

SALT IODIZATION AROUND THE WORLD: ACHIEVEMENTS AND CHALLENGES

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The food supply of more than 1.6 billion people is lacking in adequate levels of iodine, resulting in the

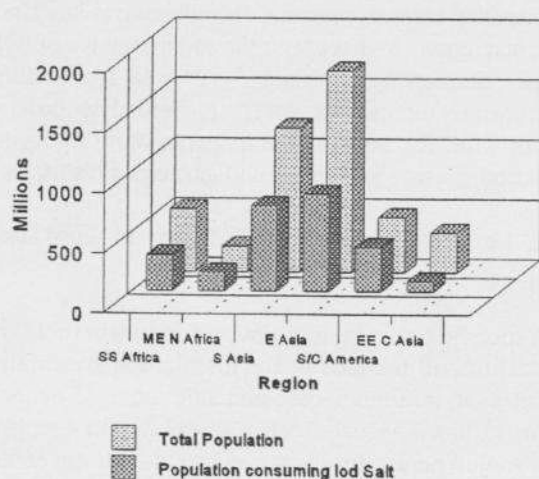


Figure 1 Global Coverage of Iodized Salt 1999.

widespread prevalence of a spectrum of iodine deficiency disorders (IDD). This public health problem can be corrected by the regular delivery of small doses of iodine to the population through commonly eaten foods or condiments. Salt is an excellent carrier for iodine and other nutrients as it is consumed at relatively constant, well-definable levels by all people within a society, independently of economic status.

In 1990, seventy Heads of State gathered at the World Summit for Children in New York and pledged to eliminate Iodine Deficiency Disorders (IDD) as one of the health and social development goals to reach by the year 2000. Salt iodization was identified as the main intervention to deliver iodine on a continuous and self-sustaining basis to populations around the world. Governments working with the salt industry and supported by international agencies and expert groups then set to plan and implement programmes that

would enable this measure. Over the past decade, as part of the Universal Salt Iodization (USI) initiative, a large number of developing countries have taken steps to ensure that all salt produced for human and livestock consumption is iodized.

Once established in a country, salt iodization is a permanent and long-term solution to the problem. It eliminates iodine deficiency and continues to provide each individual with his/her daily iodine needs and prevents recurrence. Within one year of iodized salt containing the required iodine being widely available and consumed in a community, there will be no further birth of cretins or children with subnormal mental and physical development attributable to iodine deficiency. Goitre in primary school children and adults will have started to shrink and even disappear altogether. Children will be more active and perform better at school.

Achievements

The following achievements in IDD elimination over the past decade are noteworthy:

- ▶ By 1998, more than 170 countries had committed themselves to universal iodization of salt. Many countries have provided resources for IDD elimination in their national financial budgets and are progressing toward the goal of Universal Salt Iodization.
- ▶ Salt iodization has witnessed a remarkable growth in application. According to UNICEF reports a significant proportion of the populations in more than 87 countries - at least 68% of the world's population - already have access to iodized salt. Forty-five countries have achieved more than 75% coverage^{1 2}

- ▶ Investment (Public & Private) in the iodized salt industry over the past decade exceeds one billion dollars and continues to grow³.
- ▶ More than 12 Million Cases of mental retardation in infants are being prevented annually.
- ▶ There is now potential for eliminating the ancient scourge of iodine deficiency disorders. Success with salt iodization has given governments a new confidence to address other more complex micronutrient problems using salt as well as other food carriers to deliver essential micronutrients to their populations.

In many developing countries, salt iodization is the first large-scale experience in national fortification of a commodity to eliminate a public health problem. It has taught valuable lessons in collaboration between government, industry, non-governmental organizations, the media, the community at large and other sectors. It has also offered insights into building and sustaining an intervention politically, technically, managerially, financially and culturally.

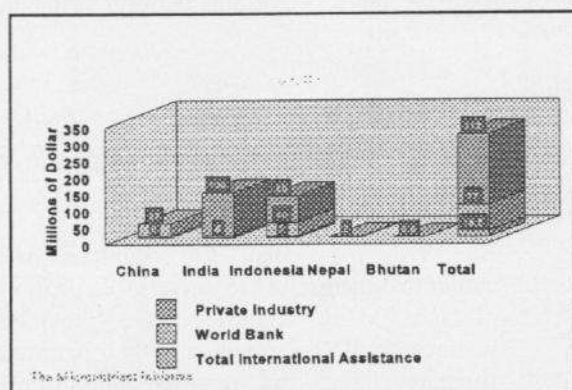


Figure 2 Leveraging of Public and Private Investment in Salt Iodization in Asia 1990-98

Status of National Salt Iodization Programs

Most countries already have all, or most, of the necessary programme components in place. Producers are clearly supporting increased production and sale of iodized salt. In the majority of countries, iodized salt is already available, public awareness and knowledge is high, IDD rates are being monitored and regulations or laws are in place or being developed. Universal salt iodization (USI) seems to be in reach, however we are not yet there.

The need therefore is to fine-tune activities. Countries of this region need to identify constraints and weakness and develop corrective actions. Monitoring is key since time and again, we have seen the re-emergence of IDD when monitoring slackens. A well-functioning, appropriate monitoring system is needed to provide information for decision-making, targeting, focusing attention, raising awareness and garnering resources.

The key role of the Salt Industry in iodization programs

The specific objective is to dovetail iodization into the prevailing salt production and distribution system in a country at minimum cost and disruption. The Salt industry has obviously been a key player in enabling this major public health achievement. However the production process and scale vary over a wide range in this most ancient of industries. Salt manufacturing techniques and product quality, vary over a wide range from cottage scale units producing a few hundred tons a year to very large fully automated plants producing several million tons. Some countries depend entirely on mining of underground rock salt deposits. Others on the extraction of salt from sea water or saline lake/underground brine by solar drying. In a few countries both forms are produced. For units with production > 10,000 tons per year that are well organized with quality control systems, the integration of iodization has been relatively easy. Such large producers account for nearly 75% of all salt for edible consumption in these countries. However a small but significant proportion of the salt is produced along coastlines or lake shores as a semi-agricultural operation by many small producers. The smaller units often operate with a minimum of organization and little or no quality control.

They are scattered along the coast or lake shores and do not lend themselves to regulation by the government. Very often precise figures regarding even their location, extent of holdings and production statistics are not available. These producers have limited financial means and lack access to technical or financial assistance to institute quality iodization processes and to monitor quality. As a result the salt produced in these units is of poor quality. This has complicated USI programmes. Additionally they have poor packaging practices or do not package the salt at all. Yet they are often the main salt supplies to the communities most at risk of IDD.

Significant experience has been built up over the years on how to handle this problem. Firstly, it is generally agreed that countries should focus initially on the larger producers. These are better able and more likely to amend practices to produce good quality salt and because of their size, will contribute to iodization of significant proportions of the country's salt. This will reinforce advocacy messages and public access to iodized salt. Larger producers also provide an example to smaller producers and develop their motivation to join the USI programme.

As a second phase of USI implementation, support needs to be provided to small producers. The producers often have to first be convinced that they have a role to play in the USI programme and that they are capable of doing it. Benefits to them, including economic returns, have to be illustrated. Their limitations and constraints need to be recognised. They cannot and should not be expected to participate for the good of the country, although this should be developed as a motivating factor. At the end of the day, the production of iodized salt must benefit them economically in order for their contribution to be sustainable. As a long-term aim, they should also be supported to upgrade their facilities in general. In order to remain economically viable, small salt producers will have to change with the times. The trend will inevitably be towards better quality, iodized salt. To work towards, they may need to form cooperatives with other producers. A shared iodization machine may be the starting point for such a cooperative.

The next step may be a packing machine. Alternatively they could be facilitated to supply their salt to a larger producer, who undertakes the task of iodization and packaging and perhaps purification.

Technical training and assistance is often needed, for example in establishing production, quality control sampling and analytical procedures. In some cases, appropriate technology for salt purification needs to be provided. Simpler quality control and analytical techniques, such as test kits, may also be needed.

A further problem experienced in some countries, is multiple levels of iodization and packaging. In this situation, raw salt producers supply their un-iodized salt to multiple small re-packagers who take on the task of iodization and packaging the salt into consumer-size bags. As with small salt producers, these facilities often do not have the capacity to consistently produce good quality iodized salt and to monitor its quality. Where this practice occurs, governments should encourage raw salt producers, especially if they are large, to iodize the salt at source. These raw salt producers can thereafter supply large sacks of iodized salt to re-packers for packing into small bags. By encouraging iodization at source, the number of facilities that need to be monitored is reduced and large producers can take advantage of economies of scale to implement more dependable and uniform iodization techniques.

The stability of iodine in salt and levels of iodization are questions of crucial importance to national planners and salt producers as they have implications for programme effectiveness, safety and cost. High humidity results in rapid loss of iodine from iodized salt, ranging anywhere from 30 to 98% of the original iodine content⁴. By refining and packaging salt in a good moisture barrier, such as low density polyethylene bags, iodine losses can be significantly reduced, during storage periods of over six months.

Over the past decade there have been significant investments in salt refining capacity in several countries. In India, refining capacity has increased from less than 5% to nearly 50% over the past 15 years. China has undergone a major modernization of refining, iodization and packaging facilities over the past six years⁵.

This augurs well for iodization since refined salt in watertight packing retains up to 80% of iodine for 12 months.

The Significant Lessons Learned

As significant as these are and as exciting as their potential might be, there is much to be done. The goal of universal iodization of all salt for human and animal salt is close to being achieved. The challenge however, does not end there. There is evidence of declining IDD prevalence but the goal of elimination has not yet been achieved. Experience over the past decade has provided several valuable lessons which point to future strategies to expand and sustain the universal iodization of salt:

Salt iodization strategies and programs need to keep adjusting to a changing environment

Globalization and free trade are having significant impacts on salt production, import, refining and distribution patterns and need to be monitored. Adequate inputs (material, financial, trained human resources) need to be ensured. Public demand for a balanced iodine intake should be expanded and sustained

IDD elimination should not remain a vertical program.

Communications and monitoring of USI and IDD elimination should be integrated within existing health/ education/agricultural extension structures and procedures in imaginative ways. Knowledge of the value of iodine could be introduced into the curricula of primary and secondary schools and health service training. Process and impact monitoring could be included in household surveys, census, and other ancillary information-gathering efforts on a permanent basis.

Quality assurance of the product, the process and the progress is key:

Quality Assurance and Quality Control systems are crucial to the success of IDD programs. These should cover:

- The Product (clean products, quality standards, appropriate iodine levels, fair prices),

- The Process (access to raw materials, iodate, packaging, labeling, quality assurance mechanisms in place, systematic and regular training, public communication, social marketing, management, accountability).
- The Progress (impact measurement in humans and animals to confirm success and shows its positive consequences in health, well-being, productivity and progress of the nation)

Apply modern technology and management tools rapidly to streamline IDD elimination programs:

We need to look at ways in which modern technology can be more rapidly applied to essentials of programmes in IDD elimination. Some immediate ways are through rapid field test and assessment techniques, electronic communications tools and reporting techniques, management information systems, training, orientation and motivation.

Key Requirements to achieve and sustain USI

In addition to programs being in place, the key needs to achieve and sustain USI include:

- ▶ Continued and strong government commitment and industry motivation are essential to eliminate IDD. We have not yet adequately addressed the hard question of "how to sustain progress when foreign aid leaves". Programs should continue after external inputs are withdrawn with more national resources in firm and permanent budgets to sustain progress. Political commitment to IDD elimination needs constant renewal. The economics of the salt industry and the food processing industry need to be more fully understood by the health and scientific community in order that recommendation for national consideration makes good business sense as well as good public policy. Elimination of IDD will reduce preventable mental retardation annually, but this must be made into a socially positive political good.
- ▶ A clear communications strategy should be implemented to expand and sustain consumer awareness and demand for iodized salt.

- The rationale should be that children have the right to reach their genetic potential and people have the right to demand fortified products like salt at convenient locations, in

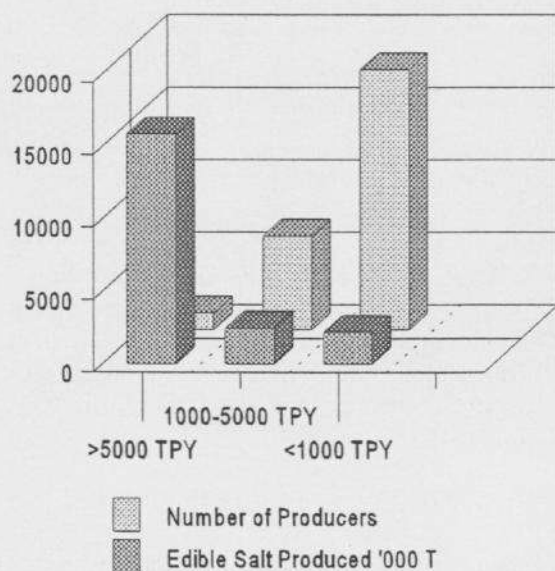


Figure 3 Contribution of Salt Production Units by Size (in Countries with Population > 1 Million)

appropriate packages, at fair prices . . . and forever.

- There is immediate need to cover those who don't receive iodized salt. A managerial overview of national resources dedicated to this effort requires priority attention. In so doing we must avoid the danger of thinking of IDD as a problem mainly for rural or mountain populations. It is a major urban problem, as well. Countries with limited resources, or smaller problems need more help; others need support to accelerate existing plans
- The Salt industry should have the mandate and resources to ensure effective iodization. Producer compliance, quality assurance, logistic problems and bottlenecks need to be addressed through effective advocacy and social communications.

- Sustained management inputs and quality assurance of product, process and progress
- Training of personnel is a vital, continuing component. The need in every country is for constant vigilance to assure that (a) the producers are fully up-to-date and have good personnel in packaging, monitoring, reporting and analysis' (b) the country is inserting knowledge about iodine into learning channels, training courses, public communication and schools; (c) the responsible agents like Ministries of Health have adequate trained personnel for their vital role of surveillance and assessment of progress in human nutrition, including laboratories and other support measures.
- Monitoring systems should be in place to ensure specified salt iodine levels and coordinated with effective regulation and enforcement.
- National training schemes in micronutrient malnutrition are priority needs. The need for constant attention to this aspect cannot be overstated. These need to be multi disciplinary in composition and scope. All stakeholders in success must be kept up to date.
- The final proof of impact and successful elimination of iodine deficiency is reflected in the reduction in prevalence of Iodine Deficiency Disorders. These need to be monitored and tracked at periodic intervals.

New Frontiers

Over the past decade there has been a world wide movement by consumer groups to raise private sector consciousness to participate in tackling social and environmental problems. Viewed from this angle, IDD control presents an opportunity for the salt industry to derive economic and social benefit for itself while simultaneously providing a social benefit to the community by fortifying the salt they produce and sell.

Salt enjoys unique advantages as a carrier of nutrients in most parts of the world in terms of universal coverage, uniformity of consumption and low cost of fortification. Encouraged by the progress made in several countries in implementing successful salt iodization programs, efforts have been directed at

examining the feasibility of fortifying salt with iron and other nutrients such as fluorine along with iodine. With production, surveillance and monitoring infrastructure for iodization programmes already in place, such an integration and coordination would enable resource savings and maximum efficiency. The commercial application of large-scale multiple fortification programs would be a major breakthrough in establishing a cost effective delivery system for these nutrients to cover large populations.

The salt industry and trade can play an important role at the global, regional and country level in terms of social advocacy and by providing the vitally needed technical and financial inputs to eliminate several nutrient deficiencies from the face of the earth.

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