# CAROTENOID RETENTION AT HarvestPlus

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Plant foods do not contain vitamin A in the form of retinol, instead they contain a precursor, provitamin A carotenoids, that can be converted into vitamin A in the body. HarvestPlus is biofortifying three food crops with provitamin A carotenoids: orange-fleshed sweet potato, maize and cassava. The purpose of this symposium is to present the scientific evidence on the provitamin A retention after storage, processing and cooking of provitamin A biofortified crops. Provitamin A carotenoid retention can vary greatly depending on the traditional cooking style of a particular country or region. Boiling orange-fleshed sweet potato for 20-30 minutes, the most common practice for cooking sweet potato in African countries, retained most (83-92%) of the β-carotene. Cassava retained on average 50% of the provitamin A after boiling, but only 30% when cassava was prepared as *gari*, which is the most popular form of cassava consumed in West Africa. Maize made into tortillas that had been nixtamilized, (a soaking process used in Central America to prepare maize dough) retained 64% of its original content, while 75% was retained when made into maize porridge prepared in laboratory conditions. The drying process decreased the provitamin A content in all three crops, but losses due to storage were greater, with some genotypes exceeding the 50% initially assumed by HarvestPlus. According to genotype, the provitamin A retention in maize after 4-month storage at room temperature ranged from 55% to 93% (unpublished data). Future research should be carried out to identify what factors in each crop are responsible for higher carotenoid retention. Lastly, general guidelines should be followed when performing retention studies and those should be specified in the publications. For example, calculation of retention corrected for weight changes during cooking, the processing and storage conditions (time, temperature) must be specified. Paired (equivalent raw and cooked) samples must also be used and the results should be analyzed statistically. Retention studies are currently underway for orange maize (in Zambia) and yellow cassava (in Nigeria) to evaluate their provitamin A retention under local conditions of processing, cooking and storage.