

Carob Bean Extract and Gum

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

Carob, which is also referred to as the carob pod or carob bean, is the fruit of the evergreen carob tree. Each carob pod contains seeds that sit in the pod's pulp. The pulp is rich in sugars and therefore is naturally sweet and tastes and looks like chocolate. It can be ground into fine powder or used in the form of an extract. The seeds also provide a source of gum.

General uses

Carob bean extract and gum have many uses, especially in the food and flavouring industry where it is used as a chocolate or cocoa substitute, or as a thickener and food stabiliser. It is also used in non-food industries such as the textile, cosmetic, and pharmaceutical industry.

Reported tobacco industry uses

Carob bean extract and gum are used as a flavouring material in commercial cigarettes. It imparts a sweet and nutty taste that enriches the smoke flavour. The extract and gum is applied to either the filter or the tobacco and makes up to 0.2 % of the total weight of the tobacco used in one cigarette.

Harmful health effects

Carob bean is generally regarded as safe for use in food and cosmetics. However, this does not suggest it is safe when inhaled from smoking cigarettes. Almost the entire carob bean extract and gum that is added to the cigarette

is burnt while smoking. This results in the formation of several harmful compounds, such as benzene. The sugars that are present in the extract can produce compounds such as polycyclic aromatic hydrocarbons, and formaldehyde. These breakdown products of sugars have been classified as human cancer-causing agents by the International Agency for Research on Cancer (a leading expert cancer organisation).

The sugars also produce acidic compounds, which make it harder for the nicotine in the cigarette smoke to reach the brain. This forces smokers to inhale deeper, and consume more cigarettes to get their nicotine fix. Furthermore, the use of carob bean extract and gum 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.

The addition of carob bean extract and gum to cigarettes help mask the naturally harsh and irritating nature of tobacco smoke by making it more pleasant and milder. In doing so, this essentially silences the body's natural cough response, which would warn that the smoke is dangerous. The flavour and attractiveness of smoking is also enhanced by the caramel flavours that are produced when the sugars are burnt.

Overall, by adding more desirable flavours such as carob bean extract and gum to cigarettes, tobacco manufacturers make it easier for smokers to become addicted. This can ultimately lead to more cigarettes being smoked and thus greater exposure to the toxic substances in cigarette smoke.

Additives in tobacco products

e.g. carob bean extract



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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This fact sheet on the tobacco additive *carob bean extract and gum* 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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