Appendix B

Global Smokeless Tobacco Product Factsheets

Chapter Contents

African Traditional Snuff Products

A wide range of smokeless tobacco products are used in the 46 countries that make up the WHO African Region. Smokeless tobacco products can take a variety of forms, are available commercially, and can be custom-made or manufactured in small factories. The products can be chewed, sniffed, sucked, or applied to teeth and gums. Several of the products are summarized here.

Photo courtesy of Olalekan Ayo-Yusuf, University of Pretoria

Product Types, Modes of Absorption, and Main Geographic Locations

Ghana traditional snuff (tawa)

This local dry snuff, often called "tawa," is prepared by mixing the dried tobacco leaf with some chemicals such as saltpeter (potassium nitrate) and grinding it into a fine powder. It may be held in the mouth or used nasally to induce sneezing to "lighten" the head; it may also be used as a depressant or stimulant.[1]

Neffa (naffa, tenfeha, nufha)

These are the names given to dry snuff that is used nasally in northern Africa. Neffa/naffa is used in Tunisia, Libya, and Algeria. Tenfeha is used in Morocco, and nufha in Algeria.[2]

Snuif

Snuif, the South African word for "snuff," is not a specific type of smokeless tobacco product. Snuif is both commercially and locally produced. Some brand names are Singleton (dry snuff), Taxi, and Ntsu (moist snuff). The custom-made traditional mix is prepared by hand-mixing finely ground sun-dried tobacco leaf with ash from local plants.[3]

Taaba

This type of smokeless product is used in a number of West African countries, including northern Nigeria, Cameroon, Senegal, Uganda, and Chad. It is locally produced from dry fermented tobacco that is pulverized and mixed with natron/atron (a naturally occurring mixture of sodium bicarbonate and sodium chloride). Taaba can be used nasally or sucked orally.

Prevalence and Demographics

Ghana traditional snuff (tawa)

Although no data are available specifically on the prevalence of use of traditional snuff, findings from the Global Youth Tobacco Survey (GYTS) in 2006 showed that 10.4% of youths in Ghana reported using "tobacco products other than cigarettes," including snuff.[4]

Neffa

Neffa is predominantly used by men. Although no data are available specifically on the prevalence of neffa use, in the Algerian provinces of Oran, Constantine, and Setif, youth prevalence of tobacco use other than cigarettes was 7.8–8.9%, according to the 2007 GYTS.[4]

Snuif

Snuif is the name given to snuff in South Africa. Its use is most common among women and people living in rural areas, as well as individuals who are older, black, or have less education and income.[5] A 2003 study in South Africa reported that 2.4% of men and 10.9% of women aged 15 years and older reported ever using any smokeless tobacco, including snuff.[6] The 2008 South African National Youth Risk Behavior Survey found that 12.1% of adolescents used smokeless tobacco in the past month.[7]

African Traditional Snuff Products

Taaba

No data are available specifically on the prevalence of dry snuff use, but the 2008 Nigeria Demographic and Health Survey found that 3.2% of adult men and 0.5% of adult women report using smokeless tobacco.[8] Although national prevalence data in Nigeria suggest relatively low use rates, 2007 data from a state in Nigeria's North-East geopolitical zone revealed smokeless tobacco use rates as high as 10.8% among men and 4.1% among women aged 15 years and older.[9] The 2008 GYTS in Nigeria found that youth prevalence of tobacco use other than cigarettes was between 13.1% and 23.3% in five states.[4] In Uganda in 2006–2007, the prevalence of any smokeless tobacco use among adults (age 15–54) was 3.9% for men and 2.6% for women,[8] and among adolescents (age 13–15), 8.6% for boys and 9.6% for girls.[4]

Chemical Measurements

Only limited data are available on the toxicity of smokeless tobacco products used in the region, but recent data suggest considerable variability in the toxicity and nicotine profiles of some of the products that have been tested. These data are expressed on a per gram basis for products analyzed as received. The amount absorbed will depend on the amount of product used.

		Total Nicotine	Free Nicotine	NNK	NNN	NNAL	Total TSNAs*
Product Type	pH	mg/g wet wt		ng/g wet wt			
Snuif, traditional snuff, South Africa	9.29	5.29	5.01	1,610	5,570	71.8	20,500
Traditional snuff, Nigeria	9.42	2.49	2.39	285	711	29.5	1,520

*Total TSNAs represent the sum of NNK, NNN, and NNAL (shown), and *N'*-nitrosoanatabine and *N'*-nitrosoanabasine (not shown).
Abbreviations: NNK = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone; NNN = *N'*-nitrosonornicotine; NNAL = 4-(methylnitrosamino) 1-(3-pyridyl)-1-butanol; TSNAs = tobacco-specific nitrosamines; mg/g = milligram per gram; ng/g = nanogram per gram.
Source: Stanfill et al. 2011 (10).

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For additional information on African traditional snuff products, please refer to Chapter 12: Smokeless Tobacco Use in the African Region.

Betel Quid
With Tobacco

Betel quid is commonly used in many countries in the Asia-Pacific region. It can be prepared in a variety of ways depending on the region, but usually contains areca nuts, slaked lime, and catechu (extract of the Acacia catechu tree) wrapped in a betel leaf. Betel quid itself is not a tobacco product, but tobacco is often added to it. Chewing betel quid without tobacco is an ancient practice in India; this product is known as "tambula" in Sanskrit.[1]

Photo courtesy of World Health Organization South-East Asia Regional Office and Dhirendra N. Sinha

Common Names
Paan or pan (India), khilli paan (Bangladesh)

Brand Names
None

Main Geographic Locations (WHO Region: Country)
South-East Asia Region: India, Sri Lanka, Bangladesh, Myanmar, Thailand, Indonesia, Nepal, Maldives[2]; **Eastern Mediterranean Region:** Pakistan, United Arab Emirates[2,3]; **Western Pacific Region:** Lao Democratic People's Republic, Palau, Cambodia, Malaysia, Vietnam, Federal States of Micronesia[2,4]

Prevalence and Demographics
Prevalence and demographic profiles of betel quid chewers vary greatly by region. The Global Adult Tobacco Survey in India (2009–2010) shows that about 6.2% percent of all adults aged 15 years and older (7.5% of males and 4.9% of females) report using betel quid with tobacco in India,[5] and 24.3% of all Bangladeshis aged 15 years and older (23.5% of males and 25.2% of females) consume betel quid with tobacco.[6] The 2009–2010 Asian Betel–Quid Consortium study found that use of betel quid with tobacco among adults aged 15 and older ranges widely across several other South-East Asian countries: Prevalence is high in Nepal (males, 43.6%; females, 34.9%) and among women in Indonesia (31.7% among females, compared to 10.4% among males). Prevalence is moderate in Malaysia (males, 6.2%; females, 12.0%), and generally low in Sri Lanka (males, 6.4%; females, 3.2%).[7] In Myanmar in 2004, approximately 16.2% of adults aged 15 years and older (males, 27.8%; females, 4.4%) chewed betel quid with tobacco.[8]

Mode of Absorption
Oral (chewed, held in mouth)

Use Patterns
Different regions will use different types of tobacco in betel quid, such as sada pata (plain tobacco flakes) and zarda (flavored tobacco flakes) in Bangladesh and India,[1,6] kiwam (tobacco paste) in Pakistan and India,[1,2] and even half a cigarette in Palau.[4,9] In Indonesia, Vietnam, and Cambodia, users may use tobacco to clean their teeth after chewing betel quid rather than inserting it directly in the quid.[9,10] Some users swallow the juices produced from chewing betel quid.[2]

Main Ingredients
Tobacco, areca nut, slaked lime (calcium hydroxide) or other alkaline agents, betel leaf, and usually catechu (*Acacia catechu* tree extract). Additional ingredients vary regionally according to local preference, and can include cardamom, saffron, cloves, camphor, aniseed, turmeric, mustard, or sweeteners.[2,9]

Betel Quid
With Tobacco

Processing/Manufacturing

Cottage industry and custom-made: Betel quid is prepared by individual vendors for sale or assembled at home by individual users. Betel quid may be prepared in a variety of ways. Areca nut can be raw, boiled, roasted, fermented, or sun-dried. Tobacco may be used raw, sun-dried, or roasted, and then finely chopped or powdered. Alternatively, the tobacco may be boiled with molasses and made into a paste. The tobacco may then be perfumed or flavored. Slaked lime and sometimes catechu are smeared on a betel leaf, then the betel leaf is folded into a funnel shape, and tobacco, areca nut, and any other ingredients are added. The top of the funnel is folded over, resulting in a quid, which is placed in the mouth and chewed.[2,9]

Chemical Measurements

Published chemical data for betel quid are not available.

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For additional information on betel quid (paan), please refer to the following chapters: Chapter 10: Smokeless Tobacco Use in the European Region; Chapter 11: Smokeless Tobacco Use in the Eastern Mediterranean Region; Chapter 13: Smokeless Tobacco Use in the South-East Asia Region; and Chapter 14: Smokeless Tobacco Use in the Western Pacific Region.

Chimó

Chimó is a tobacco-based paste that was reportedly first used in South America in the early days of European colonization. In 1497, Amerigo Vespucci reported the use of a chewing tobacco mixed with ashes in the Caribbean.[1] According to a popular legend, the aboriginal chief Chimauchu was the first to use tobacco in the form of a paste, which today is called chimó.[1]

Photo courtesy of Clifford Watson, Centers for Disease Control and Prevention

Common Names
None

Brand Names
El Tovareño, El Tigrito, El Sabroso, El Gran Búfalo, El Dragón, El Morichal, San Carleño

Main Geographic Locations (WHO Region: Country)
Region of the Americas: Venezuela, Colombia[2]

Prevalence and Demographics
Among adults in Venezuela in 2007, 1.5% of women and 6.2% of men were current users, and 3.1% of women and 15.4% of men reported ever using chimó.[3] The Venezuelan Global Youth Tobacco Survey (GYTS) was used to estimate tobacco-specific prevalence of smokeless use among students in grades 7–9. GYTS results for Venezuela nationally and for eight different states in the years 2000, 2004, and 2008 found that the prevalence of chimó use was not uniform among the states: It ranged from 3.8% to 20.7% for boys, and 2.0% to 6.6% for girls.[2] Prevalence rates of chimó use in Colombia are not available.

Mode of Absorption
Oral (sucked, held in mouth)

Use Pattern
A small amount of chimó is placed between the lip or cheek and the gum and left there for some time, usually 30 minutes. The mixture of chimó and saliva is spit out.[4]

Main Ingredients
Tobacco leaf, baking soda (sodium bicarbonate), brown sugar, ashes from the Mamón tree (Meliccoca bijuga), and vanilla and anisette flavoring. The ingredients vary according to the region.[4]

Processing/Manufacturing
Cottage industry and commercial: Chimó is usually produced by small family-operated factories, but commercial, industrial manufacturing of chimó is increasing in Venezuela. Tobacco leaves are first crushed and boiled for several hours or days, and then starch and fibers are removed. The remaining concentrated product (10 kilos of tobacco becomes one kilo of "basic" chimó paste) is a sticky, heavy, black liquid, which can be stored for maturation for up to 2 years. For maturation, it is placed in natural containers like "taparas" (dried fruit from the Tapara tree) or wrapped in banana leaves. The matured paste is seasoned with other ingredients (see "Main Ingredients"), and then packaged in small tins or candy-like wrapped cylinders.[4]

Chimó

Chemical Measurements

These data are for select products and may not represent all products of this type. These data are expressed on a per gram basis for products analyzed as received. The amount absorbed will depend on the amount of product used.

		Total Nicotine	Free Nicotine	NNK	NNN	NNAL	Total TSNAs*
Product Type	pH	mg/g wet wt		ng/g wet wt			
Chimó, Venezuela	6.98–9.40	5.29–30.1	1.32–27.4	310–2,600	318–4,260	14.9–1,330	954–9,390

*Total TSNAs represent the sum of NNK, NNN, and NNAL (shown), and *N'*-nitrosoanatabine and *N'*-nitrosoanabasine (not shown).
Abbreviations: NNK = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone; NNN = *N'*-nitrosonornicotine; NNAL = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol; TSNAs = tobacco-specific nitrosamines; mg/g = milligram per gram; ng/g = nanogram per gram.
Source: Stanfill et al. 2011 (5).

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For additional information on chimó products, please refer to Chapter 9: Smokeless Tobacco Use in the Region of the Americas.

Creamy Snuff

Creamy snuff is a tobacco-based paste sold in toothpaste-like tubes. It is often advertised as being antibacterial and healthy for teeth and gums, and it is used primarily by women.[1]

Photo courtesy of World Health Organization South-East Asia Regional Office and Dhirendra N. Sinha

Common Names
Tobacco toothpaste

Brand Names
IPCO (*Asha Industries*), Dentobac (*Goran Pharma LTD*), Tona, Ganesh, Charotar, Musa Ka, Rehmat Khan, Chad Tara, Dulhan, Suraj, Asif Ka

Main Geographic Location (WHO Region: Country)
South-East Asia Region: India[2]

Prevalence and Demographics
Creamy snuff is used primarily by women, but it also seems popular among children.[1,3] In 2004, one study in India reported that the prevalence of creamy snuff use among adolescents aged 13 to 15 years varied from 2% to 32% across 18 states.[4] Although no product-specific adult prevalence data are available, in 2009–2010 4.7% of all adults (3.3% of males and 6.3% of females) in India reported applying tobacco products, including creamy snuff, mishri, gul, or gudakhu, to their teeth and gums.[5]

Mode of Absorption
Oral (applied to teeth and gums, teeth cleaning)

Use Pattern
Creamy snuff is used to clean teeth like regular toothpaste. Some products' instructions recommend holding the paste in the mouth for a little while before rinsing.[1,3]

Main Ingredients
Tobacco, clove oil, glycerin, spearmint, menthol, camphor, water[3]

Processing/Manufacturing
Commercial: Creamy snuff is commercially manufactured and is marketed as a teeth cleaner (dentifrice).[3] Creamy snuff consists of finely ground tobacco mixed with aromatic substances, such as clove oil, glycerin, spearmint, menthol and camphor, salts, water, and other hydrating agents.[1,3] Additional information on the manufacturing of creamy snuff could not be located.

Creamy Snuff

Chemical Measurements

These data are for select products and may not represent all products of this type. These data are expressed on a per gram basis for products analyzed as received. The amount absorbed will depend on the amount of product used.

		Total Nicotine	Free Nicotine	NNK	NNN	NNAL	Total TSNAs†
Product Type*	pH	mg/g wet wt		ng/g wet wt			
Creamy Snuff, India	7.51–8.35	5.62–10.0	2.36–3.82	N/A	N/A	N/A	N/A

*All creamy snuff products were commercially manufactured.
†Total TSNAs represent the sum of NNK, NNN, and NNAL (shown), *N'*-nitrosoanatabine and *N'*-nitrosoanabasine (not shown).
Abbreviations: NNK = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone; NNN = *N'*-nitrosonornicotine; NNAL = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol; TSNAs = tobacco-specific nitrosamines; mg/g = milligram per gram; ng/g = nanogram per gram.
Source: Gupta and Sreevidya 2004 (6).

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Dissolvable Tobacco

Dissolvable smokeless tobacco products were introduced in the United States in 2001. The first products, Ariva and Stonewall, dissolved completely during use, with no residual loose tobacco or tobacco-containing sachet to discard. In 2009, R.J. Reynolds Tobacco Company released Camel Orbs, Strips, and Sticks in a variety of formulations and flavors, all of which can fully dissolve in the mouth.[1] In 2011, Altria began test marketing new dissolvable products, Marlboro and Skoal Smokeless Tobacco Sticks, which are small toothpick-like sticks coated with tobacco, which are discarded after the coating dissolves.[2] In January 2013, the manufacture and sale of Ariva and Stonewall lozenges were discontinued.[3] Because dissolvables look like candy, there is concern that children will accidentally ingest them.[4]

Photo courtesy of Clifford Watson, Centers for Disease Control and Prevention

Type	Description	Examples
Tablets	Tobacco compressed into a lozenge	Arriva, Camel Orbs, Stonewall
Strips	Tobacco pressed into a thin wafer-like dissolvable strip (somewhat like a breath strip)	Camel Strips
Sticks	Tobacco pressed into a long, thin dissolvable stick	Camel Sticks
Tobacco Sticks	Small toothpick-like stick coated with a semi-hard tobacco-containing mixture. All of this product dissolves in the mouth except the toothpick.	Marlboro Tobacco Sticks, Skoal Tobacco Sticks

Common Names
Dissolvables

Brand Names
Ariva, Stonewall *(Star Scientific)*; Camel Orbs, Camel Strips, Camel Sticks *(R.J. Reynolds)*; Marlboro Sticks *(Philip Morris)*; Skoal Sticks *(U.S. Smokeless Tobacco Company)*

Main Geographic Location (WHO Region: Country)
Region of the Americas: United States[5]

Prevalence and Demographics
A 2010 survey found that less than 1% (0.6%) of adults in the United States had tried dissolvables.[6] Dissolvable tobacco products are fairly new to the market, and as of 2011–2012, Camel, Marlboro, and Skoal dissolvable products were still being test marketed in select cities and were not nationally available.[2,5,7] As these products become more widely available, their use may become more widespread.

Mode of Absorption
Oral (sucked, held in mouth, dissolved)

Use Pattern
These products can dissolve in as few as 3 minutes (Camel Orbs) or as much as 30–60 minutes (Stonewall).[8] Tobacco sticks do not completely dissolve because the tobacco is coated onto a wooden toothpick that must be thrown away.

Main Ingredients
Tobacco, humectants, preservatives, flavors[9]

Dissolvable Tobacco

Processing/Manufacturing

Commercial: Dissolvable tobacco is commercially manufactured. Limited information is available on the specific processes used for manufacturing many of these products. To create tobacco tablets, tobacco is pasteurized and ground into fine powder, and the finely powdered tobacco is combined with flavors, such as mint and eucalyptus, and other additives that allow the tobacco to be compressed into tablet form and dissolved in the mouth.[10]

Chemical Measurements

These data are for select products and may not represent all products of this type. Data are expressed on a per gram basis for products analyzed as received. The amount absorbed will depend on the amount of product used.

Product Type*	pH	Total Nicotine (mg/g wet wt)	Free Nicotine (mg/g wet wt)	NNK (ng/g wet wt)	NNN (ng/g wet wt)	NNAL (ng/g wet wt)	Total TSNAs† (ng/g wet wt)
Tablets,‡ United States	6.92–8.10	3.03–6.85	0.37–1.65	69–280	61–214	—	536–736
Camel Sticks, United States	7.76	3.92	1.45	307	264	—	852
Camel Strips, United States	7.88	2.67	1.11	221	152	—	535

*All products were commercially manufactured.
†Total TSNAs represent the sum of NNK, NNN, and NNAL (shown), and *N'*-nitrosoanatabine and *N'*-nitrosoanabasine (not shown).
‡Includes Camel Orbs, Ariva, and Stonewall.
Abbreviations: NNK = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone; NNN = *N'*-nitrosonornicotine; NNAL = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol; TSNAs = tobacco-specific nitrosamines; mg/g = milligram per gram; ng/g = nanogram per gram.
Source: Stepanov et al. 2012 (11).

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For additional information on dissolvables, please refer to Chapter 9: Smokeless Tobacco Use in the Region of the Americas.

Dohra

Photo courtesy of World Health Organization South-East Asia Regional Office and Dhirendra N. Sinh

Dohra is a wet mixture of tobacco and other ingredients such as areca nut, catechu, and flavors. Tobacco is frequently added to this mixture in the form of zarda, a smokeless tobacco product composed of flavored tobacco flakes. Dohra is commonly used in the Allahabad District of the Uttar Pradesh state in India, and in surrounding districts, such as Jaunpur and Pratapgarh.[1]

Common Names
None

Brand Names
None

Main Geographic Location (WHO Region: Country)
South-East Asia Region: India (Uttar Pradesh)[2]

Prevalence and Demographics
It is estimated that more than 50% of people in the Jaunpur area of India use dohra.[2] There are no available data on nationally representative prevalence rates of dohra use in India.

Mode of Absorption
Oral (chewed)

Use Pattern
Users may buy the dohra spice mixture packet and tobacco packet separately and add the amount of tobacco they prefer.[1,2]

Main Ingredients
Tobacco, areca nut, and other ingredients such as catechu, slaked lime (calcium hydroxide), peppermint, cardamom[1,2]

Processing/Manufacturing
Custom-made: Dohra is produced by individual vendors for sale. It is sold either as a ready-made mixed tobacco product or in two packets, one containing tobacco (often zarda or surti) that is mixed with the contents of the second packet (areca nut, catechu, and other flavorings). Dohra is normally sold in a plastic bag with a rubber band tied around it.[2]

Chemical Measurements
No data available

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Dry Snuff

Two types of snuff are manufactured and used in the United States: moist snuff and dry (Scotch) snuff. Moist snuff is by far the most widely consumed type in the United States and Canada. It contains 20%–60% moisture and often is flavored with wintergreen or various fruit flavors. In contrast, dry snuff, a finely powdered tobacco product produced mainly from Kentucky and Tennessee fire-cured tobaccos, has a moisture content that is less than 10% by weight.[1] This factsheet describes only commercial dry snuff. Other types of dry snuff are used traditionally in many regions around the world (see the factsheets *Tapkheer and African Traditional Snuff Products* for more information).

Photo courtesy of Clifford Watson, Centers for Disease Control and Prevention

Common Names
Scotch snuff, snuff

Brand Names
Levi Garrett & Sons, Dental, Honest, Peach Sweet, Tube Rose, W.E. Garrett & Sons *(American Snuff Company)*; Silver Dollar *(Kretek International, Inc.)*

Main Geographic Locations (WHO Region: Country)
Region of the Americas: Canada, United States[1];
African Region: South Africa, Nigeria[2];
European Region: Germany[1]

Prevalence and Demographics
Use of dry snuff has declined over the last 100 years and is rare today. In 2012, the U.S. prevalence of smokeless tobacco use (including snuff and chewing tobacco) among those aged 12 years and older was 3.6% (7.1% of males and 0.4% of females).[3] Although no current prevalence data are available specifically for dry snuff use, sales of dry snuff comprised only 1.4% of all smokeless tobacco sales in the United States in 2009.[4] Prevalence data on dry snuff use in other countries are not available.

Mode of Absorption
Oral (sucked, held in mouth); **Nasal**

Use Pattern
Dry snuff is usually used orally, but it may also be inhaled into the nostrils.[1]

Main Ingredients
Tobacco (fire-cured, fermented), often flavored[1]

Processing/Manufacturing
Commercial: Dry snuff is commercially manufactured. Tobacco is fire-cured and then fermented and processed into a dry, powdered form; it may also be sweetened. The moisture content of the finished product is less than 10% by weight. It is packaged and sold in small metal or glass containers.[1]

Dry Snuff

Chemical Measurements

These data are for select products and may not represent all products of this type. These data are expressed on a per gram basis for products analyzed as received. The amount absorbed will depend on the amount of product used.

Product Type*	pH	Total Nicotine (mg/g wet wt)	Free Nicotine (mg/g wet wt)	NNK (ng/g wet wt)	NNN (ng/g wet wt)	NNAL (ng/g wet wt)	Total TSNAs† (ng/g wet wt)
Dry Snuff (5), United States	5.71–6.25	14.9–20.2	0.07–0.30	1,340–14,600	6,120–31,300	47–1,050	10,300–76,500
Dry Snuff (1), United States	5.41–7.96	4.70–24.84	0.03–3.13	—	—	—	—

*Dry snuff products were commercially manufactured.
†Total TSNAs represent the sum of NNK, NNN, and NNAL (shown), *N'*-nitrosoanatabine and *N'*-nitrosoanabasine (not shown).
Abbreviations: NNK = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone; NNN = *N'*-nitrosonornicotine; NNAL = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol; TSNAs = tobacco-specific nitrosamines; mg/g = milligram per gram; ng/g = nanogram per gram.
Sources: Lawler et al. 2013 (5); International Agency for Research on Cancer 2007, table 6 (1).

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For additional information on dry snuff, please refer to the following chapters: Chapter 9: Smokeless Tobacco Use in the Region of the Americas, and Chapter 12: Smokeless Tobacco Use in the African Region.

Gudakhu

Gudakhu (also spelled gudahku) is a paste-like product that is made from fine tobacco leaf dust and molasses (called *sheera*), red soil, and lime.[1,2] Gudakhu is predominantly used in India in the states of Bihar, Orissa, Uttar Pradesh, and Uttaranchal.[2] It may be used to clean teeth.[3,4]

Photo courtesy of World Health Organization South-East Asia Regional Office and Dhirendra N. Sinha

Common Names
None

Brand Names
Natraj

Main Geographic Location (WHO Region: Country)
South-East Asia Region: India[4]

Prevalence and Demographics
No recent information was located specifically on the use of gudakhu. Gudakhu is mainly used by women. Survey data from the 1970s found that 1% of men and 16% of women in eastern India (Jharkhand) used gudakhu.[2,4] In 2009–2010, 4.7% of all adults (3.3% of males and 6.3% of females) in India reported use of tobacco products that are applied to the teeth and gums, including gudakhu, snuff, mishri, or gul.[5]

Mode of Absorption
Oral (applied to teeth and gums, held in mouth)

Use Pattern
Gudakhu can be rubbed on the teeth and gums with a fingertip and may be left in the mouth. It is an addictive substance, with some people using it up to 20 times per day.[1]

Main Ingredients
Tobacco powder, molasses, red soil, lime, water[1,4]

Processing/Manufacturing
Commercial and custom-made: Gudakhu is available commercially, but can also be made by individuals for personal use. It can come in different types of packaging (both branded and unbranded) and is frequently carried in a metal container.[2] Additional information on manufacturing of gudakhu could not be located.

Chemical Measurements
No data available

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Gul

Gul is a pyrolysed (burned and decomposed), powdered tobacco product that is marketed in small tin cans or sachets under several different brand names. It is used as a dentifrice in India.[1]

Photo courtesy of Clifford Watson, Centers for Disease Control and Prevention

Common Names
None

Brand Names
Shajadi Gul, Mujamal Hussain Musarraf Bahi Shahi Eagle, Md. Mustafa Asgar Ali Gul (Bangladesh), Chand, Tara Marka, and Gulbadan (India)

Main Geographic Locations (WHO Region: Country)
South-East Asia Region: India, Bangladesh[1]

Prevalence and Demographics
In 2009, 5.3% of adults (5.5% of males and 5.1% of females) in Bangladesh reported using gul.[2] In India, gul is popular among women,[3,4] and in 2004, 2–6% of adolescents in various regions of India reported using it.[5] There are no recent nationally representative statistics on the prevalence of gul use in India. In 2009–2010, 4.7% of all adults in India (3.3% of males and 6.3% of females) reported using oral tobacco, including gul, snuff, mishri, or gudakhu.[4]

Mode of Absorption
Oral (teeth cleaning, applied to teeth and gums)

Use Patterns
Gul is usually used to clean teeth. It is addictive and may be used several times a day.[1,3]

Main Ingredients
Pyrolysed (burned and decomposed) tobacco leaves, molasses, other unknown ingredients[3,6]

Processing/Manufacturing
Commercial: Gul is commercially manufactured[3] and sold in small tin cans.[6] Additional information on manufacturing of gul could not be located.

Gul

Chemical Measurements

These data are for select products and may not represent all products of this type. These data are expressed on a per gram basis for products analyzed as received. The amount absorbed will depend on the amount of product used.

Product Type*	pH	Total Nicotine	Free Nicotine	NNK	NNN	NNAL	Total TSNAs†
		mg/g wet wt		ng/g wet wt			
Gul Powder, Bangladesh	8.79–9.22	33.4–34.1	29.1–31.0	1,330–1,370	5,190–8,020	590–630	13,400–17,100

*Gul products were commercially manufactured.
†Total TSNAs represent the sum of NNK, NNN, and NNAL (shown), and *N'*-nitrosoanatabine and *N'*-nitrosoanabasine (not shown).
Abbreviations: NNK = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone; NNN = *N'*-nitrosonornicotine; NNAL = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol; TSNAs = tobacco-specific nitrosamines; mg/g = milligram per gram; ng/g = nanogram per gram.
Source: Stanfill et al. 2011 (7).

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For additional information on gul, please refer to the following chapters: Chapter 13: Smokeless Tobacco Use in the South-East Asia Region.

Gutka

(Pan Masala with Tobacco)

Gutka, or gutkha, is a dry, granular tobacco that is a commercially manufactured version of paan or betel quid with tobacco.[1] Unlike paan, gutka is relatively nonperishable and packaged in small single-use packets that are easy to carry and use "anytime, anywhere."[2] Advertising of tobacco products on radio and TV has been banned in India since 2004; however, pan masala, an identical product without tobacco but the same brand names, can be advertised, and these ads are often targeted at youth.[1] As of October 2013, almost all states and union territories in India have banned gutka, although it is unclear how well these bans will be enforced.[3,4]

Photo courtesy of World Health Organization South-East Asia Regional Office and Dhirendra N. Sinha

Common Names

Pan masala. (The terms gutka and pan masala are sometimes used interchangeably, but gutka usually refers to the product with tobacco, and pan masala is the same product without tobacco.[5])

Brand Names

Manikchand, Moolchand, Tulsi, Shimla, Sikandar, Pan Parag, RMD, Sir, Shikhar, Dandia, Kuber, Wiz, Kesar, Club Class, Goa, Shanti Strong, Vimal, Zee, Mehak Silver, Silver, Kanchan

Packaging of some brands of gutka is often identical to packaging of pan masala (which does not contain tobacco), and companies may be using this identical packaging to circumvent India's 2004 ban on tobacco advertising.[1]

Main Geographic Locations (WHO Region: Country)

South-East Asia Region: India, Bangladesh, Nepal, Myanmar, Sri Lanka[2,6]; **Eastern Mediterranean Region:** Pakistan[5]

Prevalence and Demographics

In 2009–2010, 8.2% of all individuals in India aged 15 years and older (13.1% of males and 2.9% of females) reported chewing gutka.[5] Use of gutka is common among youth and young adults.[1,5,7,8] A number of surveys conducted in India have shown that pan masala and gutka are commonly chewed by children and adolescents.[5,9] Product-specific prevalence data are not available for the other countries where gutka is used.

Mode of Absorption

Oral (chewed, held in mouth)

Use Patterns

Gutka is held in the mouth and chewed. Saliva is generally spit out, but it is also sometimes swallowed.[6] These products are commonly used throughout the day.

Main Ingredients

Tobacco, areca nut, slaked lime (calcium hydroxide), catechu, and other condiments, sweeteners, and flavorings[6]

Processing/Manufacturing

Commercial and cottage industry: Gutka is generally commercially manufactured as a dry, relatively nonperishable preparation.[1] Gutka can also be a premade cottage product[10] that is packaged in nontraditional packaging (i.e., cellophane). Gutka is made from powdered tobacco, areca nut, lime, and catechu, with other condiments and sweeteners added for flavor.[2] Manufactured gutka is sold in small, brightly colored plastic and paper packets (sachets); plastic sachets were banned in India in March 2011.[11]

Gutka

(Pan Masala with Tobacco)

Chemical Measurements

These data are for select products and may not represent all products of this type. These data are expressed on a per gram basis for products analyzed as received. The amount absorbed will depend on the amount of product used.

Product Type	pH	Total Nicotine mg/g wet wt	Free Nicotine mg/g wet wt	NNK ng/g wet wt	NNN ng/g wet wt	NNAL ng/g wet wt	Total TSNAs* ng/g wet wt
Gutka,† Pakistan	8.20–8.54	0.16–2.08	0.12–1.08	11.6–208	45.4–913	7.02–53.5	83.9–1,560
Gutka,‡ India	8.46–8.88	1.09–2.33	0.86–1.78	57.1–456	167–1,280	23.2–258	370–2,250
Gutka,§ India	7.43–8.61	0.91–4.20	0.19–3.33	7.1–375	154–18,600	10.8–1,030	264–23,900

*Total TSNAs represent the sum of NNK, NNN, and NNAL (shown) and *N'*-nitrosoanatabine and *N'*-nitrosoanabasine (not shown).
†These gutka products were manufactured both commercially and by cottage industry.
‡These gutka products were commercially manufactured.
§These gutka products were manufactured by cottage industry.
Abbreviations: NNK = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone; NNN = *N'*-nitrosonornicotine; NNAL = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol; TSNAs = tobacco-specific nitrosamines; mg/g = milligram per gram; ng/g = nanogram per gram.
Source: Stanfill et al. 2011 (10).

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For additional information on gutka, please refer to the following chapters: Chapter 10: Smokeless Tobacco Use in the European Region, and Chapter 13: Smokeless Tobacco Use in the South-East Asia Region.

Iqmik

Iqmik is a homemade chewing tobacco that consists of tobacco leaves combined with ash from burnt tree fungus or wood.[1,2,3] Iqmik is commonly used by Alaska Native people, particularly the Yup'ik and Cup'ik Eskimo people in western Alaska.[2,4] In contrast to American Indian customs, tobacco use does not have a spiritual significance for Alaska Natives.[1,2] Rather, it is a relatively recent phenomenon, dating back only about 150 years in Alaska, although tobacco use among other indigenous populations in North America dates back at least 2,000 years.[2,3] Some people in the Yukon–Kuskokwim region consider iqmik a healthier alternative to smoking tobacco because its ingredients are perceived as "natural."[1,2]

Photo courtesy of Caroline Renner, Alaska Native Medical Center

Common Names
Blackbull, dediguss

Brand Names
None

Main Geographic Location (WHO Region: Country)
Region of the Americas: United States (Alaska)[5]

Prevalence and Demographics
Iqmik is used by Alaska Natives, including youth of all ages.[1,2] Iqmik is used in western Alaska, although there are reports of similar smokeless tobacco mixtures being used by indigenous populations in Western Siberia, Yukon, Labrador, British Columbia Coast, and Nova Scotia.[2,4] Data from the 2004 to 2007 Behavioral Risk Factor Surveillance System (BRFSS) found that iqmik is used by 16% to 22% of Alaska Native adults in the western region of the state.[6,7] It has also been reported that iqmik is often used by pregnant women in western Alaska.[4]

Mode of Absorption
Oral (chewed)

Use Pattern
Users may pre-chew the iqmik and place it in a small box for later use by the maker or to share with others, including elders, children, and infants. Iqmik is believed by some to relieve babies' teething pain.[1,5]

Main Ingredients
Tobacco, tree fungus ash (also known as punk, araq, or buluq ash) or other ash derived from burning driftwood, alder bush, or willow bush; these woods are used because there are few trees along the coast of western Alaska.[2,4]

Processing/Manufacturing
Custom-made: Although the ingredients are available at grocery stores and retail outlets, iqmik is always prepared by the individual user or a family or community member to share. Fire- or air-cured tobacco leaves are mixed with punk fungus ash, which is generated by burning a woody fungus that grows on birch trees, or other woody ash if punk ash is unavailable.[1,2,5] The mixture can be prepared in several ways: by pre-chewing, stirring in a bowl with water, or even using a modern blender.[1,4] Iqmik is often stored in a commercial smokeless tobacco box or a small plastic container.[2,4]

Iqmik

Chemical Measurements

These data are for select products and may not represent all products of this type. These data are expressed on a per gram basis for the prepared iqmik. The amount absorbed will depend on the amount of product used.

Product Type	pH*	Total Nicotine (mg/g wet wt)	Free Nicotine (mg/g wet wt)	NNK (ng/g wet wt)	NNN (ng/g wet wt)	NNAL (ng/g wet wt)	Total TSNAs† (ng/g wet wt)
Iqmik with Air-Cured Tobacco,‡ United States (Alaska)	11.0	38.3	38.3	209	2,995	61	7,238
Iqmik with Fire-Cured Tobacco,‡ United States (Alaska)	11.0	38.9	38.9	473	2,400	11	7,191

*pH of the prepared ash/tobacco iqmik mixture; both willow and punk ash are pH 11.0.
†Total TSNAs represent the sum of NNK, NNN, and NNAL (shown), and *N'*-nitrosoanatabine and *N'*-nitrosoanabasine (not shown).
‡Cured tobacco includes the average of twist and leaf tobacco.
Abbreviations: NNK = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone; NNN = *N'*-nitrosonornicotine; NNAL = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol; TSNAs = tobacco-specific nitrosamines; mg/g = milligram per gram; ng/g = nanogram per gram.
Source: Hearn et al. 2013 (8).

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For additional information on iqmik, please refer to Chapter 9: Smokeless Tobacco Use in the Region of the Americas.

Khaini

Khaini (or khoinee in Bangladesh) is a flaky product made of sun-dried tobacco and slaked lime. Lime is often added to the tobacco just before use.[1] Khaini is used in India, Nepal, and Bangladesh.[2]

Photo courtesy of Clifford Watson, Centers for Disease Control and Prevention

Common Names
Chada, chadha, sada, surti (in Nepal and neighboring parts of India)

Brand Names
Raja, Kuber, Wiz, Buddha Lal, Chaini, Raja Chap, Ansul Tobacco, Mirage, Ganesh Tobacco 701, Patta Chhap Tej Tobacco

Main Geographic Locations (WHO Region: Country)
South-East Asia Region: India, Bangladesh, Nepal, Bhutan[2]

Prevalence and Demographics
Among adults in India, khaini is the most commonly used type of smokeless tobacco. In 2009–2010, 11.6% of the Indian population over age 15 (18% of males and 4.7% of females) used khaini.[3] In 2009, in Bangladesh, 1.5% of all adults (1.9% of males and 1.2% of females) used khaini.[4] Product-specific prevalence rates were not available for the other countries where khaini is used.

Mode of Absorption
Oral (sucked, chewed, held in mouth)

Use Pattern
People may use khaini from 3 to 30 times a day. A regular khaini user may carry a double-ended metal container, one side of which is filled with sun-dried tobacco and the other slightly moistened slaked lime.[1,5]

Main Ingredients
Tobacco leaves, slaked lime (calcium hydroxide), and sometimes areca nut[2,6]

Processing/Manufacturing
Custom-made, cottage industry, and commercial: Khaini is usually prepared by the individual user from basic ingredients at the time of use, but commercially manufactured khaini is also available. To prepare khaini, users will use their thumbs to vigorously mix a small amount of dried tobacco leaves and slaked lime paste in the palm of the hand. Areca nut is sometimes added.[2] Additional information on the commercial manufacturing of khaini could not be located.

Khaini

Chemical Measurements

These data are for select products and may not represent all products of this type. These data are expressed on a per gram basis for products analyzed as received. The amount absorbed will depend on the amount of product used.

Product Type	pH	Total Nicotine (mg/g wet wt)	Free Nicotine (mg/g wet wt)	NNK (ng/g wet wt)	NNN (ng/g wet wt)	NNAL (ng/g wet wt)	Total TSNAs* (ng/g wet wt)
Khaini,† India	9.65–9.79	2.53–4.79	2.48–4.68	288–502	16,800–17,500	1,350–1,400	21,600–23,500

*Total TSNAs represent the sum of NNK, NNN, and NNAL (shown), and *N'*-nitrosoanatabine and *N'*-nitrosoanabasine (not shown).
†All khaini products were commercially manufactured.
Abbreviations: NNK = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone; NNN = *N'*-nitrosonornicotine; NNAL = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol; TSNAs = tobacco-specific nitrosamines; mg/g = milligram per gram; ng/g = nanogram per gram.
Source: Stanfill et al. 2011 (6).

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For additional information on khaini, please refer to the following chapters: Chapter 10: Smokeless Tobacco Use in the European Region, and Chapter 13: Smokeless Tobacco Use in the South-East Asia Region.

Kiwam

Kiwam (also spelled qiwam, qimam, khiwam, kimam) is a tobacco paste that is made from boiled and flavored tobacco leaves. The paste may be formed into granules or pellets. Kiwam is frequently used as the tobacco ingredient in betel quid (paan).[1,2,3,4]

Photo courtesy of Clifford Watson, Centers for Disease Control and Prevention

Common Names
None

Brand Names
Avon, Kashmiri, Nauratan, Raj Ratan, Pradip

Main Geographic Locations (WHO Region: Country)
South-East Asia Region: India, Bangladesh, Nepal[1,2];
Eastern Mediterranean Region: Pakistan[3]

Prevalence and Demographics
No data are available on the prevalence of kiwam use. In 2004, it was reported that kiwam is used among upper socioeconomic groups in India and Bangladesh.[1]

Mode of Absorption
Oral (chewed, held in mouth, chewed in betel quid)

Use Pattern
Kiwam may be used alone or inserted into a betel quid and chewed.[2] Additional information on patterns of kiwam use could not be located.

Main Ingredients
Tobacco, spices (cardamom, saffron, and/or aniseed), additives such as musk[1,2]

Processing/Manufacturing
Commercial: Kiwam is commercially manufactured. The stalks, stems, and veins of tobacco leaves are removed, and then the remaining leaves are boiled, soaked in water, and flavored with powdered spices and other additives.[1] Once the tobacco has softened and broken down, the resulting pulp is mashed, strained, and dried into a paste.[2] Kiwam may be sold as a paste or in granule or pellet form.[1,3]

Kiwam

Chemical Measurements

These data are for select products and may not represent all products of this type. These data are expressed on a per gram basis for products analyzed as received. The amount absorbed will depend on the amount of product used.

Product Type	pH	Total Nicotine	Free Nicotine	NNK	NNN	NNAL	Total TSNAs*
		mg/g wet wt		ng/g wet wt			
Kiwam,† India	—	—	—	100–1,030	2,500–8,950	160–1,860	5,430–22,200

*Total TSNAs represent the sum of NNK, NNN, and NNAL (shown), and *N'*-nitrosoanatabine and *N'*-nitrosoanabasine (not shown).
†All kiwam products are commercially manufactured.
Abbreviations: NNK = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone; NNN = *N'*-nitrosonornicotine; NNAL = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol; TSNAs = tobacco-specific nitrosamines; mg/g = milligram per gram; ng/g = nanogram per gram.
Source: Tricker and Preussmann 1989 (5) (more recent data was not available).

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Loose Leaf Chew

Three types of chewing tobacco are used in North America: loose leaf, plug, and twist. Although loose leaf is the most common form in the United States, the use of chewing tobacco has declined over the past few decades and is now uncommon.[1,2]

Photo courtesy of Clifford Watson, Centers for Disease Control and Prevention

Common Names
Chew, chaw, chewing tobacco, spit tobacco

Brand Names
Red Man, Granger, J.D.'s Blend *(Swedish Match North America)*; Levi Garrett, Morgan's, Taylor's Pride *(American Snuff Company)*; Beech-Nut, Our Pride, Stoker *(National Tobacco Company)*; Mail Pouch, Chattanooga Chew, Lancaster *(Swisher International)*

Main Geographic Location (WHO Region: Country)
Region of the Americas: United States[1]

Prevalence and Demographics
Product-specific prevalence rates are not available for any countries where loose leaf chew is used. In the United States, chewing tobaccos are primarily used by men and are more common in rural areas and the South and Midwest.[2] In 2012, the U.S. prevalence of past-month smokeless tobacco use (including loose leaf tobacco, snuff, and other smokeless products) for those aged 12 years and older was 3.6% (7.1% of males and 0.4% of females).[3] Although there are no statistics specifically on the prevalence of loose leaf tobacco use, sales of loose leaf chew represent 19.7% of smokeless tobacco sales in the United States.[4]

Mode of Absorption
Oral (chewed, sucked, held in mouth)

Use Patterns
A piece of tobacco 0.75 to 1 inch in diameter is either chewed or held in place. Saliva is usually spit out, but it can also be swallowed.[1]

Main Ingredients
Leaf tobacco, sugar, and/or licorice[1,5]

Processing/Manufacturing
Commercial: Loose leaf chew is commercially manufactured and usually sold in pouches. To manufacture loose leaf chew, loose cigar tobacco leaves are air-cured, stemmed, and cut or granulated to form small strips of shredded tobacco. Most brands are sweetened and flavored with sugar and licorice, accounting for loose leaf tobacco's high average sugar content (approximately 35% of its weight is sugar).[1,5]

Loose Leaf Chew

Chemical Measurements

These data are for select products and may not represent all products of this type. These data are expressed on a per gram basis for products analyzed as received. The amount absorbed will depend on the amount of product used.

Product Type*	pH	Total Nicotine mg/g wet wt	Free Nicotine mg/g wet wt	NNK ng/g wet wt	NNN ng/g wet wt	NNAL ng/g wet wt	Total TSNAs† ng/g wet wt
Loose Leaf (6), United States	5.64–5.98	4.87–7.04	0.03–0.06	238–306	942–2,830	20–90	1,550–4,100
Loose Leaf (1), United States	5.64–6.76	3.41–8.99	0.02–0.47	—	—	—	—

*All loose leaf products were commercially manufactured.
†Total TSNAs represent the sum of NNK, NNN, and NNAL (shown), *N'*-nitrosoanatabine and *N'*-nitrosoanabasine (not shown).
Abbreviations: NNK = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone; NNN = *N'*-nitrosonornicotine; NNAL = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol; TSNAs = tobacco-specific nitrosamines; mg/g = milligram per gram; ng/g = nanogram per gram.
Sources: Lawler et al. 2013 (6); International Agency for Research on Cancer 2007, table 5 (1).

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For additional information on loose leaf chew, please refer to Chapter 9: Smokeless Tobacco Use in the Region of the Americas.

Mainpuri

Mainpuri is a mixture of tobacco, finely chopped areca nut, slaked lime, cloves, and camphor.[1,2,3] It has a short shelf life and is mainly sold in the northern part of India in the Mainpuri district and nearby areas.[1] Mainpuri was also sold in neighboring Pakistan, although it was banned in 2011.

Photo courtesy of Clifford Watson, Centers for Disease Control and Prevention

Common Names
Kapoori

Brand Names
None

Main Geographic Location (WHO Region: Country)
South-East Asia Region: India (Uttar Pradesh)[2]

Prevalence and Demographics
Mainpuri is a very popular tobacco preparation in the Mainpuri district and surrounding areas of Uttar Pradesh.[5] Recent data on the prevalence of mainpuri tobacco use in Uttar Pradesh or in India nationally are not available.

Mode of Absorption
Oral (chewed, chewed in betel quid, held in mouth)

Use Patterns
No information is available on use patterns.

Main Ingredients
Tobacco, slaked lime (calcium hydroxide), areca nut, camphor, cloves[1,2]

Processing/Manufacturing
Cottage industry and custom-made: Mainpuri is manufactured by small cottage industries and prepared by individual vendors for sale. It is prepared by thoroughly mixing together tobacco, slaked lime, finely cut areca nut, and powdered camphor and cloves.[3] Additional information on the preparation of mainpuri could not be located.

Mainpuri

Chemical Measurements

These data are for select products and may not represent all products of this type. These data are expressed on a per gram basis for products analyzed as received. The amount absorbed will depend on the amount of product used.

Product Type	pH	Total Nicotine mg/g wet wt	Free Nicotine mg/g wet wt	NNK ng/g wet wt	NNN ng/g wet wt	NNAL ng/g wet wt	Total TSNAs* ng/g wet wt
Mainpuri, Pakistan	7.65	1.28	0.38	6.05	106	25.9	219

*Total TSNAs represent the sum of NNK, NNN, and NNAL (shown), and *N'*-nitrosoanatabine and *N'*-nitrosoanabasine (not shown).
Abbreviations: NNK = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone; NNN = *N'*-nitrosonornicotine; NNAL = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol; TSNAs = tobacco-specific nitrosamines; mg/g = milligram per gram; ng/g = nanogram per gram.
Source: Stanfill et al. 2011 (4).

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Mawa

Mawa is a mixture of finely chopped ingredients consisting of areca nut shavings, slaked lime, and crushed sun-cured tobacco.[1,2] It is about 95% areca nut by weight and is used in South Asia.[1,3]

Photo courtesy of Clifford Watson, Centers for Disease Control and Prevention

Common Names
None

Brand Names
None

Main Geographic Location (WHO Region: Country)
South-East Asia Region: India[1]

Prevalence and Demographics
Mawa is popular among men and young people, particularly in Gujarat, India.[1,3] Between the 1970s and the 1990s, mawa chewing increased considerably in the Bhavnagar district and adjoining areas in Gujarat, particularly among young people. One survey in 1998 in this district found that 18.9% of men and 0.1% of women used mawa.[4] A study conducted in 2007–2008 in urban Jamnagar, Gujarat, found that approximately 21% of people aged 13 and older chewed mawa.[5] National data on the prevalence of mawa use in India are not available.

Mode of Absorption
Oral (chewed)

Use Pattern
Mawa is chewed for about 10 to 20 minutes[1] and may be used as many as 5 to 25 times per day.[3]

Main Ingredients
Tobacco, slaked lime, and areca nut[1]

Processing/Manufacturing
Cottage industry and custom-made: Mawa is prepared by individual vendors for sale or is homemade by individual users. The process of making mawa consists of sprinkling small pieces of sun-cured areca nut with slaked lime and adding tobacco flakes. The mixture is rubbed together to combine the ingredients. Mawa is about 95% areca nut by weight and is sold in cellophane wrappers.[3]

Mawa

Chemical Measurements

These data are for select products and may not represent all products of this type. These data are expressed on a per gram basis for products analyzed as received. The amount absorbed will depend on the amount of product used.

Product Type	pH	Total Nicotine (mg/g wet wt)	Free Nicotine (mg/g wet wt)	NNK (ng/g wet wt)	NNN (ng/g wet wt)	NNAL (ng/g wet wt)	Total TSNAs* (ng/g wet wt)
Mawa,† Pakistan	8.31	0.16	0.11	4.47	65.5	3.98	96

*Total TSNAs represent the sum of NNK, NNN, and NNAL (shown), and *N'*-nitrosoanatabine and *N'*-nitrosoanabasine (not shown).
†Data is given for custom-made mawa.
Abbreviations: NNK = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone; NNN = *N'*-nitrosonornicotine; NNAL = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol; TSNAs = tobacco-specific nitrosamines; mg/g = milligram per gram; ng/g = nanogram per gram.
Source: Stanfill et al. 2011 (6).

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For additional information on mawa, please refer to Chapter 13: Smokeless Tobacco Use in the South-East Asia Region.

Mishri

Mishri (also known as masherior or misheri) is a dry, powdered tobacco product that is usually homemade or prepared by a vendor. Mishri is commonly believed to clean teeth.[1]

Photo courtesy of World Health Organization South-East Asia Regional Office and Dhirendra N. Sinha

Common Names
None

Brand Names
None

Main Geographic Location (WHO Region: Country)
South-East Asia Region: India[2,3]

Prevalence and Demographics
Mishri is predominantly used by women and is more common among lower socioeconomic groups.[4] Many users begin using mishri as children. While there are no national data or recent prevalence estimates, various studies of different regions from the 1970s to the present have estimated that mishri use in India has ranged between 17% and 44% of women and between 1% and 23% of men.[3,5,6,7] In 2009–2010, 5% of all individuals aged 15 years and over (3.3% of males and 6.3% of females) in India consumed oral tobacco including mishri, snuff, gul, or gudakhu.[8]

Mode of Absorption
Oral (sucked, applied to teeth and gums, teeth cleaning)[1]

Use Pattern
Mishri is rubbed on the teeth and gums, often for the purpose of cleaning the teeth. It is generally used twice a day, but users who become addicted may apply it more frequently or hold it in their mouths.[1,3,4]

Main Ingredients
Tobacco[1]

Processing/Manufacturing
Custom-made and cottage industry: Mishri is usually prepared at home by individual users, but it can also be prepared by vendors for sale and bought in the market under various names.[5] No other ingredients besides tobacco are used in the preparation of mishri. Tobacco is baked on a hot metal plate until it is toasted or partially burnt and is uniformly black. It is then powdered.[1]

Mishri

Chemical Measurements

These data are for select products and may not represent all products of this type. These data are expressed on a per gram basis for products analyzed as received. The amount absorbed will depend on the amount of product used.

Product Type	pH	Total Nicotine (9) mg/g wet wt	Free Nicotine (9) mg/g wet wt	NNK (10)	NNN (10)	NNAL ng/g wet wt	Total TSNAs
Mishri,* India	6.54	2.73	0.09	4,210	870	—	—

*Chemical measurements from both sources are for Shahin mishri.
Abbreviations: NNK = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone; NNN = *N'*-nitrosonornicotine; NNAL = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol; TSNAs = tobacco-specific nitrosamines; mg/g = milligram per gram; ng/g = nanogram per gram.
Sources: Gupta and Sreevidya 2004 (9); Stepanov et al. 2005 (10).

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For additional information on mishri, please refer to Chapter 13: Smokeless Tobacco Use in the South-East Asia Region.

Moist Snuff
(Dip)

Moist snuff is a damp, finely ground tobacco product that is more commonly used in Western countries than elsewhere. Moist snuff, also referred to as dip, is the most common form of smokeless tobacco in the United States and Canada.[1,2] This factsheet only describes commercial moist snuff. Other types of moist snuff are used in many countries around the world.

Common Names
Dip, spit tobacco (sometimes called "chew," even though it is not chewing tobacco)

Brand Names
Copenhagen, Skoal, Red Seal, Husky *(U.S. Smokeless Tobacco Company)*, Grizzly, Kodiak *(American Snuff Company)*, Kayak, Redwood, Gold River, Silver Creek, Cooper, Silverado *(Swisher International)*, Red Man, Timber Wolf, Longhorn *(Swedish Match)*

Main Geographic Locations (WHO Region: Country)
Region of the Americas: United States, Canada,[1,2] Mexico[3]; **African Region:** South Africa[1,4]

Prevalence and Demographics
Moist snuff is the most commonly used form of smokeless tobacco in the United States, Canada, and Mexico.[1,2,3] In the United States, it is primarily used by young adult white men living in the South.[5] Although no statistics specifically on the prevalence of moist snuff use are available, sales of moist snuff represented 78.2% of U.S. smokeless tobacco sales in 2010.[6] The prevalence of smokeless tobacco use in the United States in 2012 was 3.6% among people age 12 and older (7.1% of males and 0.4% of females).[7] In Canada, smokeless tobacco use is low—1% of adult men use any type of smokeless tobacco[8]—and sales of moist snuff make up more than 80% of all smokeless tobacco sales.[2]

Mode of Absorption
Oral (held in mouth, sucked)

Use Pattern
Moist snuff is commonly used loose, but can also come in small, ready-to-use pouches. It is usually held in the mouth for about 30 minutes. Saliva is usually spit out, but it can be swallowed.[1]

Main Ingredients
Tobacco, flavorings, inorganic salts, humectants[1]

Processing/Manufacturing
Commercial: Moist snuff is commercially manufactured. Tobacco leaf, stems, and seeds are air- and/or fire-cured, then processed into fine particles ("fine cut") or strips ("long cut").[1] This process ferments the tobacco, which produces more cancer-causing nitrosamines than snus manufacturing[9] (snus is often considered a different type of moist snuff). Moist snuff has a moisture content of roughly 20–60% by weight and is available in a variety of flavors, such as mint and fruit flavors. The tobacco is usually sold loose, but can also be packaged in small, tea bag–like pouches called sachets.[1]

Moist Snuff
(Dip)

Chemical Measurements

These data are for select products and may not represent all products of this type. These data are expressed on a per gram basis for products analyzed as received. The amount absorbed will depend on the amount of product used.

Product Type*	pH	Total Nicotine (mg/g wet wt)	Free Nicotine (mg/g wet wt)	NNK (ng/g wet wt)	NNN (ng/g wet wt)	NNAL (ng/g wet wt)	Total TSNAs† (ng/g wet wt)
Moist Snuff (10), United States	5.54–8.62	4.42–25.03	0.01–7.81	382–9,950	2,204–42,554	21–1,412	4,874–90,024
Moist Snuff (1), United States	5.49–8.38	7.06–24.29	0.03–8.57	—	—	—	—

*Moist snuff products were commercially manufactured.
†Total TSNAs represent the sum of NNK, NNN, and NNAL (shown), *N'*-nitrosoanatabine and *N'*-nitrosoanabasine (not shown).
Abbreviations: NNK = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone; NNN = *N'*-nitrosonornicotine; NNAL = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol; TSNAs = tobacco-specific nitrosamines; mg/g = milligram per gram; ng/g = nanogram per gram.
Sources: Richter et al. 2008 (10); International Agency for Research on Cancer 2007, table 7 (1).

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For additional information on moist snuff, please refer to the following chapters: Chapter 9: Smokeless Tobacco Use in the Region of the Americas, and Chapter 12: Smokeless Tobacco Use in the African Region.

Nass

Nass (also known as naswar) is a multinational product made of locally grown tobacco, oil, an alkaline modifier such as ash or slaked lime, and other ingredients according to regional preference.[1,2] Nass/nasway is one of the most common types of smokeless tobacco used in Pakistan, the United Arab Emirates, Uzbekistan, and Kyrgyzstan.[1,3] In Uzbekistan and Kyrgyzstan, a product known as nasway contains the same main ingredients as nass. Although there is insufficient published information to determine if nass and nasway are the same product, for the purposes of this factsheet, they are assumed to be essentially the same.

Photo courtesy of Clifford Watson, Centers for Disease Control and Prevention

Common Names
Naswar (Pakistan); niswar (United Arab Emirates); nass (Iran); nasway, nasvay (Kyrgyzstan, Uzbekistan)

Brand Names
None

Main Geographic Locations (WHO Region: Country)
Eastern Mediterranean Region: Pakistan, Iran, Afghanistan, United Arab Emirates[1,4]; **African Region:** South Africa[1,4]; **European Region:** Turkmenistan, Kyrgyzstan, Uzbekistan[5,6]

Prevalence and Demographics
In Kyrgyzstan, according to a 2011 World Health Organization report, 3.4% of all adults (7.0% of men and 0.3% of women) use nasvay.[5] In Uzbekistan, in a 2002 survey of adults between the ages of 15 and 60, only 0.4% of women reported ever using nasway in their lifetime, compared to 37.9% of men. Thus, among men in Uzbekistan, using nasway is as common as cigarette smoking.[7] Studies in Turkmenistan in 1993 reported that 12% of adults used nass.[6]

Mode of Absorption
Oral (chewed, sucked, held in mouth)

Use Pattern
Nass is usually rolled into a ball and placed under the tongue or in the cheek.[1,4,8] It is held in the mouth and sucked for 10 to 15 minutes or may be chewed slowly.[2]

Main Ingredients
Nass: tobacco, ash, cotton or sesame oil, water, and sometimes lime or gum[2,9]
Naswar, niswar, nasway: tobacco, slaked lime (calcium hydroxide), ash, oil or butter, indigo or other coloring agent, water, and sometimes flavorings such as cardamom and menthol[1,2,4,7,8,9]

Processing/Manufacturing
Cottage industry and custom-made: Nass may be made domestically by individual users or prepared by local, small-scale cottage manufacturers.[4,9] Sun- and heat-dried tobacco leaves (often *N. rustica*), slaked lime, ash from tree bark, flavorings (e.g., cardamom and menthol), and coloring agents (e.g., indigo) are mixed together with a heavy wooden mallet. Water is added and the mixture is usually rolled into balls.[1,4] The product is then packed into small polyethylene bags for sale.[4]

Nass

Chemical Measurements

These data are for select products and may not represent all products of this type. These data are expressed on a per gram basis for products analyzed as received. The amount absorbed will depend on the amount of product used.

Product Type	pH	Total Nicotine (mg/g wet wt)	Free Nicotine (mg/g wet wt)	NNK (ng/g wet wt)	NNN (ng/g wet wt)	NNAL (ng/g wet wt)	Total TSNAs* (ng/g wet wt)
Naswar,† Pakistan	8.76–9.14	10.5–14.2	8.84–13.2	29.4–309	363–545	8.6–104	478–1,380
Nasway,† Uzbekistan	8.43	8.89	6.36	88.3	628	10.5	1,100

*Total TSNAs represent the sum of NNK, NNN, and NNAL (shown), and *N'*-nitrosoanatabine and *N'*-nitrosoanabasine (not shown).
†Naswar/nasway products were produced by cottage industry.
Abbreviations: NNK = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone; NNN = *N'*-nitrosonornicotine; NNAL = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol; TSNAs = tobacco-specific nitrosamines; mg/g = milligram per gram; ng/g = nanogram per gram.
Source: Stanfill et al. 2011 (10).

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For additional information on nass/nasway, please refer to the following chapters: Chapter 10: Smokeless Tobacco Use in the European Region, and Chapter 11: Smokeless Tobacco Use in the Eastern Mediterranean Region.

Plug

Plug, one of three types of chewing tobacco sold in North America, is considered the oldest form of chewing tobacco. Plug tobacco is sweetened with sugar and licorice and pressed into a brick shape. It is sold as either "moist" or "firm" depending on the amount of moisture in the product.[1]

Photo courtesy of Clifford Watson, Centers for Disease Control and Prevention

Common Names
Chew, chaw, chewing tobacco, spit tobacco

Brand Names
Red Man, Days Work, Apple, Brown, Natural Leaf, Union Standard, Tinsley, WNT (*Swedish Match North America*), Levi Garrett, Taylors Pride, Cannon Ball (*American Snuff Company*)

Main Geographic Location (WHO Region: Country)
Region of the Americas: United States[1]

Prevalence and Demographics
Chewing tobaccos are primarily used by men and are more commonly used in rural areas and in the Southern and Midwestern United States.[2] Plug use has declined over the past century and is rare today in most regions of the United States.[1] Although there are no recent statistics specifically on the prevalence of plug use, in 2010 sales of plug represented only 0.5% of all smokeless tobacco sales in the United States.[3]

Mode of Absorption
Oral (chewed, sucked, held in mouth)

Use Pattern
A piece of plug is cut off and chewed or held between the cheek and gum. Saliva is usually spit out, but it can also be swallowed.[1]

Main Ingredients
Burley and bright tobacco or cigar tobacco leaves, licorice, and sugar[1]

Processing/Manufacturing
Commercial: Plug is commercially manufactured. Heavier grades of tobacco leaves are picked from the top of the plant and stems are removed. The tobacco is immersed in a mixture of licorice and sugar, pressed into a plug, wrapped in fine tobacco leaves, and pressed into bricks or flat blocks. Moist plug tobacco has at least 15% moisture by weight, whereas firm plug has less than 15% moisture. Plug also has a high average sugar content (approximately 25% of its weight).[1]

Plug

Chemical Measurements

These data are for select products and may not represent all products of this type. These data are expressed on a per gram basis for products analyzed as received. The amount absorbed will depend on the amount of product used.

Product Type*	pH	Total Nicotine (mg/g wet wt)	Free Nicotine (mg/g wet wt)	NNK (ng/g wet wt)	NNN (ng/g wet wt)	NNAL (ng/g wet wt)	Total TSNAs† (ng/g wet wt)
Plug (4), United States	5.10–5.95	5.12–15.1	0.01–0.04	340–941	2,920–5,140	11–188	4,090–7,750
Plug (1), United States	5.07–5.95	6.18–20.43	0.02–0.08	—	—	—	—

*All loose leaf products were commercially manufactured.
†Total TSNAs represent the sum of NNK, NNN, and NNAL (shown), *N'*-nitrosoanatabine and *N'*-nitrosoanabasine (not shown).
Abbreviations: NNK = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone; NNN = *N'*-nitrosonornicotine; NNAL = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol; TSNAs = tobacco-specific nitrosamines; mg/g = milligram per gram; ng/g = nanogram per gram.
Sources: Lawler et al. 2013 (4); International Agency for Research on Cancer 2007, table 5 (1).

References

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Rapé

Rapé is a type of dry snuff used in Brazil. Aboriginal groups may mix it with ashes from particular trees and use it for medicinal purposes.[1] Rapé is usually inhaled through the nose.

Photo courtesy of Clifford Watson, Centers for Disease Control and Prevention

Common Names
None

Commercial Names
Moeda, Caratinga, Guarany

Main Geographic Location (WHO Region: Country)
Region of the Americas: Brazil[1]

Prevalence and Demographics
Published information on rapé is limited, and data on the prevalence of rapé use are not available. The 2001 Brazilian Global Adult Tobacco Survey found that about 0.4% of adults aged 15 years and older use any type of smokeless tobacco.[2] Anecdotal evidence suggests that rapé is primarily used in rural areas and small towns, or by aboriginals in the Amazon rainforest, where its use has cultural significance.

Mode of Absorption
Nasal

Use Pattern
Rapé is inhaled through the nose. Some aboriginal groups prepare their own rapé. The Kaxinawás Indians from Acre in Brazil prepare a half portion of rapé and half portion of ashes from wood, usually from the paricá tree (*Schizolobium amazonicum*). They consume rapé by having one person use a large "V"-shaped straw to blow the dust into their partner's nose. They may use it for medicinal purposes.[1]

Main Ingredients
Dried tobacco leaf, flavorings such as tonka bean (*Dipteryx odorata*), clove, cinnamon powder, and camphor, and in some cases, ashes from select trees

Processing/Manufacturing
Cottage industry and custom-made: Rapé is produced locally on small farms, in small tobacco industries, or by Indians. The dried tobacco leaf is ground and carefully toasted. Rapé is sometimes toasted with other ingredients such as spices, herbs, and ashes, and the toasted product is then sifted into a very fine dust.

Chemical Measurements
No data available

References

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For additional information on rapé, please refer to Chapter 9: Smokeless Tobacco Use in the Region of the Americas.

Red Toothpowder

Red toothpowder contains finely powdered tobacco, herbs, flavoring agents, and other ingredients.[1] It is red in color and is usually used in India to clean teeth.[1,2] In 1992, India banned the use of tobacco as an ingredient in dental products.[2,3] Brands of red toothpowder have stopped listing tobacco as an ingredient, but lab results show that some still contain tobacco and measureable amounts of nicotine.[2,3,4,5]

Photo courtesy of World Health Organization South-East Asia Regional Office and Dhirendra N. Sinha

Common Names
Lal dant manjan

Brand Names
Dabur, Baidhyanath

Main Geographic Location (WHO Region: Country)
South-East Asia Region: India[1,2]

Prevalence and Demographics
Red toothpowder is used by men and women of all ages, as well as children.[2] There are no national statistics on the prevalence of use of red toothpowder by adults. The 2004 Global Youth Tobacco Survey, which surveys school students aged 13–15 years, found that reported prevalence of red toothpowder use ranged from 2% to 49% across various regions in India.[3]

Mode of Absorption
Oral (teeth cleaning)

Use Patterns
Red toothpowder is used to clean teeth (as a dentifrice).[1,2]

Main Ingredients
Fine red tobacco powder, herbs, flavorings.[1] Additional plant-related ingredients such as ginger, pepper, and camphor, among others, may be used.[6,7]

Processing/Manufacturing
Commercial: Red toothpowder is commercially manufactured and is often marketed as an herbal dental care product.[1] Additional information on the manufacturing of red toothpowder is not available.

Red Toothpowder

Chemical Measurements

These data are for select products and may not represent all products of this type. These data are expressed on a per gram basis for products analyzed as received. The amount absorbed will depend on the amount of product used.

Product Type	pH	Total Nicotine	Free Nicotine	NNK	NNN	NNAL	Total TSNAs*
		mg/g wet wt		ng/g wet wt			
Red Toothpowder,† India	5.75–6.71	4.47–5.09	0.03–0.21	—	—	—	—

*Study did not measure NNK, NNN, or NNAL TSNAs.
†All red toothpowder products were commercially manufactured.
Abbreviations: NNK = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone; NNN = *N'*-nitrosonornicotine; NNAL = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol; TSNAs = tobacco-specific nitrosamines; mg/g = milligram per gram; ng/g = nanogram per gram.
Source: Gupta and Sreevidya 2004 (5).

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Shammah

Shammah is a multinational smokeless tobacco product in powder or paste form, which can be either greenish-yellow ("white" shammah) or brownish-black ("black" shammah). It is made from powdered tobacco, slaked lime, ash, and black pepper and mainly used in Yemen, Saudi Arabia, and Algeria.[1]

Photo courtesy of Clifford Watson, Centers for Disease Control and Prevention

Common Names
El-Shama, bajeli, haradi, sharaci, black shammah (Yemen); al-shammah (Saudi Arabia); chemma (Algeria)

Brand Names
None

Main Geographic Locations (WHO Region: Country)
Eastern Mediterranean Region: Saudi Arabia, Yemen[1,2,3]; **African Region:** Algeria[1,4]

Prevalence and Demographics
In Yemen in 2003, 10.7% of the population aged 10 years and older used shammah (15.1% of males and 6.2% of females).[2] Shammah was used by males and females of all ages, including adolescents. Shammah use increases with age and is more common in rural than urban areas.[2] In Algeria, shammah (or chemma) is commonly consumed by men across all social groups.[4] Information on prevalence of shammah use in Algeria and Saudi Arabia is not available.

Mode of Absorption
Oral (sucked, held in mouth)

Use Pattern
Shammah is placed between the gum and lower lip or cheek.[1,2] In Algeria, users may wrap shammah in paper before putting it in the mouth.[4]

Main Ingredients
Tobacco, slaked lime, ash, black pepper, oil, flavorings, bombosa (sodium carbonate)[1,2]

Processing/Manufacturing
Cottage industry and custom-made: Shammah is usually prepared by small cottage industries or by local individual vendors for sale. The tobacco leaves are sun dried, pulverized with bombosa (sodium carbonate), and combined with other ingredients such as slaked lime, ash, black pepper, oil, and other flavorings. Shammah can be sold as a wet or dry product. To prepare wet shammah, such as black shammah, a water solution of bombosa is used rather than the dry powder alone.

Shammah

Chemical Measurements

No data available

References

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For additional information on shammah, please refer to the following chapters: Chapter 11: Smokeless Tobacco Use in the Eastern Mediterranean Region, and Chapter 12: Smokeless Tobacco Use in the African Region.

Snus

Snus is a traditional Swedish smokeless tobacco product. It is made from moist, finely ground tobacco and usually contains lower levels of tobacco-specific *N*-nitrosamines (TSNAs) than most oral tobacco products because it is pasteurized rather than fermented.[1,2] Although the use of snus is spreading to other regions of the world, in 1992 the sale of snus was banned in all countries in the European Union (EU) except Sweden.[2]

Photo courtesy of Clifford Watson, Centers for Disease Control and Prevention

Common Names
None

Brand Names
General, Catch, Ettan, Grovsnus, Göteborgs Rapé, Kronan *(Swedish Match)*; Lucky Strike, Pall Mall, du Maurier *(British American Tobacco)*; Camel *(R.J. Reynolds)*; Marlboro *(Philip Morris)*; Skoal *(U.S. Smokeless Tobacco Company)*; Knox, Skruf *(Imperial Tobacco)*, Tobaccorette

Main Geographic Locations (WHO Region: Country)
European Region: Sweden, Norway, Iceland, Finland, Denmark[3,4]; **Region of the Americas:** United States, Canada, Brazil[3]; **African Region:** South Africa[5]

Prevalence and Demographics
In Sweden in 2009, the prevalence of daily snus use among adults aged 16 years and older was 19% for males and 4% for females.[6] In Norway, which is not a member of the EU and therefore can legally sell snus, the prevalence of daily use in 2009 was 6% among adults aged 16 years and older (11% of males and 1% of females).[4] In 2010, 5.1% of U.S. adults aged 18 years and older had ever tried snus (8.5% of males and 2% of females), yet less than 1% currently used snus.[7] There is little information on prevalence of use in most of the other countries where snus is available. Although snus has been used in Europe's Nordic region for many years, it was only introduced relatively recently into the North American and South African markets, and therefore the prevalence of snus use may increase in these regions as this product becomes more widely available.[5,7]

Mode of Absorption
Oral (held in mouth)

Use Patterns
Snus can either be packaged into small, ready-to-use sachets or sold in loose tobacco form. One portion of snus is usually held in the mouth for 30 minutes or more and does not require chewing, sucking, or spitting. In Sweden the average user keeps snus in their mouth for 11 to 14 hours per day.[3]

Main Ingredients
Tobacco, moisturizers, sodium carbonate, salt (sodium chloride), sweeteners, flavorings[3,8]

Processing/Manufacturing
Commercial: Snus is commercially manufactured, but processing and manufacturing vary across regions and countries. In Sweden, finely ground air-cured tobacco is mixed with salts, water, and flavoring. Snus is similar to snuff, but snuff is fermented, which can increase the formation of TSNAs. Snus goes through a heat treatment process that pasteurizes the tobacco to kill off bacteria that aid in the formation of TSNAs.[2] During pre-sale storage, snus is kept cold to keep it "fresh" and to prevent more nitrosamines from forming.[9] However, variations in processing and manufacturing can produce variations in TSNAs.[3,8,9] Snus is either sold loose or portion packed in small tea bag-like pouches, or sachets. Snus comes in a variety of flavors.[3]

Snus

Chemical Measurements

These data are for select products and may not represent all products of this type. These data are expressed on a per gram basis for products analyzed as received. The amount absorbed will depend on the amount of product used.

Product Type*	pH	Total Nicotine (mg/g wet wt)	Free Nicotine (mg/g wet wt)	NNK (ng/g wet wt)	NNN (ng/g wet wt)	NNAL (ng/g wet wt)	Total TSNAs† (ng/g wet wt)
RJ Reynolds (10), United States	7.55–7.70	8.97–11.3	2.51–3.69	84–146	369–425	20–21	761–884
Swedish Match (8), Sweden	6.61–7.21	7.76–15.2	0.29–2.03	84.5–105	267–345	8.57–13.1	601–723
British American Tobacco (8), South Africa	6.48–7.02	13.4–17.2	0.47–1.19	171–275	925–1,440	18.6–30.4	1,720–2,700
Tobacco-rette (8), South Africa	6.56	15.0	0.49	1,340	2,950	84.2	5,850

*All snus products were commercially manufactured; manufacturer (associated products): RJ Reynolds (Camel snus); Swedish Match (General snus; Catch Peppermint snus); and British American Tobacco (Peter Stuyvesant snus; Lucky Strike snus).
†Total TSNAs represent the sum of NNK, NNN, and NNAL (shown), and *N'*-nitrosoanatabine and *N'*-nitrosoanabasine (not shown).
Abbreviations: NNK = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone; NNN = *N'*-nitrosonornicotine; NNAL = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol; TSNAs = tobacco-specific nitrosamines; mg/g = milligram per gram; ng/g = nanogram per gram.
Sources: Stanfill et al. 2011 (8); Lawler et al. 2013 (10).

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For additional information on snus, please refer to the following chapters: Chapter 9: Smokeless Tobacco Use in the Region of the Americas; Chapter 10: Smokeless Tobacco Use in the European Region; and Chapter 12: Smokeless Tobacco Use in the African Region.

Tapkeer

Tapkeer (tapkir) is a form of dry powdered snuff that may be used for teeth cleaning. It is similar to other teeth-cleaning products such as mishri.[1]

Common Names
Bajjar (Gujarat, India)

Brand Names
None

Main Geographic Location (WHO Region: Country)
South-East Asia Region: India[1]

Prevalence and Demographics
In Goa, Maharastra, Gujarat, and eastern India, tapkeer is widely used by people of lower socioeconomic status and is more commonly used by women than men.[1,2] Although there are no national or recent statistics specifically on tapkeer use, historical data indicate that 14% of women and 1% of men use tapkeer in Gujarat, India.[3] In 2009–2010, 4.7% of adults aged 15 and older (3.3% of males and 6.3% of females) reported using at least one type of applied oral tobacco product, including tapkeer, mishri, or gudakhu.[4]

Mode of Absorption
Oral (teeth cleaning, held in mouth), **Nasal**

Use Pattern
In India, tapkeer is rubbed on the teeth and gums to clean teeth. Because it is addictive, users tend to use it several times a day.[1,2]

Main Ingredients
Tobacco[1]

Processing/Manufacturing
Custom-made: In India, tapkeer is frequently prepared by individual users at home by roasting and then powdering the tobacco.[1]

Chemical Measurements
No data available

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Tobacco Leaf

Raw dried tobacco leaf may be chewed alone, but it is frequently used in betel quid in India, Bangladesh, and Myanmar.[1]

Common Names
Sada pata; chadha (Assam, India)

Brand Names
None

Main Geographic Locations (WHO Region: Country)
South-East Asia Region: India, Bangladesh, Myanmar, Bhutan[1,2]

Prevalence and Demographics
In Bangladesh in 2009, 1.8% of adults aged 15 and older chewed sada pata (plain tobacco flakes) alone (2% of males, 1.6% of females); this figure does not include adults who used tobacco leaf in betel quid.[3] National prevalence data on the use of tobacco leaf are not available for other countries. In Bangladesh and Myanmar, betel quid chewers of low socioeconomic status often put tobacco leaf in their quid.[1]

Mode of Absorption
Oral (chewed, chewed in betel quid or other custom-made product)

Use Pattern
In India, a regular user chews about a 15-cm piece of the tobacco leaf per day.[1]

Main Ingredients
Tobacco leaf[1]

Processing/Manufacturing
Custom-made: Raw tobacco leaf is usually dried and left unprocessed. It can be powdered, flaked, or sold in bundles of several long strands (about 115 cm long and 5 cm thick). A regular user consumes one 15-cm piece of the strand per day.[1]

Tobacco Leaf

Chemical Measurements

These data are for select products and may not represent all products of this type. These data are expressed on a per gram basis for products analyzed as received. The amount absorbed will depend on the amount of product used.

Product Type	pH	Total Nicotine (mg/g wet wt)	Free Nicotine (mg/g wet wt)	NNK (ng/g wet wt)	NNN (ng/g wet wt)	NNAL (ng/g wet wt)	Total TSNAs* (ng/g wet wt)
Tobacco Leaf, Bangladesh	5.92	19.7	0.15	21.7	165	24.5	574

*Total TSNAs represent the sum of NNK, NNN, and NNAL (shown), and *N'*-nitrosoanatabine and *N'*-nitrosoanabasine (not shown).
Abbreviations: NNK = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone; NNN = *N'*-nitrosonornicotine; NNAL = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol; TSNAs = tobacco-specific nitrosamines; mg/g = milligram per gram; ng/g = nanogram per gram.
Source: Stanfill et al. 2011 (4).

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For additional information on tobacco leaf, please refer to Chapter 13: Smokeless Tobacco Use in the South-East Asia Region.

Tobacco Water
(Tuibur)

Tobacco water (also known as tuibur) is tobacco smoke-infused water that is gargled or sipped. It is commonly used in northeastern India, and is called tuibur in Mizoram and hidakpha in Manipur. This product has been used since the 19th century.[1,2]

Common Names
Tuibur (Mizoram, India); hidakpha (Manipur, India)

Brand Names
None

Main Geographic Location (WHO Region: Country)
South-East Asia Region: India[3]

Prevalence and Demographics
In 2001, tuibur was used by 7.2% of adults aged 15 and older in the Aizawl district of Mizoram, and by 6.5% of adults in the Churachandpur district of Manipur.[4] The prevalence of use was similar among males and females.[1,2,4]

Mode of Absorption
Oral (gargled, held in mouth)

Use Pattern
Tuibur is either sipped from a bottle or through cotton soaked with tobacco water. It is retained in the mouth or gargled for 5 to 10 minutes before it is spit out. Although people may initially use tuibur to clean their teeth, many become addicted and will use the product up to 30 times per day.[2,4]

Main Ingredients
Tobacco smoke, water[2,3]

Processing/Manufacturing
Cottage industry and custom-made: Tuibur is produced by passing tobacco smoke through water and is sold in glass bottles.[1,4] Tuibur may be produced by small-scale industry or prepared at home for household use or sale.[4]

Chemical Measurements
No data available

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Tombol

Tombol is a mixture of tobacco and flavoring ingredients such as noura, slaked lime, areca nut, and catechu. It is used in Yemen and is very similar to betel quid (paan), which is used in southeast and western Asia.

Photo courtesy of Mazen Abood Bin Thabit, University of Aden

Common Names
None

Brand Names
None

Main Geographic Location (WHO Region: Country)
Eastern Mediterranean Region: Yemen

Prevalence and Demographics
No published information on the prevalence of tombol use is available.

Mode of Absorption
Oral (chewed, held in mouth)

Use Pattern
Tobacco and the other main ingredients are wrapped in a tombol leaf (betel leaf), placed in the mouth, and sucked and chewed. Powdered khat, a plant with psychoactive properties, may also be added.

Main Ingredients
Tobacco, areca nut (fofal), noura, slaked lime (calcium hydroxide), catechu (extract from the acacia tree), tombol leaf (betel leaf), and sometimes powdered khat (*Catha edulis*) or other flavoring ingredients.

Processing/Manufacturing
Custom-made: Tombol is prepared either by a vendor or by the user, who wraps the main ingredients (tobacco, areca nut, noura, slake lime, catechu) in a tombol leaf. There are three types of tombol: (1) Sweet—a sweetening agent, usually coconut, is added to the main ingredients; (2) bitter—additives like clove oil, cardamom, and herbal medicines are used; and (3) mixed with tobacco—tombol is often mixed with either dry, thin pieces of Yemeni tobacco, called socha (similar to Indian pattiwalla), or zarda, a scented tobacco from India.

Chemical Measurements
No data available

References
Published information on tombol could not be located.

For additional information on tombol, please refer to Chapter 11: Smokeless Tobacco Use in the Eastern Mediterranean Region.

Toombak

Photo courtesy of Clifford Watson, Centers for Disease Control and Prevention

Toombak is a type of moist tobacco commonly used in Sudan. It is made of sun-dried ground tobacco and a solution of baking soda (sodium bicarbonate) and water.[1] The word toombak can also be used to describe the native tobacco plant used to manufacture local snuff.[2]

Common Names
Sauté, sute, ammari, saood

Brand Names
El-Sanf (of high quality), Wad Amari (the name of the person who introduced toombak to Sudan), Sultan El-Khaif (the master which alters the mind)

Main Geographic Locations (WHO Region: Country)
Eastern Mediterranean Region: Sudan[1]; **African Region:** Chad

Prevalence and Demographics
No recent information is available on the use of toombak. Historically, toombak was commonly used by adult Sudanese men, particularly in rural areas. The most recent published statistics (1998) found that among adults age 18 and older in the northern region of Sudan, 34% of Sudanese men and 2.5% of women use toombak.[3] The prevalence of toombak use increases with age for both men and women and is more common in rural than urban areas.[3]

Mode of Absorption
Oral (held in mouth, sucked, used as ingredient in tombol), **Nasal**

Use Pattern
A small portion of the toombak, weighing about 10 grams, is rolled into a ball called a saffa. It is sucked slowly for 10 to 15 minutes, The saliva that is produced is then spit out by men or swallowed by women, because it is considered socially unacceptable for women to use toombak.[1,2] Users usually rinse their mouths with water after the saffa is removed. A regular user may use toombak as many as 10 to 20 times per day.[2]

Main Ingredients
Tobacco (*N. rustica*), baking soda (sodium bicarbonate, locally called atrun or natron), water[1,2,4]

Processing/Manufacturing
Cottage industry and custom-made: Toombak tobacco leaves (*N. rustica*) are harvested and left in small heaps in a field to dry for about 45 days (sun-curing). The leaves are then tied into bundles, sprinkled with water, and stored for a few of weeks at 30 to 45° C (85–110° F) to allow fermentation. The leaves are then ground into course particles by toombak mills and aged for up to a year or more in burlap sacks.[1,2] Vendors prepare ready-made toombak by gradually adding baking soda (sodium bicarbonate) to the tobacco until the mixture is approximately four parts tobacco to one part baking soda. The resulting toombak is then placed in an airtight container for about 2 hours prior to sale.[1,2,4] While toombak is not commercially manufactured, vendors display commercial names at their shops as trademarks.

In addition to selling ready-made toombak, vendors may sell dry toombak leaves and baking soda separately so that customers can prepare their own toombak.[4]

Toombak

Chemical Measurements

These data are for select products and may not represent all products of this type. These data are expressed on a per gram basis for products analyzed as received. The amount absorbed will depend on the amount of product used.

Product Type	pH	Total Nicotine (mg/g wet wt)	Free Nicotine (mg/g wet wt)	NNK (ng/g wet wt)	NNN (ng/g wet wt)	NNAL (ng/g wet wt)	Total TSNAs* (ng/g wet wt)
Toombak, Sudan	7.38–10.1	9.56–28.2	5.16–10.6	14,700–516,000	115,000–368,000	4,550–6,770	295,000–992,000

*Total TSNAs represent the sum of NNK, NNN, and NNAL (shown), and *N'*-nitrosoanatabine and *N'*-nitrosoanabasine (not shown).
Abbreviations: NNK = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone; NNN = *N'*-nitrosonornicotine; NNAL = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol; TSNAs = tobacco-specific nitrosamines; mg/g = milligram per gram; ng/g = nanogram per gram.
Source: Stanfill et al. 2011 (5).

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For additional information on toombak, please refer to Chapter 11: Smokeless Tobacco Use in the Eastern Mediterranean Region.

Twist

Twist, also called roll, is chewing tobacco that is twisted into rope-like strands and braided. It was popular in the United States in the late 1800s, but use of chewing tobacco began to decline with the expansion of the cigarette industry in 1918.[1] Twist is rarely used today, and sales of twist make up less than 1.0% of all smokeless tobacco sales in the United States.[2]

Photo courtesy of Clifford Watson, Centers for Disease Control and Prevention

Common Names
Chew, chaw, chewing tobacco

Brand Names
Moore's Red Leaf, Cumberland, Mammoth Cave, Cotton Boll, Kentucky, Warren County, Rough Country (*American Snuff Company*)

Main Geographic Location (WHO Region: Country)
Region of the Americas: United States[1]

Prevalence and Demographics
Twist use has declined over the past century and is rare today. Although statistics specifically on the prevalence of twist use are not available, 2009 sales of twist made up 0.4% of all smokeless tobacco sales in the United States.[2]

Mode of Absorption
Oral (chewed, held in mouth)

Use Pattern
Users typically cut off a piece, place it in the mouth, and chew. Saliva is usually spit out, but it can also be swallowed.[3]

Main Ingredients
Tobacco, tobacco leaf extract, and sometimes sweetener or flavorings[1]

Processing/Manufacturing
Commercial: Twist is handmade by commercial manufacturers. Air-cured or fire-cured burley tobacco leaf is treated with a tar-like tobacco leaf extract and sometimes sweeteners and other flavorings. The tobacco is then twisted into rope-like strands that are dried. The final product is a pliable, but dry, rope. Twist is sold by the piece in varying sizes, depending on the number of leaves in the twist.[1,3]

Twist

Chemical Measurements

These data are for select products and may not represent all products of this type. These data are expressed on a per gram basis for products analyzed as received. The amount absorbed will depend on the amount of product used.

Product Type	pH	Total Nicotine	Free Nicotine	NNK	NNN	NNAL	Total TSNAs*
		mg/g wet wt		ng/g wet wt			
Twist,† United States	4.73–5.77	21.6–40.1	0.02–0.22	309–556	828–2,460	n.d.‡–104	2,590–4,950

*Total TSNAs represent the sum of NNK, NNN, and NNAL (shown), and *N'*-nitrosoanatabine and *N'*-nitrosoanabasine (not shown).
†Twist products were commercially manufactured.
‡n.d. = not detectable.
Abbreviations: NNK = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone; NNN = *N'*-nitrosonornicotine; NNAL = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol; TSNAs = tobacco-specific nitrosamines; mg/g = milligram per gram; ng/g = nanogram per gram.
Source: Lawler et al. 2013 (4).

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For additional information on twist, please refer to Chapter 9: Smokeless Tobacco Use in the Region of the Americas.

Zarda

Zarda is a flaky mixture of tobacco, lime, spices, and vegetable dyes. It is frequently chewed with chopped areca nut or used as an ingredient in paan. Zarda is commonly used in South-East Asia and in countries to which people from this region have emigrated.[1]

Photo courtesy of Clifford Watson, Centers for Disease Control and Prevention

Common Names
Dokta (West Bengal, India)

Brand Names
Baba, Baghban Zafrani Zarda, Ratna Zafrani Patti, Gopal *(India)*; Zahoor Zafrani Patti, Raja Jani Zafrani Patti, Sunbrand Zafrani Banarasi Patti, Shahzadi Zafrani Patti, Najma Zaffran Patti *(Pakistan)*; Dulal Mishti, Hakim Puri, Bat One Baba, Bullet, Surma *(Bangladesh)*

Main Geographic Locations (WHO Region: Country)
South-East Asia Region: India, Bangladesh, Myanmar, Nepal, Bhutan[1]; **Eastern Mediterranean Region:** Yemen[1]

Prevalence and Demographics
In India, Bangladesh, Myanmar, and Nepal, zarda is frequently used as an ingredient in paan (betel quid), particularly among middle to upper socioeconomic groups.[2] Although specific prevalence rates for zarda use are not available, the prevalence of smokeless tobacco use is high in these South-East Asian countries, and zarda use is common.[1,2] Between 2007 and 2010, the adult prevalence rate of current smokeless tobacco use ranged from 18.6% to 29.6% in India, Bangladesh,[3] Myanmar, Nepal, and Bhutan.[4]

Mode of Absorption
Oral (chewed, chewed in paan or tombol)

Use Patterns
Zarda may be chewed by itself, but it is usually chewed with chopped areca nuts and spices. In South-East Asia it is often used in paan, and in Yemen it is used in tombol.[1,2,5,6]

Main Ingredients
Tobacco, lime, spices, vegetable dyes, and sometimes areca nut and/or silver flecks[1,5]

Processing/Manufacturing
Commercial: Zarda is commercially manufactured but is usually used in user- or vendor-made paan.[5,6] Zarda is processed by boiling broken up tobacco leaves with lime and spices until the water evaporates. It is then dried and colored with vegetable dyes.[1,2] Zarda is sold in small packets or tins.[2]

Zarda

Chemical Measurements

These data are for select products and may not represent all products of this type. These data are expressed on a per gram basis for products analyzed as received. The amount absorbed will depend on the amount of product used.

Product Type*	pH	Total Nicotine (mg/g wet wt)	Free Nicotine (mg/g wet wt)	NNK (ng/g wet wt)	NNN (ng/g wet wt)	NNAL (ng/g wet wt)	Total TSNAs† (ng/g wet wt)
Zarda (wet),‡ Bangladesh	6.51	21.3	0.63	3,840	28,600	3,460	53,700
Zarda (dry), Bangladesh	6.28	9.55	0.17	457	4,280	248	9,120
Zarda, India	5.22	30.43	0.05	829	2,910	390	5,490

*All zarda products were commercially manufactured.
†Total TSNAs represent the sum of NNK, NNN, and NNAL (shown), and *N'*-nitrosoanatabine and *N'*-nitrosoanabasine (not shown).
‡This product contains areca nut.
Abbreviations: NNK = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone; NNN = *N'*-nitrosonornicotine; NNAL = 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol; TSNAs = tobacco-specific nitrosamines; mg/g = milligram per gram; ng/g = nanogram per gram.
Source: Stanfill et al. 2011 (7).

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For additional information on zarda, please refer to the following chapters: Chapter 10: Smokeless Tobacco Use in the European Region, and Chapter 13: Smokeless Tobacco Use in the South-East Asia Region.