

General information

The tobacco industry is made up of many companies that make and sell different types of tobacco products. Whether it is smoked, chewed, sniffed or inhaled second-hand, the use of these tobacco products can and does cause debilitating and life-threatening diseases, as well as premature death. The cigarette is the single most commonly used tobacco product in the European Union (EU). Most people are aware that smoking cigarettes is harmful, as thousands of compounds are produced and released in the smoke, some of which (hundreds) are toxic. But what people may not be aware of is that most tobacco manufacturers add ingredients other than tobacco to cigarettes that affect the chemical make-up of the smoke. These ingredients are known as tobacco additives and are reportedly used, for example, to:

- give a cigarette a particular flavour;
- control the way the cigarette burns;
- keep the tobacco moist thus preventing it from drying out.

To some people, the reasons for adding these substances to a consumer product may appear perfectly reasonable. They may argue that this is not necessarily a bad thing as it makes for a better consumer experience. However, helping people to better tolerate and enjoy a product like cigarettes, which is well known to be toxic and carcinogenic, is an entirely different issue and a matter of great concern.

Additives can make cigarettes more attractive by disguising some of the undesirable effects of inhaling burnt tobacco. For example, they:

- mask the bitter taste and harsh smell of the smoke that is inhaled;
- make the inhaled smoke milder, reducing the irritation of the airways (which essentially silences any warning that the smoke is dangerous);
- turn the ash and smoke white;
- improve the appearance of cigarettes.

Ultimately, by using additives, tobacco manufacturers encourage cigarette use in people who may otherwise be deterred from smoking due to the unfavourable characteristics of raw tobacco. The more pleasant the cigarette, the easier it is for a smoker to sustain their habit, and therefore the more likely it is that they could become addicted.

Studies have also shown that burning tobacco additives can result in the formation of harmful compounds. However, it is very difficult to consider the effects of a single additive in isolation due to the overall combined effect of all the chemicals present in the tobacco smoke. Moreover, the burnt derivatives of some additives are also known to indirectly boost the effects of nicotine on the brain (nicotine being the main reason why people become addicted to smoking).

Despite this, the tobacco industry is allowed to use additives and continues to do so, on the basis that they have been considered safe for use in food or cosmetics by relevant regulatory authorities. However, this is not a sufficiently scientific basis upon which to justify their use in tobacco products. This is because people do not generally consume/use these food and cosmetic products in a state where the additives are burnt (from being exposed to very high temperatures) and then inhaled. In food and cosmetic goods, consumers are exposed to these additives in a completely different way to how they would be exposed to them through smoking tobacco products. Therefore, these additives should not be considered to have comparable effects on the body when consumed in this way. Furthermore, the fact that these additives can make tobacco products more attractive and increase their use is particularly concerning given the toxic and addictive nature of tobacco products.

Tobacco manufacturers also market 'natural' or 'clean' cigarettes that reportedly have no chemicals or additives. However, potential consumers of these cigarettes are reminded that there is no such thing as a safe cigarette, because the smoke that is produced still contains carcinogens and other toxic compounds that come from the tobacco itself.

Take home message:

Tobacco manufacturers make cigarettes more attractive, which encourages their use, and makes it easier for anyone smoking to become addicted.

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This fact sheet on the tobacco additive 2-Furfural has been created by the National Institute for Public Health and the Environment (RIVM), Bilthoven, the Netherlands. It is part of a series of 14 fact sheets on tobacco additives written in the context of the EU project Public Information Tobacco Control

(PITOC). The fact sheets aim to inform the public on the general uses, tobacco industry uses and harmful health effects of selected tobacco additives.

Seven of these fact sheets have been created by the RIVM, and seven by the German Cancer Research Center, (DKFZ), Heidelberg, Germany. The introduction is a common product. The electronic versions of the fact sheets can be found on the RIVM website www.tabakinfo.nl (sugars, sorbitol, propylene glycol, glycerol, ammonium compounds, cocoa, furfural and acetaldehyde) and the DKFZ website <http://www.dkfz.de/de/tabakkontrolle> (menthol, carob bean, cellulose fibre, prune juice, vanillin, guar and licorice).

Additives in Tobacco Products

2-Furfural

Additives are substances intentionally added to tobacco products by tobacco industry in order to render toxic tobacco products palatable and acceptable to consumers.

2-Furfural is a compound that is naturally derived from agricultural food items such as oat, and wheatbran. It has an odour and taste that is described as sweet, woody, bready, and caramel-like.

General uses

Due to the desirable flavour characteristics of 2-furfural, it is widely used as a flavour ingredient in a variety of food products and beverages.

Reported tobacco industry uses

2-furfural is naturally present in tobacco leaves, and is primarily released in tobacco smoke when a cigarette is burnt. It is also produced when other tobacco additives (such as sugars and sorbitol) are burnt.

The smoke that is inhaled from smoking a single cigarette (i.e. mainstream smoke) contains about 12 microgram of 2-furfural .

The odour and taste of 2-furfural makes it an obvious choice as a flavour ingredient for tobacco products. However, there is currently a lack of available information on tobacco manufacturers' use of 2-furfural as a flavour enhancer. In the Netherlands, only one manufacturer has reported adding 2-furfural to cigarettes to enhance the flavour of their tobacco product. When used as a tobacco additive, 2-furfural is reported to comprise 0.03% of the total weight of the tobacco used in one cigarette.

Harmful health effects

2-Furfural is a very reactive compound and is known to irritate the airways of people exposed to high levels for a long period of time. However, at the levels present in tobacco smoke, 2-furfural is not likely to cause irritation. It is not clear whether 2-furfural reacts with other compounds in smoke.

There is currently no evidence from any studies to suggest that exposure to 2-furfural in cigarette smoke could cause cancer in humans. There is however evidence that 2-furfural speeds up the development of cancers caused by other compounds that are present in tobacco smoke.

It is not yet known whether the presence of 2-furfural in tobacco smoke makes cigarette smoking more attractive. Equally, there are no reports available to suggest that 2-furfural increases the likelihood of a person becoming addicted to smoking cigarettes.

Additives in tobacco products e.g. 2-Furfural



can **increase**

- attractiveness,
- addictiveness and
- toxic emissions

therefore **increase**
smokers' exposure
to toxic smoke
emissions

Increase

- health risk,
- cancer risk,
- morbidity and
- mortality

**Lifetime smokers
lose an average of
14 years of life**

Smokers die younger

http://ec.europa.eu/health/tobacco/law/pictorial/index_en.htm