



College of Tropical Agriculture
and Human Resources
University of Hawai'i at Mānoa



Department of Agriculture
State of Hawaii

AgPro Workshop

Hawai'i's Agricultural Landscape and Food Self-Sufficiency Metrics

by

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Hale Tuahine at Magoon
September 25, 2013

Overview of Hawai'i'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

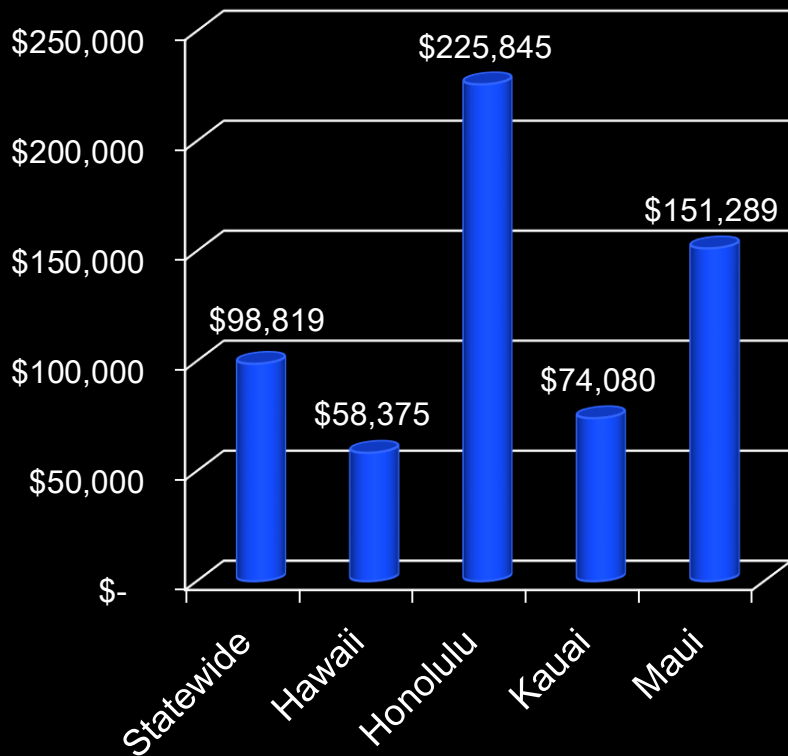
- No. of Farms: 794
- Acreage: 70,705 acres
- Average size: 89 acres
- Median size: 4 acres
- Total cropland: 29,103 acres
- Harvested cropland: 13,757 acres
- Farm sales: \$179.3 million
- Avg. Farm sales: \$225,845

2007 Ag Census

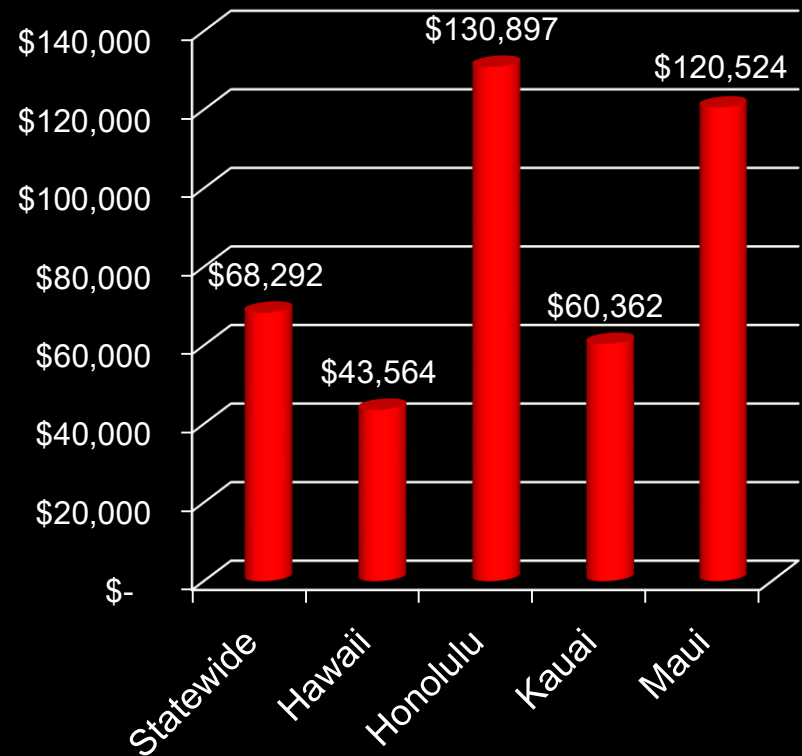
- No. of Farms: 967
- Acreage: 60,408 acres
- Average size: 62 acres
- Median size: 4 acres
- Total cropland: 18,896 acres
- Harvested cropland: 9,518 acres
- Farm sales: \$126.6 million
- Avg. Farm sales: \$130,897

Market Value of Agricultural Products Sold

Average per Farm, 2002



Average per Farm, 2007



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!

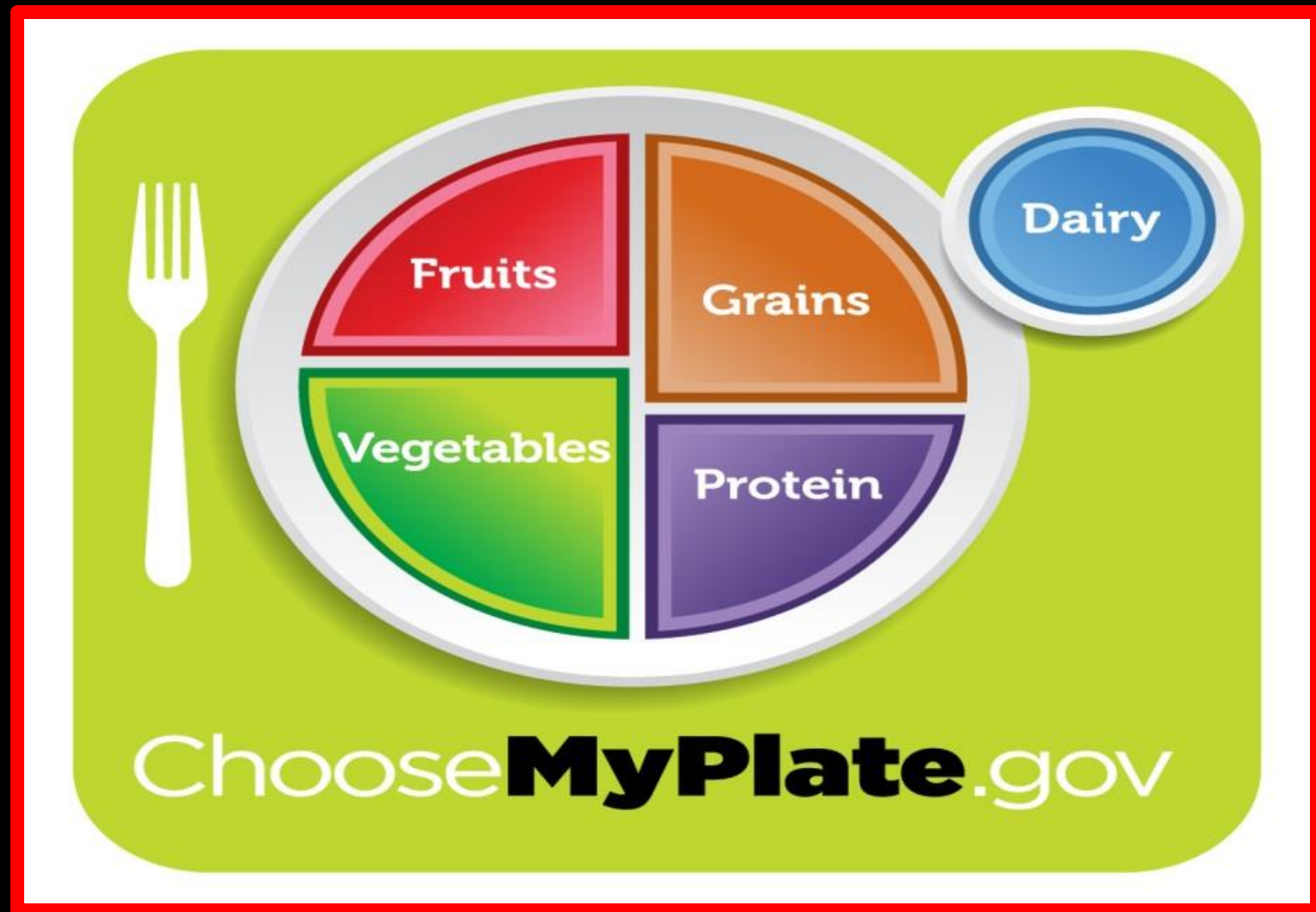
Hawai'i's food consumption and supply sources: Benchmark estimates and measurement issues

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).

Source: Loke, M.K. & P.S. Leung (2013). "Hawai'i's food consumption and supply sources: benchmark estimates and measurement issues." Agric. Food Econ. 1:10. DOI: 10.1186/2193-7532-1-10.

My Plate Illustration of Primary Food Groups



Source: USDA, 2011 (<http://www.choosemyplate.gov>)

Hawai'i's Food Availability Data Construction Chart¹

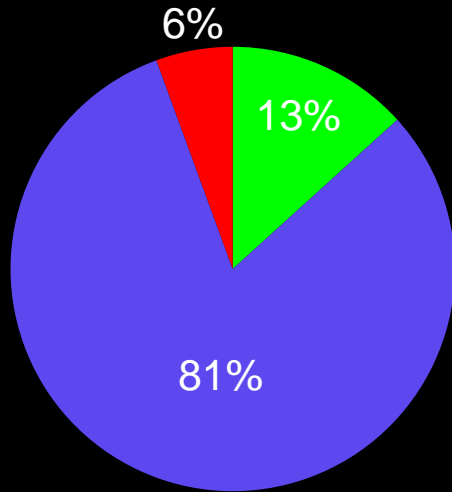


¹Commercial food only; no backyard gardening included

FAO measure:
$$SSR = \frac{P}{P + M - X} \cdot 100\%$$

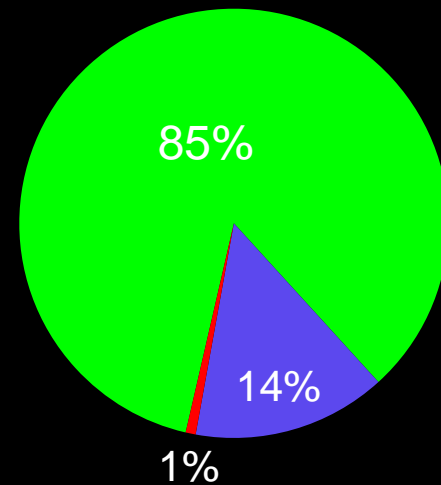
Food Supply Source and Demand Destination, Hawai'i 2010²

Supply Source
(2,518 million pounds)



■ Local ■ Continental U.S. ■ Foreign

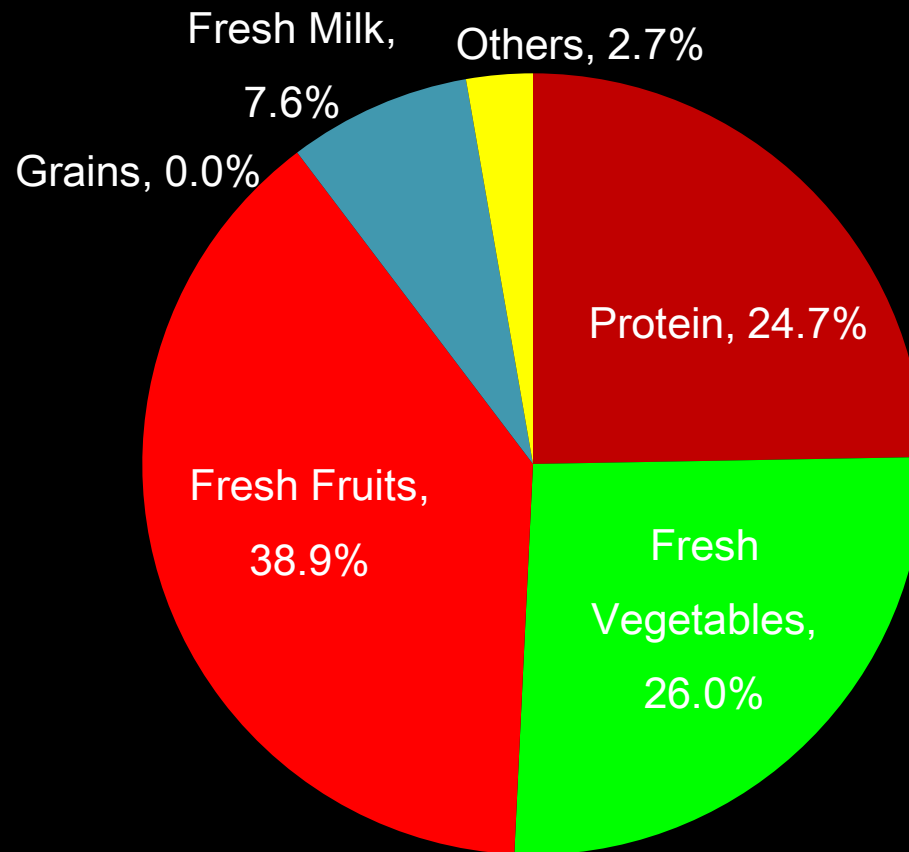
Demand Destination
(2,518 million pounds)



■ Local ■ Continental U.S. ■ Foreign

²Excludes beverage products

Distribution of Local Production by Select Food Group, Hawai'i 2010



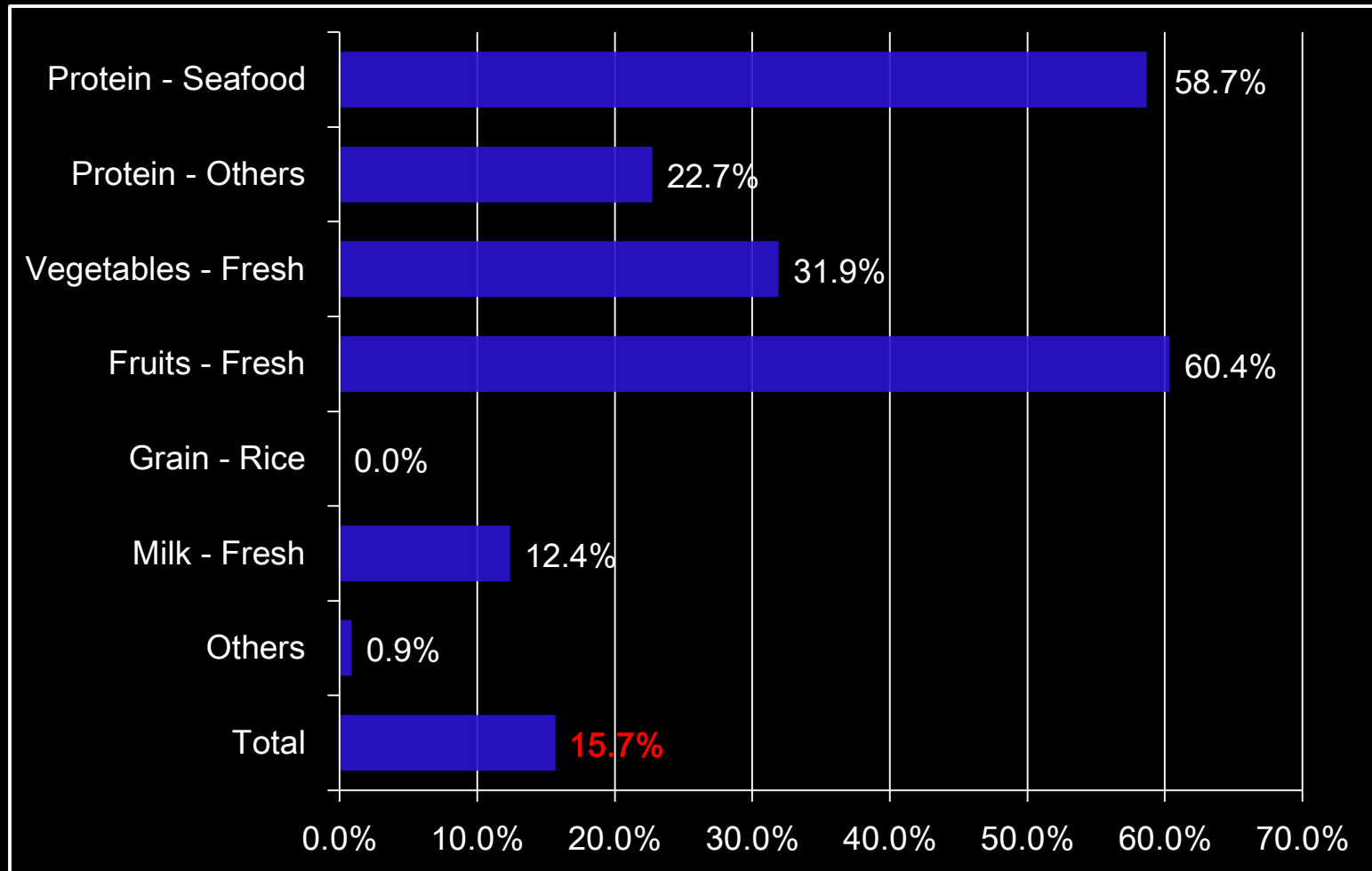
Source: NASS, Hawai'i Agricultural Statistics, 2011

Hawai'i Total and Per Capita Food Supply¹, 2010

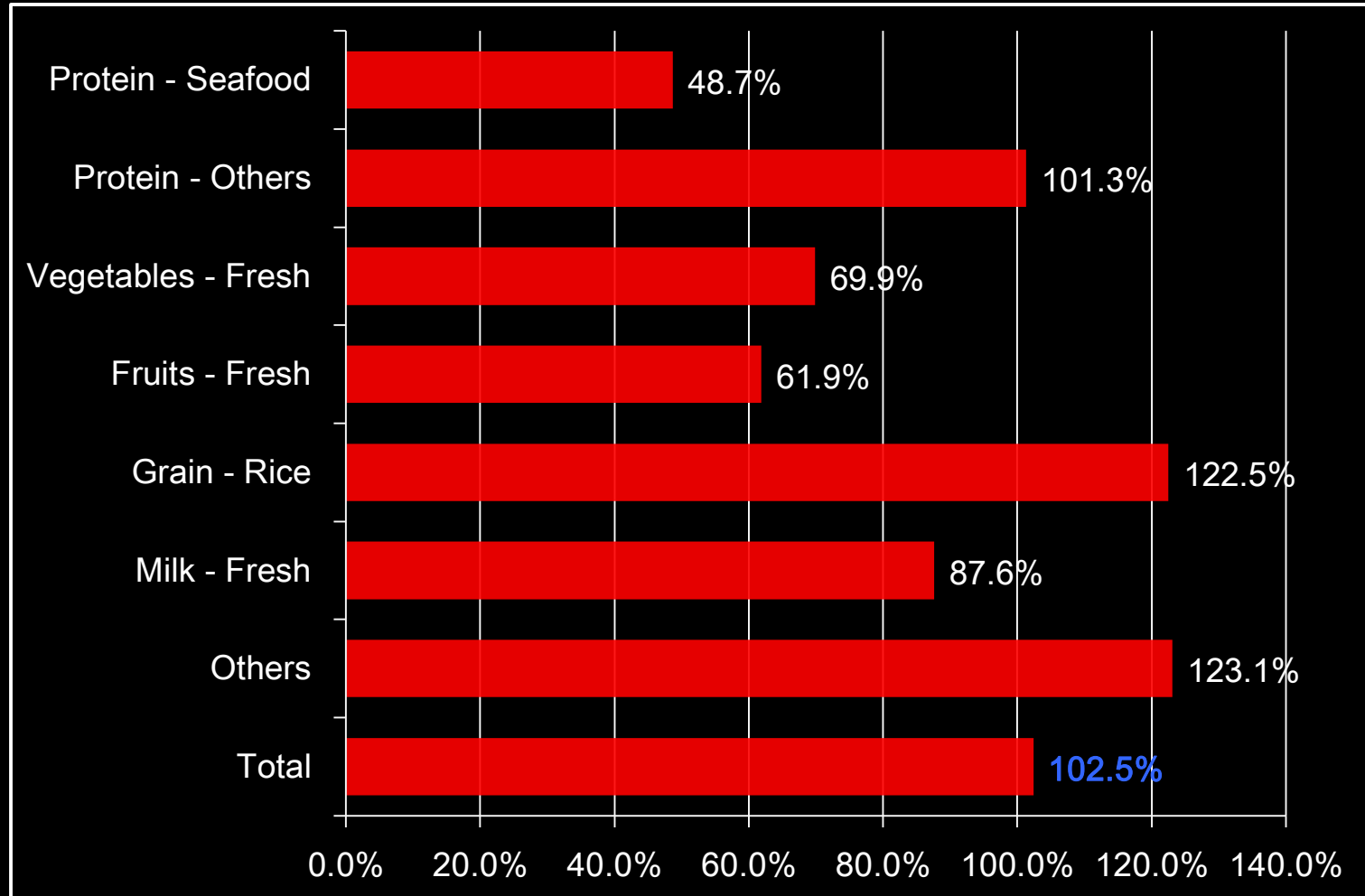
| Food Group | Local Production (million pounds) | + | Imports (million pounds) | | - | Exports (million pounds) | | = | Available Food | |
|--------------------------|--------------------------------------|---|-----------------------------|------------|---|-----------------------------|-----------|---|---------------------------|-------------------------------------|
| | | | U.S. | Foreign | | U.S. | Foreign | | Total (million pounds) | Per Capita ² (pounds) |
| Protein – Seafood | 32 | | 3 | 24 | | 3 | 1 | | 54 | 36.9 |
| Protein – Others | 51 | | 215 | 12 | | 53 | 1 | | 224 | 152.2 |
| Vegetables – Fresh | 87 | | 185 | 6 | | 5 | – | | 273 | 185.7 |
| Fruits – Fresh | 130 | | 128 | 5 | | 44 | 4 | | 216 | 149.2 |
| Grain – Rice | – | | 104 | 7 | | 20 | – | | 90 | 61.6 |
| Milk – Fresh | 25 | | 178 | – | | – | – | | 204 | 138.6 |
| Others | 9 | | 1,230 | 87 | | 243 | 13 | | 1,071 | 652.8 |
| | | | | | | | | | | |
| Total³ | 334 | | 2,043 | 141 | | 368 | 19 | | 2,131 | 1,450.4 |

Notes: ¹Primary sources: NASS (2012) Hawai'i statistics. U.S. Department of Agriculture, National Agricultural Statistics Service; ACE-WCSC (2012) Navigation data center – domestic U.S. waterborne traffic, part 4, 2010; U.S. Army Corps of Engineers, Waterborne Commerce Statistics Center; FAS (2012) Global agricultural trade system (GATS) U.S. Department of Agriculture, Foreign Agricultural Service. ²Based on de facto population of 1.47 million. ³Subject to rounding errors.

Hawai'i Food Self-Sufficiency Ratio, 2010



Hawai'i Food Import Dependency Ratio, 2010



Food SSR & IDR Equations

$$SSR = \frac{P}{P + M - X} \cdot 100\% \quad (\text{Equation I})$$

$$IDR = \frac{M}{P + M - X} \cdot 100\% \quad (\text{Equation II})$$

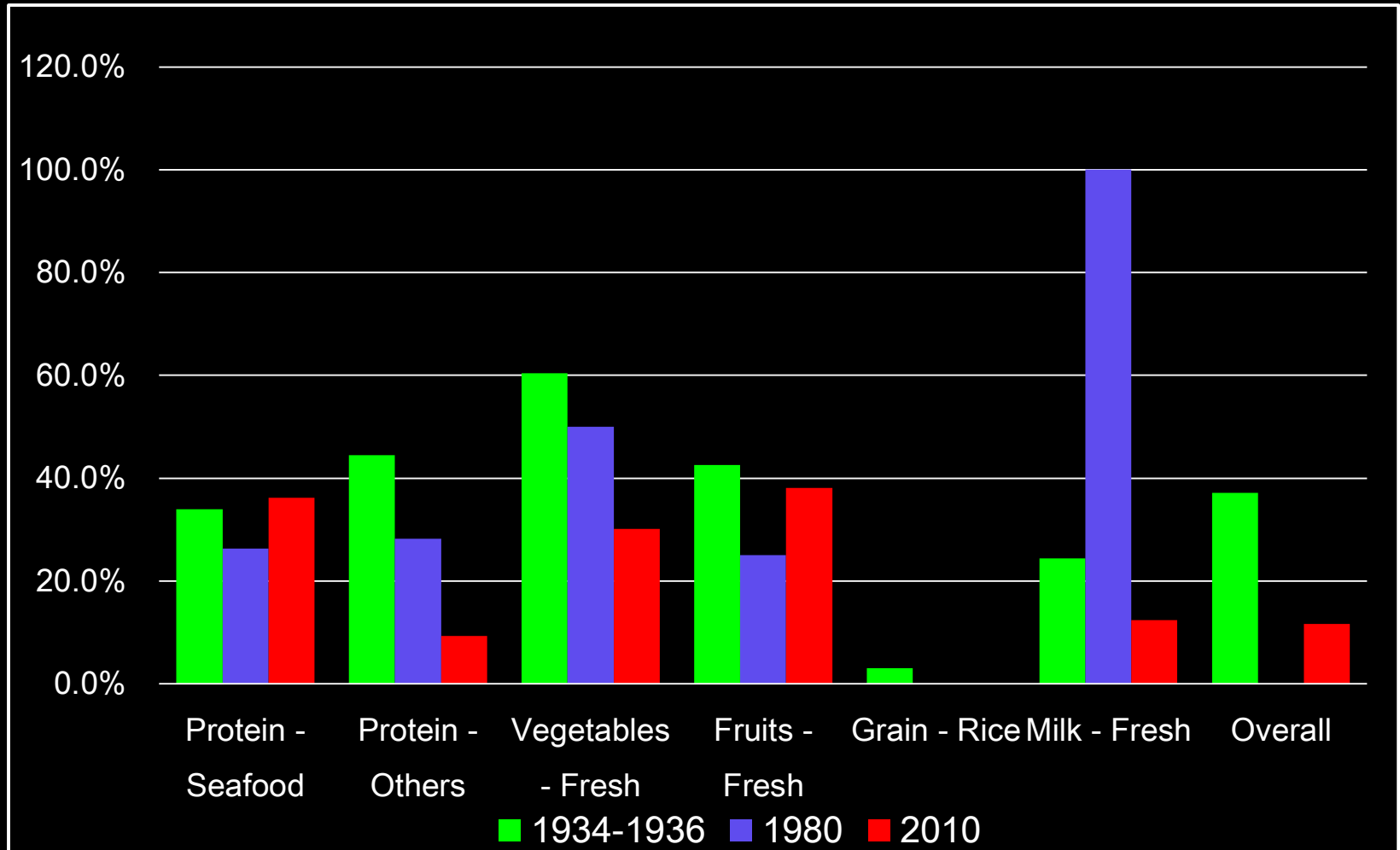
$$LR = \frac{P - X_p}{P + M - X_m - X_p} \cdot 100\% \quad (\text{Equation III})$$

$$MIDR = \frac{M - X_m}{P + M - X_m - X_p} \cdot 100\% \quad (\text{Equation IV})$$

Food Metrics: Select Food Measures for Hawai'i, 2010

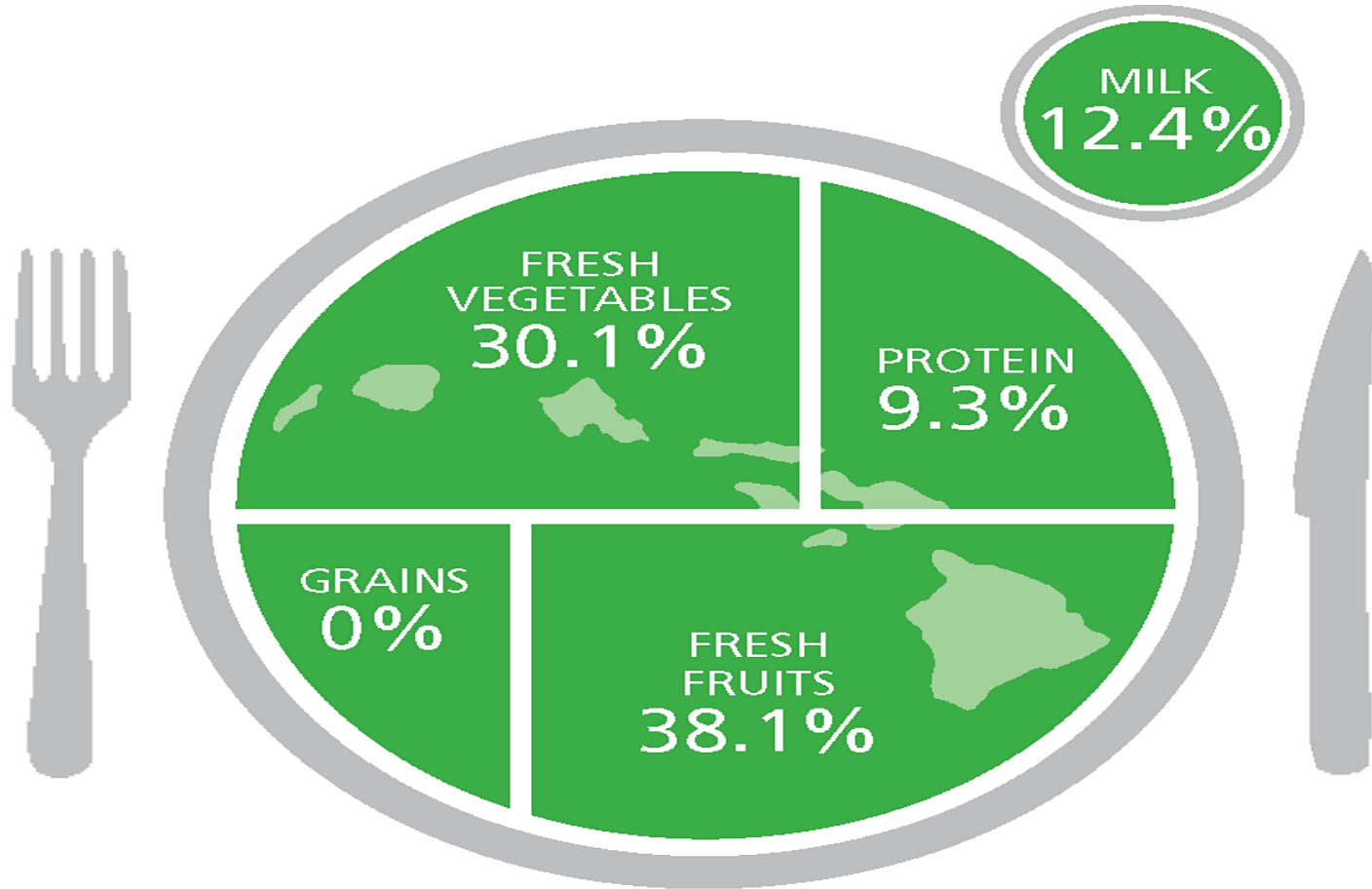
| | Group | SSR | IDR | LR | MIDR |
|---|--------------------|--------------|---------------|--------------|--------------|
| 1 | Protein – Seafood | 58.7% | 48.7% | 51.3% | 48.7% |
| 2 | Protein – Others | 22.7% | 101.3% | 9.3% | 90.7% |
| 3 | Vegetables – Fresh | 31.9% | 69.9% | 30.1% | 69.9% |
| 4 | Fruits – Fresh | 60.4% | 61.9% | 38.1% | 61.9% |
| 5 | Grain – Rice | 0.0% | 122.5% | 0.0% | 100.0% |
| 6 | Milk – Fresh | 12.4% | 87.6% | 12.4% | 87.6% |
| 7 | Others | 0.9% | 123.1% | 0.9% | 99.1% |
| | Total | 15.7% | 102.5% | 11.6% | 88.4% |

Proportion of Hawai'i Food Sourced Locally¹, 1934-36², 1980 and 2010



Notes: ¹Sources: 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). ²Estimated 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



Credit: University of Hawai'i at Mānoa College of Tropical Agriculture and Human Resources

Mahalo for your Attention!

Acknowledgements:

- Hawai'i Department of Agriculture.
- CTAHR-UHM, Research Supplemental Funds Program (Award No. [HAW01122-H](#)).
- USDA-ARS, Post-Harvest, Value Added Products and Processing Program (Award No. [58-5320-7-664](#)).
- Dr. J. Mak, Ms. F. Bain, and Mr. K. Keahiolalo.
- Industry contacts who shared information.