Salt & Chemicals: Latin America's Salt Industry

By Richard L. Hanneman

Salt is one of the most common substances on Earth and is as vital a foundation for modern civilization as it has been throughout recorded history. Life depends on it. Salt is an essential nutrient for humans and animals. Quality of life depends on it. Unlocking the ions of sodium chloride has made possible the miracles of chlorine chemistry. As a chemical feedstock for the production of chlorine and caustic soda (NaOH) and synthetic soda ash (Na_2CO_3), salt retains a modern importance rivaling its cultural and political significance of yesteryear.

Salt is all around us. We use it every day. The supply is enormous. Inexhaustible. Besides rich underground salt deposits around the globe, there's enough salt in the oceans of the world to make a full-scale relief map of Mexico and all of Central and South America—including the Andes!

We take salt for granted, but around the world hundreds of thousands of workers in the salt industry, spread throughout more than 100 salt-producing countries, labor to make possible these salt-derived conveniences and necessities of modern living.

From Alaska to Tierra del Fuego, the Americas produce almost as much salt as the rest of the world combined. Latin American salt production has increased faster than any other region in the world over roughly the past decade, primarily due to expansion of Chilean salt production—and that primarily due to the growing export of Chilean salt to maintain winter safety and mobility on highways in the United States, which is the world's largest salt producing nation and also the largest importer. The three dominant salt producing nations in Latin America—Mexico, Brazil and Chile—produce 85%-95% of the salt in the region. Most of it is produced by solar evaporation, though rock salt production is not uncommon, particularly in Chile where it's surface-mined.

Demographic and economic analyses give strong clues about salt markets. Lesser-developed economies use salt primarily to feed people and animals; more developed economies use salt more for industrial production. Thus, in Latin America's three major salt-producing countries, chemical production and other industrial uses of salt are an important market.

Humans consume, rather predictably, between 6 and 10 grams of salt a day so determining food grade salt sales usually just means doing the mathematics. Food processing operations where the product is exported or where the salt is used for non-consumed purposes (e.g., using salt brine to float peas to separate the good peas from the bad peas or for pickling vegetables like cucumbers where the brine is not ingested by the consumer) can throw off these calculations and allowances must be made in some areas, such as the remote reaches of the Amazon jungles, where primitive people often lack ready access to dietary salt.

In areas with developed agriculture, more salt is consumed in nourishing healthy poultry and livestock than is used for human nutrition. Again, animal salt sales are higher depending on the population's meat consumption (and exports).

Two popular markets in North America and Europe are less developed in Latin America: highway deicing and ion exchange water softening. Economic demands for high-speed winter travel in areas with snow- and ice-covered highways are obviously less in an area with milder winters and a less-saturated highway infrastructure. And water hardness is much lower in Latin America, where populations derive far more household water from low-hardness rivers than from mineral-dense water wells. Even in areas with harder water, a strong residential market for salt-regenerated water conditioning units generally awaits the anticipated future economic development of an affluent middle class. And industrial boilers, even with relatively soft water, can benefit by using ion exchange softener units to

combat scaling and mineral deposits and, thus, preserve operating efficiency.

Other major uses for salt in Latin America are textile dyeing, leather tanning and oil drilling. Salt has 14,000 identified end uses but major uses account for more than 80% of the total salt consumption.

The future for Latin America's salt industry is inextricably intertwined with the economic future of the region. And that future is tied closely to the political decisions that will determine general economic stability and growth. The Latin American salt industry, however, isn't passively awaiting the economic revival that will ensure its future strength. It's engaged pro-actively.

Economic development is rooted in public health and infrastructure. Latin America has been plagued with iodine deficiency for generations. Adequate iodine nutrition is required to protect the developing brain of a newborn and prevent a 10-15% lower average intellectual quotient (IQ). Endemic goiter and cretinism have been common features throughout Latin America, especially in inland areas and the mountains. Fifty years ago, some countries (e.g., Guatemala, Colombia, and Mexico) put strong programs in place to iodize salt and end iodine deficiency disorders (IDD), but some faltered and failed. Most countries established salt iodization laws in the 1950s, but virtually none had sufficient structural support to be effective or have lasting impact in the years that followed. Renewed interest in the problem arose in the late 1970s and early 1980s, and gained force during the 1990s.

Latin America is the world poster child for the global campaign to eliminate IDD[1] led by the continued improvement of leaders Brazil, Chile and Ecuador and with a spectacular improvement in Mexico.[2] International public health authorities (see www.who.int/nut/idd.htm) agree that iodizing salt is the solution to the IDD problem, and Latin America has the highest percentage of its salt iodized among all the regions around the world at 81%—significantly better than the United States.[3]

To sustain this progress, on behalf of the Network for the Sustained Elimination of Iodine Deficiency, the Salt Institute organized a conference of Latin American salt producers in Miami in March 2002. The keynote address, Kul C. Gautam, Deputy Executive Director of UNICEF, captured the themes of the meeting: the need for partnership among governments, organizations, and industry for eliminating iodine deficiency through creation of national advocacy organizations; and that sustaining universal salt iodization requires extending it to the population still not reached and iodizing all salt for human consumption instead of only table salt. All agreed that creating a "level playing field" for the salt industry was the essential pre-condition to a sustainable program of salt iodization in Latin America.

To maintain momentum, this past spring, the International Council for the Control of Iodine Deficiency Disorders (ICCIDD), organized a symposium in Cordoba, Argentina.[4]

EXTRA: Salt Resources

For more on salt, see the following:

U.S. Geological Survey
- "Salt: Statistical Compendium": http://minerals.usgs.gov/minerals/pubs/commodity/salt/stat/
- "Salt: Statistics and Information": http:// minerals.usgs.gov/minerals/pubs/commodity/salt/

U.S. Environmental Protection Agency
- "Sodium in Drinking Water": www.epa.gov/safewater/ccl/sodium.html

European Salt Producers Association: www.eu-salt.com
Salt Manufacturers Association: www.saltinfo.com
The Salt Institute: www.saltinstitute.org
Salt Archive: http://salt.org.il

Table 1. Global salt production

Worldwide, salt is produced commercially in over 100 countries with an estimated global annual output varying around 225 million tons. About 58% of this is used as chemical feed-stock. Estimates of production output vary widely, but according to one source, the approximate outputs of the primary producing nations in millions of metric tons from 1997-2001 are as shown in the table below:

	1997	1998	1999	2000	2001[1]
USA/Puerto Rico	41.50	41.30	45.00	45.60	44.80[2]
China	30.83	22.42	28.12	31.28	31.09[2]
Germany[1]	15.79[2]	15.70	15.70	15.70	15.70
India	14.25	11.96	14.45	14.45	14.50
Canada	13.26	13.30	12.69	12.16[3]	12.55[2]
Australia	8.88[3]	9.03[3]	9.89[3]	8.78[3]	9.54[2]
Mexico	7.93	8.41	8.24	8.88	8.90
France[1]	7.09[2]	7.00	7.00	7.00	7.00
Brazil	6.52	6.84	5.96	6.07	6.00
United Kingdom	6.60	6.60	5.80	5.80	5.80
Chile	5.49	6.21	6.07	5.08	5.10
Netherlands[1]	5.00	5.50[2]	5.00	5.00	5.00
Spain	4.00	3.50	3.20	3.20	3.20
Others in Latin America					
Bahamas[1]	0.900	0.900	0.900	0.900	1.100[4]
Venzuela[1]	0.350	0.350	0.350	0.350	0.800[4]
Netherland Antilles[1]	0.432	0.487	0.500[1]	0.500[1]	0.550[4]
Colombia	0.374	0.496	0.461	0.460	0.480
Guadalupe[1]	0.200	0.200	0.200	0.200	0.200
Martinique[1]	0.200	0.200	0.200	0.200	0.200
Cuba	0.164[3]	0.135[3]	0.159[3]	0.160[3]	0.160
World Total	**221.0**	**214.0**	**223.0**	**225.0**	**225.0**

1. Estimated, 2. Reported, 3. Revised, 4. Author's corrections.
SOURCE: http://minerals.usgs.gov/minerals/pubs/commodity/salt/saltmyb01.pdf

Conclusion

In conclusion, the salt industry in Latin America is vibrant and poised to participate in the anticipated emergence of the region as an even more important economic player in the world marketplace. As part of the basic infrastructure, the salt industry serves as a foundation for this bright future.

References

1. See Network for the Sustained Elimination of Iodine Deficiency website at http://www.sph.emory.edu/PAMM/PIN/regional_scorecard.htm
2. See UNICEF website at http://www.childinfo.org/eddb/idd/chamerica. htm
3. See UNICEF website at http://www.childinfo.org/eddb/idd/index.htm
4. See ICCIDD website at http://www.people.virginia.edu/~jtd/iccidd/

Note: A report of this April 30, 2003, meeting should be in the Latin American Thyroid Association newsletter here this summer.

About the author

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