Enhancing Iron Bioaccessibility in an African Cereal-based Diet using a Food-based Approach: A Potential Sustainable Strategy to Alleviate Iron Deficiency in Africa

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Background

- **Iron deficiency** remains the most common micronutrient deficiency globally and contributes to about 50% of all anaemia cases among child-bearing women[1].
- Zinc deficiency is also common where iron deficiency is prevalent[2].
- These deficiencies are especially prevalent in African populations primarily due to monotonous cereal- and other starchy food-based diets high in mineral bioavailability inhibitors with minimal animal products which are rich in bioavailable iron and zinc[3].
- Many poor communities are also not reached with conventionally fortified foods[4].

Possible solutions: Enriching African maize porridge with

- locally available plant-foodstuffs rich in iron and zinc e.g. moringa leaves[4], an important crop in Africa, traditionally consumed with cereal-based foods[5].
- and foodstuffs rich in iron bioavailability enhancers (ascorbic and citric acid) such as baobab fruit[6], widely consumed across topical Africa[6].

Experimental Design

The potential percentage contribution of total bioaccessible iron of the porridges (100 g, dry basis) to the absolute requirement (AR-1.46 mg iron/day) for child-bearing women was calculated.

Results and Discussion

Table 1: Organic acid contents (mg/100 g; dry basis) of White maize, Baobab fruit powder and Moringa leaves.

<table>
<thead>
<tr>
<th>Plant food samples</th>
<th>Ascorbic acid</th>
<th>Citric acid</th>
<th>Malic acid</th>
</tr>
</thead>
<tbody>
<tr>
<td>White maize</td>
<td>Not detected</td>
<td>48±</td>
<td>75±</td>
</tr>
<tr>
<td>Baobab fruit</td>
<td>174±</td>
<td>4440±</td>
<td>637±</td>
</tr>
<tr>
<td>Moringa leaf</td>
<td>9±</td>
<td>2779±</td>
<td>780±</td>
</tr>
</tbody>
</table>

Conclusions

Bab fruit inclusion in starchy food staples like maize-porridge could be an additional and sustainable food-based strategy to improve the iron status of child-bearing women in Africa, especially in poor-resource communities. However, this food-based strategy may not be suitable for addressing zinc deficiency.

References