Universidad Industrial de Santander

CONSTRUIMOS FUTURO

CiE

Centro de Investigaciones Epidemiológicas

UNIVERSIDAD INDUSTRIAL DE SANTANDER

Capital city . Bogotá
Population: 44,205,293

Gross domestic product : $401,000,000,000 (USD)
Total area: 1,138,910 (sq km) 439,733 (sq mi)
Money: Colombian peso

Bucaramanga

COLOMBIA
MAPA POLITICO

---- Límites internacionales
---- Límites división política interna
⊛ Capital nacional
◉ Capitales departamentales
• Poblaciones mas importantes

Escala

Quality of diet and food security in Colombia

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Quality of diet: Results.

Descriptive

National Survey on Food and
Nutrition Situation (2005).
(ENSIN-2005).

(24 Hours Dietary Recall -R24H-)

32.667 subjects
2 R24H in 3.534(9%)

Analytical

Bucaramanga surveys. Colombia.

- (Methods considered gold
  standars: weighed records)

Trend (1998 -2003)
97 subjects
(7 weighed records in all)

2008-2009 (R24H)
1505 subjects;
(2 R24H in 90.2%)

Usual Intake. ENSIN-2005.

Energy:

Total; 1758 Kcal (CI 95%; 1750 to 1766).
Males; 2019 (CI 95%; 1496 to 1526).
Females; 2019 (CI 95%; 1496 to 1526)
            Deficit; 63,7%.   Excess; 16%

Protein:

Deficit; 36,0%.

Fat:

2.5% consumes over 35% of total caloric value (TCV) derived from fat.

25.8% consume over 10% of saturated fat.

81.6% consume less than 10% of TCV derived from monounsaturated fat.

Usual Intake. ENSIN-2005.

Carbohydrates:

40.5% consumed more than 65% of TCV
3.6% consumed less than 50% of TCV

Dietary fiber:

6.1% a low risk of deficiency

Anthropometry. ENSIN-2005

0 to 4 years of age: 3.1% above +2 Z score: Weight/Height (W/H)
5 to 9 years of age: 4,3% above+2 Z score (W/H)

10 to 17 years: 10,3% above 25: Body Mass Index (BMI)
18 to 64 years: 46% above 25 BMI, (13,7% above 30 BMI)

In Colombia epidemic of overweight exists.

Coexisting malnutrition and stunting.
(W/H: 0 to 4 years; 1%). (H/A: 0 to 4 years of age: 12%)
(BMI <18.5 in 18 to 64 years of age: 3.8%).

Consumed food items. ENSIN-2005.

1-Rice; 73.8%....189.4 gr (CI 95%; 188.7 to 190.7), 2-Vegetable oil,
3-Sugar, 4-Potato, 5-Cooffe, 6-Milk, 7-Plantains, 8-Red meat,
9- Panela, 10. Bread, 11-Tomato, 12-Eggs, 13-Onion (Bulb), 14-Carrot,
15-Chocolate, 16-Chicken, 17-Soda, 18-Onio (Comun), 19- Cheese,
20-Yucca, 21-Vegetable fat, 22-Arepa, 23-Pea……………

.….24- Pasta; 16.3% of the population consumes.
Portion: 105.5 gr (CI 95%; 103.4 to 107.6).

Bucaramanga surveys. Colombia.

Trend in Bucaramanga, 1998 / 2003. (20 to 60 years of age)

Weighed records; 97 Subjects, all socieconomic levels. 7 weighed records in each subject, 14 weighed records in 72% of subjects.

Determination of usual intake using PC-SIDE (IOWA-*Carriquiry et al*.)

Herrán OF, Prada GE, Ardila Lizarazo MF. **Ingesta usual de macronutrientes y energía en Bucaramanga, Colombia: Análisis de registros de consumo 1998-2003**. *Revista Chilena de Nutrición. 2007;34(4):307-19.*

Herrán OF, Prada GE, Quintero DC. **Ingesta usual de vitaminas y minerales en Bucaramanga, Colombia**. *Revista Chilena de Nutrición. 2007;34(1):35-44.*

Herrán OF, Bautista L. **Calidad de la dieta de la población adulta en Bucaramanga y su patrón alimentario**. *Colombia Médica. 2005;36(2):94-102.*

Average frequency of consumption *. Serving per day and food group according to sex. Mean and confidence interval 95%. Adult population of Bucaramanga, Colombia,1998.

Food group	Recomemdation	Males (IC:95%) [n=52]	Females (IC:95%) [n=45]	p
Cereals, roots, tubers	2.5 - 10	4.9 (4.5, 5.3)	4.7 (4.4, 5.0)	0.002
Vegetables, green beans	1 – 2	1.6 (1.3, 1.8)	1.3 (1.2, 1.5)	0.002
Fruit	3 - 4	2.2 (1.8, 2.5)	2.2 (2.1, 2.4)	0.393
Meat, eggs, Legumes	1.5 – 2	2.7 (2.5, 2.9)	2.2 (2.0, 2.3)	0.000
Milk and derived	2 – 2.5	2.0 (1.5, 2.5)	1.9 (1.7, 2.1)	0.322
Fat	4 – 8.5	1.2 (0.8, 1.6)	1.1 (0.9, 1.2)	0.220
Sugar and sweets	2.5 - 5	3.1 (2.4, 3.7)	2.8 (2.2, 3.4)	0.042
Alcoholic beverages		1.9 (1.4, 2.3)	1.4 (0.9, 1.8)	0.121

* Based on weighed records, for seven days. † Dietary Guidelines for the Colombian population. ICBF, 2000.

Quality of diet in Bucaramanga, 1998-2003.

45.4% (CI 95; 44.1 to 46.5) of total energy/day, comes from cereals, roots, tubers and plantains.

5.9% (CI 95%; 5.2 a 6.7) of vegetables, green vetables and legumes.

11.1% (CI 95%; 10.4 a 11.9) at the expense of fruit.

25.8% (CI 95%; 24.6 a 26.9) of meat, eggs and dried leguminous.

10.5% (CI 95%; 9.9 a 11.1) come from milk and derived.

10.6% (CI 95%; 8.5 a 12.7) of fat.

12.1% (CI 95%; 11.5 a 12.8) derived from sugars and sweets.

18.3% (CI 95%; 13.8 a 22.9) of total energy/day, comes from alcoholic beverages.

Nutrient density per 1000 kcal consumed in the adult population by sex and year. Mean and confidence interval (CI, 95%). Bucaramanga. Colombia, 1998-2003.

Nutrient	Recomemdation	1998 †		2002 ‡		2003 **	
		H [n=52]	M [n=45]	H [n=33]	M [n=37]	H [n=28]	M [n=34]
Protein (g)	25 – 30	33.6 (31.9, 35.4)*	35.2 (32.8, 37.6)	32.2 (30.3, 34.1)	32.1 (30.3, 34.0)	33.9 (31.7, 36.1)	33.6 (32.0, 35.3)
Fat (g)	16 – 33	32.6 (31.1, 34.1)	33.8 (31.4, 36.3)	31.4 (29.6, 33.2)	31.7 (29.8, 33.6)	33.1 (30.7, 35.6)	32.3 (30.3, 34.2)
CHO (g)	140 – 190	142.3 (138, 147)	145.9 (142, 150)	145.8 (139, 153)	150.3 (145, 156)	141.5 (134, 149)	147.0 (141, 153)
Fiber (g)	8 – 20	4.2 (3.9, 4.6)	4.5 (4.1, 4.9)	4.7 (4.1, 5.1)	5.4 (4.7, 6.1)	4.6 (4.1, 5.0)	5.4 (4.8, 6.0)

H Male. M Female. * (CI; 95%). † *t test* between sex for all nutrients> 0.05. ‡ *t test* between sex for all nutrients> 0.05. ** *t test* between sex for all nutrients> 0.05 with the exception of fiber (p = 0.02). [n] Number of subjects.

Contribute percentage of proteins, total fats and carbohydrates to the total consumption of energy (kilocalories). Socioeconomic level, and year. Proportion and confidence interval (CI, 95%). Bucaramanga. Colombia, 1998-2003. .

Socioeconomic level	n	Protein [8 to 10 %]* [10 to 12 %]	Total Fat [25 to 30 %]	Carbohydrates [55 to 65 %]
		1998 †		
1 - 2	33	12.4 (11.8, 13.0)**	27.5 (26.3, 28.7)	60.1 (58.6, 61.6)
3 - 4	33	12.9 (12.3, 13.6)	28.3 (26.6, 30.0)	58.8 (56.9, 60.6)
5 - 6	31	15.4 (14.5, 16.4)	32.6 (31.0, 34.2)	51.9 (49.8, 54.1)
		2002 ‡		
1 - 2	21	12.7 (11.8, 13.7)	27.7 (25.6, 29.8)	59.6 (56.8, 62.4)
3 - 4	29	12.6 (11.9, 13.3)	28.3 (26.4, 30.2)	59.1 (56.6, 61.5)
5 - 6	20	13.2 (11.9, 14.5)	28.9 (26.4, 31.4)	57.9 (54.5, 61.3)
		2003 ‡		
1 - 2	18	12.6 (11.6, 13.6)	28.6 (26.2, 31.1)	58.8 (55.7, 61.9)
3 - 4	25	14.1 (13.2, 14.9)	30.0 (27.6, 32.3)	55.9 (52.9, 59.0)
5 - 6	19	13.3 (12.4, 14.3)	28.8 (26.4, 31.2)	57.9 (54.8, 60.9)

[ ] Reference Values. * 8 to 10% of the total energy if the protein is of high biological quality. 10 to 12% of the total energy if the animal protein is low. n Number of subjects. ** (CI, 95%). † Chi2 for trend in socioeconomic status for all macronutrients 0.00. ‡ Chi2 for socioeconomic trend in all the macronutrients> 0.05.

Intake (grams and percentage) by type of fat to total energy consumption (kcal). Adult population per year. Bucaramanga. Colombia, 1998-2003.

Nutrient	Range Day	Year			Chi2
		1998 [n=97]	2002 [n=62]	2003 [n=70]	
Total fat (g)	16 a 33	33.2 [31.8, 34.5] *	31.6 [30.3, 32.8]	32.7 [31.2, 34.2]	0.90
	15 a 30 %	29.4 (28.4, 30.6) †	28.3 (27.1, 29.4)	29.2 (27.9, 30.5)	0.94
MUFA (g) ‡		9.3 [8.9, 9.7]	9.4 [8.9, 9.9]	9.5 [9.0, 10.1]	0.54
		8.3 (7.9, 8.7)	8.4 (7.9, 8.9)	8.5 (8.0, 9.0)	0.48
PUFA (g) **		4.5 [4.0, 5.0]	4.4 [4.2, 4.6]	4.2 [3.9, 4.6]	0.86
	3 a 7 %	4.0 (3.6, 4.3)	3.9 (3.7, 4.2)	3.8 (3.5, 4.1)	0.91
SFA (g) |	< a 11	10.4 [9.9, 11.0]	10.1 (9.5, 10.6)	10.4 [9.9, 11.0]	0.61
	< a 10 %	9.3 (8.9, 9.7)	9.0 (8.5, 9.5)	9.3 (8.8, 9.8)	0.80
Cholesterol (mg)	< a 300	297 [261, 332]	347 [302, 389]	312 [274, 350]	0.35
PUFA / SFA		0.42 [0.40, 0.44]	0.45 [0.42, 0.47]	0.42 [0.39, 0.45]	0.90

* [ ] CI, 95% for the average grams or milligrams. † () CI, 95% for the percentage of contribution to total energy. **MUFA** monounsaturated fatty acids ‡. ** **PUFA** polyunsaturated fatty acids. | **SFA** saturated fatty acids.

Quality of diet in 2009

households surveyed (With children)

Total; 432 (270)

Bucaramanga; 99 (51)

Bogotá, D.C, 151 (101)

Sibate; 91 (60)

Tenjo; 91 (58)

Elegible Subjects; 1597
Subjects surveyed; 1505 (94,2%)

Total R24H; 2960, 1363 subjects
with two R24H (90.2%)

Nutrition Status

```
                        Sex
        BMI  |   Males        Females  |      Total
-----------+-------------------------------+----------
Underweigth|      150            154 |        304
           |    22.62          18.29 |      20.20
-----------+-------------------------------+----------
    Normal  |      284            341 |        625
           |    42.84          40.50 |      41.53
-----------+-------------------------------+----------
Overweigth |      165            231 |        396
           |    24.89          27.43 |      26.31
-----------+-------------------------------+----------
   Obesity  |       64            116 |        180
           |     9.65          13.78 |      11.96
-----------+-------------------------------+----------
     Total  |      663            842 |      1,505
           |   100.00         100.00 |     100.00
```

```
          ------------------------------------------------------
          |                    BMI Classification
Age Group |   Underweight   Normal   Overweight    Obesity
----------+-------------------------------------------------
       <1 |       23          2           1           7
Kilocal   |   970.3697    1337.605    1152.076    1252.099
Protein(%)|   8.666191    10.72576    9.560513    10.54596
Fat (%)   |   46.70572    34.82384    48.26173    37.29837
Chos(%)   |   44.62809    54.4504     42.17776    52.15568

    1 a 4 |       82         13           2           4
          |   1627.673    1671.662    1793.992    2335.177
          |   12.57194    12.2031     12.57454    7.911886
          |   28.94468    25.48546    29.41302    33.15245
          |   58.48338    62.31144    58.01244    58.93566

   5 a 17 |      185        159          15          16
          |   1986.735    2066.126    2192.474    1759.559
          |   11.77681    12.28267    13.21094    11.29229
          |   26.29343    28.12586    25.16891    28.17383
          |   61.92976    59.59146    61.62015    60.53388

  18 a 29 |        6        176          69          21
          |   1723.532    2251.214    2284.743    2100.461
          |   11.05565    12.93512    12.86018    14.25944
          |   27.52344    25.83044    27.22068    29.1831
          |   61.42091    61.23444    59.91914    56.55746

  30 a 59 |        3        227         226          94
          |   1955.762    2071.232    2184.117    1953.02
          |   11.86112    13.23043    13.13919    12.84116
          |   24.5009     25.45077    27.74862    24.95581
          |   63.63798    61.3188     59.1122     62.20303

      60+ |        5         48          83          38
          |   1615.692    1852.334    1842.542    1463.502    p=0.000
          |   15.53654    12.26664    13.93651    12.96323    p=0.000
          |   24.277      20.63428    24.61763    21.36235    p=0.002
          |   60.18646    67.09908    61.44586    65.67442    p=0.071
          ------------------------------------------------------
```

TCV (Carbohydrates) and BMI; (p =0.071)

```
----------------------------------------------------------
              |              BMI Classification
Age Group|   Underweight Normal  Overweight      Obesity
---------+------------------------------------------------
      <1 |          23         2          1            7
Kilocal  |    970.3697  1337.605   1152.076     1252.099
Chos (%) |    44.62809   54.4504   42.17776     52.15568

   1 a 4 |          82        13          2            4
         |    1627.673  1671.662   1793.992     2335.177
         |    58.48338  62.31144   58.01244     58.93566

  5 a 17 |         185       159         15           16
         |    1986.735  2066.126   2192.474     1759.559
         |    61.92976  59.59146   61.62015     60.53388

 18 a 29 |           6       176         69           21
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         |    61.42091  61.23444   59.91914     56.55746

 30 a 59 |           3       227        226           94
         |    1955.762  2071.232   2184.117      1953.02
         |    63.63798   61.3188    59.1122     62.20303

     60+ |           5        48         83           38
         |    1615.692  1852.334   1842.542     1463.502
         |    60.18646  67.09908   61.44586     65.67442
----------------------------------------------------------
```

(grimc==Normal is the base outcome): In population over 3 years of age.
Based on a Multinomial model; n=1417.

```
-------------------------------------------------------------
       grimc             RR*          P>|z|          [CI 95%]
-------------------------------------------------------------
                  Underweight (BMI <18.5)

Protein < 8%            1.65         0.127       0.86    3.16
Protein >12%            0.95         0.830       0.61    1.48
Fat <20%                1.10         0.778       0.55    2.21
Fat >30%                1.12         0.672       0.64    1.98
Cho <50%                0.82         0.541       0.43    1.54
Cho >65%                0.99         0.992       0.49    2.01
Females                 0.80         0.260       0.54    1.17
age/5 (years)           0.36         0.000       0.31    0.42
Socieconomic middle     1.23         0.300       0.82    1.84
Socieconomic upper      0.69         0.702       0.10    4.57
-------------------------------------------------------------
```

* Prevalence ratio (PR), equivalent to Relative Risk (RR).

(grimc==Normal is the base outcome): In population over 3 years of age.
Based on a Multinomial model; n=1417.

```
------------------------------------------------------------
     grimc              RR*        P>|z|        [CI 95%]
------------------------------------------------------------
            Overweight (BMI >25 a <30)

Protein < 8%            0.99       0.97      0.61    1.60
Protein >12%            1.14       0.42      0.82    1.59
Fat <20%                0.94       0.81      0.56    1.55
Fat >30%                1.10       0.65      0.72    1.66
Cho <50%                1.02       0.91      0.65    1.59
Cho >65%                0.83       0.51      0.49    1.41
Female                  1.23       0.13      0.93    1.61
Age/5 (years)           1.24       0.00      1.19    1.28
Socieconomic middle     0.77       0.08      0.58    1.03
Socieconomic upper      1.66       0.41      0.48    5.68
------------------------------------------------------------
```
 * Prevalence ratio (PR), equivalent to relative risk (RR).

(grimc==Normal is the base outcome): In population over 3 years of age. Based on a Multinomial model; n=1417.

```
------------------------------------------------------------
      grimc           RR*        P>|z|        [CI 95%]
------------------------------------------------------------
                  Obesity (BMI >=30)

Protein < 8%         1.12        0.70      0.60     2.08
Protein >12%         1.13        0.57      0.72     1.77
Fat <20%             1.97        0.05      0.97     4.01
Fat >30%             0.86        0.59      0.49     1.50
Cho <50%             0.99        0.97      0.53     1.83
Cho >65%             0.45        0.03      0.21     0.95
Female               1.50        0.02      1.04     2.17
Age/5 (year)         1.23        0.00      1.17     1.30
Socieconomic middle  0.87        0.49      0.60     1.27
Socieconomic upper   7.29        1.00      0               .
------------------------------------------------------------
```
* Prevalence ratio (PR), equivalent to relative risk (RR).

Food insecurity: Results.

National Survey on Food and
Nutrition Situation.
(ENSIN-2005).

Perception of food insecurity
by the head of household.

- 17740 households.

Bucaramanga, Bogotá, Tenjo,
Sibaté Colombia:

Calculated by the consumption of
energy and macronutrients.

- Subjects.
- Household.

- 432 households.
- 1505 subjects.

Food insecurity: Results.

ENSIN-2005.
Perception of head of household
¿In the last 30 days in the household lacks money to buy food?

40.8% of households.

   Mild: 26.1%
   Moderate: 11.2%
   Severe: 3.6%

Survey in 2009.
Energy consumption versus energy Recommendation (FAO-OMS-UNU, 2001).

56.9% of subjects.

59.3% of households.
87.6% of households (Adjust).

   Mild: 40.5%
   Moderate: 27.8%
   Severe: 19.2%

Consumption of pasta. Survey in 2009.

38.4% of subjects consumed pasta.

40.1% of household consume pasta

In homes where they consume pasta, contributes 9.0% of energy/day.
(CI 95%; 8.0 a 9.9)

By Socieconomic Status:
Level 1: 9.3% (CI 95%; 8.1 to 10.5)
Level 2: 6.4% (CI 95%; 4.2 to 8.5)
Level 3: 8.0%

Pasta consumption by socioeconomic status at household level.
[% total by level]

Level 1: 82.1%   [72.3]
Level 2: 15.7%   [18.2]
Level 3: 2.2%   [9.5]