and one composite sample was created from the three cans. Each manufacturer prepared and analyzed 3 sample replicates from each composite sample for each analysis. The analyses included nicotine (mg/pouch, mg/g), pH, OV (%), and individual pouch weight. All analyses were conducted after all samples were collected and analyzed under repeatability conditions.

Both manufacturers determined pH following CORESTA Recommended Method (CRM) N° 69 and determined OV following CRM N° 76 except that an oven temperature of $99\text{ }^{\circ}\text{C} \pm 1.0\text{ }^{\circ}\text{C}$ was used instead of $100\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$.^[1,2] Swedish Match determined nicotine in NP1 using a validated HPLC method. BAT determined nicotine in NP2 using CRM N° 62 (MTBE extraction) with minor deviations.^[3] Both manufacturers determined pouch weight by weighing individual pouches. Nicotine and pouch weight were reported on an *as-is* basis without correction for moisture. All analyses were conducted in ISO 17025 accredited laboratories and the methods were included the laboratories ISO scopes of accreditation.

¹ CRM No. 69 - Determination of pH in Tobacco and Tobacco Products, Dec. 2021, 3rd edition.

² CRM No. 76 - Determination of Moisture Content (Oven Volatiles) of Tobacco and Tobacco Products, Dec. 2021, 3rd edition.

³ CRM No. 62 - Determination of Nicotine in Tobacco and Tobacco Products by Gas Chromatographic Analysis, Dec. 2021, 3rd edition.

For the NP2, the manufacturing process included a start-up period of approximately 20 minutes in which the machine heads came online at staggered intervals in the production of the nicotine pouches. The samples produced during the start-up period were included in the homogeneity assessment and grouped to represent the initial time point. After this run-in period and for the full sample of NP1, samples were collected approximately every 15 minutes during the full production period.

3. Data – Raw

The full data set for the homogeneity assessment is presented in Appendix A and raw data plots arranged by sampling time point are presented in Appendix B. The results are presented on an as-is basis without correction for moisture.

4. Data – Statistical Analysis

Data from the NP2 start-up period were grouped to represent the initial time point. Chemical analyses were performed by a single laboratory under repeatability conditions satisfying Clause 5.15 of ISO Guide 34:2009. Evaluation with analysis of models included covariates for sample time and machine head nested within sample time per the sampling technique per Approach A in Clause 10.5 of ISO Guide 35:2006. The data was assessed for outliers, but no data points were removed. The reference value is the overall mean. The coverage factor was set at 3 and was multiplied by the standard uncertainty for the reference uncertainty. The information that will be presented in the Reference Material Data Sheets is presented in Tables 4 and 5 for NP1 and NP2 respectively. The reference values and reference uncertainties can be used by laboratories for comparison purposes in testing.

Table 1: Reference Material Data Sheet Information for NP1

Parameter	Reference Value	Reference Uncertainty	Number of accepted data points	Constant Coverage Factor
Nicotine (mg/pouch)	6,006	0,345	192	3
Nicotine (mg/gram)	15,096	0,282	192	3
Pouch weight (g)	0,398	0,024	192	3
Oven Volatiles (%)	2,2	0,2	192	3
pH	8,25	0,25	192	3

Table 2: Reference Material Data Sheet Information for NP2

Parameter	Reference Value	Reference Uncertainty	Number of accepted data points	Constant Coverage Factor
Nicotine (mg/pouch)	10,7	1,1	123	3
Nicotine (mg/gram)	15,4	1,6	123	3
Pouch weight (g)	0,6926	0,0503	123	3
Oven Volatiles (%)	47,07	5,38	123	3
pH	9,10	0,10	123	3

5. Conclusions

Two nicotine pouch reference products were produced, and the production runs were assessed for product homogeneity. The results of the homogeneity assessment demonstrate the nicotine pouches are suitable for use as reference products. The results of this analysis are presented in Reference Material Data Sheets that will be available at [Center for Tobacco Reference Products | Kentucky Tobacco Research & Development Center](#). Product Description Sheets, which include the primary materials and product characteristics, were created from the homogeneity assessment data and are provided in Appendix C. The product Description Sheets will be available at [Home | CORESTA](#). The nicotine pouch reference products will be stored at -20 °C and distributed by the University of Kentucky Center for Tobacco Reference Products. The TTPA will conduct a full chemical characterization study, and this study will serve as the basis for annual stability studies.

APPENDIX A: Raw Data

Table 1: Raw data for homogeneity testing for NP1

Sample ID ¹	Machine head	Replicate	Nicotine (mg/pouch)	Nicotine (mg/g)	Pouch Weight (g)	Oven volatiles (%)	pH
1	1	1	5,704	15,170	0,376	1,8	8,35
		2	5,848	15,270	0,383	2,2	8,40
		3	5,620	15,190	0,370	2,2	8,30
2	1	1	6,064	15,010	0,404	2,0	8,59
		2	6,110	15,050	0,406	2,1	8,27
		3	5,976	14,940	0,400	2,0	8,31
3	1	1	5,771	14,990	0,385	2,0	8,46
		2	5,955	14,850	0,401	1,9	8,40
		3	5,685	14,690	0,387	1,9	8,36
4	1	1	6,154	15,120	0,407	2,1	8,27
		2	5,905	14,800	0,399	2,2	8,19
		3	6,140	15,050	0,408	2,3	8,22
5	1	1	6,192	15,250	0,406	2,2	8,27
		2	6,294	15,240	0,413	2,3	8,32
		3	6,167	15,190	0,406	2,3	8,32
6	1	1	6,087	14,810	0,411	2,1	8,33
		2	6,022	14,906	0,404	2,1	8,28
		3	6,015	14,742	0,408	2,2	8,30
7	1	1	6,314	15,629	0,404	2,2	8,14
		2	5,996	14,483	0,414	2,0	8,21
		3	6,136	15,303	0,401	2,2	8,26
8	1	1	6,073	15,297	0,397	2,2	8,13
		2	6,062	15,117	0,401	2,1	8,08
		3	6,138	15,155	0,405	2,2	8,17
9	2	1	5,783	14,790	0,391	1,6	8,29
		2	5,809	15,010	0,387	2,0	8,29
		3	5,741	14,720	0,390	2,0	8,19
10	2	1	5,930	14,900	0,398	1,9	8,34
		2	6,009	14,910	0,403	1,9	8,27
		3	6,024	15,060	0,400	2,3	8,28
11	2	1	6,013	15,070	0,399	2,0	8,31
		2	6,113	15,130	0,404	2,0	8,25
		3	6,111	15,240	0,401	2,0	8,37
12	2	1	6,168	15,080	0,409	2,1	8,43
		2	6,180	15,110	0,409	2,2	8,28
		3	6,136	15,040	0,408	2,2	8,37
13	2	1	6,085	15,100	0,403	2,2	8,26

Sample ID ¹	Machine head	Replicate	Nicotine (mg/pouch)	Nicotine (mg/g)	Pouch Weight (g)	Oven volatiles (%)	pH
		2	5,990	14,900	0,402	2,0	8,30
		3	6,006	14,830	0,405	2,0	8,39
14	2	1	5,892	14,805	0,398	1,9	8,30
		2	6,027	14,883	0,405	2,2	8,19
		3	6,178	14,995	0,412	2,2	8,28
15	2	1	6,136	15,077	0,407	2,1	8,33
		2	5,854	14,347	0,408	2,2	8,27
		3	6,087	15,372	0,396	2,1	8,26
16	2	1	5,940	14,999	0,396	2,1	8,32
		2	5,972	14,967	0,399	2,3	8,27
		3	5,957	14,967	0,398	2,2	8,27
17	3	1	5,987	15,390	0,389	2,4	8,30
		2	5,948	15,290	0,389	2,1	8,25
		3	6,059	15,340	0,395	2,2	8,27
18	3	1	6,128	14,910	0,411	2,1	8,30
		2	6,113	15,020	0,407	2,0	8,28
		3	6,025	14,840	0,406	2,2	8,25
19	3	1	6,096	15,090	0,404	2,1	8,27
		2	6,238	15,290	0,408	2,4	8,25
		3	6,263	15,350	0,408	2,3	8,32
20	3	1	5,882	15,120	0,389	1,9	8,39
		2	5,880	15,000	0,392	2,1	8,33
		3	5,985	15,230	0,393	2,2	8,28
21	3	1	6,121	15,113	0,405	2,2	8,28
		2	6,250	15,244	0,410	2,0	8,27
		3	6,177	15,214	0,406	2,2	8,29
22	3	1	6,200	15,346	0,404	2,2	8,37
		2	6,022	15,018	0,401	2,3	8,27
		3	6,095	15,050	0,405	2,2	8,29
23	3	1	5,962	14,981	0,398	2,2	8,29
		2	5,857	14,978	0,391	2,2	8,24
		3	5,883	15,047	0,391	2,1	8,31
24	3	1	5,926	15,117	0,392	2,2	8,19
		2	5,896	15,236	0,387	2,2	8,15
		3	5,906	15,028	0,393	2,3	8,18
25	4	1	6,169	15,120	0,408	2,1	8,35
		2	6,212	15,040	0,413	2,0	8,22
		3	6,227	15,490	0,402	2,2	8,34
26	4	1	6,090	15,000	0,406	2,2	8,42
		2	6,194	15,070	0,411	2,1	8,36
		3	6,196	15,150	0,409	2,1	8,36

Sample ID ¹	Machine head	Replicate	Nicotine (mg/pouch)	Nicotine (mg/g)	Pouch Weight (g)	Oven volatiles (%)	pH
27	4	1	6,127	15,090	0,406	2,1	8,42
		2	6,038	15,020	0,402	2,2	8,37
		3	6,178	15,180	0,407	2,3	8,35
28	4	1	6,137	15,190	0,404	1,9	8,34
		2	6,064	14,900	0,407	2,2	8,23
		3	6,048	15,120	0,400	2,2	8,36
29	4	1	5,845	14,988	0,390	2,0	8,33
		2	5,910	15,038	0,393	2,0	8,20
		3	5,988	15,008	0,399	2,1	8,26
30	4	1	5,903	14,832	0,398	2,1	8,34
		2	6,034	15,161	0,398	2,1	8,31
		3	5,928	15,045	0,394	1,9	8,23
31	4	1	5,905	15,141	0,390	2,2	8,21
		2	5,804	15,154	0,383	2,1	8,14
		3	5,951	15,299	0,389	2,0	8,20
32	4	1	5,766	15,133	0,381	2,3	8,14
		2	5,839	15,205	0,384	2,3	8,19
		3	5,802	15,071	0,385	2,3	8,21
33	5	1	5,937	15,420	0,385	2,2	8,22
		2	5,933	15,450	0,384	1,9	8,16
		3	5,832	15,070	0,387	2,2	8,21
34	5	1	5,907	14,730	0,401	2,0	8,28
		2	6,105	15,000	0,407	2,2	8,17
		3	6,095	15,050	0,405	2,3	8,20
35	5	1	5,939	14,810	0,401	2,1	8,47
		2	6,041	14,880	0,406	2,3	8,15
		3	5,971	14,890	0,401	2,1	8,26
36	5	1	6,148	15,180	0,405	2,0	8,19
		2	6,049	15,160	0,399	2,3	8,10
		3	5,996	15,180	0,395	2,2	8,12
37	5	1	5,982	14,992	0,399	2,1	8,23
		2	5,903	14,944	0,395	2,2	8,13
		3	6,011	15,026	0,400	2,2	8,15
38	5	1	5,996	15,066	0,398	2,1	8,16
		2	5,980	15,101	0,396	2,1	8,06
		3	6,060	15,075	0,402	2,3	8,21
39	5	1	5,994	15,290	0,392	2,3	8,27
		2	5,923	15,226	0,389	2,2	8,24
		3	6,004	15,239	0,394	2,2	8,28
40	5	1	5,980	15,216	0,393	2,3	8,16
		2	5,822	14,740	0,395	2,4	8,16

Sample ID ¹	Machine head	Replicate	Nicotine (mg/pouch)	Nicotine (mg/g)	Pouch Weight (g)	Oven volatiles (%)	pH
		3	5,934	14,948	0,397	2,3	8,21
41	6	1	5,944	15,480	0,384	2,2	8,38
		2	6,201	15,350	0,404	2,2	8,37
		3	6,002	15,310	0,392	2,0	8,42
42	6	1	5,966	15,220	0,392	2,1	8,38
		2	6,007	15,130	0,397	2,4	8,37
		3	5,933	15,020	0,395	2,2	8,48
43	6	1	6,091	15,040	0,405	2,2	8,43
		2	6,027	15,030	0,401	2,2	8,50
		3	6,048	15,120	0,400	2,2	8,37
44	6	1	6,026	14,990	0,402	2,2	8,39
		2	6,090	15,000	0,406	2,2	8,33
		3	6,227	15,300	0,407	2,2	8,42
45	6	1	5,959	15,049	0,396	2,2	8,46
		2	6,109	15,310	0,399	2,2	8,40
		3	6,154	15,579	0,395	2,1	8,42
46	6	1	5,908	15,109	0,391	1,7	8,34
		2	5,966	15,103	0,395	2,2	8,27
		3	5,909	14,848	0,398	2,2	8,29
47	6	1	5,920	15,218	0,389	2,2	8,22
		2	5,955	15,152	0,393	2,3	8,06
		3	5,945	15,127	0,393	2,2	8,17
48	6	1	5,884	15,165	0,388	2,3	8,12
		2	5,969	15,150	0,394	2,2	8,10
		3	6,035	15,394	0,392	2,2	8,13
49	7	1	6,241	14,790	0,422	1,8	8,03
		2	6,237	14,710	0,424	2,1	7,92
		3	6,522	15,310	0,426	2,1	8,08
50	7	1	5,949	15,060	0,395	2,1	8,24
		2	5,934	14,760	0,402	2,2	8,11
		3	6,010	14,950	0,402	2,3	8,29
51	7	1	5,844	14,870	0,393	2,2	8,20
		2	5,984	15,110	0,396	2,1	8,14
		3	5,911	15,040	0,393	2,2	8,31
52	7	1	5,980	14,950	0,400	2,3	8,19
		2	6,029	15,110	0,399	2,2	8,09
		3	6,088	15,220	0,400	2,1	8,19
53	7	1	6,235	15,097	0,413	2,3	8,21
		2	6,137	15,459	0,397	2,3	8,18
		3	6,104	15,571	0,392	2,2	8,09
54	7	1	6,148	15,143	0,406	2,2	8,25

Sample ID ¹	Machine head	Replicate	Nicotine (mg/pouch)	Nicotine (mg/g)	Pouch Weight (g)	Oven volatiles (%)	pH
		2	5,864	14,847	0,395	2,3	8,26
		3	5,791	14,699	0,394	2,1	8,10
55	7	1	5,827	15,056	0,387	2,3	8,33
		2	6,067	15,361	0,395	2,2	8,29
		3	6,133	15,448	0,397	2,2	8,30
56	7	1	5,932	15,529	0,382	2,4	8,11
		2	5,986	15,271	0,392	2,3	8,27
		3	6,036	15,204	0,397	2,3	8,11
57	8	1	5,659	15,090	0,375	2,2	8,38
		2	5,882	15,160	0,388	2,2	8,17
		3	5,776	15,280	0,378	2,2	8,19
58	8	1	5,802	14,800	0,392	2,4	8,24
		2	5,817	14,580	0,399	2,1	8,19
		3	5,981	14,990	0,399	2,2	8,25
59	8	1	5,987	15,080	0,397	2,3	8,23
		2	5,890	15,220	0,387	2,3	8,22
		3	5,813	15,020	0,387	2,3	8,18
60	8	1	5,579	15,160	0,368	2,2	8,25
		2	5,340	15,170	0,352	2,1	8,22
		3	5,944	15,320	0,388	2,2	8,25
61	8	1	5,599	15,052	0,372	2,4	8,13
		2	6,394	15,333	0,417	2,2	8,13
		3	6,335	15,414	0,411	2,2	8,20
62	8	1	5,909	14,884	0,397	2,2	8,16
		2	5,820	14,734	0,395	2,1	7,99
		3	6,123	15,620	0,392	2,3	8,01
63	8	1	6,308	15,384	0,410	2,1	8,06
		2	6,481	15,618	0,415	2,3	8,06
		3	5,790	15,119	0,383	2,2	8,15
64	8	1	6,209	15,407	0,403	2,4	8,10
		2	6,084	15,210	0,400	2,1	8,05
		3	6,045	15,189	0,398	2,3	8,11

1. Three cans were pulled from each machine head at 15-minute intervals. These 3 cans were combined into a composite sample from which 3 replicate sample aliquots were taken for analysis.

Table 2: Raw data for homogeneity testing for NP2

Sample ID ¹	Machine head	Replicate	Nicotine (mg/pouch)	Nicotine (mg/g)	Pouch Weight (g)	Oven volatiles (%)	pH
1	5	1	10,8	15,8	0,6452	47,46	8,96
		2	10,3	15,0	0,6973	47,66	9,03
		3	10,8	15,8	0,7153	46,85	8,96
2	6	1	10,6	14,7	0,7186	50,90	8,93
		2	10,4	14,4	0,7274	51,23	8,97
		3	10,8	15,0	0,7181	50,51	8,92
3	3	1	10,4	15,2	0,6918	48,96	8,96
		2	10,5	15,3	0,7092	48,58	8,99
		3	10,4	15,1	0,6571	48,55	8,96
4	4	1	10,9	15,5	0,6980	46,14	8,99
		2	11,2	15,9	0,7079	46,17	8,97
		3	11,4	16,2	0,7014	46,62	8,95
5	5	1	10,2	14,6	0,6835	51,17	8,95
		2	10,2	14,7	0,7086	49,57	8,95
		3	10,1	14,5	0,6979	48,94	8,95
6	6	1	10,5	15,2	0,7242	47,92	8,92
		2	10,7	15,4	0,6938	46,33	8,97
		3	10,5	15,2	0,6599	46,74	8,93
7	1	1	10,3	15,5	0,6496	46,09	8,97
		2	10,3	15,6	0,6391	46,21	8,97
		3	10,3	15,5	0,6985	45,71	9,01
8	2	1	10,3	15,1	0,6741	47,22	8,97
		2	10,6	15,5	0,7175	47,08	8,97
		3	10,4	15,2	0,6625	47,32	8,96
9	5	1	10,4	14,9	0,6948	49,27	9,14
		2	10,3	14,7	0,7075	49,36	9,12
		3	10,5	15,0	0,6991	49,35	9,14
10	6	1	10,2	15,1	0,7060	46,87	9,18
		2	10,3	15,3	0,6614	47,12	9,18
		3	10,2	15,2	0,6525	46,50	9,14
11	2	1	9,9	14,8	0,6964	48,27	9,12
		2	9,9	14,8	0,6457	48,41	9,10
		3	10,0	15,0	0,6576	48,21	9,10
12	1	1	11,4	16,3	0,6734	44,33	9,09
		2	11,4	16,3	0,7069	44,77	9,10
		3	11,3	16,1	0,7163	44,76	9,10
13	5	1	10,8	15,0	0,7253	48,03	9,04
		2	9,7	13,5	0,7240	47,60	9,14
		3	10,5	14,6	0,7088	47,67	9,12

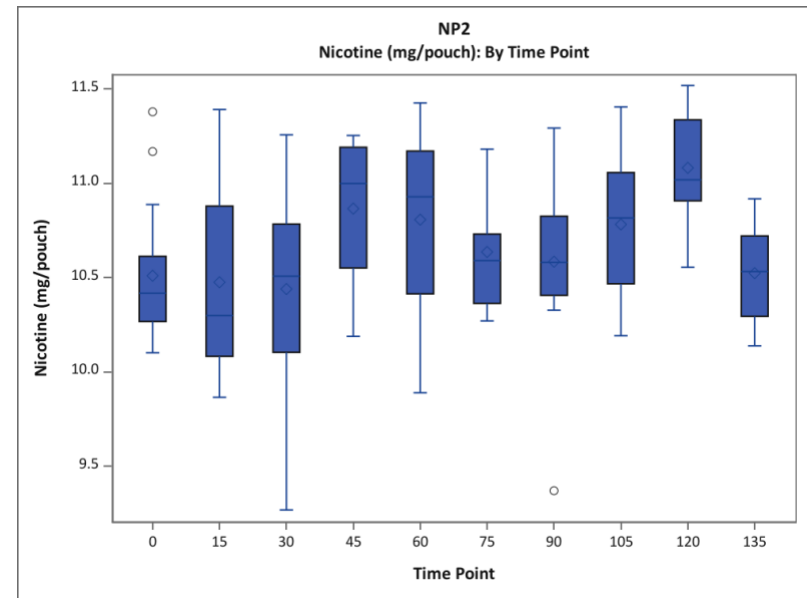
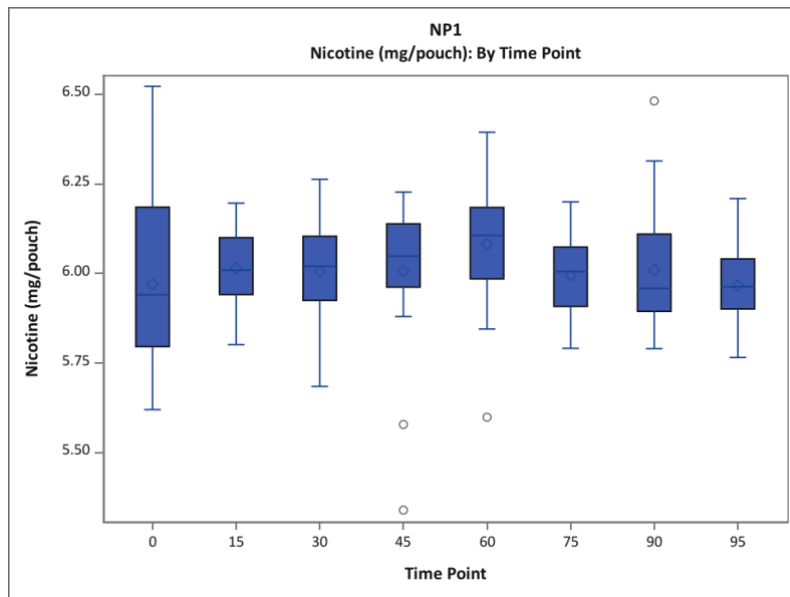
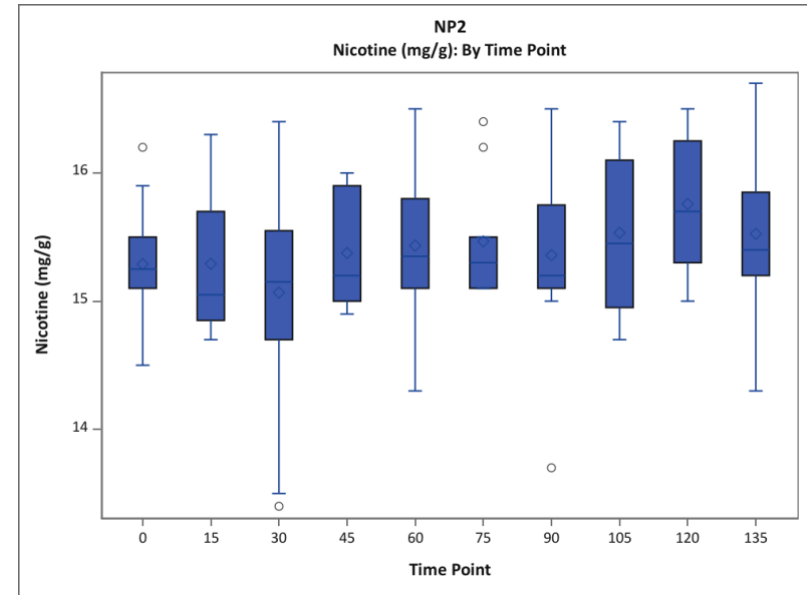
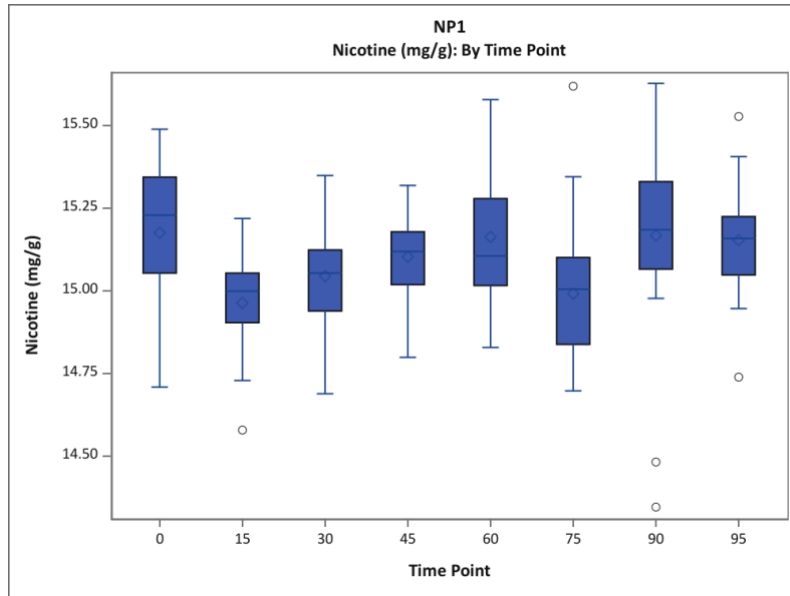
Sample ID ¹	Machine head	Replicate	Nicotine (mg/pouch)	Nicotine (mg/g)	Pouch Weight (g)	Oven volatiles (%)	pH
14	6	1	10,7	15,4	0,6963	47,32	9,07
		2	9,3	13,4	0,7010	47,59	9,08
		3	10,5	15,2	0,6776	47,51	9,06
15	2	1	10,2	15,1	0,6454	48,80	9,07
		2	10,4	15,4	0,6632	48,78	9,08
		3	10,0	14,8	0,7189	48,62	9,10
		1	11,2	16,3	0,6857	45,44	9,14
16	1	2	10,8	15,7	0,6919	45,40	9,05
		3	11,3	16,4	0,6817	44,79	9,05
		1	10,3	15,0	0,7021	49,11	9,09
17	5	2	10,3	15,1	0,6755	48,77	9,06
		3	10,2	14,9	0,6738	48,74	9,10
		1	11,0	15,0	0,7076	48,48	9,10
18	6	2	11,1	15,1	0,7449	48,12	9,08
		3	11,0	14,9	0,7547	48,39	9,06
		1	10,8	15,4	0,6929	47,89	9,05
19	2	2	11,1	15,8	0,7262	47,67	9,10
		3	10,8	15,3	0,6940	47,70	9,12
		1	11,3	16,0	0,6952	44,53	9,10
20	1	2	11,3	16,0	0,7071	44,60	9,10
		3	11,3	16,0	0,7078	44,13	9,27
		1	11,2	15,3	0,7342	47,97	9,21
21	5	2	10,5	14,3	0,7270	47,94	9,14
		3	11,4	15,6	0,7362	47,62	9,17
		1	10,9	15,2	0,7104	48,36	9,12
22	6	2	10,8	15,0	0,7172	47,26	9,18
		3	10,9	15,2	0,7294	47,26	9,10
		1	9,9	14,9	0,6726	48,41	9,20
23	2	2	10,4	15,6	0,6475	47,28	9,09
		3	10,2	15,4	0,6711	47,89	9,14
		1	11,1	16,2	0,6745	44,84	9,18
24	1	2	11,0	16,0	0,6933	44,52	9,10
		3	11,3	16,5	0,6943	44,52	9,13
		1	10,3	15,1	0,6816	48,36	9,13
25	5	2	10,3	15,1	0,6728	48,14	9,14
		3	10,5	15,5	0,6861	48,29	9,18
		1	10,6	15,1	0,6785	48,38	9,13
26	2	2	10,7	15,3	0,7478	48,66	9,07
		3	10,7	15,3	0,6778	48,17	9,09
		1	11,0	16,2	0,6942	44,37	9,07

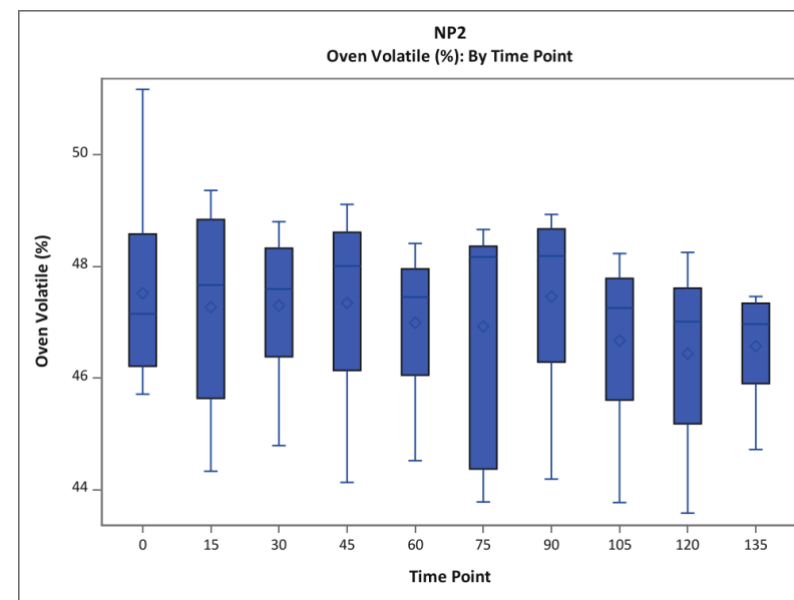
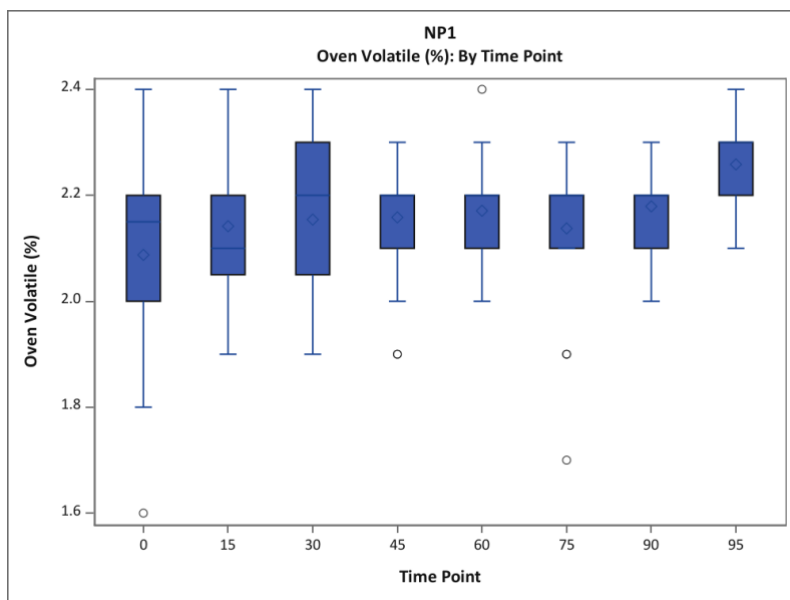
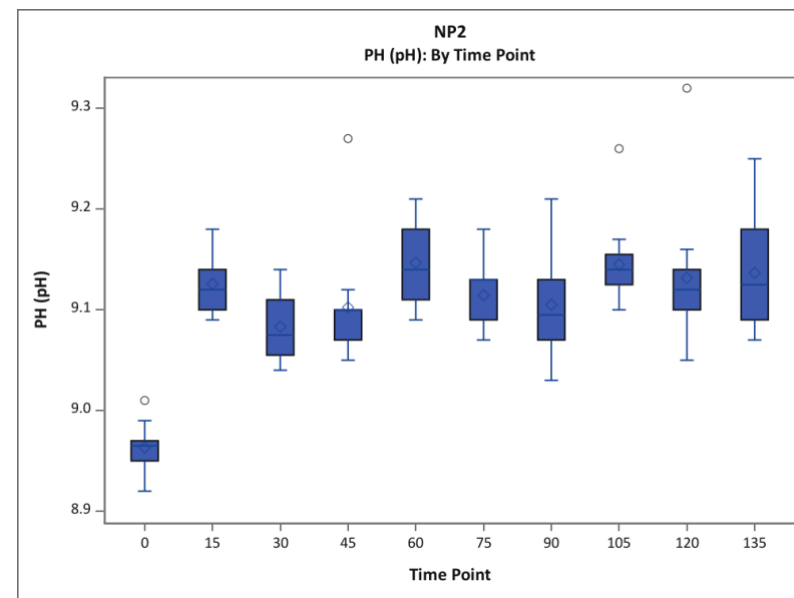
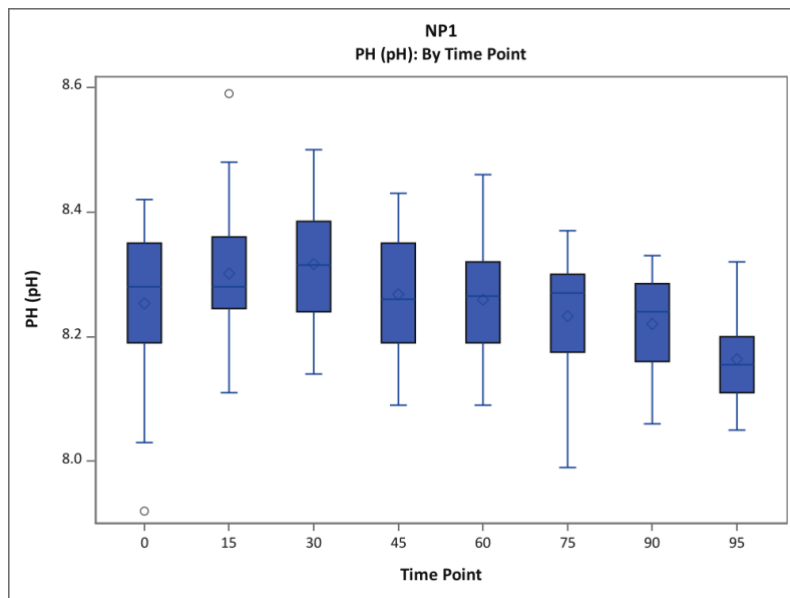
Sample ID ¹	Machine head	Replicate	Nicotine (mg/pouch)	Nicotine (mg/g)	Pouch Weight (g)	Oven volatiles (%)	pH
		2	11,2	16,4	0,6809	43,78	9,09
27	1	3	10,4	15,2	0,6703	44,18	9,13
		1	10,5	15,0	0,6966	48,93	9,10
28	5	2	10,6	15,1	0,6992	48,91	9,06
		3	10,7	15,3	0,7024	48,77	9,03
		1	9,4	13,7	0,6966	48,57	9,09
29	6	2	10,3	15,1	0,6873	48,42	9,08
		3	10,6	15,5	0,6679	48,17	9,06
		1	10,4	15,1	0,6864	48,13	9,10
30	2	2	10,4	15,1	0,6957	48,20	9,14
		3	10,7	15,5	0,6853	47,91	9,09
		1	11,0	16,0	0,7073	44,62	9,12
31	1	2	11,2	16,4	0,6663	44,66	9,18
		3	11,3	16,5	0,6797	44,19	9,21
		1	10,3	14,9	0,7068	48,10	9,26
32	5	2	10,4	15,0	0,6784	48,23	9,13
		3	10,2	14,7	0,6948	48,06	9,10
		1	11,1	15,3	0,7431	47,38	9,14
33	6	2	10,8	14,9	0,7021	46,91	9,14
		3	11,4	15,7	0,7342	47,00	9,17
		1	10,6	15,5	0,6597	47,13	9,14
34	2	2	10,8	15,8	0,7272	47,40	9,10
		3	10,5	15,4	0,6654	47,51	9,13
		1	11,1	16,4	0,6360	44,30	9,14
35	1	2	11,1	16,4	0,6950	44,23	9,12
		3	11,1	16,4	0,6917	43,77	9,17
		1	10,6	15,2	0,7009	47,38	9,16
36	5	2	10,8	15,6	0,7006	47,37	9,14
		3	11,5	16,5	0,6817	47,41	9,10
		1	11,5	16,0	0,7199	46,65	9,10
37	6	2	11,1	15,4	0,7071	46,42	9,05
		3	11,2	15,6	0,7328	46,61	9,14
		1	11,0	16,3	0,6747	43,94	9,32
38	2	2	11,0	16,3	0,6913	43,87	9,14
		3	11,0	16,2	0,6620	43,58	9,14
		1	11,4	15,8	0,7484	48,25	9,09
39	1	2	10,9	15,0	0,7230	47,94	9,10
		3	11,0	15,2	0,7014	47,81	9,10
		1	10,7	15,6	0,6786	46,93	9,12
40	5	2	10,5	15,4	0,6888	46,94	9,14

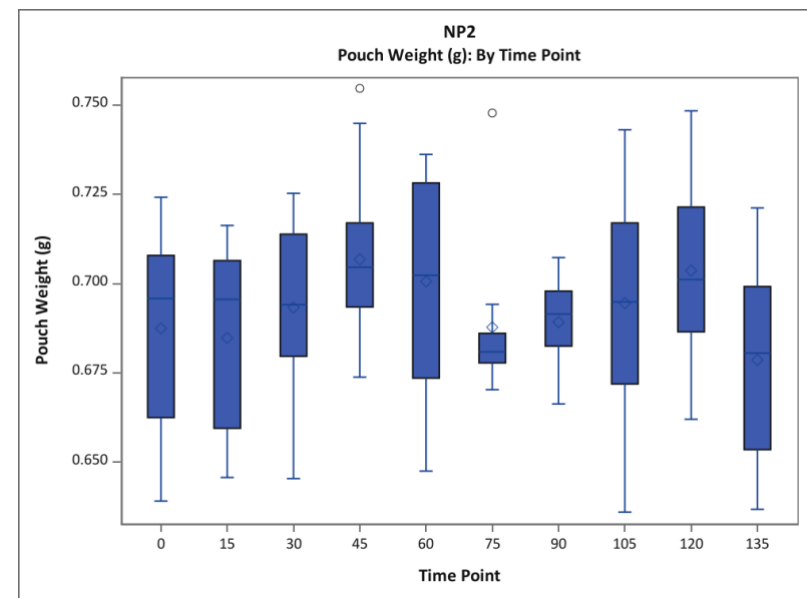
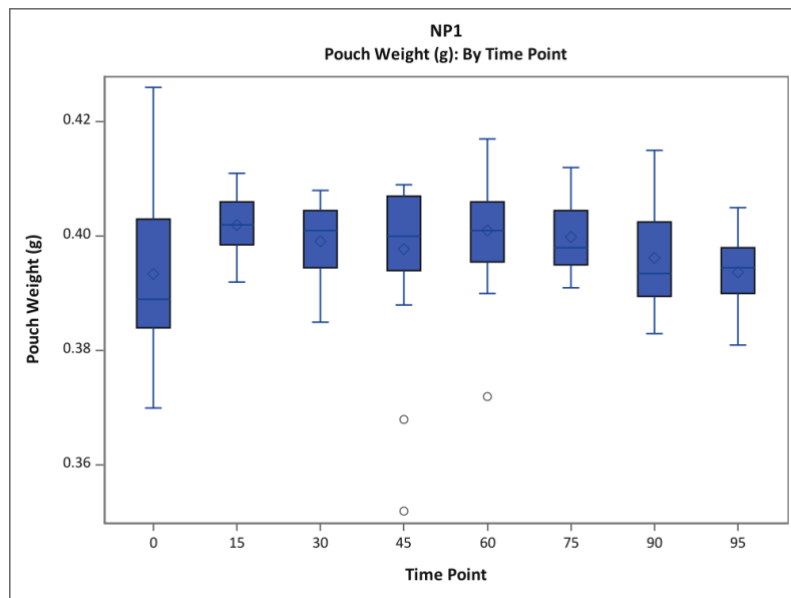
Sample ID ¹	Machine head	Replicate	Nicotine (mg/pouch)	Nicotine (mg/g)	Pouch Weight (g)	Oven volatiles (%)	pH
		3	10,3	15,1	0,6825	46,99	9,07
		1	10,9	15,4	0,7212	47,10	9,07
41	6	2	10,8	15,2	0,7154	47,36	9,09
		3	10,1	14,3	0,6903	46,92	9,09
		1	10,3	15,2	0,6486	47,32	9,10
42	2	2	10,5	15,6	0,7081	47,38	9,13
		3	10,3	15,2	0,6706	47,46	9,14
		1	10,7	16,5	0,6440	44,88	9,22
43	1	2	10,4	16,1	0,6584	44,85	9,22
		3	10,8	16,7	0,6368	44,72	9,25

1. Three cans were pulled from each machine head at 15-minute intervals. These 3 cans were combined into a composite sample from which 3 replicate sample aliquots were taken for analysis.

APPENDIX B: Data Plots by Sampling Time Point







APPENDIX C: Product Description Sheets

Nicotine Pouch Reference Product NP1 – Dry Nicotine Pouch

Manufactured in May 2024

NP1 is a nicotine pouch product that was produced without added flavorings, except for those required to produce a product that is characteristic of the style. The reference product is packaged in plastic cans that contain 15 0.4 g pouches.

The target product composition supplied by the manufacturer is given below:

Component	%
Fillers	75.87
Pouch material	8.55
Nicotine source	4.54
pH adjuster	7.06
Stabilizer	2.90
Water	0.95
Sweetener	0.13

The following parameters were determined at the time of manufacture:

Parameter	Value
Moisture content (%)	2.2
pH	8.25
Nicotine content (mg/pouch)	6.0 (as-is)

as-is: the data is presented without correction for moisture

Nicotine Pouch Reference Product NP2 – High Moisture Nicotine Pouch

Manufactured in January 2024

NP2 is a high moisture nicotine pouch product that was produced without added flavourings, except for those required to produce a product that is characteristic of the style. The reference product is packaged in plastic cans that contain twenty 0.7 g pouches.

The target product composition supplied by the manufacturer is given below:

Component	%
Fillers	43.36
Pouch material	5.39
Nicotine source	1.56
pH adjuster	0.25
Stabilizer	3.78
Water*	43.85
Sweetener	1.81
Total	100

*Additional water added after pouch manufacture

The following parameters were determined at the time of manufacture:

Parameter	Value
Moisture content (%)	47.07
pH	9.10
Nicotine content (mg/pouch)	10.7 (as-is)

as-is: the data is presented without correction for moisture