REVIEW OF IODINE AND SALT SOURCES FOR ESTABLISHING IODIZATION STANDARDS

Bohac LM,* Harding KB*, van der Haar F**, ICCIDD Global Network Iodine Task Force
*Micronutrient Initiative, Ottawa, Canada; **Emory University, Atlanta, USA; ICCIDD Global Network Iodine Task Force, Ottawa, Canada

ABSTRACT

A review of dietary sources of iodine intake, including salt from different sources and natural sources of iodine was undertaken to inform the development of iodization standards. The review included published and unpublished literature and reports, data and/or information from national salt iodization programmes.

There is a global trend of increasing contribution of salt intake through processed foods; in many countries this salt is not iodized. Except for marine food, most natural food sources are low in iodine. Additional dietary iodine via iodized livestock salt and iodine in drinking water contribute relatively little towards iodine intake of large populations. Natural sources of iodine in the diet as well as the iodine contribution via livestock salt are less critical in determining national standards, however, a key consideration is the source of dietary salt. To reflect the changing consumption patterns, iodine standards should be applicable to the total dietary salt supply.

BACKGROUND

- The scale up of universal salt iodization programmes over the past 20 years provided new evidence as well as advances in evidence informed programme development.
- The ICCIDD/GN Iodine Task Force was established in response to maturity of salt iodization programmes and strategies in the context of a changing environment.
- The aim of the Iodine Task Force is to improve the quality and effectiveness of iodine nutrition programmes and strategies, and contribute to updating programme guidance.
- This review was undertaken as part of the work under the Iodine Task Force.

OBJECTIVES

- To review factors to consider for the establishment of iodization standards by focusing on iodine intake via salt from a variety of sources as well as dietary iodine through sources other than salt iodization interventions.

NATURAL DIETARY SOURCES OF IODINE

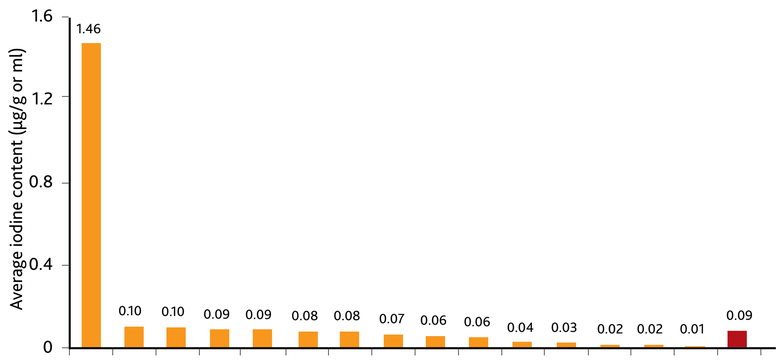
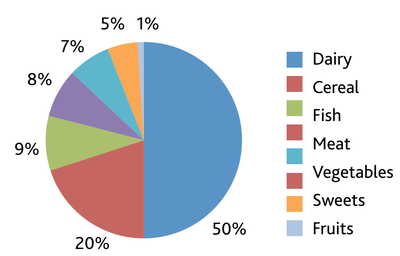


Figure 1. Average (geometric mean) iodine content of selected food groups (data from Fordyce 2003)

Figure 2. Relative contribution of various food groups to total dietary iodine intake in industrialized countries (data from Fordyce 2003)



METHODS

- A desk review of published and unpublished literature and reports, data and/or information from national iodine deficiency elimination/ salt iodization programmes to gather both knowledge and programme experience.
- The review included:
  - legislation and policies regarding salt iodization;
  - information regarding main sources of iodine intake in the diet including iodized table salt;
  - iodized salt in processed foods and iodine from other dietary sources.

TABLE 1: SELECTED EXAMPLES OF CURRENT SALT IODIZATION LEGISLATION AND STANDARDS

COUNTRY	LEGISLATION	YEAR	PERMITTED FORTIFICANT(S)	TYPE(S) OF SALT SPECIFIED	REQUIRED LEVEL IN IODIZED SALT (mg iodine/kg salt or ppm)		
					Production	Retail	Household
SENEGAL	Mandatory	Revisions on-going	KI or KIO_3	Consumer, industry and livestock	80-100 ppm (also for exportation)	30-50 ppm	For importation: 50-80ppm
INDIA	Mandatory	2011	KIO_3	Human	> 30 ppm	> 15 ppm	15 ppm
AUSTRALIA	Mandatory in bread (otherwise voluntary)	2008	KIO_3	Bread salt (organic products exempt)	45 mg/kg		
CHINA	Mandatory	2010	KIO_3	Human, including processed foods	Required level is regionally based Varying levels of 20, 25 and 30 mg/kg		
SWEDEN	Voluntary	1983	KI or KIO_3	Human	40-70 mg/kg		

RESULTS

- Information of current salt iodization legislation and standards was obtained for 55 countries.
- Iodization legislation and standards vary greatly, many do not specify iodized salt for processed foods and many have high iodization standards. (See Table 1 for selected examples.)
- There is a global trend of increasing contribution of salt intake through processed foods, however, in many countries the salt used in processed foods is not iodized.
- Except for marine food (e.g. sea fish, seaweed), most natural food sources are low in iodine. (Figure 1)
- In industrialized countries without mandatory USI, the most significant food groups contributing to iodine intake are dairy and cereal products (Figure 1), however, there is a large variation in iodine content within and between foods due to natural variations.
- Little information exists regarding the use of iodized livestock salt, particularly in developing countries; information available suggests additional dietary iodine via iodized livestock salt is not significant .
- Generally, iodine content in drinking water is low and contributes relatively little towards iodine intake of large populations.

CONCLUSIONS

Natural sources of iodine in the diet as well as the iodine contribution via livestock salt are less critical in determining national iodization standards.

The source of dietary salt is a key consideration for setting iodization standards to achieve optimal iodine intake in the population in the context of salt iodization strategies.

To reflect the changing consumption patterns, iodization standards should be applicable to the total dietary salt supply so as to include table salt as well as salt used in processed foods.

The conclusions are limited by the lack of data from some countries regarding national legislation and limited information regarding national food consumption.

ACKNOWLEDGEMENTS

The authors would like to acknowledge the financial support of the Micronutrient Initiative and the technical support of the ICCIDD Global Network Iodine Task Force.