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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This fact sheet on the tobacco additive *sugars* 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).

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Ministry of Health, Welfare and Sport

dkfz.
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Sugars

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

Sugars occur naturally in all plants and animals and are used as a source of energy as well as to produce other biologically important molecules.

General uses

Sugars are generally used in the food and drink industry as sweeteners.

Reported tobacco industry uses

Tobacco manufacturers add sugars to tobacco to improve the flavour of tobacco, and to help the tobacco bind together and stay moist. Examples of the sugars added to tobacco include glucose, fructose and sucrose.

The sugars naturally present in tobacco can comprise up to 20% of the total weight of tobacco. However, this amount varies according to the method used to process the tobacco. The amount of sugar that is intentionally added to tobacco can make up as much as 4.0% of the total weight of the tobacco used in one cigarette. This makes sugars one of the most predominant additives in tobacco. In The Netherlands, manufacturers report that the average level of sugar added is 1.3% of the total weight of tobacco used in one cigarette (and can be as high as 3.9%).

Other tobacco additives that also contain high amounts of sugars, (and thus may contribute to the overall sugar content of tobacco) include fruit juices, honey, corn, caramel and maple syrup.

Harmful health effects

Most of the sugars in tobacco are completely burnt when a cigarette is smoked and several compounds are formed. These include a group of compounds known as aldehydes, which are known to either irritate the throat (e.g. acrolein and furfural) or be linked to cancer in humans (e.g. acetaldehyde and formaldehyde). The International Agency for Research on Cancer (IARC) is an expert cancer organisation, and has classed acetaldehyde as a compound that possibly causes cancer in humans, while formaldehyde has very strong evidence of causing cancer in humans.

Some cigarette studies show that cigarettes with high sugar content produce higher levels of acetaldehyde when burnt. Acetaldehyde may enhance the addictiveness of cigarettes due to the actions of one of its reaction products, harman, on the brain. Harman is believed to behave in a similar way to anti-depressant drugs by improving a person's mood. This means that smoking dependence could be stimulated by the mood-enhancing effects of harman in cigarettes. Acetaldehyde is also thought to increase the addictiveness of cigarettes by boosting the addictive potential of nicotine. Therefore, in this way the use of sugars may be indirectly harmful, which can ultimately lead to more cigarettes being smoked and therefore greater exposure to the toxic chemicals in cigarette smoke.

Furthermore, when the sugars in tobacco are burnt, acids are formed that make it more difficult for the nicotine in the smoke to reach the brain. This can cause smokers to increase the number of puffs they take, and force them to inhale more deeply to get more nicotine from the cigarette.

Adding sugars to cigarettes (or selecting tobaccos that are naturally high in sugar) also disguises the bitter taste of the tobacco smoke, and helps to make the smoke less harsh and more tolerable to the smoker. This produces a more palatable and attractive product that encourages greater use, which is particularly concerning given that the sweet caramel flavours produced from the burnt sugars, appeal to young people and can make it easier for them to start smoking.

Additives in tobacco products e.g. *sugars*

can **increase**
- attractiveness,
- addictiveness and
- toxic emissions

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

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

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