Smokeless Tobacco Products: A Chemical and Toxicity Analysis

Background
Smokeless tobacco products are made of tobacco, water and additives. These products can be placed in the mouth and either chewed or sucked (oral), or inhaled through the nose (nasal). They come in different forms, such as plug, twist or coarsely chopped tobacco, long cut, fine cut or fine powder. Smokeless tobacco products are sold loose or pre-packaged in a pouch. The loose products and pouches are generally placed in the mouth between the cheek and gum to be sucked on. These products can be either “spit” or “spitless” tobacco products. In 2007, the Swedish style of snuff, called snus, was introduced to the Canadian market. Unlike its competitors, which undergo a fermentation process, snus is manufactured using a heat process similar to pasteurization.

As of November 2010, 28 known cancer-causing chemicals have been identified in smokeless tobacco products. Some of the toxic chemicals occur naturally in the tobacco, with factors such as the manufacturing and the aging processes influencing the levels of toxic chemicals present in smokeless tobacco products. Smokeless tobacco use is associated with many harmful health effects, including cardiovascular diseases, oral diseases and certain forms of cancer such as pancreatic cancer.

Results
In a recent study, Health Canada analyzed the physical and chemical properties of smokeless tobacco products and assessed their toxicity. The study found that products vary in their physical and chemical characteristics such as form, moisture content and chemical composition. All products contain nicotine, the drug naturally found in tobacco products that has been identified as playing an important role in addiction to these products. Some of the toxic chemicals found in the analyzed products include polycyclic aromatic hydrocarbons, tobacco-specific nitrosamines and metals (chromium, nickel, lead and arsenic).

The study indicated that the manufacturing method influences the level of certain toxic chemicals, such as polycyclic aromatic hydrocarbons and tobacco-specific nitrosamines. The pasteurized snus showed a decreased level of some toxic chemicals. Nevertheless, toxic chemicals were found in all smokeless tobacco products studied.

Key Messages

→ All smokeless tobacco products contain toxic chemicals that can cause cancer.

→ The use of smokeless tobacco products can cause harmful health effects.
The results of the toxicity tests confirmed that like other tobacco products, snus and other smokeless tobacco products are mutagenic (cause mutation in DNA), cytotoxic (affect cell structure and its components) and genotoxic (cause structural changes in chromosomes) products.

**Conclusions**

All smokeless tobacco products studied were found to contain cancer-causing chemicals and to be toxic products. Health Canada considers that their use can cause harmful health effects.

**References**

