SAFETY AND STABILITY OF IODINE IN IODIZED SALT AT PRODUCTION LEVEL IN SELECTED SALT FARMS IN THE PHILIPPINES

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**Background:** The lack of scientific data on the stability of iodine in iodized salt at the production level, amidst enforcement of legislation and advocacy for national salt iodization and use, prompted the United Nations Children’s Fund (UNICEF) to contract the services of the Food and Nutrition Research Institute of the Department of Science and Technology (FNRI-DOST) to conduct the study in collaboration with the salt producers/manufacturers of Pangasinan (Alaminos and Infanta) and Occidental Mindoro (San Jose and Magsaysay). Ten years after the implementation of the ASIN Law, several issues still need to be addressed at the production level, such as the lack of quality assurance and iodine homogeneity, high iodization level, low iodine stability, and potential safety risk to the consumers from raw sea salt used as raw material. It is important that quality assurance in salt iodization is put in place, starting from salt production.

**Objectives:** (1) To determine the level of contaminants and microbiological load present in raw salt produced in four different production sites/locations, and (2) To determine the stability of the iodine in iodized salt in four storage warehouses, using two packaging materials. **Methods:** Raw salt was collected in the production sites at the beginning and closing of the salt production season. Lead, cadmium, arsenic, mercury, calcium, and magnesium, as well as microbiological load were determined. The iodized salt was produced using the existing formula, method, equipment, and warehousing of the salt producers/manufacturers. Three sample types per production site were studied, namely: S1 (freshly harvested salt), S2 (salt stored for 1 month), and S3 (salt stored for 2 months). Iodized salt was packed in 50kg woven polypropylene (PP) sack, with and without low density polyethylene (LDPE) lining, and stored in four storage warehouses for 6-7 months. Samples were collected monthly from top, middle, and bottom layers inside each of the twelve sacks of iodized salt under study and analyzed for moisture and iodine content. SPSS software was used for data processing.

**Results:** Cadmium, mercury, and arsenic were not detected on the salt collected in the four sites. Lead content of salt in Alaminos, San Jose, and Magsaysay was found to conform with the 2.0 ppm acceptable level (ASIN Law). Calcium and magnesium contents were found to be within the 2% acceptable level. Based on BFAD standards on products high in salt, the microbiological load of raw salt was found acceptable. The stability of iodine in iodized salt was higher in S3 (76%-100%, with lining; 23%-100%, without lining), than in S2 (69%-94%, with lining; 8%-73% without lining), and in S1 (73%-86%, with lining; 8%-48%, without lining), regardless of warehousing conditions and production sites. The iodine content in iodized salt was higher with lining than without lining, regardless of
type of samples and warehousing conditions. Higher iodine stability and lower moisture loss were observed in iodized salt stored in concreted, closed, and doubled-wall sawali warehouses than in open and non-concrete warehouses. **Conclusions and Recommendations:** The raw salt was found to be safe for human consumption. Iodized salt with low moisture content prior to iodization, packed with lining and stored in concreted, closed and doubled-wall sawali warehouses was found to be stable for 6-7 months storage. The common practice of salt manufacturers of iodizing salt using freshly harvested salt without PE lining is not recommended due to the unacceptably high moisture content that leads to low iodine stability and thus wasted fortification investment. The type of warehousing, type of sample, packaging material, within-sack layers, and storage time significantly contribute to the reduction of iodine inside the sack. The study provides scientific basis for the review of some provisions in the ASIN Law, particularly the level of iodine in the iodized salt at the production site, which may have to be reduced.