Tobacco additives: The increased health risk

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International consensus: Ban on or regulation of all tobacco additives

WHO Framework Convention on Tobacco Control (FCTC)
Articles 9 and 10

Partial guidelines for implementation of Articles 9 and 10 of the WHO FCTC
More than 600 additives are used in cigarette production.

„Ingredients are indeed used to make cigarettes more palatable, and to reduce harshness and irritation.“

(House of Commons Health Committee, Memorandum by BAT

“The Tobacco Industry and the Health Risks of Smoking“, 1999)
Examples of tobacco additives

Sugars

- Improves taste
- Decreases harshness
- Increases palatability
- Binder
- Humectant

For example:
- Glucose
- Fructose
- Saccharose
- Molasses
- Fruit juices
- Honey

Combustion (high temperatures):
- Formaldehyde
- Acetaldehyde
- Acrolein
- Acetone

Caramelisation:
- 2-Furfurylmethanol
- 2-Furfurylmethanal

Maillard reaction (reaction of reduced sugars with amino acids):
- Acrylamide

Carcinogenic

Possibly genetically harmful
Menthol

- Cooling effect
- Pain-relieving and slightly numbing effect
- Desensitization to nicotine response, tolerance and longer exposure to nicotine
- Inhibition of nicotine metabolism*
- Increased absorption of tobacco smoke components into the lung
- Inhibition of breakdown of carcinogenic substances*

*possible

German Cancer Research Center, 2012
Liquorice examples of tobacco additives

- balances flavour of tobacco
- sweetens smoke

combustion

- carcinogenic substances (benzene)
- possibly carcinogenic substances (acetaldehyde)
- toxic substances (toluene, phenol)
- aldehydes

transformation

- increases palatability

facilitates initiation

contributes to toxicity and carcinogenicity of tobacco products

Harman (mood-enhancing)

facilitates addiction

PITOC 2012, German Cancer Research Center 2013
Examples of tobacco additives

Additives without flavour

• binders
  (guar gum: combustion → carcinogenic substances)

• humectants (moisturing agents)
  (glycerol, sugar: combustion → carcinogenic substances)

• colouring agents
  (azo dyes: tartrazine (yellow): carcinogenic)

PITOC, http://www.dkfz.de/de/tabakkontrolle/PITOC_Additives_in_Tobacco_Products.html;
Deutsches Krebsforschungszentrum (Ed.): Increased Health Hazards due to Additives of Tobacco Products – Consequences for Product Regulation. Heidelberg 2005
Tobacco products with characterising flavours

Only a small market!
Big market: Mix of many additives

- flavours in very low amounts
  "Ingredients are indeed used to make cigarettes more palatable, and to reduce harshness and irritation." (BAT, 1999)
  facilitation of initiation and maintenance of smoking

- interaction and synergistic effects of additives
  mixture of small amounts of several additives can have similar effects as bigger amounts of single additives

- many additives produce carcinogenic substances on pyrolysis:
  no harmless threshold levels for additives
New technologies

- enhance attractiveness
- capsule can be filled with any additive

Suitable flavors or flavorings include, but are not limited to, menthol, mint, such as peppermint and spearmint, chocolate, licorice, citrus and other fruit flavors, gamma octalactone, vanillin, ethyl vanillin, breath freshener flavors, spice flavors such as cinnamon, methyl salicylate, linalool, bergamot oil, geranium oil, lemon oil, ginger oil, and tobacco flavor. Other suitable flavors may include flavor compounds selected from the group consisting of an acid, an alcohol, an ester, an aldehyde, a ketone, a pyrazine, combinations or blends thereof and the like. Suitable flavor compounds may be selected, for
What should be done?

Ban of all additives that may enhance the palatability, smoothness and attractiveness of tobacco products

Why?

• to protect youth from initiation

• to support smokers to quit smoking
Revision of the EU Directive 2001/37/EC

What should be done?

Ban of all additives that are carcinogenic in unburnt or burnt form

Why?

• to protect consumers
• to reduce morbidity and mortality
What should NOT be done?

Set maximum levels for any additives

Why?

• no reliable methods to define a threshold level for distinctive taste
• many interactions between additives with synergistic effects on palatability, smoothness and inhalation
• ban is needed on additives that enhance palatability, smoothness and attractiveness of tobacco products

• ban is needed on additives that are carcinogenic in unburnt or burnt form

• manufacturers and importers must prove that any additive they want to use is harmless