FoodAfrica, 5-9 May 2003, Cameroon.
Abstract accepted for Food, Nutrition and Health theme

The balance between safety and improvement of nutritional value for complementary foods in African countries

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Complementary foods (CF) for young children in Africa are usually composed of vegetable products like cereals and legumes, which are characterized by a low iron bio-availability. When Finger millet *(Eleusine coracana)* and kidney beans *(Phaseolus vulgaris)* are processed by soaking, germination and fermentation, in vitro solubility of iron as determined by HCL-Pepsin and pepsin-pancreatin methods significantly improves, especially after germination. Iron solubility in germinated millet, as determined by the pepsin-pancreatin method, increased 6.8 times with addition of vitamin C. Local processing techniques like germination and fermentation are therefore suitable candidates to improve the energy density and possibly also the bio-availability of iron in CF. The use of local processing should however be combined with suitable measures to guarantee the safety of complementary foods. Contamination of grains with pathogenic bacteria like *Bacillus cereus* and *Staphylococcus aureus,* can lead to multiplication of both species in kidney beans and of only *B. cereus* in finger millet during germination. Efforts should also be taken to evaluate the presence and exposure to mycotoxins (e.g. fumonisins) associated with the consumption of ingredients which are used in the formulation of CF for children in Africa. Children's exposure assessment on fumonisins intake was estimated, based on the finger millet, kidney beans and peanuts consumption data of various CFs obtained from twenty-four-hour dietary recalls. All the grains were found to have fumonisin concentrations ranging from 5 µg kg^{-1} to 440 µg kg^{-1}. Ninety nine percent of the children were below the suggested tolerable total dietary intake (tTDI) of 2µg kg body $weight^{-1}$ day^{-1}. The low fumonisin concentrations found in finger millet, kidney beans and peanuts suggest that the exposure to fumonisin among children consuming these ingredients is relatively low, and that these ingredients are less susceptible to *Fusarium* spp. attack as it has been found in corn.