



## Use of iodized salt in processed foods and condiments to improve iodine nutrition: review of experiences and recommendations.

Karen Codling, [kcodling@ign.org](mailto:kcodling@ign.org), Iodine Global Network (corresponding author)  
Jonathan Gorstein, [jgorstein@ign.org](mailto:jgorstein@ign.org), Iodine Global Network  
Jacky Knowles, [jacky@jackyknowlesconsultancy.com](mailto:jacky@jackyknowlesconsultancy.com), Iodine Global Network  
Robin Houston, [houston.robin@gmail.com](mailto:houston.robin@gmail.com), Iodine Global Network  
Michael Durst, [michael.durst@unilever.com](mailto:michael.durst@unilever.com), Unilever  
Ans Eilander, [Ans.Eilander@unilever.com](mailto:Ans.Eilander@unilever.com), Unilever



### BACKGROUND

Salt iodization has been one of the most successful public health nutrition interventions of the past decades, significantly improving the intake of iodine and preventing deficiency. To date, salt fortification programmes have focused primarily on iodization of household salt. However, in most regions of the world, dietary consumption patterns are shifting towards increased use of industrially-processed foods and condiments. The consequence of this change is that industrially processed foods account for an increasing proportion of total salt intake. The presence and level of iodine in salt used by the food industry is, however, often not known and not considered in the design and monitoring of national salt iodization programs. As such, little is known about the actual or potential contribution of iodized salt used in the manufacture of processed foods and condiments to iodine intake.

### OBJECTIVE

The objective of this review was to obtain an improved understanding of the contribution of processed foods and condiments to salt intake, the extent to which they are made with iodized salt and hence the actual and potential contribution of processed foods and condiments to iodine intake.

### METHOD

We undertook a comprehensive review of both published and grey literature documenting experiences with the use of iodized salt in processed foods and condiments.

### RESULT

**Recommendations and Legislation:** Global guidelines recommend that all food-grade salt, including food industry and household salt, be iodized,<sup>1</sup> in order to prevent iodine deficiency. The Global Fortification Data Exchange (GFDx), a new global database on food fortification programs, indicates that 117 countries currently have mandatory legislation for fortification of salt with iodine;<sup>2</sup> of which all but 12 (90%) require its use in processed foods.<sup>3</sup>

**Salt consumption patterns:** Processed foods now provide the main source of salt intake in many countries. For example, 71, 95 and 71% of sodium is consumed through processed foods in Japan, United Kingdom and the United States respectively.<sup>4</sup> In industrialized countries, processed foods contributing most to salt/sodium intake are often bread and processed meat.<sup>5</sup> In less developed countries, salt-containing condiments are often used in place of table or cooking salt and contribute significantly to salt intake, such as soya sauce, fish sauce, fermented fish and seasoning powders in Southeast Asia or bouillon cubes in Africa. A small survey in Viet Nam in 2010, found that household salt contributed only 6% to total sodium intake; 75% of sodium intake came from condiments.<sup>6</sup> Fish and soya sauce have been estimated to be consumed by 80% and 90% of the Cambodian population.<sup>7</sup> In Senegal, 92.5% of women of reproductive age reported consuming bouillon as part of at least six meals during the previous week.<sup>8</sup>

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### RESULT

**Food industry practices:** Although the majority of countries require the use of iodized salt in production of processed foods, this requirement is not routinely enforced, and limited information is available on the extent that iodized salt is used in production of processed foods. Moreover, the food industry frequently expresses reluctance to use iodized salt for fear of adverse organoleptic changes, low retention or increased cost of iodized salt over non-iodized salt.

Practices regarding the use of iodised salt vary widely. Unilever, a transnational consumer goods company that produces a variety of processed foods, aims to use only iodized salt in its savory portfolio globally, in line with WHO recommendations for salt iodization.<sup>9</sup> In China a 2010 review found that only about one-third to a half of salt used in food processing was iodized.<sup>10</sup> In Thailand, legislation allows fish, soya sauce and salty brine producers to either use iodized salt or iodize their products directly with potassium iodate. Of these options, direct iodization is preferred because of concerns about organoleptic changes to their products and to avoid the higher cost of iodized salt.<sup>11</sup> In Viet Nam, where the salt iodization programme has recently re-started, fish sauce and other processed food producers object to the requirement to use iodized salt because of fears of adverse organoleptic changes.<sup>12</sup>

**Concerns about organoleptic changes:** A recent review on the effects of iodized salt on organoleptic properties of processed foods found no to minimal adverse organoleptic changes resulted.<sup>13</sup> The same review found that iodine retention varied significantly but was above 60% in the majority of foods.<sup>14</sup> In Cambodia, it was noted that producers of fish sauce, soya sauce and fermented fish (*prahok*) used iodized salt as long as it was readily available and non-iodized salt was not available. Moreover, they reported no organoleptic changes to their products.<sup>15</sup>

**Contribution to iodine intake:** There is evidence that use of iodized salt in processed foods is contributing significantly to iodine intake. In Australia, mandatory use of iodized salt in bread has led to increases of iodine in the food supply and improvements in the iodine intake and iodine status of women of child-bearing age and young children to the extent that a recent re-emergence of mild iodine deficiency was being addressed. Specifically, the iodine content of bread increased from 2ug/100g to 53-70g/100g and iodine intake in women of reproductive age had increased from 98ug/day to 149ug/day in the years following introduction of the mandatory requirement.<sup>16</sup>

A study in Ghana found that school aged children in northern Ghana had adequate iodine status despite very low levels of iodine in household salt. They were found to be consuming 88 (51-110) µg/day of iodine from bouillon cubes which contained 31.8 (26.8-43.7) µg/g. Per capita consumption of bouillon cubes was 2.4 (1.5-3.3) g/day.<sup>17</sup>

In Indonesia, iodized salt in instant noodles was found to contribute 19%, 12% and 6.5% of iodine recommended nutrient intake in school age children, women of reproductive age and pregnant women respectively, in addition to the 49% 48% and 28% of iodine from household salt.

In other countries, models of the potential intake of iodine from processed foods found that processed foods contribute significantly to iodine intake *if* they were made with iodized salt. For example, one analysis found that between 10-80% of the daily requirement for iodine could be provided if iodized salt was used in bread and frequently consumed foods and condiments in Egypt, Indonesia, the Philippines, the Russian Federation and Ukraine based on per capita consumption of these products, salt content of these foods and national level of iodine in iodized salt.<sup>18</sup>

### CONCLUSION

As dietary patterns change and the contribution of processed foods to salt intake increases, it is becoming increasingly important for national governments to create appropriate and adequate legislative frameworks and enabling environments to ensure the use of iodized salt in the production of processed foods. Available evidence indicates that such efforts will increase iodine intakes and potentially also improve equity in iodine nutrition and prevention of iodine deficiency. Use of iodized salt in processed foods and condiments can be facilitated by enabling legislation and regulations that clearly indicate that all salt used in the manufacture of processed foods should be iodized. Legislation and regulations can allow for exemptions in the event that adverse organoleptic changes are demonstrated. Enforcement of such legislation is essential such as by verifying use of iodized salt by producers of processed foods through document review. Furthermore, governments can create enabling environments for compliance through equivalent taxation levels for iodized and non iodized salt, or even lower taxation of iodized salt to encourage its use; and informative and consumer friendly labelling which contains all relevant information and avoids chemical names in ingredient lists of processed foods. Alignment between salt iodization and salt reduction initiatives should be promoted and monitored with the stipulation that all salt should be iodized while salt intakes are reduced. As salt intakes decline, the iodine content of iodized salt can be increased to ensure both public health objectives are realised. Finally, national iodine programs should track the different sources of iodine in the diet, in particular to better understand the contribution of processed foods to iodine intake.