

## P17 > EVALUATION OF ASCORBIC ACID CONTENT IN DIFFERENT PROGENIES OF CAMU-CAMU FROM BRAZILIAN GERMOPLASM BANK

### CORRESPONDING AUTHOR:

Rafaella MATTIETTO

Trav. Dr. Enéas Pinheiro s/n  
CEP 66095-100  
Belém – Pará  
Brazil.

EMAIL:  
rafaella@cpatu.embrapa.br

**MATTIETTO Rafaella**<sup>1</sup>, **CARVALHO Ana Vânia**<sup>1</sup>, **MATTA Virgínia**<sup>2</sup>, **RIBEIRO Sydney**<sup>1</sup>

1. Embrapa Amazônia Oriental, Belém – Pará, Brazil
2. Embrapa Agroindústria de Alimentos, Rio de Janeiro – RJ, Brazil

Camu-camu (*Myrciaria dubia*), a native species of Amazon, is the known fruit with the highest vitamin C potential and naturally occurs in Brazil. Even without official production data, camu-camu has conquered the external market with its pulp being used as food ingredients, medicines and cosmetics. Its high vitamin C content is its great appeal, as natural sources of vitamin C are demanded all over the world due its role in human metabolism. Researches have been done about *Myrciaria dubia* domestication through a genetic improvement program for cultivation in land areas. The camu-camu Germoplasm Bank (1°28'S e 48°29'W), from Embrapa Eastern Amazon, in Belém, Pará, keeps a plant collection totaling 15 populations of natural occurrence in Amazon and Pará states. The objective of this work was to evaluate the ascorbic acid content of camu-camu pulp in 13 progenies derived from those populations. Camu-camu pulp from fruits in mature degree of ripeness (intense red) was

obtained by conventional extraction method using a depulper with 0.6 mm sieve mesh. Ascorbic acid was determined using official titration method with oxalic acid as extractor solvent. Results showed significant variation (Tukey test at  $p \leq 0.05$ ) among the progenies, with values varying from 859.8 to 1790.5 mg/100g of ascorbic acid in mature camu-camu pulps. The obtained results permit to identify the progenies with higher nutritional potential and support the camu-camu genetic improvement program, which will contribute for the identification of superior genotypes, with good productivity and higher nutritional quality. The higher vitamin C content observed represents, in 100 grams, almost 40 times more than the Recommended Daily Allowances for healthy and normal adults, according to Brazilian legislation.

**Acknowledgments:** To PAVUC Project 15279.

## P18 > EFFECT OF INTAKE OF A FUNCTIONAL VEGETABLE SOUP ON SERUM CONCENTRATIONS OF CAROTENE AND FOLATE AND MARKERS OF OXIDATIVE STRESS IN HEALTHY MEN

### CORRESPONDING AUTHOR:

Francisca PÉREZ-LLAMAS

Physiology department,  
University of Murcia  
Espinardo Campus 30100  
Murcia  
Spain

EMAIL: frapella@um.es

**MARTÍNEZ-TOMÁS Rebeca**<sup>1</sup>, **LARQUÉ Elvira**<sup>1</sup>, **BURGOS María Isabel**<sup>2</sup>, **AVILÉS Francisco**<sup>2</sup>, **GONZÁLEZ Daniel**<sup>1</sup>, **SÁNCHEZ-CAMPILLO María**<sup>1</sup>, **GARCÍA Manuel**<sup>1</sup>, **WELLNER Anna**<sup>3</sup>, **BIALEK Lucy**<sup>4</sup>, **PARRA Soledad**<sup>2</sup>, **ALMINGER Marie**<sup>3</sup>, **PÉREZ-LLAMAS Francisca**<sup>1</sup>

1. Physiology department University of Murcia, Spain.
2. Hospital Virgen de la Arrixaca, Murcia, Spain.
3. Chalmers University of Technology, Göteborg, Sweden.
4. Unilever Discover R&D, Netherlands.

**Objective:** The aim was to determine whether 4 weeks consumption of an optimised vegetable soup has a beneficial effect on serum concentrations of  $\beta$ -carotene, lycopene and folate and on markers of oxidative stress.

**Methodology:** The subjects (n=14) consumed daily 300 ml of a tomato/carrot/broccoli soup, formulated and produced to obtain a product with enhanced bioavailability of micronutrients. Each serving of the soup provided: 3.9 mg  $\beta$ -carotene; 4 mg lycopene; 52  $\mu$ g of folate. Blood and urine samples were collected before the study (baseline samples), after 3 and 4 weeks consumption of the soups and after a 4-week wash out period, to follow the change in serum concentrations of  $\beta$ -carotene, lycopene, folate and homocysteine and other haematological parameters. Markers of oxidative stress (glutathione peroxidase, superoxide dismutase, isoprostanes, carbonyl groups and 8-OH-guanosine), were analysed to evaluate antioxidative properties of the soups.

**Results:** Compared with the baseline values, consumption of the soups

significantly increased the serum concentrations of  $\beta$ -carotene, lycopene and glutathione peroxidase enzyme ( $P < 0.001$ ) but did not significantly affect other biochemical parameters or markers of oxidative stress. After 3 weeks both  $\beta$ -carotene and lycopene concentrations were increased by 114%, after 4-week  $\beta$ -carotene and lycopene were enhanced by 141% and 132%, respectively. A four-week wash-out period significantly decreased serum concentrations of carotenoids and glutathione peroxidase ( $P < 0.001$ ). Serum concentrations of folate increased during the 4 weeks of soup consumption and decreased during the wash of period, but without significant differences compared with baseline values.

**Conclusions:** This limited study suggest that 4 weeks consumption of an optimised vegetable soup can significantly modulate carotene levels in the blood stream and may provide protection from in vivo oxidative damage. The results indicate that optimised fruit and vegetable products containing different phytochemicals can provide good dietary sources of bioavailable  $\beta$ -carotene and lycopene.

*The work described here has received funding from the European Community's Sixth Framework Programme under grant agreement FOOD-023115, Healthy Structuring.*