AgPro Workshop

Hawai‘i’s Agricultural Landscape and Food Self-Sufficiency Metrics

by

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NREM & HDOA

Hale Tuahine at Magoon
September 25, 2013
### Overview of Hawaiʻi’s Agricultural Landscape

#### 2002 Ag Census
- No. of Farms: 5,400
- Acreage: 1.3 million acres
- Average size: 247 acres
- Median size: 5 acres
- Total cropland: 211,120 acres
- Harvested cropland: 109,461 acres
- Farm sales: $533.4 million
- Avg. Farm sales: $98,819

#### 2007 Ag Census
- No. of Farms: 7,500
- Acreage: 1.1 million acres
- Average size: 149 acres
- Median size: 5 acres
- Total cropland: 177,626 acres
- Harvested cropland: 103,120 acres
- Farm sales: $513.6 million
- Avg. Farm sales: $68,292

#### 2011 Farm sales: $719.5 million

Overview of Oahu’s Agricultural Landscape

2002 Ag Census
- No. of Farms: 794
- Acreage: 70,705 acres
- Average size: 89 acres
- Median size: 4 acres
- Total cropland: 29,103 acres
- Harvested cropland: 13,757 acres
- Farm sales: $179.3 million
- Avg. Farm sales: $225,845

2007 Ag Census
- No. of Farms: 967
- Acreage: 60,408 acres
- Average size: 62 acres
- Median size: 4 acres
- Total cropland: 18,896 acres
- Harvested cropland: 9,518 acres
- Farm sales: $126.6 million
- Avg. Farm sales: $130,897

Sources: Census of Agriculture, Hawaii State and County Data, 2002 & 2007
Market Value of Agricultural Products Sold

Average per Farm, 2002

- Statewide: $98,819
- Hawaii: $58,375
- Honolulu: $225,845
- Kauai: $74,080
- Maui: $151,289

Average per Farm, 2007

- Statewide: $68,292
- Hawaii: $43,564
- Honolulu: $130,897
- Kauai: $60,362
- Maui: $120,524

Sources: Census of Agriculture, Hawaii State and County Data, 2002 & 2007
More Statistics on Hawai‘i’s Agriculture

**Commercial Farms & Ag Sales**

- Very Large Commercial Farms ($1 million or more): 1% in Hawai‘i produces 61% of all sales;
- Large Commercial Farms ($250K - $999K): 2% in Hawai‘i produces 17% of all sales;
- Small Commercial Farms ($10K - $249K): 31% in Hawai‘i produces 20% of all sales;
- Non-Commercial Farms (<$10K): 66% produces 3% of all sales.

**Value of Hawai‘i Food Imports:**

- $3.1 billion annually

If we can replace imports by just 10% => free up $313 million or $94 million at farm-gate.

**Multiplier effects from farm-gate:**

- Additional $188 million in sales;
- Additional $7 million in earnings;
- Additional $6 million in taxes;
- Additional 2,300 jobs.

Not a trivial amount!

Adapted from Arita et al, *UH-CTAHR EI-21*, 2012

Adapted from Leung & Loke, *UH-CTAHR EI-16*, 2008
Hawai‘i’s food consumption and supply sources: Benchmark estimates and measurement issues

What proportion of food in Hawai‘i is imported/locally sourced?

- Rocky Mountain Institute (Hawai‘i County) – 85%/15%.
- Ken Meter (Consultant) – 90%/10%.
- Ulupono – Consumers spend 8% of their budget on local food.
- Office of State Planning – 85-90%.

- Objectives: (i) Map existing food supply flows and to determine the various levels of food consumption in Hawai‘i and (ii) suggest modified measures of food SSR and IDR in Hawai‘i.
- Challenges: (i) Definition of food; (ii) Classification; (iii) Standardization (weight, calorie, nutritional, $); and (iv) Methodology (SSR & IDR).

Hawai‘i’s Food Availability Data Construction Chart¹

Available Food Supply For Local Use

- Available Food Supply For Non-Local Use

- Total Food Supply Available in Local Market for Consumption

Local Production + Imports
(Continental U.S. & Foreign)

Exports
(Continental U.S. & Foreign)

¹Commercial food only; no backyard gardening included

FAO measure:

\[ SSR = \frac{P}{P + M - X} \times 100\% \]
Food Supply Source and Demand Destination, Hawai‘i 2010

Supply Source
(2,518 million pounds)
- Local: 81%
- Continental U.S.: 13%
- Foreign: 6%

Demand Destination
(2,518 million pounds)
- Local: 85%
- Continental U.S.: 14%
- Foreign: 1%

Excludes beverage products
Distribution of Local Production by Select Food Group, Hawai‘i 2010

- Fresh Fruits, 38.9%
- Fresh Vegetables, 26.0%
- Protein, 24.7%
- Fresh Milk, 7.6%
- Others, 2.7%
- Grains, 0.0%

Source: NASS, Hawai‘i Agricultural Statistics, 2011
## Hawai‘i Total and Per Capita Food Supply\(^1\), 2010

<table>
<thead>
<tr>
<th>Food Group</th>
<th>Local Production (million pounds)</th>
<th>Imports (million pounds)</th>
<th>Exports (million pounds)</th>
<th>Available Food</th>
<th>Per Capita(^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>U.S.</td>
<td>Foreign</td>
<td>U.S.</td>
<td>Foreign</td>
</tr>
<tr>
<td>Protein – Seafood</td>
<td>32</td>
<td>3</td>
<td>24</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Protein – Others</td>
<td>51</td>
<td>215</td>
<td>12</td>
<td>53</td>
<td>1</td>
</tr>
<tr>
<td>Vegetables – Fresh</td>
<td>87</td>
<td>185</td>
<td>6</td>
<td>5</td>
<td>–</td>
</tr>
<tr>
<td>Fruits – Fresh</td>
<td>130</td>
<td>128</td>
<td>5</td>
<td>44</td>
<td>4</td>
</tr>
<tr>
<td>Grain – Rice</td>
<td>–</td>
<td>104</td>
<td>7</td>
<td>20</td>
<td>–</td>
</tr>
<tr>
<td>Milk – Fresh</td>
<td>25</td>
<td>178</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Others</td>
<td>9</td>
<td>1,230</td>
<td>87</td>
<td>243</td>
<td>13</td>
</tr>
<tr>
<td><strong>Total(^3)</strong></td>
<td><strong>334</strong></td>
<td><strong>2,043</strong></td>
<td><strong>141</strong></td>
<td><strong>368</strong></td>
<td><strong>19</strong></td>
</tr>
</tbody>
</table>

Hawai‘i Food Self-Sufficiency Ratio, 2010

- Protein - Seafood: 58.7%
- Protein - Others: 22.7%
- Vegetables - Fresh: 31.9%
- Fruits - Fresh: 60.4%
- Grain - Rice: 0.0%
- Milk - Fresh: 12.4%
- Protein - Others: 0.9%
- Total: 15.7%
Hawai‘i Food Import Dependency Ratio, 2010

- Protein - Seafood: 48.7%
- Protein - Others: 101.3%
- Vegetables - Fresh: 69.9%
- Fruits - Fresh: 61.9%
- Grain - Rice: 122.5%
- Milk - Fresh: 87.6%
- Others: 123.1%
- Total: 102.5%
Food SSR & IDR Equations

\[ SSR = \frac{P}{P + M - X} \times 100\% \quad (Equation \ I) \]

\[ IDR = \frac{M}{P + M - X} \times 100\% \quad (Equation \ II) \]

\[ LR = \frac{P - X_p}{P + M - X_m - X_p} \times 100\% \quad (Equation \ III) \]

\[ MIDR = \frac{M - X_m}{P + M - X_m - X_p} \times 100\% \quad (Equation \ IV) \]
<table>
<thead>
<tr>
<th>Group</th>
<th>SSR</th>
<th>IDR</th>
<th>LR</th>
<th>MIDR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Protein – Seafood</td>
<td>58.7%</td>
<td>48.7%</td>
<td>51.3%</td>
<td>48.7%</td>
</tr>
<tr>
<td>2 Protein – Others</td>
<td>22.7%</td>
<td>101.3%</td>
<td>9.3%</td>
<td>90.7%</td>
</tr>
<tr>
<td>3 Vegetables – Fresh</td>
<td>31.9%</td>
<td>69.9%</td>
<td>30.1%</td>
<td>69.9%</td>
</tr>
<tr>
<td>4 Fruits – Fresh</td>
<td>60.4%</td>
<td>61.9%</td>
<td>38.1%</td>
<td>61.9%</td>
</tr>
<tr>
<td>5 Grain – Rice</td>
<td>0.0%</td>
<td>122.5%</td>
<td>0.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td>6 Milk – Fresh</td>
<td>12.4%</td>
<td>87.6%</td>
<td>12.4%</td>
<td>87.6%</td>
</tr>
<tr>
<td>7 Others</td>
<td>0.9%</td>
<td>123.1%</td>
<td>0.9%</td>
<td>99.1%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15.7%</strong></td>
<td><strong>102.5%</strong></td>
<td><strong>11.6%</strong></td>
<td><strong>88.4%</strong></td>
</tr>
</tbody>
</table>
Proportion of Hawai‘i Food Sourced Locally\textsuperscript{1}, 1934-36\textsuperscript{2}, 1980 and 2010

Notes: \textsuperscript{1}Sources: Warner HH (1937) Extension Bulletin 29. Agricultural Extension Service; Department of Agriculture, Hawai‘i (1982) State functional plan technical reference document; and Food Matrix, Hawai‘i (2010). \textsuperscript{2}Estimated normal averages for period from January 1, 1934 to October 31, 1936, except the fresh fruits and vegetables groups, normal averages which cover the period from January 1, 1936 to November 1, 1936.
Hawai‘i Food Sourced Locally, 2010

- Fresh Vegetables: 30.1%
- Fresh Fruits: 38.1%
- Protein: 9.3%
- Grains: 0%
- Milk: 12.4%

Credit: University of Hawai‘i at Manoa College of Tropical Agriculture and Human Resources
Mahalo for your Attention!

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