1. Description of the Habit and Products - Snuff

1.1 Historical Aspects

Any description of the use of snuff is rich with historical references. From the first Indians of South America in the 15th century to the aristocratic society of France; to Ireland, Scotland, and England, the 18th century finally became the "age of snuff." During this era, snuff boxes, perfumed snuff, medicinal snuff, and the affectations and ritual of snuff-taking became not only the fashion, but a status symbol patronized by royalty. The church hierarchy, the military, as well as the gentlemen of society laid down snuff as they laid down cellars of wine, some snuff to be used only during the morning, noon, or evening (Penn, 1901).

The main objectives of this summary of the history and use of snuff are fivefold: 1) To review the historical aspects of snuff use, its origin, and change with time; 2) To examine the current practices of what is snuffed, how often, and where these habits are practiced; 3) To consider data on the number of persons using snuff and the quantity of the product produced and sold with emphasis on demographic patterns; 4) To discuss current consumption figures,

brands available, and production trends; and 5) To describe the various manufacturing processes involved with snuff making with emphasis on aspects that might affect levels of alkaloids, nitrosamines, or other classes of chemicals which might be significant in evaluating potential carcinogenic effects of snuff use.

The Indians of Brazil were the first people to use snuff. One of their methods was to make a cup in a rosewood block of wood and with a pestle of the same wood, they would pulverize the tobacco leaves into a powder with a delicate aroma of rosewood. The snuff, hot from the grinding, was placed in a bone tube with one end plugged to preserve the fragrance. These mills and snuff tubes could be carried from place to place and were ornately decorated (Curtis, 1935).

Friar Roman Pane, a Franciscan monk who traveled with Christopher Columbus on his second voyage to the New World in 1493, reported that the Carib Indians of the lesser Antilles (Leeward and Windward Islands, Trinidad, Tobago, and Barbados) used snuff. Snuff powder was used to narcotize, to intoxicate medicine men who cured the sick in Haiti, and to clear nasal passages. These latter uses were reported by Pane upon his return to Spain. Friar Pane's return to

Spain with snuff signaled the arrival of a habit that was to last for several centuries in Europe.

In 1519 Ocaranza found that Mexican Indians used tobacco powder to heal burns and wounds and in 1525 Herrera observed Mexican Indians holding tobacco powder in their mouth to fall asleep and to feel no pain (Stewart, 1967). The Indians inhaled powdered tobacco through a hollow Y-shaped piece of cane or a pipe by applying the forked ends into each nostril and placing the other end near the powdered tobacco. The Indians called this instrument "tobago" or "tobaca." The Spaniards later changed the word to tobacco.

In 1559 Jean Nicot, in whose honor the genus, Nicotiana, was named, was the ambassador to Sebastian, King of Portugal. He grew some tobacco and promoted the product in Europe for its magic cure-all. He is also credited with introducting snuff to Catherine de Medici, the Queen of France and widow of Henry II (1519-1589), to cure her headaches.

The Spaniards by 1531 were commercially growing tobacco in the West Indies and they maintained a monopoly over the European markets until 1575 when the Portuguese began to grow large quantities of the product. Tobacco was soon grown in Europe as a decorative plant as well as a source of medicine.

The Dutch actually named the powdered tobacco, snuff, and were likewise using the product by 1560. Portuguese and Spanish sailors carried tobacco seeds and planted them at each port of call.

By the early 1600's, snuff had become an expensive commodity and had spread throughout South America, China, Japan, and Africa. In southern Africa, people sold land and slaves for tobacco (Brooks, 1952). The origin of the terms, carotte and rappe, goes back to the 1600's when tobacco for snuff was prepared in the form of a carrot to be rasped as the quantity for use was desired (Curtis, 1935). In 1620, the Royal Snuff Factory was established in Seville and this became the center of manufacturing and development of this product. Traveling via Japan, snuff use expanded to China (Ching Dynasty) in the 1650's. Palace artisians produced exquisitely carved, inlaid, enameled or painted snuff bottles. These bottles were made of ivory, porcelain, brass, jade, coral, bone, quartz, turquoise, amber, amethyst, and bamboo. With the use of a tiny spoon attached to the bottle stopper, a small portion of snuff was placed on the left thumbnail and inhaled through the nose. The Chinese believed that snuff cured pains in the eyes and teeth, alleviated throat

ailments, asthma, constipation, cold symptoms, and promoted sweating.

By 1650, snuff use had also spread from France to England, Scotland, and Ireland. The Irish called snuff "powder or smutchin." The Scottish adopted the use of snuff quite readily using such large amounts of "sneeshin" that a wooden figure or effigy of a Highlander still signposts Scottish snuff shope (Harrison, 1964).

It was during the reign of Queen Anne (1702-1714) that snuff use first reached its peak in England. The French custom of proper use of snuff had spread to British society. Snuff was called the "final reason for the human nose." Throughout the time of George III and his wife, Charlotte (1760-1820), snuff use continued to be popular. The queen was referred to as "Snuffy Charlotte" because of her snuff use. An entire room in Windsor Castle was devoted to her snuff stock.

The aristocratic popularity of snuff contributed a minor art-form to the European heritage. The snuff box became a status symbol of opulence reflecting the wealth and rank of its owner. Napoleon Bonaparte was said to own an annual set of 365 snuff boxes. Lord Nelson, the Duke of Wellington, Marie Antoninette,

Disraeli, Pope, and the famous Samuel Johnson all used snuff (Harrison, 1964). Snuff poisoning also gave rise to diplomatic intrigue during this time. It was generally used by the Spanish to eliminate political enemies such as the French. The Jesuits were likewise accused of secretly poisoning their enemies with snuff.

In the early 1700's, ready-made snuff became available and snuff boxes became popular throughout England. British sailors who could not smoke on fire-proned wooden ships became snuff users.

Jeweled gold and silver snuff boxes became the appropriate gift for admiration and friendship not only among the British, but also for visiting governmental dignitaries. In fact, in 1823, the House of Commons debated the high cost of 7,000 British pounds a year for the purchase of snuff boxes for gifts. Although there were hundreds of varieties of snuff in Europe at this time, three basic types were made. Scotch snuff was dry, strong, and unflavored, finely ground powder. Maccaboy snuff was moist and highly scented. Rapee snuff, also known as Swedish snuff, was coarsely grated (Heimann, 1980).

The leading snuff suppliers of the time, whose shop is still open in Haymarket, London, provided

King George IV with his own special blends, King's Morning Mix, King's Plain, and King's Carotte. Snuff was often home-made, ground up, and dried by means of an iron hand grater that resembled a modern cheese grater. The tightly rolled tobacco leaves (carotte) were often soaked in cinnamon, lavender, or almond oils. The snuff was usually placed on the back of the hand and inhaled.

Sneezing became part of non-verbal communication in European society. When one person was bored by another's verbage, he sneezed to show lack of interest in the conversation or discussion. This fact is the origin of the phrase, "not to be sneezed at" which indicates that something that is said is worthwhile.

Both males and females used snuff in England and this practice, along with dancing, hunting, and card playing, was a fashionable indulgence of the nobility and governing classes. The proper manner of inhaling snuff was to place a small quantity on the back of the hand and sniff it up the nostrils to induce a sneeze. Some users also dipped snuff by moistening a twig and dipping it into the snuff and chewing it or retaining it in their mouth between the gum and cheek. The ritual of snuff use became a detailed art

consisting of twelve operations such as ....take the box in the left hand, tap the lid thrice, take a pinch between the thumb and forefinger, etc.

In 1612, snuff made its way to America by way of John Rolfe, husband of Pocahontas. Rolfe introduced the better Spanish variety of tobacco to insure the survival of the Jamestown Colony located on the Chesapeake Bay and River in Virginia. By 1613, tobacco had become one of the major exports of the American colonies. Most of the colonists in America never fully accepted the English style of snuff use because it reminded them of their abhorrence of the British rulers. Nevertheless, American aristocrats used snuff and Dolly Madison was known to distribute samples of snuff to White House guests. During the 1800's until the mid 1930's a communal snuff box was installed for members of the United States Congress. The colonists also found it more suitable to their tastes to place snuff in their mouth rather than to sniff it.

The first snuff mill in America was constructed in Rhode Island in the 1750's and operated by Gilbert Stuart, father of the famous painter of George Washington by the same name. The snuff was made from New England tobacco and was said to equal Stuart's native Scottish varieties (Robert, 1949).

Pierre Lorillard, a Huguenot, established a snuff mill in New York in 1760 and carefully guarded his ingredients and blends. He was killed during the American Revolution, but his business was rebuilt by his sons, Peter and George. In 1789, the first American advertisement for tobacco was printed by the Lorillards featuring the now famous American Indian to advertise all tobaccos, including snuff.

During the 19th and early 20th centuries in America, dental snuff was advertised to relieve toothache, to cure neuralgia, bleeding gums, scurvy, and to preserve and whiten teeth and prevent decay. By 1945 the American Snuff Company in Memphis, Tennessee claimed to be the largest snuff manufacturer in the world. Their product was sweetened and claimed less medicinal qualities and more flavor components.

Historically, the production of snuff in the United States was never great although between 1880 and 1930 it increased from four million pounds to more than 40 million pounds per year. Snuff was made from dark air- and fire-cured leaves. Stems and leaves were aged in hogsheads and conditioned before being cut into one to two inch width strips. The chopped leaves underwent further fermentation for

some two months. During this period, the tobacco lost its creosote-like odor and became more aromatic. It was next dried by being passed through steam-heated containers at which time the dried tobacco was pulverized to fine powder in a revolving steel drum. The powder was passed over silk cloth containing as many as 96 threads (38/cm) per inch. All coarse residue was then returned to the mill for additional grinding before being packed into 100 pound bags for storage prior to repacking in smaller containers for retail sale. The so-called Scotch and Copenhagen snuff was used for dipping and then placing in the mouth. Rapee or French snuff was used for inhaling, and Maccaboy snuff was both sucked and inhaled (Garner, 1951).

Any history of snuff use would not be complete without a discussion of the various attacks on tobacco by the church, state, and medicine throughout almost four centuries. In 1590 in Japan, tobacco was prohibited and users lost their property or were jailed. The Scottish King James I, in 1604, took over the British Throne and became a strong anti-smoking advocate. He increased taxes on tobacco by 4,000 percent in an attempt to reduce the quantity imported to England.

In 1633, the Sultan Murad IV of Turkey made any use of tobacco a capital offense punishable with death by hanging, beheading, or starvation. The sultan maintained that tobacco caused infertility and reduced the fighting capabilities of his soldiers.

Michael Federovich Romanov, the Russian Czar (1613-1645) prohibited the sale of tobacco stating that users would be punished by cutting off their noses, castration, or beating. Persistent users would be killed.

A Chinese law in 1638 threatened that anyone possessing tobacco would be beheaded.

Snuff use was so widespread during the mid 1600's that Pope Urban VIII banned its use in churches. Pope Innocent X attacked the use of snuff by priests in the Catholic Church. Other religious groups followed with bans of snuff use. John Wesley (1703-1891), the founder of Methodism, attacked the use of snuff in Ireland. Likewise, the Mormons, Seventh-Day Adventists, Parsees and Sikhs of India, monks of Korea, Tsai Li sect of China, and some Ethiopian Christian sects forbid the use of snuff.

In Germany (Bavaria) tobacco was available only with a doctor's prescription. Frederick the Great, the Prussian King, prevented his mother, the Dowager

Queen of Prussia, from using snuff at his coronation in 1790. Louis XV, ruler of France from 1723-1774, banned snuff use from the Court of France.

Finally, any history of snuff must address its medical uses and abuses. From the era of Hippocrates who first induced sneezing using powder as a sternutatory, aromatic sneezing substances have been throught to cure various nasal problems. Originally, snuff came in colors of green, brown, and black with spices and herbs added to provide flavor that caused the sneezing reflex, cleared the sinuses of congestion, and eased breathing.

In 1761, John Hill, a London physician and botanist concluded that nasal cancer could develop as a consequence of tobacco snuff use (Redmond, 1970). He reported six cases of "polypusses, a swelling in the nostril that was hard, black, and adherent with the symptoms of an open cancer." Dr. Hill became the first physician to indicate an association of tobacco with cancer (Redmond, 1970).

The medicinal claims of snuff were debated and counter-attacked. In 1789, a University of Cambridge scholar wrote a 63 page document on the danger of snuffing tobacco. He gave case histories of snuff destroying nasal nerves and causing a loss of

appetite, impaired vision, mental retardation, convulsions, and death.

Now, a look at contemporary history indicates that during the 1970's in the United States until the present, snuff use along with chewing tobacco has steadily increased, especially among adolescents (11 percent each year since 1974, according to the Centers for Disease Control in Atlanta, Georgia) with an estimated 22 million smokeless tobacco users in the United States. In 1970, 3 percent of the males and 1 percent of females used snuff. By 1974, only 2 percent of males and 1 percent of females used snuff (National Clearing House for Smoking and Health, 1973, 1976). During the 1980's, snuff dipping has rapidly gained popularity among young adult males (Glover et al., 1983).

Traditionally, a snuff user in the United States was 45 years old. Today, he is probably a 35 year old white male working in a blue collar occupation as well as a male in the 18-30 year age group of which college students are a prominant component (Centers for Disease Control, 1984). It is estimated that more than 7 million males use moist snuff in the United States (Rizio, 1983).

Moist snuff has benefited from the change of lifestyles toward a more informal dress and back-to-the-land attitude and fascination with the "he-man" or "macho" image. Advertisements featuring sports personalities have made moist snuff more acceptable to young males (Rizio, 1983). These youth are placing snuff cans in the back pocket of their jeans and repeatedly washing their pants with the can in the pocket to form a bleached ring, the impression of the "in-group" who uses snuff (Glover et al., 1981). It is a symbol of virility, maturity, and toughness (Christen, 1980).

Media promotions by sports figures are teaching young people the proper way to dip snuff. One lesson goes like this....

> "....take a small pinch in your thumb and forefinger, and put it between your cheek and gum and leave it there. No need to chew....the tobacco releases its great flavor giving you real satisfaction. At first, you could feel a slight irritation on the gum, and the tobacco may move around in your mouth more than it should, and you might work up too much saliva, but learning is part of the fun and these things pass with practice. Two weeks should make you a pro" (Christen, 1980).

Moist snuff use has also increased as social restrictions on smoking in public places and in the work place have expanded. Certain work sites such as mines and factories have always prohibited smoking.

Now many establishments such as restaurants and offices further prohibit cigarette smoking.

1.2 Current Practices

In different parts of the world, snuff has distinct constituents. The abrasive quality, tobacco content, chemical components, and manufacturing processes vary (Roed-Peterson and Pindborg, 1973). For a better understanding of what is used, it is necessary to describe snuff for nasal and oral use in various regions of the world.

First and for historical reasons, nasal snuff will be described. As far as quality is concerned, German and British nasal snuffs are considered to be the best. The majority of nasal snuff is produced in West Germany (240,000 kilos per year) followed by Britain (150,000 kilos per year) and France and Italy (less than 100,000 kilos per year) (Poschl, June 1980). Today, snuff used nasally is concentrated mainly in Germany, Britain, and South Africa.

In Germany, there are five manufacturers of snuff and they supply hundreds of varieties and flavors.

(The authors wish to acknowledge Dr. A.G. Christen and his colleagues to whom they are indebted for a thorough summation of the history and folklore of snuff use, Christen, 1982).

The most well-known type is Bavarian "Schmalzler." Most of the snuff in Germany is flavored with menthol and ranges in boxes of 4, 5, 7, and 10 grams. In Britain, too, the range of snuff choices are great. On the other hand, in countries where there is a tobacco monopoly such as France, Italy, Austria, and the Eastern European countries, the selection is small and the use of snuff is comparatively low. These countries usually import snuff from Germany and Britain. The Benelux countries do not use snuff in large quantities. In Holland, there is no production of snuff and in Belgium and Luxemburg it is insignificant. These countries also rely on importing snuff from Germany and Britain. Germany and Britain export snuff to Switzerland, North America, South America, Australia, and South Africa. Snuff use is almost unknown in the Balkan States and the Near East. It is of interest to note that nasal use of snuff is not practiced in Brazil although the most important raw material for the production of Bavarian "Schmalzler" snuff comes from that country. This raw material, called "Mangotes," is packed in cowhides, fermented with sugar and spun into rope made from tobacco leaves (Poschl, June 1980).

In Britain, snuff is inhaled, although the precise method and use may vary from person

to person. Some people will transfer a pinch directly from the snuff box to the nostril, while others use a silver spoon to carry the snuff from the back of the hand to the nostril. The President of The Society of Snuff Grinders, Blenders and Purveyors continues to print on each box a list of the 12 Operations that in 1857 were described as "the true artistic method." It is still permissible to use snuff, but not smoke cigarettes, in the Houses of Parliament (Harrison, 1964).

In the United States, Scandinavia, and North Africa, snuff is used orally. In these parts of the world, the product is known as snus, souffi, or snuff, and consists of pulverized and mostly damp and coarse-gained tobacco.

Next, the basic types of snuff used in the United States will be described. According to the United States Department of Agriculture Marketing Services, there are two basic types of snuff, Dry Snuff and Moist/Fine cut snuff. Dry snuff is used in brands in which tobacco is processed into a dry, powdered substance. Dry snuff is also known as scotch, an aberration of the word, scorch, referring to the heat used in tobacco curing. This type of snuff consists of three varieties: plain, mild, or sweet. The plain flavor is soley tobacco flavored; mild has some

flavoring; and sweet contains a wide range of spices and aromas such as attar of rose, oil of lavender, nutmeg and cloves (Shapiro, 1981). Dry snuff is similar to European snuffs that most often are sniffed through the nose (Rizio, 1984). Dry snuff is made from Kentucky, Tennessee, and Virginian fire-cured tobaccos.

Moist snuff consists of brands in which tobacco is processed into fine particles or strips. The finely ground tobacco leaves and stems are packed with a moisture content for a granular structure. This form of snuff is flavored and packaged in a damp form in a round, flat container and is known as the Copenhagen type. Fine-cut tobacco is a variation of moist snuff and resembles cigarette tobacco, but it is used in the same manner as moist snuff. Until 1980, fine-cut tobacco was classified by the U.S. Department of Agriculture as chewing tobacco, but is now designated as a form of moist snuff. Moist snuff is made from air- and fire-cured tobacco. Fine-cut tobacco comes with such flavors as mint, raspberry, and wintergreen added. Moist and fine-cut snuff are packed in 1.2 oz flat, round tins (Rizio, 1984).

In the United States, dry snuff is used mostly by middle-aged and older people whereas fine-cut/moist

snuff is used by the younger generation. Each week, the average snuff user of fine-cut/moist snuff probably uses one and one-half 1.2 oz cans (Maxwell, September, 1980). In general, urban snuff dippers in the United States prefer the moist, sweet type whereas rural users like the dry, strong taste of the Scotch type (Ferrell et al., 1971).

During the early 1960's in the United States, snuff use was primarily confined to the South or Northwestern states. The typical user was a middle or lower socio-economic white female who began using snuff between the ages of 10 and 20 years. She was usually elderly, without teeth, and the wife of a farmer (Rosenfeld and Callaway, 1963).

The usual method of using snuff in the United States is to place a pinch of the flavored powdered tobacco in the gingival buccal area, between the mucosa of the cheek or lip and the gums, or beneath the tongue, and to suck on the quid from 30 minutes to as long as a person is awake. This current habit of oral use is in contrast to the 18th century practice of sniffing the snuff into the nasal cavity. Oral use of snuff is colloquially referred to as "snuff dipping" in the Southern United States. Some users of dry snuff measure out a small quanity

in the lid of the container, or with a special spoon and then place the snuff between the lower lip and the gum. Moist snuff is used by gathering the slightly damp form of tobacco in the form of a "pinch" between the thumb and forefinger and tucking it between the lower lip and gum. According to the U.S. Tobacco Company, an average buyer of moist snuff uses one to one and one-half tins per week (Bantle, 1980). It is estimated that two million people in the United States use snuff (Hoffmann et al., 1982).

In Denmark, snuff was originally used as a fine, dry powder that was inhaled through the nose, but now it is used orally like chewing tobacco (Zacho et al., 1968). Danish snuff users prefer the brand, Goteborg Snus (Gothenburg Snuff). In a study of 112 Danish males whose average age was 58.6 years, the oral mucosal area was exposed to snuff from 4 to 24 hours daily, but most people used snuff for 16-24 hours each day (Pindborg et al., 1980). This wet snuff which is highly alkaline (pH 8 to 9) is used throughout Scandinavia (Greer and Poulson, 1983). In a study of 450 male patients with oral leukoplakia, 32 used the wet, Gothenburg variety. The average age of these patients was 58.4 years (Roed-Petersen and Pindborg, 1973).

Swedish snuff is made of tobacco leaves which, after drying, grinding, and storing, are mixed with water, salts, and flavoring. Fresh snuff consists of approximately 0.88 percent nicotine. In 1978, approximately 3,400 tons of snuff were sold in Sweden and the product was used by some 700,000 to 800,000 Swedes. The user places the snuff in either the vestibular area of the upper or lower jaw (Frithiof et al., 1983).

According to a recent report by Hirsch, almost all snuff users in Sweden are males (17 percent of the population) between the ages of 15 and 30 years. Only one percent of Swedish females use snuff regularly. Among school children, in one study, aged 13 to 16 years, from 11 percent to 15 percent of the boys and none of the girls used snuff regularly. This trend in Sweden of young people using snuff is perhaps due to wide-spread advertising and reports in the medical literature that encourages the use of smokeless tobacco as a substitute for cigarette smoking (Russell et al., 1980).

There are geographical differences in the use of snuff in Sweden. The use is more wide-spread in the north where some 25 percent of the male population over the age of 15 years uses snuff daily. Snuff

dipping is also more common in rural areas (20 percent) and in small towns (13 percent) than in large towns. Other tobacco use such as cigarette smoking are (7 percent) often combined with snuff use. It was found that people with high consumption of snuff usually smoked fewer cigarettes than did those people with moderate snuff usage. Of male snuff users, 43 percent did not smoke cigarettes, 22 percent smoked sometimes, and 35 percent were regular smokers as well as snuff users (Hirsch, 1983).

In another study of 114 male snuff dippers in Sweden aged 20 to 88 years, the mean number of hours per day of oral exposure to snuff was 6.8 hours with a range of from one to 24 hours. The average grams per day was 13.8 (ranging from 4 grams to 50 grams). The mean number of years of snuff use in this group was 23.8 years (ranging from 1 to 68 years) (Axell et al., 1976).

The average weekly consumption of snuff in 1980 in Sweden was approximately 100 grams. Between 1970 and 1980, the sale of snuff increased in that country some 4 percent per year. In 1980, some 700,000 Swedes, predominantly males, used snuff. The total sales was 3,750 tons per year which equals approximately 5.4 kg per user (Osterdahl and Slorach, 1983).

An oral health study was undertaken on a separate group of Swedish school children (232 school children) ages 13 and 14. No females used snuff regularly, but 11 percent of the boys were regular users. The average consumption of snuff was five pinches per day and snuff was present in the oral cavity an average of 3.5 hours among this group (Modeer et al., 1980).

Sales of snuff in Sweden continue to increase. Ljunglofs Ettan was the most popular brand and the preference among users continues to be for the aromatic brands. In Norway, Generalsnu was the most preferred brand during 1983. In Finland, Ljunglofs Ettan held the leading position among imported snus brands (Tobacco Journal International, April 1983).

An examination of snuff use in Southeast Asia finds Thailand as an example. Thai snuff, a tan, dry powder, is taken in snuff doses with the aid of a U-shaped metal tube. One end of the tube is placed in the mouth and the other in the nasal passage. Air blown from the mouth scatters the powder into the nose from which it is inhaled (Harrison, 1964).

Snuff use in Pakistan is declining and accounted for only 0.6 million pounds in 1975 and it was estimated that there would be a further decline to

0.4 million pounds by 1980 (Tobacco Journal International, 1976).

Finally, among the Fingo and Xhosa tribes of South Africa, snuff is placed between the gingival and lower lip of the buccal area. Among the elderly Bantu, both male and female, snuff is usually retained in the front of the mouth. The saliva mixes with the snuff and is then swallowed. After the snuff has lost its flavor, the procedure is repeated (VanWyk, 1966). Snuff taking among these tribes is practiced by most people and it plays an important role in traditional customs and ceremonies.

1.3 Occurrence

This section will examine some geographic areas where snuff dipping is practiced with special emphasis on the number of people, sex, and age distribution patterns. After an examination of these particular studies related to some medical problem, several recommendations for future research on snuff usage will be suggested.

One of the most comprehensive studies of snuff use was carried out in North Carolina. This study concentrated on 255 women with oral and pharyngeal

cancer. In this group, a racial comparison indicated that Whites dipped snuff an average of 47.6 years versus 36.1 years for Blacks. Whites used more cans (1.15 oz or 36 grams) per week than did Blacks (3.0 versus 2.4). The duration of snuff use was less among cigarette smokers (33.0 years on the average) than among nonsmokers (47.4 years) (Winn et al., 1981).

In North Carolina, snuff dipping most often has been observed in the middle and lower socio-economic groups. Many persons dipped snuff most of their waking hours and babies were often given snuff to calm them. Some snuff users slept with the quid in their mouths. In a study of 290 patients with oral cavity lesions, it was not unusual to find that the persons had used snuff regularly before the age of 10 years and 75 percent of the patients had continued to use snuff for 40 years (McGuirt, 1983). In an earlier study in North Carolina, where oral cancer was studied, it was found that the patients who used snuff tended to be over the age of 60 and of low socio-economic class (Peacock et al., 1960). Approximately 30 percent of women in central North Carolina were snuff users as compared to 1.3 percent of women in the United States as a whole (Christen and Glover, 1981).

In the southeastern United States, and, especially in the tobacco belt, snuff is used mostly by rural women (McGuirt, 1983).

In a population of 15,000 snuff users who resided primarily in Tennessee, the average age of the subjects who were examined for snuff-dippers lesions was 55 years, and 75 percent of these people were women (Smith, 1975). This elevated number of users probably represents a regional population sample bias (Smith et al., 1970).

Other investigations in Tennessee (Rosenfeld and Calloway, 1963) Georgia (Brown et al., 1965), and Arkansas (Landy and White, 1961) indicated snuff was used by more than 75 percent of the subjects who had lesions in the gingival-buccal fold. In another study in the early 1960's in Georgia, 39 percent of the urban women and 72 percent of rural women with oral cancer had used snuff (Vogler et al., 1962). Another case study found a 36 year old female suffering from hypokalemia myopathy who habitually used snuff. She had a daily consumption in excess of 20 to 30 grams (Valeriano et al., 1983).

There have been several studies of young people and their use of snuff in the United States. In Atlanta, Georgia, out of 500 boys in elementary and

high school, ages 10 to 16 years old, who were evaluated for tobacco usage, 11 percent reported regularly using snuff (Chemical Engineering News, 1983).

In an urban school population of 565 males (average age 13.8 yrs), 200 males were selected for a follow-up dental study. Of this selected group, 11 percent used snuff regularly (Weathers, 1983). In another study of college athletes, as many as one-third of the varisity football and baseball team members in a Texas college were either tobacco chewers or snuff users or used both products (Christen, 1980). These students used from 2 to 8 dips of snuff per day (average of 5 dips). Thirteen of the 14 athletes dipped snuff (Christen et al., 1979).

Finally, a recent study in Sweden concentrated on 50 male snuff users (average age 41.3 years; range of 15-84 years). The mean number of years of snuff use was 20.2 (range of 1 - 60 years) with a daily exposure of 8.5 hours (range of 0.3 - 20 hours). The daily consumption for this group was 17.1 grams (range of 4 - 50 grams) (Hirsch et al., 1982). Other studies have shown a daily exposure of snuff to vary from 7 hours (Axell et al., 1976) to 16 hours (Roed-Petersen and Pindborg, 1973).

A review of these studies on snuff use indicates that it is not possible to determine exactly who is using snuff (age, sex, social class, etc.); how often snuff is being used; and, precisely where this habit is practiced in the world. The data sets which already exist pertain primarily to specific regional population groups and are focused on hospitalized or clinical populations who have some forms of oral-mucosal lesions. Therefore, the following research recommendations and future needs are given:

* Existing evidence suggests that snuff use is on the increase, especially among young males in the United States. It continues to be used by athletes, farmworkers, and rural women in the South. Studies on these groups need to be continued with usage patterns confirmed.

* A strategy for a large-scale epidemiological study should be initiated on snuff use with data collected world-wide.

* Various researchers should be encouraged to monitor the snuff habit using common study designs. Methods of analysis such as standardized inquiries with uniform questions and follow-up time frames should be clearly defined.

* All possible "other tobacco use" confounding variables should be taken into account in any analysis. Given the complexity of analyzing tobacco usage, common measures of exposure of cigarette smoking, cigar and pipe use, and chewing tobacco should be gathered.

* Precise measure of exposure and dosage such as a salivary or urinary cotinine assay as a biological monitor ought to be obtained to validate questionnaire results and to more adequately define individual exposure variations.

* It appears that all brands of snuff are not identical in chemical composition. Thus, the content of snuff in different parts of the world should be determined if any meaningful linkage to medical problems is to be forthcoming.

* Finally, it would be economically worthwhile to explore existing data sets where researchers may have obtained information about snuff use. Some of these groups include MRFIT, Framingham, and the Kaiser Permanente Group.

1.4 Commercial Products

The Tobacco Industry Profile compiled by the Tobacco Institute indicates that the total United States consumption of snuff (including overseas armed forces) was 43.9 million pounds in 1982, up from 25.5 million pounds in 1981 and 23.9 million pounds in 1980 (Tobacco Institute, 1981, 1982, 1983). During 1983, moist snuff increased in sales and offset the decline in chewing tobacco in the United States. This form of snuff may have been substituted for chewing tobacco by workers in many industries (Tobacco Situation, March 1984). The total United States consumption of snuff in 1983 was up to 46.7 million pounds (Tobacco Situation, March 1984).

The primary manufacturers of snuff in the United States are Conwood, General Cigar, U.S. Tobacco, and Brown and Williamson (See Table 1). U.S. Tobacco cornered 89.3 percent of the market in 1982 for moist and fine cut snuff whereas Conwood and General Cigar together had 75.2 percent of the dry snuff market.

Per capita consumption (18 years and over) in the United States in both 1982 and 1983 was .26 pounds, up from .25 pounds in 1981 (Tobacco Situation, March 1984).

Snuff in the United States has been and continues to be almost exclusively used orally. One of the first dry snuff brands, Garrett (Conwood) was brought on the market in 1782 and has continued to sell uninterrupted. In 1822, moist snuff was introduced to the United States with the brand, Copenhagen (U.S. Tobacco). This has been the most popular brand for more than 160 years (Rizio, 1983).

While dry snuff has been declining in the United States, moist snuff has been increasing. However, the extent of this trend is difficult to determine because prior to 1982, dry snuff and moist snuff were classified together. In 1982, dry snuff sales were down 4.1 percent from 1981, yet moist snuff sales increased by 9.5 percent (Rizio, 1983). The total output of snuff in the United States was 44.3 million pounds in 1983 (Tobacco Situation, June 1983). There are currently 81 different brands of snuff on the American market (See Table 2). It is estimated that there are two million consumers of snuff in the United States (Hoffmann et al., 1982).

World production of snuff is estimated to be 20 million kilos per year. However, genuine snuff tobacco that is inhaled through the nostrils as used in the Federal Republic of Germany (approximately

300,000 kg), France and Italy (each with less than 100,000 kg), Great Britain (approximately 200,000 kg), as well as Belgium, Switzerland, East Germany, and South Africa amount to about one million kg per year at the most. Snus or souffi in Scandinavia and North Africa respectively, and "snuff" in the United States are not genuine snuff tobacco as was historically recognized. This latter type is placed in the mouth and is unsuitable for the nose (Poschl, 1983).

Manufacturing of snuff was up to 3,929 tons in Sweden in 1982 indicating a steady rise since 1973 (Swedish Tobacco Company, 1980, 1981, 1982). Adequate data on snuff use in other countries after 1966 has not been obtained. Therefore, no discussion of current trends can be contributed at this time.

1.5 Manufacturing Processes

The manufacturing of snuff dates back some 400 years and is perhaps the most difficult form of tobacco processing. In contrast to other tobacco products, snuff undergoes a further process of fermentation and the formulas are the proprietary information of each manufacturer. The methods for

producing the final product are varied with over 100 different tastes and aromas possible.

Fire- and dark air-cured tobaccos are used to make snuff. Generally the whole leaf is used. These dark or burley leaves are grown mainly in Tennessee, Kentucky, West Virginia, Pennsylvania, Wisconsin, and Virginia. The leaves are aged from one to three years with snuff tobacco being aged a greater number of years than chewing tobacco (Shapiro, 1981). After heavy reconditioning, the tobacco undergoes fermentation with the entire process taking about two months. In the United States, the tobacco is cut into strips of one to two inches (2.5-5.0 cm) wide prior to fermentation. The fermented tobacco is then dried and ground into fine powder. Various perfumes are added to the United Kingdom snuff and it is marketed as dry snuff (18 - 22 percent moisture) or wet snuff (28 - 30 percent) moisture. In the United States, snuff is either blended with flavors and aromas or left plain (Akehurst, 1981).

The dark brown heavy tobaccos are moistened with salt water or sugar sauces followed by another process of fermentation. This fermentation process must be carefully monitored for temperature and time. There are some types of snuff that take

several years to mature completely and, like good wine, must be stored in cool warehouses over a period of years. After this curing process has been completed, the tobaccos is pulverized into coarse, medium, or fine grained powder. The powdered tobacco is then moistened again with additives of aromatic sauces (Poschl, 1983).

There are four different technological processes in the manufacturing of snuff. Each type will be briefly described. The Carrot Method is a process whereby tobacco leaves are stripped into "carrots" and pressed together into rolls. After several years have passed, the carrots melt together until they coalesce into a hard pulp which can only be crushed or pulverized by powerful grinding machines. This is the oldest method of manufacturing snuff and because it is so time-consuming, it is now obsolete. In the Paris Method, Virginia and Kentucky tobaccos are pounded in salt water and left to ferment for several years in cool storage rooms. The tobacco is compressed into batches of several hundred weights for storage. Next, the tobacco is crushed or pulverized in pounding machines, sieved and remoistened with salt water. This method produces the so-called "black varieties" such as "Paris" and

"Saarbrucken." The Paris Method is used rarely except in the Federal Republic of Germany and France. In the Rapid Method, tobacco leaves and stems are pulverized on high-speed, blower-type crushers, sieved, and then moistened with a brine solution. This process is followed by a rapid fermentation in hot rooms where the tobacco is left for 6 to 8 weeks. It is then sieved again and mixed with 5 to 8 percent of fine cooking salt and fermented for a longer period of time. The Rapid Method is the most widely used process today which produces the so-called "green" snuffs known as Kovno, "refreshment" tobacco, and Danzig types as well as the modern English type of snuff. Menthol, peppermint oil, camphor and other aromatic additives such as attar of roses and oil of cloves are blended with the tobacco. The grain size is small, much like powder. The outstanding feature of these rapid method snuffs is their high concentration of aromatics. The snuffs being produced by this method in the Federal Republic of Germany, Great Britain, Switzerland, Belgium and France have a consistently light to dark-brown color. The final type of processing is called the Schmalzler Method where the tobacco leaves come mainly from Brazil. The leaves

are cut and moistened with sugar sauces prior to fermentation at high temperatures over a period of months. The tobacco is then dried and ground on special machines called "grinding chairs", sieved, and then moistened with fine oils. At one time, clarified butter had been used on Brazilian tobacco, which, since 1830 was produced only in Bavaria. Thus, the genus term "Schmalzer" (Schmalz is the German word for lard or melted fat.) was adopted. Schmalzler tobacco gets its fragrance as a result of rolls imported from Brazil. These rolls are fresh from the field and spun into ropes with the inclusion of special sugar sauces and fermented in tanks for a long period of time so that the special sauces saturate the tobacco. The ropes are then twisted, tightly pressed, and sewn into fresh cowhides. The aroma is reminiscent of rum and this is the only process that produces this scent. The Schmalzler snuffs are a speciality of Bavaria and are popular because they do not contain menthol (Poschl, 1983).

All of the various types of snuff have a common feature in that they contain a higher percentage of moisture and additives than any other tobacco product (from 20 to almost 50 percent of their dry weight). To prevent drying, snuff tobaccos must be carefully

packed in foil bags, tightly sealed cans, or plastic containers. The bags contain quantities of 20, 50, and 100 grams and the small tins contain 4, 5, and up to 10 grams (Poschl, 1983).

In the Federal Republic of Germany, the production of genuine snuff for the nose is carried out chiefly in Bavaria, particularly in Landshut where some 70 percent of German snuff manufacturing is located. In the United Kingdom, there are five snuff factories in Sheffield and Kendal. In France, the French tobacco monopoly produces snuff at Morlaix on the Atlantic coast. Other than these mentioned places, only a few scattered medium-sized factories remain in Europe and they produce less than one percent of the snuff. With the exception of India, Thailand, and Turkey, there is almost no manufacturing of snuff being carried out in Eastern Europe, South America, or Asia. On the world market, the quality of German and British snuff is considered to be the best (Poschl, 1983).

In Britain, the majority of the country's snuff manufacturers make only snuff. They market it themselves as well as make name brands for companies that do not manufacture their own. Snuff making in Britain has seen nothing like the technological

changes that have transformed the cigarette making industry. Only in the field of packing snuff has there been significant innovations in recent times.

At Illingworths, Britain's largest snuff producer, dark-fired tobacco leaves and stems are used (mostly short leaves from Malawi). The dried leaves are ground into a coarse powder in a motor-powered mortar with four pestles before being reduced to a finer powder in a three-pestle grinder. (These machines were bought in 1867 and are still being used.) The powdered tobacco is then sieved through fine mesh and the mesh is cleared by having a loose length of chain swirl around inside. A separate pestle and mortar grind menthol obtained from China. After potash, soda ash, and pharmaceutical soda have been added to the sieved tobacco, menthol is blended. These special formulas are retained by the company and snuff users remain loyal for life to a particular brand (World Tobacco, 1981).

In different sections of the world, snuff has different components. The quality and constituents of the tobacco as well as the manufacturing processes vary widely (Roed-Petersen and Pindborg, 1973). In the Scandinavian countries, wet snuff is highly alkaline (pH 8 - 9) and is the preferred type (Hirsch et al., 1982).

In Sweden, snuff is manufactured from dark Kentucky and Virginia tobacco that is stronger than that used for cigarettes. The quality of the tobacco is dependent upon the soil and climate where it is grown. The final snuff product is also influenced by such factors as how the tobacco was grown, when and how it was harvested, and in what manner the tobacco leaves were dried. The drying process is critical for the determination of the ultimate chemical composition of the tobacco. Snuff tobacco is mostly dried by air with open fires (dark-fired). In the manufacturing process, the tobacco is cut, ground, and various courseness of powder results. Water and salt are added to keep the product fresh before it is heated. Various ingredients are then added with the exact composition remaining a trade secret (Hirsch, 1983).

Denmark uses tobacco from Kentucky and processes the tobacco into snuff with the aid of glycerin, salt, syrup, malt extract, sal-ammoniac, and ethereal oils. The blended powder is heated to 70C (Zacho, 1968).

Oriental snuff used in such countries as Thailand differs in its preparation and constituents from that of Europe and the United States. It is approximately 50 percent dry tobacco and 50 percent Oriental gum

with a small amount of pulverized cuttle bone added. The gum is made by heating "white earth" that contains calcium carbonate and phosphate at high temperatures in a kiln. After adding water, the gum paste is mixed with tobacco and dried in the sun (Harrison, 1964).

Snuff in South Africa is prepared by grinding tobacco leaves into a powder that is subsequently mixed with wet ash of incinerated aloe leaves of the marlotthii species. The ratio of the blend is five parts of tobacco to one part of aloe ash. Ash of other plants as well as cow dung ash may be used. Next, water and flavoring agents such as lemon or eucalyptus oil are added. When the mixture has dried, it is ready to be used. The taste is biting and the odor is pungent. Analyses of samples of South African snuff shows not only nicotine to be present but also polycyclic hydrocarbons such as 3:4 benzyprene and 1:2 benzperylene (VanWyk, 1966). Also, two metals, chromium and nickel, were found in high concentrations in snuff used among the rural Africans in Swaziland (Baumslag et al., 1971).

Production of snuff in the United States has never been large. It is made primarily of fire-cured tobacco with a small quantity of dark air-cured tobacco also going in the blend. Some of the leaf is

stemmed, but usually the entire leaf is used with extra stems added. The major types of snuff are fine and coarse, dry and moist, plain and toasted, salted, sweetened, flavored and scented (Maxwell, September 1980).

TABLE 1

United States Chewing Tobacco Market
(Thousands of pounds, percent of market)

Year	Brand (Plug)	Pounds	Share
1971	R.J. Reynolds	12,792	64.9%
1972		12,569	66.1
1973		12,345	67.0
1974		11,744	66.1
1975		11,068	65.1
1976		10,625	65.0
1977		10,248	64.9
1978		9,218	63.7
1979		8,599	63.1
1980		8,108	63.2
1981		7,702	64.7
1982		6,955	67.9
1971	Conwood	4,625	23.4%
1972		4,232	22.3
1973		3,854	20.9
1974		3,667	20.6
1975		3,644	21.4
1976		3,488	21.3
1977		3,417	21.6
1978		3,235	22.3
1979		3,160	23.2
1980		3,000	23.4
1981		2,610	21.9
1982		1,825	17.8
1971	Brown and Williamson	1,435	7.3%
1972		1,350	7.1
1973		1,403	7.6
1974		1,548	8.7
1975		1,520	8.9
1976		1,507	9.2
1977		1,441	9.1
1978		1,386	9.6
1979		1,283	9.4
1980		1,207	9.4
1981		1,177	9.9
1982		1,099	10.7
1971	Pinkerton	875	4.4%
1972		850	4.5
1973		830	4.5
1974		810	4.6
1975		775	4.6
1976		725	4.5
1977		690	4.4
1978		640	4.4
1979		580	4.3
1980		510	4.0
1981		420	3.5
1982		370	3.6

continued

Year	Brand (Moist Plug)	Pounds	Share
	Pinkerton		
1978	Redman Moist Plug	-	-
1979		-	-
1980		1,070	28%
1981		2,200	34
1982		1,560	31
	R.J. Reynolds		
1978	R.J. Gold	-	-
1979		-	-
1980		1,234	32%
1981		1,651	25
1982		1,136	22

continued

Year	Brand (Twist/roll)	Pounds	Share
1971	Conwood	1,127	49%
1972		1,110	49
1973		1,138	50
1974		1,140	51
1975		1,160	52
1976		1,195	52
1977		1,133	52
1978		1,116	53
1979		1,063	53
1980		1,022	54
1981		1,000	54
1982		956	54
1971	R.C. Owen	918	40%
1972		915	41
1973		931	41
1974		936	42
1975		1,075	48
1976		1,103	48
1977		1,045	48
1978		990	47
1979		943	47
1980		864	46
1981		850	46
1982		811	46
1971	R.J. Reynolds	253	11%
1972		226	10
1973		199	9
1974		151	7
1975		18	-
1976		-	-
1977		-	-
1978		-	-
1979		-	-
1980		-	-
1981		-	-
1982		-	-

continued

Year	Brand (Loose Leaf)	Pounds	Share
	Pinkerton		
1972	Redman	-	-
1973		-	-
1974		-	-
1975		-	-
1976		-	-
1977		-	-
1978		-	-
1979		-	-
1980		23,410	34%
1981		24,300	34
1982		25,029	35
	Lorillard		
1972	Beech-Nut	10,900	24%
1973		10,700	22
1974		11,300	22
1975		11,000	20
1976		10,000	17
1977		9,900	16
1978		9,600	15
1979		13,000	19
1980		12,550	18
1981		12,299	17
1982		11,359	16
1972	General Cigar	5,432	12%
1973		5,201	11
1974		4,629	9
1975		5,892	11
1976		5,900	10
1977		3,900	6
1978		4,270	7
1979		4,540	7
1980		4,630	7
1981		5,710	8
1982		5,980	8

continued

Year	Brand (Loose Leaf)	Pounds	Share
1972	R.J. Reynolds	-	-
1973		-	-
1974		-	-
1975		-	-
1976		-	-
1977		137	-
1978		1,784	3%
1979		2,994	4
1980		3,522	5
1981		3,454	5
1982		3,060	4

Maxwell Report: Smokeless Grows; Cigars Decline
by John C. Maxwell, Jr.
Tobacco Reporter
Vol. 110 (8), August 1983, 56-67

The Smokeless Tobacco Industry, 1982
Tobacco International
Vol. 184 (15), July 23, 1982

TABLE 2

Consumption Per Capita of Chewing Tobacco in the United States (including overseas forces), 1970-83

Per male 18 years and over

Chewing Tobacco

Year	Pounds
1970	1.06
1971	1.09
1972	1.08
1973	1.10
1974	1.13
1975	1.15
1976	1.17
1977	1.22
1978	1.25
1979	1.34
1980	(*)
1981	1.16
1982	1.09
1983	1.06

(*) information not available

Tobacco Situation
TS-171, March 1980
TS-183, March 1983
TS-187, March 1984

TABLE 3

United States Chewing Tobacco Output by Category, 1970-1983

Period	Chewing Tobacco			
	Plug	Twist	Fine-Cut	Loose Leaf
	Million Pounds			
1970	23.0	2.4	4.9	40.1
1971	21.6	2.4	4.9	41.5
1972	19.9	2.3	5.2	45.5
1973	18.4	2.2	5.4	46.0
1974	18.7	2.1	5.9	48.1
1975	17.9	2.2	6.7	54.6
1976	17.6	2.3	7.8	56.7
1977	16.5	2.3	9.1	58.5
1978	15.9	2.1	12.0	64.6
1979	15.3	2.0	13.3	71.7
1980	(*)	(*)	1.9	72.1
1981	11.4	6.5	1.8	70.3
1982	10.5	5.2	1.7	73.0
1983	9.7	4.4	1.7	71.0

*New product classifications became effective January 1, 1982. Revisions for 1980 are not available.

Tobacco Situation
TS-161, September 1977
TS-171, March 1980
TS-183, March 1983
TS-187, March 1984

TABLE ____

Consumption of Chewing Tobacco in the United States
1900–1962

Year	Per capita consumption, all persons aged 15 years and over Chewing Tobacco lbs.
1900	4.10
1910	3.99
1920	3.06
1930	1.90
1940	1.00
1950	0.78
1960	0.51
1961	0.51
1962	0.50

Patterns of Smoking Behavior
Leonard M. Schuman, M.D.

Research on Smoking Behavior
NIDA Research Monograph 17, 1977

TABLE ____

United States Domestic Smokeless Tobacco Use*

Year	Chewing Tobacco lbs.
1975	80,594,000
1976	83,941,000
1977	88,673,000
1978	92,345,000
1979	100,932,000

Increased approximately 15 percent
*Figures from The Tobacco Merchants Association, New York, USA

U.S. Smoking Tobacco Market in the Shadow of Smokeless Products
by Donna Rizio and Dieter Neuber

Tabak-Journal International, Vol. 6, 1980, 511

TABLE ____

Prevalence of Snuff Use and Tobacco Chewing in the United States

Age 21 and over

	1970		1975	
	Male	Female	Male	Female
Snuff	2.9%	1.4%	2.5%	1.3%
Chewing	5.6%	0.6%	4.9%	0.6%

Smoking and Health - A Report of the Surgeon General, 1979

TABLE ____

CONSUMPTION

Total U.S. consumption (including overseas armed forces)

Year	Million Pounds of Chewing Tobacco
1981	106.0
1982	106.5
1983	88.0

Tobacco Industry Profile 1981, 1982, 1983

Prepared by The Tobacco Institute
1875 I Street, N.W.
Washington, D.C. 20006
Telephone: 202/457-4800 or toll free: 800/424-9876

TABLE ____

Sales of Chewing Tobacco in kg

Country	1974	1975	1976	1977	1978
Netherlands	313,000	293,000	256,000	263,000	-
Norway	85,000	63,000	69,000	69,000	59,000
South Africa	152,480	185,291	181,100	158,695	139,943
Sweden	1,595	1,662	2,424	1,962	1,908

Tabak Journal International, Vol. 6, December 1979

TABLE ____

Estimated Per Capita Consumption of Chewing Tobacco in Selected Countries

Unit: Grammes

	1962	1963	1964	1965	1966	Rate of increase (%)
Australia	-	-	-	-	-	-
Austria	8	8	8	8	8	-
Belgium	-	-	-	-	-	-
Canada	41	36	35	32	31	- 24.4
Denmark	68	66	66	51	50	- 26.5
France	16	14	15	14	14	- 12.5
Germany, Fed. Rep.	37	34	30	33	32	- 13.5
Ireland	-	-	-	-	-	-
Italy	-	-	-	-	-	-
Japan	-	-	-	-	-	-
Netherlands	-	-	-	-	-	-
New Zealand	-	-	-	-	-	-
Norway	67	52	50	50	50	- 25.4
Portugal	-	-	-	-	-	-
Spain	-	-	-	-	-	-
Sweden	8	-	-	-	-	-
Switzerland	-	-	-	-	-	-
United Kingdom	-	-	-	-	-	-
United States	220	220	220	210	210	- 4.5

The Major Markets for Unmanufactured Tobacco
Geneva, 1968
International Trade Centre

TABLE ____

Consumption of Chewing Tobacco in Sweden

Year	Chewing tobacco tons	Population total millions	Population 15 + Years of age millions
1973	15.0	8.1	6.5
1974	14.6	8.2	6.5
1975	14.0	8.2	6.5
1976	14.3	8.2	6.5
1977	14.7	8.3	6.6
1978	14.9	8.3	6.6
1979	18.1	8.3	6.7
1980	18.0	8.3	6.7
1981	23.6		
1982	23.3		

Annual Reports of the Swedish Tobacco Co.

TABLE ____

Data on Consumption of Tobacco Products in The United States by Persons 14 Years of Age or Older*

Chewing Tobacco

Year+	Pounds
1880	3.15
1890	3.99
1900	3.56
1910	3.35
1920	2.36
1925	1.97
1930	1.47
1935	0.91
1940	0.74
1945	0.68
1950	0.49
1951	0.45
1952	0.43
1953	0.42
1954	0.41
1955++	0.40

*Based on the unsteamed processing weight of the tobacco.
+Data from 1940 to 1950 include tobacco consumption by overseas military personnel.
++ Provisional data.

A Study of the Etiological Factors in Cancer of the Mouth
Ernest L. Wynder, M.D., Irwin J. Bross, Ph.D., and Rivkah M. Feldman, B.A.

Cancer, Vol. 10 (6), 1957, 1300-1323

TABLE ____

Estimated Consumption of Chewing Tobacco in Selected Countries

in Tons

	1962	1963	1964	1965	1966	Rate of Increase %
Australia	-	-	-	-	-	-
Austria	45	45	45	45	45	-
Belgium	-	-	-	-	-	-
Canada	500	450	450	410	410	- 18.0
Denmark	230	230	230	180	180	- 21.7
France	540	500	540	500	500	- 7.0
Germany, Fed. Rep.	1,630	1,540	1,310	1,500	1,500	- 8.0
Ireland	-	-	-	-	-	-
Italy	-	-	-	-	-	-
Japan	-	-	-	-	-	-
Netherlands	-	-	-	-	-	-
New Zealand	-	-	-	-	-	-
Norway	180	140	140	140	140	- 22.2
Portugal	-	-	-	-	-	-
Spain	-	-	-	-	-	-
Sweden	45	-	-	-	-	-
Switzerland	-	-	-	-	-	-
United Kingdom	-	-	-	-	-	-
United States	28,940	29,260	29,720	29,000	29,130	0.7

The Major Markets for Unmanufactured Tobacco, Geneva, 1968
International Trade Centre

TABLE ____

Production of Chewing Tobacco in kg

Country	1974	1975	1976	1977	1978
Algeria			4,045,710	4,220,160	
Austria			8,945	5,240	
Belgium	7,100	6,000	4,800	3,900	3,300
Canada			230,638	197,762	
Denmark	102,000	99,000	90,000	84,783	80,489
Egypt			52,000	50,000	
Finland			1,342	1,199	
France			133,600	131,000	
Libya			80,320	79,310	
Mexico			1,000,000	1,050,000	
Netherlands	313,000	288,000	253,000	253,000	-
Pakistan			2,344,000	3,954,880	
South Africa	158,480	185,291	181,100	158,695	139,943
Sweden	13,000	12,000	12,000	13,000	13,000
Tunisia			705,286	752,864	
U.S.A.			37,941,000	40,817,000	

Tabak Journal International, Vol. 6, December, 1978
Tabak Journal International, Vol. 6, December, 1979

TABLE ___

Tobacco Consumption in Various Countries

Calendar Year	Austria	Brazil		Canada	Denmark	France	India	Norway	Sweden	U.S.A
	Chewing tobacco Mn. lbs.	Cut tobacco Mn. lbs.	Plug tobacco Mn. lbs.	Plug tobacco Mn. lbs.	Chewing tobacco Mn. lbs.	Chewing tobacco Mn. lbs.	Chewing tobacco Mn. lbs.	Chewing tobacco Mn. lbs.	Chewing tobacco Mn. lbs	Chewin tobacc Mn lbs
1920				6.6	3.1				0.8	
1921				6.2	2.5				0.7	
1922				10.1	2.0				0.6	
1923	0.5			9.1	2.6				0.6	
1924	0.6			8.3	2.5				0.5	
1925	0.7			8.5	2.5				0.5	
1926	0.7			8.0	2.4				0.5	
1927	0.8			7.7	2.3			2.1	0.4	
1928	0.9			7.1	2.2			2.1	0.4	
1929	0.9			6.5	2.1			2.1	0.4	
1930	0.8			5.9	2.1			2.0	0.3	
1931	0.8			5.3	2.0			1.8	0.3	
1932	0.8			4.6	1.8	2.1		1.7	0.3	
1933	0.8			4.2	1.7	2.0		1.5	0.3	
1934	0.7	(1935/39 average)		4.2	1.6	2.0		1.5	0.2	
1935	0.6	2.8	85.8	3.9	1.6	1.9		1.4	0.2	
1936	0.6			3.7	1.5	1.9		1.4	0.2	
1937	0.6			3.6	1.5	1.8		1.3	0.2	
1938	0.6			3.2	1.4	1.7		1.3	0.2	
1939	0.5			3.2	1.3	1.5		1.3	0.2	
1940	0.7	(1940/44 average)		3.1	1.3	1.2		1.2	0.2	
1941	0.9	2.6	89.0	3.0	1.4	1.3		0.8	0.2	
1942	0.8			3.5	1.4	1.1		0.7	0.1	
1943	0.7			3.5	0.9	1.0		0.5	0.1	
1944	0.3			3.2	0.9	0.7		0.4	0.1	
1945	0.1	2.5	90.2	3.2	0.8	1.0		0.4	0.1	
1946	0.1	2.5	90.6	2.9	1.2	1.3		1.2	0.1	
1947	0.1	2.5	90.8	2.7	1.1	1.5		0.9	0.1	
1948	0.1	2.5	91.0	2.3	1.0	1.6	124.6	1.0	0.1	
1949	0.2	2.5	91.1	2.5	1.0	1.4	127.5	0.8	0.1	87.5
1950	0.3	2.4	91.2	2.3	0.9	1.3	128.9	0.7		85.9
1951	0.3	2.3	91.4	2.0	0.9	1.3	116.9	0.7	0.0	84.3
1952	0.2	2.3	91.6	1.8	0.8	1.3	109.7	0.6	0.0	82.8
1953	0.2	2.3	91.7	1.8	0.8	1.2	109.1	0.6	0.0	82.0
1954	0.2	2.0	91.7	1.5	0.8	1.2	114.8	0.6	0.0	79.3
1955	0.2	1.9	91.6	1.5	0.7	1.2	118.2	0.5	0.0	77.5
1956	0.2	2.0	91.4	1.2	0.7	1.2	121.4	0.5	0.0	74.2
1957	0.1	2.0	91.2	1.1	0.6	1.4	117.5	0.5	0.0	70.8
1958	0.1	2.5	90.8	1.3	0.6	1.4	127.1	0.5	0.0	68.0
1959	0.1	2.7	90.4	1.2	0.6	1.3	129.6	0.4	0.0	66.7

ontinued

alendar Year	Austria	Brazil		Canada	Denmark	France	India	Norway	Sweden	U.S.A.
	Chewing tobacco Mn. lbs.	Cut tobacco Mn. lbs.	Plug tobacco Mn. lbs.	Plug tobacco Mn. lbs.	Chewing tobacco Mn. lbs.	Chewing tobacco Mn. lbs.	Chewing tobacco Mn. lbs.	Chewing tobacco Mn. lbs.	Chewing tobacco Mn. lbs	Chewing tobacco Mn lbs.
960	0.1	2.9	89.8	1.1	0.6	1.3	133.2	0.4	0.0	63.8
961	0.1	3.1	88.1	1.1	0.5	1.2	137.2	0.4	0.0	64.4
962	0.1	3.3	86.4	1.1	0.5	1.2	141.0	0.4	1.0	63.8
963	0.1	3.5	84.6	1.0	0.5	1.1	119.4	0.3	1.0	64.5
964	0.1	3.7	82.8	1.0	0.5	1.2	118.5	0.3	1.0	65.5
965	0.1	4.0	81.0	0.9	0.4	1.1	118.2	0.3	1.0	63.9
966	0.1	3.5	79.1	0.9	0.4	1.1	117.4	0.3	1.0	64.2
967	0.1	3.7	77.2	0.8	0.4	1.1	117.3	0.2	1.0	64.3
968	0.0	3.8	75.3	0.7	0.3	1.1	116.8	0.2	1.0	65.4
969	0.0	3.9	73.3	0.6	0.3	1.1	113.6	0.2	1.0	69.3
970	0.0	4.1	71.3	0.6	0.3	1.1	112.1	0.2	1.0	68.2
971	0.0	4.1	69.1	0.6	0.3	1.1	111.8	0.2	1.0	71.8
972	0.0	4.2	66.9	0.6	0.2	1.1	102.5	0.2	1.0	72.5
973	0.0	4.9	64.6	0.6	0.2	1.1	95.5	0.2	1.0	74.5

obacco Consumption in Various Countries.
dited by P. N. Lee
obacco Research Council
esearch Paper 6, Fourth Edition, 1975

TABLE 1

United States Snuff Market
(Thousands of pounds, percent of market)

Year	Brand (Dry Snuff)	Pounds	Share
1971	Conwood	6,020	43.0%
1972		5,949	42.8
1973		5,908	42.5
1974		5,795	42.3
1975		5,697	42.2
1976		5,724	42.4
1977		5,568	42.5
1978		5,500	42.3
1979		5,450	42.5
1980		5,400	42.7
1981		5,250	43.0
1982		4,833	43.2
1971	General Cigar	3,422	24.4%
1972		3,631	26.2
1973		3,816	27.4
1974		3,874	28.3
1975		3,750	27.7
1976		3,820	28.2
1977		3,781	28.9
1978		3,991	30.7
1979		4,030	31.4
1980		4,051	32.0
1981		3,950	32.4
1982		3,580	32.0
1971	U.S. Tobacco	3,063	21.9%
1972		2,911	20.9
1973		2,792	20.1
1974		2,716	19.8
1975		2,749	20.4
1976		2,710	20.1
1977		2,571	19.6
1978		2,435	18.7
1979		2,339	18.2
1980		2,251	17.8
1981		2,132	17.5
1982		1,985	17.7
1971	Brown and Williamson	1,495	10.7%
1972		1,409	10.1
1973		1,384	10.0
1974		1,315	9.6
1975		1,304	9.7
1976		1,249	9.3
1977		1,180	9.0
1978		1,097	8.4
1979		1,013	7.9
1980		953	7.5
1981		848	7.1
1982		800	7.1

continued

Year	Brand	Pounds	Share
	(Moist Snuff)		
1971	U.S. Tobacco (a)	8,265	46.2%
1972		8,305	48.3
1973		8,479	47.9
1974		8,491	49.9
1975		9,001	47.6
1976		9,666	45.0
1977		9,973	46.8
1978		10,327	45.4
1979		10,910	42.8
1980		11,374	41.7
1981		11,755 (a)	38.0
	(Fine Cut)		
1971	U.S. Tobacco (b)	5,010	28.0%
1972		5,188	30.1
1973		5,655	32.0
1974		6,026	35.5
1975		7,204	38.1
1976		8,460	40.3
1977		10,020	47.1
1978		11,696	50.8
1979		13,486	52.9
1980		14,613	53.5
1981		15,545 (b)	50.3
1982	Moist Snuff combined with Fine Cut	29,200	89.3

(a) includes Copenhagen, Seal and Anchor (Discontinued 1972)
(b) includes Skool and Happy Days and others

1980	General Cigar	400	1.5%
1981	(Moist Snuff and Fine Cut)	1,200	3.9
1982		1,100	3.3
1980	Conwood	913	3.3
1981	(Moist Snuff and Fine Cut)	2,400	7.8
1982		2,500	7.6

Smokeless Keeps Growing; Cigars Keep Declining
by John C. Maxwell, Jr.
Tobacco International, Vol. 185 (15), 1983

The Smokeless Tobacco Industry in 1982
by John C. Maxwell, Jr.
July 23, 1982

TABLE 2 -

NAMES OF SNUFF

Anchor
Anderson Snuff
Banjo Snuff
Big Horn Snuff
Brandee Snuff
Bruton Snuff
Bruton Snuff Thrift
C C Snuff, Pocket Tin
C C Snuff, Thrift
Checkerberry Snuff
Club Imports, Snuff
    Smith's Pocket Tins
    Smith's Pocket Dispenser
    Smith's Mini Bottles
    Dr. Johnson's Tubes
Dental Snuff
Dental Snuff Thrift
De Voe Eagle Scotch Snuff
Dixie Snuff, Pkt.
    Thrift
Egerton Snuff
Extra Strong Snuff
Garrett's Snuff, Pkt.
Garrett Snuff Thrift
Gold River Moist Snuff
Good Luck Snuff
Happy Days
Hawkens Snuff
High Toast Snuff
Honest Snuff
Honest Snuff Thrift
Honey Bee Snuff
Key Snuff
Kodiak Snuff
Ladies Choice Snuff
Lorillard
    Maccaboy Snuff, Thrift
    Maccaboy Snuff, Pkt.
    Salt Snuff
    Sweet Snuff, Pkt.
    Sweet Snuff, Thrift
Navy Snuff, Plain/Sweet, Pkt.
    Sweet, Thrift
Old Mill Snuff
Peach Snuff, Pkt.
Peach Snuff Thrift
Peach & Honey Sweet Snuff, Pkt.
Peach & Honey Sweet Snuff, Thrift
Railroad Mills (Pin./Sweet)
Railroad Mills Snuff
Railroad Mill Maccaboy Snuff
    (Red Label), Pkt.
    Thrift
Rainbow Sweet Snuff, Pkt.
Rainbow Sweet Snuff, Thrift
Ralph Snuff, Pkt.
Ralph Snuff Thrift
Red Seal Snuff Thrift
Red Seal Snuff, Pkt.
Red Rose Snuff
Right Cut
Rooster Snuff, Can, Pkt.
Rooster Snuff Thrift
Royal Danish Snuff
Scotch King Snuff
Seal Snuff
Silver Creek Moist Snuff
Silver Cup
Skoal Snuff
Skoal Bandit
Society Snuff
Square Snuff, Pkt.
Square Snuff Thrift
Standard Snuff
Starrs Snuff
Strawberry Snuff
Suavity Snuff
Sun Rappe Snuff
Superior Snuff
Three Thistle Snuff
Top Snuff (Mild/Sweet) Pkt.
Top Snuff (Mild/Sweet)
Tube Rose, Pkt.
Tube Rose, Can
Wild Cherry Snuff
Winter Clipping
Workmate Snuff

TABLE ____

Consumption Per Capita of Snuff in the United States
(including overseas forces), 1966-1983

Per capita 18 years and over

Year	Pounds
1966	.23
1967	.23
1968	.21
1969	.20
1970	.19
1971	.19
1972	.18
1973	.18
1974	.18
1975	.17
1976	.17
1977	.16
1978	.16
1979	.15
1980	.15
1981	.25
1982	.26
1983	.26

Tobacco Situation
TS-155, March 1976
TS-161, September 1977
TS-187, March 1984

Consumption of Snuff in Sweden from 1973 to 1982

Year	Snuff tons	Population total millions	Population 15 + Years of age millions
1973	2,710	8.1	6.5
1974	2,812	8.2	6.5
1975	2,943	8.2	6.5
1976	3,189	8.2	6.5
1977	3,361	8.3	6.6
1978	3,442	8.3	6.6
1979	3,550	8.3	6.7
1980	3,665	8.3	6.7
1981	3,754		
1982	3,929		

Annual Reports (1980, 1981, 1982)
Swedish Tobacco Co.

TABLE ____

Sales of Snuff in kg

Country	1974	1975	1976	1977	1978
Australia	805	1,218	808	1,023	1,369
Canada	599,984	579,385	534,307	560,759	570,249
Ireland	10,900	10,100	9,500	8,500	9,600
Italy	142,894	126,493	122,799	110,841	104,862
Norway	283,000	263,000	267,000	283,000	268,000
South Africa	1,391,017	1,474,086	1,495,043	1,363,795	1,244,163
Sweden	2,812,000	2,943,000	3,189,000	3,361,000	3,442,000

Tabak Journal International, Vol. 6, December 1979

TABLE ____

Prevalence of Snuff Use in the United States

Age 21 and over

	1970		1975	
	Male	Female	Male	Female
Snuff	2.9%	1.4%	2.5%	1.3%

Smoking and Health - A Report of the Surgeon General, 1979

TABLE ____

Estimated Per Capita Consumption of Snuff in Selected Countries

Unit: Tons

	1962	1963	1964	1965	1966	Rate of Increase (%)
Australia	-	-	-	-	-	-
Austria	-	-	-	-	-	-
Belgium	-	-	-	-	-	-
Canada	410	360	410	410	360	- 12.1
Denmark	410	410	410	360	360	- 12.1
France	360	320	320	320	270	- 25.0
Germany, Fed. Rep.	-	-	-	-	-	- -
Ireland	40	40	-	-	-	-
Italy	410	410	360	320	270	- 34.1
Japan	-	-	-	-	-	-
Netherlands	-	-	-	-	-	-
New Zealand	-	-	-	-	-	-
Norway	450	450	450	410	410	- 8.9
Portugal	-	-	-	-	-	-
Spain	-	-	-	-	-	-
Sweden	2,540	2,540	2,540	2,490	2,490	- 2.0
Switzerland	-	-	-	-	-	-
United Kingdom	360	360	360	360	320	- 11.1
United States	15,020	14,470	14,200	13,380	13,250	- 11.8

The Major Markets for Unmanufactured Tobacco, Geneva, 1968
International Trade Centre

TABLE ____

United States Domestic Smokeless Tobacco Use*

Year	Snuff lbs.
1975	25,210,000
1976	25,750,000
1977	24,427,000
1978	24,252,000
1979	23,857,000

Increased approximately 15 percent

*Figures from the Tobacco Merchants Association, New York, USA

U.S. Smoking Tobacco Market in the Shadow of Smokeless Products
by Donna Rizio and Dieter Neuber

Tabak-Journal International, Vol. 6, 1980, 511

TABLE ____

CONSUMPTION

Total U.S. consumption (including overseas armed forces)

Year	Million Pounds of Snuff
1981	23.9
1982	25.5
1983	43.9

Tobacco Industry Profile 1981, 1982, 1983
Prepared by The Tobacco Institute
1875 I Street, N.W.
Washington, D.C. 20006

TABLE ____

Consumption of Snuff in the United States
1900-1976

Year	Per capita consumption, all persons aged 15 years and over Snuff lbs.
1900	0.32
1910	0.50
1920	0.50
1930	0.46
1940	0.38
1950	0.36
1960	0.29
1961	0.27
1962	0.26

Year		Per capita consumption, all persons aged 18 years and over as designated Snuff lbs.
1962		0.28
1963		0.27
1964		0.26
1965		0.24
1966		0.23
1967		0.23
1968		0.21
1969		0.20
1970		0.19
1971		0.19
1972		0.18
1973		0.18
1974		0.18
1975		0.17
1976	(Est)	0.17

Patterns of Smoking Behavior
Leonard M. Schuman, M.D.

Research on Smoking Behavior
NIDA Research
Monograph 17, 1977

TABLE ____

Tobacco Product: Output of Snuff (United States)

Year	Million Pounds
1970	26.5
1971	26.4
1972	25.5
1973	25.3
1974	25.0
1975	24.4
1976	24.8
1977	25.0
1970	26.3
1971	27.1
1972	26.0
1973	25.3
1974	24.8
1975	24.7
1976	24.6
1977	25.3
1978	24.4
1979	24.7
1980	(*)
1981	42.5
1982	45.5
1983	44.3

*New product classifications became effective January 1, 1982. Revisions for 1980 are not available.

Tobacco Situation
TS-161, September 1977
TS-168, June 1979
TS-182, December 1982
TS-184, June 1983

TABLE ____

Data on Consumption of Snuff in The
United States by Persons 14 Years of Age or Older

Year	Snuff (pounds)
1880	0.12
1890	0.22
1900	0.30
1910	0.47
1920	0.47
1925	0.45
1930	0.43
1935	0.37
1940	0.36
1945	0.41
1950	0.34
1951	0.33
1952	0.33
1953	0.32
1954	0.32
1955	0.32

A Study of the Etiological Factors in Cancer of the Mouth
Ernest L. Wynder, M.D., Irwin J. Bross, Ph.D., and Rivkah M. Feldman, B.A.

Cancer, Vol. 10 (6), 1957, 1300-1323

TABLE ____

Production of Snuff in kg

Country	1974	1975	1976	1977	1978
Algeria			745,302	992,138	
Austria			2,900	2,000	
Belgium	6,400	5,200	3,600	3,000	2,900
Canada	594,177	553,553	585,493	570,529	565,880
Denmark	241,000	240,000	223,000	215,328	202,932
Egypt			22,000	9,000	
Finland			13,237	14,190	
France			80,000	70,000	
Germany, Fed. Rep.			292,000	294,000	
Ireland	11,000	10,000	10,000	9,000	9,000
Israel	-	36,485	35,213	35,176	33,016
Italy	145,630	107,206	126,390	150,805	84,960
Libya			11,645	15,030	
Marocco			60,620	66,120	
Pakistan			4,501,000	4,082,000	
South Africa	1,391,017	1,474,086	1,495,043	1,363,795	1,244,163
Sweden	2,831,000	2,917,000	3,241,000	3,523,000	3,468,000
Switzerland			10,027	8,286	
U.S.A.			11,271,000	11,164,000	

Tabak Journal International, Vol. 6, December, 1978
Tabak Journal International, Vol. 6, December, 1979

TABLE ____

Estimated Per Capita Consumption of Snuff in Selected Countries

Unit: Grammes

	1962	1963	1964	1965	1966	Rate of Increase (%)
Australia	-	-	-	-	-	-
Austria	-	-	-	-	-	-
Belgium	-	-	-	-	-	-
Canada	33	29	32	32	27	- 18.2
Denmark	12	12	12	10	10	- 16.7
France	10	9	9	9	7	- 30.0
Germany, Fed. Rep.	-	-	-	-	-	- -
Ireland	21	20	-	-	-	-
Italy	11	10	9	8	7	- 36.4
Japan	-	-	-	-	-	-
Netherlands	-	-	-	-	-	-
New Zealand	-	-	-	-	-	-
Norway	167	167	161	146	146	- 12.6
Portugal	-	-	-	-	-	-
Spain	-	-	-	-	-	-
Sweden	430	420	420	410	400	- 7.0
Switzerland	-	-	-	-	-	-
United Kingdom	9	9	9	9	8	- 22.3
United States	120	110	110	100	100	- 16.7

The Major Markets for Unmanufactured Tobacco, Geneva, 1968
International Trade Centre

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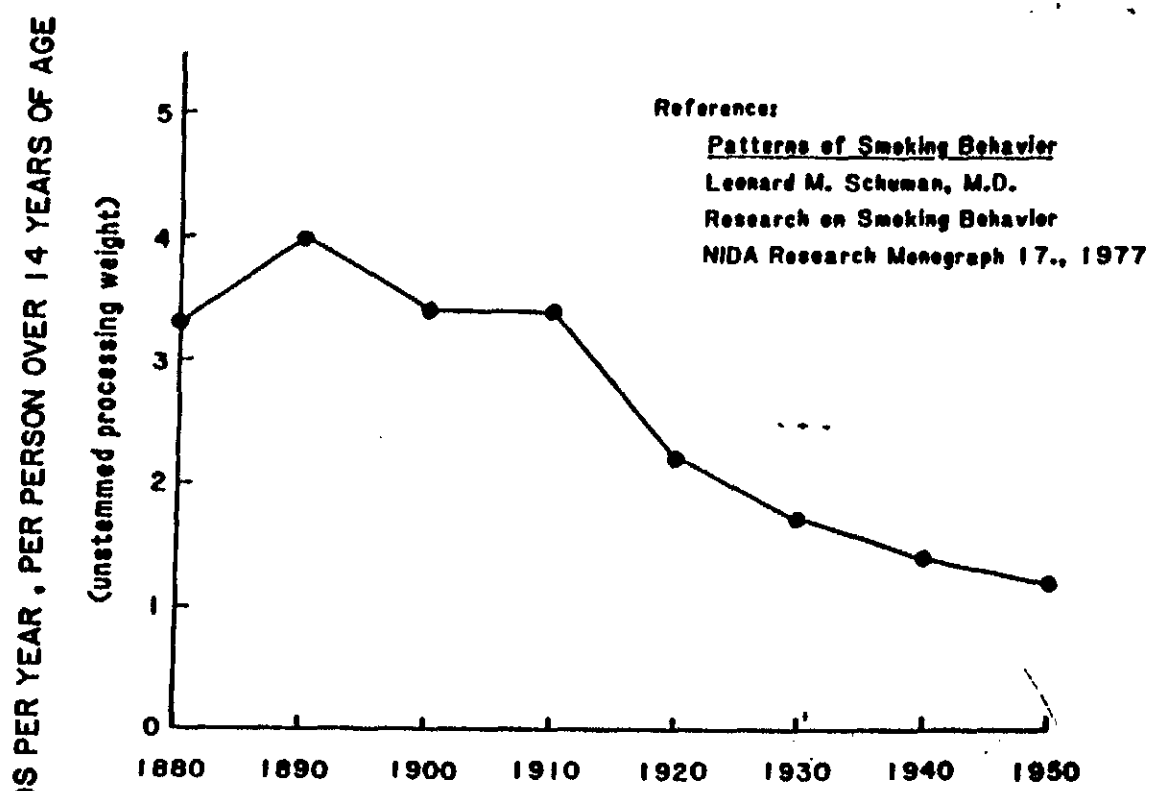
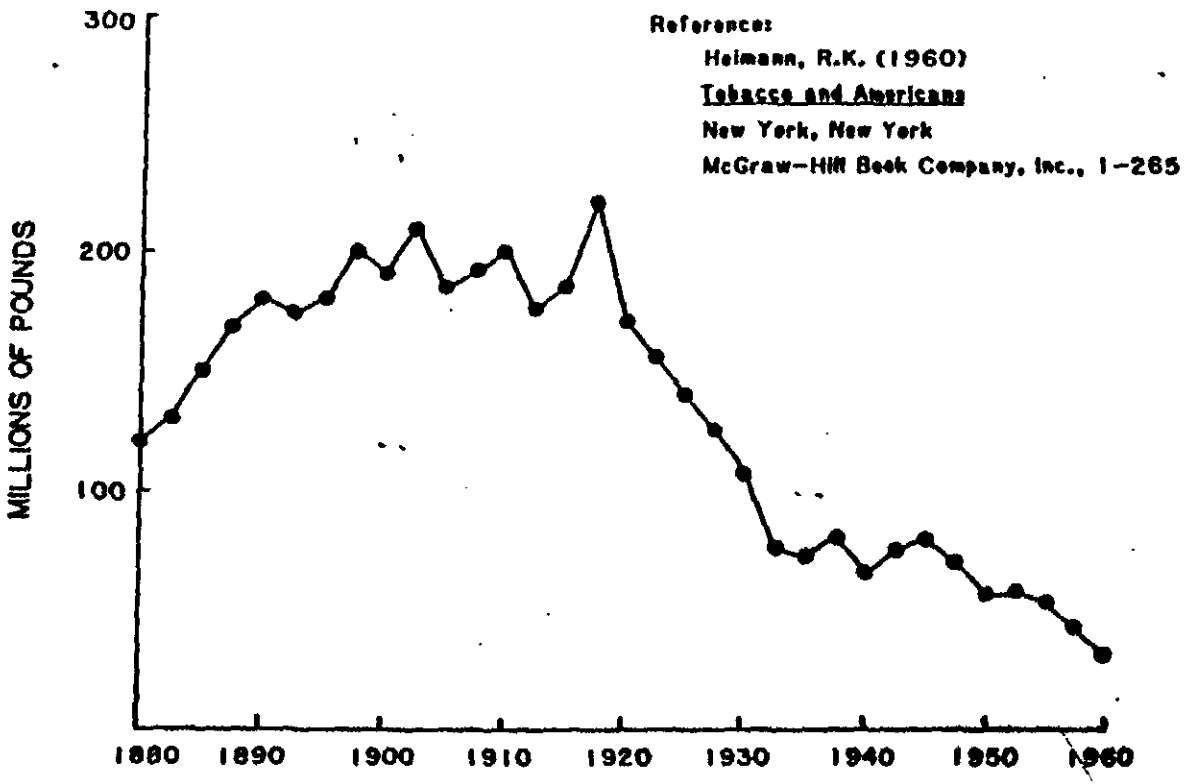
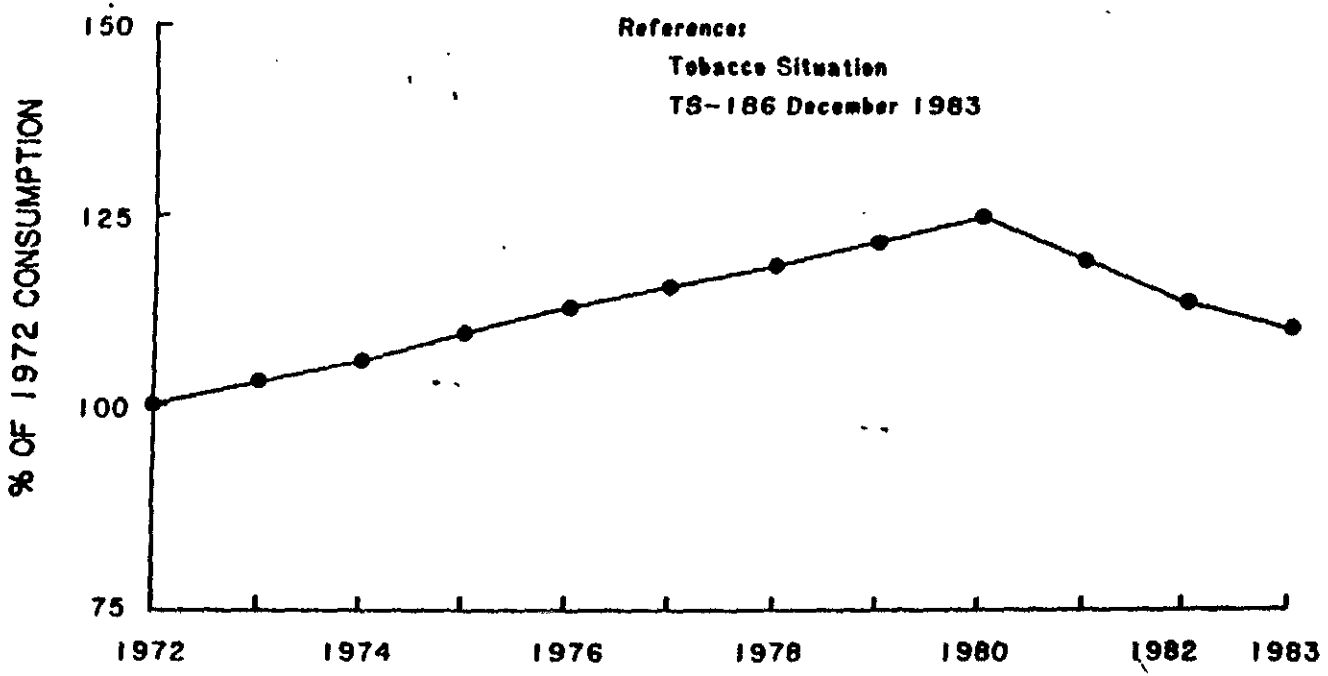


CONSUMPTION OF CHEWING TOBACCO IN THE UNITED STATES
1880–1940



CHEWING TOBACCO CONSUMED IN THE UNITED STATES
1880-1960



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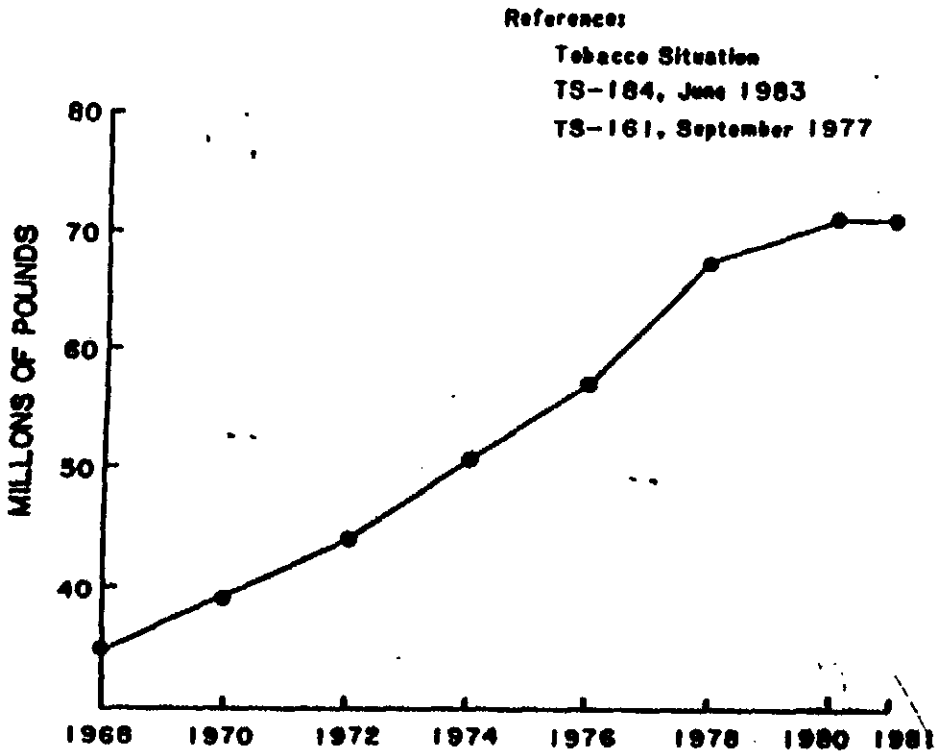
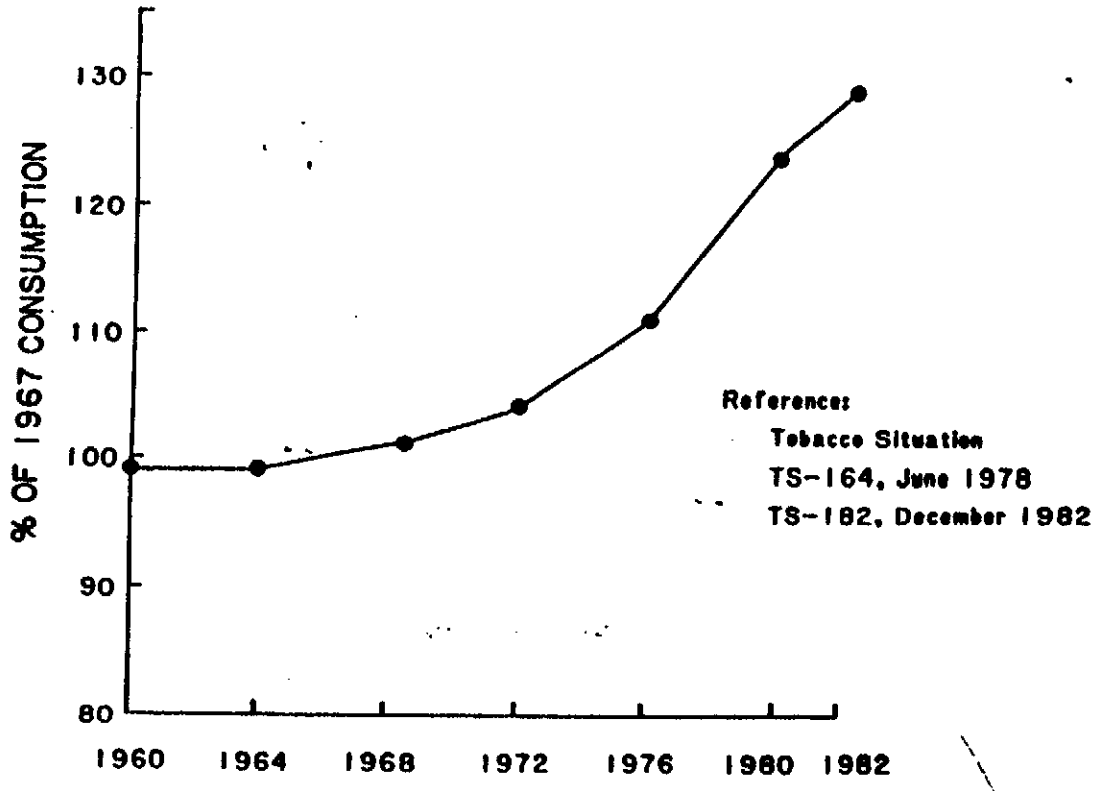
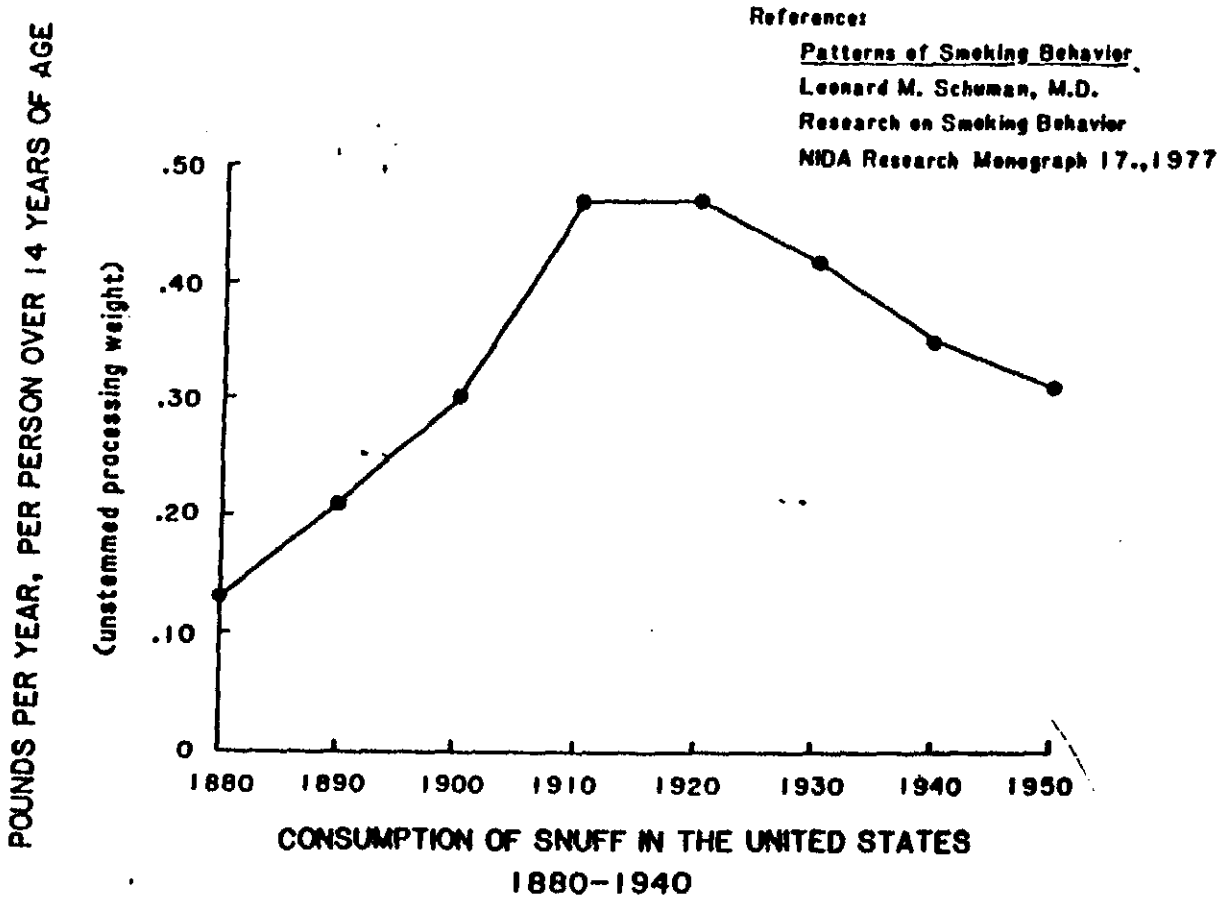
1972-1983



CHEWING TOBACCO PRODUCTION IN THE UNITED STATES
1968-1981



CONSUMPTION OF CHEWING TOBACCO IN THE UNITED STATES
1960-1982


Reference:
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NIDA Research Monograph 17., 1977
POUNDS PER YEAR, PER PERSON OVER 14 YEARS OF AGE
(unstemmed processing weight)
.50
.40
.30
.20
.10
0
1880
1890
1900
1910
1920
1930
1940
1950
CONSUMPTION OF SNUFF IN THE UNITED STATES
1880-1940

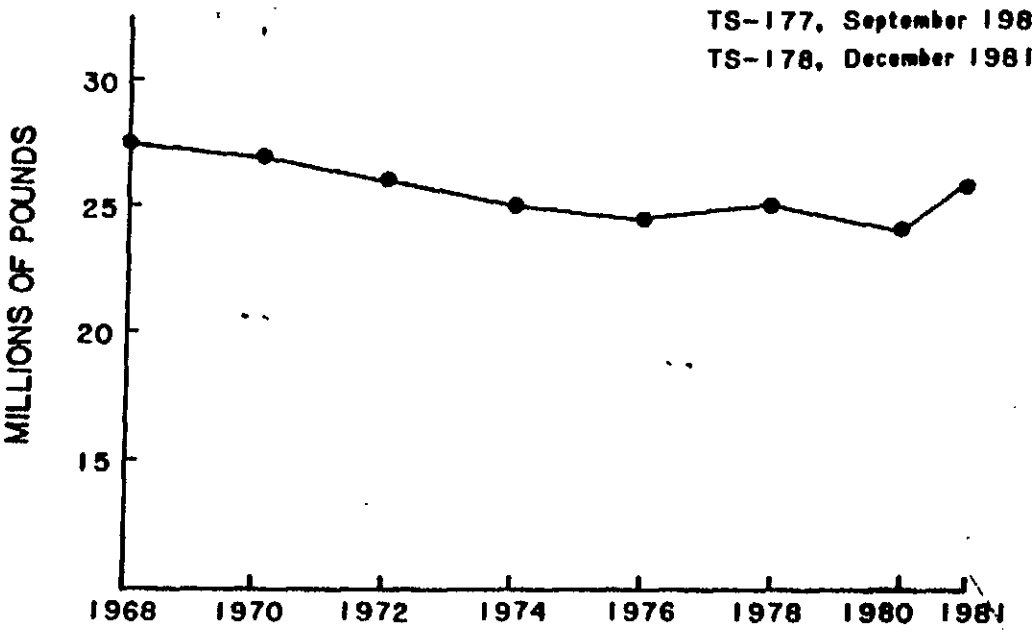
Reference:

Tobacco Situation

TS-164, June 1978

TS-177, September 1981

TS-178, December 1981



SNUFF PRODUCTION IN THE UNITED STATES
1968-1981

TABLE ___

Snuff Consumption in Various Countries

	The Republic of Ireland	Italy	Morocco	Norway	Portugal	South Africa	Sweden	United Kingdom	U.S.A
1920	0.3					0.1	14.4		36.
1921	0.3					0.1	13.4		35.
1922	0.3					0.1	12.5		38.
1923	0.3	'21-'25				0.1	12.1		39.
1924	0.3	average				0.1	11.8		39.
1925	0.3	4.6				0.1	11.7		37.
1926	0.3			1.0		0.1	11.6		38.
1927	0.3			1.0		0.1	11.3		40.
1928	0.3	'26-'30		1.1		0.1	11.0	1.0	40.
1929	0.3	average		1.0		0.1	10.7	1.0	40.
1930	0.3	3.8		0.9		-	10.7	0.9	40.
1931	0.3			0.9		-	10.7	0.9	39.
1932	0.3			0.9		0.1	10.7	0.9	36.
1933	0.2	'31-'35		0.9		0.1	10.5	0.9	36.
1934	0.2	average	0.5	0.9		0.1	10.1	0.9	37.
1935	0.2	2.9	0.5	0.9		0.1	9.9	1.0	38.
1936	0.2		0.5	1.0		0.1	9.7	1.0	36.
1937	0.2		0.5	1.0		0.1	9.7	1.0	36.
1938	0.2	'36-'40	0.5	1.0		0.2	9.6	1.0	37.
1939	0.2	average	0.5	1.2		0.2	9.4	1.0	38.
1940	0.2	2.4	0.6	1.2	0.1	0.3	8.6	1.0	37.
1941	0.2		0.6	1.0	0.1	0.3	8.5	1.1	39.
1942	0.2	'41-'45	0.6	0.8	0.1	0.1	7.5	1.2	41.
1943	0.2	average	0.7	0.6	0.1	0.2	7.2	1.1	43.
1944	0.2	1.6	0.8	0.6	0.1	0.2	7.7	1.2	42.
1945	0.2		0.8	1.1	0.1	0.2	7.7	1.1	43.
1946	0.2	'46-'50	0.7	1.1	0.1	0.2	7.7	1.0	39.
1947	0.2	average	0.8	1.2	0.1	0.1	7.6	0.8	39.
1948	0.2	1.2	0.7	1.2	0.1	0.2	7.4	0.8	41.
1949	0.2		0.8	1.2	0.1	0.2	7.1	0.7	41.
1950	0.1		0.9	1.2	0.1	0.2	6.9	0.7	40.
1951	0.1	'51-'55	0.9	1.2	0.1	0.5	6.4	0.7	39.
1952	0.1	average	0.9	1.2	0.1	0.6	6.5	0.7	38.
1953	0.1	1.2	0.8	1.2	0.1	0.2	6.4	0.8	38.
1954	0.1		0.8	1.2	0.0	0.2	6.4	0.7	38.
1955	0.1		0.8	1.2	0.0	0.0	6.3	0.7	39.
1956	0.1	1.1	0.7	1.1	0.0	0.0	6.1	0.7	37.
1957	0.1	1.1	0.8	1.1	0.1	0.0	6.0	0.7	36.
1958	0.1	1.1	0.8	1.1	0.0	0.0	5.9	0.7	34.
1959	0.1	1.1	0.8	1.0	0.0	0.0	5.8	0.6	33.
1960	0.1	1.0	0.8	1.0	0.0	0.0	5.9	0.6	34.
1961	0.1	1.0	0.8	1.0	0.0	0.0	5.7	0.6	33.
1962	0.1	0.9	0.8	1.0	0.0	0.0	5.6	0.6	33.
1963	0.1	0.9	0.8	1.0	0.0	0.2	5.6	0.5	31.
1964	0.0	0.8	0.8	0.9	0.0	0.2	5.6	0.5	31.
1965	0.0	0.7	0.8	0.9	0.0	0.2	5.5	0.5	29.
1966	0.0	0.6	0.8	0.8	0.0	0.2	5.5	0.5	29.
1967	0.0	0.6	0.8	0.9	0.0	0.2	5.3	0.5	28.
1968	0.0	0.6	0.8	0.6	0.0	0.2	5.2	0.5	27.
1969	0.0	0.5	0.9	0.7	0.0	0.2	5.3	0.5	28.
1970	0.0	0.4	0.9	0.7	0.0	0.2	5.5	0.4	28.

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continued

	The Republic of Ireland	Italy	Morocco	Norway	Portugal	South Africa	Sweden	United Kingdom	U.S.A
1971	0.0	0.4	0.1	0.7	0.0	0.2	5.8	0.4	26.
1972	0.0	0.4	0.1	0.6	0.0	0.2	5.9	0.4	25.
1973	0.0	0.3				0.2	6.0	0.4	25.
1974	0.0							0.4	

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				5.9	0.4	26.6			
1972	0.0	0.4	0.1	0.6	0.0	0.2	6.0	0.4	

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Snuff Consumption in Various Countries

	Argentina	Austria	Barbados	Canada	Denmark	Finland	France	Iceland	India
1920				0.7	0.4	0.1			
1921				0.7	0.5	0.1			
1922				0.7	0.4	0.2			
1923		0.3		0.8	0.6	0.2			
1924		0.3		0.8	0.6	0.2			
1925		0.3		0.8	0.6	0.2			
1926		0.3		0.8	0.7	0.2			
1927		0.3		0.9	0.7	0.2			
1928		0.3		1.0	0.7	0.2			
1929		0.3		1.0	0.8	0.2			
1930		0.3		1.0	0.8	0.2			
1931		0.3		0.9	0.9	0.2			
1932		0.2		0.8	0.9	0.1	5.6	0.08	
1933		0.2		0.7	0.9	0.1	5.3	0.08	
1934		0.2		0.8	0.9	0.1	5.1	0.06	
1935		0.2		0.8	1.0	0.1	4.8	0.07	
1936		0.2		0.8	1.0	0.2	4.4	0.07	
1937		0.2		0.8	1.0	0.2	4.1	0.07	
1938		0.2		0.8	1.0	0.2	3.8	0.10	
1939		0.1		0.8	1.0	0.2	3.6	0.07	
1940	0.0	0.2		0.8	1.1	0.1	3.1	0.04	
1941	0.0	0.2		0.9	1.2	0.1	2.4	0.06	
1942	0.0	0.1		0.9	1.1	0.1	2.6	0.07	
1943	0.0	0.1		0.9	1.0	0.1	2.6	0.08	
1944	0.0	0.1		1.0	1.2	0.1	1.8	0.08	
1945	0.0	0.0		1.0	1.2	0.0	1.9	0.07	
1946	0.0	0.0		1.0	1.4	0.1	1.9	0.07	
1947	0.0	0.0		1.0	1.2	0.1	2.0	0.10	
1948	0.0	0.1		1.0	1.2	0.1	1.9	0.08	4.4
1949	0.0	0.1		1.0	1.1	0.1	1.7	0.08	5.3
1950	0.0	0.1		0.9	1.1	0.1	1.7	0.08	5.6
1951	0.3	0.1		0.9	1.1	0.1	1.6	0.08	7.9
1952	0.0	0.1		0.9	1.1	0.1	1.5	0.08	7.9
1953	0.0	0.0		0.8	1.1	0.1	1.4	0.08	8.4
1954	0.0	0.0		0.9	1.1	0.1	1.3	0.08	9.4
1955	0.0	0.0		0.8	1.0	0.1	1.3	0.08	9.7
1956	0.0	0.0		0.8	1.0	0.1	1.2	0.08	9.9
1957	0.0	0.0		0.8	1.0	0.1	1.1	0.09	9.1
1958	0.0	0.0		0.8	1.0	0.0	1.0	0.07	10.0
1959	0.0	0.0		0.8	1.0	0.0	0.9	0.08	11.3
1960	0.0	0.0		0.9	1.0	0.0	0.9	0.07	12.2
1961	0.0	0.0		0.8	0.9	0.0	0.8	0.07	12.8
1962	0.0	0.0		0.9	0.9	0.0	0.8	0.07	12.3
1963	0.0	0.0		0.8	0.9	0.1	0.7	0.07	9.5
1964	0.0	0.0	0.01	0.9	0.9	0.1	0.7	0.07	10.2
1965	0.0	0.0	0.01	0.9	0.8	0.1	0.7	0.07	9.5
1966	0.0	0.0	0.01	0.8	0.8	0.1	0.6	0.07	8.6
1967	0.0	0.0	0.01	0.8	0.7	0.1	0.6	0.07	9.9

continued

	Argentina	Austria	Barbados	Canada	Denmark	Finland	France	Iceland	India
1968	0.0	0.0	0.01	0.08	0.7	0.1	0.5	0.07	10.0
1969	0.0	0.0	0.01	0.08	0.6	0.1	0.5	0.06	9.9
1970	0.0	0.0	0.01	0.08	0.6	0.1	0.4	0.06	9.9
1971	0.0	0.0	0.01	0.08	0.6	0.0	0.4	0.06	9.8
1972	0.0	0.0	0.01	0.08	0.6	0.0	0.3	0.06	10.5
1973	0.0	0.0	0.00	0.08	0.5	0.0	0.3	0.05	9.5
1974									

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NAMES OF CHEWING TOBACCO

Apple Plug
Apple Thick
Apple Jack Chewing Tobacco
Beechnut
Big Kick Chewing Tobacco
Big Duke Chewing Tobacco
Big Red Chewing Tobacco
Black Maria
Blood Hound
Bourbon Street Chewing Tobacco
Bull of the Woods
Bulls Eye Plug
B & W Sun Cured, Regular Cut
B & W Sun Cured, Thick Cut
Cannonball Plug
Chattanooga Chew
Conwood Chewing Tobacco
Cup Plug
Elephant Butts
Hav-A-Chew
Havana Blossom Chewing Tobacco
Honest Tobacco
Honey Plug
Horse Shoe Plug
King Bee
Levi Garrett Chewing Tobacco
Levi Garrett Plug
Lieberman's Chewing Tobacco
Lucky Joe Plug
Mail Pouch, Sweet
Mail Pouch Country Blend
O B Joyful Chewing Tobacco
Old Taylor Twist
O. R. Butts
Pay Car Chewing Tobacco
Peachy Chewing Tobacco
Penn Clipping Chewing Tobacco
Penn's Natural Leaf
Plow Boy
Red Coon Plug
Red Fox Chew
Red Horse Chew
Red Juice
Reynolds Natural Leaf
Reynolds Sun Cured
Rich Dark-Honeydew & Flake
Ripe Peaches Plug
R. J. Gold Plug Tobacco
Rosebud Plug
Stallion Chewing Tobacco
Sweet Mail Pouch
Target
Taylor Pride Plug
Tinsley's Thick
Top Plug
Tub Chewing Tobacco
Union Standard Chew
Union Standard Plug
Union Station Chewing Tobacco
Union Workman
W-B Cut Chewing Tobacco
Whalen Plain Chewing Tobacco
Wintermint Fine Cut Chewing Tobacco
W N T Natural Thick
Work Horse Chewing Tobacco
XX Black Chewing Tobacco
Yankee Girl Chewing Tobacco
Yellow Tag Twist