

Can bouillon cubes deliver iodine to West African populations?

Dédényo M. Adossi Institut de recherche pour le développement; **Nita Dalmiya** IGN Regional Coordinator for West & Central Africa

Although salt iodization is mandatory across West and Central Africa, household coverage with iodized salt is currently below 90% in most countries. Surveys and studies show that condiments such as bouillon cubes may be helping to meet the dietary requirements for iodine in some population groups. This is due to the fact that bouillon cubes contain as much as 50–60% of salt, and if this salt is adequately iodized, it can make an important contribution to the total dietary iodine intake. To make the most of this potential iodine source, an exploratory study was carried out in 5 countries in the region: two salt-producing countries (Ghana and Senegal), and three salt importing countries (Burkina Faso, Niger, and Togo). The objective was to review the legislation, regulatory standards, and practices relevant to the use of iodized salt in bouillon cube production, and to identify barriers to adopting bouillon as a complementary strategy to support the elimination of iodine deficiency. We conducted interviews with producers, distributors of iodized salt, and officials from Ministries of Health and Trade.

Consumption of bouillon cubes in West Africa

According to the 2006 national FRAT survey in Senegal, the median consumption of bouillon was 0.7 g/day in children and 3.4 g/day in women. A more recent national IDD survey (2015) reported that almost 80% of the surveyed population had consumed bouillon around 11–15 times in the week before the survey, corresponding to approx. 20 g of bouillon (2.8 g/day), or 9.7 g of salt (1.4 g/day). In Burkina Faso, the National Iodine Status and Anemia (ENIAB) 2014 Survey estimated that bouillon cubes were consumed by around 88% of households. Recent national data on bouillon consumption in Ghana, Niger, and Togo are currently limited (see Box).

Bouillon cubes are an important source of iodine in northern Ghana

Abdul-Razak Abizari University for Development Studies, Tamale, Ghana

Bouillon cubes are widely consumed by poor households in Ghana. Because their main ingredient is salt, bouillon cubes could be a good source of iodine if iodized salt were used in their production, and if their consumption by target groups was high. A recent cross-sectional study measured the iodine content of bouillon cubes, estimated their daily intake in 250 Ghanaian school-age children (SAC) aged 6–13 years from primary schools in northern Ghana, and evaluated their potential contribution to iodine intakes. The results showed that the median (IQR) UIC and estimated iodine intake were 242 (163, 365) $\mu\text{g/L}$ and 129 (85, 221) $\mu\text{g/day}$, indicating adequate iodine status. Median household salt iodine concentration ($n = 100$) was only 2.0 (0.83, 7.4) $\mu\text{g/g}$; 72% of samples contained $<5 \mu\text{g}$ iodine/g. Iodine concentrations in drinking water and milk-based drinks were negligible. Median iodine content of bouillon cubes was 31.8 (26.8, 43.7) $\mu\text{g/g}$ with large differences between brands. Estimated median per capita consumption of bouillon was 2.4 (1.5, 3.3) g/day and median iodine intake from bouillon was 88 (51, 110) $\mu\text{g/day}$. This study clearly shows that, despite low household coverage with iodized salt, iodine nutrition in school-age children in this region is adequate and an estimated two-thirds of their dietary iodine is obtained from bouillon cubes. This study is in press at the journal *Public Health Nutrition*.

Legislation and iodization standards across the region

In Senegal, the quality of bouillon is regulated by a non-mandatory standard (NS 03-146), which recommends the use of iodized salt in bouillon production, but it does not specify the required final content of iodine. The Ministry of Trade is currently examining the possibility of making this standard mandatory. In Ghana, bouillon cubes must comply with quality standard GS 675:2007, which does not explicitly mention the use of iodized salt. The regulatory texts in Burkina Faso, Niger, and Togo make no specific reference to bouillon cubes, and there is neither a national quality standard for bouillon nor a regulation that would limit or prohibit its consumption. However, bouillon must meet the same safety standards as other food products on the market.

Bouillon as a vehicle for iodine

In Ghana, there is a need to understand the current bouillon consumption trends and how the population dietary habits would be affected if the use of iodized salt in bouillon were to become part of the national IDD strategy. It has been suggested that the consumption of meat or fish-flavored bouillon could lower the consumption of actual meat and fish, which would reduce the population's protein intake. Therefore, it is important to focus not just on the benefit of additional micronutrients, but also understand the overall impact of bouillon consumption on public health. It is therefore necessary to collect robust data on food consumption before any policy recommendations can be made. If dietary iodine comes mainly from salt, it would be important to focus on activities to ensure adequate iodization levels by modernizing the salt industry, which would provide a long-term solution to the problem.



Bouillon cubes may be an important source of iodine in the West African diets, covering the needs of most populations.

According to Senegal's "Cellule de Lutte contre la Malnutrition" (CLM), all salt used by the food industry should be iodized at the prescribed levels. Only by focusing on improving the quality of iodization can Senegal's USI strategy be made more effective. Yet, the impact of bouillon consumption on population salt intake should not be ignored, given its association with the precipitous global rise in non-communicable diseases. Likewise, the potential effect on health of other bouillon ingredients, such as e.g., monosodium glutamate, should also be considered. Until more evidence becomes available, it is premature to advocate for any policy change that might directly or indirectly encourage the consumption of salty condiments.

In Burkina Faso, there is a widely held belief that not only salt but also glutamate in bouillon increase the risk of cardiovascular disease, which may be a barrier to a successful complementary fortification strategy. In countries where iodine content in bouillon cubes is not yet subject to national legislation, national fortification programs should consider putting appropriate regulatory

restrictions in place, if deemed appropriate and safe by the Ministry of Health.

Incentives and barriers to fortifying bouillon

The only barrier to the use of iodized salt in bouillon reported by the surveyed producers is the local availability of good-quality salt in sufficient quantities to meet the production needs. The quality of salt available locally does not always meet the manufacturing requirements for particle size, moisture, and sometimes iodine content. To meet these needs, producers rely on imported salt.

All surveyed producers stated that iodization to an adequate level is a condition that must be met for any salt to be accepted. In most cases, iodine levels are determined based on a certificate of laboratory analysis provided with the salt, but some producers (two out of three in Senegal and one of three in Ghana) conduct additional internal quality checks. Those who report iodization levels on their product take into account the losses of iodine during processing and the iodine content reported by their suppliers, but the details of their calculations were not disclosed.

Importing bouillon

The only reported constraint on bouillon cube importation is a competitive environment where unfair practices prevail, which could result in sub-standard products entering the market. For those who import bouillon containing iodized salt, the decision to add iodine has already been made by the salt producers. Importers of bouillon whose products are not labeled as containing iodized salt have declared their willingness to import iodized bouillon cubes if regulations are in place and if bouillon producers agree to supply the product. All surveyed importers agreed that the decision to use iodized salt in bouillon should be escalated to the producers.

Discussion

None of the five countries surveyed in this study currently have legislation designed specifically to regulate the use of iodized salt in bouillon, and the absence of imports regulation is a shortcoming. There is also a considerable shortage of locally available, high-quality iodized salt even though the producers are willing to use it voluntarily.

The study concluded that the reluctance to consider bouillon cubes as part of the official strategy to control iodine deficiency, expressed by many agencies within Ministries of Health, stems from the negative impact of salt consumption on public health. But rather than block any legislative measures, this concern should be used to generate support for better regulatory standards for salt/iodine content in bouillon. It is important to remember that the idea behind using iodized salt in bouillon is not strictly to encourage or discourage its consumption—indeed, no fortification program is designed to change the consumption habits of the fortified food—but to assure that the salt used in the manufacture of bouillon is adequately iodized, and to improve the iodine status of the population.