Objective
To train FSOs on Food Fortification

Drugs & Food Control Organisation, Jammu & Kashmir in collaboration with Food Safety & Standards Authority of India (FSSAI) organised Induction Training Program for Food Safety Officers at Jammu & Kashmir from 15 February, 2018.

Training Schedule
A session on food fortification was integrated into the currently running Induction Program for FSOs.

During the one-hour classroom session, Food safety officers Annexure 1 were trained on technical aspects of Food Fortification. The recent FSSAI directive on Standards was discussed to create better understanding at regulatory front. The training presentation shared by Food Fortification Resource Centre, placed at Annexure 2 captured details like:

- Open market availability
- How to handle and store premix
- Perform qualitative spot tests

Conclusion

- 14 Food safety officers were trained on Food Fortification.
- They were also introduced to the Food Fortification Resource Centre (FFRC) and its online portal http://ffrc.fssai.gov.in/ffrc/home.
Annexure 1

List of Food Safety Officers

- Sh. Jameel Ahmed Chauhan
- Sh. Ishfaq Ahmad Bhat
- Sh. Tawheed Amin
- Sh. Firdous Ahmad Ahangar
- Sh. Suneel Singh
- Ms. Sadiya Javaid
- Ms. Arjumand Nisar
- Ms. Nadiya Rashid Malik
- Ms. Nadia Bhasir
- Sh. Faheem Raja
- Sh. Ishtiaq Ahmad
- Ms. Renu Bharti
- Ms. Chitra Pokhriyal
- Ms. Jiji Mary Johnson
Annexure 2

Food Fortification

Food Fortification Resource Centre
Food Safety and Standards Authority of India

Contents

• Introduction to Food Fortification
• Fortification Standards
• Fortification Technology
• Role of a Food Safety Officer
Introduction to Food Fortification

• Fortification is addition of key vitamins and minerals such as Iron, Iodine, Zinc, Vitamins A & D to staple foods such as rice, wheat, oil, milk and salt to improve their nutritional content
• India has a high burden of micronutrient deficiencies caused by Vitamin A, Iodine, Iron and Folic Acid leading to Night Blindness, Goitre, Anaemia and various birth defects
  ➢ 58.4 percent of children (6-59 months) are anaemic
  ➢ 53.1 percent women in the reproductive age group are anaemic
  ➢ 35.7 percent of children under 5 are underweight

(Source: National Family Health Survey (NFHS))

• In India Food Fortification has been implemented for commodities, namely:
  ➢ Rice (Iron, Folic Acid, Vitamin B12)
  ➢ Milk (Vitamin A & Vitamin D)
  ➢ Salt (Iron & Iodine)
  ➢ Edible Oil and Vanaspati ((Vitamin A & Vitamin D)
  ➢ Whole wheat flour & Refined wheat flour (Iron, Folic Acid, Vitamin B12)
## Fortification Standards – May 2017

<table>
<thead>
<tr>
<th>Micronutrient</th>
<th>Atta &amp; Rice (/kg)</th>
<th>Oil (/gm)</th>
<th>Milk (/ltr)</th>
<th>Salt (/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitamin B12</td>
<td>10 µg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Folic Acid</td>
<td>1300 µg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iron</td>
<td>20 mg</td>
<td></td>
<td></td>
<td>850-1100 mg</td>
</tr>
<tr>
<td>Vitamin A</td>
<td>1500 µg RE</td>
<td>25 IU</td>
<td>770 IU</td>
<td></td>
</tr>
<tr>
<td>Vitamin D</td>
<td>4.5 IU</td>
<td></td>
<td>550 IU</td>
<td></td>
</tr>
<tr>
<td>Iodine</td>
<td></td>
<td></td>
<td></td>
<td>30 mg</td>
</tr>
<tr>
<td>Zinc</td>
<td>30 mg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pyridoxine</td>
<td>5 mg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Niacin</td>
<td>42 mg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Riboflavin (B2)</td>
<td>4 mg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thiamin (B1)</td>
<td>1.5 mg</td>
<td></td>
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</tr>
</tbody>
</table>
+F Logo Specifications

- **square** represents completeness
- **plus sign (+)** is about adding extra nutrition and vitamins to daily meals
- **ring around the letter ‘F’** illustrates the ring of good health, protection and an active life
- **Colour Blue** symbolizes purity and good health
- basic need for good health and food fortification

+F logo shall be displayed on the Fortified Food Labels as given in the Schedule-II of Food Safety and Standards (Fortification of Foods) Regulations, 2017, together with the statement “Fortified with.................................(name of the fortificant)

- The statement “**SAMPOORNA POSHAN SWASTHA JEEVAN**” is optional and may also be given under the logo
Process/Technology of Fortification

- Rice (Iron, Folic acid & Vitamin B12)
  - Can be fortified using dusting, coating or extrusion technology
  - Extrusion is the technology of choice
  - Milled broken rice is pulverized, mixed with a premix containing vitamins and minerals
  - Fortified rice kernels (FRK) are produced through an extruder machine
  - FRK is added to non-fortified rice in ratio ranging from 1:50 to 1:200

Wheat Flour (Iron, Folic acid & Vitamin B12)

- Simple and cost effective technology
- Premix is added through a volumetric feeder located towards the end of the milling process
Edible Oil (Vitamin A & Vitamin D)

- simple blending and easily achievable
- these are fat-soluble vitamins, they permit easy and cost-effective addition without the need for elaborate equipment and can be uniformly distributed in oil

Milk (Vitamin A & Vitamin D)

- technology to fortify milk is simple, well-established, available, and the cost of fortification is low
- Vitamin A and D premixes are widely available in India
Double Fortified Salt (DFS) (Iodine & Iron)

- DFS may be produced by mixing iodized salt with either/or Ferrous Sulphate and Encapsulated Ferrous Fumarate

- While producing DFS with Ferrous Sulphate, Sodium hexametaphosphate (SHMP) is used as a stabilizer

- Ferrous Fumarate is encapsulated with Soya Stearin to prevent interaction between iodine and iron

Role of a Food Safety Officer

1. To Check Quality, Storage, Handling of Premix

   - Is the premix stored in clean, dry and hygienic conditions?
   - Is the temperature of premix storage between 25°C -30°C?
   - Is the premix storage tank in direct contact with sunlight?
   - Does the plant follow ‘FIRST IN – FIRST OUT’ system?
2. To Check Labelling and Packaging of fortified foods

- Does the packet of the product have Fortified logo?
- Does the packet contain warning information for people sensitive to fortificants?
- Is the sample labelled as per FSSAI Regulations for Fortification of Food?
- Does the packet contain license no?

3. To perform Qualitative Tests

➢ These tests indicate only the presence or absence of micronutrient in sample. For eg:

Ring test for Vitamin A in oil and milk

- colorimetric method involves adding a chromogenic reagent Tri-Fluoro acetic acid (TFA) to a volume of solubilized fortified food sample
- TFA reacts with retinol to produce a blue color, whose intensity is proportional to the amount of retinol in the sample
Iron spot test for Iron in wheat flour

- Ferric iron added to flour reacts with a thiocyanate (KSCN) reagent to form a red colored complex
- Deeper red color will be formed with enriched and fortified flour compared with the untreated flour

Deep red/brown fortified wheat flour

Iron spot test for Iron in Fortified rice

- In this test, reagents react with ferric (iron) ions to generate a dark brown-red pigment

Fortified kernels in fortified rice turn red/black indicating presence of iron
Iodate spot test for Iodine in Salt

- iodate in salt oxidizes an iodide reagent in the presence of hydrogen ions to form free iodine which turns starch blue

FSOs must follow all the legal procedures after sampling and should penalize the accused.

THANK YOU

For more information visit: http://ffrc.fssai.gov.in/ffrc/home