

Government of Andhra Pradesh
Department of Food Safety Department

Iodine Deficiency Disorder is a world-wide Public Health Problem of today.

Consequences of Iodine Deficiency:

- (1) Impairment of Physical & Mental Development.**
- (2) Affecting learning ability and lowered I.Q. the Iodine Deficiency Disorder affect human resources development as well as productivity of Nation.**

SPECTRUM OF IDD

CHILDREN :

- **LOWERD I Q**
- **IMPAIRED LEARNING**
- **MENTAL RETARDATION**
- **SPEECH & HEARING DEFECTS**

ADULTS :

- **LACK OF ENERGY**
- **REDUCED PRODUCTIVITY**
- **GOITRE**
- **IMPAIRED MENTAL FUNCTIONS**

PREGNANT WOMEN :

- **SPONTANEOUS ABORTIONS**
- **STILL BIRTHS**
- **BIRTH OF CRETINS**



Male from Ecuador about 40 years old, deaf-mute, unable to stand or walk. Use of the hands was strikingly spared, despite proximal upper-extremity spasticity.



Severe IDD: a dwarfed cretin woman with a "barefoot doctor" of the same age (35 years) from the Hetian district, Xinjiang, China.

(Courtesy of Dr Ma Tai of Tianjin).



Three women of Himalayas with typical endemic goiters.



An adult male from the Congo, with three women of the same age (17-20 years), all of whom are myxedamatus cretins.

➤ **Iodine is one of the essential micronutrients required for the normal mental and physical well being of human beings. Iodine deficiency occurs when iodine intake falls below recommended levels. The requirement of Iodine is 150 micrograms per person per day. The tiny quantity of Iodine is required everyday by the thyroid gland for adequate production of the hormone thyroxine.**

- ❖ 100-150 micrograms of iodine is required to be taken daily for normal human growth and development.
- ❖ Food is the normal source of supply of this micronutrient.
- ❖ However, with the environment itself reflecting iodine deficiency, over the years, food products in different parts of the world have shown low iodine content.
- ❖ Hence, a need has arisen for supplementing iodine in our daily diet through other than natural sources.

HISTORY

- ❖ **Series of surveys conducted by the Central and State Health Directorates, ICMR and Medical Institutes.**
- ❖ **No State / UT is free from the problem of Iodine Deficiency Disorder.**
- ❖ **71 million population are suffering from goitre and other IDD.**
- ❖ **Samples surveys have been conducted in 25 States and UT out of 310 Districts surveyed – 283 districts (10% prevalence of IDD).**
- ❖ **THE GOAL OF THE PROGRAMME IS THEREFORE TO BRING THE INCIDENCE OF IDD BELOW 10%.**

WHY IODISATION OF SALT ?

- ❖ It is one of the few commodities that comes closest to being universally consumed daily by all sections of society irrespective of economic level.
- ❖ Desirable daily requirement of iodine for the human body.
- ❖ The mixing of an iodine compound to salt is a simple operation without any chemical reaction.
- ❖ The addition of iodine does not change the colour, taste or odour of common salt, thus making it acceptable to all.
- ❖ The level of iodine in iodized salt is well within the safe limits. A person has to consume at least 10 to 15 times the normal daily dosage if iodine were to trigger hyperthyroidism
- ❖ Consumed daily and uniformly by all segments of society.
- ❖ Most cost effective vehicle, Hence (approx. 90 countries).

REASONS IN FAVOUR OF COMPULSORY IODISATION OF SALT.

- 1** Grave threat to cognitive development of children.
- 2** Also leads to enlargement of thyroid gland – goiter, brain damage, deafmutism, and to mental retardation, cretinism – there is a major social cost involved if these problems are not prevented.
- 3** Ecological profile of the Indian sub continent makes it vulnerable to low iodine content in the soil and hence in the nutritional iodine intake.
- 4** Salt is the most effective vehicle for universal and compulsory iodisation, in view of its obligatory daily consumption by all sections of society, in fixed quantity. It is also universally acknowledged as the most cost effective vehicle in comparison with iodised oil, bread, milk, sauce, water etc.

5 Iodine deficiency can be easily combated by iodisation of salt.

6 No state or UT is free from I.D.D. it is a public health problem not only in the Himalayan terrain, but in pockets all over the country.

7 In the matter of “informed” choice, question arises as to who will exercise the right of the fetus or the unborn child who is also vulnerable to Iodine Deficiency Disorders. Government need to exercise this right in the matter or public health.

8 There is no proven harm to health in compulsory iodisation of salt.

9 The ethical issues involved in allowing freedom of choice, subjugating proven medical benefits.

Standards for Iodised salt under the FSSAI Rules, 2011.

Iodine content at -

Production level - 30 ppm.

Consumer level - 15ppm.

- **loss of iodine during long transportation and the storage.**
- **Average consumption of salt to be 10 gm. / person / day, the iodine intake will amount to 150 micrograms, which is the estimated normal requirement of iodine for an average person.**
- **Iodine intake up to 1000 micrograms per day is estimated to be safe for human consumption.-WHO**

Food Safety & standards Act, 2006 sets standards for quality.

- **All iodized salt producers and re-packers are required to ensure that the salt marketed by them conforms to the standards prescribed under the Provisions and Rules of the Food Safety & Standards Act, 2006 is implemented by the Food (Health) administration in the state.**
- **The food Safety Officers are empowered to draw samples of iodized salt in accordance with procedures set out in the rules and get them analyzed in the State Food Laboratory.**
- **If a specimen fails to conform to the specifications, either in terms of its iodine content or other characteristics, the Food Inspectors are empowered to launch prosecutions against the manufacturer/producer of such sub-standard iodized salt. After adjudication of the offence manufactures for sale or stores or sells or distributes shall be liable to a penalty which may extend to five lakh rupees. [Sec. 51]**

Provisions relating to Salt in Food Safety & Standards Act, 2006 rules and regulations, 2011.

The salt manufactures/dealers/retailer shall comply with the statutory regulations for manufacturing/sale of salt for human consumption laid under Food Safety & Standards Act, 2006 and rules and regulations made thereunder.

Food Safety & Standards (Licencing & Registration of Food business) Regulations, 2011

Sec. 31(1) of FSS Act, 2006 read with Regulation 2.1.2(1) of Food Safety & Standards (Licencing & Regulation of Food Business) Regulations, 2011 specifies that “No Food Business operator who manufacture, store, distribute, sold or exhibit for sale shall conduct business except under licence/registration.”

Food Safety and Standards (Prohibition & Restrictions on Sales) Regulations, 2011.

2.3 Prohibition and Restriction on sale of certain products

Regulation -2.3.12: Restriction on sale of common salt – No person shall sell or offer or expose for sale or have in his premises for the purpose of sale, the common salt, for direct human consumption unless the same is iodized:

Provided that common salt may be sold or exposed for sale or stored for sale for iodization, iron fortification, animal use, preservation, manufacturing medicines, and industrial use, under proper label declarations, as specified in the Regulation 2.4.5 (21 & 42) of Food Safety and Standards (Packaging and Labelling) regulations, 2011.

Food Safety and Standards (Prohibition & Restrictions on Sales) Regulations, 2011.

2.3.14: Restrictions relating to conditions for sale

Regulation – 2.3.14.(3) - Iron fortified common salt shall be sold only in high density polyethylene bag (HDPE) 14 mesh, density 100 kg/m³, unlaminated package which shall bear the label as specified in the Regulation 2.4.5 (21 & 42) of Food Safety and Standards (Packaging and Labelling) regulations, 2011.

Food Safety & Standards (Food Product Standards & Food Additives) Regulations, 2011.

Substances added to Food (Preservatives)

3.1 –Food Additives: regulation (4) Preservatives: Common salt is a Class I preservative

3.1.11: Use of Flavour Enhancers: regulation (1) Monosodium Glutamate is not allowed in Salt.

3.2: Standards of Additives regulation (12)-Synthetic Food Colour.

Edible Common Salt (diluent/filler material) conforming to the prescribed standards shall be permitted to use in colour preparations

Food Safety and Standards (Contaminants, Toxins & Residues) Regulations, 2011.

Regulation 2.1.1.(2): Iron fortified common Salt shall not contain Lead or Copper or Arsenic in excess of 2 ppm.

Quality Standards

Standards of quality of the Iodized Salt in Chapter 2.9.30 (2) of FSS (Food Product Standards & Food Additives) Regulation, 2011.

Chapter: 2.9: Salt, Spices, Condiments & related products:

Note: (1) The extraneous matter wherever prescribed, shall be classified as follows:

- a). Organic extraneous matter such as chaff, stems, straw**
- b). Inorganic extraneous matter such as dust, dirt, stones and lumps of earth and shall not exceed 2% by weight of the total Extraneous matter**

FSS (Food Product Standards & Food Additives) Regulation, 2011.

2.9.30 Edible Common Salt:

1. Edible Common Salt means a crystalline solid, white, pale, pink or light grey in colour free from contamination with clay, grit and other extraneous adulterant and impurities. It shall not contain moisture in excess of six per cent of the weight of the un-dried sample. The matter insoluble in water shall not exceed 1.0 per cent by weight on dry weight basis.

The product may contain food additives permitted in the regulations. The total matter insoluble in water where an anticaking agent has been added shall not exceed 2.2 % and sodium chloride content on dry basis shall not be less than 97.0 % by weight.

FSS (Food Product Standards & Food Additives) Regulation, 2011.

2. Iodised Salt means a crystalline salt, white or pale, pink or light grey in colour, free from contamination with clay, grit and other extraneous adulterants and impurities. It shall conform to the following standards:

Moisture	Not more than 6.0 % by weight of the un-dried sample.
Sodium Chloride (NaCl)	Not less than 96.0 % by weight on dry basis.
Matter insoluble in water	Not more than 1.0 % by weight on dry basis
Matter soluble in water Other than NaCl	Not more than 3.0 % by weight on dry basis

**FSS (Food Product Standards & Food Additives)
Regulation, 2011.**

Iodine content at—

(a) Manufacture level

**Not less than 30
ppm on dry weight basis.**

**(b) Distribution channel
incl. retail level**

**Not less than 15 ppm on
dry weight basis.**

The product may contain food additives permitted in regulations. The total matter insoluble in water where an anticaking agent has been added shall not exceed 2.2 % and sodium chloride content on dry basis shall not be less than 97.0 % by weight.

FSS (Food Product Standards & Food Additives) Regulation, 2011.

3. Iron Fortified Common Salt means a crystalline solid, white or pale, pink or light grey in colour, free from visible contamination with clay and other extraneous adulterants and impurities. It shall conform to the following standards:

Moisture	Not more than 5.0 % by weight.
Water insoluble matter	Not more than 1.0% on dry weight basis.
Chloride content as NaCl	Not less than 96.5% by weight on dry weight basis
Matter insoluble in dil HCl	Not more than 3.0 % by weight on dry weight basis, (determined by the method specified in IS 253-1970).

FSS (Food Product Standards & Food Additives) Regulation, 2011.

Matter soluble in water other than NaCl	Not more than 2.5% on dry weight basis
Iron content (as Fe)	850-1100 parts per million.
Phosphorous as Inorganic (PO ₄) Sulphate as (SO ₄)	1500-2000 parts per million Not more than 1.1% by weight
Magnesium as (Mg) water soluble	Not more than 0.10% by weight
pH value in 5% aqueous Solution	2 to 3.5

The product may contain food additives permitted in regulations. The total matter insoluble in water where an anticaking agent has been added shall not exceed 2.2 % on dry weight basis.

FSS (Food Product Standards & Food Additives) Regulation, 2011.

5. Iron Fortified Iodized Salt (double fortified salt) means a crushed Crystalline Solid; white or pale or pink or light grey in colour, free from contamination with clay and other extraneous adulterants and impurities. Salt used for manufacture of double fortified salt shall have minimum 99.0 % sodium chloride content on dry weight basis and moisture not more than 1.5 % and it shall conform to the following standards:

Moisture

Not more than 1.5 per cent by weight.

Water insoluble matter

Not more than 1.0% on dry weight basis.

Chloride content (as NaCl)

Not less than 97.0% on dry weight basis

FSS (Food Product Standards & Food Additives) Regulation, 2011.

Matter insoluble in dilute HCl

Not more than 0.30 % on dry weight basis

Matter soluble in water other than NaCl

Not more than 2.5% on dry weight basis

Iron content (as Fe)

850-1100 parts per million.

Iodine content:

a. Manufacturers level

Not less than 30 ppm

b. Distribution Channel
incl. Retail level

Not less than 15 ppm

Phosphorous as P O

2800-3100 parts per million.

Sulphate as (SO₄)
weight.

Not more than 1.1% by

FSS (Food Product Standards & Food Additives) Regulation, 2011.

Magnesium as (Mg)

Not more than 0.10% by wt.

Water soluble

pH value in 5% aq. Solution

3.5 to 5.5

Food Safety & Standards (Packing & Labelling) Regulations, 2011:

Regulation 2.4.5 (20) Every container or package of table iodized salt or iron fortified common salt containing permitted anticaking agents shall bear the following label namely.

**IODISED SALT / IRON FORTIFIED COMMON SALT
CONTAINING PERMITTED ANTICAKING AGENTS**

Regulation 2.4.5 (21) Every container or package of iron fortified common salt shall bear the following label, namely

IRON FORTIFIED COMMON SALT

Protocol to collection of samples:

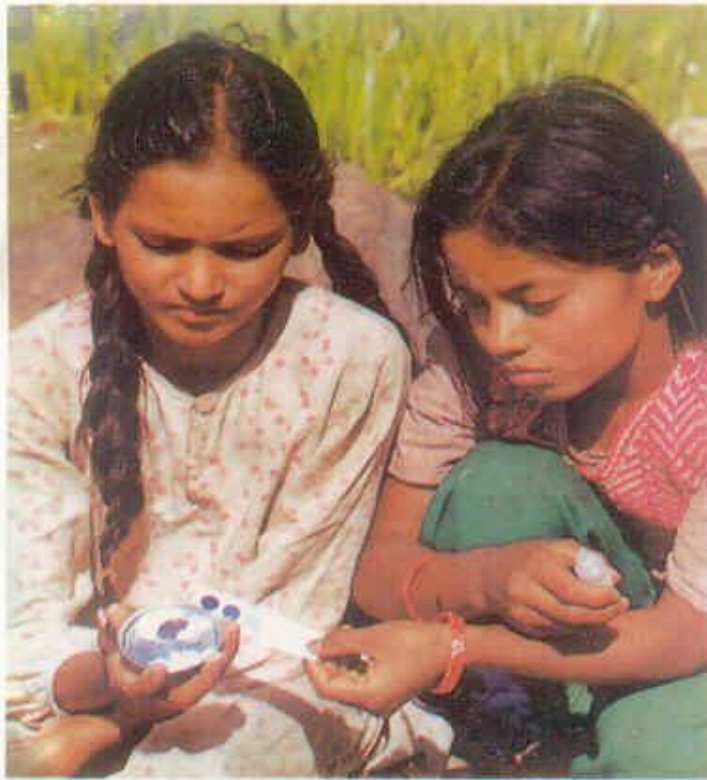
The Food Safety Officers inspect Food Business Operators in Salt- manufactures/salt packers, wholesalers, retailers to check the adequacy of iodine content in Iodized Salt of various brands including Crystal iodized salt with the help of “*SPOT TEST KITS*” supplied by UNICEF. If the samples are found inadequate in Iodine content, samples such salt will be collected for analysis.

The Food Safety Officers also check the quality of iodized salt being used in Midday meal centres in Schools / Welfare Hostels/Ashram Schools etc.

Samples of Salt found packed in one Kg. pack must be presumed that it is meant for human consumption irrespective of label declaration.

PACKING

- **The packing of iodised salt for distribution is an important aspect of the IDD control program. In order to keep iodine losses to a bare minimum, the packing material must be safe, protective and compact.**
- **The recommended packing material for iodised salt are:**
 - **HDPE bags, preferably laminated.**
 - **LDPE pouches and**
 - **Polythene lined jute bags.**
- **The normal detail packing units used are 500 grams and 1 Kg. For bulk packing, the units approved at present are 40, 50 & 75 and 100 Kgs.**



- The iodine testing kit contains a vial with a chemical solution. One drop of chemical solution turns a salt sample violet if it contains iodine. For assessing the iodine level, the intensity of the violet colour developed as a result of this reaction is compared with the colour strip indicating levels of iodine concentration, and whether iodine is present or absent. Using the kit, iodine content of the salt varying from 15-30-ppm can be detected even at the household level.



THANK YOU