

Additives in tobacco products

Cellulose Fibre

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

Cellulose fibre is the basic structural material of most plants, and can be obtained from various natural plant-based sources such as wood pulp, cotton, flax and hemp.

General use

Cellulose fibres are used to make many different products that include paper, textiles, and cardboard. The cellulose that makes up these fibres (or a modified version) is also used in the food industry as anti-caking agents, emulsifiers, formulation aids, stabilizers, thickeners and texturizers, and also in the pharmaceutical and cosmetic industries where it performs similar roles.

Reported tobacco industry uses

The tobacco part of most cigarettes (i.e. the shredded brown interior) is a mixture of the tobacco leaf and a paper-like product called 'reconstituted tobacco'. Reconstituted tobacco is made up of mashed tobacco stems and other parts of the tobacco leaf that would otherwise be discarded. Tobacco manufacturers add cellulose fibre to help bind and fill this reconstituted tobacco in cigarettes.

Tobacco manufacturers also use cellulose to prepare both the cigarette paper that wraps the tobacco, and the filter (both the inner and outer layers). The cigarette paper is a very important part of a cigarette. It controls how the tobacco burns, and the amount of smoke. Generally, the more cellulose used the greater the amount of smoke that is produced.

Cellulose fibres are naturally present in tobacco (at levels ranging from about 5 % to 12 %). The maximum amount of

cellulose fibres that is further added is about 6 % of the total weight of the tobacco used in one cigarette.

Harmful health effects

Cellulose Fibre is generally regarded as safe for use in food and cosmetics. However, this does not suggest it is safe when inhaled from smoking cigarettes. The entire cellulose fibre added to the cigarette is burnt while smoking. Many harmful compounds are formed that can either irritate the eyes and upper parts of the airways (e.g. acrolein), or cause cancer, such as polycyclic aromatic hydrocarbons, benzo[a]pyrene, benzene, furan, and formaldehyde. These compounds have been classified as human cancer-causing agents by the International Agency for Research on Cancer, (a leading expert cancer organisation).

The use of cellulose fibres may be indirectly harmful due to the formation of compounds called aldehydes (e.g. acetaldehyde), which can make cigarettes more addictive by enhancing the addictive potential of nicotine. Aldehydes are very reactive and produce other compounds such as the substance harman, which can also make cigarettes more addictive due to its mood-enhancing effect on the brain. This can ultimately lead to more cigarettes being smoked and thus greater exposure to the toxic substances in cigarette smoke.

In some products, flavours such as vanilla are added to cellulose during the paper-making process. This ensures that the smell of the smoke coming from the lit end of the cigarette (i.e. sidestream smoke) has a more pleasant aroma. This is a concern because not only could it allay any potential worries smokers may have about their habit but it could also increase non-smokers tolerance to sidestream smoke, and thereby increase their exposure to second-hand smoke.

Additives in tobacco products e.g. cellulose fibre



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

Additives in tobacco products

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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Author: Dr. Urmila Nair

This fact sheet on the tobacco additive *cellulose fibre* has been created by the German Cancer Research Center (DKFZ), Heidelberg, Germany. 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 German Cancer Research Center (DKFZ), Heidelberg, Germany, and seven by the National Institute for Public Health and the Environment (RIVM), Bilthoven, the Netherlands. The introduction (or rather the general information) is a common product. The electronic versions of the fact sheets can be found on the DKFZ website <http://www.dkfz.de/de/tabakkontrolle> (carob, cellulose, guar gum, liquorice, menthol, prune juice and vanillin) and the RIVM website <http://www.tabakinfo.nl> (2-furfural, ammonium compounds, cocoa, glycerol, propylene glycol, sorbitol and sugars; additionally, a fact sheet on the tobacco smoke compound acetaldehyde is available).



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