Setting the Context of MNPs in Public Health Nutrition Programming

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Micronutrient Powders Consultation
Washington DC, October 19th, 2015
Our goal is to create local capacities for the countries to decide and implement the appropriate interventions, and for achieving this…..

we need to receive the wisdom from the field; those experiences that are neither published nor many times considered “scientifically” important, because the opinion and knowledge of the local colleagues is essential.

SCIENCE OF DELIVERY or IMPLEMENTATION SCIENCE.
Elizabeth (Betsy) Jordan-Bell (USAID/GH/HIDN/NUT; LNS meeting, October 16th, 2015)

1. The importance of **context assessment**: because it defines needs and causes, and determine potential usefulness of strategies and interventions. Data gap must be filled.

2. The **resources are finite**: and so we need to select wisely the interventions, in order to promote own country investments.

Before acting, we need to assess the needs (magnitude, severity, extension of the problems, and the possible causes), and analyze the feasibility of the potential solutions (acceptance, affordability—and mechanisms of financing-, sustainability).
Although foods (nutrients) are insufficient to assure “good nutrition”, they are still essential.
The nutritional value of onion

<table>
<thead>
<tr>
<th>&lt; 1 % RNI</th>
<th>1-3 % RNI</th>
<th>4-5 % RNI</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>Energy, Protein</td>
<td>-</td>
</tr>
<tr>
<td>Niacin, Vit. $B_{12}$</td>
<td>Vit. $B_1$, $B_2$, Panthotenate, Folate</td>
<td>Vit. $B_6$, Vit. C</td>
</tr>
<tr>
<td>Vitamins A, D, E, K</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Iron, zinc, selenium</td>
<td>Calcium</td>
<td>Magnesium</td>
</tr>
<tr>
<td>Iodine</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

% of the WHO Recommended Nutrient Intake for 1-3 years old children, assuming 25 g onion intake. Nutrient composition of the onion taken from the USDA Food Composition Table (edible portion), product NDB: 11283.

But onion also stimulates that the body metabolizes mycotoxins…. Very positive.

All substances required for the human physiology are provide by foods; so, the basic intervention is DIETARY DIVERSITY, regardless the nutrient density of individual foods.
Selected as the introductory phrase of the National Nutrition Research Roadmap 2015-2020 for Advancing Nutrition Research to Improve and Sustain Health in the USA, by the Interagency Committee of Human Nutrition Research (ICHNR):

“Let food be thy medicine, and thy medicine be thy food”

Hippocrates, “the Father of Medicine”, c 489 BC to c 370 BC

We get from foods much more than the known nutrients, an so “we are what we eat”.
Characteristics of unscrupulous medicine

1. It is expensive
2. It is unnecessary
3. It may be harmful
Are the MNP’s harmful?

Not at all !!!!

**Reason:** Because if any risk exists it is due to the amount, the quality, and the moment and conditions of ingestion of the micronutrients that are supplied and not to the vehicle as those are being delivered.

**But…**

If we accept that the MNP’s are safe, we should also accept that ….

**…. The MNP’s do not have any impact either.**

**Reason:** Because the MNP’s are simple vehicles of micronutrients. They are not the solution but the means for delivering the solution (the micronutrients).

The MNP’s are neither harmful nor efficacious as they are simple vehicles of the solution (micronutrients that are deficient in individuals and populations).
We do not know, because everything depends on the context, and therefore this is a question that goes beyond the MNP’s; this is general for any intervention that supplies micronutrients.

Kay Dewey (University of California, Davis; LNS meeting, October 16th, 2015):

Synthesis of what has been learned to date from the iLiNS Project and implications for program and policy:

1. Potential for population to respond: [Inadequate status (or intake)]

2. Potential for population to benefit: [The intervention has the capacity to correct the inadequate condition (amount, quality, moment and frequency of the supply)]

Thus far, it has been demonstrated that consuming iron, vitamin A, and zinc, carried out by MNP’s, at least 60 days every 180 days, the nutritional anemia of children can be prevented and corrected (i.e. the “proof of concept”).
Are the MNP’s expensive?

This is an important question, because it refers to one of the qualities of the MNP’s as vehicles to deliver micronutrients and allows their comparison with other alternative means.

<table>
<thead>
<tr>
<th>Item</th>
<th>MNP’s – 1 g</th>
<th>LNS’s – 20 g</th>
<th>Blended f. – 42 g</th>
<th>F. staple – 50 g</th>
</tr>
</thead>
<tbody>
<tr>
<td>13 micronutrients*</td>
<td>$0.0030</td>
<td>$0.0015</td>
<td>$0.0027</td>
<td>$0.0028**</td>
</tr>
<tr>
<td>+ Ca and Mg ***</td>
<td>-</td>
<td>$0.0034</td>
<td>$0.0050</td>
<td>-</td>
</tr>
<tr>
<td>Cost product</td>
<td><strong>$0.03-0.04</strong></td>
<td><strong>$0.10-0.14</strong></td>
<td><strong>$0.14</strong></td>
<td><strong>$0.025</strong></td>
</tr>
<tr>
<td>Energy (kcal)</td>
<td>4</td>
<td>118</td>
<td>180</td>
<td>180</td>
</tr>
<tr>
<td>Protein (g)</td>
<td>-</td>
<td>2.6</td>
<td>16.0</td>
<td>4.9</td>
</tr>
<tr>
<td>Ess. Fatty acids</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Distribution Cost</td>
<td>?</td>
<td><strong>$0.03-0.14</strong></td>
<td><strong>$0.10-0.20</strong></td>
<td><strong>$0.00</strong></td>
</tr>
</tbody>
</table>

* Cost in 2013 for the WHO formula of MNP to use in emergencies (i.e. 100% RDA/AI, exc. iron - 86%, zinc - 49%) for 1-3 years old children, and without considering cost of selenium and copper. In this case, about 50% of the cost is due to the addition of vitamin E, and vitamin C.
** Although vitamin C would be difficult to be added in most staple foods, and providing sufficient amounts of some micronutrients may be uncertain.
*** LNS and blended flours may also contain Phosphorus, Potassium, and vit. K, but their costs were not added here.

$0.03-0.04$ $0.10-0.14$ $0.14$ $0.025$
Thus: Combination of complementary strategies is needed.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Biofortification</th>
<th>Food Fortification</th>
<th>Supplementation</th>
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</thead>
<tbody>
<tr>
<td><strong>Principle</strong></td>
<td>Increase nutrient content through selection and breeding of basic vegetable crops</td>
<td>Incorporation of micronutrients to edible vehicles during the manufacturing process</td>
<td>Syrups/tablets/powders, of micronutrients consumed with/without foods (home-“fortification”)</td>
</tr>
<tr>
<td><strong>Impact</strong></td>
<td>Additional quantity and quality of the supplied micronutrients, and the conditions of ingestions (very little to do with the carrying vehicle)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PROGRAMMATIC EFFICIENCY (Sustainability)**

<table>
<thead>
<tr>
<th></th>
<th>Biofortification</th>
<th>Food Fortification</th>
<th>Supplementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feasible to produce</td>
<td>✓</td>
<td>✓✓</td>
<td>✓✓✓</td>
</tr>
<tr>
<td>Easy to deliver</td>
<td>✓✓✓</td>
<td>✓✓*</td>
<td>✓</td>
</tr>
<tr>
<td>Accessed by consumers</td>
<td>✓✓</td>
<td>✓✓✓*</td>
<td>✓</td>
</tr>
<tr>
<td>Practical to monitor</td>
<td>✓</td>
<td>✓✓*</td>
<td>✓✓✓</td>
</tr>
<tr>
<td>Viable total cost</td>
<td>✓✓</td>
<td>✓✓✓*</td>
<td>✓</td>
</tr>
</tbody>
</table>

* If centralized and reasonable-developed food industries are involved.
Why some programs have worked and others have not? From standards to utilization

**Program**
- Safe
- Efficient
- Permanent

**Design**
- National Policies

**Science and Assessment**

**Cost-Effectiveness**
- Biomarkers
- Clinical and functional signs

**Impact Evaluation**
- Access
- Acceptance
- Adherence

**Supervision**
- National production
- Importation

**Utilization**
- Community level

**Standards/Reg.**
- Inputs and materials
- Labeling, Distribution

Causes
Feasibility
(proof of concept)
EFFICACY

EFFECTIVITY