

DGF/VC/46C

2nd March, 1966

Dr. S. J. Green,
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P.O. Box 6500,
MONTREAL 30.

Dear Jim,

Dr. Evelyn has now finished Phase I of the studies on transfer of coumarin during pipe smoking and this letter gives the broad outline of the results so that you may discuss them with Leo during your visit. A second copy is enclosed should you wish to leave one with him.

For our studies we have used Wills CUT GOLDEN BAR (ready rubbed) as this does not contain any coumarin in the flavour. We have added coumarin to this at three levels (0.13%, 0.65% and 1.20%), using a solution in ethanol.

The pipes (Meerschaum lined, straight stem briar - Orlik Medium Billiard, Shape M13) were smoked using a CSM 10 smoking machine. The charge (2-2.2 g.) was lit under constant suction and smoked completely at 12 puffs per minute using a 20 ml. puff of 2 seconds duration. The smoke was collected in a cold trap (see Report No. RD.169-R).

Four charges were smoked per determination and duplicate determinations were carried out. Both tobacco and smoke condensate were extracted with methanol and assayed without concentration by G.L.C. analysis on a Carbowax 20 M column, using 6-methyl coumarin as an internal standard.

The transfer is calculated as the ratio of the weight of coumarin in the smoke to the weight of coumarin in the charge of pipe tobacco and then expressed as a percentage. The nicotine transfer, calculated in the same way, was run as a check on the smoking technique.

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The results are as follows:

<u>Level of added coumarin (%)</u>	<u>Mean coumarin transfer (%)</u>	<u>Mean nicotine transfer (%)</u>	<u>Coumarin transfer Nicotine transfer</u>
0.13	63	55	1.15
0.65	69	63	1.10
1.20	68	61	1.10
Control tobacco	-	65	-
Control tobacco + ethanol	-	59	-

(The effect on the nicotine transfer of spraying ethanol on the control tobacco is the same as that found earlier by Dr. Backhurst.)

As a check, Dr. Evelyn investigated AMPHORA tobacco, which contains 0.09% coumarin, and found a transfer of 64%, which substantiates our results nicely for the lower level.

Incidentally, we were misled at the start of our work once we had established the analytical method, because meerschaum-lined pipes which had been previously used in the setting-up experiments were impregnated with coumarin. When using these pipes we found a transfer of 87% for the 0.13% level. It is, therefore, essential that any determination at a low level be made using virgin pipes.

The report on this work will be urged and we hope to get it out in two weeks or so. Meanwhile, we will move on to Phase II, the investigation of 6-methyl coumarin. Indications are that this does not give coumarin in the smoke.

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Our results are in good agreement with the transfer figure determined by Dr. Sharman of I.T.Co. using glass pipes and a puffing regime of 10 small volume puffs per minute. For a loading of 0.03% coumarin he found a transfer of 67% to the mainstream smoke of which 50% was retained by the smoker, i.e., one third of the coumarin added to the tobacco was retained by the smoker.

There are no grounds, therefore, for revising the new permitted levels in either an upward or downward direction.

I hope your trip has proved interesting and successful. Everyone here sends their best wishes.

Yours sincerely,



Encl: duplicate copy

C.c. Dr.S.J.Green, Millbank
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