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# ASSESSMENT

OF THE ACTUAL OR POTENTIAL CONTRIBUTION  
OF INDUSTRIALLY-PROCESSED FOOD SALT  
TO POPULATION IODINE INTAKE



ASSESSMENT OF THE ACTUAL OR POTENTIAL  
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Final National Report: [Republic of Armenia](#)

Armenia

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Assessment of the actual or potential contribution of industrially-processed food salt to population iodine intake (Final National Report: Republic of Armenia), 2020

Hrayr Aslanyan, National Institute of Health named after academician S. Avdalbekyan, MoH, RA, 2020. Pages 26

The Final National Report presents the process and findings of the assessment of the actual or potential contribution of industrially-processed food salt to population iodine intake. The assessment is conducted during 2019 by a National Working Group (NWG) led by the National Institute of Health (NIH), Ministry of Health (MoH) of the Republic of Armenia with technical and financial support from the Iodine Global Network (IGN). The report is designed for health system organizers, public health experts, health providers, as well as other specialists interested and involved in health system issues.

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## Final National Report: [Republic of Armenia](#)

### Assessment of the actual or potential contribution of industrially-processed food salt to population iodine intake

April 2020

The purpose of this document is to present the process and findings of the Assessment of the contribution of industrially-processed food salt to population iodine intake, conducted during 2019 by a National Working Group (NWG) led by the National Institute of Health (NIH), Ministry of Health (MoH) of the Republic of Armenia with technical and financial support from the Iodine Global Network (IGN). The final report on this assessment is primarily for national use and the authors may further amend it, as appropriate, to fit the findings and recommendations of the national workshop on the subject, planned for April 2020 in the capital city of Yerevan, Armenia.

#### 1. Rationale for Why it was Considered Important to Assess the Use of Iodised Salt in Processed Foods

In the Republic of Armenia (RA), the recent WHO STEPS survey of NCD risk factors revealed that the adult population of the country (18-69 aged people) consumes around **10 g** of salt per day and the percentage of people who always or often eat **processed foods** high in salt is over 31%<sup>1</sup>. Further, a comprehensive review of the WHO, UNICEF, IGN materials and other important documents showed that there is growing international recognition that most of the total salt intake comes from processed foods (70–80%) and, therefore, food manufactured with iodized salt in recipe is becoming the main source of iodine for consumers<sup>2</sup>.

Given the above evidence, there is a common understanding locally that salt used for food processing might represent a significant proportion of all food-grade salt and could ensure a significant intake of iodine, if iodized. Hence, efforts are needed to enforce the provision for all food grade salt to be adequately iodized and used in the production of processed foods, to achieve

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<sup>1</sup> - "ARMENIA STEPS Survey, 2016-2017. Fact Sheet":

[https://www.who.int/ncds/surveillance/steps/Armenia\\_2016\\_STEPS\\_FS.pdf](https://www.who.int/ncds/surveillance/steps/Armenia_2016_STEPS_FS.pdf)

<sup>2</sup>- H.Ts.Aslyan, N.E.Sergeeva, A.A.Zaqaryan. About assessment of the extent to which iodized salt is used in processed foods and food processors' level of knowledge on iodine nutrition. J.MedSciArm., 2018, v.LVIII, N 4, p 3-14

and/or sustain optimal iodine status among all population groups (IGN Global guidance recommends USI to ensure iodine intake for all population groups, regardless of dietary habits in regard to salt intake from household salt or salt from processed food, including condiments).

Universal salt iodization (USI) strategy In Armenia was mandated through the RA government decree No 353-N (2004). Production and import of the non-iodized salt and its use for food processing was prohibited, “*except for cases when the use of iodized salt was not allowed by production technology*” (this might become a loophole for sale and use of non-iodized salt). A year later, the Survey of Iodine Nutrition in Armenia<sup>3</sup> showed that 97.2% of household salt samples contained more than 15 mg iodine/kg salt and the national MUIC among 8-10 years old children slightly exceeded the WHO-recommended upper limit. Iodine content in salt was subsequently reduced to  $40 \pm 15$  mg/kg. The food-manufacturing industry was apparently making considerable contribution to dietary iodine consumption thanks to its use of iodized salt in processed foods (though no direct data were reported). The success in attaining the goal of elimination of iodine deficiency in Armenia was acknowledged in 2006 by the Network for Sustained Elimination of Iodine Deficiency (certificate was granted)<sup>4</sup>. A follow-up national iodine survey, conducted in 2016-2017, confirmed that the country’s population has adequate iodine nutrition and is protected against iodine deficiency; the component of iodine intake attributed to salt from processed foods was greater than that attributed to household salts<sup>5</sup>(more surprisingly, in IDD endemic Armenia, the share of “native iodine” in this study was much more, than shares from the salt used in processed foods and from household salt **combined**).

Throughout 2000-2009, the IDD elimination programme in Armenia was basically approached as a MoH-led intervention. Its success was attributed to dedicated effort of a Multidisciplinary Working Group (MWG), responsible to government for the national programme oversight. Also, Avan Salt Company (ASC) - the country’s single salt producer, as a strong proponent of USI in Armenia -continued supplying adequately iodized edible salt for optimum iodine nutrition in the population. After 2009, based on provisions of the RA Law “On Food Safety” (2006), the responsibility for food monitoring was assigned to the Food Safety Inspectorate under the RA government (FSI): its risk-based audits plans up to 2017 did not envisage inspections of iodine content in the salt used in food manufacturing. The MoH/NCDC continued monitoring

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<sup>3</sup>- Ministry of Health of Armenia, National Statistical Service of RA. **Gerasimov G.** Report on results of a national representative survey of iodine nutrition and implementation of universal salt iodization program in Armenia. Yerevan: UNICEF, 2005.

<sup>4</sup> -F. van der Haar, G.Gerasimov, V.Q.Tyler et al. *Universal salt iodization in the Central and Eastern Europe, Commonwealth of Independent States (CEE/CIS) Region during the decade 2000–09. Food and Nutrition Bulletin, vol. 32, no. 4 (Suppl.), 2011, 124 p.*

<sup>5</sup>- Hutchings N, Aghajanova E, et al. Constituent analysis of iodine intake in Armenia. *Public Health Nutrition: 2018, N 21(16), p. 2982-2988* <https://www.ncbi.nlm.nih.gov/pubmed/30189914>

the iodine content in the salt on household level, only; USI in Armenia lost an important component – the monitoring of iodine level in salt on retail and production levels. The MWG was no more operational (MoH interaction with FSI was weak).

The USI component on inspections and enforcement of the use of iodized salt in processed foods was re-established through a Joint Order (829-A and 74-A, March 2016) of the Ministries of Health and Agriculture (currently, Economy). Throughout 2018-2019, the assigned government body – the Food Safety Inspectorate identified several food-processing areas, which, referring to above-mention “**exception**”, developed their own guidelines (“technical conditions”) for use of non-iodized salt (ASC-supplied “salt for industrial purposes”). The use of non-iodized salt in the food industry was never studied. The practice of “exceptions” may yet turn out to be of certain significance, if they further expand the share of non-iodized salt or when policies are in place to influence national dietary salt reduction. Armenia does not have relevant policy, though the MoH recently applied to the National Institute of Standards to establish a voluntary range of salt content in a popular type of bread.

Some of the main reasons why it was important for implementing this assessment were:

- To provide health authorities with an instrument to assess the contribution of widely consumed processed foods to iodine intakes of the population, to refine salt iodization strategy (achieve “true USI”) to ensure sustainability of the population adequate iodine nutrition;
- To strengthen engagement with the salt and food industry and other stakeholders to expand awareness of USI and address current programme challenges (specifically, poor monitoring of food, manufactured with iodized salt in recipe).
- To assess potential impact of salt reduction policies on iodine intake (in case the MoH develops such a policy, aimed at reducing the consumption of salt in order to prevent CVD).

## 2. Situation Analysis to Determine the Need to Strengthen the USI Strategy

- i. Data from ARMSTAT – the 2018 Yearbook<sup>6</sup> and ILCS Report<sup>7</sup> –show that a wide range of processed foods, including “key” salt-containing products, such as bread, cheese, processed meat products, pickled vegetables, etc., are produced and largely consumed in the country. These data in combination with information from certified laboratories on

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<sup>6</sup> - Statistical Committee of the Republic of Armenia (ARMSTAT): Statistical yearbook of Armenia, Yerevan, 2018: <https://www.armstat.am/en/?nid=586&year=2018>

<sup>7</sup>- SOCIAL SNAPSHOT AND POVERTY IN ARMENIA. Statistical and analytical report, based on findings of 2017 Integrated Living Conditions Survey (ARMSTAT), 2018: <https://www.armstat.am/am/?nid=82&id=2095>

salt content in salt-containing foods (see Attachment 4 to the Feedback on the IGN Programme Guidance) indicate that population in Armenia consumes large amounts of rather salty staple and convenience foods (having higher salt levels compared with countries of the Region).

- ii. The RA Demographic Health Surveys of 2000<sup>8</sup>, 2005<sup>9</sup> and 2015/16<sup>10</sup> provided data on the proportions of country households consuming adequately iodized salt (>15 ppm), constituting respectively 83.6% (n=5976), 97,1% (n=6656) and 98,7% (n=7838). Similarly, a study for constituent analysis of iodine intake in Armenia indicated excellent coverage of iodized salt in the country, with 93.4% (mean iodine content of 35,5 mg/kg) of table salt samples tested consistent with the national standard<sup>11</sup>. In addition, data from National CDC regular external monitoring showed<sup>12</sup> that throughout recent several years almost all households (>97%) in Armenia consume adequately iodized salt (at the table and for cooking).
- iii. As mentioned in Chapter 1 (ref.3), the USI strategy in Armenia became mandatory by Government Decree No 353-N of 12.02.2004 with the standard set at a relatively high level of iodine -  $50 \pm 10$  mg/kg salt. The National Survey of Iodine Nutrition (June 2005) showed that the national median UI level among 8-10 years old children was 313  $\mu$ g/L, somewhat exceeding the WHO-recommended limit. Armenia was advised to reduce the mandated standard to the level of  $40 \pm 15$  mg iodine/kg salt (enacted by decree No 1863-N of 21.12.2006). In general, the study confirmed that Armenia eliminated iodine deficiency in its population through effective programme of universal salt iodization. It was also concluded, that the food industry was making considerable contribution to dietary iodine consumption thanks to its use of iodized salt in processed foods<sup>13</sup>. The follow-up national iodine survey was conducted after 12 years lapse (2016), under the auspices of the Ministry of Health. The research team, supported by IGN, was composed of researchers from Columbia University College of Physicians & Surgeons and School of Medicine (USA) and Yerevan State Medical University. Urine samples were analyzed for iodine concentration at the Boston Medical Centre Iodine Research Laboratory. The

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<sup>8</sup> - Armenia DHS 2000. Calverton, Maryland, USA: NSS/Armenia, Ministry of Health/Armenia, and ORC Macro, 344 p.

<sup>9</sup>-Armenia DHS 2005. Calverton, Maryland, USA: NSS/Armenia, Ministry of Health/Armenia, and ORC Macro, 2006, 634 p.

<sup>10</sup>- Armenia DHS 2015-16. Rockville, Maryland, USA: NSS/Armenia, Ministry of Health/Armenia, and ICF, 2017.

<sup>11</sup>- Hutchings N, Aghajanova E, et al. Constituent analysis of iodine intake in Armenia. *Public Health Nutrition*: 2018, N 21(16), p. 2982-2988 <https://www.ncbi.nlm.nih.gov/pubmed/30189914>

<sup>12</sup>- See Attachments to the Feedback on the IGN Programme Guidance: Attachment 5.2. Monitoring of edible salt for iodine content in households, 2009 – 2018: National Centre for Disease Control and Prevention (NCDC), MoH, RA.

<sup>13</sup>- F. van der Haar, G.Gerasimov, V.Q.Tyler, A.Timmer. Universal salt iodization in the Central and Eastern Europe, Commonwealth of Independent States (CEE/CIS) Region during the decade 2000–09: Experiences, achievements, and lessons learned. *Food and Nutrition Bulletin*, vol. 32, no. 4 (Supplement), December 2011, 124 pages.

median UIC was 242µg/L for SAC, 226 µg/L for PW and 311 µg/l for WRA (see more details in the Attachment 6 to the Feedback on the IGN Programme Guidance). These values confirm that the iodine intakes in Armenia are optimal. Conclusion is made that iodine deficiency has not recurred; the country's population has adequate iodine nutrition and is protected against iodine deficiency<sup>14</sup>.

- iv. The NCD prevention and control is a stated priority: several policy documents call for a comprehensive health system response to reduce the NCD burden. However, there is a lack of pragmatic implementable recommendations on which such a response should be based<sup>15</sup>. Overall, four national strategic programmes (with respective action plans, timelines and budget allocations) were adopted by government decrees<sup>16</sup>, suggesting some steps towards implementing many of the core population-based interventions for NCD prevention. None of the programmes contain any activity, aiming at reducing salt intake and salt content in foods. Armenia does not have maximum population salt intake targets. There is no surveillance system to measure, monitor and evaluate population salt consumption patterns and the major sources of salt in the diet.

It is evident that Armenia has achieved adequate iodine status nationally. The adequate iodine intake at population level could be attributed to consumption of iodine from both household salt (showing consistent coverage with adequately iodized salt >90%) and industrially-processed food salt. However, no dietary assessment of the contribution of Industrially-processed foods to salt and iodised salt intake was ever carried out in Armenia. Such an assessment might provide data for identifying the potential impact of “exceptional use” of non-iodized salt and/or a salt reduction policy on sustainability of USI implementation and IDD elimination in the country.

In terms of the strategy, the national team confirmed that the existing salt iodisation regulation is inclusive of the mandatory use of iodised salt by the food industry; however, implementation of the regulatory provisions needs to be further enforced to address any exception, first and foremost for widely used foods.

The salt supply chain: In Armenia, the Avan Salt Company (ASC) is the single salt producer and it consistently supplies adequately iodized edible salt. Back in 1998-1999, the ASC had

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<sup>14</sup>- Hutchings N., Gerasimov G. Salt iodization in Armenia: A model of sustained success. IDD NEWSLETTER, NOV., 2017, 45 (4), p. 2-3; [https://www.ign.org/newsletter/idd\\_nov17\\_armenia\\_alternative.pdf](https://www.ign.org/newsletter/idd_nov17_armenia_alternative.pdf)

<sup>15</sup> -Better non-communicable disease outcomes: challenges and opportunities for health systems. Armenia Country Assessment (J.Farrington, et al), WHO, 2017, 53 p. [http://www.euro.who.int/\\_data/assets/pdf\\_file/0018/336123/HSS-NCDs-Armenia.pdf](http://www.euro.who.int/_data/assets/pdf_file/0018/336123/HSS-NCDs-Armenia.pdf)

<sup>16</sup>- See Attachments to the Feedback on the IGN Programme Guidance: **Attachment 7**. The rationale for negative answer to the Situation Analysis Question 4 (referenceN28, listing four Government decrees on NCDs)

been annually supplying 12,000 MT of fully iodized edible salt and this amount was sufficient to cover national consumption needs (see ref. N4). Throughout recent years (2013-2018), the ASC has been annually supplying around 15,000 MT of food-grade salt composed of two types of adequately iodized salt - vacuum “Extra” quality salt and rock salt, at the ratio 50 : 1. In parallel, the factory produces around 6,000 MT of “selective rock salt” (>5 kg lumps) mainly for animal consumption and, partially (approx. 1/4) - for grinding and packaging by the ASC itself (labelled as “for industrial purposes”) and by small-scale salt producers (10 workshops) and supply of this non-iodized salt product to food stores and to food processors. The total amount of imported food-grade iodized salt for recent 4 years ranged within 2-3 thousand MT per year, constituting approx. 1/6 share of the salt supply in the national markets (in 2018, the largest share of the imported salt was from Ukraine, Iran and Russian Federation). An approximate estimate of the total amount of food-grade salt (both, iodized and non-iodized), produced per annum in Armenia and imported from foreign sources (an average for 6 years), is 19,100 MT, or 6,33kg per capita. Of this amount, up to 17,500 MT, or 5,8kg per capita (approx. 92%) is iodized. The ASC dominates the country salt markets; the largest share of its food-grade salt is iodized and is apparently sufficient to cover national iodized salt needs for human consumption, though some small share (8%) of its salt products can reach households and food processors as non-iodized salt.

Food processing: Armenia is a net producer of bread and has rather developed industry of dairy products (e.g. brine cheeses), meat and meat products (sausages & intermediates), pasta, and pickled/preserved vegetables. These are the key salt-containing products, for which there is clear reliance on local production (>90% of traditional cheeses, “Bologna” type sausages, fermented pickles, etc.). Imports are more tangible in the group of hard cheeses and pasta. Salt content of domestically processed foods is regulated at national level, by Institute of Standards, establishing voluntary range of salt levels in specific foods to underpin the producers’ guidelines. The NIH experts comment that locally produced foods are rather salty: there is need to reformulate industry standards and recipes to reduce the levels of salt in them. Based on **monthly** reports from 2834 enterprises, including > 50 food industries, the ARMSTAT produces annual statistical bulletins on products or groups of products (> 30) they produce (in physical terms). Actual annual release of several groups of salt containing foods such as bread and pasta, meat products, cheese, mayonnaise, preserves, as well as sodium salt itself is presented in the ARMSTAT bulletin “Production of basic products in industrial

organizations in physical terms, January–December, 2018”<sup>17</sup>. Disaggregated data from individual producers or regulators is difficult to obtain.

### 3. Legislative Framework for the Use of Iodised Salt in the Manufacture of Industrially-Processed Foods

The main regulatory documents for development and implementation of the National IDD elimination programme and USI in the Republic of Armenia (RA) are: 1) RA Government Decree No 353-N of 12 February 2004 “On the approval of the national programme for control and prevention of dietary iodine deficiency among the population of the Republic of Armenia, the timetable for the plan of priority actions (2004–2007), as well as amendment to the Government Decree No 902 of 31 December 2000”; 2) No 1863-N of 21 December 2006, “On introducing amendment to the Decree of the Government of Armenia No 353 of 12 February 2004”. Yerevan: Government of Armenia, 2006.

The Decree No 353-N includes the following provisions:

- *The salt, produced or imported in the Republic of Armenia for use by population in food (household use and consumption), should be iodized; thereto, the iodine content in the iodized salt should be  $40 \pm 15$  mg per kg salt (in force in 60 days after publication of this decree);*
- *The public catering facilities or food processing organizations or sole proprietors must use only iodized salt in foodstuffs produced for domestic supply (except for cases when the use of iodized salt is not allowed by production technology).*
- *Package labelling for the iodized salt, produced for “use in food”, should have marking «Iodized food-grade salt», which should cover not less than 10% of the total package marking surface.*

The IDD elimination programme document (attachment to the Decree No 353) clearly specified the National Centre for Disease Control and Prevention (NCDC) of the Ministry of Health (MoH) responsible for enforcing the requirements for all types of food-grade salt, including ensuring the use of iodized salt in the food industry. After 2007, based on provisions of the RA

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<sup>17</sup> - [https://www.armstat.am/file/article/bnexen\\_12\\_2018.pdf](https://www.armstat.am/file/article/bnexen_12_2018.pdf) (and Attachment 3 to Feedback on the IGN Programme Guidance)

Law “On Food Safety” (2006), the responsibility on food monitoring (inspections) and standard setting was assigned to the State Food Safety Service (SFSS) of the Ministry of Agriculture<sup>18</sup>.

The programme regulatory framework was further strengthened following UNICEF/IGN sub-regional USI sustainability workshop for countries of Eastern Europe and Central Asia (Almaty 2015). Based on recommendations of the workshop, the Armenia’s Ministry of Health (MoH) in cooperation with the Ministry of Agriculture (MoA) developed a package of “*Rules of the state control and implementation of monitoring over the content of iodine in food-grade salt, information exchange and public communication*”, which was enacted through **Joint Order** of the two ministries (MoH: No 829-A of 23.03.2016 and MoA: No 74-A of 18.03.2016). The Joint Order defines responsibilities, methods and procedures for monitoring of iodine content in the salt:

- *in the retail system and at the level of food industry and catering organizations - by SFSS, being the authorized body in the area of food safety (assigned by the Government Decree No 218-N of 21.02.2013),*
- *in households – by NCDC<sup>19</sup>, in conjunction with its routine investigations of foci of communicable diseases (Decree No 353-N of 12.02.2004),*
- *methods for analysis of iodine content in food-grade salt, fortified with potassium iodate, and procedures and forms for data exchange and public communication.*

Yet, the Joint Order does not suggest a joint coordination mechanism (to involve MoH, SFSS, the salt and food industry, etc.), maintenance of a database, joint interpretation of data and activities, reporting and dissemination of information - altogether to facilitate concerted action by the principal stakeholders.

Stipulated by provisions of the above Joint Order, in 2017the SFSS proceeded inspecting the iodized salt (both locally produced and imported) in the markets and the food industry. The SFSS **2017-2018** reports on iodine content in samples (approx.300) of the food-grade salt from imported lots and from retail, catering and food manufacturing organizations were not posted on their website in due course. The data on iodine levels in the samples of the food-grade salt from households were not posted at NCDC website, at all. Information, obtained through formal requests, did not specify the sources and types of the salt, sampling site, type of deviation from national standard, etc. (almost 10% of samples did not meet the national standard).

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<sup>18</sup> - In July 2019, the Ministry of Agriculture was abolished; the Ministry of Economic Development and Investments was transformed into Ministry of Economy that incorporates the agricultural sector in its structure. The SFSS was transformed into Food Safety Inspectorate (FSI) under Government of the Republic of Armenia.

<sup>19</sup> - The NCDC is the major public health institution of the RA Ministry of Health.

Thus, based on the review of the legislative environment for salt iodization in Armenia, it is possible to draw the following conclusions.

- ❖ RA Government Decree, enacted on USI, is a normative act (sub-law) that ensures mandatory iodization of food-grade salt in the country. Production and import of non-iodized salt for its use in households and food-processing industry is prohibited; iodine standard is set and maintained (“40±15”, in effect from 01 July 2007).
- ❖ The regulation for salt iodisation in Armenia clearly indicates inclusion of the salt for industrially-processed foods, as well as the salt for household use and consumption. However, there is a gap in regulatory provisions of mandatory salt iodization – the one that makes exception for use of non-iodized salt based on production technology requirements. The latter is a loophole, permitting sale and use of non-iodized salt in the country.
- ❖ The monitoring of the IDD elimination programme and USI implementation in Armenia is supported by a number of normative acts, including government decrees and ministerial orders. The monitoring of the iodine content in the food-grade salt at household level is implemented by the health sector (NCDC), and at the levels of salt retail and use in food industry – by the SFSS of the agriculture sector (since mid-2019, the SFSS is transformed into FSI under the RA Government). The latter is the regulatory authority, responsible for enforcing requirements for the use of iodised salt in the food industry. The interaction between NCDC and FSI is weak.
- ❖ In the Republic of Armenia, the legislation for salt iodization is a stand-alone regulatory document (government decree).
- ❖ The national standard for the level of iodine in the food-grade salt is incorporated into the regulatory document (RA Government Decree No 353).

#### **4. Assessment of the Contribution of Industrially-Processed Foods to Salt and Iodised Salt Intake and Interpretation for the USI Strategy**

Based on the list and type of data recommended by the Programme Guidance document, the following sources were identified in Armenia and used throughout the piloting exercise:

- i. The key salt-containing industrially-processed foods with estimates of the level of consumption:

**ARMSTAT** presents dynamics of household income, expenditures and basic food consumption, based on data from Integrated Living Conditions Survey (ILCS). The source

of information is **the Diary** of current expenditures, consumption, and incomes. Surveys are conducted annually, with monthly substitution of approx. 500 households countrywide. Latest food consumption information is presented in the “Social snapshot and poverty in Armenia” summary report<sup>20</sup>, which contains a list of 12 main food groups with estimates of average consumption quantities for **groups**, including groups of salt-containing foods, such as bakery goods, meat products, cheeses, etc. (it does not mention food group of spices, condiments, sauces, or bouillon cubes).

The XLS list of specific food products consumed at home is presented in the “Household’s Integrated Living Conditions Survey anonymised micro-data database” (purchased and consumed food and non-food products): the XLS list of micro-data database gives estimates of average monthly per capita consumption of specific products<sup>21</sup> (it provides sufficient breakdown of widely consumed processed foods, including salt-containing foods, e.g. several types of bread, pasta, cheeses, sausages, etc.

Consumption of salt-containing foods by specific population groups was impossible to estimate as HCES provides average per capita consumption data for total population only.

- ii. The salt content of these key foods, with estimates of the relative contribution to average daily salt intake:
  - a. In total, over 200 results of titrimetric measuring of salt content in 9 groups of salt-containing foods<sup>22</sup>, including items of the main list (bread, cheese, meat products, pickled & preserved vegetables), were extracted from **2018-2019 annual reports** of two certified laboratories - the laboratories of the NIH/MoH and the STANDARD DIALOG Ltd.; some of the above total of results were provided by the Ministry of Economy (in response to national team request), collected from laboratories of large food-manufacturing companies.
  - b. Salt levels in bread were estimated using data of salt content in baker’s recipe, as well (this estimation resulted in  $M = 1,47 \text{ g}/100 \text{ g}$  at  $n = 29$ ; see also reference No 22).
  - c. Salt concentrations in commonly consumed in Armenia salt-containing foods are presented in publications in J. Med.Sci.Arm., 2020, 1-3 (in print).
  - d. The average daily intake of salt from each product was calculated using the percent product weight as salt multiplied by the estimated average daily intake of the product.

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<sup>20</sup>- <https://www.armstat.am/en/?nid=82&id=2095>(Feedback on the IGN Programme Guidance: **Attachment 1.1**).

<sup>21</sup>- <https://www.armstat.am/en/?nid=207> (30 food products are presented in the IGN Programme Guidance: **Attachment 1.2**).

<sup>22</sup> - Salt content of all selected food products is presented in summary table in the IGN Programme Guidance: **Attachment 4**).

- iii. The proportion of the salt used for production of each food that is currently adequately iodised in the country:
  - a. The proportions of country **households**, consuming adequately iodized salt (**IS**) in Armenia are obtained from three sources –reports on RA Demographic Health Surveys of 2005 and 2015/16, the study of Hutchings N, et al. “Constituent analysis of iodine intake in Armenia”, and outcomes of the MoH/NCDC regular external monitoring (references No 9, 10, 11, 12);
  - b. The proportion of IS used for production of bread commonly consumed in Armenia is obtained from the results of the “Assessment of the extent to which iodized salt is used in processed foods” (reference No 2);
  - c. The proportions of IS used in production of cheese, meat products, pickles, etc. are estimated using results of food industry checks by Food Safety Inspectorate (2017-2018); in addition, data are obtained from the Food Safety Department of the Ministry of Economy, which had approached to large food-manufacturing companies for information on the use of IS and, then, shared the information with the national team.

**Selection of models and scenarios:** Based on analysis of existing data and information, the team agreed on estimates for proportions of key salt-containing foods produced with iodized salt, as 93,4% for household salt, 82% for bread, 7% for cheese, 83% for meat products and intermediates, 44% for pickled/preserved vegetables, 5% for pasta, and 0% for tomato paste and mayonnaise. The model assumed that the iodine content of iodized salt was the average of the national salt iodine standard, i.e. 40 mg/kg. Armenia was part of the 66<sup>th</sup> World Health Assembly, where all countries unanimously agreed to reduce their mean salt intake by 30% towards a target of 5 g/day, by 2025<sup>23</sup>. Therefore, the team decided to apply a relative salt reduction target of 30% for table salt and all processed foods (as a separate scenario) in case the MoH opts for a policy to reduce salt consumption in order to prevent CVD (with overall purpose to inform policy-makers on whether such a reduction would affect the iodine status of the population).

It was agreed to produce **two models**: (1) the main modelling produced for the general adult population group and (2) the modelling on pregnant and lactating women, based on an assumption that their food and iodine intake is similar to that in the general population. No

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<sup>23</sup>-66<sup>th</sup> World Health Assembly. Follow-up to the Political Declaration of the High-level Meeting of the General Assembly on the Prevention and Control of Non-communicable Diseases. WHA66.10, 27 May 2013

modelling was possible for the groups of children under the age of 2 years and those aged 2 to 18 years, given the apparent absence of food consumption data for these groups.

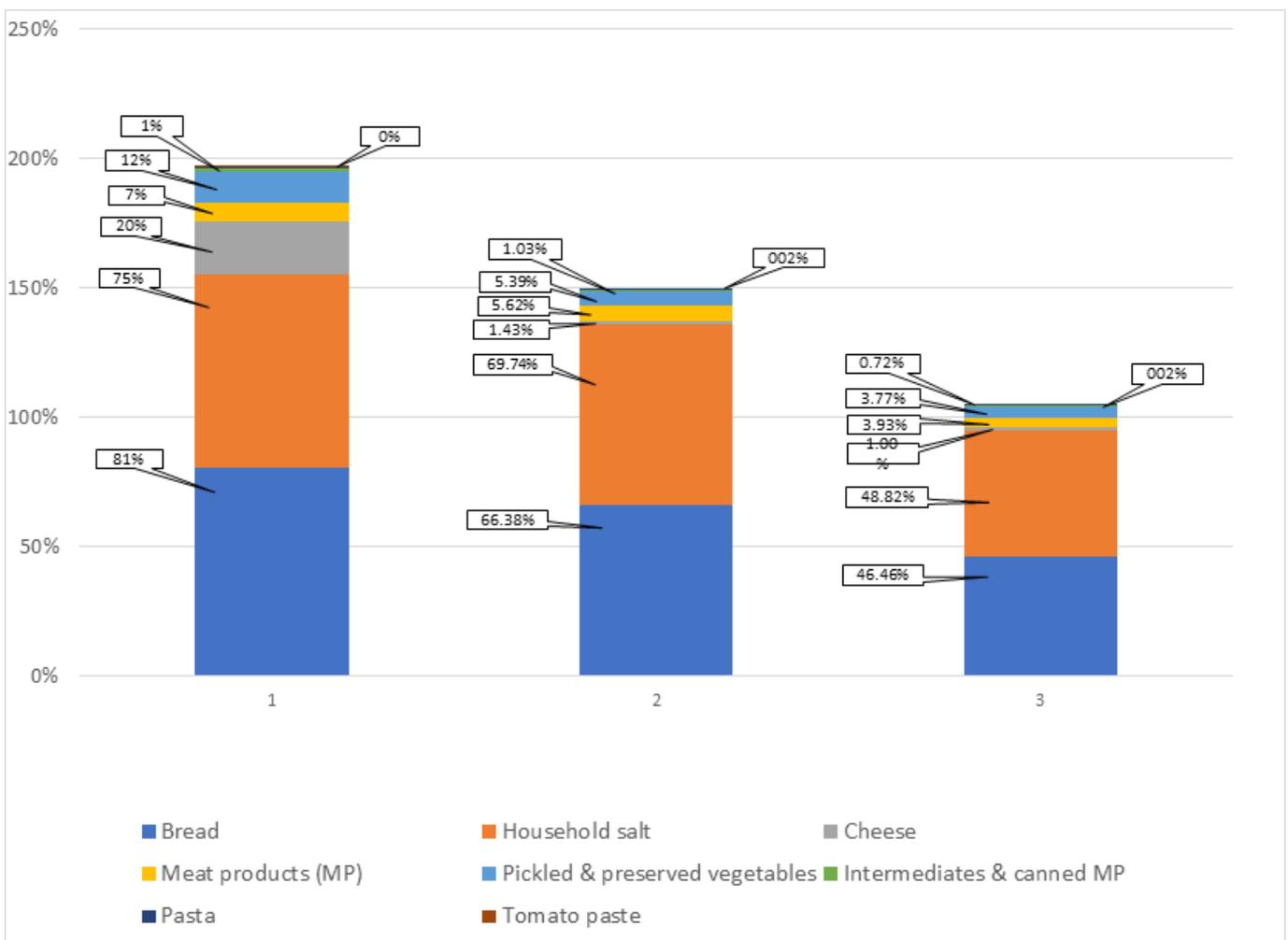
The team looked into **three potential scenarios**: (1) potential iodine intake from all food grade salt (100%) iodized; (2) estimated current iodine intake (based on current evidence of 93,4% coverage with iodized salt among households, 82% coverage at bakeries, 7% for cheese, 83% for meat products and intermediates, 44% for pickled/preserved vegetables, 5% for pasta, and 0% for others); and (3) potential iodine intake if current iodization levels are maintained and salt reduction target of 30% is established and, then, achieved in next years (to inform the national USI strategy, in case any negative impact is expected).

**The outcome of models:** The modelling exercise allowed the national team to estimate the contribution of the six key salt-containing processed foods as well as the household salt to iodine intake for two population groups - general adult (non-pregnant) population and pregnant & lactating women. Corresponding estimates in the form of graphs are presented in fig. 1 and 2. The main findings are as follows:

- Salt average per capita daily intake from household salt and the six key salt-containing foods constitutes 10,6g, of which 4,0g comes from household salt, with further 4,3g - from bread and another 2,3 g- from the rest of the key salt containing foods (combined contribution). The average per capita daily intake of salt was assumed to be similar in the two population groups under analysis, the general adult (non-pregnant) population and that of the pregnant and lactating women.
- The Modelling showed that, under scenario 1, 196% and 118% of the daily Recommended Nutrient Intake (RNI) for iodine in adult (non-pregnant) population and in pregnant women, respectively, could *potentially* be met if 100% of household and food industry salt for the identified key salt-containing foods was iodised.
- *Currently, under scenario 2*, an estimated 149% and 90% of the daily RNI iodine for non-pregnant adults and pregnant women, respectively, is being met by the use of iodised salt in about 93,4% of households and the selected industrially-processed foods. Actual data on consumption of the same foods prepared outside the home (supplied by small-scale producers) is not known. Eating outside is not that popular in Armenia, therefore amounts of iodine from these dietary salt sources are not considered significant.
- In the scenarios 3, If the 30% salt reduction target is met and the use of iodised salt remained at the same level as current then these same sources of (potentially iodised) salt would meet 105% and 62% of the daily iodine RNI for non-pregnant adults and pregnant women, respectively.

**Figure 1.** Contribution to % daily RNI iodine from iodised salt from estimated per capita consumption of selected processed foods – Republic of Armenia, (NON-PREGNANT) ADULT (RNI iodine 150µg/day).

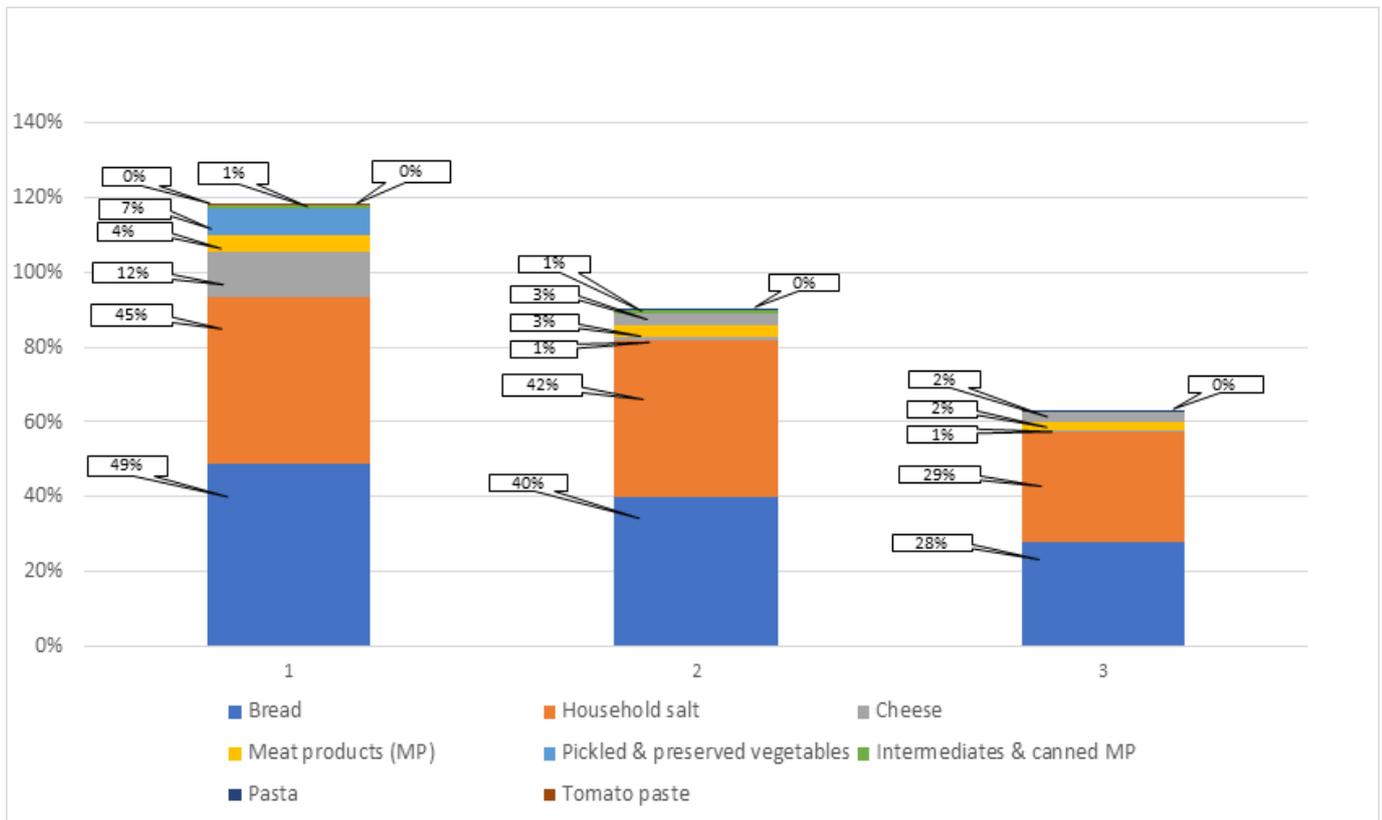
Scenario (column) 1 = potential iodine intake (if all salt 100% iodised), 2 = estimated current iodine intake (based on 93,4% household salt iodised, 82% bakery salt, 7% cheese salt, 83% salt for meat products and intermediates, 44% pickles salt, 5% pasta salt, and 0% salt for other foods), 3 = potential iodine intake if current iodisation levels are maintained and salt reduction of 30% is established/achieved.



Note: Percent of iodine consumption with different foods represent proportions of RNI (Recommended Iodine intake), i.e. 150 mcg/day, not proportions of average daily iodine intake.

**Figure 2.** Contribution to % daily RNI iodine from iodised salt from estimated per capita consumption of selected processed foods – Republic of Armenia, PREGNANT WOMEN (RNI iodine 250µg/day).

Scenario (column) 1 = potential iodine intake (if all salt 100% iodised), 2 = estimated current iodine intake (based on 93,4% household salt iodised, 82% bakery salt, 7% cheese salt, 83% salt for meat products and intermediates, 44% pickles salt, 5% pasta salt, and 0% salt for other foods), 3 = potential iodine intake if current iodisation levels are maintained and salt reduction of 30% is established/achieved.



Note: Percent of iodine consumption with different foods represent proportions of RNI (Recommended Iodine intake), i.e. 250 mcg/day, not proportions of average daily iodine intake.

**Discussion:** Existing evidence in the RA (Iodine nutrition survey, 2016) demonstrates an excellent iodine intake (based on mUIC) among various population groups and suggests that Armenia has achieved optimal iodine nutrition, at national level. However, few points of caution are worth noting here:

- Our assessment yielded an average intake of **10,6 g** salt from household salt and key salt-containing foods, whereas the Armenia’s NCD STEPS Survey of 2016 (ref. No 1) had found a mean salt intake at **9,8 g/day** among 18–69 aged people: 11 g/day in men, 8,4 g/day - women. In a parallel study (ref. No 11), sodium content was measured in urine of reproductive age women: UNaC/UCr ratios approximated an average sodium intake of 5,5 g/day, equivalent to a salt intake of **13,9g/day**. Obviously, further studies are needed to provide a more valid estimate of mean population level salt intake.

- The largest share (over 3/4) of iodine intake in the two population groups in all three scenarios can be attributed to iodised household and bread salt. In Armenia, bread is the leading staple food with rather high per capita consumption level, far ahead of relevant levels in the vast majority of the countries in the European Region<sup>24</sup> and very close to consumption levels ( $\approx 300$  g/day) in countries of the Mediterranean Region<sup>25</sup>. Based on well-known approach (ref. 24), the salt content in the finished product (in baked bread) was estimated in our case from the salt concentration in the dough (baker's recipe or BR) by dividing it to 1,25 (resulted in  $M=1,47\text{g}/100\text{g}$ ;  $n=29$ ). In parallel, scarce data were obtained on assessment of salt content in bread through direct measurement ( $n=7$ ): in this case, the mean content of the salt in 100 gram of "averaged" bread amounted to  $1,33 \pm 0,31$ , that is **9,5%** less, than estimated on the basis of the BR. Hence, institutional capacities should be developed for monitoring of IS levels in bread to allow precise quantification of salt in bread and avoid any overestimation of iodine intake from this most important staple food.
- Dietary patterns in Armenia are shifting towards increased consumption of processed foods; the latter are known worldwide to be a major source of salt in people's diets. Armenia is also confronted with excessive consumption of the sodium (salt); therefore, the RA government has stated the challenge of NCDs/CVDs prevention **as a priority**. In case the MoH opts for a salt intake reduction policy, then there is still space for reduced targets (by 30%) on salt content in key salt-containing foods without affecting adversely the iodine status of the population: if salt iodisation remains at the same level, as current, then the same sources of iodised salt would meet 105% of the daily iodine RNI for non-pregnant adults. As to pregnant women, then this 30% reduction may result in small decrease of iodine intake by pregnant women, who have higher daily requirements for iodine (providing 62% of the daily iodine RNI). The latter may become noticeable if there will be more "exceptions" for use of non-iodised salt in manufacturing of processed foods or when the production and distribution of non-iodised food-grade salt is expanded.

***In addition** to estimating the percent of RNI for iodine that could be provided through using adequately iodised salt in the selected industrially-processed food products, the assessment team moved forward re-calculating the percent of all listed foods in daily iodine consumption totalling **in 100%**. The results, presented in Attachment 1 (page 22), provide visually clear understanding of the role of each product in average daily iodine intake (in all three scenarios).*

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<sup>24</sup>-Quilez J., Salas-Salvado J. Salt in bread in Europe: potential benefits of reduction. Nutrition Reviews 2012, 70(11):666-78.

<sup>25</sup> - Al-Jawaldeh A., Al-Khamaiseh M. Assessment of salt concentration in bread commonly consumed in the Eastern Mediterranean Region, EMHJ, 2018, V. 24 , No. 1, 18-24.

## 5. Enabling Factors Required for Expansion of a Salt Iodisation Strategy to Include Salt for Food Processing

The assessment of strengths, weaknesses and opportunities to refine the current salt iodization strategy in the Republic of Armenia, based on consideration of the national status of the **seven** enabling factors listed in the Programme Guidance, is presented in the table below.

| Enabling factor   | Strength/weakness  | Opportunity  |
|---|--|--|
| <p><b>Legislation</b> adequate to enforce the iodisation of salt used in industrially-processed foods</p> | <p>Government Decree N 353, enacted on USI in Armenia in 2004, is a normative act (sub-law) that ensures <b>mandatory iodization</b> of all food-grade salt produced and imported in the country, including the salt for household use and for public catering, as well as the salt used in industrially-processed foods. There is, however, a gap in the regulation of mandatory salt iodization – the one that makes <b>exception for use of non-iodized salt based on food production technology</b> (is not specified). The latter is a loophole, permitting production, sale and use of non-iodized salt in the country.</p> <p>The monitoring of the iodine content in the food-grade salt at household level is implemented by the health sector (MoH/NCDC), and at the levels of salt retail and use in food industry – by the Food Security Inspectorate (FSI). The latter is the regulatory authority, responsible</p> | <p>Based on the <b>Joint Order</b> (829-A and 74-A, March 2016), the Ministries of Health and Economy and FSI should address the gap in the regulatory provision of mandatory salt iodization (<b>the exception for use of non-iodized salt</b>) and achieve a “true USI strategy” to encompass the entire supply of salt destined for both households and the food industry. The FSI should reflect in its audit instructions the irrelevance of the above exception to the salt in widely used processed foods, first and foremost to the salt in commercial bread production - the major staple food in Armenia. Universal use of iodized salt in bread-baking will ensure equal access of all population groups to iodine-fortified salt.</p> <p>The stakeholders should establish an overriding mechanism (committee or a board) to coordinate programme oversight within and beyond sectors. USI monitoring information must</p> |

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|   | <p>for enforcing the use of iodized salt in the food industry. The interaction between NCDC and FSI is weak.</p>  | <p>specify the sources and types of the salt, sampling site, deviation from national standard; meeting/discussion will be held to address the issue.</p>  |
| <p><b>Standards</b> for salt iodization based on total salt consumption, including salt consumed through processed foods?</p> | <p>In Armenia, the mandated <b>standard</b> for salt iodization (<math>40 \pm 15</math> mg iodine/kg salt) is the central provision of the above regulatory document: hence, the standard is based on <b>total salt consumption</b>, including the salt consumed through processed foods. The adequacy of the national standard is confirmed in studies of population iodine status, based on UIC, accounting for all dietary iodine sources (see Chapter 2).</p> <p>The country's USI regulation implies that all subsequent guidelines, including food industry standards ("conditions") refer to mandatory use of iodized salt. However, based on "<i>exception for use of non-iodized salt</i>", the producers of 1-2 food groups (e.g. ethnic brine cheese and several types of pickled vegetables) operate within their own guidelines ("conditions") using to certain degree non-iodized salt.</p> | <p>Is evident from the following:</p> <ol style="list-style-type: none"> <li>1. According to iodine nutrition surveys of 2005 and 2016, the country's population has adequate iodine nutrition and is protected against iodine deficiency;</li> <li>2. According to FSI audits of 2018/19, the majority of food processors use iodized salt - their guidelines (tech. conditions) include clear reference to the Decree N353 on mandatory use of iodized salt in food industry;</li> <li>3. However, the use of non-iodized salt in some specific areas of food processing may yet turn out to be of certain significance, if its share is expanded or when policies are in place to influence national dietary salt reduction. This must be addressed (regulated) to avoid USI deterioration.</li> </ol> <p>Hence, stakeholders must reestablish coordination mechanism to ensure sustainability of elimination of iodine deficiency for future generations.</p> |
| <p><b>Food control protocols</b> adequate to ensure monitoring, inspection and</p>  | <p>The monitoring/inspections of iodized salt are conducted at the levels of salt production (Avan Salt) and imports, as well as in</p>   | <p>In 2017, the National Institute of Health (NIH) of the Ministry of Health (MoH) implemented an IGN-supported project on</p>  |



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| <p>enforcement of the use of iodized salt in the manufacture of processed foods</p>          | <p>retail markets, catering organizations and food industry, enabling correction (or refusal) of under- or over-fortified salt prior to its supply and use. The protocol enacted through 2016 Joint Order, defines responsibilities, methods and procedures for monitoring of iodine content in the food-grade salt. It includes assigned authority (FSI) for inspections and enforcement of the use of iodized salt in processed foods (see Chapter). The major public health agency – NCDC performs monitoring of the iodine content in household salt. However, the FSI and NCDC reports are not posted on their website in due course. Data, obtained through formal requests, do not specify the sources &amp; types of the tested salt, sampling site, type of deviation from national standard. Stakeholder meetings are not held to address emerging issues.</p> <p>FSI and NCDC have sufficient laboratory capacity to determine iodine in salt.</p> | <p>assessment of the status of National IDD elimination programme, reviewing the progress of USI strategy in Armenia. Findings and conclusions of the project were shared with stakeholders (primarily with FSI and Avan Salt).</p> <p>Based on the recommendations of the above assessment, it was agreed to initiate, inter alia, a revision of the 2016 Joint Order so as it suggests a coordination mechanism (to involve MoH/NCDC, Ministry of Economy, Food Safety Inspectorate, the salt and food industry) for monitoring and inspections of iodized salt in the manufacture of processed foods, that should focus on key salt containing products. The regulation should ensure maintaining a database on the results of the monitoring and enforcement activities; provide joint interpretation of data, reporting and dissemination of information - altogether to facilitate concerted action by the principal stakeholders.</p> |
| <p>Mechanisms to improve <b>awareness</b>, engagement and practices of the food industry</p> | <p>At early stage of introducing USI in RA (2005-07), the awareness building was led by a MoH Multidisciplinary Working Group (MWG), involving specialists from food &amp; salt industries.</p> <p>Then, based on the RA Law “On Food Safety” (2006), the responsibility on food monitoring</p>   | <p>Meetings and discussions were held with senior officials of the FSI, Ministry of Economy, Avan Salt and NIH/MoH and it was agreed:</p> <ol style="list-style-type: none"> <li>1. Given the provisions of the RA Law “On Food Safety” (2006) and RA Government Decree No 218-N of 21.02.2013, the FSI, in</li> </ol>   |

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|  | <p>and standard setting was transferred from NCDC to FSI. The MWG stopped functioning, and up to 2017 there was no mechanism to inform industry of the requirement to use only IS in the manufacture of processed foods. Fortunately, Avan Salt continued to remain a strong proponent of USI: it dominates the salt market and consistently and adequately iodizes its edible salt production.</p> <p>Currently there is no mechanism to regularly engage specialists from salt and food industries, public health and food safety agencies for information sharing and jointly managing the progress. A recent study showed that despite the preferred practice of using iodized salt in food processing, many food processors do not appear to have a fair level of knowledge about iodine being essential for proper functioning of thyroid gland, about IDD and their prevention through use of iodized salt. There are no plans for targeted communication activities to address the lack of knowledge and misperceptions that support demand for non-iodized salt among some food processors.</p> | <p>cooperation with NCDC and NIH, will support the reestablishment of the MWG;</p> <p>2. The FSI will address the lack of knowledge and misperceptions that support demand for non-iodized salt among some food processors (through targeted communication activities).</p> <p>3. The Food Safety Laboratory of the Biology Department of the State University will initiate research to clarify misperceptions on potential changes in the texture, color, or taste of several products (local brine cheeses) due to use of iodized salt. The study is expected to provide evidence needed to overcome perceived challenges in this area (eventually, when there is evidence, to limit the above-mentioned exceptions to a small number of products that are not of key importance in iodine nutrition).</p> <p>4. The Ministry of Economy will provide data on food-grade salt imports, and Avan Salt Company (ASC) - on domestic production and supply of food-grade salt; these partners (as MWG members) will participate in assessment of overall salt supply situation in the country.</p> |
| <p>Comprehensive <b>communication</b> plan in place with identified audiences,</p> | <p>USI regulatory documents mention plans for communication activities. Largely supported by UNICEF in 2005-2007, the</p>  | <p>As soon as an effective functioning national body, responsible to the government for the national IDD elimination programme</p>  |



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| <p>messages, and methods, incorporating salt reduction messages</p>  | <p>National IDD elimination programme had been implementing training, public education and social mobilization to increase knowledge on IDD and consumption of iodized salt. The focus of activities, however, was on in-service training of health professionals. In principle, Armenia succeeded to achieve USI without a large-scale public communication campaign. Subsequently, the activities were not institutionalized neither at NCDC not at FSI or any other stakeholder: there were no plans to specifically address lack of knowledge and/or misperceptions that support demand for non-iodized salt among food processors &amp; general population. In Armenia, the NCD prevention and control is a stated priority. Four strategic programmes are adopted, suggesting interventions for NCD prevention. However, none of them contain activities, aiming at reducing salt intake and salt content in foods.</p> | <p>(committee council or MWG) is re-established, a comprehensive communication plan with identified audiences, messages, and methods should be developed.</p> <p>Communication on USI strategy should be part of IEC activities at the MoH (NCDC &amp; NIH), Ministry of Economy and FSI under the RA Government. Activities should address lack of knowledge and misperceptions that support demand for non-iodized food-grade salt among relevant audiences.</p> <p>The <b>communication</b> plan will incorporate salt reduction messages as soon as Armenia develops and adopts a salt reduction strategy with maximum population salt intake target and sodium content targets for foods.</p> |
| <p>Household <b>surveys</b> (HCES, dietary, nutrition, other) designed to capture information on the consumption of key salt-containing industrially processed foods</p> | <p>RA Statistical Committee (ARMSTAT) presents dynamics of household income, expenditures and basic food consumption (HCES), based on data from Integrated Living Conditions Survey (ILCS). Surveys are conducted during one year with monthly substitution of 500 households. The List of micro-</p>   | <p>The MoH/NIH and FSI in cooperation with ARMSTAT should initiate review of the List of micro-data database to explore potential for presenting more disaggregated data on several salt-containing foods, e.g. on widely consumed group of cereal-based foods (bread vs. pastry), tomato-based products (juices, pasta,</p>   |

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|  | <p>data database gives estimates of average monthly per capita consumption of specific food products with sufficient breakdown of widely consumed processed foods, incl. salt-containing foods. However, information for different population groups is not available. Due to lack of funds, no dietary or nutrition survey is conducted in the RA.</p>  | <p>preserves), sauces, etc. To this end, it would be feasible to invite the HCES Unit of ARMSTAT to be part of stakeholder interim mechanism, facilitating access to timely and accurate information on the contribution of both household and industrially-processed food salt to total salt intake.</p>   |
| <p>Financial and personnel resources available to strengthen the national strategy for USI according to the above points</p> | <p>Financial and personnel resources to sustain USI strategy are limited. The components of the National IDD elimination programme are split between public health (NCDC &amp; NIH) and food safety agencies. Food inspectors have poor understanding of health benefits of USI. Iodine nutrition studies are conducted with external assistance (UI assays in reputable iodine laboratories abroad). A feasibility study for creation of a laboratory for UI determination was planned back in 2005; its need was recalled in the government decree No 40 of 2014. However, a specialized laboratory to conduct regular UI studies is still absent.</p> | <p>After re-establishment of MWG and appointment of the MWG Chair and the Manager of the National IDD elimination programme, stakeholders must develop an advocacy strategy to raise funds for: clear USI legislative framework (addressing exceptions); training of food inspectors in public health aspects of USI enforcement in food industry; introduce simple data monitoring methods; the MoH will strengthen the biomonitoring capacity of programme to include urinary iodine assays at the newly-established National Reference Laboratory of the MoH/NCDC.</p> |

## 6. National Action Plan

Based on the outputs of the present assessment, a national action plan is developed, showing **several steps** to advocate for and implement a refined salt iodization strategy, aiming to ensure sustainability of the population adequate iodine nutrition in Armenia. They are as follows:

1. The Ministry of Health in cooperation with the Ministry of Economy and the FSI – to address the gap (**the exception**) in the legislative framework of mandatory salt iodization in Armenia – to amend relevant provisions of USI regulations (Decree N 353 of 2004 and Joint Order 829-A/74-A of 2016) to achieve a “true USI strategy”, encompassing the entire supply of salt destined for both households and **the food industry**; subsequently, to include in the FSI instructions and in food-processing guidelines a clear reference to Decree N353 on IS mandatory use; in parallel, clearly specify the products (e.g. brine cheese), that can be produced using non-iodized salt (if evidence is provided).
2. Re-establish the Multidisciplinary Working Group (MWG), responsible to the government, and appoint a manager for the National IDD elimination programme (NFP); strengthen the latest regulatory document on USI - the Joint Order of 2016, amending it with additional provision to include MWG Chair, members from sectors and partners – health (NCDC, NIH) and economy, food security (FSI), salt industry (ASC), traders’ and food manufacturers’ associations, media and consumer NGOs; develop the MWG TOR to ensure the USI strategy oversight that aims at bringing the stakeholders together to jointly manage the progress, discuss emergent information, make decisions on barriers, and promote public accountability by regular publicity.
3. The Ministry of Health in cooperation with the FSI - review protocols/procedures of USI monitoring to ensure maintenance of a database on the results of the monitoring and enforcement activities; specify the sources and types of the tested salt, sampling site, type of deviation from national standard, etc.; provide joint interpretation of data, reporting and dissemination of information; envisage quarterly meetings to review data from USI monitoring, as well as an annual forum to discuss achievements and needs and to promote information dissemination – altogether to facilitate concerted action by the principal stakeholders.
4. Strengthen engagement (partnership) between ministries, inspection bodies, academicians and food industry around the existing legislation for USI implementation (monitoring, inspections, and enforcement):
  - a. Ministry of Economy (MoE) and Avan Salt Company (ASC) –provide data on food-grade salt imports (MoE) and on domestic production and supply of food-grade salt (ASC) and participate in assessment of overall salt supply situation in the country (both, MoE and ASC);

- b. Food Safety Inspectorate (FSI) – provide data on regular monitoring of food-grade salt at retail and food industry levels and ensure data interpretation (with information on geography of testing, sources and types of salt, deviation from standard);
  - c. Support/conduct targeted communication work for salt traders & food manufacturers - to address the lack of knowledge and misperceptions that support demand for non-iodized salt among some retailers and food processors;
  - d. Initiate research at Food Safety Laboratory of the Biology Department of the Yerevan State University - to clarify misperceptions on potential changes in the texture, colour, or taste of several products due to use of iodized salt (e.g. brine cheese) to provide evidence needed to overcome perceived challenges in this area (eventually, if there is an evidence, to limit the above-mentioned exception to a small number of products that are not of key importance in iodine nutrition).
  - e. Conduct a working group meeting (April 2020), to present the findings and recommendations of this assessment and proceed to development of relevant working plans of actions in each area.
5. Develop a comprehensive communication plan of activities with identified audiences, messages, and methods to address lack of knowledge and misperceptions among relevant audiences, including health providers, food inspectors, media and general population. Include IEC activities on USI strategy into the general plan of IEC activities at the MoH (NCDC & NIH), Ministry of Economy and FSI. As soon as Armenia develops and adopts a salt reduction strategy, review the plan and incorporate in it relevant salt reduction messages.
6. The MoH/NIH and FSI in cooperation with ARMSTAT – to initiate review of the List of micro-data database to explore potential for presenting more disaggregated data on several salt-containing foods, e.g. on widely consumed group of cereal-based foods (bread vs. pastry), tomato-based products (juices, pasta, preserves), sauces, etc. to invite the HCES Unit of ARMSTAT to be part of stakeholder coordination mechanism (MWG), facilitating access to timely and accurate information on the contribution of both household and industrially-processed food salt to total salt intake.
7. Conduct population-based regular dietary or nutrition surveys that include assessment of iodized household salt use, iodine status and salt intake; whenever possible, to investigate associations between these factors.
8. Develop research proposals to State Committee of Science of the Ministry of Education and Science of the Republic of Armenia to mobilize resources for studies/surveys, aiming to address



the lack of information on the salt content of the main salt-containing foods that are produced using iodized salt in recipe (assuming these are major sources of iodine in diet) and the barriers for use of iodized salt in some processed foods (brine cheese, pickles).

## Average daily iodine intake from salt in identified key salt-containing foods

| Food product      | Daily per capita consumption (g) | Salt content, (% product weight) | Daily salt intake from the product (g) | Main outcome: If all food industry salt is iodized                  |  | Optional: if data on current food use of iodized salt is known |  |   | Optional: salt reduction policy is implemented or planned                                      |  |
|-------------------|----------------------------------|----------------------------------|--|---|--|--|--|---|--|--|
|                   |                                  |                                  |  | Potential iodine intake (mcg) from daily intake of the product* (g) | Potential % of average daily iodine intake from the product* | Percent of total salt used in the product that is iodized      | Current iodine intake (mcg) from daily intake of the product** (g) | Current % of average daily iodine intake from the product** | Potential iodine intake (mcg) from daily intake of the product if salt reduction target is met | Potential % daily iodine intake from the product if salt reduction target is met |
| Household salt    | 4                                | 100                              | 4.0                                    | 112   | 37.8   | 93.4%  | 104.61   | 46.6  | 73.23  | 46.6   |
| Bread             | 295                              | 1.47                             | 4.3                                    | 121   | 40.9   | 82.0%  | 99.57  | 44.4  | 69.70  | 44.4   |
| Cheese            | 28                               | 3.92                             | 1.1                                    | 31  | 10.5   | 7.0%   | 2.15   | 0.96  | 1.51   | 0.96   |
| Meat products     | 12.5                             | 2.90                             | 0.4                                    | 10  | 3.4  | 83.0%  | 8.42   | 3.75  | 5.89   | 3.75   |
| Pickles           | 28.3                             | 2.32                             | 0.7                                    | 18  | 6.1  | 44.0%  | 8.09   | 3.60  | 5.66   | 3.60   |
| Intermediates     | 3.7                              | 1.80                             | 0.1                                    | 2   | 0.7  | 83.0%  | 1.55   | 0.69  | 1.08   | 0.69   |
| Pasta             | 19.3                             | 0.13                             | 0.0                                    | 1   | 0.3  | 5.0%   | 0.04   | 0.02  | 0.02   | 0.01   |
| Tomato paste      | 2.4                              | 1.02                             | 0.0                                    | 1   | 0.3  | 0.0%   | 0.00   | 0.00  | 0.00   | 0.00   |
| <b>T O T A L:</b> | <b>393.2</b>                     |                                  | <b>10.6</b>                            | <b>296</b>  | <b>100%</b>  |  | <b>224.43</b>  | <b>100%</b>   | <b>157.1</b>   | <b>100%</b>  |

\*- assuming 100% salt iodised at mean national standard level with 30% iodine loss;

\*\* - based on % food industry salt iodised with 30% iodine loss.

