Charting a Path Toward Food Self-Sufficiency in Hawai‘i County

by

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ABSTRACT

Hawai‘i County, which contains 57% of the state’s farmland, has significant potential to increase local food production but remains heavily dependent on imports. While state-level estimates suggest that 85–90% of Hawai‘i’s food is imported, the absence of consistent, county-level data obscures the true measure of dependency. Since 2009, cuts to agricultural statistical programs have left substantial gaps in tracking local production and food flows, hindering the ability to monitor progress toward state goals of doubling local food production by 2030 and sourcing 50% of state institution food locally by 2050. This report reviews existing literature, data sources, and methodologies to identify tools for accurately measuring Hawai‘i County’s food self-sufficiency. Comparative analysis of three key frameworks by Leung & Loke (2013), Melrose & Delparte (2012), and ANCORS (2023) reveals the value of weight-based metrics and integrated datasets while also underscoring limitations such as inadequate geographic resolution and lack of origin-specific data. Production statistics from USDA NASS, import data from USA Trade Online, and port receipts from the Waterborne Commerce Statistics Center each provide valuable but incomplete perspectives on the county’s food supply. The findings point to the need for expanded county-level, weight-based production reporting, refined import tracking to distinguish between local, mainland, and foreign sources, and integrated, cross-verified datasets. Applying standardized, community-informed metrics, such as Leung & Loke’s modified formulas, would allow for more accurate assessments of self-sufficiency and progress over time. With these improvements, Hawai‘i County can more effectively target strategies to reduce import dependency, strengthen local agriculture, and build a resilient food system.

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INTRODUCTION

Hawai‘i has long faced the challenge of heavy reliance on imported food. A commonly cited estimate suggests that 85–90% of the food consumed in the islands is imported, yet this oft-repeated figure lacks a clearly documented or current source. Multiple estimates over the years illustrate this uncertainty: the Rocky Mountain Institute estimated Hawai‘i County’s food import share at 85% (Page et al., 2007); food systems analyst Ken Meter placed Hawai‘i’s import share at over 90% (Halweil, 2004); and the Ulupono Initiative (2011) reported that Hawai‘i consumers spend only 8% of their food dollars on locally grown food. A 2013 study using 2010 data introduced a modified import dependency ratio (MIDR) and localization ratio (LR), estimating that just 11.6% of food available for consumption in Hawai‘i was locally sourced, while 88.4% came from imports (Loke & Leung, 2013).

At the same time, the state has set ambitious goals: to double local food production by 2030 and to ensure that 50% of food served in state institutions is locally sourced by 2050. Yet efforts to track progress have been significantly hampered by limited and fragmented data. In 2009, the State of Hawai‘i laid off dozens of Department of Agriculture employees, including much of its research and statistics staff, as part of a broader round of budget cuts (Jung, 2021). Then in 2012, the USDA’s National Agricultural Statistics Service (NASS) consolidated 46 field offices into 12 regional offices, leading to the closure of Hawai‘i’s NASS office and reducing its staff from nine to two (Jung, 2021). These events drastically weakened both state and federal capacity to collect and report agricultural production and import data. Furthermore, there is currently no centralized system for measuring county-specific food flows.

The most recent county-level quantitative assessment is the *Hawai'i County Food Self-Sufficiency Baseline* (Melrose & Delparte, 2012), which estimated that the island produced 95% of its fresh milk, over 51% of seafood, over 34% of vegetables, more than 32% of fruit, 17% of fresh beef, and none of its grain. These estimates were based on the last available state-collected data before agricultural statistics collection was largely discontinued in 2009 due to budget cuts.

In addition to data limitations, systemic vulnerabilities place Hawai'i's food system at risk. The *2023 Food System Resilience Indicators for Hawai'i* report highlights that the majority of food imports enter through Honolulu Harbor. Distribution to the outer islands depends on just-in-time logistics, minimal storage infrastructure, and fragile lifelines susceptible to sea level rise, natural disasters, and port disruptions. While these risks have primarily been assessed at the state level, they pose even greater challenges for more remote and decentralized counties like Hawai'i Island, which depend on secondary ports and local supply networks.

This report focuses on Hawai'i County, which contains 57% of the state's total farmland acreage and arguably holds the greatest potential to increase local food production and self-sufficiency (USDA NASS, 2024). Historically, the island supported a more localized food system, shaped by subsistence practices, backyard gardening, plantation-era food production, and direct exchange within communities. But over the past century, Hawai'i became deeply embedded in global food systems, resulting in a sharp decline in local food self-reliance. Today, the island is dependent on refrigerated shipping, global agribusiness supply chains, and large-scale retailers offering imported foods at lower costs than most local producers can match. As a result, Hawai'i Island has

little documented food storage and is estimated to have just 7–21 days of available food at any given time (Melrose & Delparte, 2012).

This report asks: How can Hawai‘i County adopt or adapt existing frameworks to accurately assess food self-sufficiency? By examining existing knowledge, policy frameworks, and current data, the goal is to identify tools and strategies that can support Hawai‘i County in developing a coordinated, measurable approach to advancing local food self-reliance.

LITERATURE REVIEW

State and County Food Self-Sufficiency Goals and Metrics

The state's *Increased Food Security and Food Self-Sufficiency Strategy* (Office of Planning, 2012a) outlines objectives to improve agricultural infrastructure, support producers, and expand access to local foods. It recognizes the need to establish baseline data and measurable indicators for evaluating progress, a recurring theme across state planning documents.

A key contribution of this strategy is its emphasis on standardizing metrics for tracking food system resilience and self-sufficiency. Three core metrics are introduced:

- **Self-Sufficiency Ratio (SSR):** Measures the proportion of local demand that is met by local production. A higher SSR indicates stronger local production capacity.
- **Import Dependency Ratio (IDR):** Represents the proportion of local food consumption met by imports. A lower IDR suggests reduced dependency on external food sources.

- **Market Import Dependency Ratio (MIDR):** A measure that considers market-based consumption patterns and economic transactions, helping assess how much of local food demand is met through imports in retail and institutional channels.

These metrics offer a foundation for evaluating food self-sufficiency over time and underscore the need for accurate, timely data collection and coordination between agencies.

Volume II of the strategy (Office of Planning, 2012b) provides a detailed historical and technical reference on Hawai‘i’s agricultural systems. It discusses structural barriers to local production, such as land tenure, water access, and infrastructure gaps, offering context for understanding current limitations and opportunities.

The *Report on the Strategic Plan to Double Local Food Production and Exports by 2030* (Hawai‘i Department of Agriculture, 2020) builds on this framework by outlining targeted actions to increase local food production. It calls for annual reporting on key metrics (e.g., farm revenue, food import volumes, crop yields) and recommends the creation of a centralized statewide database to support long-term monitoring and accountability, while also encouraging counties to pilot and tailor data collection methodologies to their unique contexts.

At the county level, the *County of Hawai‘i General Plan 2045 Draft* (County of Hawai‘i, 2024) explicitly identifies food self-reliance and resilience as planning priorities. It supports the development of local markets, food aggregation infrastructure, and policies that reduce import dependency. However, it does not propose specific

methods for tracking food flows, further underscoring the need for operational guidance and data systems at the local level.

Although state-level policy provides a broad roadmap, implementation is often delegated to counties, which vary widely in their food systems and infrastructure. Hawai‘i County, home to the state’s largest landmass, accounts for 604,184 acres of land in farms, representing 57% of Hawai‘i’s total, according to the 2022 Census of Agriculture (USDA NASS, 2024). Yet, as highlighted in the *Food System Resilience Indicators for Hawai‘i* report (Ulupono Initiative & Hawai‘i Public Health Institute, 2023), there remains a lack of standardized indicators and county-level coordination to evaluate food resilience or track key metrics such as local food aggregation or consumption rates. Taken together, these documents highlight both the progress made in establishing food self-sufficiency goals and the gaps that remain in operationalizing them at the county level.

Current Limitations in Food System Data Collection

A key challenge across the literature is the fragmented nature of food system data. The *AgriFood Systems Report 2025: Building a Resilient, Equitable, and Healthy Food System in Hawai‘i* (HIAP, 2023) explicitly identifies the need for reliable, disaggregated, and timely data as a core barrier to effective planning. It stresses the importance of systems thinking and holistic supply chain mapping, providing a statewide framework that can guide Hawai‘i County in developing its own localized tracking model. The report supports the need for a county-level system that aligns with broader goals while remaining context-specific.

Historically, the Hawai‘i Department of Agriculture’s Agricultural Development Division, in collaboration with USDA NASS, published the *Statistics of Hawaii Agriculture* yearbooks from 1945 through 2011 (USDA NASS, n.d.). These comprehensive reports tracked crop acreage, yields, livestock inventories, farm counts, and, in some years, import volumes for key commodities. The series was discontinued after the 2011 edition. Civil Beat reporting attributes this to budget constraints and the impacts of federal sequestration, which led to cutbacks in USDA’s statistical programs, including those in Hawai‘i (Jung, 2021). With the loss of state-level statistical staff, consistent publication of this dataset ceased, leaving a critical gap in publicly available data on imported food quantities.

Additional staffing cuts during the late 2000s and early 2010s further limited the capacity of HDOA to maintain robust data collection. Civil Beat noted that “many of the regular reports and surveys were halted,” including monthly market reports on bananas, papayas, vegetables, and livestock that had historically provided farmers with valuable insights (Jung, 2021). Although HDOA’s Market Analysis and News Branch (MANB) continues to publish periodic reports on specific commodities such as bananas, coffee, and papayas, these are now limited in scope and frequency. The program persists in a scaled-back form, with a self-described “skeleton crew” managing what remains of the data collection effort (Jung, 2021). A 2021 Civil Beat investigation concluded that many of Hawai‘i’s agricultural data series are now outdated or discontinued.

Despite these challenges, the MANB has continued to provide valuable insights into Hawai‘i’s food import dependency. A 2019 HDOA report titled *Statistics on Imports of Select Vegetables* estimated the import share for five key vegetables by calculating the

ratio of imports to total consumption (imports plus local production). The methodology involved using USDA per capita consumption data, scaled to Hawai‘i’s population, to estimate total demand, and then subtracting local production figures (from USDA-NASS) to estimate import volumes. The analysis found that over 91% of the lettuce and oriental squash consumed in Hawai‘i were imported, as well as 84% of kale. Conversely, only about 12.6% of head cabbage was imported, suggesting a relatively strong local market for that crop. Eggplant showed an even split between imports and local supply. The report emphasized an inverse relationship between local production and import reliance, noting that “Hawai‘i traditionally relies more on imports when it produces less locally” (HDOA, 2019). While the estimates offer useful snapshots for identifying strategic opportunities for import replacement and localized food resilience, they rely on generalized national consumption patterns and do not account for differences in local dietary habits or data gaps in processed or multi-ingredient food imports.

The *Staple Food Commodities Value Chain Analysis* (HIAP, 2021) offers valuable insight into Hawai‘i’s heavy reliance on imported staple foods and the structural challenges that hinder local production and distribution. The report examines the value chains of 14 key commodities—including rice, wheat, and animal feed—finding that most are imported due to limited local processing infrastructure, land access, and economies of scale. It underscores the lack of comprehensive and consistent data across the food system, reinforcing the need for robust metrics and tracking systems to assess production capacity, market flows, and supply chain bottlenecks. This analysis supports the argument that without county-level data on local food flows, including import volumes and aggregation infrastructure, decision-makers are unable to target investments

or measure progress toward food self-sufficiency. The report's emphasis on cross-sector collaboration and systems-level mapping complements the need for a unified, localized data system in Hawai‘i County.

The *2020 Agricultural Baseline Update for All Hawaiian Islands* provides a valuable snapshot of current agricultural land use and crop acreage across the state, including county-specific data for Hawai‘i Island. While the report does not directly address food self-sufficiency, it offers critical context for understanding what is being grown and where. This baseline data can inform estimates of local production potential and identify priority areas for expansion.

Call for Standardized and Community-Informed Indicators

The report *Food System Resilience Indicators for Hawai‘i* (Mason, 2023) underscores the need for standardized indicators and community-informed metrics. They advocate for mixed-methods approaches—such as integrating producer surveys, community listening sessions, and production and distribution data—to produce a more holistic picture of local food systems. Importantly, they highlight the importance of embedding community voices in metric development to ensure relevance, transparency, and long-term accountability. However, despite these recommendations, there has been limited adoption of these tools at the county level, including in Hawai‘i County. As a result, counties remain under-equipped to measure local food resilience or to systematically track progress toward self-sufficiency goals.

The *Island of Hawai‘i Whole System Project Phase I Report* (2007) presents one of the earliest attempts to estimate food import dependency specific to Hawai‘i Island. While the report is a valuable historical reference, it explicitly acknowledges the

limitations of its estimates, which are derived from secondary data, assumptions, and anecdotal evidence rather than direct trade records. The authors sought to assess food system vulnerabilities, including dependency on imports, resilience of local food systems, and potential for increased food self-sufficiency. They highlighted issues such as centralized shipping through Honolulu Harbor, high dependency on off-island inputs for agriculture, and lack of system-wide metrics for measuring progress. The report provides a conceptual framework that emphasizes the interconnectedness of energy, water, food, and transportation systems, anticipating many of the food resilience concerns discussed in more recent research. It also underscores the longstanding need for county-specific trade data and comprehensive systems mapping—gaps that remain largely unaddressed nearly two decades later.

The *Michigan Good Food Charter* (Michigan State University Center for Regional Food Systems, 2010) provides a replicable policy model that incorporates measurable goals, baseline data, and continuous evaluation. While tailored to a different context, it demonstrates how a state or county can adopt a unified vision and implement shared metrics to monitor progress. Hawai‘i County could adapt this model by convening a multi-sector food policy council to guide data collection and dashboard development.

Ultimately, a successful tracking system for Hawai‘i County should be both technically sound and community-informed. Incorporating lessons from other regions while tailoring tracking systems to Hawai‘i Island’s unique communities and infrastructure may offer the best path forward.

Conclusion

This literature review reveals a clear gap in Hawai‘i County’s ability to accurately track local food aggregation and food imports, an essential foundation for meeting self-sufficiency goals. While there is a strong policy push at the state level to increase local food production and reduce dependency on imports, the mechanisms for measuring and reporting on progress remain underdeveloped. Across the reviewed sources, there is a consistent call for standardized metrics and centralized data systems that are community-informed. This review lays the foundation for the next phase of research: designing a roadmap for implementing such a system.

METHODOLOGY

This research examined previous studies and existing data sources used to assess food self-sufficiency in Hawai‘i, with a focus on their applicability to Hawai‘i County. The review followed a qualitative comparative method, systematically identifying, summarizing, and evaluating each methodology’s data sources, analytical framework, and key assumptions.

The process began with a literature search for peer-reviewed articles, government reports, and technical studies that quantified local food production and import dependency in Hawai‘i. Core references included *The Hawai‘i County Food Self-Sufficiency Baseline Study* (Melrose & Delparte, 2012), *Hawai‘i’s food consumption and supply sources: Benchmark estimates and measurement issues* (Leung & Loke, 2013), and related policy and planning documents. Current datasets from federal and state agencies were then reviewed, including the U.S. Census Bureau’s USA Trade Online

database for international trade data at the state and customs district level; the U.S. Army Corps of Engineers Waterborne Commerce Statistics Center for domestic and international cargo shipment data by port; and the USDA National Agricultural Statistics Service (NASS) Census of Agriculture and commodity-specific reports for vegetables, melons, tropical, and specialty crops. Additional sources included publications from the Hawai‘i Department of Agriculture.

Each methodology was assessed for geographic resolution, level of detail in commodity categorization, availability of weight-based production and import data, frequency and timeliness of data collection, and transparency in reporting. This evaluation allowed for the identification of strengths and limitations in the context of measuring Hawai‘i County’s food self-sufficiency. The analysis ultimately focused on determining the extent to which each data source could support accurate, localized assessments of production and imports, while identifying the most significant gaps, particularly the absence of county-level weight-based production and import data.

COMPARATIVE METHODOLOGICAL REVIEW

Introduction to Approach

To assess the applicability of various food self-sufficiency frameworks to Hawai‘i County, this comparative analysis begins with a review of Leung & Loke’s (2013) methodology for estimating local food consumption and production in Hawai‘i. Their work provides a foundational approach to quantifying self-sufficiency through market share analysis—an approach highly relevant to this report’s aim of tracking local food system performance and food imports.

Framework 1: Leung & Loke (2013)

Methodology Summary

Leung and Loke (2013) developed a methodology to evaluate the extent to which Hawai‘i relies on imports versus local production for food consumption. Their study focused on 11 fruit and vegetable commodities selected for their high potential for import substitution. Rather than using dollar value, calorie, or nutrient content, they measured food self-sufficiency by product weight (in kilograms), arguing that weight is a more neutral and consistent metric, especially given the nature of waterborne trade data and the wide variability in value and nutrient content across commodities.

To estimate total food consumption in Hawai‘i, the authors used per capita consumption, calculated by dividing total estimated food weight by the de facto population of Hawai‘i in 2010, which includes residents, tourists, military personnel, and their dependents. This total consumption figure was then broken down by origin—local production, imports, and exports—using data from three primary sources:

1. Local production data from the U.S. National Agricultural Statistics Service (NASS, 2012)
2. Interstate shipment data from the U.S. Army Corps of Engineers, Waterborne Commerce Statistics Center (ACE-WCSC, 2012)
3. Foreign import/export data from the U.S. Foreign Agricultural Service (FAS, 2012)

The initial framework employed widely recognized measures from the Food and Agricultural Organization (FAO): the Self-Sufficiency Ratio (SSR) and Import Dependency Ratio (IDR):

$$SSR = \frac{P}{P + M - X} \times 100\%$$

$$IDR = \frac{M}{P + M - X} \times 100\%$$

Where:

- P = local production
- M = food imports
- X = total exports

However, Leung and Loke found that these conventional indicators failed to account for re-exports (i.e., imported food that is subsequently exported) and exports of locally produced food. To address this, they refined the metrics with more precise measures:

- Xm = re-exports of imported food
- Xp = exports from local production

Using these variables, they proposed updated formulas:

$$SSR^{1} = \frac{P}{P + M - Xm - Xp} \times 100\%$$

$$IDR^{1} = \frac{M}{P + M - Xm - Xp} \times 100\%$$

Then, they defined two new terms—Localization Ratio (LR) and Modified Import Dependency Ratio (MIDR)—which better represent the proportion of food available for consumption that is either locally sourced or imported, respectively:

$$LR = \frac{P - Xp}{P + M - Xm - Xp} \times 100\%$$

$$MIDR = \frac{M - Xm}{P + M - Xm - Xp} \times 100\%$$

By definition, the sum of LR and MIDR equals 100%:

$$LR + MIDR = \frac{P - Xp + M - Xm}{P + M - Xm - Xp} \times 100\% = 100\%$$

The authors applied these formulas across major food groups and found that, when re-exports and local exports were accounted for, only 11.6% of food available for consumption in Hawai‘i in 2010 came from local production (LR), while 88.4% came from imports (MIDR).

Strengths

A key strength of Leung and Loke's (2013) framework is its use of weight-based metrics and methodological refinements to standard food self-sufficiency formulas. By standardizing measurements in product weight (kilograms), the authors align with how most shipping data is reported and avoid distortions caused by economic value or nutritional comparisons—which can vary significantly even within the same product category depending on factors like processing, preservation method, or production practices.

Their model integrates three robust federal data sources: local production (NASS), interstate shipments (ACE-WCSC), and international trade (GATS), each of which comes with specific strengths and limitations in assessing Hawai‘i's food self-sufficiency. The ACE-WCSC tracks the annual weight of waterborne cargo entering U.S. ports, categorized by commodities and origin, providing insights into inbound domestic and international shipments. Commodities are grouped hierarchically using 1-digit, 2-digit, and 4-digit codes, with distinctions between domestic and foreign in-shipments,

although no further detail on country or state of origin is provided (U.S. Army Corps of Engineers, n.d.). The Global Agricultural Trade System (GATS), in contrast, provides monthly import and export data that identifies country of origin for agricultural commodities, but does not specify which port or state receives them (USDA, Foreign Agricultural Service, n.d.). The data can be viewed by product groups using the Harmonized System (HS), an international classification system for traded goods maintained by the World Customs Organization. Codes are structured hierarchically: HS-2 (two-digit) codes identify broad sectors, HS-4 (four-digit) codes specify product groupings, HS-6 (six-digit) codes narrow to more precise goods, and U.S.-specific ten-digit codes under the Harmonized Tariff Schedule (HTS) and Schedule B provide the most granular detail (Figure 1; Gabriele, 2025). Still, these combined sources illustrate both strengths and data gaps in understanding food flows to Hawai‘i.

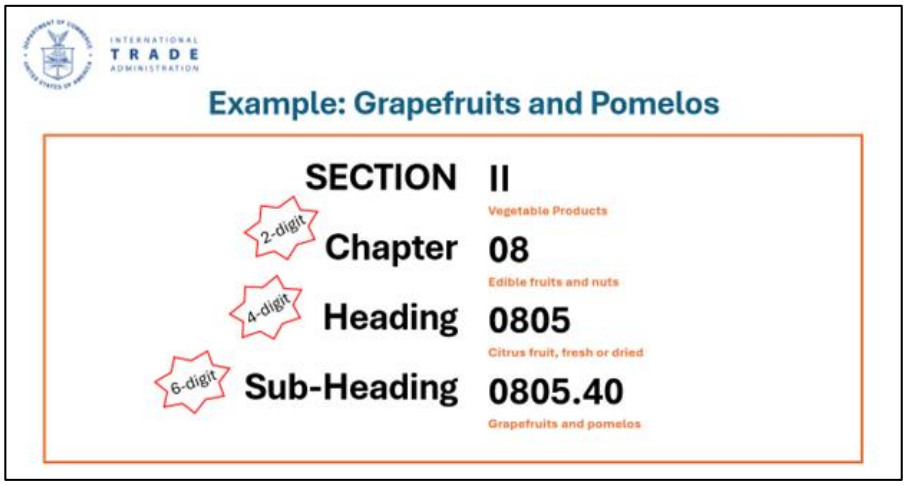

Figure 1: The Harmonized System (HS) nomenclature structure, showing sections, chapters, headings (commodity groups), and subheadings (product descriptions). Source: Gabriele (2025).

A particularly innovative feature of their methodology is the adjustment for distinguishing re-exports (Xm) and local exports (Xp), which improves the accuracy of self-sufficiency and import dependency estimates. Subtracting re-exports from total imports (M) ensures that goods not intended for local consumption do not artificially inflate Hawai‘i’s reliance on imports. Likewise, removing exports from local production figures ensures a more accurate representation of what remains for local consumption.

The use of publicly available federal datasets enhances the transparency and replicability of their analysis. The visual summary provided in their methodology (Figure 2) further strengthens the framework by clearly illustrating data sources and analytical steps, making their methodology accessible to policymakers and researchers interested in replicating or adapting the method.

Figure 2: Hawai‘i food availability data construction chart.
Source: Leung & Loke (2013).

Limitations

Despite its rigor, the framework has a few limitations. First, it is applied only at the state level, which means it does not capture county-specific nuances, limiting its direct applicability to analyses of food self-sufficiency in Hawai‘i County. Second, while NASS production data is relatively detailed, it is aggregated at the state level and may

underrepresent smallholder or diversified farms, especially those that do not report to national databases.

Although ACE-WCSC data can indicate the weight of food products entering specific ports like Honolulu Harbor, it lacks granularity. Categories such as “Vegetables & Products” are broad, preventing a breakdown by specific commodities. The dataset also does not indicate final destinations after arrival; it captures only entry into the state, not subsequent inter-island distribution (e.g., to Hawai‘i Island). In addition, it excludes food arriving by air. Most critically, the data does not reflect actual consumption—only shipments received—meaning that sales, waste, or spoilage are not accounted for.

A further limitation lies in the classification of shipments by immediate origin. For example, foreign imports routed through continental U.S. ports are labeled as domestic shipments in ACE-WCSC, obscuring their true origin (U.S. Army Corps of Engineers, n.d.). This can skew calculations of import dependency and localization. While Leung and Loke attempt to correct for this blind spot by consulting with local wholesalers and shipping agents, the reliance on qualitative estimation introduces a margin of uncertainty.

Lastly, the methodology assumes that all local food production (minus exports) is consumed first, followed by imports (minus re-exports) to meet remaining demand. While this assumption simplifies modeling, it may not align with real-world consumer preferences, market logistics, or patterns of food waste. Thus, while the framework provides a solid foundation for estimating self-sufficiency and import dependency, the accuracy of its outputs is ultimately limited by data availability, assumptions, and the scale at which it is applied.

Applicability to Hawai‘i County

Leung and Loke’s model offers a strong methodological foundation for assessing food self-sufficiency in Hawai‘i County. The framework’s use of standardized weight-based metrics (rather than dollar or calorie value) is especially suitable for the Hawai‘i context, where high food costs and nutritional disparities make dollar-value comparisons misleading. The modified formulas, Localization Ratio (LR) and Modified Import Dependency Ratio (MIDR), provide a more accurate estimate of food availability by accounting for both re-exports and local exports. These adjustments are particularly useful for places like Hawai‘i County, which engage in inter-island trade and may produce food that is shipped elsewhere.

However, a key limitation is the availability of county-level data. While the original study draws on robust, regularly updated national datasets (NASS, ACE-WCSC, and GATS), these sources do not offer sufficient geographic granularity to isolate food production, consumption, or trade patterns specific to Hawai‘i County. Moreover, many smallholder, diversified, and subsistence producers, who play a significant role in Hawai‘i’s local food system, are underrepresented in these datasets. Adjusting the framework for Hawai‘i County would require supplementing these sources with localized data, such as state or county reports, direct surveys, and insights from local producers, wholesalers, and distributors.

Despite these challenges, the clarity and transparency of Leung and Loke’s framework make it a valuable tool for updating estimations of food self-sufficiency across the state of Hawai‘i. While breaking down these estimates by county, such as for Hawai‘i County, would require more granular data, particularly around local food

production and inter-island trade flows, the overall methodology remains sound. This framework could be adapted to generate more localized assessments and guide evidence-based strategies to reduce import dependence and strengthen regional food system resilience.

Framework 2: Melrose & Delparte (2012)

Methodology Summary

Melrose and Delparte's *Hawai'i County Food Self-Sufficiency Baseline Study* (2012) aimed to assess Hawai'i Island's food self-sufficiency by comparing local food production with estimated consumption, using product weight (pounds) as the unit of measurement. Their approach relied heavily on data from the 2007 Census of Agriculture conducted by the National Agricultural Statistics Service (NASS), which provided county-level production figures for a select group of staple foods. To estimate demand, the authors used the 2010 Census to determine a resident population of 185,079, adding the average daily visitor count of 25,287 to reach a de facto population of 210,366. From this, they estimated a daily demand of 631,098 meals (assuming three meals per person per day), then applied national food consumption models to project the island's total food requirements in pounds.

Per capita consumption estimates were sourced from *USDA Fact Book*, *Profiling Food Consumption in America* (2008). This yielded an annual food need of over 410 million pounds to feed the island's combined population. Local production volumes for individual food groups (e.g., beef, milk, fruit) were then compared against these consumption needs to determine the proportion of local vs. imported supply. These findings were visually represented in the Hawai'i Island Food Self-Sufficiency Scorecard

(Figure 3), which charted the share of consumption met by local production across major food groups. The gradient portion of each bar in the scorecard estimated informal food contributions (e.g., subsistence or non-commercial production), while the labeled percentages represented data-verifiable local output.

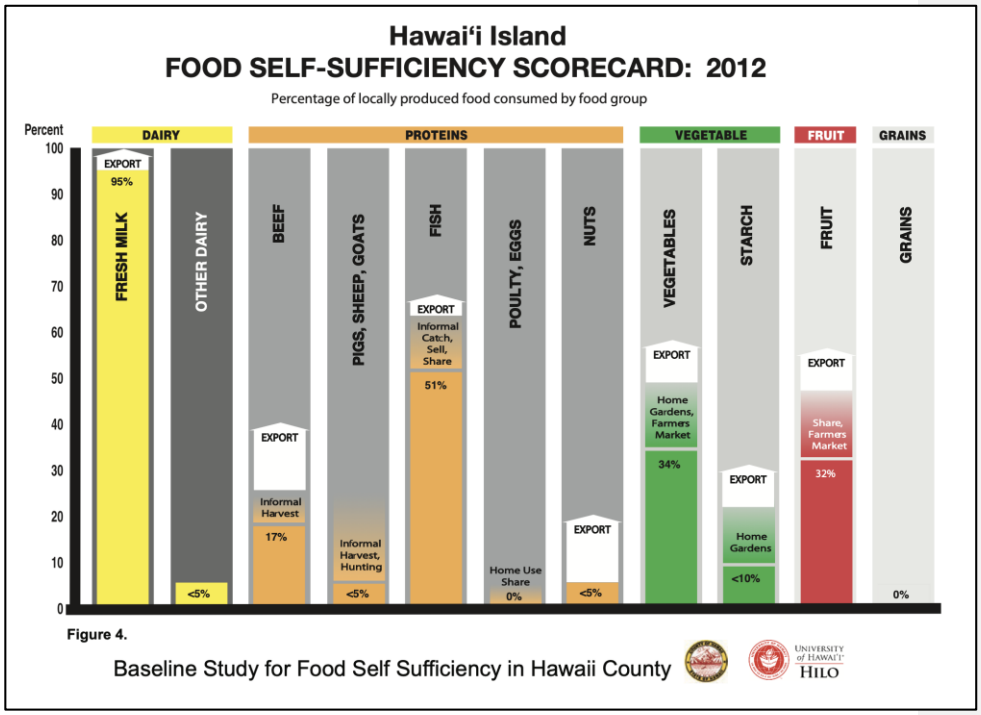

Figure 3: Hawai'i Island Food Self-Sufficiency Scorecard.
Source: Melrose and Delparte (2012).

Strengths

Melrose and Delparte's report stands out for its clear intent to create a practical, locally grounded baseline of food self-sufficiency specific to Hawai'i Island. One of its primary strengths is its direct use of production and consumption weight-based estimates (in pounds) to calculate local food availability across ten key food categories. Unlike

some frameworks that are abstract or overly generalized, this report is rooted in place-specific data, including inputs from the 2007 USDA Census of Agriculture, the Hawai‘i Department of Agriculture’s Market Analysis and News Branch, and consultation with local experts. The integration of both formal and informal food systems, including gradient visual estimates for contributions from home gardens, wild harvest, and subsistence practices, adds nuance that is often missing in purely quantitative models.

Commented [1]: Excellent. I like how the model incorporates informal food systems as well. As we know, these are quite important in the islands, and having a standardized way to estimate such flows would be helpful.

The authors are also notably transparent about their data sources and limitations, openly discussing the reliability of NASS data, the variability in methodology by food group, and the assumptions used in their consumption estimates. The inclusion of both resident and visitor populations in demand calculations reflects an important reality for Hawai‘i Island’s food system planning. Overall, the report offers a clear, visually communicative presentation, particularly through the Food Self-Sufficiency Scorecard, that remains relevant for informing local policy, education, and community conversations.

Limitations

Despite the overall transparency of the report, the methodology is applied inconsistently across food groups, which complicates direct comparison. For instance, while fruits and vegetables are analyzed using import-versus-local data from HDOA’s Market Analysis and News Branch (MANB), other categories rely on informal estimates or personal communications, with no formal production data available. The estimation of informal food sources (e.g., home gardens, hunting, and gathering) is also uneven; some food groups include these contributions via gradient shading in the scorecard, while others do not.

Although Melrose and Delparte consistently use weight (in pounds) as the unit of analysis, the degree of methodological rigor and sourcing varies across food categories. This makes it difficult to directly compare the findings or to replicate the methodology without additional data clarification. In contrast, frameworks such as Leung and Loke (2013) use kilograms and offer standardized formulas and definitions across all categories, allowing for more consistency.

Additionally, the authors rely on national per capita consumption data based on 2000 USDA estimates, which may not reflect the cultural or dietary patterns specific to Hawai‘i. The assumption that every individual consumes three meals a day also introduces some uncertainty, as eating habits may vary widely. Finally, while the report draws on the USDA’s 2007 Census of Agriculture (NASS), the authors rightly note that this data source is only collected every five years and relies on self-reporting, which may result in gaps or inaccuracies—particularly among small-scale or diversified producers.

Applicability to Hawai‘i County

This report was designed specifically for Hawai‘i Island, making its methodology and findings highly applicable to Hawai‘i County’s planning needs. By estimating annual food demand for both residents and visitors and comparing it to documented local production, Melrose and Delparte offer a pragmatic baseline for understanding the island’s food system. Their Food Self-Sufficiency Scorecard, which visually compares local production to estimated demand for key food groups, provides an effective communication tool for policymakers and the public alike.

The use of weight as a standard metric aligns reasonably with other food self-sufficiency assessments and can be converted for compatibility. The authors’ inclusion of

informal food systems acknowledges the significant but often undocumented role of subsistence practices in Hawai‘i. While future assessments would benefit from more uniform methodology and updated data, this report remains a valuable foundation for localized food system planning and resilience-building in Hawai‘i County.

Framework 3: ANCORS (2023)

Methodology Summary

The Pacific Food Trade Database (PFTD), developed by the Australian National Centre for Ocean Resources and Security (ANCORS) in 2023, is a cleaned and aggregated dataset based on international food trade data from 16 Pacific Island countries and territories. Using raw data from UN Comtrade (2000–2021), the team compiled and standardized more than 5,000 individual HS codes, aggregating them into 47 high-level food system categories (e.g., cereal-based goods, meat and meat products, dairy, roots and tubers). Commodities were classified by end use—food, feed, or seed—and converted into standardized units (primarily kilograms) using a clearly documented cleaning protocol. The methodology includes extensive cross-referencing and manual validation to address unit inconsistencies, misclassifications, and omissions in the original trade records. While the database focuses only on imports and exports, not production or consumption, it serves as a comprehensive tool for tracking international food flows at the regional level.

Strengths

A key strength of the PFTD is its transparency and replicability. The methodology is thoroughly documented, with decisions around data exclusions, commodity

reclassification, and unit conversions clearly explained. The grouping of commodities into intuitive food system categories enhances usability for food systems research and policy analysis, while the provision of accompanying R scripts supports adaptation and further analysis. By cleaning and standardizing long-term trade data across 16 countries, the project fills a significant gap in Pacific regional food system research, where trade data is often inaccessible or inconsistently reported. The PFTD is also openly available, increasing access to reliable information for governments, researchers, and development agencies.

Limitations

Despite its value, the PFTD's reliance on international trade data limits its ability to assess food self-sufficiency or local food resilience. It does not include domestic food production or consumption figures, nor does it track subnational trade within countries. For non-reporting countries, the dataset depends on mirror data (i.e., data from trade partners), which may omit certain goods or misrepresent the volume of trade. The classification of commodities by end-use (food, feed, or seed) is based on HS codes and not on in-country use, which may lead to inaccuracies in assessing the actual food supply. In addition, the dataset does not distinguish between consumer and industrial food uses, and does not provide nutritional, caloric, or dollar value information—only product weight in kilograms.

Applicability to Hawai‘i County

While Hawai‘i is not included in the PFTD, the methodology provides a useful reference for analyzing food imports into the state. Similar cleaning protocols and

aggregation categories could be adapted to analyze data from USA Trade Online, which provides access to U.S. import data by HS code. As Leung and Loke (2013) also note, using weight as the unit of analysis helps avoid distortions that may arise from using dollar or calorie values, particularly when comparing diverse food types. However, because the PFTD excludes local production data and lacks insight into inter-island flows, it cannot be used on its own to calculate food self-sufficiency ratios. Its primary value lies in complementing production-based frameworks by improving visibility into Hawai‘i’s international dependencies and trends in import reliance over time.

Local Production Data Review

USDA National Agricultural Statistics Service

The USDA National Agricultural Statistics Service (NASS) provides some of the most comprehensive datasets on agricultural production in Hawai‘i. The primary source is the Census of Agriculture, conducted every five years, which offers state- and county-level statistics across a wide range of crops, livestock, and farm characteristics (USDA NASS, 2024). In 2022, the Census reported data for Hawai‘i County on acreage harvested, number of farms, and value of sales for most agricultural products, but not on total production weight (e.g., pounds or tons) for food crops. While this information is essential for understanding land use and market value, it presents challenges for calculating food self-sufficiency, which requires estimates of total edible yield available for consumption.

The voluntary nature of the Census of Agriculture can lead to underreporting or uneven coverage across counties, depending on grower participation (USDA NASS,

2024). For Hawai‘i County, the 2022 Census captured the scope of fruit, vegetable, and livestock production in terms of acreage and farm numbers but left a critical gap in physical production metrics. Without these weight-based measures, analysts must rely on either yield-per-acre assumptions or supplementary reports to estimate total tonnage.

NASS produces annual commodity-specific reports for Hawai‘i, such as the *Hawaii Vegetables and Melon Crops Report* and the *Tropical Fruits and Specialty Crops Report*. These reports provide production in pounds, price per pound, and farm gate value for selected crops, but they are only available at the state level (USDA NASS, 2023; USDA NASS, 2025). For example, the 2021 *Tropical Fruits and Specialty Crops Report* recorded 5.36 million pounds of citrus, tropical fruit, and tropical specialty crops statewide, with cacao production totaling 129,000 pounds and lychee production reaching 570,000 pounds (USDA NASS, 2023). The *Vegetables and Melon Crops Report* similarly reported detailed weight-based production data for crops such as sweet potatoes, leaf lettuce, and green onions (USDA NASS, 2025).

Statewide totals for 2018 and 2021 (see Table 1) illustrate notable declines over this period, underscoring both inter-annual volatility and the value of having weight-based measures—ideally at the county level—for food self-sufficiency analysis.

Crop Category	2018 Production (pounds)	2021 Production (pounds)	Percent Change from 2018 to 2021
Tropical & Specialty Crops	9,654,050	5,356,750	-44.5%
Vegetables	50,020,000	45,235,000	-9.6%

Table 1: Statewide Production of Selected Crops, Hawai‘i (2018 vs. 2021). Table created by the author using data from: USDA National Agricultural Statistics Service (2023; 2025).

While these state-level datasets are valuable for understanding Hawai‘i’s aggregate output, they do not reveal intra-state disparities. If similar reporting were disaggregated by county, it could provide critical insights into regional production capacity and help refine food self-sufficiency calculations. The ability to compare localized production weights against county-level dietary needs would allow for more accurate assessments of resilience and vulnerabilities in the food supply chain. At present, however, the lack of county-level weight data forces analysts to choose between relying on acreage as a proxy or making broad estimations based on statewide yields.

In the context of Hawai‘i County, this limitation is significant. The island’s agricultural mix, climate conditions, and market channels differ from those on other islands, meaning statewide averages may misrepresent local realities. Expanding NASS’s commodity-specific surveys to include county-level production weight data or establishing a parallel local reporting mechanism would substantially improve the accuracy of self-sufficiency assessments and policy planning.

Review of Import Data Sources

USA Trade Online (U.S. Census Bureau)

Through USA Trade Online, the U.S. Census Bureau’s Economic Indicators Division provides data on merchandise trade by commodity and state, reported at the 2-, 4-, and 6-digit HS levels. As of August 2025, monthly data are available from January 2008 through June 2025. This analysis includes all 17 food and edible agricultural

commodity categories reported at the two-digit HS level in the dataset. I selected three reference years—2020, 2022, and 2024—to provide an even distribution across the past five years and to highlight recent trends without presenting an overwhelming number of data points.

Figure 4 presents the total import value in U.S. dollars for each commodity category. The data reveal several categories with consistently high dollar values over time, most notably *Fish, Crustaceans & Aquatic Invertebrates*, which ranks highest in all three years, followed by *Beverages, Spirits & Vinegar* and *Prep Cereal, Flour, Starch or Milk; Bakers Wares*. These rankings highlight ongoing external dependencies for certain types of foods, particularly those common in both retail and food service sectors.

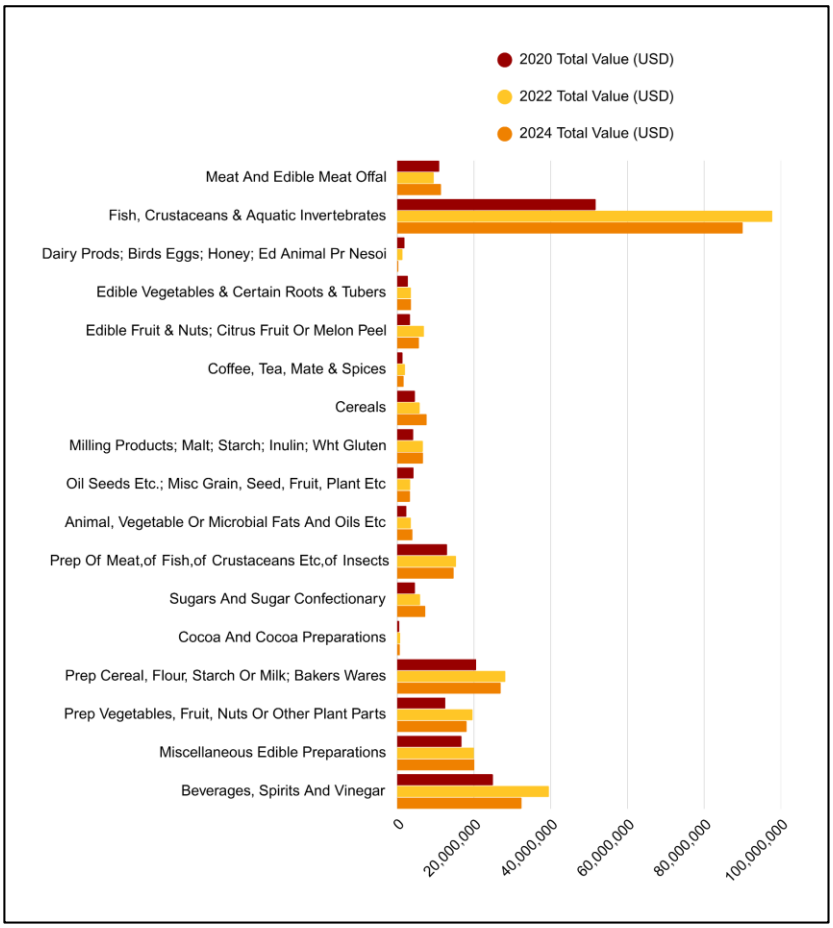

Figure 4: Total value (USD) of selected agricultural commodity imports into Hawai‘i, 2020, 2022, and 2024. Figure created by the author using data from: U.S. Census Bureau, Economic Indicators Division, USA Trade Online.

However, using dollar value as a metric for food self-sufficiency introduces key limitations. As Leung and Loke (2013) point out, dollar-based measures can distort reality and misrepresent food availability, as prices vary widely across commodities and grades. Relying on dollar value risks overemphasizing luxury or high-cost imports while

underrepresenting staple food needs. In contrast, weight-based measures offer a more neutral and consistent way to estimate how much food is available for human consumption.

Figure 5 presents the same commodity categories measured by total weight (shipping weight [SWT], kg), combining *Containerized Vessel SWT*, the weight of goods transported by sea, and *Air SWT*, the weight of goods transported by air. These two measures together capture the primary modes by which foreign imports enter Hawai‘i.

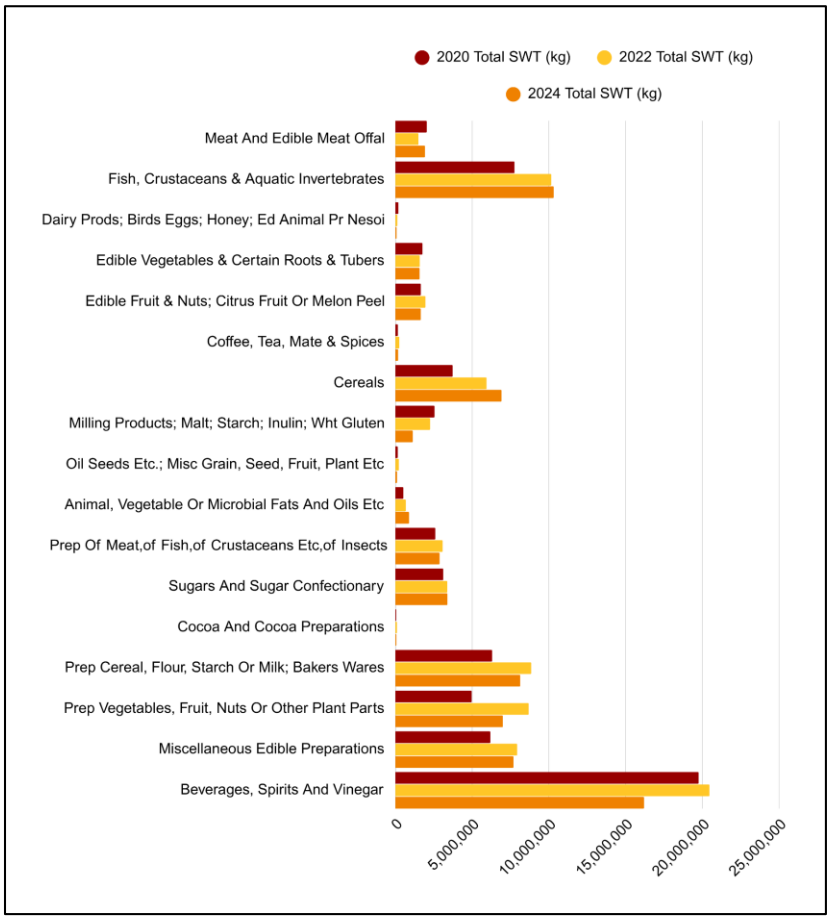

Figure 5: Total weight (SWT) of selected agricultural commodity imports into Hawai‘i, 2020, 2022, and 2024. Figure created by the author using data from: U.S. Census Bureau, Economic Indicators Division, USA Trade Online.

Based on this combined measure of total weight (Figure 5), the top commodity in 2020, 2022, and 2024 was Beverages, Spirits, and Vinegar, followed in all three years by Fish, Crustaceans, & Aquatic Invertebrates. The third spot varied by year but, on average, was held by Prep Cereal, Flour, Starch or Milk; Bakers Wares. Beverages rank first in weight likely because of their density and heavy packaging (often in glass containers),

while fish and baked goods reflect consistent demand in both retail and food service sectors. The fluctuation in the third-ranked commodity may reflect variability in market demand, seasonal production cycles overseas, or changes in trade patterns. These categories also held the top spots by total USD value (Figure 3), though in a different order. This overlap suggests that these imports are not only high in volume but also represent significant economic value, reinforcing their central role in Hawai‘i’s import dependency.

Examining imports in both USD value and total weight shows clear changes over time. From 2020 to 2022, the total weight of selected agricultural commodity imports increased by 21.5% (63.6 million kg to 77.2 million kg), while total value rose by 49.5% ($180.8 million to $270.4 million). In 2024, import weight declined by 9.1% from 2022 levels, though remained 10.4% higher than in 2020. The total value in 2024 decreased slightly from 2022 (–5.7%) but was still 41.0% higher than in 2020. The rise in USD value likely reflects both inflation and higher global commodity prices, while the increase in weight between 2020 and 2022 suggests a genuine growth in import volume. This jump may be linked to pandemic-related supply chain disruptions in 2020 followed by a rebound as tourism and local economic activity recovered. Even with the modest decline in 2024, import volumes remain elevated compared to 2020, underscoring Hawai‘i’s ongoing dependence on imported agricultural commodities.

One important limitation of this dataset is that imports are recorded at the point of entry into U.S. customs jurisdiction. Goods entering the continental United States and later shipped to Hawai‘i are counted as imports to the state of entry, with any subsequent movement to Hawai‘i classified as domestic trade. This means such shipments are

excluded from Hawai‘i’s import data in USA Trade Online. This presents a significant gap in assessing food self-sufficiency because Hawai‘i relies heavily on ocean freight from the continental United States.

The dataset also does not distinguish between goods intended for consumer consumption and those used for industrial processing. Furthermore, even when goods are shipped directly to Hawai‘i, they are aggregated under the Honolulu customs district, which covers all ports in Hawai‘i and does not disaggregate data by county, making it difficult to determine how much is specifically destined for Hawai‘i Island or other neighbor islands (U.S. Census Bureau, n.d.). While the data are still useful as an indicator of international dependency, they must be interpreted with caution when evaluating the resilience of Hawai‘i’s food system.

Waterborne Commerce Statistics Center (U.S. Army Corps of Engineers)

The Waterborne Commerce Statistics Center (WCSC) of the U.S. Army Corps of Engineers publishes the *Waterborne Commerce of the United States* (WCUS) report, which compiles annual measures of domestic and foreign cargo traffic for all U.S. ports. The WCUS Ports and Waterways Web Tool is an interactive version of this report, allowing users to view annual cargo data by port and commodity. Data are reported in short tons and broken down by intraport, receipts, and shipments. For this analysis, receipts were examined, as they indicate goods brought into a port.

The tool provides data for all Hawai‘i ports, including Kawaihae and Hilo on Hawai‘i Island, which receive food commodities from domestic and, to a lesser extent, foreign sources. Honolulu, O‘ahu, was also included for comparison in Table 2, as it is the state’s primary container port and a major entry point for imported food that may later

be distributed to neighboring islands. While Kawaihae and Hilo show very little foreign activity overall, one exception occurred in 2022, when Hilo received 211,335 short tons of Food Products not elsewhere classified (NEC) from a foreign source—compared to 1,764 short tons domestically—an unusually high figure compared to other years. Honolulu Harbor, in contrast, regularly receives foreign-sourced food commodities (U.S. Army Corps of Engineers, n.d.).

Port	2019	2020	2021	2022	2023
Hilo, Hawai‘i Island	11,518	6,826	19,967	219,128	12,563
Kawaihae, Hawai‘i Island	54,163	70,598	81,188	74,547	67,335
Honolulu, O‘ahu	629,426	525,143	528,487	528,119	534,589

Table 2: Receipts (short tons) of food commodities at selected Hawai‘i ports, 2019–2023. Table created by the author using data from: U.S. Army Corps of Engineers, Waterborne Commerce Statistics Center (WCUS Ports and Waterways Web Tool).

Commodity codes can be viewed at the 1-, 2-, and 4-digit level, with the 4-digit level providing the most detail. 4-digit food commodity receipts show that Food Products NEC accounted for the largest share of food receipts into Hawai‘i Island ports, followed by Vegetables & Products and Groceries (Table 3). Vegetables & Products and Groceries remained steady top categories across all five years, while Dairy Products saw a sharp decline after 2020, with volumes falling below 300 short tons annually from 2021 onward. Rice and Meat, Fresh, Frozen both showed gradual decreases over time, while minor commodities such as Fish (Not Shellfish), Wheat Flour, and Fruit Juices nearly disappeared from the dataset after 2020. The combined Kawaihae and Hilo data illustrate the concentration of Hawai‘i Island’s incoming food receipts in a few key commodity categories, with overall trends suggesting high variability for some products and steady or declining volumes for others.

Commodity	2019	2020	2021	2022	2023
Food Products NEC	37186	50108	75047	270066	58517
Vegetables & Prod.	8112	10544	10667	7859	6876
Groceries	5855	4615	5697	5468	5424
Grain Mill Products	1037	1264	3391	4378	3512
Rice	2421	2362	2295	2047	1846
Meat, Fresh, Frozen	1932	1823	1799	1616	1324
Dairy Products	6089	4267	172	198	291
Sugar	0	0	0	21	85
Fish (Not Shellfish)	941	421	21	0	0
Wheat Flour	23	0	0	0	0
Fruit Juices	66	0	0	0	0
Animals & Prod. NEC	0	0	45	0	0

Table 3: Receipts (short tons) of food commodities at Hilo and Kawaihae ports combined, 2019–2023. Table created by the author using data from: U.S. Army Corps of Engineers, Waterborne Commerce Statistics Center (WCUS Ports and Waterways Web Tool).

The WCSC dataset offers several strengths for assessing Hawai‘i County’s food self-sufficiency and reliance on imports. Its port-specific granularity allows for detailed analysis of Hilo and Kawaihae separately, while commodity-level categorization at the 4-digit code level makes it possible to identify key product types. The data also distinguishes between domestic and foreign sources, which is essential for understanding the island’s exposure to global supply chains. In addition, the WCUS Ports and Waterways Web Tool provides data spanning 2002–2023, enabling trend analysis over more than two decades. The standardized measurement in short tons further facilitates comparison across ports and time periods.

However, there are some limitations. Receipts data do not directly equate to local consumption, as goods may be stored, re-exported, or shipped to other islands before being consumed. Additionally, the annual reporting format obscures seasonal or monthly fluctuations that could affect food supply resilience. Finally, some commodity categories, such as "Food Products NEC," are so broad that they mask specific items, making it difficult to assess vulnerabilities in certain food groups. The unusually low volumes reported for categories such as sugar, fish (not shellfish), wheat flour, fruit juices, and animals & products NEC also raise questions as to whether these items are being captured under the broad "Food Products NEC" category—something that cannot be determined from the available data.

Overall, WCSC data provides valuable insight into high-level trends in food receipts at Hawai‘i Island ports, but it should be supplemented with additional sources, such as USA Trade Online and local production statistics, to create a more comprehensive understanding of Hawai‘i's import dependency and food self-sufficiency.

HDOA Market Analysis and News Branch Historic Inshipment Data

In contrast to the limitations of federal import datasets, Hawai‘i once maintained a more nuanced and locally relevant source of data. The *Statistics of Hawaii Agriculture 2008*, developed by the Hawai‘i Department of Agriculture (HDOA) Agricultural Development Division and the USDA National Agricultural Statistics Service, was the last of its kind to offer annual inshipment data for 15 types of fresh fruits and 33 types of vegetables. Unlike federal sources, this report compared local production with imports to calculate Hawai‘i's market share for each commodity, offering clear insight into the state's dependence on specific food items. For example, as shown in Figure 6, in 2008

Hawai‘i produced 8,100 pounds of sweet potato and imported 1,616 pounds, resulting in a local market share of 83%. In contrast, only 55 pounds of lemons were produced locally compared to 3,501 pounds imported, with a market share of just 2%, revealing a significant opportunity for local lemon production. The report also included crop pricing, which would be highly valuable for current farmers assessing market potential.

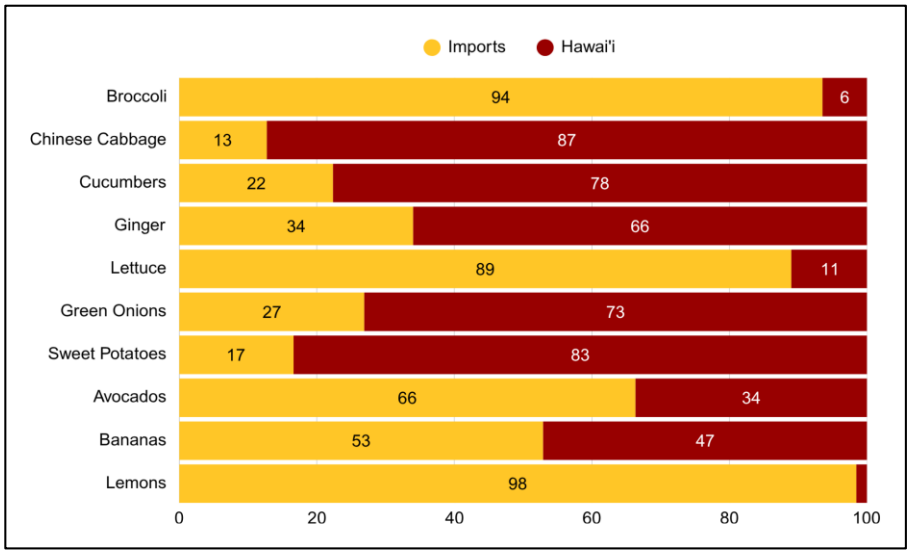

Figure 6: Hawai‘i Market Share vs. Imports for Selected Commodities in 2008. This figure illustrates the percentage of local versus imported market share for selected fruits and vegetables in Hawai‘i in 2008. Figure created by the author using data from: *Statistics of Hawai‘i Agriculture 2008* (Hawai‘i Department of Agriculture & USDA NASS).

While the *Statistics of Hawaii Agriculture* continued to be published until the final 2011 edition, the collection of inshipment data was discontinued after 2008. This change followed a reduction-in-force that eliminated all Market Analysis and News Branch positions at HDOA. As a result, contemporary efforts to evaluate Hawai‘i’s food self-sufficiency must rely on fragmented and incomplete datasets, which limits the ability to conduct accurate commodity-specific or market-based planning.

Conclusion

Overall, the comparative analysis reveals that no single dataset currently offers a complete, origin-specific picture of Hawai‘i County’s food imports and local production. However, the Waterborne Commerce Statistics Center (WCSC) stands out as one of the most valuable resources for county-level measurement because it records both foreign and domestic receipts for ports such as Hilo and Kawaihae. This means that food commodities shipped from Honolulu, including those originally imported from abroad or the continental United States, are still captured in Hawai‘i County’s inflow totals, even though they are classified as domestic shipments. As a result, WCSC data can provide a relatively robust estimate of the total tonnage of food entering the county, regardless of its origin. The primary limitation is that it does not distinguish between locally produced, continental U.S.-produced, and foreign-produced goods, making it difficult to assess true import dependency.

On the production side, the USDA National Agricultural Statistics Service (NASS) Census of Agriculture delivers rich detail on acreage, farm numbers, and value of sales, but without production weights, local yield estimates must be inferred from state-level reports or generalized yield assumptions. Commodity-specific NASS reports on vegetables, melons, tropical fruits, and specialty crops provide weight-based production data, but only at the state level, leaving county-level production capacity less defined.

Past studies such as the *Hawai‘i County Food Self-Sufficiency Baseline* (Melrose & Delparte, 2012) and *Hawai‘i’s Food Consumption and Supply Sources: Benchmark Estimates and Measurement Issues* (Leung & Loke, 2013) demonstrate that combining

multiple datasets, while adjusting for their limitations, can produce useful benchmarks for planning and policy. The challenge is not a complete absence of data, but rather the need to refine, disaggregate, and align existing sources so they more accurately capture Hawai‘i County’s unique production and consumption dynamics. Ultimately, no data source or combination of sources will be perfect, and some degree of estimation will always be part of the process. Future efforts should focus on integrating these sources to generate more precise, localized, and timely measures of production, imports, and consumption.

RECOMMENDATIONS

Expand County-Level Agricultural Production Reporting

Improving the accuracy of local production estimates requires more granular and weight-specific reporting at the county level. While the USDA NASS provides valuable acreage, farm number, and value-of-sales data through the Census of Agriculture and annual commodity reports, much of this information stops short of offering weight-based production figures for individual counties. Without these figures, yield estimates for Hawai‘i County must be inferred from statewide averages.

NASS should be encouraged, through coordinated advocacy from county agencies, producer associations, and policymakers, to expand its reporting to include county-level, weight-based production data for major food crops in Hawai‘i. This could be implemented either as an enhancement to the existing Census of Agriculture or as part of annual commodity-specific reports.

Where federal reporting changes are not immediately feasible, county-level data collection could be strengthened through partnerships between the Hawai‘i Department of Agriculture, local food hubs, producer cooperatives, and agricultural nonprofits. These collaborations could design standardized reporting templates that collect yield, harvest volume, and sales data directly from producers. Ensuring that these local data collection methods align with national reporting standards, such as NASS definitions, commodity classifications, and units of measure, would make the resulting datasets more compatible with state and federal statistics.

Over time, a robust county-level production database could enable far more accurate self-sufficiency assessments, improve the targeting of agricultural support programs, and provide farmers, policymakers, and food system planners with the detailed insights needed to strengthen local food resilience.

Enhance Tracking of Food Imports into Hawai‘i County

WCSC already provides one of the most comprehensive records of food shipments into Hawai‘i County by reporting both foreign and domestic receipts for Hilo and Kawaihae ports. However, the inability to distinguish between locally produced, continental U.S.-produced, and foreign-produced goods within these domestic receipts limits the dataset’s usefulness for measuring true import dependency. Addressing this gap will require refining how shipment origins are recorded and reported. Stakeholders such as county planning departments, agricultural agencies, and food system nonprofits, could collaborate with shipping lines, freight forwarders, port authorities, and the Hawai‘i Department of Transportation to collect more detailed information at the bill-of-lading or cargo manifest level.

These improvements would not necessarily require changes to federal reporting systems but could instead involve parallel local data collection efforts that track commodity origins before or as they enter the county. Such efforts could also be designed to align with existing classification systems used by WCSC, making integration and cross-verification more seamless. Over time, more precise tracking of commodity origins would allow analysts to separate domestic receipts into locally produced versus continental U.S.-sourced goods, significantly improving the accuracy of county-level self-sufficiency calculations and food system planning.

Integrate and Reconcile Multiple Data Sources for Cross-Verification

No single dataset currently provides a complete picture of food supply and demand in Hawai‘i County, but each source captures part of the story. NASS offers detailed agricultural production data (often in acreage and value, sometimes in weight), WCSC provides tonnage for both domestic and foreign shipments into Hawai‘i County ports, and USA Trade Online tracks foreign trade flows into the state. By integrating these three sources into a single, hybrid model, analysts could create a more comprehensive estimate of local supply and import dependency. An agreement between the County of Hawai‘i and NASS to regularly share production weight data could further strengthen the accuracy and timeliness of these estimates.

In practice, this would mean converting all datasets into a common unit, such as pounds or metric tons, so they can be directly compared. Where NASS only reports acreage, standardized yield-per-acre factors could be applied to estimate total production weight. WCSC tonnage data could be cross-referenced with USA Trade Online records to identify which imported goods originated overseas versus the continental U.S., and then

matched against NASS production figures to determine the extent to which local production meets local consumption needs.

To ensure accuracy, this process should follow the type of data-cleaning and reconciliation used in ANCORS' port studies. This involves systematically flagging inconsistencies between datasets (e.g., when WCSC shows high tonnage for a commodity category that NASS reports as having low or no local production), investigating the source of those discrepancies, and adjusting the model where needed. By cross-checking and correcting at each step, the final estimates would be more reliable and defensible for use in planning, policy, and future self-sufficiency calculations.

Pilot and Update Food Self-Sufficiency Calculations Using Leung & Loke's Formulas

Leung and Loke's (2013) modified Minimum Import Dependency Ratio (MIDR) and Local Replacement (LR) formulas remain among the most rigorous and transparent methods for quantifying food self-sufficiency in Hawai‘i. These formulas take into account the proportion of local demand met by imports (MIDR) and the degree to which imports could theoretically be replaced with increased local production (LR). Applying these methods to today's data would allow for direct comparability with past benchmarks while producing updated, policy-relevant figures.

At the statewide level, current datasets including NASS production data, USA Trade Online trade flows, and WCSC cargo tonnage could be compiled to replicate and update Leung and Loke's calculations. This would produce new, standardized benchmark figures for Hawai‘i as a whole, reflecting changes in both import dependency and local production capacity since their original 2010–2011 data set.

In parallel, a pilot project could adapt the formulas for county-level use, using WCSC port-specific receipts for Hawai‘i County as the import component and combining them with locally derived production estimates from NASS acreage data, state commodity reports, and yield conversion factors. While the first iteration of a county-level MIDR and LR will inevitably face data gaps, particularly in disaggregating imports by commodity, it would serve as a proof of concept, revealing exactly where improved granularity or new data collection is needed.

By running the calculations at both scales, stakeholders could identify differences between state-level and county-level self-sufficiency patterns, target interventions more precisely, and build a replicable framework for tracking progress over time.

Increase Methodological Transparency

For data to be effectively integrated and interpreted, the underlying methods must be clear. Agencies such as NASS should be encouraged to publish more detailed documentation of data collection and aggregation practices, particularly for commodity-specific reports.

Similar transparency is needed from other major data providers, such as WCSC and USA Trade Online, whose aggregation rules and geographic classifications can significantly influence interpretation. For example, clarifying how shipments are categorized as foreign or domestic, how transshipments are recorded, and what commodity codes are included under broad categories like “Food Products NEC” would help local analysts avoid misinterpretation.

Greater methodological clarity would allow researchers and policymakers to assess whether the data is fit for specific analytical purposes, identify where adjustments

or supplemental data are needed, and integrate multiple sources with greater confidence. This level of documentation would also improve reproducibility, enabling future analysts to replicate calculations, compare findings over time, and build more accurate models of food self-sufficiency at both the state and county level.

CONCLUSION

Improving the measurement of food self-sufficiency in Hawai‘i County requires both better data and stronger integration of existing resources. The Comparative Methodological Review demonstrated that while valuable datasets already exist, such as NASS production reports, WCSC cargo statistics, and USA Trade Online trade flows, each captures only part of the picture. Without county-level weight-based production data, clearer distinctions in import origins, and transparent documentation of collection methods, current assessments will continue to rely on estimates and assumptions that obscure the true balance between local production and imports.

The recommendations outlined in this report present a pathway for addressing these gaps through a combination of advocacy, collaborative local data collection, methodological integration, and pilot testing of calculation models. By expanding county-level production reporting, refining import tracking, reconciling multiple data sources, updating MIDR and LR calculations at both state and county scales, and increasing methodological transparency, Hawai‘i County can establish a more accurate and replicable framework for assessing its food system.

Ultimately, more precise self-sufficiency metrics will not only improve planning and policy but also help identify concrete opportunities to strengthen local agriculture, reduce import dependency, and build a more resilient food system for Hawai‘i Island.

With coordinated action from state agencies, county planners, researchers, and producer networks, the tools and processes are within reach to make these improvements a reality.

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BIOGRAPHICAL SKETCH

Katie Wortman is dedicated to creating more equitable food systems that nourish communities, support farmers, and care for the ʻāina. Her deep connection to agriculture and natural farming is rooted in cherished memories of her family's farm in Ōkute-juku, Mizunami-shi, Japan. She continues that legacy at Ocean Grace Farms, a small regenerative cacao farm in Kalaoa, Hawaiʻi Island. Katie brings six years of experience in sustainable food systems, education, and nonprofit development, with expertise in grant writing, program design, impact reporting, and creative communications. Since 2022, she has supported Kohala Food Hub, first as Manager and now as Development & Design Consultant, securing funding, strengthening communications, and helping expand access to fresh, locally grown food. She has also contributed to the success of local organizations such as Vibrant Hawaiʻi. Katie's work is grounded in systems thinking, equity, and a belief that change is possible by uplifting the people, knowledge, and resources already present in our communities.