



Tropentag, October 5-7, 2011, Bonn

“Development on the margin”

Evaluation of Heat-sensitive Micronutrients in Fresh, Sun-dried and Solar-dried *Capsicum* Varieties Grown in Peru

MARCUS NAGLE¹, BIRGIT JANKOWSKY², KARLA PEÑA PINEDA³, LLERMÉ RIOS³, MATTHIAS JÄGER⁴, DONATUS NOHR², JOACHIM MÜLLER¹

¹University of Hohenheim, Department of Agricultural Engineering, Tropics and Subtropics Group, Germany

²University of Hohenheim, Institute of Biological Chemistry and Nutrition, Germany

³National Institute of Agricultural Innovation (INIA), Peru

⁴Bioversity International, Colombia

Abstract

The genus *Capsicum*, with its centre of origin in Central and South America, is an important ingredient in national cuisines. Most species are found to contain high contents of carotenoids such as β -carotene which can be metabolised in human body to vitamin A. Vitamin A deficiency is a global problem affecting millions of people, especially children and pregnant women. Additionally, *capsicum* is also rich in vitamin C and capsaicin which gives a pungent taste. Particularly in Peru, many small-scale farmers live from the cultivation of local *capsicum* varieties, which is sold both as fresh and dried material. This work aimed to evaluate the content of carotenoids and vitamin C of some local species of *capsicum* as well as the effect of drying via different methods under Peruvian winter conditions at the coast. The traditional procedure of open sun drying directly on the ground, suspected to cause considerable nutritional losses and decrease product quality, was evaluated against the use of advanced solar drying technology, namely the ‘Hohenheim’ tunnel dryer. Comparisons were made between fresh and dried materials using three local commercial varieties of different *Capsicum* species. Additionally, six local accessions of a gene bank were analysed. Analyses were carried out by conducting high performance liquid chromatography (HPLC) using methods adapted especially for this study. Furthermore, measurements of water activity, moisture content and surface colour before, during and after drying were obtained. In this study, the vitamin and carotenoid content of three local varieties and six accessions of a gene bank in Peru were identified. It was observed that drying in the traditional way was almost impossible under Peruvian winter conditions (coast) and resulted in microbiological degradation, whereas almost all solar dryer samples reached the aimed moisture content. Dried *capsicum* with higher carotenoid and vitamin content provides products of better nutritional and economic value, which will contribute to food security.

Keywords: Capsicum, carotenoids, high performance liquid chromatography, micronutrients, Peru, solar drying, vitamin C