

Traditional food consumption by indigenous women in Guasaganda, Central Ecuador

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Introduction:

Indigenous women in Ecuador are the poorest segment of the population and suffer from malnutrition.

- 37.4% of the indigenous population are poor (living with less than 84 USD/month)
- 13% of adult women with BMI \geq 25 have stunted children (H/A < -2SD)
- 36.5% of indigenous children are stunted (H/A < -2SD) and 24.6% are obese (BMI > 25)
- 8.5% of indigenous women with BMI \geq 25 are also anaemic (Hb < 12g/dL)

Source: ENSANUT 2014, INEC 2012

Objective:

Evaluate the consumption (in g) of Traditional Foods (TFs) by indigenous women in Guasaganda, Central Ecuador

Research question:

How are the traditional diets of indigenous women in Guasaganda composed? and do the latter meet healthy eating recommendations?

Results:

Food (bio)diversity

- 120 different TFs = locally produced, gathered or hunted
- 14 traditional medicinal plants = locally gathered
- 47 purchased foods = not locally produced, purchased in markets
- 33 processed/industrialized foods = processed by the industry

Traditional food intake

| Most-consumed TFs WDDS food groups | Scientific name + author | Repeated 24-hour recall (N=427) | | | FFQ (N=127) |
|--|--|---------------------------------|-------|--------|----------------|
| | | g / serving | Min | Median | Max |
| Starchy staple foods | | | | | |
| Plantain | <i>Musa x paradisiaca</i> L. | 5.8 | 87.5 | 451 | 2.5 times/week |
| Cassava | <i>Manihot esculenta</i> Crantz | 10 | 58.4 | 292 | 1 time/week |
| Maize | <i>Zea mays</i> L. | 0.2 | 33.6 | 455 | 1 time/month |
| Taro/papa china | <i>Colocasia esculenta</i> (L.) Schott | 10 | 38.2 | 251 | 1 time/month |
| Dairy | | | | | |
| Milk | | 0.3 | 183.1 | 467 | 3 times/week |
| Flesh foods | | | | | |
| Beef | <i>Bos taurus</i> | 4 | 32.3 | 255 | 1 time/week |
| Chicken | <i>Gallus gallus domesticus</i> | 8.5 | 36.9 | 330 | 1 time/week |
| Freshwater fish | Eight species merged | 15 | 41.6 | 506 | 1 time/week |
| Pork | <i>Sus domesticus</i> | 15 | 51.8 | 220 | 1 time/week |
| Eggs | | 0.5 | 49.4 | 83 | 2 times/week |
| Vitamin A-rich dark leafy vegetables | | | | | |
| Hierbita | <i>Coriandrum sativum</i> L. | 0.002 | 2.4 | 13 | 7 times/week |
| Culantro | <i>Eryngium foetidum</i> L. | 0.5 | 1.8 | 4.3 | 1 time/week |
| Other vitamin A-rich vegetables and fruits | | | | | |
| Banana | <i>Musa acuminata</i> Colla | 60 | 164.4 | 329 | 3 times/week |
| Papaya | <i>Carica papaya</i> L. | 57 | 182.9 | 200 | 1 time/week |
| Baby Banana | <i>Musa acuminata</i> Colla | 52 | 52 | 104 | 1 time/week |
| Pumpkin | <i>Gurania</i> spp. | 24 | 77.3 | 95.2 | 1 time/month |
| Other fruits | | | | | |
| Orange | <i>Citrus maxima</i> (Burm.) Merr. | 1 | 185.2 | 1500 | 4 times/week |
| Tree tomato | <i>Solanum betaceum</i> Cav. | 25 | 91.7 | 183 | 2 times/week |
| Mandarine | <i>Citrus reticulata</i> Blanco | 95 | 120 | 213 | 2 times/week |
| Other vegetables (no other traditional vegetables) | | | | | |
| Beans and peas | | | | | |
| Faba beans | <i>Vicia faba</i> L. | 2 | 17.5 | 72 | 1.5 times/week |
| Red beans | <i>Phaseolus vulgaris</i> L. | 6 | 60.3 | 121 | 1 time/month |
| Nuts and seeds | | | | | |
| Peanut | <i>Arachis hypogaea</i> L. | 5 | 10.9 | 55 | 2 times/month |



Food Variety Score

= 23

Women Dietary Diversity Score

(if > 5, diet is adequate for most of its nutrients)

= 7

* Kruskal-Wallis rank sum test as residuals showed no normal distribution and variances were not equal. When p < 0.05 Tukey method was used (familywise 5% level of significance), significant differences in means are indicated with different letters ** Wilcoxon rank-sum test (5% level of significance) as variances were not equal; n is the number of food records

Methodology:

Dietary survey

- random selection of participants (indigenous adult women)
- 18 villages in Guasaganda
- villages were identified by GPS coordinates
- N = 427 → 24-h recalls
- subsample 127 → Food Frequency Questionnaire
- portion size of food was measured using a standard cup, dish and spoon

Plant food inventory

- plants were collected for identification
- transect sampling in 1,137 m² of forest and 375 m² of agricultural land

Interviews on animal food consumption

- 18 groups interviews
- children, adolescents, adults and elders
- Female and male

Statistical analysis

- Sportfire S+ was used for summary statistics, t-test and ANOVA

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Source: ENSANUT 2014, UNICEF-Ecuador 2007 Juan Larrea

Mean consumption in g (SD) of TFs, purchased and processed foods

| Origin | Food group | Recommendations | Reference | TFs Mean (SD) | n | Purchased Mean (SD) | n | Processed Mean (SD) | n | p-value |
|--------|------------|-----------------------|------------------------------|----------------------------|-----|----------------------------|-----|--------------------------|-----|----------|
| Plant | Fruit | 200 g/day | Kromhout <i>et al.</i> 2016 | 187.8 (224.9) ^a | 315 | 132.9 (70.2) ^a | 64 | 21.3 (147) ^b | 3 | 0.6472* |
| | Vegetable | 200 g/day | Kromhout <i>et al.</i> 2016 | 16.6 (20.9) | 406 | 90.9 (50.4) | 425 | - | - | 0** |
| | Starch | 167 g/day | EFSA-NDA, 2010 | 106.5 (83.3) ^a | 298 | 368.8 (196.5) ^b | 419 | 46.3 (28.4) ^c | 198 | 0* |
| | Sweetener | - | | 12.7 (7.9) ^a | 132 | 2.8 (1.6) ^b | 4 | 16.3 (9.6) ^c | 365 | 0* |
| | Nuts | 15 g/day | Kromhout <i>et al.</i> 2016 | 17.1 (14.6) | 12 | - | - | - | - | - |
| | Legumes | Once per week | Kromhout <i>et al.</i> 2016 | 26 (18) | 177 | 48.3 (34.9) | 93 | - | - | 0** |
| Animal | Fish | Once per week | Kromhout <i>et al.</i> 2016 | 83.6 (105) ^a | 48 | 76.5 (61.1) ^a | 57 | 47.1 (46.4) ^b | 36 | 0.0169* |
| | Bushmeat | - | | 0.25 | 1 | - | - | - | - | - |
| | Chicken | 36.3 g/day of protein | EFSA-NDA, 2012 | 60.4 (57.5) | 155 | - | - | 2.8 (3.5) | 69 | 0** |
| | Eggs | - | | 40.9 (21.8) | 141 | - | - | - | - | - |
| | Red meat | 50 g/day | McMichael <i>et al.</i> 2007 | 78.7 (59.1) | 226 | - | - | 7.9 (11.4) | 106 | 0** |
| | Dairy | 3 portions/day | Kromhout <i>et al.</i> 2016 | 180.5 (172.3) | 210 | - | - | 34.1 (97.4) | 41 | 0** |
| Other | Drinks | 3 cups of tea/day | Kromhout <i>et al.</i> 2016 | 306.6 (133.1) | 177 | - | - | 326.1 (150.1) | 65 | 0** |
| | Oil | - | | 6.6 (2.9) | 3 | - | - | 20.6 (10.3) | 426 | 0.0097** |

Conclusions:

- The studied diet meets recommendations for prevention of diet-related chronic diseases when fruits, tea, local fish, locally produced beans and nuts are consumed. However, starch and animal protein are consumed in excess. The consumption of vegetables does not meet recommendations.
- The mean consumption of beef exceeds the adequate amount for a healthy diet (36.3 g/day). Subjects eating more than 50 g/day should reduce meat consumption to the latter maximum to prevent cancer and maintain low Greenhouse Gas Emissions (for human and environmental health).
- Malnutrition can be prevented by the consumption of traditional foods, but native people needs to have financial capacity to buy vegetables and starchy foods to meet recommendations. Plantain and banana (*Musa* spp.) are adequate local sources of energy and micronutrients.

References:

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