IODIZING SALT
A Health Policy

THE COSTA RICAN EXPERIENCE
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<tr>
<td>CEN</td>
<td>Education and Nutrition Center*</td>
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<td>Center for Comprehensive Child Health Care*</td>
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<td>Costa Rican Social Security System*</td>
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<td>CNP</td>
<td>National Production Council*</td>
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<td>CODESA</td>
<td>Costa Rican Development Corporation*</td>
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<td>COONAPROSAL, R.L.</td>
<td>National Salt Producers Cooperative*</td>
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<td>INCAP</td>
<td>Institute of Nutrition of Central America and Panama</td>
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<td>INCIENSA</td>
<td>Costa Rican Institute for Research and Training in Nutrition and Health*</td>
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<td>INFOCOOP</td>
<td>National Institute for the Promotion of Cooperatives*</td>
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<td>INISA</td>
<td>University of Costa Rica’s National Institute for Health Research*</td>
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<td>FAO</td>
<td>Food and Agriculture Organization of the United Nations</td>
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<td>MAG</td>
<td>Ministry of Agriculture and Animal Husbandry*</td>
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<td>MEIC</td>
<td>Ministry of Economy, Trade and Industry*</td>
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<tr>
<td>MS</td>
<td>Ministry of Health*</td>
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<tr>
<td>WHO</td>
<td>World Health Organization</td>
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<td>PAHO</td>
<td>Pan American Health Organization</td>
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<td>UNICEF</td>
<td>United Nations Children’s Fund</td>
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* by its Spanish acronym
Experiencia en Costa Rica
In simplified terms, this document tells how and why salt iodization began in Costa Rica. At the same time, it explains the important role that iodine plays in health and the advantages of iodizing salt.

One reason for telling this brief story is that Costa Rica must continue learning, based on its own experience, on how to watch over its population’s health and welfare. Another equally important reason is that other countries in the region may also learn from this salt iodization success story.

A long time had to pass before Costa Rica was able to make salt iodization something attainable and, to this end, it required the coordinated work of many groups and individuals. The efforts and interests of salt producers, state health institutions, research organizations, legislation, and consumers had to be coordinated. This document narrates, in a summarized manner, how all this came about.

Should anyone need further information than that contained herein, please refer to the report Salt iodization in Costa Rica: A learning experience. It shows a broader perspective of the summarized information in this document. The report, along with other related documents, are available for readers at http://www.unicef.org/costarica/.
I. THE IMPORTANCE OF IODINE AND SALT IODIZATION

Iodine is Essential for Health and Development

Iodine is essential for human health and physical and mental development for the following reasons:

- It is a mineral needed for an adequate and complete diet.
- It allows individuals to have a good performance in intellectual activities, to be alert, and to have an adequate movement coordination.
- It helps the thyroid gland, located in the front area of the neck, to produce thyroid hormones. These are linked to the proper functioning of the brain, the nervous system, and the regulation of the energy metabolism.
The human body requires iodine in small quantities. Iodine deficiency exists whenever average consumption is less than 150 micrograms (µg) per day.

**Problems Arising from Iodine Deficiency**

If iodine intake is insufficient, serious health and development problems occur.

In children, iodine deficiency causes:

In adults, iodine deficiency is linked to:

- **During pregnancy, severe iodine deficiency may cause:**
  - One of the consequences arising from iodine deficiency is the appearance of goiter. When the ingestion of iodine is insufficient, the lobes of the thyroid gland enlarge and a lump appears in the neck. If this lump is small, it should not constitute a serious health threat. However, when the lump is larger, it may generate an obstruction and severe asphyxiation problems.
- Reduced learning capacity.
- Low academic performance and higher drop out rates.
- Mental retardation.
- Growth problems and dwarfism.
- Deaf - Muteness.
- Neurological disorders

Children

- Fatigue.
- Poor job performance.
- Low resistance to cold temperatures.

Adults

- Miscarriages.
- Stillbirths.
- Interference in the fetal brain development.
- Birth of babies with severe mental retardation - known as cretinism - which affects the psychomotor development of infants.

Pregnancy
During pregnancy, severe iodine deficiency may cause:

- Miscarriages
- Stillbirths
- Interference in the fetal brain development
- Birth of babies with severe mental retardation—known as cretinism—which affects the psychomotor development of infants

One of the consequences arising from iodine deficiency is the appearance of goiter. When the ingestion of iodine is insufficient, the lobes of the thyroid gland enlarge and a lump appears in the neck. If this lump is small, it should not constitute a serious health threat. However, when the lump is larger, it may generate an obstruction and severe asphyxiation problems.

The Importance of Iodizing Salt

The health problems derived from iodine insufficiency in the human body can be prevented by following a simple and low-cost measure: iodizing the salt for human consumption.

- Iodizing salt is the most effective, simple, and low-cost health measure.
- Salt is the most effective, effortless and low-cost way of providing the necessary iodine for people to stay healthy.
- The population’s access to iodized salt is a worldwide objective; this is why many countries enforce this preventive measure as a mandatory national policy.
- There are countries that have not been able to implement this policy in an effective manner.
II. THE CASE OF COSTA RICA

Iodine Deficiency Disorders: Endemic Goiter

During decades endemic goiter constituted a public health problem in Costa Rica. It particularly affected school-age children, as well as a high percentage of pregnant women.

Costa Rica was able to significantly reduce endemic goiter and by the end of the 1970s, it ceased to be a public health issue.

How did it manage to eradicate endemic goiter and control iodine deficiency among the population? What mechanisms were put in place to attain an effective salt iodization policy in the country? How was it able to achieve the mass consumption of iodized salt among the population? The following summarizes the external and internal factors which achieved the eradication of goiter and controlled iodine deficiency through salt iodization.
The International Context

Costa Rica received assistance from a series of regional and international organizations:

- The Institute of Nutrition of Central America and Panama (INCAP) provided funding, technical assistance, and convinced the countries in the region to push for nutrition policies.
- During the 1950s and 1960s, the research conducted on iodine deficiency disorders resulted in considerable progress in the development of salt iodization technology.

At that time, the Central American countries had legislation that made it mandatory to iodize salt. But these laws were not enforced and, to top it off, were insufficient. A salt iodization policy involving all the actors was lacking: state institutions, corporations, consumers, legislators, health experts, research institutes, and others. The joint participation of all these actors was finally possible in Costa Rica thanks to changes that took place in the 1970s.

A Strengthened Health System

In the 1970s the country promoted a new health model.

- The State universalized health care and invested in sanitary infrastructure throughout the national territory.
- The State opted for preventing health problems and created primary health care programs, such as the Rural Health Care and the Community Health Care Programs.
- Health clinics were built throughout the country and technical staff received training on undertaking basic community tasks.
- It sponsored the participation of communities in the improvement of health care strategies.
- The coverage of programs such as the Education and Nutrition Centers (CENs) and the Centers for Comprehensive Child Health Care (CINAIls) was expanded.
The fortification of food staples was introduced in the nutrition programs as a new work area, and in the 1974-1980 National Food and Nutrition Plan, a food fortification program was included with three subprograms. One of these was salt iodization for human consumption.

**Protectionist Policies and the Modernization of the National Industry**

In the 1970s the State fostered the organizational and technological development of the national industry. Autonomous public institutions were created with the purpose of providing technical and financial support to national producers and promoting modernization processes. In the case of the salt production, the institutional support enabled organization among producers, improved their production, and prompted an alliance with the Health Sector in its salt iodization programs.
Cooperativism proved fundamental in the organization of salt producers. By the mid-1970s—a period of glory for Costa Rican cooperativism—a cooperative of salt producers was formed, which united salt producers and proved vital for implementing the salt iodization policy.

**The Organization of Salt Producers**

Prior to the 1970s, salt producers were subject to inadequate work conditions.

- Their production was done in a traditional manner, it harmed the environment, and it caused health problems.
- Salt was poorly paid to the producer, and the small salt producers lacked incentives and credits to improve their production conditions.
- Upon entering the Central American Common Market in the 1960s, Costa Rica did not have a competitive salt production in the market, and salt producers were at risk of disappearing.

In 1974, a group of salt producers in Guanacaste and Puntarenas founded the National Salt Producers Cooperative—COONAPROSAL R.L. This cooperative improved the standing of salt producers in the market and promoted the process of drying salt with solar energy. In addition, it eliminated traditional production methods, improved the living conditions of producers associated to the cooperative, and promoted the organization and collective work methods.

With the support of state institutions, COONAPROSAL R.L. increased its capacity to receive salt from its associates, while making inroads in the national salt market. The country became self-sufficient in supplying salt to the national market, and producers even had surpluses for export purposes.
III. THE STAGES OF THE SALT IODIZATION POLICY

How the Sustainable Salt Iodization Policy Came About?

In Costa Rica the first executive decree making it mandatory for salt producers to add iodine to salt was ratified in 1941. Nonetheless, this compulsory measure was not enforced due to several obstacles. Thirty years after this decree, in 1970, the initiative of fortifying salt with iodine was once again activated in the country. To this end, an executive decree was passed, making it mandatory for all common salt to contain iodine in a homogenous form, thereby establishing the Iodized Salt Regulations.

The decree and regulations were very important, but were not automatically enforced. The country had to go through several stages to be able to enforce them. These regulations allowed to create an effective and sustainable policy for salt iodization that had a positive impact on the population’s health. Following are these stages in a summarized manner.

STAGE ONE: An Alliance Between the State and Salt Producers

In order to enforce the legislation passed since 1970, it was necessary to create an alliance between the State and the salt producers. This alliance was possible thanks to certain factors, namely:

- The strong state mechanisms that made the population’s health a priority.
- The committed involvement of the private sector.
- A state cooperation policy.
STAGE TWO: Modernization of Production and Legal Adjustments

In the 1970s certain changes were included in the salt production which favored the salt iodization policy. In turn, legal provisions were gradually adjusted in order to guarantee an adequate fortification.

- The “cooked” salt production system, which used firewood for evaporation, was replaced by the solar drying system.
- Progress was also made in the product’s packaging, its marketing, as well as sanitary measures for handling the product.
- By means of a refining plant, the process for cleaning/drying the salt was introduced. This resulted in a dry, purified and homogenous salt.
- The Food Control Department of the Ministry of Health began supervising the salt plants and trade. However, its supervisory capacity was limited.

STAGE THREE: Evaluation of the Policy’s Impact

With the purpose of consolidating the salt iodization policy, it was necessary first to learn about its impact on the population. Several studies evidenced the following:

- The iodine deficiency disorders among the child population decreased.
- By the end of the 1970s, cretinism ceased being a serious health problem in the country.
- Endemic goiter was reduced.
- There was a higher consumption of iodine than prior to salt iodization.
- Salt producers were iodizing salt, however in many cases, in doses inferior to those stipulated in the decree.
- At certain times, salt had excessive iodine which might possibly induce a hyperthyroidism epidemic among susceptible individuals.
STAGE FOUR:
The Quality of Salt Improves and is Fortified with Fluoride

- Due to problems with dental cavities in the population, the enrichment of water with fluoride—a micronutrient that reinforces and strengthens dental structures—was attempted in 1976. However, this idea did not render the expected results.

- In 1983, the Department of Oral Health of the Ministry of Health, having studied the success of salt iodization, undertook a study involving the enrichment of salt with fluoride. Salt iodization in Costa Rica was studied and problems with the iodine dosage were found. Most of the salt producers failed to comply with the minimum requirements in order to add fluoride to their products.

- A better salt quality is needed to fluorinate salt than that used in the iodization process. In addition, in incorrect doses, fluoride may be toxic.

- Quality control needed to be assured in the plants and fluoride needed to be handled by trained personnel. For this reason, the Ministry of Health encouraged salt producers to recognize their shortcomings and modify their practices accordingly.

- Salt producers were able to equip their production plants with laboratories and train their personnel in the analysis of iodine and fluoride in the salt.

- A new legislation was passed governing new sanitary provisions, and salt producers demanded a ban on the sale of salt that was not properly iodized or fluorinated.

- The Fluorination Program was assigned to INCIENSA. This organization monitors salt iodization and, if it were to detect inadequate levels of iodine or fluoride that do not meet the standards, it contacts the salt producers to jointly review the situation and correct it as needed.
STAGE FIVE: Actions Targeted to Endemic Areas

At the beginning of the 1990s, the regulations were being enforced in most of the country. However, a 1989 survey on goiter showed that in the province of Guanacaste goiter had increased, especially in rural areas. As such, it was declared an endemic area. The following describes the measures undertaken and the results obtained:

- The Ministry of Health implemented a monitoring system in the area. With the support provided by UNICEF and the Kiwanis Club, they established Sentinel Schools that allowed for the monitoring of iodine deficiencies.

- In some rural areas in Guanacaste the salt used for cattle was being consumed for human use; for this reason, they attempted to promote salt iodization for cattle. The idea was unsuccessful, and in its place, they developed a communications and education strategy aimed at promoting the consumption of iodized salt in the affected areas.

- Teaching and health personnel participated in implementing this strategy. Using teaching materials and radio spots, valuable information was transmitted to students and pregnant women.

- In 1999 Sentinel Sites were created aimed at monitoring the nutritional status of the population in urban and rural areas.

- Studies at the Guanacaste sentinel site evidenced that the iodized salt consumption habits had changed in the population. Children were able to include their new knowledge about iodine and transmit it to their families.
STAGE SEVEN: Laws are Sensitive to Changes in Dietary Habits of the Population

In the mid-1990s Costa Rica faced a new challenge: health centers reported an increase in goiter cases. Half of these originated in the province of Cartago. In studying the cases, it was found that families did have iodized salt at home, but during meal preparation it was being replaced by other seasonings, such as instant bouillon cubes and store-bought consommés, made with uniodized salt. This research identified a modification in the population’s dietary habits that reduced the ingestion of iodine.

Faced with this knowledge, laws were amended accordingly. In 2001 a new decree was passed, making it mandatory for all salt used in the food industry to be iodized, as well as fluorinated in the case of salt used in consommés. The latest National Nutrition Survey in 2008-2009 showed that the majority of the grade school student population did not suffer from iodine deficiency.
V. TEN LESSONS LEARNED

Below are the main lessons learned in the salt iodization process in Costa Rica:

1. It is essential to develop public policies that make salt iodization compulsory for human consumption nationwide.

2. The State must enforce these policies and establish effective controls.

3. The laws and regulations must take into consideration the conditions of the salt producers.

4. Governments and companies must promote improvements in the production processes to guarantee the quality and iodization of salt.

5. It is necessary to create and consolidate, in the framework of a shared social responsibility, alliances between key sectors and actors involved.

6. The State must provide political, technical and financial support to the salt producers. It is not a good idea to demand that salt be iodized without providing state support to producers.

7. It is worth considering contingency plans for the salt producers that fail to comply with the regulations, redirecting these toward other production sources.

8. It is convenient to promote periodic research studies to find out the impact of salt iodization in the population's health. Also, the population needs to be informed about the benefits of consuming iodized salt.

9. The Sentinel Schools and the Sentinel Communities are a sensible way of monitoring the nutritional aspect of the population. In addition, an alliance between teachers and health personnel helps educate the population and reverse the situation in endemic areas.

10. The epidemiological supervision and monitoring of the salt iodization quality must be ongoing. This demands a permanent vigilance of the changes that continuously occur in the market, as well as in the dietary habits of the population.
This document has summarized the various conditions that guaranteed the success of the salt iodization policy in Costa Rica. To have successfully faced goiter and other disorders caused by iodine deficiency helped improve human development for a substantial number of people, as well as the country’s economic and social development.

Nonetheless, the success achieved is not guaranteed eternally and the country must be able to face the threats that each period poses to this policy. To this end, the sustainability of institutional efforts and the entrepreneurial commitment proves to be essential.

The Costa Rican experience points out the need to remain vigilant at all times for iodine deficiencies in the population.

The current challenge is to guarantee that the policies promoted internationally to reduce salt consumption do not attempt against the effectiveness of a vehicle as generous as this, through which iodine has reached all the homes in Costa Rica, without distinction.