NATIONAL FOOD ACCOUNTING AND
ESTIMATING DEMAND FOR FOOD IN TROPICAL AFRICA
TABLES AND CHARTS

By

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FOOD PRODUCTION PER CAPITA

DEVELOPED COUNTRIES

DEVELOPING COUNTRIES

The developing countries have gained only 0.4 percent per year. In none of the regions has the index reached 110, and Africa has shown a downturn since 1961.

Food production per capita has trended upward 3.5 percent per year in the developed countries. To each of the regions the index of food production per capita has reached or exceeded 110 at least 2 times in the 20 years.


USDA series for Africa per capita food production (Chart 1) based on:
1. Maize in South Africa
2. Wheat in Morocco and Tunisia
3. Cotton in Egypt, Sudan, and Tunisia
4. Cocoa in Ghana, Nigeria, and Ivory Coast
5. Coffee in a number of countries.
TABLE 1. NUMBER OF PEOPLE ESTIMATED BY THE FAO TO HAVE HAD AN INSUFFICIENT PROTEIN-ENERGY SUPPLY IN 1970, BY REGION*

<table>
<thead>
<tr>
<th>Region</th>
<th>Population (millions)</th>
<th>Percent below lower limit</th>
<th>Number below lower limit (millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developed</td>
<td>1074</td>
<td>3</td>
<td>28</td>
</tr>
<tr>
<td>Developing*</td>
<td>1751</td>
<td>25</td>
<td>434</td>
</tr>
<tr>
<td>Latin America</td>
<td>233</td>
<td>13</td>
<td>36</td>
</tr>
<tr>
<td>Far East*</td>
<td>1020</td>
<td>30</td>
<td>301</td>
</tr>
<tr>
<td>Near East</td>
<td>171</td>
<td>18</td>
<td>30</td>
</tr>
<tr>
<td>Africa</td>
<td>273</td>
<td>25</td>
<td>67</td>
</tr>
<tr>
<td>World*</td>
<td>2825</td>
<td>16</td>
<td>462</td>
</tr>
</tbody>
</table>

* excluding Asian centrally planned economies.


TABLE 2. FAO ESTIMATES OF AVERAGE ENERGY AND PROTEIN SUPPLY, 1961 AND 1969-71, BY REGION*

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(kcal per caput)</td>
<td>(kcal per caput)</td>
<td>(gms per caput)</td>
<td>(gms per caput)</td>
<td>(percent)</td>
<td>(percent)</td>
</tr>
<tr>
<td>Developed market economies</td>
<td>2950</td>
<td>3090</td>
<td>87.5</td>
<td>95.1</td>
<td>115</td>
<td>121</td>
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<tr>
<td>Western Europe</td>
<td>3020</td>
<td>3130</td>
<td>89.3</td>
<td>93.7</td>
<td>118</td>
<td>123</td>
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<tr>
<td>North America</td>
<td>3110</td>
<td>3220</td>
<td>92.3</td>
<td>106.2</td>
<td>118</td>
<td>126</td>
</tr>
<tr>
<td>Oceania</td>
<td>3210</td>
<td>3260</td>
<td>92.7</td>
<td>108.1</td>
<td>121</td>
<td>123</td>
</tr>
<tr>
<td>Other developed market economies</td>
<td>2420</td>
<td>2550</td>
<td>73.3</td>
<td>79.1</td>
<td>102</td>
<td>108</td>
</tr>
<tr>
<td>Eastern Europe and U.S.S.R.</td>
<td>2990</td>
<td>3260</td>
<td>85.8</td>
<td>99.3</td>
<td>116</td>
<td>127</td>
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<tr>
<td>TOTAL Developed Countries</td>
<td>2960</td>
<td>3150</td>
<td>87.0</td>
<td>96.4</td>
<td>116</td>
<td>123</td>
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<tr>
<td>Developing market economies</td>
<td>2130</td>
<td>2210</td>
<td>55.0</td>
<td>56.0</td>
<td>93</td>
<td>97</td>
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<tr>
<td>Africa</td>
<td>2120</td>
<td>2190</td>
<td>55.7</td>
<td>58.4</td>
<td>91</td>
<td>94</td>
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<tr>
<td>Far East</td>
<td>2050</td>
<td>2080</td>
<td>51.3</td>
<td>50.7</td>
<td>92</td>
<td>94</td>
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<tr>
<td>Latin America</td>
<td>2410</td>
<td>2530</td>
<td>63.7</td>
<td>65.0</td>
<td>100</td>
<td>105</td>
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<tr>
<td>Near East</td>
<td>2200</td>
<td>2500</td>
<td>62.3</td>
<td>69.3</td>
<td>89</td>
<td>102</td>
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<tr>
<td>Asian centrally planned economies</td>
<td>2020</td>
<td>2170</td>
<td>54.7</td>
<td>60.4</td>
<td>86</td>
<td>92</td>
</tr>
<tr>
<td>TOTAL Developing Countries</td>
<td>2100</td>
<td>2200</td>
<td>54.9</td>
<td>57.4</td>
<td>91</td>
<td>95</td>
</tr>
<tr>
<td>WORLD</td>
<td>2360</td>
<td>2460</td>
<td>65.2</td>
<td>69.0</td>
<td>100</td>
<td>104</td>
</tr>
</tbody>
</table>


The figures relate to protein and energy content of the food available at the retail level after allowance for the storage and marketing losses and waste.
NATIONAL FOOD ACCOUNTING

Objectives
To quantify present average situation: Food balance sheet
Breakdown by:
- Income: Household budget survey
- Locality: Nutrition survey
- Season of year:
- Place in family:
To quantify likely future situation: Road check-cum-marketing survey

Food Balance Sheet
Prod. + trade + stocks = seed + food + waste + nonfood + processing + human consump.

"Famine equation": \( \frac{\text{AHC}}{365 \times \text{population}} - 15\% \leq \) "requirements"

Limitations
1. Homogeneity assumption
2. Data availability

Conclusion: A useful tool, but handle with care. Compare with other evidence.

Household Budget Survey
Most useful data source (but remember purpose for which it was conducted)

Usual coverage:
1. 1 week - 1 month
2. Small number of households; extrapolation problems
3. Urban-rural breakdown
4. Ethnic breakdown
5. Varying income ranges; often difficult to relate to total population
6. Expenditures, not quantities for foodstuffs

Nutrition Surveys
1. Only source for individual food intake
2. Very expensive, very inefficient in use of manpower
3. Tiny samples or misleading results, "Hunger in America"

Road Check-cum-Marketing Surveys
1. Long time coverage—usually 12 months
2. Stop all or % of vehicles at convenient spot
3. Develop common load denominators
4. Variations: markets as to focus

Cost Comparison
FBS - one man, one country
Road check - Uganda: $10,000
HBS - Ceylon: 250 surveyors, 10,000 households
Nutrition survey - INCAP: $300,000; 34 men; 2,000 households
TABLE 3. FOOD BALANCE SHEET

Population: on (metric tons unless otherwise specified)

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Domestic Production</th>
<th>Change in Stocks</th>
<th>Foreign Trade</th>
<th>Gross Exports</th>
<th>Gross Imports</th>
<th>Gross Supplies</th>
<th>Ind. Food</th>
<th>Non-Food</th>
<th>Waste</th>
<th>Processing</th>
<th>Available for Human Consumption</th>
<th>Per Capita</th>
<th>Daily Availability</th>
<th>Protein</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
TABLE 4. Ceylon: Food balance sheet, average 1955-60*  
(Average population = 9,305,000)  

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Production</th>
<th>Gross exports</th>
<th>Gross imports</th>
<th>Available supply</th>
<th>Seed &amp; food†</th>
<th>Waste‡</th>
<th>Non-food manufacture</th>
<th>Gross food supply</th>
<th>Extraction rate</th>
<th>Net food supply</th>
<th>Per capita supply per day</th>
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<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Grams</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1000 metric tons</td>
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<tr>
<td>Rice</td>
<td>731.9</td>
<td>712.5</td>
<td>1,444.4</td>
<td>59.4</td>
<td>30.3</td>
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<td>1,254.7</td>
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<td>Wheat flour</td>
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<td>—</td>
<td>206.5</td>
<td>60.8</td>
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<td>7.0</td>
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<td>17.6</td>
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<td>17.1</td>
<td>9.0</td>
<td>13.4</td>
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<td>Sorghum</td>
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<td>0.8</td>
<td>9.0</td>
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<td>Total</td>
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<td>1,250.0</td>
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<td>Roots and tubers</td>
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<td>176.9</td>
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<td>Sweet potatoes</td>
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<td>3.8</td>
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<td>Potatoes</td>
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<td>—</td>
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<td>33.0</td>
<td>33.0</td>
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<td>9.6</td>
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<td>Total</td>
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<td></td>
<td>174.0</td>
<td>174.0</td>
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<td>74.0</td>
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<td>Sugar</td>
<td>—</td>
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<td>144.2</td>
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<td>Refined</td>
<td>—</td>
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<td>126.6</td>
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<td>Not refined</td>
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<td></td>
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<td>18.6</td>
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<td>6.0</td>
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<tr>
<td>Jaggery</td>
<td>—</td>
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<td>4.2</td>
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<td></td>
<td>4.2</td>
<td>4.2</td>
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<td>Total</td>
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<td>—</td>
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<td></td>
<td>190.0</td>
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<tr>
<td>Pulses</td>
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<td>—</td>
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<td>—</td>
<td></td>
<td>58.0</td>
<td>12.7</td>
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<td>Blackgram</td>
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<td>12.8</td>
<td>12.8</td>
<td></td>
<td>3.8</td>
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<tr>
<td>Grams</td>
<td>4.2</td>
<td>4.3</td>
<td>4.3</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
<td>4.3</td>
<td>4.3</td>
<td></td>
<td>1.4</td>
</tr>
<tr>
<td>Chick peas</td>
<td>—</td>
<td>4.9</td>
<td>4.9</td>
<td>—</td>
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<td>—</td>
<td></td>
<td>4.9</td>
<td>4.9</td>
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<td>1.8</td>
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<tr>
<td>Lentils</td>
<td>—</td>
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<td>16.5</td>
<td>—</td>
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<td></td>
<td>16.5</td>
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<tr>
<td>Other</td>
<td>2.5</td>
<td>5.8</td>
<td>8.3</td>
<td>0.15</td>
<td>—</td>
<td>—</td>
<td></td>
<td>8.1</td>
<td>8.1</td>
<td></td>
<td>2.3</td>
</tr>
<tr>
<td>Total</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
<td>58.0</td>
<td>12.7</td>
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</tr>
<tr>
<td>Vegetables</td>
<td>475.0</td>
<td>—</td>
<td>475.0</td>
<td>25.0</td>
<td>—</td>
<td>—</td>
<td></td>
<td>450.0</td>
<td>450.0</td>
<td></td>
<td>125.2</td>
</tr>
</tbody>
</table>

CHART 2. TYPICAL BUDGET SURVEY FINDINGS ON FOOD EXPENDITURE BEHAVIOR

GHANA, URBAN HOUSEHOLD BUDGET SURVEY SAMPLES, 1953 AND 1955:
PERCENTAGE OF TOTAL DOMESTIC EXPENDITURES SPENT ON FOOD, PER CAPITA MONTHLY FOOD OUTLAYS, AND HOUSING SIZE, BY EXPENDITURE CLASS


CHART 3. TYPICAL BUDGET SURVEY FINDINGS ON FOOD EXPENDITURE BEHAVIOR

GHANA, URBAN HOUSEHOLD BUDGET SURVEY SAMPLES, 1953 AND 1955: EXPENDITURES FOR SELECTED STARCHY STAPLES AS A PERCENTAGE OF TOTAL OUTLAYS FOR THESE ITEMS, BY EXPENDITURE CLASS *

ACCRA (453 households)

KUMASI (570 households)

SEKONDI-TAKORADI (386 households)

Expenditure class limits shown by vertical lines.

Maize products

Fresh manioc

Yams

Plantains

Fruits

Fresh meat, cheaper cuts

Smoked and dried fish

Fresh meat, dearer cuts

Shelfish

Cassava

Possums

Rice

Fish

Turnip

Fresh fish

Fresh meat, cheaper cuts

Smoked and dried fish

Fresh meat, dearer cuts

Shelfish


* See source note to Chart 5B.

a Kenkey and dough.

b Gari and kokonte.

c Kokonte.

CHART 4. FINDINGS OF NEW TYPE BUDGET SURVEY:
APPARENT PER CAPITA DAILY ENERGY AND PROTEIN AVAILABILITIES
IN SRI LANKA, 1969-70*

* Reproduced from T. T. Poleman, "World Food: A Perspective,"
Science, 9 May 1975, p. 516.
Chart 5. Ghana, Produce Movement Census, 1957/58: Annual Flow of Staple Foods Passing the Several Check Points


Movements of less than 400 metric tons not shown.


- Plantains
  - Annual volume delivered to Accra: 40,000 metric tons
  - 31 billion calories

- Maize
  - Annual volume delivered to Accra: 33,000 metric tons
  - 108 billion calories

- Fresh Manioc
  - Annual volume delivered to Accra: 35,000 metric tons
  - 24 billion calories

- Manioc Products
  - Annual volume delivered to Accra: 27,000 metric tons
  - 91 billion calories

*Based on unpublished returns from the 1957/58 Produce Movement Census.


CHART 8. KAMPALA MARKETS MONITORED DURING PRODUCE MOVEMENT CENSUS, 1967/68*


CHART 9. SUPPLY OF MATOKE, MAIZE FLOUR, SWEET POTATOES AND FRESH CASAVA IN NSABYIYI MARKET (IN CALORIES) MARCH TO SEPTEMBER 1967

Readings on
NATIONAL FOOD ACCOUNTING


THE FOOD BALANCE SHEET


THE CONSUMPTION SURVEY


13. FAO, Program of Food Consumption Surveys (Rome, 1964), (optional; on Mann 2-day reserve).


ROAD CHECK-CUM-MARKETING SURVEYS


OTHER TECHNIQUES


CONVERSION FACTORS (These are on Mann 2-day reserve; look at them to become familiar with this type of source.)


