



# Brazilian underutilised species to promote dietary diversity, local food procurement, and biodiversity conservation: a food composition gap analysis

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## Abstract

**Background** Brazil is home to a large portion of the world's biodiversity, but, paradoxically, the country's agriculture and food security are very reliant on exotic or introduced crops or species. Native species are being neglected and forgotten with natural landscapes and traditional foods being replaced by monocultures of commodity crops and pasture for livestock, causing habitat and biodiversity loss. At the same time, Brazil faces dietary simplification and high levels of malnutrition. Much of the neglected native biodiversity is highly nutritious and exploring these food sources could help provide sustainable solutions to diversifying diets, tackling malnutrition problems, and promoting agricultural development through local food procurement, while also promoting biodiversity conservation and climate change adaptation and resilience. However, notable knowledge and evidence gaps still need to be addressed to better integrate biodiversity for enhancing food and nutrition security, including scientific data on the nutritional value and composition of native underutilised species. In Brazil, the Biodiversity for Food and Nutrition (BFN) project generated food composition data, developed recipes, and increased appreciation and awareness of the value of underutilised, nutrient-rich biodiversity through strategic research partnerships with universities and research institutes.

**Methods** For this food composition gap analysis of native Brazilian biodiversity, the BFN project established partnerships with universities and research institutes for the generation of food composition data (macronutrients, vitamins, and minerals) and the development of recipes for 70 native underutilised species of fruits and vegetables of economic potential. Food composition data was gathered by doing a literature review, using compilation methods developed by the Food and Agriculture Organization of the United Nations and the International Network for Food Data Systems. Food composition analysis is being done for data that was missing or incomplete. Data is being made available on a food composition and recipes database developed with the Information System on Brazilian Biodiversity.

**Findings** From May, 2014, to March, 2016, the nine partner universities in Brazil compiled existing food composition data for 59 of the 70 selected indigenous Brazilian fruit and vegetable species for which data were available. Food composition analysis is being done for missing or incomplete data (especially for vitamins, minerals, and dietary fibre) for all 70 species and will be finalised in 2018. Results thus far show that many of the studied species are high in vitamins, such as the high concentrations of vitamin A encountered in the pulp of peach palm (*Bactris gasipaes*; 317 µg retinol activity equivalent [RAE] per 100 g), tucumã (*Astrocaryum aculeatum*; 808 µg RAE per 100 g) and buriti (*Mauritia flexuosa*; 1204 µg RAE per 100 g). High vitamin C concentrations were found in the pulp of camu-camu (*Myrciaria dubia*; 1620 mg/100 g), guabiroba (*Campomanesia xanthocarpa*; 428 mg/100 g) and mangaba (*Hancornia speciosa*; 209 mg/100 g). Protein concentrations were high in seeds of chicha (*Sterculia striata*; 19 g/100 g), pequi (*Caryocar brasiliense*; 29 g/100 g) and baru (*Dipteryx alata*; 29 mg/100 g).

**Interpretation** The data is being used as an advocacy tool for promoting native species in public initiatives including policy incentives for improving their production and market chains. By working through regional partners, capacities were developed in different regions, directly engaging more than 100 students and professors. These groups act as multipliers, building additional human capacity and operating as opinion leaders and policy advisors, including the provision of research and technical backstopping for municipal managers, school managers, nutritionists, and cooks responsible for implementing the National School Feeding Programme, thus the partnership is likely to favour the inclusion of biodiversity in school meals.

**Funding** Global Environment Facility.

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### Contributors

DMdOB, CNSO, and LC contributed to the design, coordination of activities, and revision and validation of data produced by partner universities and research institutes in Brazil. TB and DH provided general guidance and contributed to the design and coordination of activities. RS was the national coordinator for developing and testing recipes as well as coordinating the implementation of activities at the Federal University of Goiás.

### Declaration of interests

We declare no competing interests.

Published Online  
May 28, 2018

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For the food composition and recipes database see <https://ferramentas.sibbr.gov.br/ficha/bin/view/FN/>