**CFS voluntary guidelines on food systems comments**

**Question 1 – does chapter 1 adequately reflect the current situation**

I do not believe that the current chapter 1 adequately reflects the critical nature of micronutrient malnutrition. Currently paragraphs 2, 3 and 4 each highlight undernutrition, micronutrient malnutrition and overweight/obesity. But the reality is that micronutrient malnutrition dwarfs the other two in terms of population numbers in that is co exists with both undernutrition and overweight/obesity and also in those with ‘normal weights’. The fact that it is hidden means it is often overlooked and its impacts are severe, especially for young children and women. So micronutrient malnutrition deserves a broader coverage than it currently receives given micronutrients are a critical component of a healthy diet. In fact children aged 6-24 months require more nutrients per pound of bodyweight than at any other time in their lives, and given their small stomachs, require high nutrient density diets.

It would be good to discuss the key micronutrient deficiencies and the impact that these deficiencies have.

2. Guiding Principles

While I agree with the principles listed I miss a reference to the critical role of agriculture in terms of raw material supply within the food system. While industrial fortification for micronutrients is clearly viable surely it is preferable and more sustainable for agriculture to supply a diversified raw material base in terms of nutrients. Given staple grains are a core part of a diversified food system growing more nutritious varieties of those crops is critical. This brings in the role of crop breeding – both genetic engineering/transgenic as well as conventional crop breeding – to increase the availability of biofortified crops, staple crops with higher levels of nutrients. These biofortified crops can reduce the need for industrial fortification or supplements.

In some countries transgenic varieties of crops such as maize are already available but the transgenic element, that not normally found in the crop, is usually with respect to pest/disease resistance. Surely where transgenic crops are acceptable then exploiting the technology to include higher levels of existing nutrient content or inclusion of a missing nutrient, such as vitamin A in Golden Rice, should be pursued.

However, in food systems where transgenic raw materials are precluded, conventional breeding, by CGIAR centers in conjunction with HarvestPlus, has already produced higher nutrient biofortified varieties of many crops by exploiting the natural variation in nutrient content between varieties of the same crop. The nutrient content can vary markedly among different varieties of the same crop. For example, aromatic rices normally have higher iron and zinc content than non aromatic varieties. By protecting biodiversity and genetic variation we preserve these nutrient variations as well leveraging our ability to breed more nutritious crop varieties than those traditionally grown with combined agronomic advantages.

Examples include higher zinc rice and wheat, higher Vitamin A maize, cassava, sweet potato, higher iron beans and pearl millet. These conventionally bred crops are not only biofortified but agronomically competitive – farmers don’t grow for nutritious traits they grow for productivity. These biofortified crops are already so successful that the leaders in breeding and policy development, from CIP and IFPRI, were awarded the World Food Prize. Relegating them to R and D (h) under production systems therefore seems inadequate.

But in summary, a guiding principle should be that the agricultural sector grows the most nutritious varieties of a crop available for the prevailing agronomic conditions, and the R and D pipeline focuses on increasing the availability of these crops. This requires a change in mindset for crop breeders, requiring examination of nutrient profiles when they are selecting crop varieties for preferred traits, such as drought tolerance, and to ensure that the new varieties have at least as high a level of key nutrients as the variety they are designed to replace but preferably more. This is critical going forward as evidence indicates that climate change may well reduce nutrient levels in some crops and agronomic conditions.

3. Policy Entry Points

It is disappointing that at the moment the only recognition of biofortified crops in the whole document, is under production systems section h). While further research and development on biofortified crops is important to both increase current nutrient levels and broaden the portfolio of crops, conventionally bred biofortified crops already available, are consumed by 40 million people, and are already part of food systems.

In Mozambique bakers replace part of the wheat flour when making bread and the resulting small bread buns have all the vitamin A a child under 5 requires daily. In Malawi Bakers Pride Bakeries as using orange flesh sweet potato puree in bread making to incorporate vitamin A in bread. In Rwanda high iron beans are available in supermarkets. In the Democratic Republic of the Congo a new World Bank supported programme with government will disseminate high iron beans, and vitamin A maize, cassava and sweet potato to 99,000 farmers in the next 5 years.

These crops also have significant advantages for women, g) in production systems. Many of them are primary crops for women, like beans, cassava and orange flesh sweet potato, and give women both productivity benefits and nutrition benefits. High iron beans in DRC require 2 hours less cooking time – critical in a context where women and girls spend many hours collecting firewood and are exposed to smoke while cooking. In Uganda women received orange flesh sweet potato vines through community nutrition meetings. Their production was so successful their husbands gave them additional land to cultivate without taking the profits.

Vitamin A maize offers a potential advantage to women given varieties higher in Vitamin appear to be less susceptible to fungal contamination and the development of aflatoxins. This is critical for women who often struggle to dry their crop adequately, increasing aflatoxin development which negatively impacts on child growth and at high levels can result in morbidity and mortality.

Finally, climate change i) is not just about decreased output but also potentially decreased nutrient levels in crops which are produced. This makes it a critical part of adaptation that we scale up the dissemination of biofortified crops in food systems to reduce the impact of nutrient losses. Additionally, climate change is likely to increase aflatoxin contamination in many maize areas where undernutrition is already prevalent. Combatting this with biofortified varieties higher in vitamin A is an important part of adaptation.