

**C. INDUSTRY RESEARCH ON THE CONSUMER'S NEED FOR AN ADEQUATE DOSE OF NICOTINE**

**1. Industry Research on Importance of Supplying Sufficient Nicotine to Provide Consumer Acceptance and "Satisfaction"**

The industry has conducted extensive research establishing that smokers require a certain level of nicotine from their cigarettes and that tobacco "satisfaction" is attributable to nicotine's systemic effects after absorption, rather than to its immediate sensory effects in the mouth, nose, and throat.<sup>280</sup>

In the mid 1970's, BATCO Group Research & Development conducted Project Wheat, a study whose purpose was to identify the different motivations for smoking and correlate those motivations with what BATCO characterized as a smoker's "Inner Need level."<sup>281</sup> The researchers established smokers' "Inner Need level" by identifying the extent to which they smoked to relieve stress, to aid concentration, and as a food substitute to avoid weight gain.<sup>282</sup> In other words, a smoker's "Inner Need" was defined by the extent to which the smoker used cigarettes for the drug effects of nicotine. (See description of the effects of nicotine on mood and weight in FINDINGS § I.D., *supra*.) The researchers hypothesized that the "Inner Need

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<sup>280</sup> BATCO Group Research & Development Centre. Research Conference. Southampton, England. September, 1984. Page 1. Proposed Revisions for 1985-87:

*Specific attention will be focussed on nicotine to identify its contribution to product attributes, particularly acceptability and satisfaction. A range of de-nicotinised tobacco blends, supplemented with varying levels of nicotine, will be prepared. These will be used in studies aimed at assessing the specific sensory properties of nicotine and the relationship between tar and nicotine in terms of product acceptability. The studies will provide an initial opportunity to separate immediate product acceptability from longer-term satisfaction.*

<sup>281</sup> See Project Wheat - Part 1, note 204, *supra*, at p. 1; Project Wheat - Part 2, note 204, *supra*, at p. 1.

<sup>282</sup> See Project Wheat - Part 1, note 204, *supra*, at pp. 5, 10-11, 16-25.

level" would correlate with the smoker's preferred nicotine delivery, and that smokers with higher "Inner Need" would prefer cigarettes that delivered higher nicotine levels.

Project Wheat was intended to help BATCO develop cigarettes that were more acceptable to consumers.<sup>283</sup> The Project Wheat researchers emphasized the importance of nicotine delivery over all other product features (including taste) in achieving an acceptable and satisfying cigarette:

*In considering which product features are important in terms of consumer acceptance, the nicotine delivery is one of the more obvious candidates. Others include the taste and flavour characteristics of the smoke, physical features such as draw resistance and rate of burn, and the general uniformity of the product, to name but a few. The importance of nicotine hardly needs to be stressed, as it is so widely recognised.*<sup>284</sup> [Emphasis added.]

The researchers found that "Inner Need" correlated positively with daily cigarette consumption, depth of inhalation, and anticipated difficulty in giving up smoking; *i.e.*, a higher "Inner Need" smoker would smoke more cigarettes, inhale more deeply, and anticipate greater difficulty in quitting smoking than a lower "Inner Need" smoker.<sup>285</sup> The researchers concluded that "Inner Need" defined a requirement for nicotine by the smoker.<sup>286</sup>

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<sup>283</sup> See Project Wheat - Part 1, note 204 *supra*, at p.1.

<sup>284</sup> See Project Wheat - Part 1, note 204 *supra*, at p. 3.

<sup>285</sup> *Id.* at p. 2.

<sup>286</sup> BATCO Group R&D Conference on Smoking Behavior. October 11-12, 1976, at p. BW-W2-02295.

The Project Wheat researchers also found that smokers of low nicotine delivery cigarettes derive less satisfaction from their cigarettes than smokers of medium or high nicotine cigarettes.

*Compared with the other two categories of smoker [medium and high], those respondents who smoke low nicotine cigarettes (less than 1.0 mg per cigarette) see their brand as milder, smoother, less satisfying and with not quite such a good taste, comments which are of course perfectly logical.*

Project Wheat - Part 2, note 204, *supra*, at p. 10.

Tobacco industry documents show that smoker "satisfaction" is one of the key attributes of consumer acceptance of tobacco products. These documents also make clear that "satisfaction" is a tobacco industry euphemism that refers to the pharmacological response to nicotine that smokers seek to obtain from smoking.<sup>287</sup> A BATCO scientist, in a 1969 presentation describing the research activities of BATCO Group Research & Development, stated that:

*The presence of nicotine is the reason why the tobacco plant was singled out from all other plants for consumption in this rather unusual way.*

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<sup>287</sup> Wood DJ. BATCO Group Research & Development. "Aspects of the R&DE Function. Notes for a talk given at Chelwood. September, 1969." (The document bears the date July 20, 1970). Page 7.

*See also:*

Proceedings of BATCO Group R&D Smoking Behaviour-Marketing Conference, Session I. July 9-12, 1984. Session I discusses nicotine's whole body dose and its relationship to smoker satisfaction. *See, e.g.,* p. BW-W2-03242: nicotine underlies smoking maintenance "and as a consequence probably provides the basis of smoking satisfaction"; at p. 03243: nicotine's "whole body response [is] associated with satisfaction." Session II discusses methods for assessing smoker response to changing deliveries:

*German butt analysis [testing of cigarette butts to determine smokers' nicotine uptake] and switching experiments [exposing smokers to cigarettes with varying deliveries] were used to indicate the capacity of external studies [as opposed to laboratory measures of smokers' nicotine uptake] to indicate . . . measurement of smokers changing the way they smoke in order to satisfy their needs.*

Ferris, RP. Notes from the Proceedings of the Smoking Behaviour-Marketing Conference. July 9-12, 1984. Page 21.

Imperial Tobacco. Matinee Marketing Strategy. 1971. Page 11. "A cigarette that delivers physiological satisfaction, yet is low in tar and nicotine, must surely be a major objective..."

BATCO Structured Creativity Conference. Southampton, England. June 25-28, 1984. The purpose of this conference was "to stimulate genuinely innovative product-based project ideas." Moist snuff was proposed as an alternative to cigarettes so as "[t]o capitalise on the potential downtrend of the smoking habit as the only means to achieve nicotine satisfaction by participating in a parallel product market free of social/health concerns and with attractive profitability." [Emphasis added.]

BATCO Group R & D. Research Conference. Rio de Janeiro, Brazil. August 22-26, 1983, at p. BW-W2-01838.

BATCO Group R & D. Nicotine Conference Outline. Southampton, England. June 6-8, 1984, at p. BW-W2-01977.

*Nicotine has well documented pharmacological action. It is claimed to have a dual effect, acting both as a stimulant and a tranquilliser. It is believed to be responsible for the "satisfaction" of smoking, using this term in the physiological rather than the psychological sense.*<sup>288</sup>

The proceedings to the 1983 BATCO Group R&D Research Conference in Rio de Janeiro state that:

*The basic assumption is that nicotine, which is almost certainly the key smoke component for satisfaction, is fully released to the body system before exhalation takes place. [Emphasis added].*<sup>289</sup>

A 1984 BATCO Nicotine Conference similarly concluded that:

*Intuitively it is felt that "satisfaction" must be related to nicotine. Many people believe it [is] a "whole body response" and involves the action of nicotine in the brain.*<sup>290</sup>

An RJR-MacDonald Marketing Summary Report from 1983 concludes that the primary reason people smoke "is probably the physiological satisfaction provided by the nicotine level of the product."<sup>291</sup>

The term "satisfaction" is also used by the smokeless tobacco industry to refer to the physiological effects of nicotine on the user. The senior vice president for marketing of the U.S. Tobacco Co. wrote in a memo on new product development:

*Flavorwise we should try for innovation, taste and strength, nicotine should be medium . . . Virtually all tobacco usage is based upon nicotine. "the kick."*

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<sup>288</sup> See Wood, note 287, *supra*, at p. 7.

<sup>289</sup> See BATCO Group R & D Research Conference, Rio de Janeiro, 1983, note 287, *supra*, at p. 10.

<sup>290</sup> See BATCO Conference Outline, 1984, note 287, *supra*, at p. BW-W2-01977.

<sup>291</sup> *RJR-MacDonald v. Canada*, 5.3 TPLR 4.26.

satisfaction. [Emphasis added.]<sup>292</sup>

These documents show that tobacco companies know that tobacco "satisfaction" is provided by nicotine's pharmacological effects on the brain and that the industry strives to offer products that meet this need.

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<sup>292</sup> Deposition of Per Erik Lindqvist, *Marsee v. U.S. Tobacco*, Civil Action No. 84-2777R (W.D. Ok. 1986). Transcript of Jury Trial Proceedings at p.1662. In: 1.7 TPLR 3.216.

## 2. Industry Research to Determine the Minimum and Maximum "Dose" of Nicotine Required by Consumers of Tobacco

The tobacco industry has focused extensive research efforts on methods to assay systemic nicotine absorption so that it may estimate nicotine doses obtained and required by smokers.<sup>293</sup> Tobacco company documents reveal that the primary purposes of these efforts are to better understand the relationship between nicotine dose and nicotine's pharmacological effects in smokers, and to establish the level of nicotine that must be provided in tobacco to produce these effects. Better knowledge of nicotine's dose-response effect in smokers results in a better understanding of how smokers respond to cigarettes with varying nicotine deliveries and how different doses of nicotine may affect smoker satisfaction.

As early as 1970, the tobacco industry had investigated and attempted to determine the

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<sup>293</sup> See e.g.:

BATCO. *Fate of Nicotine in the Body*. 1963.

BATCO R&D. *Relation Between 'Extractable Nicotine' Content of Smoke and Panel Response*. March 17, 1967.

BATCO R&D. *Nicotine in Smoke and Human Physiological Response*. March 26, 1970.

BATCO. *Relative Contributions of Nicotine and Carbon Monoxide to Human Physiological Response*. November 15, 1971.

BATCO Group R&D *Further Studies of the Effect of Nicotine on Human Physiological Response*. June 5, 1973.

*Proceedings of the BATCO Group R&D Smoking Behaviour-Marketing Conference*. Session I. July 9-12, 1984. Page 16 (slides).

See Ayres, note 172, *supra*.

BATCO Group R&D *Nicotine Studies: A Second Report. Estimation of Whole Body Nicotine Dose by Urinary Nicotine and Cotinine Measurement*. March 31, 1981. Page 3.

*Proceedings of the BATCO Smoking Behaviour-Marketing Conference, Session I (1984):21, slide at p. BW-W2-03243; Session II (1984):21, slide at p. BW-W2-02406.*

minimum level of nicotine necessary for consumer acceptance. At a BATCO R&D

Conference held that year, the conferees agreed that:

*Nicotine is important, and there is probably a minimum level necessary for consumer acceptance in any given market.*<sup>294</sup>

A 1972 Philip Morris document from a Council for Tobacco Research conference addressing why people smoke reveals the basis of the industry's concern about maintaining nicotine levels above a defined minimum:

*Despite many low nicotine brand entries into the marketplace, none of them have captured a substantial segment of the market. In fact, critics of the industry would do well to reflect upon the indifference of the consumer to the industry's efforts to sell low-delivery brands. 94% of the cigarettes sold in the U.S. deliver more than 1 mg of nicotine. 98.5% deliver more than 0.9 mg. The physiological response to nicotine can readily be elicited by cigarettes delivering in the range of 1 mg of nicotine. [Emphasis added.]*<sup>295</sup>

Similarly, the 1984 BATCO Group R & D Nicotine Conference concluded:

*Cigarettes which have a delivery of less than 0.7 mg of nicotine per cigarette as measured on a smoking machine, do not achieve large volume sales.*<sup>296</sup>

In Project Wheat, discussed in § II.C.1., *supra*, a 0.7 mg nicotine test cigarette was found to be unacceptable by smokers regardless of the smokers' relative nicotine requirements; the low-dose product was rejected by smokers with both high and low nicotine requirements.<sup>297</sup>

An internal Philip Morris document from 1978, detailing plans to study cigarettes wit

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<sup>294</sup> BATCO Group R&D *Summary Conclusions: Group Research Conference*. St Adele, Canada. September 11, 1970. Page 1.

<sup>295</sup> See Dunn, note 133, *supra*, at p. 4.

<sup>296</sup> BATCO Conference Outline, 1984, note 287 *supra*, at p. BW-W2-01977.

<sup>297</sup> See Project Wheat - Part 2, note 204, *supra*, at p. 47.

different levels of nicotine at a given tar level, shows that Philip Morris, too, conducted studies to find the minimum level of nicotine delivery necessary to satisfy smokers' need for nicotine:

*Question 4. Tar delivery delivery being the same, what are the behavioral consequences of smoking low nicotine rather than high nicotine cigarettes?*

*This question will be answered by conducting a series of shift studies using cigarettes of similar low tar but differential nicotine deliveries. The low nicotine delivery will ensure that the total nicotine in the system remains at or near the nicotine need threshold, thus maximizing the proportion of the day's cigarette consumption which is smoked out of need. . . .*

*The results may shed light on the manner by which nicotine control is achieved.<sup>297a</sup> [Emphasis added.]*

Demonstrating the industry's continuing interest in determining the minimum dose of nicotine that must be contained in a cigarette to provide satisfaction, the BATCO "Group R&D Research Programme, 1984: Proposed revisions for 1985-87," states that studies would be done by the industry

*to establish the minimum dose of smoke nicotine that can provide pharmacological satisfaction for the smoker. [Emphasis added.]<sup>298</sup>*

One key to identifying the minimum and maximum doses of nicotine was the development of a method to accurately measure nicotine in the human body. A 1976 Council for Tobacco Research Annual Report identifies a need for better methods to measure nicotine levels in human smokers:

*. . . an expansion of information on the actual ranges or durations of plasma nicotine levels attained by human smokers (and users of other forms of tobacco) under actual conditions of life should be attainable . . . Sensitive, specific and rapid assays for plasma nicotine and its major metabolites have*

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<sup>297a</sup> Memorandum to T.S. Osdene from W.L. Dunn. Plans and Objectives - 1979. December 6, 1978. In Cong Rec. H7670 (daily ed. July 25, 1995).

<sup>298</sup> See BATCO, note 280, *supra*, at p. 2.



*long been needed.*<sup>299</sup>

Another series of studies conducted by Philip Morris was designed to discover the relationship between the dose of nicotine provided by a cigarette, the level of nicotine in the bloodstream following that cigarette, and the length of time before the nicotine in the bloodstream fell to the point that the smoker experienced the urge for another cigarette. This required Philip Morris to develop an assay for nicotine and saliva and correlate salivary nicotine with blood nicotine:

*Our theorizing on the role of nicotine suggests that cigarettes will be smoked whenever body nicotine content drops below a certain (unknown) level. . . .*

*We are engaged in systematic investigation of the changes in salivary nicotine content as a function of the time since smoking and magnitude of intake . . . .*

*Assuming that salivary nicotine concentrations will reflect blood nicotine concentrations, we can then proceed to a fourth stage in the research, relating the easily obtained salivary concentrations to the urge to smoke.*<sup>299a</sup> [Emphasis added.]

A 1980 BATCO Group R&D study report, "Method for Cotinine and Nicotine in Blood and Urine," describes an improved analytical method for the simultaneous measurement of nicotine and cotinine (nicotine's major metabolite in man) in samples of blood and urine.<sup>300</sup>

<sup>299</sup> Report of the Council for Tobacco Research - U.S.A., Inc. Annual Report 1976. Page 12.

<sup>299a</sup> Memorandum to T.S. Osdene from W.L. Dunn. Plans and Objectives - 1980. January 7, 1980. In Cong Rec. H7672 (daily ed. July 25, 1995).

<sup>300</sup> Read GA, Anderson IGM. BATCO Group R&D *Method for Nicotine and Cotinine in Blood and Urine*. Report No. RD 1737-C. May 21, 1980. Page 12 (established and validated an assay for nicotine and cotinine in blood and urine that is sufficiently sensitive to determine changes in ". . . plasma levels of nicotine achieved in response to varying concentrations of or different dose levels of nicotine").

*See also New Cigarette Prototypes that Heat Instead of Burn Tobacco*. Winston-Salem, NC: R.J. Reynolds Tobacco Co. 1988:457-557. Comparative study of humans smoking the NEW CIGARETTE and a Reference Cigarette. (Compared nicotine pharmacokinetics in smokers smoking the New (heated tobacco) cigarette and a regular burning cigarette to determine whether the New cigarette provided a nicotine dose comparable to a regular burning cigarette. Researchers measured smokers' plasma and urine

The method was developed to better study the systemic effects of nicotine and the extent to which those effects influence smoking behavior and smoker satisfaction. The report states:

*In some instances, the pharmacological response of smokers to nicotine is believed to be responsible for an individual's smoking behaviour, providing the motivation for and the degree of satisfaction required by the smoker. [Emphasis added.]<sup>301</sup>*

*Naturally, during any study of the biological effect of nicotine it is of paramount importance to accurately assess the dose of nicotine absorbed. . . [Where the causal relationship between nicotine and individual biochemical, physiological or psychological responses are to be investigated, accurate information regarding nicotine dose is essential. [Emphasis added.]<sup>302</sup>*

A 1981 BATCO Group R&D study developed a rat model to estimate "whole body nicotine dose" by measuring urinary nicotine and cotinine levels. The researchers concluded that the model would likely be a good predictor of nicotine dose in humans and, therefore, would aid in understanding the relationship between nicotine delivery and smokers' choice of particular brands:

*These results strongly suggest that the whole body dose of nicotine can be predicted from urinary levels of nicotine and cotinine. The findings have immediate and obvious significance to both animal toxicity and human behavioural studies. They are particularly relevant to the development of an understanding of an individual smoker's daily nicotine requirement and the relationship between nicotine dose and smoking behaviour under conditions of brand switching/delivery modification. [Emphasis added.]<sup>303</sup>*

A presentation at a 1983 BATCO Smoking Behavior Conference describes how to

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concentrations of nicotine to compare nicotine doses.)

<sup>301</sup> See Read, note 300, *supra*, at p. 2.

<sup>302</sup> *Id.* at pp. 2-3.

<sup>303</sup> BATCO Group R&D *Nicotine Studies: A Second Report. Estimation of Whole Body Nicotine Dose by Urinary Nicotine and Cotinine Measurement*. March 3, 1981, at pp. 9-10.

design and execute a study of plasma cotinine as a function of cigarette nicotine delivery.<sup>304</sup>

It establishes that there is a linear relationship between plasma cotinine and nicotine delivery.

A session on "Nicotine Dose Estimation" at BATCO's 1984 Smoking Behaviour-Marketing

Conference was intended "to review the current status of plasma/urinary measures estimates

[sic] of nicotine dose and to identify the significance of those measures for the smoker and

product design." It was concluded that:

*[u]nder appropriate conditions plasma nicotine and cotinine measures can be used to estimate daily nicotine intake.*<sup>305</sup>

Using assay methods such as those discussed above, tobacco companies have

discovered that smokers obtain a fairly consistent dose of nicotine from tobacco. Moreover,

tobacco companies are aware that smokers obtain this dose to maintain a desired blood level

of nicotine throughout the day, and that achieving this dose results in smoker satisfaction.<sup>306</sup>

For example, following a presentation on the role of nicotine in smoking behavior at the 1976

BATCO Conference on Smoking Behavior, it was observed "that smokers may be people

suffering from a nicotine disorder and needed a certain dose level per day."<sup>307</sup> The speaker

agreed and referred to a Battelle study which found that the nicotine level of smokers

remained constant during the day, dropped during the night, and was restored to near its

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<sup>304</sup> Deines WH. BATCO. *Smoking Behaviour Conference: Overview*. 1983. (Attended by eight B&W employees). Page BW-W2-03280.

<sup>305</sup> Proceedings of the BATCO Smoking Behaviour-Marketing Conference, Session I. July 9-12, 1984. Montreal, Canada. Slide at p. BW-W2-02641, "Nicotine Dose Estimation."

<sup>306</sup> Proceedings of the BATCO Smoking Behaviour-Marketing Conference, Session I. July 9-12, 1984. Slides at pp. BW-W2-03243, BW-W2-03236: "whole body response: associated with satisfaction . . . [whether] dose of nicotine is adequate or inadequate."

<sup>307</sup> Proceedings of the BATCO Group R&D Smoking Behaviour-Marketing Conference. (Mrs. A.K. Comer, speaker.) Discussion on paper No. 2. October 1976. Southampton, England. Page BW-W2-02150.

daytime constant level by the first cigarette of the day.<sup>308</sup> The conferees then speculated that there may be a maximum dose of nicotine and that after this dose is achieved smokers may use cigarettes for reasons other than obtaining nicotine:

*A further question in this area was whether there is a maximum nicotine level in smokers and, when this has been achieved, does the smoker smoke for reasons other than to obtain nicotine?*<sup>309</sup>

A paper presented at the 1977 BATCO International Smoking Behaviour Conference concluded that smokers adjust their smoking rate, depending on psychological factors and even diet, to maintain a certain body nicotine content.<sup>310</sup>

Relying on plasma nicotine/cotinine measurements, a 1984 BATCO Nicotine Conference concluded that:

*[such] measurements can give reliable estimates of the nicotine uptake by groups of smokers, and with suitable precautions, by an individual smoker. Many smokers appear to obtain 12-14 mg of nicotine per day from their cigarettes.*<sup>311</sup>

A BATCO presentation from the 1984 BATCO Smoking Behaviour-Marketing Conference entitled "Current Status and Future Direction of Smoking Behavior Research" contains a discussion of whole body dose and whole body pharmacological properties of nicotine in relation to smoking satisfaction.<sup>312</sup> A chart accompanying the presentation plots a

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<sup>308</sup> *Id.* at p. BW-W2-02151.

<sup>309</sup> *Id.* at p. BW-W2-02151.

<sup>310</sup> BATCO International Smoking Behaviour Conference. Chelwood Vachery, England. 1977. Page 2.

<sup>311</sup> See BATCO Conference Outline, 1984, note 287, *supra*, at p. BW-W2-01977.

<sup>312</sup> Proceedings of the BATCO Smoking Behaviour-Marketing Conference, Session I. Montreal, Canada. July 9-12, 1984. Page BW-W2-03236.

24-hour nicotine blood level curve, with peaks representing the nicotine dose obtained from cigarettes smoked during the day. Each peak actually represents a series of smaller peaks that indicate the dose of nicotine delivered by each puff. Each puff is characterized as a "pulsed high concentration bolus dose of nicotine."<sup>313</sup>

The report states that among smokers there is broad consistency in the whole body nicotine doses obtained by different groups and types of smokers.<sup>314</sup> This is so despite the fact that smoking products have a wide range of nicotine deliveries and despite wide variations in smoking behavior, such as puff duration, puff intensity, puff volume, puff interval, and depth of inhalation. The report states that the fact that widely disparate smoking behavior nonetheless results in fairly consistent whole body nicotine doses (12-14 mg per day) across a broad range of smokers demonstrates that nicotine underlies smoking maintenance.<sup>315</sup> Smokers maintain a fairly consistent whole body dose or blood level and self-administer additional nicotine doses when total body nicotine dose declines due to metabolism of nicotine. Therefore, the report concludes, the dose of nicotine "probably provides the basis for smoking satisfaction"<sup>316</sup> as it restores the whole body dose to the desired level.

The smokeless tobacco industry has also investigated the dose of nicotine that is absorbed into the blood and bodies of smokeless tobacco users. Pharmacokinetic studies

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<sup>313</sup> *Id.* at p. BW-W2-03238.

<sup>314</sup> *Id.* at p. BW-W2-03241.

<sup>315</sup> *Id.* at p. BW-W2-03241-42.

<sup>316</sup> *Id.* at p. BW-W2-03242.

performed by the U.S. Tobacco Co. (UST) reveal that the researchers were interested in how much nicotine was absorbed into the body, how much was metabolized, and how fast nicotine and its metabolites were eliminated from the body. Documents admitted into evidence in a court case reveal that the company investigated the disposition profile of nicotine and its metabolite in both plasma and urine in naive and habituated users of tobacco snuff.<sup>317</sup> The study found no difference between these two populations. UST also performed a study to compare the pharmacokinetics of nicotine and its metabolites following administration of snuff and cigarettes.<sup>318</sup> According to a report of the study, the purpose of this research was to "delineate the similarities and differences in nicotine pharmacokinetics after acute and chronic use of smoked and smokeless tobacco products."<sup>319</sup>

The tobacco industry has also investigated the difference between minimum acceptable and optimum nicotine levels. Project Wheat was designed to test the assumption that the optimum level of nicotine might vary for different types of smokers. The study report concludes that the optimum nicotine delivery for U.K. male smokers is approximately 1.5 mg of nicotine. An earlier Imperial Tobacco study referenced in the Project Wheat report had similarly concluded that the optimum nicotine delivery for U.K. smokers was around 1.4 mg per cigarette and that stepwise reduction in nicotine delivery caused progressive rejection of

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<sup>317</sup> U.S. Tobacco Co. *Pharmacokinetics of Nicotine and its Major Metabolites in Naive and Habituated Snuff Takers*. Plaintiff's exhibit 3.27 from *Marsee v. U.S. Tobacco* (W.D. Ok. 1986) (Civil Action No. 84-2777R).

<sup>318</sup> U.S. Tobacco Co. *Results of Comparison of Routes of Nicotine Administration*. Plaintiffs exhibit 3.28 from *Marsee v. U.S. Tobacco*, note 317, *supra*.

<sup>319</sup> *Id.*

the 1.4-mg cigarette by consumers.<sup>320</sup>

These documents make clear that the industry is aware that tobacco products must deliver an adequate dose of nicotine, that there is a minimum dose below which the desired pharmacological effects of nicotine are not elicited, and that consumers will not accept a product that does not deliver an adequate dose of nicotine.<sup>321</sup>

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<sup>320</sup> See Project Wheat - Part 2, note 204, *supra*, at p. BW-W2-01721-2.

<sup>321</sup> Although currently marketed low-delivery products may "yield" less than the amount of nicotine shown in these industry documents to be the minimum accepted dose, machine measured yields may underestimate the amount of nicotine smokers actually obtain from cigarettes. See FINDINGS § I.C. at p. 112.

### 3. Industry Research on How Consumers "Compensate" to Achieve an Adequate Dose of Nicotine

When smokers are given cigarettes with a lower nicotine yield (as measured by a smoking machine), than their regular brands, they often "compensate" by smoking the cigarette more intensely, e.g., by taking larger or more puffs, or by smoking more cigarettes.<sup>322</sup> Tobacco company documents reveal that the industry recognizes both that smokers compensate and that the purpose of compensating behavior is to allow smokers to obtain a dose of nicotine that satisfies their physiological need for nicotine.<sup>323</sup> The industry's

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<sup>322</sup> See, e.g.:

Guyatt AR, Kirkham AJ, Baldry AG, Dixon M, Cumming G. *How Does Puffing Behavior Alter During Smoking of a Single Cigarette?* Pharmacol. Biochem. Behav. 1989;33(1):189-195.

Benowitz NL, Hall SM, Herning RI, Jacob P III, Jones RT, Osman AL. *Smokers of Low-Yield Cigarettes Do Not Consume Less Nicotine.* N. Engl. J. Med. 1983;309(3):139-142.

Memorandum from P.N. Lee to H.R. Bentley. *Tar Reduction and Nicotine Compensation.* July 19, 1979. Attached to the memorandum is a document that reviewed the existing scientific literature on smoking compensation prepared by Lee for the UK's Tobacco Advisory Council, July 19, 1979. The author concluded, at page 4, that:

*Taken together, the evidence above seems to indicate that a smoker, when switching to a brand with lower nicotine yield, will tend to 'compensate' mainly by altering inhalation patterns but partly perhaps by a small increase in consumption.*

<sup>323</sup> "Compensation" is acknowledged in the following documents, among others:

BATCO Group R&D Conference. *The Effect of Puff Volume on "Extractable Nicotine" and on the Retention of Nicotine in the Mouth.* Laboratory Report No. L.314-R. Southampton, England. August 21, 1969.

Creighton D, McGillivray LM. BATCO R&DE. *Relative Contributions of Nicotine and Carbon Monoxide to Human Physiological Response.* Report No. RD839-R. Southampton, England. November 15, 1971. Page 22.

Armitage AK. Some recent observations relating to the absorption of nicotine from tobacco smoke. In: Dunn WL, ed. *Smoking Behavior: Motives and Incentives.* Washington, DC: VH Winston & Sons; 1973:83:

*The human smoker can and does adjust the dose of nicotine he takes into his mouth very subtly, by adjusting either the size of his puff or the rate at which he puffs (this was shown very clearly by the elegant experiments of Ashton and Watson [1970], to which*



study of compensation by smokers provides compelling evidence that the industry knows that its market is based on nicotine dependence and that tobacco products are nicotine delivery systems.

Tobacco company researchers have repeatedly recognized the phenomenon of compensation and acknowledge that it occurs because smokers are seeking a specific dose of

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*Domino [this volume] referred); . . . and the smoke taken into the mouth can be inhaled very deeply, moderately deeply, slightly, or not at all.*

BATCO Group R&D Conference on Smoking Behaviour. October 11-12, 1976. Southampton. Table III. Page BW-W2-02251 (questions whether increase in CO can result when a smoker compensates for reduced nicotine delivery to the mouth.)

Thornton RE. BATCO Group R&D *Some "Benefits" of Smoking*. Report No. RD 1461. January 26, 1977.

Courtney JR, Comer AK. BATCO Group R&D *The Study of Human Smoking Behaviour Using Butt Analysis*. Report No. RD 1608. August 7, 1978.

Lee, note 322, *supra*.

Read G, Anderson IGM, Chapman RE. BATCO Group R&D *Nicotine Studies: A Second Report. Estimation of Whole Body Nicotine Dose By Urinary Nicotine and Cotinine Measurement*. March 31, 1981. Pages 9-10.

Proceedings of the BATCO Smoking Behaviour-Marketing Conference, Session III. July 9-12, 1984. Slides at p. BW-W2-02748-02750, 02754-02759.

*Id.* Koehn E. Potential of nicotine addiction. Page 64, BW-W2-02651.

*Id.* Pangritz D. Discussion (Minutes). Page 65, BW-W2-02647-02651.

R.J. Reynolds, note 300, *supra*, at pp. 479, 482-3, 490-2.

Tobacco Advisory Council. *Reduction in Sales Weighted Average Cigarette Brand Tar Yield: Problems Associated with the Suggestion to Achieve Further Stages According to a Fixed Timetable* (prepared by TAC for members of the Independent Scientific Committee on Smoking and Health) at p. 3:

*There are circumstances in which smokers, when switching to a brand with a reduced tar yield, will tend to 'compensate' whether consciously or subconsciously, if they find some aspect of a new cigarette less acceptable than that of their normal brand, in such a way as to restore to some extent the loss of satisfaction associated with the reduced tar yield itself, or associated with some inevitable consequence of the reduced tar yield, for example reduced nicotine yield. . . .*

nicotine from each cigarette. For example, Senior Philip Morris scientist William L. Dunn wrote to an outside researcher in 1975 that smokers compensate for reduced nicotine in cigarettes through a variety of techniques designed to increase the amount of nicotine that enters the bloodstream:

*The ultimate index [of nicotine consumption] is how much passes over into the bloodstream . . . We're now looking at the fate of the smoke entering the mouth; how much goes down, how much comes back out, and related behavioral events that we anticipate finding to be dose-regulating mechanisms of remarkable precision and sensitivity.*

*Thus to accommodate to the 15 percent reduction in available Marlboro nicotine, the smoker who was getting 50 percent of the available nicotine over into his blood from the Marlboro delivering 1.1 mg of nicotine into a smoking machine now must get 59 percent of what the current Marlboro offers him. He can take bigger puffs, or inhale more from the supply drawn into the mouth . . . or for more efficient extraction of the goodies, he can draw it in deeper or hold it longer.<sup>323a</sup> [Emphasis added.]*

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<sup>323a</sup> Letter to Stanley Schachter, Columbia University from William L. Dunn. September 8, 1975. *In Cong Rec. H7662* (daily ed. July 25, 1995).

*See also:*

Memorandum to T.S. Osdene from W.L. Dunn. Behavioral Research Accomplishments-1977. December 19, 1977. *In Cong Rec. H7666, supra:*

*[N]icotine compensation is a real phenomenon . . .*

In this report, the researchers describe a study confirming their hypothesis that "some people smoke for nicotine, and that these people try to obtain a relatively constant amount of nicotine from their cigarettes." The internal study showed that smokers they called "nicotine regulators" obtained more nicotine from their cigarettes following a period of deprivation than when allowed to smoke freely.

Dunn WL. 1600/Smoker Psychology/January 1-31, 1976 [Monthly Report]. February 10, 1976. *In Cong Rec. H7663, supra.* This report describes a new study being undertaken by Philip Morris "to identify nicotine regulators and non-regulators." The study design involved measuring "the daily nicotine intakes" of a group of smokers when allowed to smoke their own cigarettes, then measuring their nicotine intakes when given cigarettes with higher or lower delivery than their own brand:

*We want to find out if we can "force" our potential regulators to modify their puff volumes, inhalation volumes, and/or smoke retention times in order to obtain their usual nicotine dose.* [Emphasis added.]

Memorandum from W.L. Dunn to T.S. Osdene. Quarterly Report - January 1-March 31, 1975. March 25, 1975. *In Cong Rec. H7662, supra.* Reports on a Philip Morris study showing compensation behavior in smokers:

*Preliminary data suggest that more cigarettes are smoked and more puffs taken when the observations follow a two-hour deprivation period than following two hours when smoking is*

In 1984, the minutes of the BATCO Smoking Conference included the following summary of the researchers' discussion of compensation:

Compensation

*There are two general forms of compensation:*

- a) Number of cigarettes smoked eg. [sic] low tar smokers increasing consumption.*
- b) Puffing/inhalation regime eg. [sic] increasing or decreasing/puff volume, duration, puff frequency, amount inhaled.<sup>324</sup>*

The researchers further stated that:

*it is accepted that nicotine is both the driving force and the signal (as impact) for compensation in human smoking behaviour.<sup>325</sup>*

In fact, the tobacco industry is not merely aware of compensation behavior but has conducted extensive research on compensation. Company researchers administer cigarettes that deliver a range of nicotine doses to smokers and then measure the amount of nicotine

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*permitted.*

Dunn WL. 1600/Smoker Psychology/October 1-31, 1977 [Monthly Report]. November 11, 1977. *In Cong Rec. H7665, supra.* Philip Morris researchers describe a study on whether smokers who smoke many cigarettes out of "need" will demonstrate compensation behavior if given low nicotine cigarettes.

Memorandum to T.S. Osdene from W.L. Dunn. Plans and Objectives - 1980. January 7, 1980. *In Cong Rec. H7665, supra.* This document describes Philip Morris' development of specialized monitoring devices designed to determine whether smokers, when given cigarettes with different nicotine deliveries "regulate or 'titrate' the amount of nicotine taken up via inspiration of smoke."

<sup>324</sup> Brooks GO. Minutes from BATCO Group R&D Smoking Behaviour-Marketing Conference, Session III. July 9-12, 1984. Page 55.

<sup>325</sup> *Id.* at p. 56.

Later at the same conference, there was a discussion of a study showing that when given a cigarette with a significantly different yield than his own, a smoker will alter his puffing behavior but will not alter his inhalation pattern. To explain this phenomenon, "[d]elegates were reminded that a smoker extracts virtually all of the nicotine from the smoke even with a shallow inhalation. Therefore what has he to gain by deliberately inhaling more deeply?" *Id.* at p. 69.

actually absorbed by the smoker, per puff or per cigarette.<sup>326</sup> These studies show that smokers tend to obtain close to the same amount of nicotine from each cigarette, despite differences in yield as measured by the smoking machine. In a 1974 BATCO conference, researchers described the results of one such study:

*The Kippa study in Germany suggests that whatever the characteristics of cigarettes as determined by smoking machines, the smoker adjusts his pattern to deliver his own nicotine requirements (about 0.8 mg. per cigarette).*  
[Emphasis added.]<sup>327</sup>

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<sup>326</sup> See:

BATCO Group R&D Conference on Smoking Behaviour. Southampton, England. October 11-12, 1976. Page BW-W2-02253-85.

Adams PI. Research Dept., Imperial Tobacco Ltd. Changes in personal smoking habits brought about by changes in cigarette smoke yield. In: *Proceedings of the Sixth International Tobacco Scientific Congress*. November 1976. Pages 102-108.

BATCO, note 310, *supra*, at p. 2.

*Although conflicting results were presented, the prevailing view is that smokers do tend to compensate in some way when going from a high tar (nicotine) to a low tar (nicotine) cigarette, or vice versa. Studies have been carried out with high and low nicotine cigarettes, "anti-smoking" cigarette holders, and cigarettes with shortened tobacco sections.*

Pritchard WS, Robinson JH. The sensory role of nicotine in cigarette "taste", smoking satisfaction, and desire to smoke. As abstracted in: *International Symposium on Nicotine: The Effects of Nicotine on Biological Systems II*. Satellite Symposium of the 12th International Congress of Pharmacology. Montreal, Canada. July 21-24, 1994. Page 113.

See also:

Ashton H, Stepney R, Thompson JW. Self-titration by cigarette smokers. *British Medical Journal*. 1979;2:357-360.

<sup>327</sup> Notes on the BATCO Group R&D Conference at Duck Key, FL. January 12-18, 1974. (Attended by Hughes, Sanford, Esterle of B&W). Page 2.

See also Notes from the German presentation. BATCO Group R&D Conference 1979. Part I, February 5-9, 1979. Page BW-W2-03536:

*One of the interesting results from the KIPA studies is that cigarettes which vary from 1.1 - 0.4 mg nicotine by machine smoking are smoked by humans in the narrow range of 0.8 - 0.7 mg nicotine.*

At a 1984 conference, a BATCO researcher also reviewed several other studies indicating that when smokers are given cigarettes with higher or lower nicotine levels than their regular brands, they tend to adjust both the number of cigarettes they smoke and the way they smoke them to attain a steady dose of nicotine.<sup>328</sup> In support of this conclusion, the BATCO researcher presented a chart showing that between 1965 and 1975, as the machine-measured nicotine yield of cigarettes went down, the annual consumption of cigarettes per smoker went up.<sup>329</sup>

The researcher concluded that "increased consumption is related to reduced nicotine"<sup>330</sup> but that the relationship is not one-to-one. Instead, he found that a 10% reduction in nicotine resulted in a 1% rise in the number of cigarettes smoked, and a 50% reduction in nicotine resulted in a 10% rise in the number of cigarettes smoked.<sup>331</sup> As a result of this finding, he concluded that "most compensation must occur at the individual cigarette level,"<sup>332</sup> i.e., by altering the way the smokers smoked individual cigarettes. In fact, the data he presented showed that when smokers were given cigarettes with a range of nicotine yields, their nicotine intake from each cigarette hovered around the amount they took in from their regular brand rather than varying to the degree that would have been predicted from the

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<sup>328</sup> Proceedings of the BATCO Smoking Behaviour-Marketing Conference, Session III. July 9-12, 1984. Ferris. Pages BW-W2-02748 - 02750, BW-W2-02754 - 02759.

<sup>329</sup> *Id.* at p. BW-W2-02754.

<sup>330</sup> *Id.* at p. BW-W2-02755.

<sup>331</sup> *Id.*

<sup>332</sup> *Id.*

machine yields.<sup>333</sup>

Other tobacco company studies show similar results.<sup>334</sup> A report on research conducted by Philip Morris Europe in the early 1970's concluded that smokers tended to obtain the same amount of nicotine from a cigarette, regardless of the nicotine content of the cigarette or its machine-tested yield:

*The most frequent nicotine yield was 0.4 to 0.5 mg of nicotine per cigarette. This yield is not dependent upon the nicotine content of the tobacco and is not related to the nicotine yield under Coresta (machine) smoking conditions. The difference between nicotine yields obtained under standard laboratory procedures and yields obtained under "real" smoking conditions is explained by the existence of a compensation mechanism in the smoker. This compensation mechanism seems to be in operation for a proportion of the consumer population to adjust the nicotine yield to their needs or liking.*<sup>334a</sup>

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<sup>333</sup> *Id.* at p. BW-W2-02757. Ashton, Stepney, and Thompson (1979b). *Expected and observed nicotine intake in a brand-switching experiment.* (Chart.)

<sup>334</sup> *See:*

BATCO Group R&D Proceedings of the R & D Conference. Montreal, Canada. October 25, 1967. Page 4.

*The development of low TPM [total particulate matter], low nicotine cigarette should be expanded. This raises the question of the level of nicotine required and the consumer study by Bristol can be helpful in determining this . . . there was evidence that in Germany per capita cigarette consumption increased for the lower nicotine brands.*

Proceedings of the BATCO Group R&D Smoking Behaviour-Marketing Conference, Session I. July 9-12, 1984. Presentation slide BW-W2-03231. Under the heading *Brand Switching Down Delivery*, the chart provides a list of three "means to achieve a higher dose[:] . . . increase in puffing parameters, increase in numbers of cigs. smoked, more puffs taken."

Read GA. Internal v. external studies. Proceedings of the BATCO Smoking Behaviour-Marketing Conference, Session II. July 9-12, 1984. Page 19.

*The German butt analysis studies have indicated how smokers respond to reductions in machine smoked nicotine deliveries under natural smoking conditions. This observation of product oversmoking supports the laboratory findings of an increase in smoking behaviour parameters in subjects switched to lower delivery products.*

R.J. Reynolds, note 300, *supra*, at pp. 479, 482-3, 490-2.

<sup>334a</sup> Gustafson and Haisch. PME Research: 1972-1974. *In Cong Rec.* H7662 (daily ed. July 25, 1995).

[Emphasis added.]

Thus, the tobacco companies' own studies demonstrate that smokers use the cigarette as a nicotine delivery system and vary their smoking behavior to obtain a specific dose of nicotine.

#### 4. Industry Research and Knowledge of Tobacco Users' Inability to Quit

Tobacco companies are aware of the large number of smokers who have tried to quit using tobacco, and of the very small number who actually succeed. The evidence known to tobacco companies about smokers' unsuccessful attempts to quit shows that tobacco companies know that a large percentage of their market consists of people who demonstrate one of the characteristic features of addiction. See p. 81 et seq.

The great difficulty smokers experience when they try to quit was conceded by Joseph F. Cullman, III, the former chief executive officer of Philip Morris. Mr. Cullman was called as a witness in the Cipollone lawsuit and gave the following answers in response to questions from one of the plaintiff's attorneys:

*Q. But it is difficult [to quit]?*

*A. That's what it says here and I'm not disagreeing with it.*

*Q. They said it was very difficult. Do you agree with that?*

*A. I would say it's difficult.*

*Q. And it's difficult for the vast majority of smokers, you would agree with that, too, would you not?*

*A. That's a question of semantics. What's the vast majority? A lot of smokers have a hard time quitting [sic].*

*Q. Let's see, most smokers have a tough time giving up cigarettes?*

*A. Well, if they didn't, there would be many fewer smokers than there are today.<sup>335</sup> [Emphasis added.]*

Furthermore, internal Brown and Williamson documents reveal that the tobacco

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<sup>335</sup> Examination of Joseph Cullman, III, former chief executive officer, Philip Morris, Inc. *Cipollone v. Liggett Group, Inc., et al.*, Civil Action No. 83-2864 (SA)(D.N.J.). February 29, 1988. Afternoon Session. Transcript of proceedings, at pp. 3311-3314.



industry is extremely interested in rates of attempted and successful quitting, and keeps close track of these rates. At the 1984 BATCO Smoking Behaviour-Marketing Conference, attended by representatives from various BATCO companies, including Brown and Williamson, each of the participating companies was asked to fill out a questionnaire that asked how many smokers in their respective countries attempted to quit in each of the previous 5 years and how many actually quit (for as long as 6 months). Brown and Williamson's response to the questionnaire, which covered quitting rates in the United States, reported that, for the years 1981 through 1983, 32 million to 34 million Americans attempted to quit each year, while only 9 million to 10 million of those were able to quit for as long as 6 months.<sup>336</sup> Thus, Brown and Williamson's own data reveal that while almost half the total number of U.S. smokers attempted to quit each year, only about a third of those who tried to stop smoking were able to quit for as long as 6 months. These tobacco industry data suggest that at least one-third of U.S. consumers of cigarettes are purchasing cigarettes because they are unable to stop smoking.

In fact, data reported at the same conference showed that the percentage of smokers who continue to smoke even though they do not want to is much higher than suggested by 6-month data. Data from the Canadian tobacco company representatives indicated that rates of permanent quitting were well below quitting rates reported at 6 months. A Canadian participant reported to the assembled BATCO researchers that only 10% to 12% of those Canadian smokers attempting to quit succeeded for up to 1 year; less than 4% were able to

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<sup>336</sup> Proceedings of the BATCO Smoking Behaviour-Marketing Conference, Session I. July 9-12, 1984. Page BW-W2-03212. No figures were provided by B&W on attempts to quit for the years 1979 and 1980.

quit permanently.<sup>337</sup>

The presenter responsible for summing up the results of the conference questionnaire agreed that, while a large percentage of smokers do not want to smoke, most of those smokers feel compelled to continue to smoke:

*Although intentions and attempts to quit are relatively high (30-40% of smokers [in a given year]), the actual success rate of quitting is relatively low and stable.*<sup>338</sup>

It was thus well known to the participating companies that a very large percentage of their customers were smoking not out of choice but because they could not quit.

Other companies also understand that many of their consumers would like to quit but are unable to do so.<sup>339</sup> A Philip Morris researcher who studied a "cold turkey" campaign in

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<sup>337</sup> Proceedings of the BATCO Group R&D Smoking Behaviour-Marketing Conference. July 9-12, 1984. Session IV. Page BW-W2-03381. See also Session III at p. 83 (BW-W2-03379-03382). The researcher also presented data showing that while 22% of smokers claimed that they intended to "cut down," in fact "both the claimed and calculated rate of daily usage (21.6 and 25.6 [cigarettes] respectively) have increased since the introduction of lights." (BW-W2-02790, 03379, 033820). Other data reported at the same conference provided additional confirmation of the large percentage of smokers who would prefer not to smoke. A study on "Smoker Consonance-Dissonance Breakdown" was presented which showed that approximately 75% of smokers surveyed had attempted to quit, and approximately 60% were currently serious about quitting. Session III at p. BW-W2-03386.

See also, Larsen PS, Silvette H. *Tobacco Experimental and Clinical Studies: A Comprehensive Account of the World Literature, Supplement I*. (1968), Chapter 15; *Supplement II* (1971), Chapter 17; *Supplement III* (1975), Chapter 21, which contain discussions of surveys concerning smokers' desire to quit and difficulty in successfully quitting. This review was funded by the Council for Tobacco Research.

<sup>338</sup> Proceedings of the BATCO Smoking Behaviour-Marketing Conference, Session IV. July 9-12, 1984. Page 12.

<sup>339</sup> See:

R.J. Reynolds Tobacco Company, response to Citizen Petitions 94-0069/CP1 and 94P-0077/CP1. November 2, 1994. Pages 66-69.

RJR-MI Brand Group and Ogilvy & Mather (Canada) Ltd. *Vantage Brand Positioning Statement*. 1979. Page 80041:

*B. User Image*

*Primarily female, white collar, extremely concerned about their health, and would like to*

the small Iowa town of Greenfield in 1969 reported that those who succeed in quitting smoking over the long term are a much smaller group than those who would like to quit and who attempt to quit.<sup>340</sup> The researcher cited the findings of Hunt and Matarazzo<sup>341</sup> in proposing that most attempts to quit smoking are not long-lasting: "[I]n summarizing many reports of long-term quitting using various techniques, [the authors] show that the percentage of nonrecidivists [successful quitters] decreases as a function of time . . . in a negatively accelerated fashion."<sup>342</sup> The Philip Morris researcher found that in Greenfield only 28% of those smokers who agreed to quit as part of the cold turkey campaign were still not smoking after 7 months. The researcher then observed that the small number of Greenfield residents who managed to stay off cigarettes for more than 7 months was, based on other published reports of success rates for quitting smoking, about average.<sup>343</sup>

The researcher also described findings that revealed in part why it is so hard for smokers to quit. He reported that smokers who quit for more than 7 months continued to

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*quit smoking.*

Kwechansky Marketing Research for Imperial Tobacco Ltd. *Project 16*. October 18, 1977. Page vi.

Kwechansky Marketing Research for Imperial Tobacco Ltd. *Project Plus/Minus*. May 7, 1982. Page i.

<sup>340</sup> Ryan FJ. Philip Morris Research Center. Cold turkey in Greenfield, Iowa: a follow-up study. In: Dunn WL, ed. *Smoking Behavior: Motives and Incentives*. Washington, DC: VH Winston & Sons; 1973:231-241.

<sup>341</sup> *Id.* at p. 233.

<sup>342</sup> *Id.* at p. 233.

<sup>343</sup> Ryan FJ. Bird-I. A study of the quit-smoking campaign in Greenfield, Iowa, in conjunction with the movie, *Cold Turkey*. Appendix 1, p. 1000348712. The author also appended to the unpublished version of this report excerpts from internal company memos, pointing out that although the cold turkey campaign in Greenfield was as intense an anti-smoking effort as could be imagined, "carton sales at the Super Value store have shown a strong increase since the dog days of August."

suffer a variety of adverse effects related to quitting, including weight gain, restlessness, depression, ill-temper, constipation, nervous mannerisms, and loss of energy.<sup>344</sup> These are some of the classic symptoms of nicotine withdrawal, described earlier.<sup>345</sup>

Market research documents also show that tobacco companies have conducted research in quitting behavior and have documented the reasons why people quit and why they fail to quit, despite a desire to do so.<sup>346</sup> A market research firm reporting on a survey of smokers' views about the health implications of smoking observed that:

*a minority expresses a resentment about the addictive aspects of smoking. Being "out of control," unable to quit causes them to feel somehow unworthy . . . Nicotine is usually singled out as the culprit here. However, even these smokers would be reluctant to give up the satisfaction elements in smoking. So they are in a quandry [sic]."*<sup>347</sup>

Another market research firm reported its findings about the inability of young smokers to quit when they want to:

*However intriguing smoking was at 11, 12 or 13, by the age of 16 or 17 many regretted their use of cigarettes for health reasons and because they feel*

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<sup>344</sup> See Ryan, note 340, *supra*, at p. 234.

<sup>345</sup> See FINDINGS § I.B., *supra*.

<sup>346</sup> See e.g. The Creative Research Group. *Project Viking, Vol. III: Product Issues*. Prepared for Imperial Tobacco Ltd., Feb/Mar 1986.

Kwechansky Marketing Research for Imperial Tobacco Ltd. *Project Plus/Minus*. May 7, 1982. Pages 41-51.

<sup>347</sup> The Creative Research Group. *Project Day-Exploratory Phase in Edmonton*. Prepared for Imperial Tobacco Ltd. August 1988. Page 11.

See also Market System, Inc. *Project Eli Focus Groups Final Report*. Prepared for Imperial Tobacco Ltd. July, 1982. Page 5. Smokers refer to smoking as "satisfying a craving."

*unable to stop smoking when they want to.*<sup>348</sup>

The fact that many smokers smoke even though they do not enjoy smoking is conceded in a candid marketing research document prepared for Imperial Tobacco Ltd., which reported that it is particularly difficult to sell cigarettes by "trading on the positives" because the industry is "vexed by the unique problem that users of the category do not necessarily like the product."<sup>349</sup> Another document reports that many smokers of ultra-low tar and nicotine cigarettes want to quit and "refer to their behavior in terms of 'satisfying a craving' while smokers of stronger cigarettes talk about taste and satisfaction."<sup>350</sup>

In summary, the tobacco companies' data show that users find it extremely difficult to quit smoking and that many tobacco users would quit if they could. Their data also show that, of those smokers who try to quit, only a small percentage succeed permanently. Consequently, tobacco manufacturers are aware that the large percentage of their customers who try to quit but fail continue to buy and use tobacco products, in large part to satisfy their dependence on nicotine-containing tobacco. Use of tobacco to satisfy nicotine dependence is

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<sup>348</sup> See Kwechansky Marketing Research. *Project 16*, note 339, *supra*, at p. vi.

See also Kwechansky Marketing Research. *Project Plus/Minus*. May 7, 1982. Study Highlights. In a follow-up study, the same market research firm reported the following results:

*The desire to quit seems to come earlier now than before, even prior to the end of high school....However, the desire to quit, and actually carrying it out, are two quite different things, as the would be quitter soon [sic] learns...*

According to a report in *Newsday*, a 1957 "motivation survey" prepared for Liggett on smoker attitudes about smoking amid growing health concerns contained the following statement:

*What smokers are really saying is: 'I wish I had never started to smoke . . . but now that it's got me, I know that I can't stop.'*

Riley J. Smoke-Trial Documents Make Titillating Reading. *Newsday*. July 19, 1988.

<sup>349</sup> See The Creative Research Group Ltd., note 346, *supra*, at p. 64451.

<sup>350</sup> See Market System Inc., note 347, *supra*, at p. 5.

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**a use that affects the structure or function of the body.**