

Snus, a harmful tobacco product

Background

In the European Union, tobacco products are regulated by the Directive „on the approximation of the laws, regulations and administrative provisions of the Member States concerning the manufacture, presentation, and sale of tobacco products“ (2001/37/EG)¹⁷. An important aim of Directive 2001/37/EC is the improvement of the health protection of the citizens. With regard to health protection, the Directive, amongst others, prohibits the placing on the market of tobacco for oral use. This is also valid for snus.

With regard to the concrete measures for the revision of Directive 2001/37/EC, which have been enumerated by the European Parliament and the European Commission, the German Cancer Research Center urgently recommends the adoption of mandatory legislation for all Member States that will guarantee a better protection of youth and consumers from the health hazards of tobacco. Such a legislation will, amongst others, continue to prohibit the placing on the market of smokeless tobacco products, including Swedish snus, because these products are harmful to health.

Snus is harmful to health

Swedish snus is an oral tobacco product that is placed between the lip and gum. It consists of finely ground tobacco, mixed with flavours, salt, water, humectants and chemical buffering agents. It is available loose and portion packed, both in different flavour varieties.

▪ Smokeless tobacco products contain nicotine and cause addiction

Snus and other smokeless tobacco products contain nicotine that cause dependence⁷. Overall, smokeless tobacco products and snus deliver similar amounts of nicotine as cigarettes^{5,22}. During the course of a day users of smokeless tobacco absorb on average a similar amount or even higher quantities of nicotine than cigarette smokers⁶.

Users of smokeless tobacco develop dependency similar to that of smokers⁵. Young people who consume snus experience similar, if not higher nicotine dependence and withdrawal symptoms compared to cigarette smokers³⁰. Accordingly, for the consumers of oral tobacco cessation is difficult¹³.

▪ Smokeless tobacco products contain carcinogens and toxic substances

Around 28 carcinogens have been identified in smokeless tobacco products²³. The major and most abundant carcinogens are the highly carcinogenic tobacco-specific *N*-nitrosamines, which are present in different concentrations depending on the type of product. In addition, smokeless tobacco contains volatile *N*-nitrosamines, form-

aldehyde, benzo[*a*]pyrene, heavy metals, polonium-210, uranium-235 and -238, and other carcinogens^{20,23}.

Nicotine is a neurotoxin and may cause symptoms of poisoning such as nausea and impaired respiration and can ultimately lead to respiratory arrest resulting in death^{18,19}. Nicotine doses of 0.8 to 1.0 mg/kg body weight are considered to be lethal. In children, as little as one milligram of nicotine can produce symptoms of poisoning¹⁹.

▪ Smokeless tobacco products cause serious diseases that may be lethal

The carcinogenic substances in smokeless tobacco products can cause pancreatic cancer^{1,8,9,26}, oral cancer³¹ and oesophageal cancer⁹. Smokeless tobacco products, including snus, cause periodontitis, dental caries, tooth loss^{14,21,24}, gingival recession^{3,11}, premature birth, and preeclampsia (pregnancy-related high blood pressure)^{15,16}. Some scientific evidence suggests that consumption of smokeless tobacco may be associated with cardiovascular disease^{4,10}, diabetes and the metabolic syndrome²⁸ (Fig. 1).

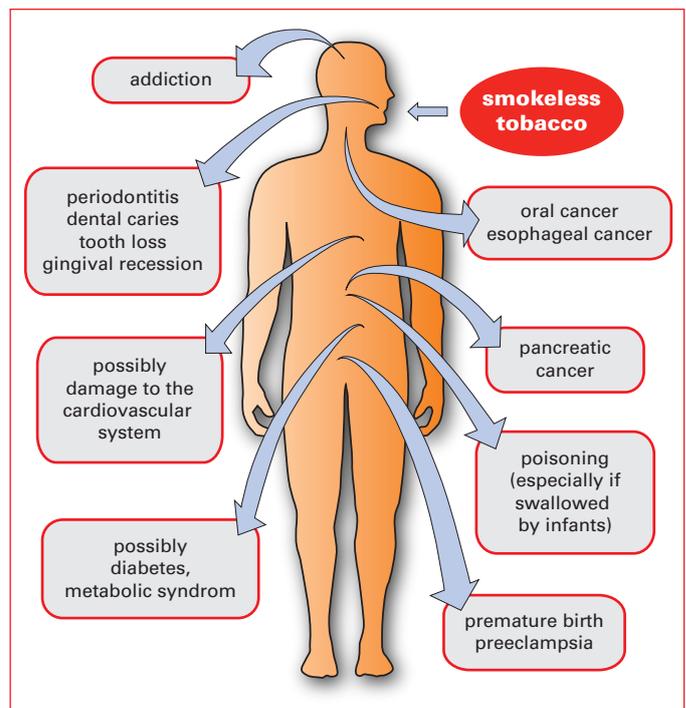


Figure 1: Health damage caused by the consumption of smokeless tobacco. Source: Ashley 2008⁴. Illustration: German Cancer Research Center, Unit Cancer Prevention, 2010.

There is no reason to introduce smokeless tobacco products on the European market

Smokeless tobacco products do not provide any health benefit (Fig. 2) for the European population. However, in the long term they would increase the total tobacco consumption.

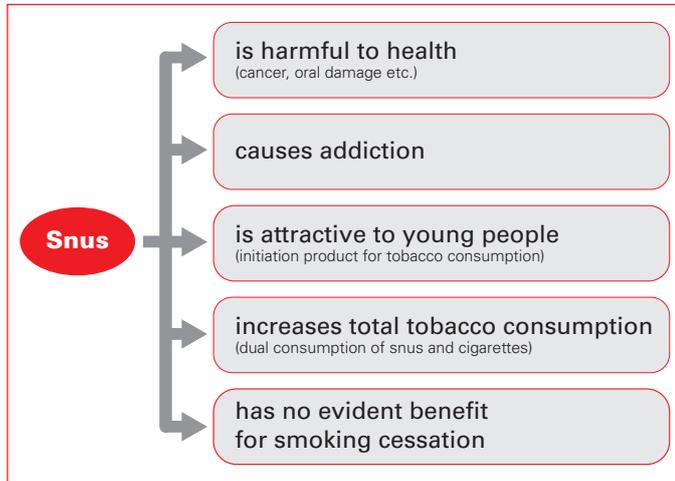


Figure 2: Disadvantages of snus. Illustration: German Cancer Research Center, Unit Cancer Prevention, 2010.

▪ **Smokeless tobacco products are attractive to young people**

Smokeless tobacco products with low nicotine content and intense flavour can serve as initiation products for young people^{2,4,27}. In the United States and Sweden, consumption of smokeless tobacco products increased significantly in recent years, particularly among young men^{2,29}. The dual use of smokeless tobacco and cigarettes is common among young males^{29,35}.

▪ **Smokeless tobacco products will increase the total tobacco consumption in the long term**

Manufacturers promote their products as a substitute for smoking in situations where smoking is not allowed⁴. In view of the increasing smokefree policies worldwide, this encourages additional smokeless tobacco consumption by smokers undermining the political efforts to reduce tobacco use^{12,27}.

▪ **Smokeless tobacco products are not effective for smoking cessation**

Currently, there is no convincing scientific evidence that smokeless tobacco products could be helpful in smoking cessation^{4,32,33}. Thus, recommending smokeless tobacco products as an aid in smoking cessation may promote a false perception of safety.

Health risk can be reduced by tobacco cessation rather than switching to another form of tobacco usage³².

Experience from Sweden shows that snus has been used to switch from smoking to snus use rather than for tobacco cessation. Approximately one in four former smokers switch to snus²⁹, but most smokers (66 percent) succeed in tobacco cessation without the use of snus²⁵. Moreover, amongst women snus use is low and most of them succeed cessation without snus^{25,29}. In Sweden, tobacco consumption among men is high: 40 percent of Swedish men use tobacco²⁹. Although the proportion of smokers is low, the proportion of snus users has increased significantly, but the decline in smoking prevalence is primarily due to the sharp increase of never smokers.

▪ **The number of smokers has declined in many countries without use of any smokeless tobacco products**

Thanks to increased implementation of tobacco control measures in recent years, smoking prevalence decreased in many countries where the sale of smokeless tobacco products is prohibited. For example in Germany, the UK, the Netherlands, Italy and Finland, in the period of 2006 to 2009, the proportion of smokers declined by five percent. In Sweden, however, the proportion of smokers declined to a lesser extent in the same period³⁴ (Fig. 3).

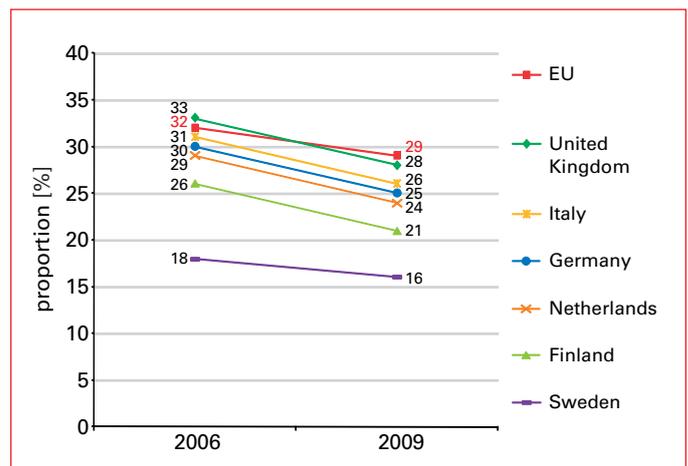


Figure 3: Proportion of smokers in selected countries of the EU. Source: TNS Opinion & Social, 2010 (Eurobarometer)³⁴. Illustration: German Cancer Research Center, Unit Cancer Prevention, 2010.

In order to protect the health of the European population the ban on oral tobacco products, including snus, should be retained.

Publication details

© 2010 German Cancer Research Center, Heidelberg

Authors:

Dr. Katrin Schaller, Dr. Urmila Nair, Dipl. Biol. Sarah Kahnert

Suggested citation:

German Cancer Research Center (Ed.): Snus, a harmful tobacco product. Heidelberg, 2010

Responsible for the content:

Dr. Martina Pötschke-Langer
German Cancer Research Center
Unit Cancer Prevention and
WHO Collaborating Centre for Tobacco Control

Im Neuenheimer Feld 280
D-69120 Heidelberg
Fax: +49 (0) 6221 42 30 20
E-Mail: who-cc@dkfz.de

Snus, a harmful tobacco product

References

- (1) Alguacil J, Silverman DT (2004) Smokeless and other noncigarette tobacco use and pancreatic cancer: a case-control study based on direct interviews. *Cancer Epidemiol Biomarkers Prev*, 13, 55-58
- (2) Alpert HR, Koh H, Connolly GN (2008) Free nicotine content and strategic marketing of moist snuff tobacco products in the United States: 2000-2006. *Tob Control*, 17, 332-338
- (3) Andersson G, Axell T (1989) Clinical appearance of lesions associated with the use of loose and portion-bag packed Swedish moist snuff: a comparative study. *J Oral Pathol Med*, 18, 2-7
- (4) Ashley DL, Burns D, Djordjevic M, Dybing E, Gray N, et al. (2008) The scientific basis of tobacco product regulation. *World Health Organ Tech Rep Ser*, 1-277, 271 p following 277
- (5) Benowitz NL (1988) Nicotine and smokeless tobacco. *CA Cancer J Clin*, 38, 244-247
- (6) Benowitz NL (1999) Snuff, nicotine and cardiovascular disease: implications for tobacco control. *J Am Coll Cardiol*, 34, 1791-1793
- (7) Benowitz NL (2010) Nicotine addiction. *N Engl J Med*, 362, 2295-2303
- (8) Boffetta P, Aagnes B, Weiderpass E, Andersen A (2005) Smokeless tobacco use and risk of cancer of the pancreas and other organs. *Int J Cancer*, 114, 992-995
- (9) Boffetta P, Hecht S, Gray N, Gupta P, Straif K (2008) Smokeless tobacco and cancer. *Lancet Oncol*, 9, 667-675
- (10) Boffetta P, Straif K (2009) Use of smokeless tobacco and risk of myocardial infarction and stroke: systematic review with meta-analysis. *BMJ*, 339, b3060
- (11) Burgan SW (1997) The role of tobacco use in periodontal diseases: a literature review. *Gen Dent*, 45, 449-460; quiz 469-470
- (12) Carpenter CM, Connolly GN, Ayo-Yusuf OA, Wayne GF (2009) Developing smokeless tobacco products for smokers: an examination of tobacco industry documents. *Tob Control*, 18, 54-59
- (13) Ebbert JO, Carr AB, Dale LC (2004) Smokeless tobacco: an emerging addiction. *Med Clin North Am*, 88, 1593-1605
- (14) Ekfeldt A, Hugoson A, Bergendal T, Helkimo M (1990) An individual tooth wear index and an analysis of factors correlated to incisal and occlusal wear in an adult Swedish population. *Acta Odontol Scand*, 48, 343-349
- (15) England LJ, Kim SY, Tomar SL, Ray CS, Gupta PC, et al. (2010) Non-cigarette tobacco use among women and adverse pregnancy outcomes. *Acta Obstet Gynecol Scand*, 89, 454-464
- (16) England LJ, Levine RJ, Mills JL, Klebanoff MA, Yu KF, et al. (2003) Adverse pregnancy outcomes in snuff users. *Am J Obstet Gynecol*, 189, 939-943
- (17) European Parliament and Council of the European Union (2001) Directive 2001/37/EC of the European Parliament and of the Council of 5 June 2001 on the approximation of the laws, regulations and administrative provisions of the Member States concerning the manufacture, presentation and sale of tobacco products. *Official Journal of the European Communities*, L 194/26 - L 194/34
- (18) Ferrea S, Winterer G (2009) Neuroprotective and neurotoxic effects of nicotine. *Pharmacopsychiatry*, 42, 255-265
- (19) Goldfrank LR NL, Howland MA, Lewin NA, Flomenbaum NE, Hoffman RS, eds. (2006) Nicotine and tobacco preparations. In: *Goldfrank's Toxicologic Emergencies*. McGraw-Hill, New York, 1221-1230
- (20) Hatsukami DK, Ebbert JO, Feuer RM, Stepanov I, Hecht SS (2007) Changing smokeless tobacco products new tobacco-delivery systems. *Am J Prev Med*, 33, S368-378

- (21) Hirsch JM, Livian G, Edward S, Noren JG (1991) Tobacco habits among teenagers in the city of Goteborg, Sweden, and possible association with dental caries. *Swed Dent J*, 15, 117-123
- (22) Holm H, Jarvis MJ, Russell MA, Feyerabend C (1992) Nicotine intake and dependence in Swedish snuff takers. *Psychopharmacology (Berl)*, 108, 507-511
- (23) International Agency for Research on Cancer (2006) Smokeless tobacco and some tobacco-specific nitrosamines. *IARC Monographs on the Evaluation of Carcinogenic Risks to Humans*, 89, IARC, Lyon
- (24) Johansson I, Tidehag P, Lundberg V, Hallmans G (1994) Dental status, diet and cardiovascular risk factors in middle-aged people in northern Sweden. *Community Dent Oral Epidemiol*, 22, 431-436
- (25) Lundqvist G, Sandstrom H, Ohman A, Weinehall L (2009) Patterns of tobacco use: a 10-year follow-up study of smoking and snus habits in a middle-aged Swedish population. *Scand J Public Health*, 37, 161-167
- (26) Luo J, Ye W, Zendejdel K, Adami J, Adami HO, et al. (2007) Oral use of Swedish moist snuff (snus) and risk for cancer of the mouth, lung, and pancreas in male construction workers: a retrospective cohort study. *Lancet*, 369, 2015-2020
- (27) Mejia AB, Ling PM (2010) Tobacco industry consumer research on smokeless tobacco users and product development. *Am J Public Health*, 100, 78-87
- (28) Norberg M, Stenlund H, Lindahl B, Boman K, Weinehall L (2006) Contribution of Swedish moist snuff to the metabolic syndrome: a wolf in sheep's clothing? *Scand J Public Health*, 34, 576-583
- (29) Patja K, Hakala SM, Bostrom G, Nordgren P, Haglund M (2009) Trends of tobacco use in Sweden and Finland: do differences in tobacco policy relate to tobacco use? *Scand J Public Health*, 37, 153-160
- (30) Post A, Gilljam H, Rosendahl I, Bremberg S, Galanti MR (2010) Symptoms of nicotine dependence in a cohort of Swedish youths: a comparison between smokers, smokeless tobacco users and dual tobacco users. *Addiction*, 105, 740-746
- (31) Roosaar A, Johansson AL, Sandborgh-Englund G, Axell T, Nyren O (2008) Cancer and mortality among users and nonusers of snus. *Int J Cancer*, 123, 168-173
- (32) Scientific Advisory Committee on Tobacco Products Regulation (2010) Recommendation on smokeless tobacco products.
- (33) Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR) (2008) Health effects of smokeless tobacco products.
- (34) TNS Opinion & Social (2010) Tobacco, Special Eurobarometer 332, Wave 72.3. on behalf of the Directorate General Health and Consumers of the European Commission, Brüssel
- (35) Tomar SL, Alpert HR, Connolly GN (2010) Patterns of dual use of cigarettes and smokeless tobacco among US males: findings from national surveys. *Tob Control*, 19, 104-109