Production of Cambodian salty condiments with iodized salt

Universal salt iodization was defined as long ago as 1994 as iodization of “all salt for human and animal consumption, including salt for food processing” (1). The importance of iodizing salt used for food processing was reinforced by WHO guidelines on salt fortification issued in 2014 (2). Most countries with mandatory legislation for salt iodization do include salt for processed food in the scope of their legislation: 96 out of 109 (3). However, programs have tended to focus on ensuring only the iodization of household salt, and only household coverage is monitored in most national salt iodization programs. This is despite the fact that salt from processed foods contributes significantly and increasingly to salt intake in most countries.

Use of iodized salt in processed foods appears to be particularly important in the South-East Asia region, where use of salty condiments, such as soya sauce, fish sauce, seasoning powder and fermented fish, in place of table or cooking salt, appears to be particularly prevalent. A small survey in Hanoi, Viet Nam in 2010, found that household salt contributed only 6% to total sodium intake; 75% of dietary sodium came from condiments such as seasoning powder, fish sauce, and monosodium glutamate (4).

Out of the 13 countries with mandatory salt iodization legislation in South-East Asia and the Pacific, all require the iodization of salt used in processed foods (3). Compliance with this requirement is mixed however, in particular with regards to the above-mentioned salty condiments:

- **In China**, soya sauce producers report that they do not use iodized salt (5).
- **In Thailand**, legislation allows fish, soya sauce, and salty brine producers to either use iodized salt or iodize their products directly with potassium iodate. Reportedly all have chosen the latter option because of concerns about organoleptic changes to their products and to avoid the higher cost of iodized salt (6).
- **In Laos**, most fish sauce is imported from neighboring countries. Local producers reportedly don’t use iodized salt (7).
- **In Viet Nam**, where the salt iodization program has recently re-started, fish sauce producers are objecting to the requirement to use iodized salt because of fears of organoleptic changes (8).

Cambodia seems to be an exception. In 2003, the Royal Government of Cambodia passed Sub-Decree No 69 on the Management of Iodized Salt Exploitation. **Prakas** No 30 of the National Council for Nutrition, which provides guidelines for implementation of the Sub-Decree, indicates that “All people, Restaurants, Industries, Enterprises, Handicrafts, Hospitals and all places in the Royal of Cambodia shall use iodized salt for preparing foods for eating.” Thus, all fish and soya sauce produced in Cambodia is required to be made with iodized salt.
Anecdotal reports indicate that “Before the sub-decree on the management of iodized salt, exploitation was in place, there were many complaints of changes in color when using iodized salt for fish sauce production, but there was no evidence. Since the sub-decree was issued and came into effect, there were no problems reported for fish sauce production using iodized salt.” Following implementation of the Sub-Decree it was reported that all fish and soya sauce was made with iodized salt as non-iodized salt was not available (9). However, Cambodia’s experience with the production of fish and soya sauce has never been officially documented. UNICEF Cambodia and IGN, therefore, collaborated to document Cambodia’s experience in the production of fish and soya sauce with iodized salt in the period 2003-2010, when the salt iodization program was being fully implemented3.

A survey of condiment producers

A national consultant visited the 30 largest fish and soya sauce producers in late 2017. He collected information on their production amounts and practices and the kind of salt used in the period 2003-2010. A key question was whether or not they had noticed any changes to their product when they switched to using iodized salt, and if so, what did they do about it. He also asked what they knew about the requirement to use iodized salt and whether government authorities ever came to monitor the type of salt they used. During the interviews it became clear that, while most fish sauce producers made their product by fermenting fish with salt, some used fish brine that is produced from the manufacture of prahok, a fermented fish paste which is also an important salty condiment in Cambodia. The consultant therefore also interviewed a selection of prahok producers, to collect the same information.

The information provided by the fish and soya sauce producers and prahok producers of Cambodia indicated that they all used only iodized salt for all of their production for the whole period of 2003 to 2010. Moreover, they all said they were still using iodized salt at the time of the interview. In order to try to double check this, we collected samples of salt used by the prahok producers; five of the six samples collected were iodized, although one had very low levels of iodine, and one had very high levels. Only one sample was not iodized at all. While the sample is small, it does support the information provided by the producers.

The producers also advised that they had not experienced any changes to their products with the use of iodized salt, and the largest fish sauce producer said he felt that it is not possible to find fish or soya sauce made with non-iodized salt today in Cambodia. Their experience is supported by a study undertaken in Thailand. In the study, fish sauce was made by fermenting fish with salt for six months. One batch was made with iodized salt and another with non-iodized salt. The two fish sauces were subjected to blind taste tests by two panels of consumers. Fish sauce made with iodized salt received slightly higher acceptability scores for appearance, color, acceptability, and flavor. Iodine was also shown to be well retained, in particular if the fish sauce was made in the shade. The same study found similar, slightly higher acceptability scores and iodine retention for fermented fish (10). These results are in line with studies on use of iodized salt in other processed foods: no impacts to color or taste were found in a wide range of foods including processed meats, cheese, bread and cereals, potato products, canned goods, and several types of vegetable pickle (11).

Conclusions

Cambodia appears to be the only country in the region to have fully implemented the requirement to use iodized salt in the production of salty condiments, namely fish and soya sauce and fermented fish paste, to date. Their experience provides strong evidence that can support implementation of this important component of universal salt iodization programs in other countries in the region.

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1 UNICEF’s regional categorization; the South-East Asia and Pacific region includes 27 countries.
2 A prahok is a ministerial or inter-ministerial decision signed by the relevant Minister(s).
3 In 2010, UNICEF stopped funding potassium iodate for salt iodization. Data collected from 2014-2016 demonstrated that the proportion of household salt iodized and adequately iodized had fallen significantly from the period prior to 2010. Therefore, the period for this study has been restricted to 2003-2010.