The Salt Industry to 1980

W. E. Dickinson
The Salt Institute
206 N. Washington St.
Alexandria, Virginia

ABSTRACT

Total U.S. dry salt production has declined for the period 1970–1972, with only evaporated salt production showing an increase. The most rapid growth market for the U.S. salt industry in this decade will be for water softening.

The market for highway deicing salt, which reached 10 million tons in the 1970–71 winter, had declined since then. The drop is attributed to a lack of snow and ice over much of the United States snow-belt, coupled with concern over the environmental effects of deicing salt. Nevertheless, salt is the most environmentally safe material that can be applied to melt ice and snow. Furthermore, it is inexpensive and is abundant. The industry is working to prevent misuse of the product.

The latest available data show dry salt production in 1971 of 19.6 million tons in the U.S. and about 4.6 million tons in Canada. In addition to highway deicing, significant markets include the chemical industry, grocery sales and foods, water conditioning and agricultural uses.

U.S. salt producers are being forced to compete with growing amounts of imported salt. Imported salt accounts for 20% of this country's dry salt consumption and import tonnage has increased 180% in the last decade.

The outlook for salt sales to the chemical industry is "firm with good prospects over the short-term future." But the percentage of dry salt versus brine used for chemical production has steadily declined.

A bright spot is the outlook for salt use by the water softening industry; the market is "consistent and non-seasonal." Sales of water softening appliances are increasing at the rate of about 10–15% annually. Over seven million softeners are in use, and each requires between 800–1,000 pounds of salt per year for regeneration of ion exchange systems.

Salt for human consumption is a "solid contributor" to the industry's growth. Companies in the industry also offer a number of food products such as salad dressing, concentrates and mixes and spices and seasonings of all kinds. The salt industry sells and leases a wide range of salt applicators and dispensers to companies in the food industry. These devices apply the right kind of salt, in the right amount, to every good product from "soup to nuts."

Salt sales to feed dealers and feed mixers for animal consumption continue steady.

Some salt companies lease mined-out space in their mines for storage of "everything from valuable movie prints to liquified petroleum gas."

Rising costs for fuel, transportation, supplies, packaging materials and additives are a major problem for salt producers.

INTRODUCTION

At this meeting four years ago, The Salt Institute reported (Dickinson, 1970) on the dynamic growth of the salt industry. The industry was called "vibrant and alive," and there was discussion of new rock salt mines and solar salt production facilities expanding at a record pace. U.S. dry salt production had skyrocketed from 9.2 million tons in 1958 to 17 million tons by 1967. In Canada, dry salt production had tripled between 1958 and 1967 to 4 million tons.

The leading salt market in 1969 was, as now, highway deicing. Other salt uses were growing apace. Healthy increases were predicted for water softening, agricultural salt uses, human consumption, chemicals and other markets for the product. At that time salt producers were gearing up to meet the new demand and there appeared to be few barriers to continued expansion.

But a funny thing happened on the way to the 1980's. After 12 years of steady expansion, domestic (U.S.A. salt production declined 4 percent in 1971. Output of salt in brine declined and rock salt output went down 3.3 percent. Only evaporated salt production showed an increase.

U.S. salt production and imports

Preliminary figures for 1972 show that total U.S. salt output—brine and dry—was 43.9 million tons valued at $304.9 million. This is slightly less tonnage than even in 1971, and a decline for the second straight year.

The U.S. Bureau of Mines attributed lack of normal growth to the continued slow pace of the U.S. economy reflected in a leveling of demand for chlorine and other chemicals. ("Salt in 1972," U.S. Bureau of Mines).

The interest of the members of the Salt Institute is in the dry salt market. The U.S. Bureau of Mines naturally reports total salt production, and its figures also include tonnage of salt contained in brines. Much of this production is captive for the Chlor-Alkali industry.

The latest available figures show dry salt production in 1971 of 19.6 million tons in the U.S.A. In Canada, the total was about 4.6 million tons in 1971. Of the U.S.A. total, about 5 million tons was evaporated or grainer salt, 2 million tons was solar salt and 13.7 million tons was rock salt.

Significant Markets for Domestic Production Include:

Highway Deicing	- 9 million tons
Chemicals	- 3.8 million tons
Grocery sales and Foods (Dairy, canning, baking, etc.)	- 3 million tons
Water conditioning	- 3–3½ million tons

In addition to consumption of 19.6 million tons of domestically-produced dry salt another 3.8 million tons of imported dry salt for 1971 must be added. In 1958, the U.S.A. imported only 600,000 tons of salt. By 1967, that figure had reached 2.4 million tons, with vast increases in Canadian, and Mexican imports and with the addition of a Tunisian source. Today imported salt accounts for 20 percent of this country's dry salt consumption. In the last decade, import tonnage has increased an amazing 180 percent.

When they compete against imported salt, the U.S.A. members of the Salt Institute compete against a product that in 1971 had a per-ton value of only $3.74. Over one million tons of salt imported from a Mexican salt operation had a per-ton value, according to the U.S. Bureau of Mines, of less than $2.50. Lately, our Canadian members have experienced the same kind of competition from salt imported into their country from Rumania.

SALT USES

Highway deicing

The highway deicing market has been the bright hope for the salt industry. Today, along with vast increases in salt imports, it is a cause for concern. At the Third Salt Symposium, it was predicted that U.S. and Canadian deicing salt use, then at 7 million tons, would reach 10 million tons a year by 1975. That level was reached ahead of schedule with the winter of 1970–71. Unfortunately, the U.S. picture has skidded downhill since that time. Several factors influence the U.S. deicing market and its outlook for domestic producers. Included are import competition, impact of weather conditions, and increased concern over environmental effects of deicing salt.

By far the largest share of the low-value imported salt finds its way onto snow-belt streets and highways for winter deicing purposes. In 1971, over 2 million tons of imported salt was spread on icy roads in the United States. It was a bargain for taxpayers, a bust for the suppliers. In addition, the deicing salt business always has been subject to change due to lack of snow and ice and low temperatures. But seldom has there been such bad—or good—weather—two winters running.

In an annual report for 1972, one large salt company reported its net operating income down 73% and blamed low salt prices resulting from industry-wide oversupply caused by the abnormally mild 1971–72 winter weather. This past winter, weather scientists say the polar jet stream and the subtropical jet moved out of their normal patterns and, in effect, sealed off most of the United States from the storms we normally experience.

The result has been a second terrible winter for deicing salt sales.

Finally, the deicing business has been affected by environmental concerns. One state has enacted legislation that resulted in a 25 percent reduction of salt use for highway deicing. Two other states are actively considering measures to control storage and application of salt.

Furthermore, many public works agencies have begun strict salt reduction programs in the name of environmental protection. Indeed the salt industry has supported these efforts through its own *"Sensible Salting"* campaign aimed at eliminating wasteful use of the product.

The end result of these factors has been to reduce salt use by many toll roads, states, cities and other governmental units. For example, Connecticut has reduced its salt use by one-third and Maine by one-fifth.

The impact of these factors is varied. First, Canadian salt use for street and highway deicing has been relatively unaffected, except that Canadian exports to the U.S. for deicing have fallen off. Normally, Canadian winters are "good" weather for the salt industry and Canadian road authorities continue to upgrade the winter maintenance level so that deicing salt use remains at a healthy level.

The total picture for the U.S. and Canada is somewhat different. Deicing salt use peaked in 1970–71 at 11.5 million tons. It fell to 10.9 million tons the following winter. And it will amount to about 10 million tons in 1973. From this level we can expect a gradual climb as weather returns to normal. More motor vehicles take to the roads, and

winter maintenance is upgraded on more miles of highway.

Predicting the future for deicing salt is difficult. The negative influences on the market have already been discussed. On the plus side, it should be noted that salt is the most environmentally safe material that can be applied to melt ice and snow. It is inexpensive, it is abundant, and salt producers have made it available throughout the snow-belt. Furthermore, the Salt Institute is working to prevent misuse of our product because it is in the public interest, and the industry's interest, to do so.

It is my feeling that salt use will ultimately return to a steady growth pattern, although nothing like the rapid 12 percent annual growth of the period 1968–71. One industry leader has predicted a future growth rate of 2½ percent annually in the deicing salt market.

It is very difficult to predict with any certainty what will happen to deicing salt use between now and 1980. In spite of this moderate growth is expected despite the negative influences on the market. On the negative economic side, imports undoubtedly will continue to provide much of the highway and street deicing purposes.

Chemicals

Another important market for the dry salt producers is the chemical industry.

At the 1969 Salt Symposium, the Salt Institute reported that U.S. production of chlorine and caustic soda products had more than doubled since 1958. Dry salt consumption by the chemical industry was then 3.8 million tons. It was estimated that the chemical industry would require 6 million tons of dry salt by 1975.

Today industry sources report the chlorine and caustic market for dry salt is firm with good prospects over the short-term future. However, dry salt use has not grown at the pace predicted. In 1971, the U.S. chemical industry consumed approximately 4 million tons of dry salt, the lion's share for chlorine production. The U.S. Bureau of Mines reported that 19.6 million tons of salt went for chlorine production in 1971. But only 3 million tons of this was dry salt. In fact, the percentage of dry salt versus brine used in the chlor-alkali industry has steadily declined. In 1945, it was 993,000 tons of dry salt for chlorine production versus 1.5 million tons of brine, or 37 percent dry salt. By 1963, the dry salt share was down to 24 percent; in 1971, it was only 18 percent. The trend in the chlor-alkali industry understandably is to locate farther from markets and nearer to low-cost brine and power sources. New plants now being constructed will consume brine, not dry salt.

On the basis of the declining dry salt share of this market, only about 12 percent of the salt for chlorine production will be dry salt in 1980. That will give the dry salt producers 4 million tons versus 1973's 3 million for chlorine production. Adding growth in use of dry salt for production of all other chemicals and total dry salt consumption for chemicals will be between 5.5 and 6 million tons by 1980.

Water conditioning

A bright spot for the salt industry is the continued growth in use of salt for water softening. The consumption of water softener salt is consistent and non-seasonal. It will grow even faster in the future as people become more aware of the need for quality water.

Jerry Peterson, editor of *Water Conditioning Magazine*, had this to say about the industry: Prospects have never been better as a whole. There are some problem areas, but overall the industry has never been healthier. Doubtless his statement reflects the fact that sales of water softener appliances are increasing at the rate of 10–15 percent annually. There are several reasons for this

1. In a time of rising prices, the cost of water softeners is coming down due to manufacturing economies and lower component prices. A unit that retailed for $600 in 1968 costs about $425 in 1973.

2. The success of the mass merchandising in water softener appliance sales is a key to increased market penetration. Many firms followed the lead of Sears-Roebuck in offering a complete line of appliances.

3. The market for water softeners grows with each new housing start, especially in areas where water is marginal owing to hardness, iron, and tannin content or other esthetically unpleasant characteristics.

The best available estimate is that in 1972 the water conditioning industry sold 700,000 automatic home units. This figure does not include rental exchange units owned by dealers, nor does it include commercial installations.

A big part of this $650 million-a-year industry is the salt sold by water conditioning dealers. Aggressive dealers find home delivery of salt a lucrative business. In one survey conducted by a Salt Institute member, salt sales accounted for 10.6 percent of annual business volume for the average dealer, and this figure has since risen.

Salt for water softener regeneration moves through several marketing channels. Water conditioning dealers, grocery store sales, feed dealers and others account for sales and consequently it is difficult to arrive at a precise usage figure for this market. However, it is known that there are about 7 million softeners in use. Furthermore, it is known that these softeners require between 800–1000 pounds of salt per year for regeneration. Accordingly, salt use for water softening amounts to between 3 and 3½ million tons per year. Conservatively, salt use for water softening should reach 6 million tons by 1980 in the United States. Very little salt is used for water softening in Canada, primarily because the country's hard water areas are sparsely populated.

Other salt markets

Salt for human consumption continues as a solid contributor to the industry's growth. The categories included in food-related consumption include meat packing, fishing, dairy, canning, baking, flour and food processing and grocery sales. In 1971, sales in this area totaled nearly 3 million tons, with some water softening salt included in the sales to grocery stores.

The industry today has a number of food products in addition to salt. These include salad dressings, food concentrates and mixes, and spices and seasonings of all kinds. Small containers of packet and portion products constitute substantial sales for several salt companies. Products using salt include jams and jellies, mustard, honey, cheese, sugar, catsup, and salt for such customers as airlines, the vending industry, restaurants and institutions.

For a variety of customers in the canning and food processing business, the salt industry sells and leases a wide range of salt applicators and dispensers including brine, compacted and granular systems. These apply the right kind of salt, in the right amount, to every food product from soup to nuts.

In the agricultural field, the salt industry continues to upgrade its products to provide livestock producers a full range of salt-based minerals. The salt industry is a leader in uniform labeling and guaranteed analysis of the ingredients of its agricultural products. Salt sales to feed dealers and feed mixers totaled about 2 million tons in 1971, with some of that in the form of salt for water softening and a small amount for human consumption.

Other products and services

The modern salt industry turns out salt in a variety of shapes, sizes, packaging and with additives for a variety of needs. Some companies are involved in more than just salt production. In addition to applicators for use in canning and foods, salt companies provide specialized equipment for tanners, chemical plants, meatpackers and others who need to dissolve and apply dry salt.

Some salt companies are putting their production facilities to dual use, for salt production and for storage. There will be several papers at this Symposium about different aspects of storage of liquified gas. And there is discussion and experimentation now of using salt cavities for storing radioactive waste and even refuse. In other locations, rock salt mines provide a controlled, safe environment for storage of everything from valuable records to classic movie prints.

Of course, the industry's basic product will always be salt and the tremendous expansion in recent years equips the industry to supply all demands for its product in the forseeable future. This unprecedented expansion has included:

1. New solar plants in Australia, mainly to supply Japanese demand, with projected capacity of over 5 million tons.
2. A new rock salt mine in New York State with annual capacity of 2½ million tons.
3. A solar salt works in the Netherlands Antilles with initial capacity of 400,000 tons annually.
4. A new solar operation in the Bahamas to yield 500,000 tons a year.
5. Expansion of a Mexican solar operation from less than half a million tons in 1959 to 4½ million tons today.
6. Major new production at the Great Salt Lake, with one company capable of producing 5 million tons of salt yearly—as a by-product!

Major expansion projects at existing mines and plants in the U.S. and Canada

The effect of this expansion has been to give the industry a super-abundance of rock and solar salt, and more than enough evaporated salt to meet demand in most parts of the country.

At the same time, rising cost in the salt industry place unrelenting pressures on rock and salt producers as they strive to profitably market the salt they are capable of producing.

The president of a large salt company recently commented that the economics of our business have reached the point where there is a definite lack of incentive to make additional capital investment! He noted that despite a stringent cost reduction program, his company's basic evaporated salt business has almost become a break-even operation in recent years due to continued absorption of spiralling costs. And he added that falling prices and higher costs have shrunk profits below an acceptable level in the rock salt business. This major salt producer cited these cost increases in a 1½ year period:

1. Fuels up 16–18 percent.
2. Wood pallets up 14 percent.
3. A primary salt additive up 12 percent.
4. Packaging materials up 9–14 percent.

Additionally, the cost of transporting salt to market continues to rise. Since mid-1967, the railroads have received approval for a half dozen general freight increases that have hiked the rates for salt by 50 percent. In 1971, the U.S. salt industry paid railroads $53.2 million to haul 15.7 million tons of salt to market. That amount will rise with rail increases proposed in 1973. Truck rates have increased about 5 percent annually, while water transportation costs have stayed about the same.

Like all other industries, the salt industry is deeply involved in design and installation of pollution control devices and modifications to comply with U.S. Government and state environmental protection programs. The

industry must improve its hundreds of stockpile and terminal operations so that the storage of salt does not threaten the surrounding environment. New storage methods being developed include use of a vacuum to hold covering materials in place, cable tie-down systems, and spray-on materials for application over stockpiles.

Production of salt at the 31 U.S. and Canadian evaporating plants requires 2½–5 million BTU's of heat per ton. Energy costs are rising for everyone. Our producers expect natural gas prices to rise 10–15 percent per year over the next 5 years, if it is available. In some states where evaporated salt is produced, fuel oil is twice as expensive as natural gas and propane is 3 times as much.

SUMMARY

The salt industry has always been one of steady growth. The basic product of the industry is essential for many applications. The industry's bellwether market for the past decade has been highway deicing and it will remain so, but with slower growth than before. The chemical industry, agriculture salt uses and foods are steady contributors. Water conditioning is a bright spot.

Like many other industries, the salt producers must cope with increasing regulation by governmental agencies. They must find ways to compete with growing imports while fighting rising costs for fuels, transportation, labor and materials. With the talent and resources available in the industry, the Salt Institute is confident of a successful future beyond the 1980's.

REFERENCES

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