Mainstream (MS) and sidestream (SS) smoke of 3R4F reference cigarettes was simultaneously generated using a modified (8-2070) smoking machine and directed to the two different exposure canals. Three target exposure concentrations within the range of commonly used in smoke toxicity studies were selected per WTPM: (rest total particulate matter): MS smoke (500, 250, and 60 µg/L); SS smoke (130, 95, and 55 µg/L). The exposure duration was 3 hr for all exposure runs. CO (atmospheric monoxide), WTPM, nicotine, aldehydes (formaldehyde, acetaldehyde, acrolein, propenialdehyde, and creatanaldehyde), butyl lengths, particle size, and environmental parameters (temperature and relative humidity) at the animal exposure nose-pores were measured. Exposure was controlled by Battelle Exposure Data Acquisition and Control (BEDAC) automated system.

Spatial homogeneity of smoke was determined by obtaining duplicate filters from the top, middle, and low tiers. Spatial homogeneity among and between the tiers was confirmed by nose-port velocity measurements. CO concentration was monitored during each smoke exposure using CO-analyzer (California Analytical Instruments Inc.; Orange, CA). The particle size of the MS smoke was determined using a Monier-style cascade impactor. Particle size of the SS smoke was measured using a SMPS (TSI Inc.; St Paul, MN). WTPM was assessed by gravimetric analysis of filter samples collected throughout the entire duration of the exposure.

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