



Amazonian fruits availability in agro-alimentary primary chain in Pastaza, Ecuador

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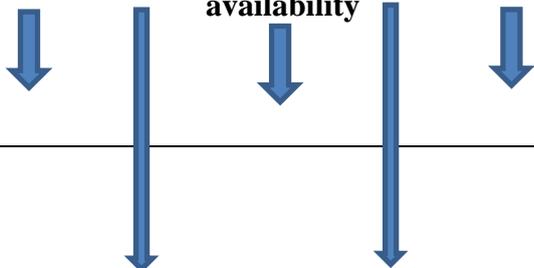
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Graphical Abstract

Puyo markets, Pastaza, ecuadorian Amazonia

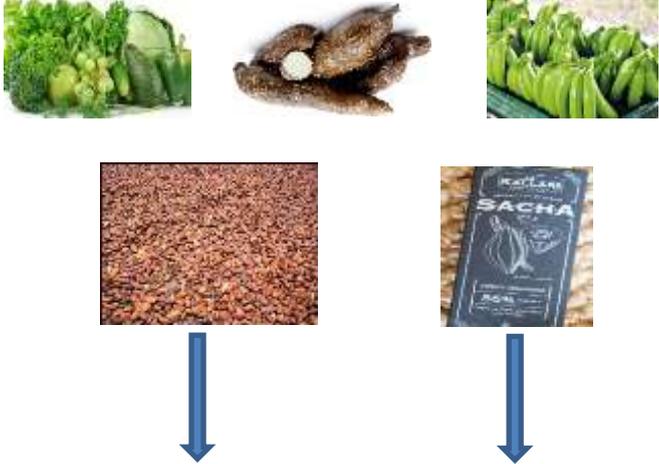


Amazonian food in markets of the Puyo, in low availability



Abstract.

In the present work the fruits availability that contribute to a healthy diet in the markets of the Puyo city, that affects the low production with added value are calculated. In the consulted literature, there are authors who identify the availability indicator for sale, as basic for agrifood chains competitiveness, as well as, the need of high nutritional value products for better health in consumers. Interviews were conducted to identify the ancestral knowledge about the fruits and plants use and their availability in inventories for the client, as well as on the presence of basic market elements, define the dimensions of competitiveness in customer, economic, technical, market, environmental, social and financial. A sample of nine markets in the city

 <p style="text-align: center;">LOW AVAILABILITY OF AMAZON FOODS, PUYO MARKETS, ECUADOR</p>	<p>of Puyo was made, the fundamental characteristic being that they are the largest markets of the city, although they cannot be classified according to the international classification. 140 products were studied in the Puyo city markets. The results showed the products availability per family, where the highest value with 0,37% is represented by banana and cassava, 0,12% vegetables, 0,14% fruits, 0,13% grains, 0,12% processed fruits and 0,12 % processed meat products. It is concluded that there is a lack of Amazonian products in the markets of the city of Puyo due to the low production of tangibles typical of the area.</p> <p>Keywords: Food availability, amazon, Ecuador, agrofood chains</p>
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1. Introduction

Amazonia is an important center of plant domestication (Meyer, Duval & Jensen, 2012). Its great biological and cultural diversity (Balée, 2013) make it an especially interesting area to study the role of human societies in plant domestication and diversification (Clement et al., 2010).

There are several articles that describe and illustrate the fruits of all woody plants occurring in the Amazonian forest (Van Roosmalen et al., 2000). It is estimated that at least 10,000 species of trees, shrubs, lianas, twiners and hemi-epiphytes occur in lowland Amazonia, five times as many as have been included in the Field Guide to the Fruits of the Guianan Flora. The cultivated plants efficiency in terms of yield production can be measured by means of the growth indexes, which indicate the plants efficiency for environmental factors at the site where they grow and the way the plants distribute their nutrients (Archila et al. 1998).

Globally, an estimated 1.02 billion people are undernourished (FAO, 2009). The literature on vulnerability, food security and ecosystem services has tended to emphasize cultivated foods (Ericksen et al., 2009). However, there is substantial evidence that wild foods are an important part of the global food basket. By other hands There is a growing evidence supporting the hypothesis that the Amazon is a mosaic of anthropogenic landscapes, managed and domesticated by indigenous pre-Columbian people in various degrees, rather than a pristine and untouched forest (Levis et al., 2012).

In this study the fruits availability that contribute to a healthy diet in the markets of the city of the Puyo, that affects the low products production with value added, are calculated.

2. Materials and methods

An interview was conducted to identify the ancestral knowledge of fruits and plants where names and surnames, province, region, fruit name, leaf, product derivative, name of remedy with the plants, plant origin and disease that heals were investigated.

The calculation of the product availability for sale is calculated as:

$$DPcs = (CPCcs / CPRcs) \bullet 100$$

Where:

DPcs: Product availability according to customer's order

CPCcs: Number of completed orders delivered to the customer

CPRcs: Number of orders made by the customer

Sample

A sampling from nine markets in the city of Puyo was made, the fundamental characteristic being that they are the largest markets of the city, although they cannot be classified in this way according to the

international classification. A range of 140 products were studied in each Puyo markets, representing a 37% in banana and cassava, 12% in vegetables, 14% I fruits, 13% in grains, 12% in processed products and 12 % processed meat products.

3. Results and discussion

The products availability per family is analyzed, the highest value of the indicator is the bananas (table 1). Vegetables, fruits, grains, processed products and meat products are presented in percentage values ranging from 0.12 to 0.14%.

Table 1: Products Availability per family

Product family	Availability (%)
banana and cassava	0.37
Vegetables	0.12
Fruits	0.14
Grain	0.13
Processed products	0.12
Meat products	0.12

The products availability per market is shown in figure 1. It is observed that banana and cassava with 0.40% represents the greatest presence. The remainders of the foods are the percentage range of 0.12 to 0.14%.

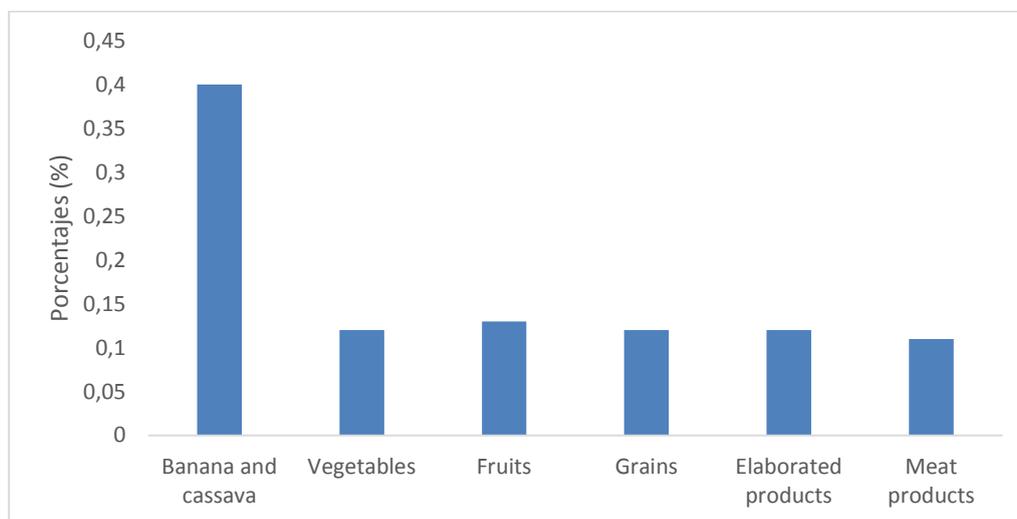


Figure 1. Products availability in the markets, Puyo (%).

Fruits and plants availability from Amazonian origin in the Puyo Markets is shown in table 2. The low existence of these foods in the shops of the Puyo is observed. In larger markets the food products availability of Amazonian origin is almost nothing.

Table 2. Amazonian fruits and plants availability in the Puyo shops.

Market	Availability
Market 1	0,01
Market 2	0,00
Market 3	0,01
Market 4	0,01
Super Market 1	0,00

Super Market 2	0,00
Super Market 3	0,00
Super Market 4	0,00
Super Market 5	0,03

The interviews show the role of the Amazon State University with research projects in the environment, agriculture and agroindustry thematic that allow the development of agricultural production in the Amazon that enable increases in the availability of primary food consumption and the agro industrial processes development.

The main production form in the Amazon region is the *chakra*, in which the majority of the agricultural products shown in this work are obtained. The "*chakra*" attracts attention because it is an element of the traditional multifaceted agriculture, understood as one that is not completely inserted in the models of agriculture industry (Azevedo, 2004). The Ecuadorian Amazon is occupied by ten groups indigenous peoples who use and transform the forest unique according to its own conceptions of the world. The subsistence activities are agriculture, harvesting, hunting and fishing; the economy of other groups has diversified with the commercialization of agricultural and forestry products, as well as paid employment (Gray et al., 2008).

Amazonian conditions, with a high fragility and need for environmental protection, require the cooperative work of producers and incipient marketers in order to increase the foods availability that allow an increase in agro industrial processes.

4. Conclusions

It is concluded that there are no Amazonian products in the markets of the Puyo city, which affects the low production of products in this society. This effect is due to the agricultural development that occurs in the Amazon. The Amazon Stated University could be changing this reality with research projects in the environment, agriculture and agroindustry thematic that allow the agricultural production development and agro industrial process.

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