

Cigarette relighting – implications for tobacco constituents



Masonic Cancer Center

UNIVERSITY OF MINNESOTA

Comprehensive Cancer Center designated
by the National Cancer Institute

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INTRODUCTION

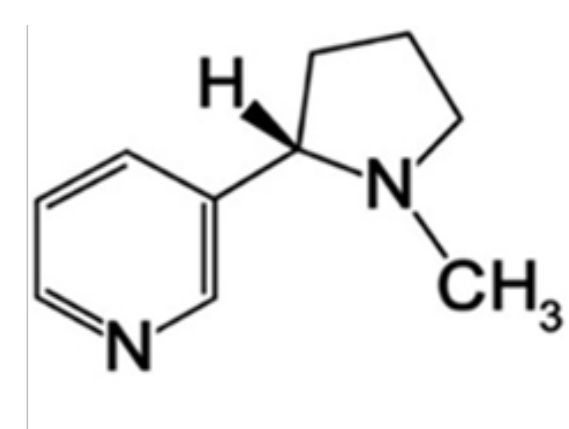
Relighting – extinguishing, saving, and later relighting unfinished cigarette butts is prevalent behavior with 44-73% of current smokers reporting that they relight cigarettes, 17-21% of those say they relight ‘usually’ or ‘frequently.’¹ Certain vulnerable populations such as racial/ethnic minorities, people of low socioeconomic status (SES), LGBT persons and those suffering from mental illness are disproportionately affected by tobacco-associated diseases and are more likely to engage in relighting behavior².

Variety of chemical and physical processes are occurring during cigarette combustion resulting with formation of complex smoke mixture. As smoke is drawn through tobacco a portion of the combusted tobacco constituents are deposited on the unheated tobacco at the proximal end of the cigarette³. Extinguishing and later relighting unfinished cigarette could contribute towards substantial changes in the chemistry of the tobacco and cigarette smoke. Therefore better understanding of the exposures to tobacco smoke toxicants and carcinogens from relit cigarettes and its implications for tobacco related disease is needed.

GOAL

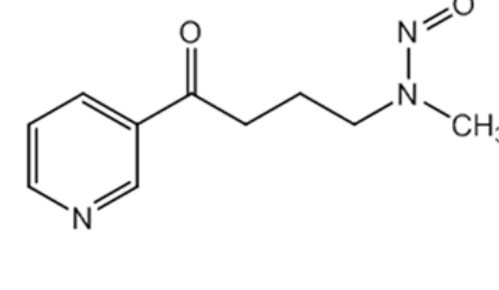
To investigate the potential effect on cigarette relighting on key chemical constituents implicated in addictiveness, toxicity, and carcinogenicity of tobacco and cigarette smoke.

Addictive constituent

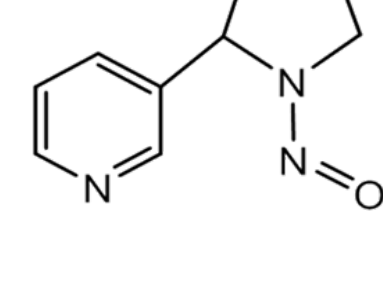


Nicotine

Carcinogens

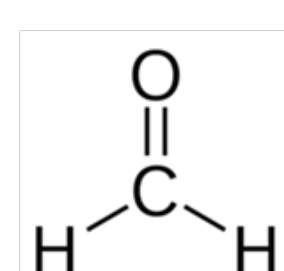


NNK

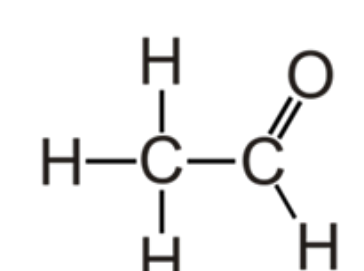


NNN

Respiratory toxicants

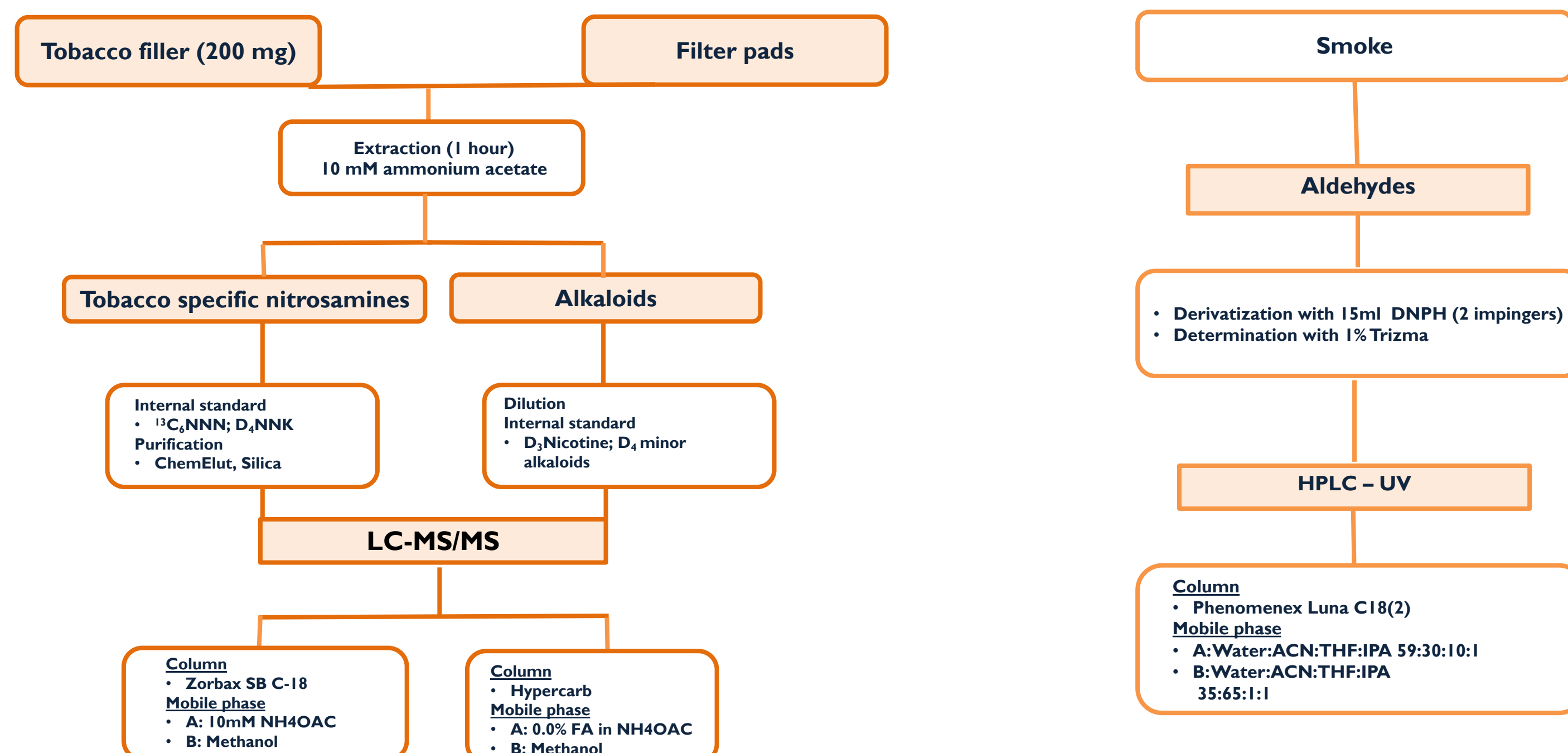
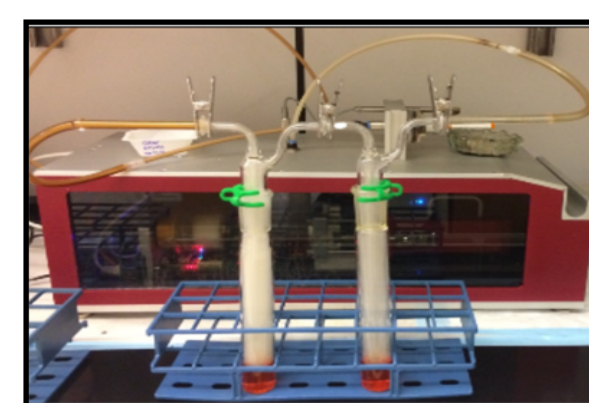
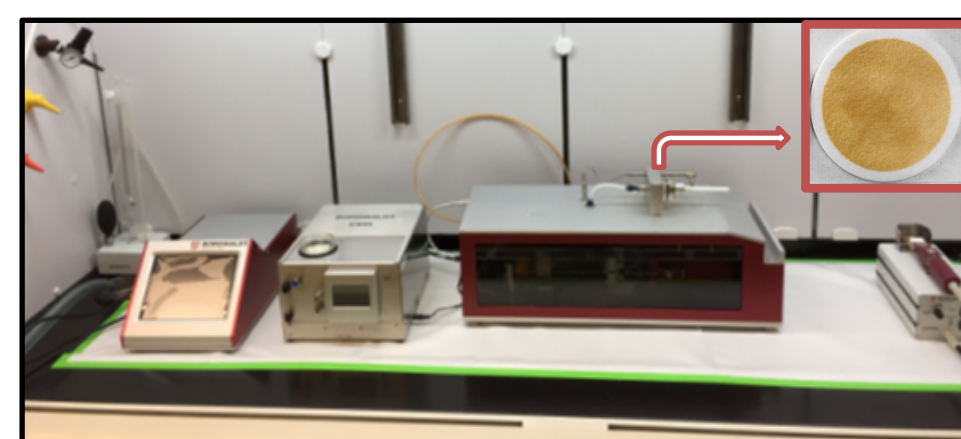


Formaldehyde



Acetaldehyde

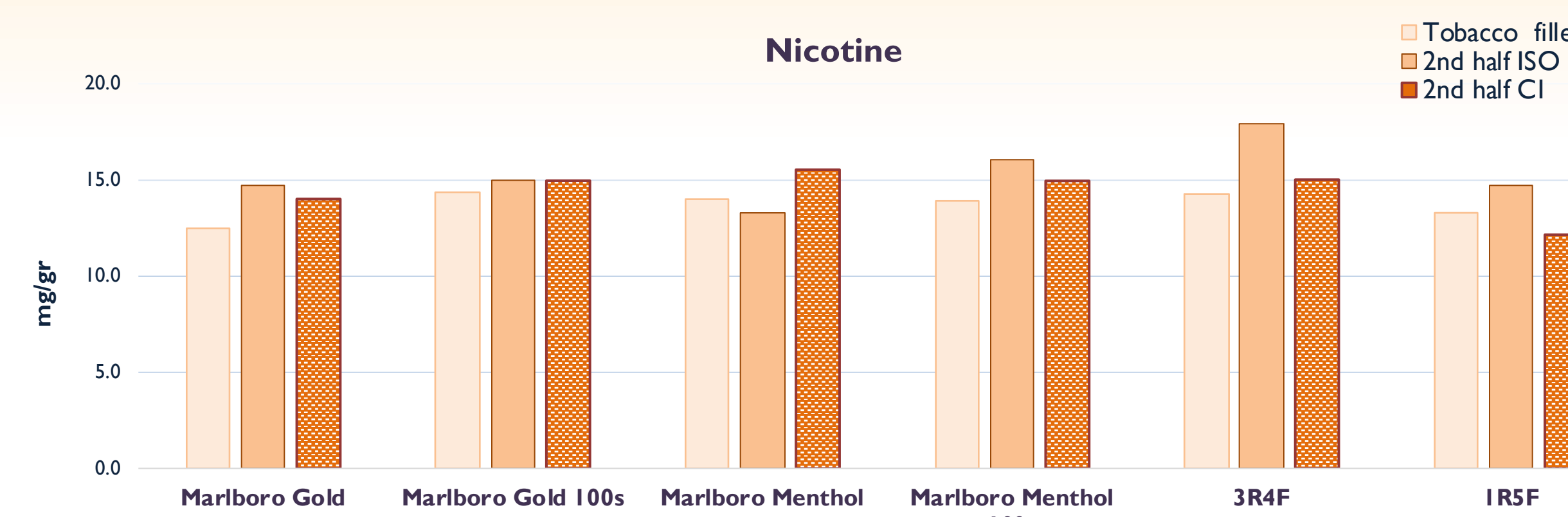
METHODS



RESULTS

Findings from analysis of left over tobacco filler of half-smoked cigarette

Nicotine levels in the filler of original and half-smoked cigarette

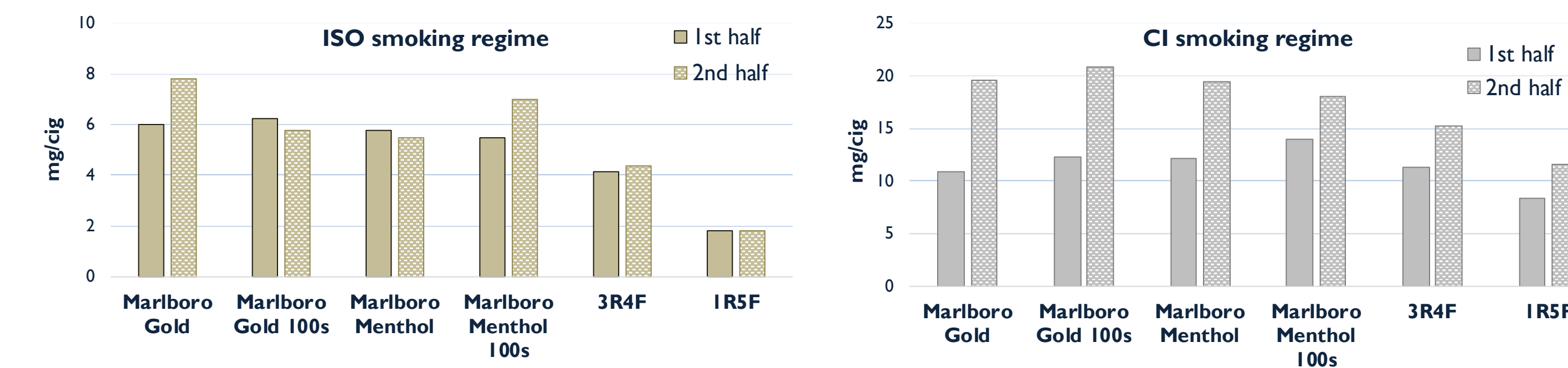


TSNA levels in the filler of original and half-smoked cigarettes

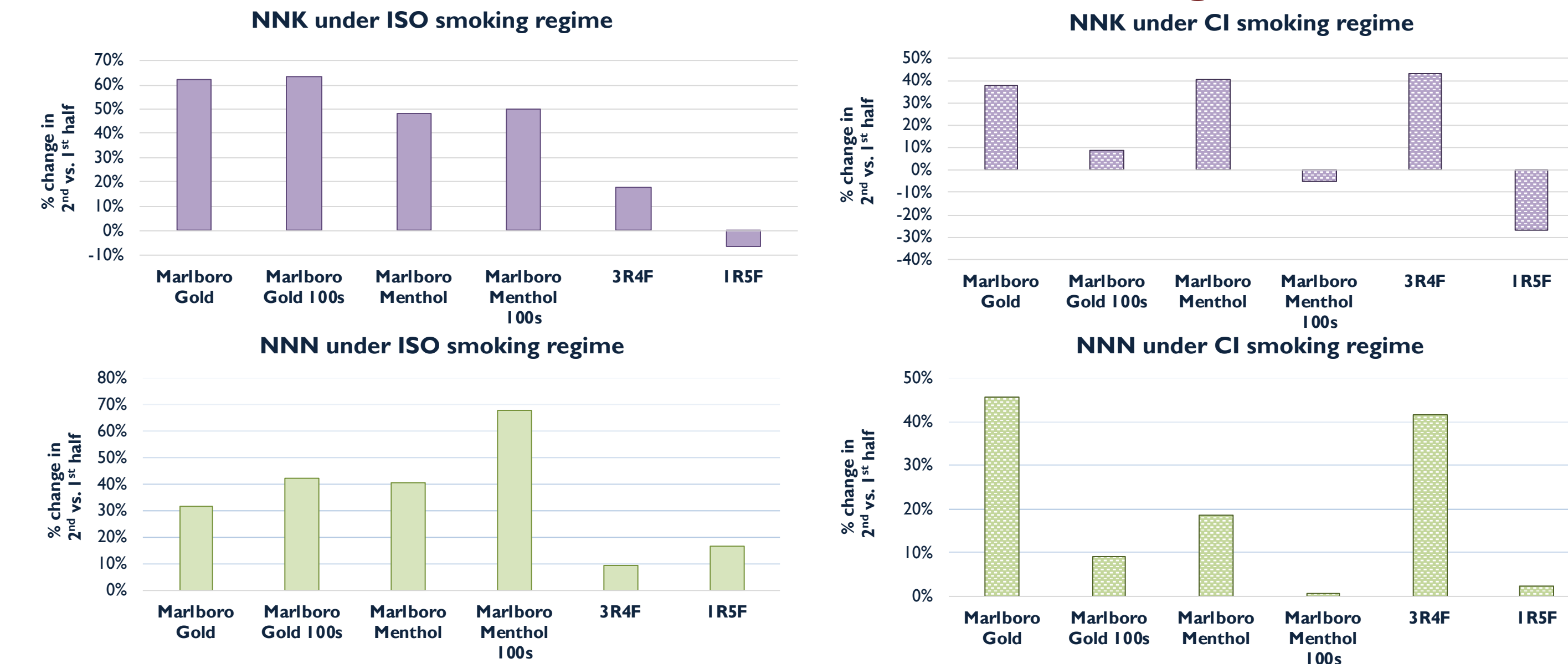


Findings from analysis of smoke of re-lit cigarette

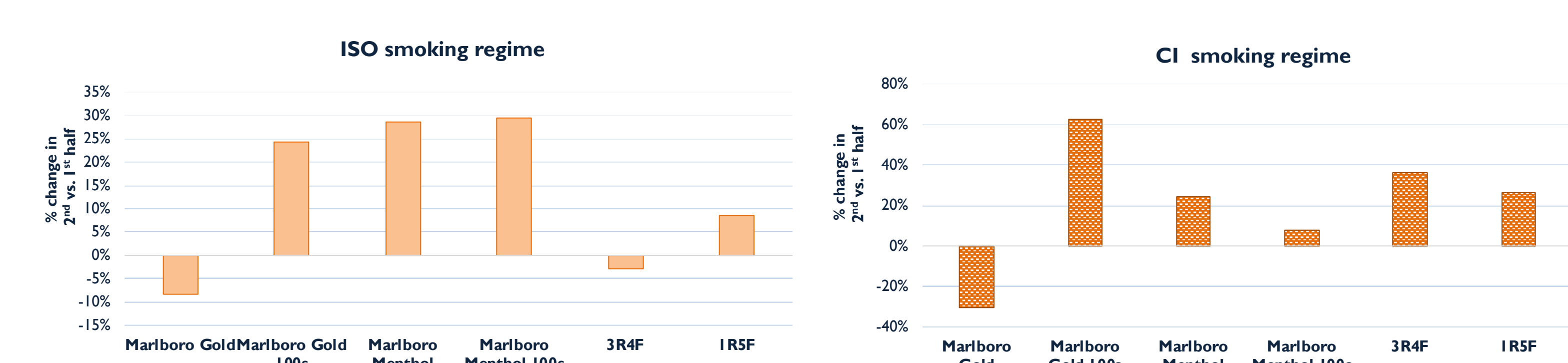
Total particulate matter (TPM) in the smoke of first and second cigarette halves



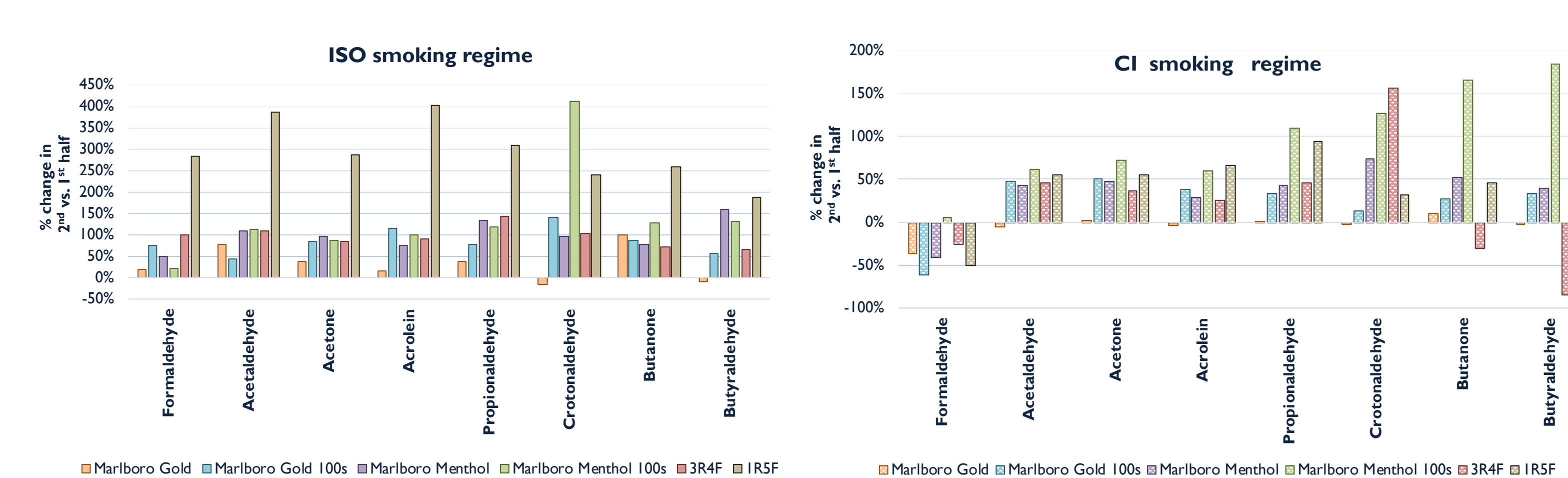
Difference in smoke TSNA levels between first and second cigarette halves



Difference in smoke nicotine levels between first and second cigarette halves



Difference in aldehyde levels between first and second cigarette halves



SUMMARY

- Overall, there was an increase in nicotine in the left over tobacco filler of half-smoked cigarette using ISO and CI smoking regimens
- Levels of tobacco specific nitrosamines (NNN, NNK) were higher in the leftover tobacco filler of half-smoked cigarette under CI regime, on average, NNK increased by 38%.
- Similarly, levels of nicotine and nitrosamines in smoke increased in the 2nd half of the cigarette smoked under both regimens, ISO and CI
- Generally, there was increase in aldehyde levels under both smoking regimens. On average, acetaldehyde, respiratory toxicant and carcinogen, increased in the 2nd half of the cigarette smoke by 86% and 37% for ISO and CI respectively
- Re-lighting a cigarette might expose smokers to higher levels of nicotine and carcinogens than exposures from the first half of the same cigarette, potentially posing increased health risks
- Study on tobacco smoke toxicants and carcinogens exposure in smokers engaging in relighting behavior is underway

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ACKNOWLEDGMENTS

This study was supported by NCI through the NIH Tobacco Regulatory Science Program (R01-CA179246) and UMFO011369 from UMN. LC-MS/MS was carried out in the Analytical Biochemistry Shared Resource of the Cancer Center.
We thank Bob Carlson for graphic design assistance