LIVE WELL SAN DIEGO

2019 REPORT

The State of the Food System in the San Diego Region

COUNTY OF SAN DIEGO

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Contents

EXECUTIVE SUMMARY

A food system includes all processes and infrastructure in place to feed a population. The overarching components of the food system are inputs, production, manufacturing and processing, storage and distribution, consumption, labor and workforce development, and disposal of food and food-related products. All these components are interconnected and can effect positive or negative impacts to the social, environmental, and economic conditions of a population, also known as the triple bottom line. Using this triple bottom line as a lens to assess the conditions of a food system and to guide its future state recognizes the role that the food system plays in people's health and wellbeing, as well as its effect on environmental sustainability and on the economic welfare of society.

In 2016, the County of San Diego (County*) Board of Supervisors initiated the *Live Well San Diego* Food System Initiative to work towards a robust and resilient local food system that builds healthy communities, supports the economy, and enhances the environment. One of the main priorities for the Food System Initiative is to develop the State of the Food System Report for the San Diego Region on a cyclical basis.

The purpose of this report is to understand what the food system looks like in San Diego county, its current state, its challenges, and areas of opportunity. The report also identifies metrics to track progress in the different areas of the food system. The goal is for this report and its future iterations to serve as an informative resource for community education and engagement and also help inform programs and policy change.

The creation of the State of the Food System Report was led by the County in close collaboration with the San Diego Food System Alliance and with the input and contributions of representatives from government agencies, nonprofits, academic and research institutions, and industry groups from throughout the San Diego region.

Next steps will include establishing partnerships to identify, prioritize, and pursue key opportunities that stem from this report and previous efforts to make improvements in the different areas of the food system. This effort will require the continued collaboration of all organizations and stakeholders involved in the creation of this report as well as the engagement of community, industry, and decision makers in the region.

*For the purposes of this report, County with a capital "C" refers to the County of San Diego government organization; whereas county with a lowercase "c" refers to the geographical area of the county.

THE FOOD SYSTEM REQUIRES CRITICAL NATURAL, ENVIRONMENTAL, AND ECONOMIC INPUTS.

For example, agricultural land, soil, water, ocean and coastal waters, energy and equipment, and labor are essential. **In San Diego county, 242,554 acres of land are occupied by the agricultural industry for grazing, orchards, vineyards, and the cultivation of field and specialty crops.** There are 5,082 farms in San Diego county where approximately 70 percent are considered small as they operate on less than 10 acres. San Diego county has year-round agricultural production due to the mediterranean climate and the diversity of soils that support different commodities across marine to desert landscapes. Soils are crucial for the health of crops and to protect San Diego county agricultural land from destructive natural events such as flooding, wildfires, and drought.

The State of California was in a five-year drought from 2012 through 2016 where San Diego county was mandated to reduce water consumption by 25 percent in urban areas, and farmers were faced with a mandatory 15 percent reduction on water usage. San Diego county has responded to water supply challenges through diversification efforts (e.g. groundwater, recycled water, seawater desalination and conservation, and water supplied through multiple irrigation districts), which have resulted in high water costs. **This has led to innovation in water use technology, such as automatic drip irrigation, and the use of hydroponics and aquaponics.**

With San Diego county located along the Pacific Ocean, commercial fishing and aquaculture utilize the bays and coastal waters to produce and harvest fish and seafood. There are three commercial fishing harbors in San Diego county with infrastructure that comprises only about 4 percent of the water and 1 percent of the land area that are potentially suitable for commercial fishing. Commercial aquaculture is at a smaller scale in San Diego county, with only one farm, which is located in the Agua Hedionda Lagoon.

ALTHOUGH 95 PERCENT OF AGRICULTURAL LAND IN THE COUNTY IS DEDICATED TO FOOD PRODUCTION, ONLY 30 PERCENT OF THE TOTAL ECONOMIC VALUE OF AGRICULTURE DERIVES FROM FOOD PRODUCTION WITH THE REMAINING 70 PERCENT DERIVING FROM NURSERY AND CUT FLOWER PRODUCTS.

Commercial agriculture as a whole ranks as one of the largest industries in San Diego county and contributes significantly to the local economy through $1.8 billion in annual total sales and a total economic impact of $2.8 billion.

Approximately 91 percent of farms in the county are under 50 acres, and about 70 percent of the total farms are less than 10 acres, well below state averages, highlighting the prevalence of small farms in San Diego county. San Diego county has the highest concentration of organic farmers in the United States with more than 350 U.S. Department of Agriculture Certified Organic growers generating over $71 million in total organic product sales. **The highest yielding edible crops grown in San Diego county are avocados, citrus, and vine-ripened tomatoes.** Conducting business and profitability, along with water, soil, and pest management were identified as key challenges for commercial agriculture. Furthermore, climate change may have an increased impact on production challenges, such as increased heat and a diminishing water supply.

Urban agriculture is emerging in densely populated areas of San Diego county to provide food access and promote community development. **Examples of urban agriculture are community or school gardens, community supported agriculture based in urban areas, and the use of innovative food production methods such as hydroponics and aquaponics in urban settings.** Some challenges with urban agriculture in San Diego county are the high cost of real estate, high cost of water at residential rates, and the diversity of policies and regulations related to urban agriculture throughout San Diego county's 19 jurisdictions.

Commercial fishing operations in San Diego county currently harvest from the wild and land over 60 species valued at upwards of $10 million annually. Methods and techniques used for fishing comply with strict regulations and science-based management meant to safeguard against overharvest of stocks, capture of bycatch, and environmental impacts, making **San Diego county's local catch some of the most responsibly sourced in the world.** Although, local seafood is responsibly sourced, there is a lack of waterfront infrastructure, including offloading and storage, to support distribution, regulatory limitations, and a lack of workforce training and development which is limiting further expansion of the industry.

Commercial aquaculture, or the farming of seaweeds, fish and/or shellfish in tanks on land or in coastal waters, is a relatively young industry in the region. As such, there are regulatory obstacles in siting facilities in San Diego county, and California in general

THE NEXT STAGE OF THE FOOD SYSTEM IS MANUFACTURING AND PROCESSING WHICH TRANSFORMS RAW INGREDIENTS LIKE LIVESTOCK AND AGRICULTURAL CROPS INTO EDIBLE PRODUCTS FOR CONSUMPTION.

San Diego county imports raw products (e.g. wheat flour, corn meal, and yeast) for the production and manufacturing of bakery products and tortillas. Also, San Diego county imports cacao and coffee beans from overseas and locally manufactures chocolate (valued at $27.8 million in 2015) and coffee (valued at $63.4 million in 2015). In addition to importing, San Diego county exports milk production valued at $6.9 million in 2015

to be pasteurized and packaged. Similarly, meat processing of cattle and calves valued at $26.8 million in 2015 does not occur within the county. However, **the largest crops produced in San Diego county are citrus (valued at $151.7 million) and avocados (valued at $121 million) which are sold whole rather than going through processing and manufacturing.**

The manufacturing and processing industry is regulated through a hierarchy of jurisdictions from the national to local level in order to ensure the nation's food system protects the public from foodborne illness through food safety practices and regulations. Inspection and permitting for all local retail food facilities is conducted by the San Diego County Department of Environmental Health.

FOOD PRODUCED IN SAN DIEGO COUNTY IS DISTRIBUTED THROUGH THREE PATHWAYS:

1) Directly to the consumer through farmers' and fishermen's markets and shares in consumer supported agriculture (CSA), 2) directly to organizations and businesses and 3) through traditional distributors to organizations and businesses.

The prevalence of small farms in San Diego county present challenges for farmers to work with distributors because the revenue splits required to do so cut into profits to levels that are not economically sustainable for the farmers. Therefore, some small farms choose to sell directly to small businesses and organizations and to consumers through CSA deliveries.

There is a strong geographic barrier to access locally sourced seafood if not directly from the fishermen's market. Two recent studies revealed that the availability of San Diego-sourced seafood within the city of San Diego was limited to seafood markets and restaurants located within 1 km (0.6 miles) of the coast.

There is high demand for locally sourced food; however, distributors lack a coordinated system or platform for viewing the crop supply by farm in order to meet demand of locally sourced food. On the other hand, small producers do not benefit from economies of scale and it is difficult for them to meet the volume demanded from larger organizations and businesses. The challenges of distributors and producers are passed on to the consumer in the form of higher prices. Therefore, a concerted effort needs to take place to build up community awareness around the value of local food, in order for businesses, organizations, and communities to place a higher value on local food. Efforts also need to take place to address equity issues for disadvantaged communities who may not be able to access and afford higher-priced, local food.

SAN DIEGO COUNTY'S DEMOGRAPHICS AND CONSUMPTION PATTERNS DRIVE CONSUMER DEMAND FOR LOCAL FOOD.

San Diego county is home to approximately 3.3 million people with the second highest percentage of millennials (born between 1980 and 1994) in the nation, comprising nearly one-third of the San Diego county population. Through food choices, consumers influence food production, food processing, and ultimately food prices. **Consumer purchasing behaviors – particularly among the millennial age cohort, the largest, most diverse cohort in U.S. history – have shifted due to the growing awareness of the connection between food, the environment, and health. This awareness has led to increased consumer demand for better food, food that is fresh, healthy, local, organic, and sustainable.**

With these purchasing behaviors and San Diego county's strong tourism industry,

HOW CAN RESIDENTS SUPPORT THE LOCAL FOOD SYSTEM?

- Choose stores and restaurants that source food locally and support workers.
- Ask for locally-sourced seafood at markets and restaurants and try the San Diego local varieties of seafood.
- Visit and shop at local Certified Farmers' Markets and the Fishermen's Market.
- Sign up for Community Supported Agriculture to receive a share of fresh produce from a local farm.
- Get involved with community gardens and urban agriculture.
- Buy produce that is in season.
- Buy "ugly" produce, which is aesthetically unappealing but just as nutritious.
- Track where and how food is wasted at home and reduce portion sizes.
- Donate excess edible food at your local pantry or food bank (San Diego Food Bank and Feeding San Diego).
- Contact a gleaning group to donate any excess produce grown at home.
- Volunteer with a small-scale farm, food bank, gleaning group, or local pantry.
- Limit your use of plastic (straws, silverware, bags, etc.) and styrofoam (takeout containers, dinnerware).

recent laws and regulations like the Cottage Food Law, Pacific to Plate, and the Agricultural Promotion Program in unincorporated San Diego county present unique opportunities for producers to diversify their operations and revenue sources and for consumers to engage with local producers. **San Diego county has 36 Certified Farmers' Markets, 21 farm stands, 17 CSA programs, 1 dockside fishermen's market, and an emerging local farm-to-table and ocean-to-table movement.**

THE QUALITY AND AVAILABILITY OF THE FOOD AND DRINK WE CONSUME IMPACTS THE HEALTH AND WELLBEING OF ALL PEOPLE ACROSS OUR LIFE SPAN.

The methods of production, processing and preparation, as well as consumption, all play a role in whether food helps to nourish the body or results in adverse health impacts. A shift towards large-scale commodity crop production coupled with technological advances have led to a rise in the production of inexpensive, highly processed, and nutritionally poor foods.

Prices and access to healthy foods remain a significant barrier to healthy eating. International organizations define food insecurity as a situation that exists when people lack secure access to sufficient amounts of safe and nutritious food for normal growth and development and an active and healthy life. **In 2017, an estimated 443,000 (1 in 7) people in San Diego county experienced food insecurity.**

In addition to food insecurity, food deserts also persist in San Diego county. Food deserts are residential areas with limited access to affordable and nutritious food. Living in a food desert has been linked to poor diet and greater risk of obesity, while people who live near grocery stores are more likely to consume fruits and vegetables and less likely to be obese. **In 2010, approximately 23 percent (or over 700,000 people) of the San Diego county population lived in a food desert.** As researchers have documented in the San Diego region and other regions in the U.S., food deserts have emerged over time as the result of policy and planning decisions that often times have not been favorable to

historically disadvantaged groups and have led to white flight, suburbanization, disinvestment and store closures among these areas. Organizations and programs such as BrightSide Produce and the Live Well Community Market Program work to reach food insecure and low-income communities with healthy affordable food.

HUMAN LABOR IS ESSENTIAL FOR EVERY COMPONENT OF THE FOOD SYSTEM.

Ten percent of San Diego county's economy is represented by food system jobs. There are approximately 163,281 jobs in San Diego county's food economy. The majority of food-related employment is found in food service, eating and drinking places, accounting for over 100,000 jobs or 63 percent of the food economy, which is consistent with the strong tourism industry in the San Diego region.

Even though the food services and drinking places is one of the largest and fastest growing segments of the regional food economy, they are the lowest paid jobs in the San Diego food system. **Furthermore, overall wages within the San Diego food system are significantly lower than in the rest of the economy.** In addition to low wages, food system workers face other economic and social issues, including inconsistent implementation of legal protections, wage disparities, and economic insecurity. These issues are also related to race, ethnicity, immigration status, and gender of food system workers. In 2017, 37 percent of food system workers in San Diego county were immigrants (compared to 27 percent in non-food jobs) and 64 percent were people of color (compared to 51 percent in non-food jobs). The vast majority of workers throughout the food system were Latinos, especially in farming where Mexican immigrants alone represent 55 percent of the workforce.

IT IS ESSENTIAL THAT A WELL-TRAINED WORKFORCE BE PREPARED TO ADDRESS THE CHALLENGES OF THE FUTURE ACROSS ALL ASPECTS OF THE FOOD SYSTEM.

Agriculture and seafood production face similar challenges in education and workforce development with the average age of commercial farmers and fishermen about or over 50 years old. **Therefore, San Diego county food system education and workforce development is key to remain sustainable and resilient in the long term.** Educational programs, formal and non-formal, are available in the county to provide the region and its residents access to information and classes. However, there is a greater need than the collective capacity of providers for food system training programs. Educational opportunities are further limited because the populations who could most benefit from training or further education face numerous barriers to program participation, including transportation, childcare, financial support during the duration of programs, and stable housing.

WASTED FOOD OR FOOD LOSS IS ANY FOOD THAT IS GROWN AND PRODUCED FOR HUMAN CONSUMPTION, BUT THAT IS ULTIMATELY NOT EATEN.

In the United States, 40 percent of the food that is grown is never consumed, resulting in over 50 million tons of wasted food that ends up in landfills annually. At the State level, 6 million tons of food is thrown away each year, which makes up 18 percent of all the material that goes to the landfills. **It is estimated that in San Diego county, over 500,000 tons of food is wasted each year, while 1 out of every 7 residents face food insecurity**. In

addition to source reduction and prevention, there are efforts to recover edible food before it is wasted through pantries and gleaning organizations.

In 2016 the County of San Diego led the creation of a Food Donation Action Plan that was produced in collaboration with food system and food donation stakeholders in the region. The goal of the plan is to support and improve food donation in the San Diego region in order to help address food and nutrition insecurity, while also reducing food loss. **In support of the Food Donation Action Plan, the County Board of Supervisors took action on December 12, 2018, to waive Department of Environmental Health permit and registration fees for pantries and to provide funding to support food donation efforts and food safety.**

Not only are valuable resources wasted when food is not consumed, organic material that is left to decompose in landfills creates methane, a greenhouse gas that contributes to climate change. Food that is no longer suitable for donation can be diverted from landfills for agricultural and industrial uses and for composting and anaerobic energy production. In addition to local efforts, State and federal legislation and regulations are designed to divert organic material from landfills, including food, as a way to reduce greenhouse gases. Moreover, there are laws that support reduction of wasted food by facilitating food donation and helping people make informed decisions about when food is still safe to eat versus when it should be discarded.

WHERE DO WE GO FROM HERE?

Continued collaboration and engagement of key stakeholders and decision makers will be key to the sustainability and advancement of the food system in the San Diego region. The following areas of opportunities can inform next steps for improving the different components of the local food system:

INPUTS

- Continued support of land preservation efforts to secure land for agricultural uses.
- Support farmers to implement smart irrigation technology to help reduce water use and costs.
- Investment is needed in infrastructure that supports commercial fishing, such as storage and processing facilities.
- Support water, waterfront, and land uses that help take advantage of the available potential of the commercial fishing and aquaculture industries.

FOOD PRODUCTION

- Commit financial resources to incentivize farmers and ranchers to implement carbon-farming practices and to support pilot projects.
- Promote “dense” planting among growers. The practice puts more trees in production per acre than previous practices. Outcomes include increased production per acre, reduced labor per unit produced, and reduced water use per unit produced.
- Support experimental plantings that could lead to established commercial production, which are currently taking place with coffee, dragon fruit (pitahaya), olives, mandarins, and other crops.
- Support the expansion of hydroponic and aquaponic production methods as environmentally sustainable alternatives for food production that can also help address issues of land availability.
- Support land use policies and regulations that accommodate more urban agriculture. For instance, the Urban Agriculture Incentive Zones Act.
- Incentivize the inclusion of urban agriculture components as part of new housing developments.
- Make parkland available for community gardens.
- Improve waterfront infrastructure in the San Diego region to capture a share of the $28 million worth of fish and seafood that is landed annually by San Diego county fishermen in ports north of the county.
- Promote the practice of harvesting lightly across an array of fish species to reduce the risks of impacting stocks, increase our ability to respond to climate change challenges, and provide a more stable business model.
- Seek opportunities to expand the establishment of fishermen’s markets in the San Diego region.
- Provide consumer education on species that are sourced locally and how to prepare them and provide more information/conduct public outreach that addresses common concerns surrounding fishing and aquaculture (e.g., environmental impacts and health concerns).
- Seek opportunities to expand the distribution of local aquaculture products throughout the San Diego region.

MANUFACTURING AND PROCESSING

- Support food manufacturing and processing infrastructure that promotes a shared economy by encouraging the development and shared use of community kitchen spaces.

STORAGE AND DISTRIBUTION

- Increase opportunities for seafood direct marketing and other alternative marketing arrangements where fishermen sell to restaurants and markets, which would result in shorter, more local seafood supply chains that potentially increase the availability of local product within the county. An added benefit of more direct sales is the connection of seafood producers and consumers which raises awareness of local fisheries.
- Create a coordinated system or platform for displaying and sharing crop supply by

farm and develop methods for providing greater real-time transparency of crop availability for distributors and buyers.

- Seek opportunities for small farmers to aggregate their crops for distribution in order to reduce costs and build collective economies of scale, such as the development of a local food hub.
- Seek opportunities for fishermen to collaborate with other producers (e.g. through port-wide marketing associations) to help meet demand and take advantage of economies of scale.
- Conduct outreach to raise public awareness around the value of local food, in order for businesses, organizations, and communities to place a higher value in local food.

CONSUMER DEMAND

- Develop methods to track and understand how much food produced locally remains within the county so opportunities can be identified to increase local food production and consumption in the region.
- Increase the accessibility of local food to underserved communities to ensure that it can be available to all.
- Seek opportunities to develop niche products and markets to cater to the region's diverse ethnic groups and their unique preferences for flavors and products from their native lands.

NUTRITION AND FOOD SECURITY

- Continue to support nutrition assistance programs that help secure access to nutritious food for underserved populations.
- Seek opportunities to address underlaying poverty conditions that lead to food insecurity.
- Support breastfeeding practices by advocating for worksite breastfeeding policies, breastfeeding friendly community healthcare centers and childcare providers, home visiting programs, educational forums for families and providers, scientific research, direct breastfeeding counseling, and the establishment of the first milk bank in San Diego.
- Pursue opportunities to address food deserts by building on existing resources and supporting small stores through financial, marketing and technical assistance.
- Consider the effects of gentrification, suburbanization and disinvestment over historically disadvantaged groups when developing policies and plans that affect food access.

LABOR AND EMPLOYMENT

- Support policies that promote and advance fair labor practices for all.

EDUCATION AND WORKFORCE DEVELOPMENT

- Seek opportunities to make education and training opportunities related to the food system accessible to disadvantaged populations.
- Seek opportunities to expand Farm to School programs by developing policies and funding infrastructure to support consistency in programming at schools.
- Provide economic incentives for small school districts to start a Farm to School program.
- Seek opportunities to connect existing farmers and fishermen with new generations of producers to share knowledge and expand workforce development in these sectors.

WASTED FOOD

- Develop and fund directed educational campaigns to teach people how to properly store food, shop smarter, cook from root-to-leaf/nose-to-tail, and how to meal plan to reduce wasted food.
- Support the food donation network in the San Diego region by investing in incentive programs and grants that help address infrastructure needs, such as storage, refrigeration, and transportation.
- Support gleaning organizations with funding and infrastructure to expand food rescue efforts.
- Seek opportunities to connect potential donors of food not suitable for human consumption to farms in need of spent grain and other food donations to feed animals.
- Explore strategies to utilize wasted food for biofuel and bio-products in order to incorporate use of alternative energy sources and mitigate the environmental and economic impact of wasted food.
- Invest in infrastructure to process food scraps and explore opportunities to co-locate organic waste processing facilities at landfill and wastewater treatment sites.
- Increase education and training around on-site residential and commercial composting and develop policies that support these efforts.

INTRODUCTION

THE SAN DIEGO REGION FOOD SYSTEM

A food system includes all processes and infrastructure in place to feed a population; from all the inputs that are necessary to grow food, to the management of wasted food at the tail end, and everything in between: production, manufacturing and processing, storage and distribution, consumption, and disposal of food and food-related products. Each of these overarching components include other sets of systems that support more specialized functions, such as water systems for growing, supply chain for distribution, etc. All the components of the food system are interconnected and can have positive or negative impacts on the social, environmental, and economic conditions of a population, also known as the triple bottom line. Using this triple bottom line as a lens to assess the conditions of a food system and to guide its future state recognizes the role that the food system plays in people's health and wellbeing, as well as its effect on environmental sustainability and on the economic welfare of society.

San Diego county is known for its nice weather, which favors the region's $1.7 billion agriculture industry where a third of the crops grown are food. However, climate change presents an important challenge to the local food supply. With the changing climate the region has already started to experience more severe droughts and wildfires, which negatively affect the agriculture industry. Additionally, the high costs of land and water present an important barrier for new and young farmers to enter the commercial agriculture market, a concerning situation when considering that the average age of the region's farmers is over 60 years, with no succession plan in place.

The region's commercial agriculture landscape includes thousands of small farms (less than 10 acres) which are successful at producing a variety of food crops. These small farms face important obstacles to help get that food onto people's plates locally, such as lack of economies of scale to compete with larger out-of-county producers and lack of infrastructure and few marketing channels that fit their production scale. Comparable challenges are shared by the local fishing industry, which once gave the region the title of the 'Tuna Capital of the World' and today faces challenges with a shortage of waterfront and regionwide seafood system infrastructure, regulatory limitations, a lack of workforce training and development, and the potential negative effects of climate change.

While most of the population in the San Diego region enjoys a secure and varied food supply, food access continues to be an issue to 1 in 7 San Diego county residents who are food insecure. This comes at a time when 40% of the food produced in the nation is wasted. Sometimes, the very people working to produce that food and make it available to society face challenges to access it for themselves and their families. While California has a number of labor laws protecting workers, protections for workers across the food system are not implemented consistently and food system workers tend to have lower wages than workers from other industries. This situation coupled with our region's high cost of living (housing, transportation, etc.) can negatively impact the quality of life of local food system workers.

However, the food system in the San Diego region is well positioned to positively contribute to the triple bottom line. There is a growing awareness in San Diego county about the value of food and the importance of preventing its waste and rescuing edible food from going to the landfill to repurpose it for higher uses, such as feeding people who experience food insecurity. There is also growing interest in "zero waste" policies that keep organics, including food, out of the landfills to prevent greenhouse gas emissions as a result of the decomposing process. Additionally, San Diego county farmers are consciously willing to adapt and to adopt practices that enhance the environment and make the region more resilient against climate change. The very challenges that threaten our food supply have given way to innovation in the way we grow our food. The use of aquaponics and hydroponics are rising as new efficient, environmentally friendly food production methods which can also be implemented out of the fields in urban settings. San Diego county farmers look for opportunities to save water and implement water-saving irrigation techniques as a way of facing the challenges that drought conditions and water costs present to their operations. As the changing climate will continue to present challenges to local agriculture, climate-smart agricultural and ranching practices have the potential to significantly lower greenhouse gas emissions while improving soil health, reducing water use, increasing crop yields, improving livestock health, and protecting lands against the threat of wildfires.

ProduceGood gleans citrus from San Diego residential orchards that would otherwise go to landfill.

The steady growth of San Diego county's agricultural diversity indicates that the agricultural industry is working to become more resilient to economic shocks and natural and/or human-driven hazards that have the potential to disrupt production. New experimental crops continue to emerge as viable economic opportunities for the region's growers. This is an important opportunity to the local food system as market niches can develop for new and diverse crops taking advantage of the ethnic and cultural diversity of county residents and their unique tastes and needs for food. The regions diverse population includes a large group of millennials who have an increased

sense of awareness of the implications of their food choices for the triple bottom line, of knowing where their food comes from, what is in it, and how it is produced. As the focus on local food continues to grow, it is important to take advantage of the region's unique strengths and opportunities to continue to build a thriving food system for San Diego county.

STATE OF THE FOOD SYSTEM REPORT FOR THE SAN DIEGO REGION: PURPOSE, PROCESS, AND NEXT STEPS

In 2016, the County of San Diego (County) Board of Supervisors initiated the *Live Well San Diego* Food System Initiative (Food System Initiative) to work towards a robust and resilient local food system that builds healthy communities, supports the economy, and enhances the environment. The Food System Initiative supports the County's *Live Well San Diego* vision of a region that is building better health, living safely, and thriving. One of the main priorities for the Food System Initiative is to develop the State of the Food System Report for the San Diego Region on a cyclical basis.

The purpose of this report is to understand what the food system looks like in San Diego county, what is its current state, and what are its challenges and areas of opportunity. The report also identifies metrics to track progress in the different areas of the food system. The goal is for this report and its future iterations to serve as an informative resource for community education and engagement and also help inform programs and policy change.

Other important efforts in the region have taken place in previous years to examine the local food system: 1) the 2010 report Assessing the San Diego County Food System: Indicators for a More Food Secure Future from UC Davis Agricultural Sustainability Institute and the San Diego Food System Working Group; and 2) the 2011 Final Recommendations of the San Diego Urban-Rural Roundtable (SDURR), convened by the San Diego Food System Working Group and the nonprofit Roots for Change. The San Diego Food System Working Group was an ad hoc collaboration of growers, public health and environmental experts from local government and nonprofit agencies, and other food system stakeholders. The SDURR consisted of a series of meetings among numerous leaders and stakeholders from throughout the San Diego region to develop a set of recommendations with the goal of improving the food system for all residents of San Diego county. Data and metrics identified by these two efforts were included in the State of the Food System Report.

The creation of the State of the Food System Report was led by the County in close collaboration with the San Diego Food System Alliance and with the input and contributions of dozens of food system stakeholders throughout the San Diego region (a full list is included in the Acknowledgments page) including representatives from government agencies, nonprofits, academic and research institutions, and industry groups. Stakeholder input was included through an initial stakeholder meeting in January 2018, to help inform the content and develop an outline for the report. Subsequently, a Stakeholder Advisory Group—a subset from the initial stakeholder meeting—was formed and continued to convene through late 2019 to refine the content/outline of the report as well as select metrics to research and include for the different areas of the food system. The Stakeholder Advisory Group also helped identify contributors from different sectors who would provide content and data to help write the different sections of the report. Content contributors provided key information, data, pictures, charts, and maps to produce the report. With close collaboration of County staff, content contributors, and the consultant MIG Communications, the final report was produced.

Next steps will include establishing partnerships to identify, prioritize, and pursue key opportunities that stem from this report and previous efforts to make improvements in the different areas of the food system. This effort will require the continued collaboration of all organizations and stakeholders involved in the creation of this report as well as the engagement of community, industry, and decision makers in the region.

DATA LIMITATIONS

The creation of the State of the Food System Report required the research and analysis of existing data from local, State and federal sources, including government agencies, research institutions, and nonprofit organizations. Primary research was not included within the scope of this report. Although the focus of the report is on the local food system (for the purposes of this report, local is being defined as contained within the boundaries of the county of San Diego), State and national data are also referenced in the report whenever local data was not available. Data has not been captured/researched for a number of metrics that were identified by the Stakeholder Advisory Group as key to tracking progress in the different areas of the San Diego region food system. A table with existing food system metrics is included as an appendix to this report. A wish list of additional metrics is also included to help inform potential future research opportunities to help close the gap for local food system data.

Some of the main data sources for this report include reports such as the United State Department of Agriculture's Census of Agriculture (Ag Census), which is produced every five years. Given the availability of data to inform the State of the Food System Report, from the Ag Census and other important data sources that update information on a periodic basis, this report will be updated on a five-year cycle.

SECTION 1

INPUTS

WHAT ARE THE INPUTS THAT ARE REQUIRED FOR FOOD PRODUCTION?

Food production requires natural, environmental, and economic inputs. The commercial agriculture industry requires land that is suitable for raising animals and growing crops, animal feed, nutrient-rich soil, seeds, fertilizer, and clean water to support food production. Healthy fish populations, waterfront property, and access to harbor water are essential inputs for commercial fishing and aquaculture operations, or farmed seafood, which is the breeding and cultivation of plants and animals in all water environments (1). Finally, energy, equipment, and labor are essential inputs to all food production methods. The availability and cost of each of these inputs is subject to a range of natural, market, and regulatory forces.

AGRICULTURAL LAND

According to the San Diego County 2018 Crop Statistics & Annual Report, in San Diego county, 242,554 acres of land are occupied by the agricultural industry for grazing, orchards, vineyards and the cultivation of field and specialty crops. Approximately 95 percent of agricultural land (230,279 acres) in the San Diego region is dedicated to food production with the remaining 5 percent to nursery and cut flowers (12,275 acres) (2). As a whole, the San Diego region farmland is comprised of 5,082 farms, more than any other county in the U.S., according to the U.S. Census of Agriculture (3). Approximately 70 percent of these farms are categorized as "small" as they operate on less than 10 acres (3).

High property values in San Diego county make the purchase of agricultural land an ongoing challenge for entry-level farmers. Land ownership is more desirable for agriculture than leasing because farmers are hesitant to make long-term capital investments on leased land. Because land prices serve as a barrier to entry-level farmers, land prices are also a contributing factor to the aging population of principal farm operators in San Diego county whose average age now exceeds 62 years (4). Many new farmers who do enter the food production market tend to be older and have access to adequate financial resources. Interestingly, farming is not the only source of income for the majority of agricultural producers in San Diego county. According to the University of California Cooperative Extension (UCCE) 2018 Growers' Needs Assessment survey, roughly 74 percent of agricultural producers have an income outside of farming (4). The U.S. Department of Agriculture also highlights a similar statistic of off-farm sources of income, which, on average, account for more than 90 percent of all farm household incomes in the U.S. (5).

PURCHASE OF AGRICULTURAL CONSERVATION EASEMENT PROGRAM (PACE)

The County of San Diego has an agricultural conservation program known as the Purchase of Agricultural Conservation Easement (PACE) Program. The PACE Program promotes the long-term preservation of agriculture in the County of San Diego.

Under the PACE Program, willing agricultural property owners in the County unincorporated communities are compensated for placing a perpetual easement on their property that limits future uses to agriculture. As a result, the agricultural land is preserved and the property owner receives compensation making the land's continued use for agriculture more viable.

Since the inception of the County of San Diego's PACE program in 2013, 26 properties covering approximately 2,328 agricultural acres have been preserved. The cost of these PACE easement acquisitions is approximately $5.99 million at an average cost of $2,600 per acre, not including administrative costs.

SOIL

Soil health and quality is crucial for food production. A wide variety of soils exist in San Diego county due to the region's Mediterranean climate, location, unique geologic features and hazards (e.g. active fault lines, steep topography, earthquakes and weathering). The diversity of soils and geologic features, specifically 34 soil classifications, contribute to the microclimates that support roughly 30 natural vegetation communities and the growth of over 200 different commodities across marine to desert landscapes (6,7). The combination of the climate and the soil varieties provide year- round agricultural production in San Diego county (7).

Time, climate variation, human impacts, as well as physical, chemical, and biological characteristics all play a role in soil health and quality (8). Even though healthy soil develops over thousands of years, this resource has not traditionally been well understood or highly regarded. Through educational campaigns, healthy soil and vegetation are increasingly recognized as necessary to protect San Diego county lands from wildfires, flooding, drought and other destructive events. The ability of the agricultural industry to improve soil health and address other related environmental co-benefits is largely dependent on the ability and/or willingness of farmers and ranchers to commit financial resources to this effort (8). It is difficult to boost soil health quickly because agriculture management practices that sequester carbon are long-term processes. However, other environmental co-benefits from these practices, such as climate resilience, erosion prevention, and improving the soil's ability to absorb and hold water can be realized more rapidly, allowing soil to regenerate and boost nutrients (9). More information on carbon sequestration practices is included in Section 2.

WATER

According to the San Diego County Water Authority, 95 percent of water was imported by the Metropolitan Water District of Southern California in 1991. In an effort to diversify and secure the region's water supply, by 2020 about one third of the San Diego region's water will be supplied by the Metropolitan Water District, about one third by the Imperial Irrigation District Transfer, and the remaining one third of water will be supplied through local diversification of groundwater, recycled water, seawater desalination and conservation (10). The cost to diversify and secure the water supply has, however, resulted in a two-fold increase in water prices over the past 12 years, which makes the production of several water-intensive food crops financially challenging in San Diego county (11). Although the diversification of water supply by local agencies has helped to secure municipal water for agriculture, it is worth noting that San Diego county is currently in abnormally dry conditions despite the State of California no longer being in a drought since 2017. Regions with abnormally dry conditions experience some water deficits and a slowing of crop growth (12), so the availability of municipal water for agriculture becomes even more relevant for our region's agricultural production.

The State of California was in a drought from 2012 to 2016, where in early 2014, then Governor Jerry Brown declared a State drought emergency. In the State declaration, residents of California were urged to voluntarily reduce water usage by 20 percent and that individual municipalities would implement mandatory water restrictions (13,14). In response to the declaration, the San Diego County Water Authority implemented a "drought alert" which mandated water conservation up to 20 percent (15). Local growers and farmers who purchased water from local agencies did not face the

same restrictions as were experienced by residential and commercial users.

However, with the continuation of the drought, in early 2015, then Governor Jerry Brown issued an Executive Order (EO B-29-15) which mandated reductions in water use statewide, specifically, reducing water consumption in urban areas by 25 percent (16). In this case, farmers and growers in San Diego county experienced a mandatory 15 percent restriction in water use for the remainder of the drought.

In addition to potentially being affected by possible water usage restrictions during drought events, farmers operating in groundwater basins governed by the State of California's Sustainable Groundwater Management Act (Upper San Luis Rey, Borrego Valley, San Diego River Valley, and San Pasqual Valley) may be subject to new well-monitoring and pumping restrictions as a result of this regulation, in order to strengthen management and sustainability of local groundwater (17, 18).

In response to pressures on the cost and supply of water, farmers have invested in water use technology. For example, a San Diego county farmer adopted an automatic drip irrigation system along with wireless sensors in the soil of his avocado orchard, which enables the farmer to monitor and adjust the irrigation when necessary. With the implementation of this technology, the farmer is saving on water and overall production costs (2). Other innovative strategies to address water constraints is the use of hydroponics, or the production of food or plants without soil, and aquaponics which is a subset of hydroponics, where fish and plants are produced utilizing the methods of hydroponics and aquaculture (19). Through an aquaponics production system, a farmer in San Diego county is concurrently growing lettuce and tilapia fish. This production system allows the farmer to use less water as the soilless water that flows through the fish tanks carries nutrients and acts as a filter to the lettuce (2).

OCEAN

Ocean inputs support San Diego county's commercial fishing industry and aquaculture. Fish and shellfish (e.g., lobster, crabs, prawns, sea urchins, snails) are wild harvested, and at a smaller scale aquaculture is utilized for seafood (e.g., clams, mussels, oysters, seaweed) production which is grown in tanks on land or using gear (e.g., lines, racks, bags) in local coastal waters.

An estimated 21 acres of harbor water and 8.5 acres of waterfront land is dedicated to commercial fishing across the county's three commercial fishing harbors: San Diego Bay, Mission Bay, and Oceanside Harbor. These estimates total only about 4 percent of the water area and 1 percent of the land area that are potentially suitable for commercial fishing, but that are dedicated to other uses that have similar requirements. These other uses include operations and berthing by commercial marine sales and services, commercial recreational fishing and boating, and private sportfishing (20-22).

An estimated 2.5 acres of land and 25 acres of water of the 66-acre outer area of Agua Hedionda Lagoon in Carlsbad, are dedicated to commercial aquaculture for food production at the Carlsbad Aquafarm. An additional estimated 0.14 acres of water in San Diego Bay are dedicated to businesses piloting operations in hopes of establishing the production of shellfish and seaweed for food. An offshore fish farm, the Pacific Ocean Aquafarms Project (formerly Rose Canyon Fisheries) led by Hubbs Sea World Research Institute, has been proposed for a location three to four miles off of Mission Beach in Federal waters, but has not yet been permitted (20, 23).

The operational aquaculture facilities seem relatively small scale but estimating the water area that is potentially available for aquaculture is difficult and requires assessments of not only the physical and biological requirements of the farmed species and farm infrastructure, but also the needs of a multitude of other ocean users. A Preliminary Assessment Report with such analysis was recently conducted for the San Diego Bay and adjacent waters by the San Diego Ocean Planning Partnership concluding that 1,800 acres inside the bay and about 7,000 acres outside the bay were farmable; however, commercial fishing and environmental groups have concern over the amount and location of identified areas. Using only this San Diego Bay region information on potentially available area for aquaculture in San Diego (i.e., not including potential aquaculture sites in or adjacent to the county's other coastal waters), only about 0.3 percent (27.5 out of 8,800 acres) of available water area is currently utilized by aquaculture (24).

Although difficult to assess in absolute terms due to a lack of information on potentially useable land and water area in the entire San Diego region, the total area of San Diego coastal waters and adjacent waterfront land dedicated to commercial fishing and aquaculture is a relatively small fraction of potentially suitable area. Regulatory challenges surrounding seafood production, consumer choices (imports vs locally sourced seafood), and the community's decisions regarding competing water and waterfront land uses, all contribute to a seafood industry that operates well below its potential in San Diego county. The impacts of this are a loss of responsibly sourced food, job opportunities, and money. In 2019 the Southwest Fisheries Science Center revealed that between 1997-2016, San Diego county lost out on an average of 57,197 metric tons of seafood landings per year valued at $28.3 million per year to ports north of the county due to a lack of supporting infrastructure and resources in the San Diego region (25-27).

References

(1) National Oceanic and Atmospheric Administration (NOAA). US Department of Commerce. Aquaculture, Overview. https://www.fisheries.noaa.gov/topic/aquaculture

(2) Crop Statistics & Annual Report 2018. Department of Agriculture Weights and Measures, County of San Diego. https://www.sandiegocounty.gov/awm/crop_statistics.html

(3) Census of Agriculture, 2017 Census Volume 1, Chapter 2: County Level Data. United States Department of Agriculture (USDA), National Agriculture Statistics Service. https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_2_County_Level/California/

(4) University of California Cooperative Extension (UCCE), San Diego. Grower Needs Assessment for Sustainable Food Production in San Diego County. September 30, 2018. https://f2icenter.org/wp-content/uploads/2018/10/Growers-Needs-Assessment.pdf

(5) Unites States Department of Agriculture (USDA), Economic Research Service. Farming and Farm Income. https://www.ers.usda.gov/data-products/ag-and-food-statistics-charting-the-essentials/farming-and-farm-income/

(6) USDA SCSFS (United States Department of Agriculture, Soil Conservation Service and Forest Service). 1973. Soil Survey: San Diego Area, California. Available at: https://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/california/CA638/0/part1.pdf. Accessed 25 July 2019.

(7) County of San Diego and American Farmland Trust. 2009. San Diego County Farming Program Plan. Accessed 25 July 2019. Available at: https://www.farmlandinfo.org/sites/default/files/San%20Diego%20FPP.pdf

(8) Doran, John W. 2002. Soil health and global sustainability: translating

(9) Building a Climate Friendly San Diego from the Ground Up. San Diego County Farm Bureau, San Diego Food System Alliance, and Batra Ecological Strategies. May 2018. http://www.sdfsa.org/carbon-farming

(10) San Diego County Water Authority. Water Supplies. https://www.sdcwa.org/water-supplies; https://www.sdcwa.org/annualreport/2017/water-supply-reliability.php

(11) Voice of San Diego. 2017. San Diegans Pay Some of the Highest Water Rates in the State and Country by Ry Rivard. https://www.voiceofsandiego.org/topics/government/san-diegans-pay-some-of-the-highest-water-rates-in-the-state-and-country/

(12) National Integrated Drought Information System (NIDIS). Drought in California. https://www.drought.gov/drought/states/california?places=san+diego+county

(13) California Department of Water Resources. Water Basics: Drought. https://water.ca.gov/Water-Basics/Drought

(14) NPR. Jerry Brown Declares A Drought Emergency In California. 2014. https://www.npr.org/2014/01/17/263494972/jerry-brown-declares-a-drought-emergency-in-california

(15) KPBS. Drought-Stricken California Ramps Up Water Restrictions. 2015. https://www.kpbs.org/news/2015/mar/17/tougher-drought-regulations-expected-be-approved-c/

(16) Executive Order B-29-15 State of Emergency Due to Sever Drought Conditions. Economic Impact Analysis.2015.https://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/docs/emergency_regulations/econ_analysis.pdf

(17) California Department of Water Resources. SGMA Groundwater Management. https://water.ca.gov/Programs/Groundwater-Management/SGMA-Groundwater-Management

(18) County of San Diego Planning and Development Services. San Diego County Sustainable Groundwater Management. https://www.sandiegocounty.gov/pds/SGMA.html

(19) United States Department of Agriculture. National Agricultural Library. Production Practices. https://www.nal.usda.gov/afsic/production-practices-0

(20) Port of San Diego Master Plan. 2017. San Diego Unified Port District. https://pantheonstorage.blob.core.windows.net/waterfront-development/Port-Master-Plan.zip

(21) Mission Bay Master Plan Update. 2002. City of San Diego. https://www.sandiego.gov/sites/default/files/mb_park_master_plan.pdf

(22) Hill, T. 2011. Oceanside Harbor: San Diego County's Northernmost Anchorage. The Log: California's Boating and Fishing News. 21 Nov 2011. Available at: https://www.thelog.com/local/oceanside-harbor-san-diego-county-s-northernmost-anchorage/ Accessed 14 May 2019.

(23) Anderson, Erik. 2018. Port Hopes Seaweed Farm Takes Root In San Diego Bay. September 6 2018. KPBS. Available at: https://www.kpbs.org/news/2018/sep/06/port-hopes-seaweed-farm-takes-root-san-diego-bay/ Accessed 06 April 2019

(24) San Diego Ocean Planning Partnership. 2018. Preliminary Assessment Report. https://www.slc.ca.gov/wp-content/uploads/2019/02/SDOPP-Preliminary-Assessment-Report-December-2018.pdf

(25) Southwest Fisheries Science Center) 2019. Fact sheet: The Importance of Working Waterfronts to Providing a Sustainable Supply of Seafood to U.S. Consumers: A San Diego Example. NOAA. 11 February 2019.

(26) Talley, T. S., A. Batnitzky. 2014. Testing the feasibility of urban coastal direct seafood markets. Final report in fulfillment of a project funded by the Ocean Protection Council and Collaborative Fisheries Research West. https://caseagrant.ucsd.edu/sites/default/files/marketers%20summary_0.pdf

(27) Talley, T. S., H. Warde, N. Venuti. 2016. Local Seafood Availability in San Diego, California Seafood Markets. Future of Food: Journal on Food, Agriculture and Society 4 (2): 40-49. Available at https://caseagrant.ucsd.edu/sites/default/files/TalleyEtAl2016_FOFJ_SeafoodMkts.pdf

Resources

CAF (Carlsbad Aquafarm) 2017. Carlsbad Aquafarm, Inc. http://carlsbadaquafarm.com/

City of Carlsbad, Agua Hedionda Lagoon: https://www.carlsbadca.gov/residents/fun/lagoons/agua.asp

THDM (Tuna Harbor Dockside Market). 2017. Tuna Harbor Dockside Market. Available at: http://thdocksidemarket.com/new/index.html

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Photo by Tomoko Matsubayashi.

SECTION 2

FOOD PRODUCTION

WHAT IS THE ROLE OF FOOD PRODUCTION IN THE LOCAL ECONOMY?

San Diego county's Mediterranean climate and coastal setting allow for the local production and harvesting of food through a range of means including the year-round commercial cultivation of agricultural crops, animal husbandry (raising of cattle and calves for food production), commercial fishing, aquaculture, and urban farming.

Commercial agriculture is one of the largest industries in San Diego county and contributes significantly to the local economy with $1.8 billion in annual total sales (1) and a total economic impact of approximately $2.88 billion (2). According to the San Diego County 2018 Crop Statistics & Annual Report, there are 242,554 acres dedicated to commercial agricultural production in the county (1). Although 95 percent of agricultural land in San Diego county is dedicated to food production, only 30 percent of the total economic value of agriculture derived from food production. The remaining 70 percent of the total economic value of agriculture in San Diego county originated from nursery and cut flowers, which only makes up 5 percent of the total agricultural land (1).

Avocados, citrus, and vine-ripened tomatoes are the highest yielding edible crops grown in San Diego county and are largely shipped out of the region, while miscellaneous fruits and vegetables remain in local markets. The most common food products derived from animal husbandry in the region are eggs, followed by beef and dairy, though collectively livestock and poultry comprise less than 5 percent of the agricultural market in the region (1).

In densely populated areas of San Diego county, urban farmers are using innovative methods to produce hyper-local food on small plots of land that are integrated into the complex economic and ecological systems of cities. Most of these crops are sold to the public through community supported agriculture (CSA) shares or at local farmers' markets.

Dominated by the rise and subsequent fall of the tuna industry throughout the 20th century, commercial fishing operations in San Diego county currently harvest from the wild and land over 60 species valued at over $10 million annually (3,4). An additional $28 million is landed annually by San Diego county fishermen in ports north of the county but could be landed at home with improved waterfront infrastructure (5). Growing interest in fishermen's markets, like the Tuna Harbor Dockside Market, and other alternative marketing arrangements are helping to increase local availability of healthy food, strengthen demand for more of the region's diverse seafood products, and revitalize the industry (3, 6).

Commercial aquaculture, or the farming of seaweeds, fish and/or shellfish in tanks on land or in coastal waters, is a relatively young industry in the region. Only one commercial aquaculture facility in San Diego county produces food (oysters, mussels, clams and red ogo seaweed) for human consumption (7). There are two pilot businesses supported by the Port of San Diego's incubator program that are actively exploring the feasibility of growing seaweeds and shellfish in the San Diego Bay. Additionally, one offshore fish farm is proposed for three to four miles off the coast of Mission Bay.

WHAT FOODS ARE PRODUCED?

2018 TOTALS OF FOOD PRODUCTION*

Crop	Acres	Number of Head	Tons	Total Value
Fruit and Nut Crops	33,049	NA	208,372	$322,949,527
Vegetable and Vine Crops	3,217	NA	26,583	$131,260,784
Livestock and Poultry	NA	13,244	NA	$18,759,533
Apiary Products	NA	NA	NA	$3,437,378
Livestock and Poultry Products (Milk, Eggs)	NA	NA	NA	$40,825,539
TOTAL	36,266	13,244	234,955	$517,232,761

* For more information on specific crop categories, please refer to the County of San Diego Department of Agriculture Weights and Measures' Crop Statistics & Annual Report 2018. https://www.sandiegocounty.gov/content/dam/sdc/awm/docs/2018_Crop_Report_web.pdf

2018 TOP FOOD CROPS

Avocados	$121,038,020
Lemons	$70,103,338
Tomatoes	$60,996,624
Oranges	$43,063,782
Eggs, Chicken Market	$33,371,691

HOW IS FOOD PRODUCED IN SAN DIEGO COUNTY?

COMMERCIAL AGRICULTURE AND FARMING METHODS IN SAN DIEGO COUNTY

In 2017, approximately 94 percent of farm business in San Diego county had a value of sales under $250,000, which is consistent with small farming operations (8). Approximately 91 percent of farms in the county are under 50 acres, and about 70 percent of the total farms are less 10 acres, well below state averages, highlighting the prevalence of small farms in San Diego county (8).

In 2018 the University of California Cooperative Extension (UCCE) released the Growers' Needs Assessment for the San Diego region which found that among survey respondents, the majority (78 percent) of farmers in San Diego county are full owners, with about half of the farms operating as sole proprietors (48 percent). About one fourth (28 percent) of respondents use lease agreements and about half (52 percent) use hired labor in their farm operations (9).

According to the 2017 Census of Agriculture, San Diego county has the highest concentration of organic farmers in the

United States with more than 350 U.S. Department of Agriculture Certified Organic growers generating over $71 million in total organic product sales (1,8). According to the 2018 UCCE survey, 36.4 percent of farmers are involved with organic agriculture production to some degree whether as certified organic (16.23 percent); organic but not certified (17.98 percent); or transitioning to organic (2.19 percent). However, the majority of farmers continue to use conventional farming practices (9).

Nearly nine percent of farmers report using controlled environment agriculture methods and ten percent indicate using a mix of production systems (9). For example, a farm can utilize both field-grown organic products and hydroponics; or nursery potted farming along with aquaponics; or any other permutation of combining methods. Hydroponics is the production of food or plants in a solution of nutrients without soil, and aquaponics is a subset of hydroponics where fish and plants are produced utilizing the methods of hydroponics and aquaculture (10). Hydroponics allow for farmers to decrease water usage, use less land and soil, and control the environment to eliminate the need to use pesticides (1). The controlled environment segment has great potential and has seen a tremendous increase over the past few years as growers work to intensify their farms to increase productivity.

URBAN AGRICULTURE IN SAN DIEGO COUNTY

Urban agriculture includes the production, distribution, and marketing of food and other products within the cores of metropolitan areas and at their edges.

Examples of urban agriculture include:

- Community, school, backyard and rooftop gardens with a purpose extending beyond home consumption and education.
- Urban market gardens.
- Innovative food-production methods such as aquaponics that maximize production in small areas.
- Community supported agriculture based in urban areas.
- Family farms located in metropolitan greenbelts.

The most striking feature of urban agriculture, which distinguishes it from agriculture in rural contexts, is that it is integrated into the urban economic and ecological system. Such linkages include the employment of urban residents as laborers, use of typical urban resources (like organic waste as compost and urban wastewater for irrigation), direct links with urban consumers, direct impacts on urban ecology (positive and negative), being part of the urban food system, competing for land with other urban functions, and being influenced by urban policies and plans.

Urban agriculture provides benefits for communities by generating positive impacts in the following realms:

- Social impacts: Creates safe places, reduces blight, provides access to land, promotes community development, builds social capital, provides education and youth development opportunities, and enhances cross-generational and cultural integration in neighborhoods.
- Health impacts: Increases food access and security, fruit and vegetable consumption, food and health literacy, general well-being (mental and physical health).
- Economic impacts: Provides job creation and training, business incubation, market expansion for farmers, economic savings on food, and increased home values.
- Environmental impacts: Contributes to improved soil quality, reduction of storm water runoff, improved air quality, reduction of urban heat island effect, increased biodiversity, reduced carbon emissions, and waste reduction.

In San Diego county, urban farmers grow a range of vegetables, fruits, grains, honey, and other edible crops on small parcels of land that average less than an acre in productive areas. Most urban farming operations in the county are non-profit organizations and report gross sales of less than $25,000 per year. The Urban Growers' Collaborative Project managed by the University of California, San Diego Center for Community Health is working to coordinate efforts between urban farming operations to increase efficiency and better meet market demand (12).

New for-profit urban farms have emerged all around the county in the last few years, indicating interest and demand from both consumers and entrepreneurs in investing in San Diego county's local food system. Additionally, some for-profit urban farming ventures show promise as a tool for social equity in our local food system as demonstrated by an urban farm that includes a CSA that serves low-to-moderate income Latino families in the South Bay and City Heights.

COMMERCIAL FISHERIES IN SAN DIEGO COUNTY

Commercial fishing in San Diego county is, by default, urban because of the location of the fishing harbors along the coast in heavily populated areas and the subsequent ties with the urban economic, social, and ecological system. According to the California Employment Development Department, there are approximately 20 relatively small-scale fishing operations in San Diego county, many are largely owned and operated by individual families (13). This is reflected in the predominance of the small-sized fishing vessels (60' or less) that populate scenes of local fishing harbors. A variety of fishing techniques are used to land 60-70 species, including pots and traps, hook and line, seines and nets, and hand collections while diving. All methods comply with strict regulations and science-based management (e.g., seasonal closures, catch limits, gear modifications) meant to safeguard against overharvest of stocks, capture of bycatch (species not intended to be caught through fishing activity), and environmental impacts, making San Diego county's local catch some of the most responsibly sourced in the world (14-16).

ACTION SPOTLIGHT

CLIMATE SMART AGRICULTURE

AND THE ROLE OF COMMERCIAL FARMERS IN REDUCING GREENHOUSE GASES

Carbon pollution in the atmosphere contributes to climate change, but it also is the foundation that makes up all living things. Carbon farming, also known as climate-smart agriculture, is a set of farming and ranching practices that trap carbon in the soil, turning carbon pollution in the atmosphere into the forms of carbon that build and nourish living things. Examples of these practices include mulching, cover cropping, no-till or low-till row crops, compost application to croplands and rangelands, and permanent crops such as orchard trees, bushes, and vines. Carbon farming reduces greenhouse gas emissions, as well as prevents erosion, increases soil fertility, and builds climate resilience (11).

The commercial agriculture industry generates approximately 163,692 metric tons of carbon dioxide equivalents, which accounts for 5 percent of the greenhouse gas emissions in San Diego county. This includes emissions from livestock, fertilizer use, and equipment. Climate-smart agricultural and ranching practices have the potential to significantly offset these emissions while improving soil health, reducing water use, increasing crop yields, improving livestock health, and protecting lands against the threat of wildfires.

San Diego county is poised to be a strong leader in climate-smart agriculture and the San Diego Carbon Farming Task Force, a coalition led by the San Diego Food System Alliance (SDFSA), which includes farmers, non-profits, and government agencies, has a vision to be a key partner in developing a resilient, climate-friendly region. The Task Force has developed an action plan that is intended to overcome barriers to the adoption of climate-smart agricultural practices by improving education, building partnerships, and demonstrating best practices.

COMMERCIAL FARMERS AS ENVIRONMENTAL STEWARDS

The role of farmers as stewards of the land and catalysts to slow down the impacts of climate change is not fully recognized and is underappreciated. The 2018 UCCE survey results demonstrate that farmers are consciously willing to adapt and to adopt practices that will enhance the environment and make the region more resilient against climate change. Sixty five percent of respondents of the survey indicated they are adopting a number of conservation practices in their farm operations, including but not limited to mulching (26.34 percent), compost application (21.68 percent), and no-till or reduced-till (17.38 percent). The most important benefits cited by farmers to justify the adoption of these practices include drought resistance (20.12 percent), environmental stewardship (18.67 percent), and yield improvements (17.01 percent) (9).

Increasing the understanding and appreciation for the contributions that farmers make to the environment and quality of life in San Diego county is critical to developing programs and incentives that will ensure agriculture remains viable for the benefit of all.

According to the 2018 County of San Diego Climate Action Plan (CAP) emissions from agricultural equipment accounted for 52 percent of all agricultural emissions in 2014. Most agricultural equipment, such as tractors and pumps, are petroleum-diesel-powered. The CAP includes strategies that support the conversion of such equipment to fuels with lower carbon emission rates, such as renewable diesel, compressed natural gas, and electric equipment. Currently, the San Diego County Air Pollution Control District provides financial incentives to convert gas and petroleum diesel-powered farm equipment to electric-powered equipment.

According to data provided by the California Department of Fish and Wildlife (CDFW), approximately 165 commercial fishing vessels are registered in the county annually, though not all boats are actively fishing throughout the year (4).

AQUACULTURE IN SAN DIEGO COUNTY

The Carlsbad Aquafarm at the Agua Hedionda Lagoon has a 50-year history of shellfish and seaweed production and research conducted by farm staff and academic partners. The lagoon is approximately 390 acres and is divided into 3 sections where the area dedicated to aquafarming totals 66 acres. The Carlsbad Aquafarm grows oysters and mussels on suspended lines and in submerged trays above the seafloor, where the shellfish are protected and have access the nutrient rich tidal flows of the Pacific Ocean. Products from the farm are sold in markets throughout Southern California (7).

WHO PRODUCES FOOD IN SAN DIEGO COUNTY?

THE TYPICAL COMMERCIAL FARMER IN SAN DIEGO COUNTY

Based on the 2018 UCCE survey, the typical farm owner and/or operator in San Diego county is a white male over the age of 50 with at least a 4-year college level education and almost 20 years of farming experience. More than seventy percent of farm producers in San Diego county are males (9), though the region still ranks first in California in the number of farms with a female principal producer (8). Approximately 70 percent of farmers identified themselves as white (not of Hispanic origin); while Hispanic or Latino (8.88 percent) and Asian (5.4 percent) comprise the two next largest single race groups of farmers (9).

Over 50 percent of farmers are 61 or older and may be on their way to retirement (9). Enacting policies and developing strategies that will encourage and facilitate access to land and other productive resources by younger farmers is not only needed but critical to sustain agriculture as a viable industry in the county.

Survey respondents identified profitability as the most important motive influencing their decision to farm. However, other factors like environmental stewardship and lifestyle or quality of life are also important drivers.

In contrast to farm owners and/or operators, farm workers are primarily Latino, young, and born outside of the United States. They represent the majority of the workforce in agriculture, especially in San Diego county where the cultivation of citrus, avocado, tomatoes, berries, and other fruits and vegetable crops requires significant labor inputs. According to 2017 U.S. Census data, among the 12,677 people employed in agriculture, forestry, and fishing in San Diego, over 10,500 (83 percent) are hired laborers working for wages for someone else (17). We return to this issue in section 7.

THE TYPICAL URBAN FARMER IN SAN DIEGO COUNTY

Based on a 2017 survey conducted by the University of California, San Diego Center for Community Health, the typical urban farmer in San Diego county is a white female in her mid-30s who has been farming for approximately 5 years (12).

THE TYPICAL COMMERCIAL FISHERMAN IN SAN DIEGO COUNTY

Based on anecdotal reports from San Diego county and a 2007 report from Santa Barbara, the typical commercial fisherman is a white male in his mid-50s who has been fishing for about 25 years. Not including crew, only 10 percent of fishermen were less than 40 years old in 2007 (18).

The annual workforce that is required to operate commercial fishing vessels is difficult to calculate as crewmembers are often hired on a contract basis. Based on the number of fishing licenses issued by CDFW, as many as 800 people could be employed in the commercial fishing industry each year. The estimated earnings (total payroll) of an average fishing operation has ranged between $150,000 – $200,000 annually since 2010, according to California Employment Development Department (13).

WHAT ARE THE CHALLENGES FOR FOOD PRODUCERS IN SAN DIEGO COUNTY?

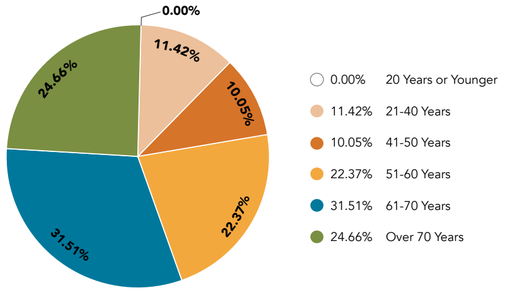
FOR COMMERCIAL AGRICULTURE

Factors directly impacting profitability or the ability to conduct business are considered the major challenges to local commercial agriculture. Respondents of the 2018 UCCE survey identified the actual costs of doing business, laws and regulations, business planning and record-keeping, and regulations related to labor as their main challenges (9). The most important issues and challenges related to markets and marketing include sale prices, direct marketing opportunities, marketing alternatives, and trade or foreign competition.

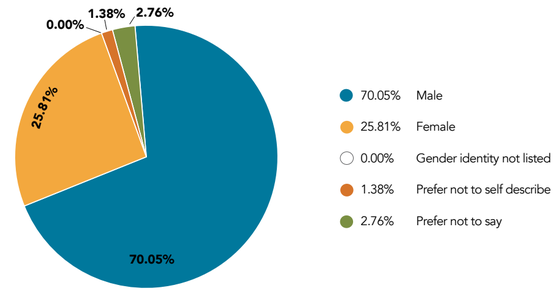
On the production side, water and irrigation management, soil and fertility management, plant diseases, and pest control strategies are the most important issues and challenges identified (9). Climate change may have an increased impact to these production challenges. Specifically, through increased heat and changing precipitation patterns, loss of farmland and rangeland due to wildfires, diminishing water supply, higher water costs which leads to a change in viable crop types and possible crop losses, and a decrease in water holding capacity in soil which leads to increased runoff and risks of floods and mudslides (11). Moreover, an increased concertation of carbon dioxide, warmer temperatures, and wetter climates are preferred for pests and plant diseases. According to the California Department of Food & Agriculture, with the changing

SAN DIEGO COUNTY FARMERS

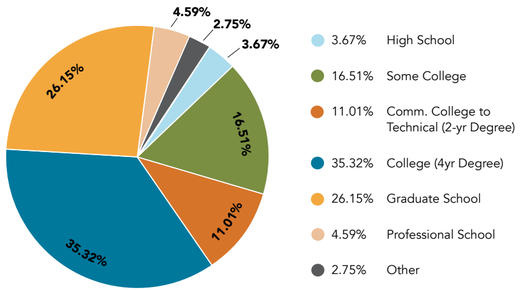
AGE



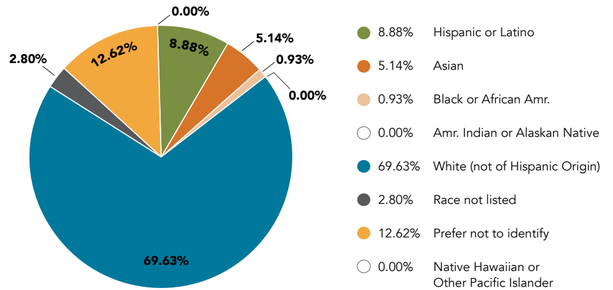
GENDER

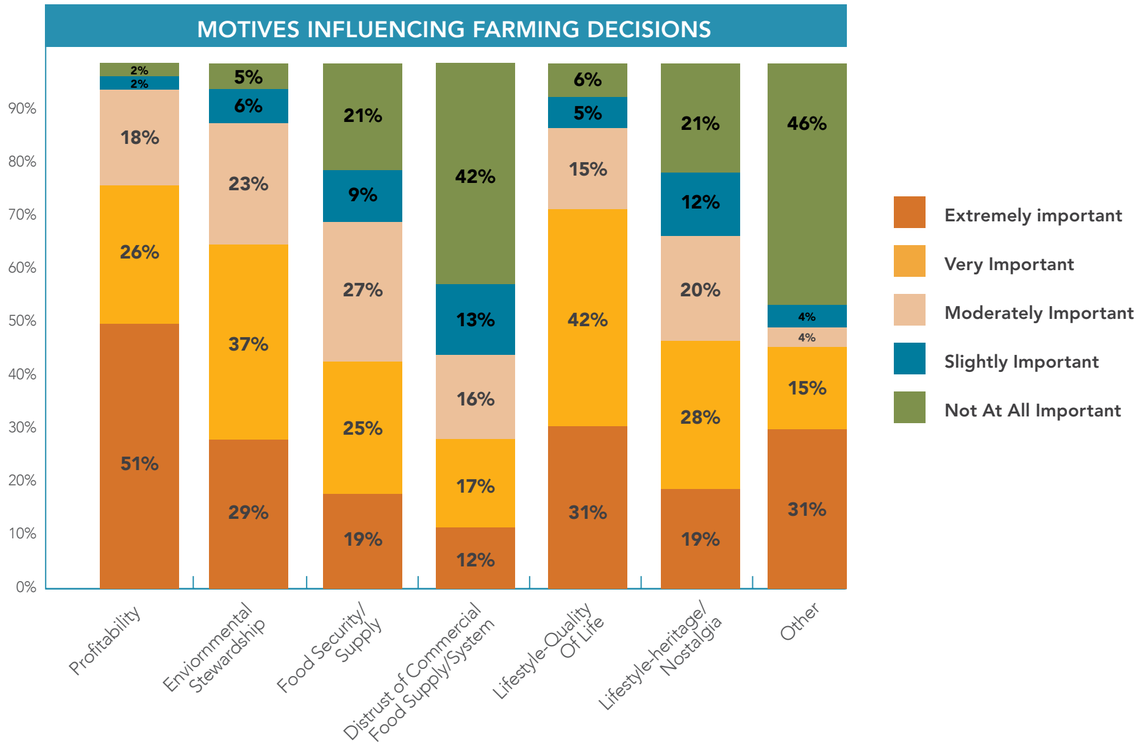


EDUCATION



ETHNICITY





climate, it is widely acknowledged that an increase in pest infestations may occur in California due to climate change. Therefore, pest and plant disease management and programs may shift and/or increase to adapt to changes (19).

FOR URBAN AGRICULTURE

The following factors present challenges for urban agriculture:

- The high cost of real estate makes urban land inaccessible and/or insecure (leasing) for most urban farmers.
- The high cost of water metered at residential rates is a barrier to economic farm viability.
- The inability to serve medium to large distribution channels due to lack of volume/coordination and lack of aggregation infrastructure and support amongst urban farmers.
- The diversity of policies related to urban agriculture throughout San Diego county's 19 jurisdictions and a lack of centralized resources/technical assistance on policy is an entry and expansion barrier for urban farmers.
- The lack of aggregated and updated resources to meet the needs of would-be and existing urban farmers.

FOR COMMERCIAL FISHING AND AQUACULTURE

Challenges in the San Diego region and across the state include a lack of public awareness of local sourcing and products, a shortage of waterfront and city-wide seafood system infrastructure, regulatory limitations, and a lack of workforce training and development which is needed to step into continued growth (18, 20-22). The uncertain but impending challenges associated with a changing climate and ocean will likely result in shifts in the year-to-year and longer-term abundances and distributions of stocks, as well as interfere and potentially disrupt fishing operations at sea and along the waterfront (i.e., impacts of increased storms and sea level rise) (23).

While fisheries' resources are abundant, the current conservative and strict regulatory structure may limit access to some viable fisheries' resources and fishing grounds. Regulatory structures could be more flexible (adaptable) to increase resiliency in the face of a changing climate. For example, permit costs can be prohibitive in limiting equitable access to some fisheries, and fishery specific permits limit the ability to diversify catch, which would reduce the likelihood of depletion of particular species and provide a greater variety of fresh seafood products (24). Collaborative work is necessary to overcome barriers, seek opportunities, market products together, and benefit from economies of scale.

For aquaculture, it is difficult to site facilities due to demands on shoreline and ocean space, and difficult to permit facilities because of environmental and safety concerns, and the many challenging and complex requirements from multiple agencies. Comprehensive and inclusive planning, including all ocean and waterfront users, regulators, managers, scientists, and aquaculture interest is necessary.

WHAT ARE THE OPPORTUNITIES FOR FOOD PRODUCERS IN SAN DIEGO COUNTY?

FOR COMMERCIAL FARMING

San Diego growers continue to thrive despite challenges caused by increased water

costs, labor shortages, and pest pressures by applying new technology, conducting experimental field trials, and producing niche commodities that are attractive to the county's ethnically diverse population or those looking for something new to eat.

The following efforts to apply innovative strategies in order to diversify and increase crop yields demonstrate opportunities for commercial agriculture:

- Extensive research and increasing amounts of planted acreage of tree crops are devoted to "dense" planting. The practice puts more trees in production per acre than previous practices. Outcomes include increased production per acre, reduced labor per unit produced, and reduced water use per unit produced.
- Experimental plantings that could lead to established commercial production is taking place with coffee, dragon fruit (pitahaya), olives, mandarins, and other crops.

FOR URBAN AGRICULTURE

Several technical assistance providers have recently emerged to address the needs of urban farmers in San Diego county. These include both new organizations and collaborations between existing resource providers. Some examples include the South San Diego Small Business Development Center's Business of Farming Course, Seeds @ City, SDFSA Urban Agriculture Working Group, and the Urban Growers' Collaborative Project. The Urban Growers' Collaborative Project is an example of collaboration and coordination between urban farmers to meet market demand more efficiently together and to develop multi-farm CSAs serving low-to-moderate income consumers and/or consumers living in areas without convenient access to affordable, high-quality, local produce options.

Land use policies and regulations could be modified to accommodate more urban agriculture. For instance, the Urban Agriculture Incentive Zones Act is a California bill originally passed in 2014 (AB 551) and recently extended to 2029 (AB 465). The Act is being implemented in the City of San Diego and the City of Chula Vista to offer tax incentives to private landowners willing to lease vacant land (up to 3 acres) to urban farmers for a minimum of 5 years (25, 26). New housing developments are also including plans for urban agriculture components.

FOR COMMERCIAL FISHING AND AQUACULTURE

The diversity of seafood resources in the waters of San Diego county are probably the greatest natural opportunity for the seafood industry. Harvesting lightly across an array of species reduces the risks of impacting stocks, increases our ability to respond to climate change challenges, and provides a more stable business model (23, 24, 27, 28).

Diversity of the harvested products also provides more choices for consumers, contributing to healthier diets. These rich ocean resources converge with several recent actions to contribute to the responsible growth of the seafood industry in San Diego, including rebounding fish stocks, such as rockfishes, and the exploration of new sustainable fisheries and aquaculture products (e.g., native clams and seaweeds). Other opportunities include the 2015 State legislation (AB 226), dubbed Pacific to Plate, which streamlines the process for permitting and operating fishermen's markets and the development of a program to train new fishermen (29).

Additionally, the Seaport development in downtown San Diego will feature one of the county's last working fishing harbors, Tuna Harbor, as a centerpiece of the development. Commercial fishermen and Protea Waterfront Development, along with the Port of San Diego, are working together to create a world class fishing harbor that could help to address many of the infrastructure needs identified that are currently limiting the seafood system in San Diego (30). Further, consumers (and the food service industry) are providing opportunities for growth through strengthening of local and healthy food movements, and growing interest in local fisheries, fishermen, and fishermen's markets as reflected by recent local media coverage, including Edible San Diego, KCET's Food and Living, Sunset Magazine, San Diego Reader, and San Diego Magazine (31 – 37). The following strategies provide further opportunities to increase public awareness about locally sourced fish and seafood:

- Provide more information to the public about what species are sourced locally and how to prepare them.
- Encourage consumers to visit the local fishermen's market, ask for local seafood at restaurants and markets, and try local seafood that may be novel to them.
- Provide information to the public that addresses common concerns surrounding fishing and aquaculture (e.g., environmental impacts and health concerns).
- Provide more information and conduct public outreach about the strict U.S. regulations surrounding environmental issues, food safety, and workers' rights that make domestic seafood some of the most responsibly sourced in the world.

ACTION SPOTLIGHT

SAN DIEGO COUNTY

DEPARTMENT OF AGRICULTURE, WEIGHTS AND MEASURES (AWM)

The San Diego County's Department of Agriculture, Weights and Measures (AWM) protects the food supply by trapping, identifying, excluding, and eradicating harmful agricultural organisms that threaten residential and commercial agricultural produce. One of the biggest threats to local agriculture is the spread of invasive pests on plants and produce imported into San Diego county from both domestic and international points of origin.

In order to prevent the spread of pests, and protect the region's agriculture and the environment, AWM maintains and manages the following resources and programs:

High-Risk Pest Exclusion Program

Inspects thousands of plant shipments coming into the county each year to ensure they are free from plant pests and diseases that threaten agriculture and the environment. Halting the introduction of harmful and poisonous pests not only reduces their destructive effects on food and ornamental crops, but also lessens the need for agricultural quarantines on local industry.

Agricultural Detector Dog Team Program

The program supports the statewide pest prevention network via parcel shipments by using well trained detector dogs at parcel facilities. Part of the statewide 14 teams, AWM's two dog teams are trained to effectively and efficiently find parcels containing plant materials and agricultural products which are then subjected to inspections. The teams work at various terminals such as FedEx, UPS and the U.S. Post Offices throughout the region. The teams also conduct outreach to educate and serve as ambassadors in the community.

Pest Detection Program

Specialists place traps in fruit trees in residential yards throughout the county and check them on a regular basis as defense against the introduction and spread of agricultural pests, such as invasive fruit flies, Light brown apple moth (LBAM), Asian citrus psyllid (ACP), Japanese beetle, and Gypsy moth. Early detection of these pests allows for prompt eradication efforts to begin before pests multiply and spread.

Pesticide Regulation Program

AWM enforces State pesticide laws and regulations. AWM inspectors work to ensure pesticides are used in a safe and legal manner while protecting human and animal health, as well as the environment.

Emergency Quarantine Projects

AWM collaborates with State and federal agencies, industry, stakeholders, and the public on emergency quarantine projects to eradicate or prevent the spread of pests of agricultural economic importance. Current quarantines in the region are for the LBAM and the ACP. Federal and State quarantines are established to protect agricultural trade when specific agricultural pests or diseases are detected. The goal of agricultural quarantines is to prevent the spread of pests and diseases as early as possible to ensure local growers can continue to market and ship their commodities to other counties, states, and countries.

Citrus Quarantine Program

This program protects the sustainability of citrus production by preventing the artificial spread of the ACP that transmits the devastating disease of citrus called Huanglongbing (HLB). ACP and HLB threaten San Diego county's $151.7 million citrus industry. AWM inspects hundreds of citrus growers, packers, transporters, and fruit sellers to ensure compliance with quarantine laws and regulations. AWM conducts outreach to enhance the public growers' awareness and provide information about the spread of the pest's devastating plant disease.

Entomology and Plant Pathology Diagnostic Labs help local growers, agricultural professionals, and county residents to appropriately control pests in a timely, safe and effective manner by providing suspect pest determinations at no charge for the public and growers.

Honey Bee Protection Program

This program promotes responsible hobbyist and commercial beekeeping and ensures public safety through outreach, best management practices, beekeeper registration, and compliance monitoring.

Other Programs:

AWM promotes agriculture by ensuring there is fairness and equity in the marketplace through inspections that verify produce maturity, certification of organic or local production, and through outreach efforts to help local producers on how to maintain compliance with laws and regulations and where to locate resources. Inspection programs ensure that our San Diego county farmers are not faced with unfair competitive disadvantages.

The Direct Marketing Program certifies producers and market locations which come together to create Certified Farmers' Markets. These markets bring the consumer face-to-face with local farmers connecting the consumers with their food source and producer. AWM assists those who are seeking to establish a Certified Farmers' Market and encourages farmers' market operators to accept Electronic Benefit Transfer, expanding the availability of fresh, locally grown fruits and vegetables to underserved communities.

AWM partners with the County Department of Public Works' Watershed Protection Program and the University of California Cooperative Extension, leveraging resources and knowledge to ensure protection of the environment and agricultural sustainability.

References

(1) Crop Statistics & Annual Report 2018. Department of Agriculture Weights and Measures, County of San Diego. https://www.sandiegocounty.gov/content/dam/sdc/awm/docs/2018_Crop_Report_web.pdf

(2) Economic Contributions of San Diego County Agriculture. County of San Diego, Department of Agriculture Weights and Measures. https://www.sandiegocounty.gov/content/dam/sdc/awm/docs/SDAgImpact.pdf

(3) California Sea Grant. 2019. California Seafood Profiles. Web. https://caseagrant.ucsd.edu/seafood-profiles/

(4) California Department of Fish and Wildlife. 2019. Annual commercial fishing licenses and fishing vessel registrations. Database queried and data provided by Valerie Taylor, CDFW, Los Alamitos, CA. 11 January 2019.

(5) Southwest Fisheries Science Center) 2019. Fact sheet: The Importance of Working Waterfronts to Providing a Sustainable Supply of Seafood to U.S. Consumers: A San Diego Example. NOAA. 11 February 2019.

(6) MYC (Market Your Catch). 2014. Alternative marketing of your catch. California Sea Grant and U.C. Santa Barbara. http://marketyourcatch.msi.ucsb.edu/ Accessed 10 January 2019.

(7) Carlsbad Aquafarm. 2017. Carlsbad Aquafarm, Inc. web. http://carlsbadaquafarm.com/

(8) Census of Agriculture, 2017 Census Volume 1, Chapter 2: County Level Data. United States Department of Agriculture (USDA), National Agriculture Statistics Service. https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_2_County_Level/California/

(9) Lobo, R. Koundinya, V., Gonzales, J. and Xu, W.Q. (2018) Grower Needs Assessment for Sustainable Food Production in San Diego County. University of California Cooperative Extension (UCCE), San Diego, CA. https://ucanr.edu/sites/cetest/files/293157.pdf

(10) United States Department of Agriculture. National Agricultural Library. Production Practices. https://www.nal.usda.gov/afsic/production-practices-0

(11) Building a Climate Friendly San Diego from the Ground Up. San Diego County Farm Bureau, San Diego Food System Alliance, and Batra Ecological Strategies. May 2018. http://www.sdfsa.org/carbon-farming

(12) University of California, San Diego Center for Community Health (2017). Urban Growers' Collaborative Project Phase One Report. https://ucsdcommunityhealth.org/wp-content/uploads/2017/12/UCSD-CCH-Urban-Growers-Collab-Phase-1-Report-2017.pdf

(13) California Employment Development Department. 2018. Quarterly Census of Employment and Wages. Available at: https://www.labormarketinfo.edd.ca.gov/qcew/cew-select.asp.

(14) NOAA Fishwatch. 2019. Fishwatch: U.S. Seafood Facts. https://www.fishwatch.gov/sustainable-seafood/the-global-picture Accessed 01 May 2019

(15) California Sea Grant. 2011. Discover California Commercial Fisheries. Web. https://caseagrant.ucsd.edu/project/discover-california-commercial-fisheries

(16) Tune Harbor Dockside Market. thttp://thdocksidemarket.com/new/index.html

(17) Figures computed by Pascale Joassart-Marcelli using the United States Census. 2019. American Community Survey 5-Year Estimates (2013-2017). US Census Bureau. Department of Commerce.

(18) Culver, Carolynn, John Richards, Caroline Pomeroy. 2007. Commercial Fisheries of the Santa Barbara Channel and Associated Infrastructure Needs. California Sea Grant Publication T-062. 101 pp. https://caseagrant.ucsd.edu/publication/commercial-fisheries-of-the-santa-barbara-channel-and-associated-infrastructure-needs

(19) California Department of Food & Agriculture. Horizon Water and Environment. 2014. Statewide Plant Pest Prevention and Management Program – Final Program Environmental Impact Report.December. (HWE 11.001) Oakland, CA. https://www.cdfa.ca.gov/plant/peir/docs/final/Volume-1_Main-Body.pdf

(20) Talley, T. S., H. Warde, N. Venuti. 2016. Local Seafood Availability in San Diego, California Seafood Markets. Future of Food: Journal on Food, Agriculture and Society 4 (2): 40-49. Available at https://caseagrant.ucsd.edu/sites/default/files/TalleyEtAl2016_FOFJ_SeafoodMkts.pdf

(21) Pomeroy, Caroline., Cynthia J. Thompson, Melissa M. Stevens. 2010. California's North Coast Fishing Communities. Historical Perspective and Recent Trends. Final Report to the California State Coastal Conservancy. California Sea Grant Publication T-072. Pp 340. https://escholarship.org/uc/item/6993f78b

(22) Soto, M. 2018. Have we achieved "Ocean to Plate"? Determining the availability of San Diego-sourced seafood in the city's seafood restaurants. Capstone Project in partial fulfilment of the Master's in Advanced Studies in Marine Biodiversity and Conservation. Scripps Institution of Oceanography. Available at: https://escholarship.org/uc/item/56s893bx

(23) Chavez, F. P., C. Costello, D. Aseltine-Neilson, H. Doremus, J.C. Field, S.D. Gaines, M. Hall-Arber, N.J. Mantua, B. McCovey, C. Pomeroy, L. Sievanen, W. Sydeman and S.A. Wheeler (California Ocean Protection Council Science Advisory Team Working Group). 2017. Readying California Fisheries for Climate Change. California Ocean Science Trust, Oakland, California, USA. http://www.oceansciencetrust.org/wp-content/uploads/2016/06/Climate-and-Fisheries_GuidanceDoc.pdf

(24) Anderson, S., E.J. Ward, A.O. Shelton, M.D. Adkison, A.H. Beaudreau, R.E. Brenner, A.C. Haynie, J.C. Shriver, J.T. Watson and B.C. Williams. 2017. Benefits and risks of diversification for individual fishers. PNAS https://doi.org/10.1073/pnas.1702506114

(25) Assembly Bill No. 551: Urban Agriculture Incentive Zones. 2013-2014

http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140AB551

(26) Assembly Bill No. 465: Urban Agricultural Incentive Zones. 2017-2018. California Legislative Information. https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180AB465

(27) Klinger D., R. Naylor. 2012. Searching for solutions in aquaculture: charting a sustainable course. Annual Review of Environment and Resources 37: 247.

(28) Neori A., A.M. Nobre. 2012. Relationship between trophic level and economics in aquaculture. Aquaculture Economy and Management 16: 40–67.

(29) Assembly Bill No. 226: Retail Food Safety: Fishermen's Markets. (Pacific to Plate). California Legislative Information. https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201520160AB226

(30) iNewsSource. 2018. Seaport developer, fishermen reach deal to help save San Diego's storied fishing industry. Brad Racino. 24 October 2018. https://inewsource.org/2018/10/23/seaport-san-diego-fishermen-agreement/

(31) Edible San Diego. 2015. Schooled on Fish: Shift to sustainability helps local seafood industry thrive. July-August 2015. By: M. Steiger

(32) KCET. 2016. As Fresh As It Gets: A Fish Market Run by Local Fishermen. Food and Living, KCET. By C. Wei. https://www.kcet.org/food-living/as-fresh-as-it-gets-a-fish-market-run-by-local-fishermen (01 Nov 2016)

(33) Sunset Magazine. 2017. Ocean to Table. February 2017. By Claire Leschin-Hoar.

(34) San Diego Reader. 2018. Places: Tuna Harbor Dockside Market. https://www.sandiegoreader.com/places/tuna-harbor-dockside-market/#

(35) San Diego Magazine. A Deep Dive into the San Diego Fishing Industry. San Diego Magazine. 31 July 2019. By T. Johnson. https://www.sandiegomagazine.com/San-Diego-Magazine/August-2019/A-Deep-Dive-into-the-San-Diego-Fishing-Industry/

(36) San Diego Union Tribune. 2014. Fish market lands big catch of customers. 02 August 2014. By: B. Sykes. https://www.sandiegouniontribune.com/business/growth-development/sdut-tuna-harbor-dockside-market-urchins-san-diego-2014aug02-htmlstory.html

(37) San Diego Union Tribune. 2019. Tuna Harbor fish market celebrates city's fishing heritage, local catch. 18 May 2019. By: G. Moran. https://www.sandiegouniontribune.com/lifestyle/food-and-cooking/story/2019-05-18/tuna-harbor-fish-market-celebrates-citys-fishing-heritage-local-catch

Resources

County of San Diego 2018 Climate Action Plan: https://www.sandiegocounty.gov/content/dam/sdc/pds/advance/cap/publicreviewdocuments/PostBOSDocs/San%20Diego%20County%20Final%20CAP.pdf

Golden, S. (2013). Urban agriculture impacts: Social, health, and economic: A literature review

Knizhnik, H.L. (2012) The environmental benefits of urban agriculture on unused, impermeable and semi-permeable spaces in major cities with a focus on Philadelphia, PA.

Lobo, R. and Gonzales, J. (2019). San Diego County agriculture… not your average farm! San Diego Grown (Winter 2019). San Diego County Farm Bureau. 8-10.

RUAF Foundation: a global partnership on sustainable, urban agriculture: https://www.ruaf.org/

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SECTION 3

FOOD MANUFACTURING AND PROCESSING

WHAT IS FOOD MANUFACTURING AND PROCESSING?

The Food Manufacturing and Processing Industry is an important sector of the overall food system. Food manufacturing and processing operations transform raw ingredients like livestock and agricultural crops into edible products for consumption. Groups within the food manufacturing industry are distinguished by the raw animal or vegetable materials that are processed into food products.

According to the U.S. Bureau of Labor Statistics, subsector industry groups include: Animal Food Manufacturing, Grain and Oilseed Milling, Sugar and Confectionery Product Manufacturing, Fruit and Vegetable Preserving and Specialty Food Manufacturing, Dairy Product Manufacturing, Animal Slaughtering and Processing, Seafood Product Preparation and Packaging, and Bakeries and Tortilla Manufacturing (1).

WHAT DOES FOOD MANUFACTURING AND PROCESSING LOOK LIKE IN THE SAN DIEGO REGION AND WHAT ARE THE CURRENT TRENDS IN THIS INDUSTRY?

According to the Economic Contributions of San Diego County Agriculture report, the majority of food manufactured in the county utilizes imported raw products from outside the county, such as wheat flour, corn meal, and yeast for bread, bakery, and tortilla product manufacturing. For example, cacao and coffee beans are imported from overseas to locally manufacture chocolate (valued at $27.8 million in 2015) and coffee (valued at $63.4 million in 2015). In addition to importing, the county of San Diego exports raw products for manufacturing and processing. For example, almost the entire local fluid milk production, which totaled $6.9 million in 2015 left the county to be pasteurized and packaged (2).

Citrus and avocados are the largest crops grown in the San Diego region, with total values of $151.7 million and $121 million respectively (3). These crops target the fresh market and are mainly sold whole locally rather than going through processing and manufacturing. Small scale processing of other fruits into jams and jellies can be found as an option through farmer's markets, which provides an option for products that do not meet cosmetic standards (ugly food) for the fresh market (2).

San Diego county could see an increase in home-based and small-scale manufacturing and processing in the coming years if regulations remain favorable and consumer preferences for local produce continue to trend upward as evidenced by the breadth of Certified Farmers' Markets. Midsize manufacturing and processing ($1 million annual sales) will remain flat without a catalyst from inputs in the supply chain, such as an increase in the production of produce or a new livestock operation. Other influences that could increase manufacturing and processing could include subsides for infrastructure, shifts in the political or economic conditions of neighboring counties, and shifts in cross border commerce between the U.S. and Mexico.

USDA
NUMBER & TYPE OF USDA PERMITTED FACILITIES IN SAN DIEGO COUNTY

Certification - Export, Identification - Meat, Identification Poultry	6
Certification - Export, Identification - Meat, Identification - Poultry, Imported Product	1
Certification - Export, Meat Processing, Poultry Processing	5
Certification - Export, Meat Processing, Poultry Processing, Voluntary Processing – Meat	1
Imported Product	1
Meat Processing	2
Meat Processing, Poultry Processing	12
TOTAL	28

HOW AND WHY IS FOOD MANUFACTURING AND PROCESSING REGULATED?

The Food Manufacturing and Processing Industry is regulated through a hierarchy of jurisdictions from the national to local levels with a common goal of ensuring the nation's food system protects the public from foodborne illness through food safety practices and regulations. Within each jurisdiction, there are multiple categories, types, and scales of manufacturing and processing. Further information can be found in each agency's online directory.

The U.S. Department of Agriculture (USDA) maintains a listing of establishments that produce meat, poultry and/or egg products regulated by the Food Safety and Inspection Service pursuant to the Federal Meat Inspection Act, the Poultry Products Inspection Act, the Egg Products Inspection Act, and the Humane Methods of Livestock Slaughter Act (4).

At the state level, the Food and Drug Branch (FDB) of the California Department of Public Health regulates the manufacturing, processing, storage and distribution of food products. Processors of general food commodities (e.g. baked goods, noodles,

CALIFORNIA DEPARTMENT OF PUBLIC HEALTH
QUANTITY OF CALIFORNIA STATE PERMITTED FACILITIES IN SAN DIEGO COUNTY BY CITY

SAN DIEGO	220	FALLBROOK	5
VISTA	64	LA MESA	5
SAN MARCOS	49	LA JOLLA	3
OCEANSIDE	38	LAKESIDE	3
EL CAJON	36	SANTA YSABEL	2
CARLSBAD	33	SANTEE	2
CHULA VISTA	25	ALPINE	1
POWAY	17	BONITA	1
ESCONDIDO	16	DEL MAR	1
NATIONAL CITY	10	IMPERIAL BEACH	1
VALLEY CENTER	7	JULIAN	1
ENCINTAS	6	LEMON GROVE	1
RAMONA	6	SAN YSIDRO	1
SPRING VALLEY	6	SOLANA BEACH	1
CORONADO	5		
TOTAL			566

processed fresh vegetables, seafood, snack foods, dietary supplements, etc.) must obtain a Processed Food Registration from FDB (5).

At the local level, the Food and Housing Division of the San Diego County Department of Environmental Health (DEH) oversees inspection and permitting for all retail food facilities. DEH issues a large number of local permits, whereas a relatively low number of state and federal permits are issued due to the region's small food production scale and direct-to-consumer model (6). Also, because the region is in close proximity to Los Angeles county and Imperial county where larger scale production, manufacturing and processing operations are well established, San Diego county has tended to focus economic development efforts on other sectors and industries.

SAN DIEGO COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH - NUMBER & TYPE OF SAN DIEGO COUNTY PERMITTED FACILITIES IN SAN DIEGO COUNTY

Boat	27	Non-Profit Food Facility	262
Caterer/Caterer - Direct Sales	257	Prepackaged Cart/Truck	360
Detention Facility Government/ Detention Facility Private	11	Prepackaged Lunch Truck	45
Host Facility	3	Pre-Packaged Retail Market	1215
Licensed Health Care Facility	100	Restaurant Food Facility	7824
Limited Food Prep Cart	148	Retail Food Processing	83
Minimal Food Preparation	1198	Retail Market with Deli	1245
Miscellaneous Food Facility	641	School Processing Food Facility/School Satellite Food Facility	708
Miscellaneous Satellite	47	Single Operating Site	227
Mobile Food Facility Commissary Non-Processing	10	Vending Machine	6
Mobile Food Facility Commissary Processing	21	Vending Machine Commissary	2
Mobile Food Facility Prep Unit	485	Wholesale Food Warehouse	102
TOTAL			**15,027**

SAN DIEGO COUNTY HAS APPROXIMATELY

15,000

PERMITTED FOOD FACILITIES
(Restaurants, Markets, Food trucks/carts)

Each year, the Department of Environmental Health receives **APPROXIMATELY 700 FOODBORNE ILLNESS** complaints for retail food facilities.

OVER THE PAST **5 YEARS**, DEH RESPONDED TO AN AVERAGE OF

150 FOOD RECALLS

PER YEAR THAT HAVE IMPACTED FOOD AT OUR LOCAL RESTAURANTS AND MARKETS

IN 2018, 18,125 INSPECTIONS yielded the **CLOSURE OF 203** restaurants due to imminent public health risks

Graphic uses sources 9 & 10

LOCALLY, THE **TOP 5** RISK FACTORS OBSERVED IN RESTAURANTS IN 2018 WERE:

- IMPROPER HOT AND COLD HOLDING TEMPERATURES
- FOOD CONTACT SURFACES NOT PROPERLY CLEANED AND SANITIZED
- LACK OF PROPER HANDWASHING OR GLOVE USE
- PRESENCE OF VERMIN
- IMPROPER COOLING OF POTENTIALLY HAZARDOUS FOODS

DEH has a performance metric goal to reduce the top three Centers for Disease Control and Prevention risk factor violations associated with foodborne illness to **8% OR LESS**. Reducing the rate of violations helps to protect residents and guests of San Diego County from foodborne illness.

5 BUGS MOST LIKELY TO CAUSE AN OUTBREAK:

- CAMPYLOBACTER *CASES: 883
- SALMONELLA *CASES: 576
- E-COLI *CASES:288
- NOROVIRUS *CASES: Not tracked
- CLOSTRIDIUM PERFRINGENS *CASES: Not tracked

*2017 San Diego data

FOOD SAFETY

The Center for Disease Control and Prevention estimates that each year in the U.S., 48 million people get sick from a foodborne illness, 128,000 are hospitalized, and 3,000 die (7). Foodborne pathogens such as bacteria, viruses, and parasites can contaminate food anywhere along the food production chain, from fields where food is grown to cutting boards in kitchens, to the hands that serve the food in restaurants.

Food safety regulations were created to prevent foodborne illness and are overseen by federal, state, and local authorities, such as the Food and Drug Administration (FDA), United States Department of Agriculture (USDA), California Department of Public Health and local environmental health jurisdictions, in order to protect food throughout the supply chain. Most cases of foodborne illness are preventable through best management practices, including protection from contamination, employee hygiene, foods from approved sources, proper temperature control when holding potentially hazardous foods and reaching minimum internal cooking temperatures for food which vary based on the type of food.

As a method to safeguard people from foodborne illness, the FDA and USDA have established elaborate systems to test food and monitor it for foodborne pathogens or contaminates. Food producers and manufacturers work with the FDA and USDA to recall their products from the marketplace when the products are mislabeled or when the food may present a health hazard to consumers because the food is contaminated or has caused a foodborne illness outbreak. Food recalls have increased by 10 percent from 2013 to 2018 and in the last quarter of 2018, 17 million pounds of food was recalled by the USDA (8). Additionally, recalls often cause consumers to throw away similar products because of the uncertainty around the product purchased being potentially associated with the recall.

By not maintaining food safety from farm to fork, food that would have otherwise fed humans or animals is wasted (more of this topic in Section 9). This comes at a time when California is struggling to find ways to reduce waste from going to our overburdened landfills and address feeding persons in need in our community. Food safety is a key element to a food system that ensures products are safe for people to consume.

THE CENTER FOR DISEASE CONTROL AND PREVENTION IDENTIFIES THE TOP 5 RISK FACTORS FOR FOODBORNE ILLNESS TO BE:

1. IMPROPER HOLDING TEMPERATURE CONTROL OF POTENTIALLY HAZARDOUS FOODS
2. IMPROPER COOKING TEMPERATURES OF POTENTIALLY HAZARDOUS FOODS
3. FOOD FROM AN UNAPPROVED SOURCE
4. EMPLOYEE HYGIENE ISSUES, SUCH AS IMPROPER HANDWASHING
5. CONTAMINATION OF FOOD OR FOOD CONTACT SURFACES

References

(1) United State Department of Labor, Bureau of Labor Statistics. Industries at a Glance, Food Manufacturing: NAICS 311. https://www.bls.gov/IAG/TGS/iag311.htm

(2) Economic Contributions of San Diego County Agriculture. County of San Diego, Department of Agriculture Weights and Measures. https://www.sandiegocounty.gov/content/dam/sdc/awm/docs/SDAgImpact.pdf

(3) Crop Statistics & Annual Report 2018. Department of Agriculture Weights and Measures, County of San Diego. https://www.sandiegocounty.gov/content/dam/sdc/awm/docs/2018_Crop_Report_web.pdf

(4) United States Department of Agriculture. Meat, Poultry and Egg Product Inspection Directory. https://www.fsis.usda.gov/wps/portal/fsis/topics/inspection/mpi-directory

(5) California Department of Public Health. Food and Drug Branch (FDB): Processed Food Registration.https://www.cdph.ca.gov/Programs/CEH/DFDCS/Pages/FDBPrograms/FoodSafetyProgram/ProcessedFoodRegistration.aspx

(6) County of San Diego, Department of Environmental Health Food and Housing Division (FHD). Food Program. https://www.sandiegocounty.gov/content/sdc/deh/fhd/food/food.html

(7) Centers for Disease Control and Prevention, Burden of Foodborne Illness: https://www.cdc.gov/foodborneburden/estimates-overview.html

(8) Beach, Coral, Food recalls in the final quarter of 2018 reveal problems with bacteria, labeling; Food Safety News, February 12, 2019; https://www.foodsafetynews.com/2019/02/food-recalls-in-final-quarter-of-2018-reveal-problems-with-bacteria-labeling

(9) Moyer, Lindsay, The most common causes of foodborne illness outbreaks, Center for Science in the Public Interest, https://cspinet.org/tip/most-common-causes-foodborne-illness-outbreaks

(10) County of San Diego, Reportable diseases and conditions by year 2013-2017, https://www.sandiegocounty.gov/content/dam/sdc/hhsa/programs/phs/documents/Reportable%20Diseases%20and%20Conditions_SDC_2013-2017.pdf

Resources

USDA, Economic Research Service: Manufacturing: https://www.ers.usda.gov/topics/food-markets-prices/processing-marketing/manufacturing.aspx

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SECTION 4

STORAGE AND DISTRIBUTION

HOW IS FOOD STORED AND DISTRIBUTED IN SAN DIEGO COUNTY?

Food that is produced in San Diego county reaches the general population through a process of distribution; a critical component of the overall food system. Locally sourced food is distributed through three main pathways: 1) directly to the consumer through farmers' and fishermen's markets and shares in consumer supported agriculture (CSA), 2) directly to institutions and businesses, and 3) through traditional distributors to institutions and businesses. In some cases, food is processed or packaged outside of the county and then it is re-imported into the county for distribution, as discussed in Section 3.

WHAT ARE THE CHALLENGES ASSOCIATED WITH FOOD STORAGE AND DISTRIBUTION IN SAN DIEGO COUNTY?

FOR FISHERMEN

Traditional seafood supply chains include large-scale dockside buyers that buy product from fishing vessels and set the seafood on a long series of domestic and/or international export, processing, packaging and, in some cases, re-importation. Two recent studies revealed that the availability of San Diego-sourced seafood within the city of San Diego was limited to seafood markets and restaurants located within 1 km (0.6 miles) of the coast. This strong geographic barrier was attributed in part to a shortage of waterfront and city-wide infrastructure, including refrigerated and freezer storage, live tanks, direct marketing space, and local seafood processors (1).

FOR FARMERS

According to the 2017 Census of Agriculture, there are an estimated 3,500 small farms operating on less than 10 acres in San Diego County (2). These farms must be cost efficient in production, storage, and distribution to sustain their businesses because they are not able to benefit from economies of scale. Their larger counterparts have greater economic means to scale their operations with space for back office operations, planting and growing, and storage and distribution as examples. It is often challenging for small farmers to work with distributors because the revenue splits required to do so cut into profits to levels that are not economically sustainable for the farmers. Instead, small farmers often sell directly to organizations, businesses and consumers through CSA deliveries. While often providing greater revenue per sale than working through distributors, direct deliveries lead to higher transportation costs and take away valuable time from other farming operations for small farmers.

FOR DISTRIBUTORS

A coordinated system or platform for displaying and sharing crop supply by farm does not currently exist in San Diego. Therefore, with the large number of small farms to track in the county, distributors often lack accurate and up-to-date knowledge of each farm's crop supply.

Local food supply shortages exist when dealing with the volume needed by some organizations interested in buying local food, which makes it challenging for distributors to meet that volume needed with supply solely from San Diego county farms. Moreover, the expected prices for bulk buys of local food are often too low to work for the small farmer who does not produce enough volume to benefit from economies of scale. Given these supply shortages when dealing with larger volumes at a commercial level, the price for locally sourced food tends to be higher than that of imported food.

Consequently, the local farmer cannot compete on price with the larger farmer, who is typically not local. As a result, distributors have to look for options outside the county to meet the local demand for food.

FOR BUYERS

The challenges associated with distributing local food are passed on to the buyer in the form of higher prices. This ultimately leads to food inequity, where low-income populations cannot afford and therefore do not have access to high quality, fresh, and local food.

Particularly if buying directly from farmers, organizations often face challenges with ensuring that deliveries will be accurate and on-time. They may also pay higher transaction costs and be required to navigate more cumbersome management processes than when working with traditional distributors.

In order to increase demand and justify the higher costs associated with locally produced food, greater effort is required to raise public awareness of the social, environmental, and economic impacts associated with purchasing decisions. While many community-based organizations are working to address these issues both in supporting small farm product distribution and healthy food access, challenges persist at a systemic level.

WHAT ARE THE OPPORTUNITIES ASSOCIATED WITH FOOD STORAGE AND DISTRIBUTION IN SAN DIEGO COUNTY?

An opportunity exists for San Diego county farmers to develop methods for providing greater real-time transparency of crop availability for distributors and buyers. Another opportunity is for small farmers to aggregate their crops for distribution in order to reduce costs and build collective economies of scale. Some work has already been completed in order to advance this strategy through the 2018 San Diego County Food Hub Needs Assessment, a report that showed interest from all involved stakeholders around developing a food hub model of support (3).

Similar approaches can be beneficial for the commercial fishing industry, which faces similar challenges of unpredictability in supply, a need to meet current demand with imports, and a need to collaborate with other producers to help meet demand and take advantage of economies of scale (e.g., through port-wide marketing associations). Increasing opportunities for seafood direct marketing and other alternative marketing arrangements, where fishermen sell to restaurants and markets, would result in shorter and more local seafood supply chains. This would potentially increase the availability of local product within the county. An added benefit of more direct sales is the connection of seafood producers and consumers which raises awareness of local fisheries.

However, until any of these strategies are implemented, a concerted effort needs to take place to build up community awareness around the value of local food, in order for businesses, organizations, and communities to place a higher value on local food. Efforts also need to take place to address equity issues for disadvantaged communities who may not be able to access and afford higher-priced, local food.

ACTION SPOTLIGHT

THE FARM TO INSTITUTION MOVEMENT

In order to generate increased demand for locally sourced food and provide greater incentives for distributors to work with local farmers, the San Diego based non-profit organization, Community Health Improvement Partners (CHIP), has established the Farm to Institution Center. The Center has a two-part mission: 1) to improve community health by improving access and consumption of healthy foods and 2) to support farmers in the creation and growing of a vibrant, diverse, and local agricultural scene.

The Center has developed three institutional food service collaborative groups: the Nutrition in Healthcare Leadership Team, the Farm to School Taskforce, and the Farm to Institution Council. Each of these collaboratives are working to build momentum for the Farm to Institution movement in their respective sectors across San Diego county.

Success of this approach is indicated by local food procurement among San Diego county school districts increasing from $3 million in 2013 to $19 million in 2017, according to the State of Farm to School in San Diego County report. This has led to greater demand for distributors to source locally-grown food (4). For the purposes of the State of Farm to School Report, local food has a three-tiered definition: tier 1 is food grown, raised or produced in San Diego county, tier 2 is within 250 miles of the county, and tier 3 is in California. The tiered definition allows the school districts to support local food, incorporate a diverse range of products, and source at competitive prices (4).

CERTIFIED FARMERS' MARKET

Certified Farmers' Markets (CFMs) provide growers the opportunity to market directly to consumers without engaging food brokers or distributors. They are generally held on a weekly basis in public locations such as town squares or downtown streets. In these settings, local agricultural producers are able to educate consumers about how their food is grown and to suggest food preparation methods. San Diego county has 36 CFMs that operate throughout the region.

Market managers are responsible for promoting CFMs and coordinating growers or vendors who pay a fee or percent of sales for booth space. Catt Fields-White is the CFM manager for the Little Italy Mercato (Saturdays and Wednesdays) and the Pacific Beach Market (Tuesdays). In the following interview, she shares her perspective on the San Diego county food system based on her 11 years of experience as a market manager.

INTERVIEW WITH CATT FIELDS-WHITE

April 28, 2019

What was your background when you decided to become a CFM manager?

I have been an entrepreneur and always in the food system. I worked with chefs, marketing consulting, owned a restaurant and published a trade publication for restaurants.

How did you get involved and what inspired you to open a CFM?

It was a bit self-serving at first. I lived in Little Italy and at the time there was no grocery store or really any fresh food. I knew chefs and farmers, and chefs wanted fresh food. The Little Italy Business Improvement District encouraged me to start a market if I could figure out how it could be self-sustaining.

Do all your markets accept EBT, Market Match and WIC?

Yes, at all the markets I manage. These programs increase the sales for farmers because you can use them to buy fresh produce here.

All farmers participating at any CFM would benefit from EBT sales, but the federal program requires a lot of bookkeeping and it is difficult for small CFMs to resolve because the time to devote to recording keeping is too time consuming or the payroll to hire a person is too expensive that the market would not profit.

Do you remember what you felt like on the first day you opened the Little Italy Mercato Certified Farmers' Market?

Excited! I have 9 grandchildren and I didn't want them to end up in a situation where they didn't have access to fresh food. On that first day, my husband and I walked behind the stalls

and we saw empty boxes upon empty boxes. The empties meant the farmer sold out of the produce s/he brought to the market.

The farmers were happy, and the neighborhood was happy. It was a successful shopping experience for all. Some of the first farmers are here today. They are Bob Polito, Schaner Farms, Rodney Kawano, Heritage Family Farms, Gilbert Quintos and the Maciel Family.

The story behind Heritage Family Farm is that when the owner retired, he sold the farm to the workers who are all Hispanic and they are here today still selling under the family banner.

Were there lessons learned?

Advertisement. It was important to advertise where the market was and to profile the farmers. Some lessons market managers learn is that you need to give the shopper some choice so they can decide what tomato variety to purchase, for example, but not saturate the market where every vendor is allowed to sell tomatoes so that no one at the end of the day makes a profit. The market needs a good mix of different varieties to be successful. It's a balanced experience for the shopper to be able to browse a little yet not get frustrated from there being too many choices.

Also, the farmers taught me that the market has to be open rain or shine because to them, once they harvest the fruit or pull the root out of the ground it can't go back – they have to sell it or it goes bad. The customers trust the market to be open rain or shine so there is a commitment to be open for the market to be successful and sustainable. What we don't want to happen is for customers to not trust the market to be open because those sales would go to a brick and mortar store, which is always open rain or shine.

Would you recommend opening a farmers' market to others?

Yes, but it will take exactly the right location for it to be successful and there are many factors like the community's need for one, enough residents who can access it, proximity of grocery stores and farmers. Most farmers can only do one or two markets a week because the farm size is not big enough to supply multiple market days in a week but many large established markets where farmers are successful are saturated where there is no more room for new farmers. I opened the Wednesday market to give small sized farms and new farmers a chance to become established and hope in the long-term it can build into a chef's market.

From your lens, how have markets changed since you first opened?

CFMs attract more people because people are aware and want to know where their food comes from. The most important aspect is that customers come face to face with the farmer and have a chance to learn about the farmer's farm practices and build a relationship with him/her.

Do you see trends?

I also see more young people, Millennials, shopping and asking questions about the farming methods and interested in food. Young farmers tend to go deep on certain crops and need to be encouraged to farm a variety of other produce. Farmers are also finding ways to extend seasons and learn different non-traditional farming methods to stay competitive longer within a season. For example, there is a significant trend to utilize hoop-houses which can extend the growing season for some plants. [A hoop-house is clear plastic dome that is draped over curved PVC piping over the crop row and acts as a wind and cold weather barrier while still allowing light to pass through to the plant to carry out photosynthesis]. Farmers are learning different production methods and becoming more educated on how to deal with the challenges of a limited water supply and labor.

What would you consider to be the reason for Farmers' Markets as they relate to the State of the Food System?

Two reasons: 1) small farms can be financially sustainable through sales at farmers' markets because the wholesale market is not as profitable for farmers, 2) as people become more aware of their food source, they want to know how their food is grown. There is an advantage when they come face to face with the farmer.

What do you see as the biggest concern for farmers?

Not enough labor or water or land. Older farmers retiring and the land going to a developer instead of a farmer. Land is expensive.

For customers?
There is a shortage of farmers and as they age out the food source will be unknown or less known.

For the region?
Risk management costs. If insurance for a market operator continues to rise, it could put smaller markets, especially, out of business.

For non-ag vendors?
Permit, labor, and insurance costs continue to go up for these very small businesses.

What do you see as the biggest reward for farmers?

Financial stability, opportunity, satisfaction, speaking/engaging with people who are eating your produce.

For customers?
The crazy sense of community, better tasting food, better value because it's fresh and has longer lasting shelf life.

For the region?
Happy residents. There is a turn up in real estate because real estate brokers see an added value when there is a farmers' market in the area.

For non-ag vendors?
Low cost entry to get into business. It is an alternative way to build a means of financial support.

What would you say about the farmers who operate in the context of CFMs?

Strong financially, they are more aware of what people are looking for in a food system in terms of what people want to eat as they get to hear the shoppers' requests. New farmers are learning and networking with the older farmers and the lessons are valuable.

You have stepped outside of being an operator into being an educator which is altruistic. Can you tell me why?

I'm a big fan of entrepreneurship. I learned that farmers and food makers are passionate about what they do, but do not have a business background. I provide them with that business education, and training on the various permit processes and requirements because I want them to be successful and financially sustainable. The farmers' market can only be successful and sustainable if individual farmers are successful and financially stable. Remember, I have 9 grandchildren and I want them to always have access to fresh food!

Is there anything else you would like to share?

If people realize how valuable food is, there will be less food wasted. They'd take care of that purchase or consume it rather than throw it away.

For example, if a bunch of carrots costs 50 cents, (a consumer) could easily allow it to spoil and get thrown out. If that same bunch is purchased at $2.50, it is now more of an investment, therefore, it will get eaten and enjoyed.

FISHERMEN'S MARKET

TUNA HARBOR DOCKSIDE MARKET

In 2010, two young fishermen, Zack Roach, Jr. and Luke Halmay, began selling fresh seafood caught by their families and 10 other local commercial fishermen. An estimated 25-40 people came by the dock every Saturday morning to buy fresh fish directly from the F/V Addiction, Roach's father's boat docked in Tuna Harbor, in the Port of San Diego.

With aspirations of growing this small, off-the-boat endeavor into a fishermen's dockside market at Tuna Harbor, a group of San Diego fishermen, a couple of aquafarmers and a local maritime lawyer, formed the Tuna Harbor Dockside Market LLC in June 2013. Their efforts quickly came to a standstill, however, as there was no regulatory pathway to permit fishermen's markets.

The hard work and tenacity of the Tuna Harbor Dockside Market group, along with the support of other fishermen and the community, turned things around quickly not only for this market, but for the State. In 2013, researchers from California Sea Grant and University of San Diego partnered to study the feasibility of establishing a fishermen's market in San Diego and found widespread demand for local seafood and availability of enough supply to satisfy consumers (5). A local journalist, Clare Leschin-Hoar, published an article in the Voice of San Diego in June 2014 outlining the regulatory hurdles involved in establishing a fishermen's market which mobilized local decisionmakers (6). Within weeks of this article being published, San Diego County Supervisor Greg Cox and Chairman of the Unified Port of San Diego,

Bob Nelson helped fishermen acquire short-term permits to operate the Tuna Harbor Dockside Market.

On opening day, August 2, 2014, an estimated 1,300 people came to the newly opened Tuna Harbor Dockside Market over the course of five hours to buy local catch from ten vendors representing nine fishing vessels and one aquafarm. In its first few weeks of operation, the Market averaged 350 visitors per week who bought a total of 1.1 tons of seafood. The enthusiasm surrounding the fishermen's market was reflected in the extensive local press coverage, including Eater San Diego, Edible San Diego, NPR, Times of San Diego, San Diego Union Tribune, Voice of San Diego, Fishermen's News, and California Sea Grant News.

With help from a Fishermen's Market Working Group, which included fishermen, scientists, seafood processors, restauranteurs, and representatives from federal, state, and local agencies, San Diego County Department of Environmental Health staff drafted a revision to State legislation that would allow for the streamlined permitting of outdoor fishermen's markets. This would become Assembly Bill 226, dubbed "Pacific to Plate," and introduced by Assembly Speaker Toni Atkins in early 2015 (7). The bill received unanimous support in the California Assembly and Senate and was signed into law by Governor Jerry Brown in October of 2015, providing a pathway for fishermen in other parts of the state to establish their own markets.

Tuna Harbor Dockside Market celebrates its five-year anniversary in August 2019, and since its founding, has grown in popularity attracting 450 - 550 members of the public each week and an ever-growing number of local chefs. More fishermen and their families have also gotten involved as vendors and more than 50 different species have been featured since opening. The Tuna Harbor Dockside Market has begun to reconnect San Diegans to local, affordable, fresh seafood and the seafood producers, which has been very limited in San Diego (8, 9). The fishermen's market has also provided fishermen with the opportunity to meet San Diego's seafood lovers, diversify their sales, and make a little more money for part of their catch by selling directly to consumers, who also save by buying direct.

References

(1) Soto, M. 2018. Have we achieved "Ocean to Plate"? Determining the availability of San Diego-sourced seafood in the city's seafood restaurants. Capstone Project in partial fulfilment of the Master's in Advanced Studies in Marine Biodiversity and Conservation. Scripps Institution of Oceanography. Available at: https://escholarship.org/uc/item/56s893bx

(2) Census of Agriculture, 2017 Census Volume 1, Chapter 2: County Level Data. United States Department of Agriculture (USDA), National Agriculture Statistics Service. https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_2_County_Level/California/

(3) Community Health Improvement Partners (CHIP). October 2018. San Diego County Food Hub Needs Assessment. https://f2icenter.org/wp-content/uploads/2018/11/SDC-Food-Hubs-Needs-Assessment-Report.pdf

(4) Community Health Improvement Partners. September 2018. The State of Farm to School in San Diego County 2016-17. https://f2icenter.org/wp-content/uploads/2018/09/FINAL-F2S-Report-1.pdf

(5) Talley, T. S., A. Batnitzky. 2014. Testing the feasibility of urban coastal direct seafood markets. Final report in fulfillment of a project funded by the Ocean Protection Council and Collaborative Fisheries Research West. https://caseagrant.ucsd.edu/sites/default/files/marketers%20summary_0.pdf

(6) Voice of San Diego. 2014a. By: C. Leschin-Hoar. June 2014. https://www.voiceofsandiego.org/active-voice/whats-stopping-fishermen-from-tackling-the-market-on-dry-land/

(7) Assembly Bill No. 226: Retail Food Safety: Fishermen's Markets. (Pacific to Plate). California Legislative Information. https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201520160AB226

(8) Soto, M. 2018. Have we achieved "Ocean to Plate"? Determining the availability of San Diego-sourced seafood in the city's seafood restaurants. Capstone Project in partial fulfilment of the Master's in Advanced Studies in Marine Biodiversity and Conservation. Scripps Institution of Oceanography. Available at: https://escholarship.org/uc/item/56s893bx

(9) Talley, T. S., H. Warde, N. Venuti. 2016. Local Seafood Availability in San Diego, California Seafood Markets. Future of Food: Journal on Food, Agriculture and Society 4 (2): 40-49. Available at https://caseagrant.ucsd.edu/sites/default/files/TalleyEtAl2016_FOFJ_SeafoodMkts.pdf

Resources

California Sea Grant. 2015. CA Sea Grant informs new law to permit Fishermen's Markets. https://caseagrant.ucsd.edu/news/pacific-to-plate

CASG (California Sea Grant). 2019. California seafood profiles. https://caseagrant.ucsd.edu/seafood-profiles?field_region_of_california_tid%5B%5D=306&keys=

THDM (Tuna Harbor Dockside Market). 2017. Tuna Harbor Dockside Market. Available at http://thdocksidemarket.com/new/index.html

Local Press Coverage of Tuna Harbor Dockside Market:

Voice of San Diego. 2014b. By: C. Leschin-Hoar https://www.voiceofsandiego.org/topics/food/local-fishermen-land-the-big-one-a-dockside-market/

Eater San Diego. 2017. A rising tide: San Diego chefs are celebrating local fishermen. By: K. Bridgwater. 22 May 2017. https://sandiego.eater.com/2017/5/22/15647860/a-rising-tide-san-diego-chefs-celebrating-local-fishermen-their-catch

Fishermen's News. 2017. San Diego's open air fish market. By: K. R. Meeks, https://www.fishermensnews.com/story/2017/01/01/features/san-diegoandaposs-open-air-fish-market/442.html

Edible San Diego. 2015. Tuna Harbor Dockside Market Reinvigorates San Diego Fishing Industry. By: M. Steiger.

http://ediblesandiego.ediblecommunities.com/shop/tuna-harbor-dockside-market-reinvigorates-san-diego-fishing-industry

San Diego Union Tribune. 2014. Fish market lands big catch of customers. 02 August 2014. By: B. Sykes. https://www.sandiegouniontribune.com/business/growth-development/sdut-tuna-harbor-dockside-market-urchins-san-diego-2014aug02-htmlstory.html

Times of San Diego. 2014. https://timesofsandiego.com/life/2014/08/02/hundreds-turnout-grand-opening-seaside-fish-market/

California Sea Grant. 2014. San Diego's Open-Air Fish Market Debuts to Hungry Crowds.

https://caseagrant.ucsd.edu/news/san-diegos-open-air-fish-market-debuts-to-hungry-crowds

NPR. 2015. By: Tregeser, C. https://www.kpbs.org/news/2015/jan/20/assembly-speaker-atkins-wants-fish-markets-run-swi/

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SECTION 5

CONSUMER DEMAND

HOW DOES CONSUMER DEMAND INFLUENCE THE FOOD SYSTEM?

Consumer demand for food is a key driver in the development of food and agricultural policies at local, state, national, and global scales. Through their food choices, consumers influence food production, food processing, and food prices. At the same time, consumer food choices are impacted by several factors, including the following:

- *Biological determinants such as hunger, appetite, and taste*
- *Economic determinants such as cost, income, and availability*
- *Physical determinants such as access, education, skills (e.g. cooking), and time*
- *Social determinants such as culture, family, peers, and meal patterns*
- *Psychological determinants such as mood, stress, and guilt*
- *Attitudes, beliefs, and knowledge about food*

This section highlights consumer demographics, food purchasing and consumption patterns, and consumer demand for local food in San Diego county.

WHAT ARE THE CHARACTERISTICS OF CONSUMERS IN SAN DIEGO COUNTY?

San Diego county is one of the fastest growing counties in the United States with a population of 3.3 million countywide (1). The region is affluent, well-educated, ethnically diverse, and home to the second highest percentage of Millennials (born between 1980 and 1994) in the nation, comprising nearly one-third of the San Diego county population (2).

Though on average the region is prosperous, this prosperity is not enjoyed equally across the population. Males have an average income that is 1.26 times higher than that of females in the region (3). The income inequality index (GINI index) in San Diego county is 0.472, which is higher than the national average (a score of 0.0 on the GINI index means a society has perfect equality of income distribution; a score of 1.0 indicates total inequality where only one person holds all the income) (3). According to the U.S. Census Bureau, the poverty rate in San Diego county is 11.9 percent (1). In addition, over 1 in 7 San Diegans experience food insecurity, which is defined as the lack of consistent access to enough food for a healthy life (5).

The population is comprised of various ethnic groups from a range of geographic regions with distinct preferences for flavors and products from their native lands. The largest ethnic groups in the San Diego region have origins or ancestries in Mexico, the Philippines, and Vietnam, but recent immigrants from various Southeast Asian and Eastern African countries have added to this diversity. An in

LOCAL RESIDENTS

50.3% 49.7%

AVERAGE HOUSEHOLD INCOME

$70,588

AGE[1]

35.8 MEDIAN AGE

14% OVER 65

21.6% OVER 18

67.1% COMPLETED SOME COLLEGE[2]

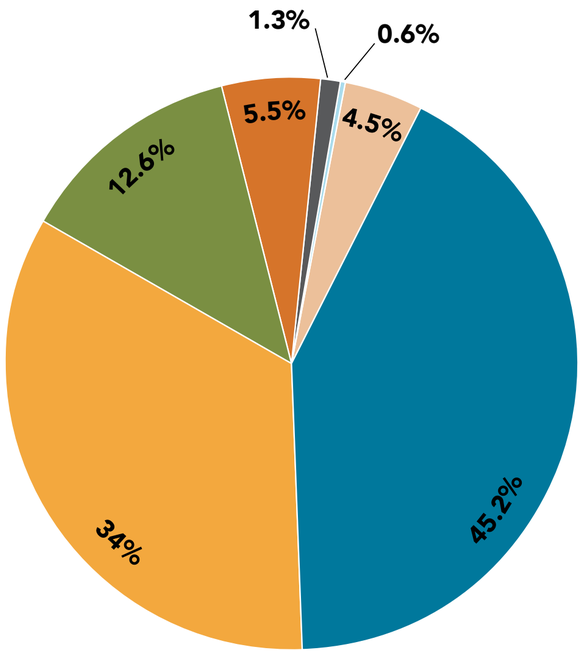
85.9% COMPLETED HIGH SCHOOL[2]

23.6% OF THE COUNTY'S RESIDENTS WERE BORN IN OTHER COUNTRIES[1]

[1] US Census Bureau

[2] County of San Diego Health and Human Services 2016 Demographic profiles

SAN DIEGO COUNTY DEMOGRAPHICS



- 45.2% White, Non-Hispanic
- 34% Hispanic
- 12.6% Asian
- 5.5% Black
- 1.3% American Indian & Alaskan
- 0.6% Hawaiian & Pacific Islander
- 4.5% Two or more races

U.S. Census Bureau - Percentages add to more than 100% as carried over from the U.S. Census website

depth look at these ethnic groups is critical because there may be opportunities for niche products and markets as is the case with long-time residents.

WHAT ARE THE EXISTING FOOD PURCHASING PATTERNS OF SAN DIEGO CONSUMERS?

Food is the third highest expenditure after housing and transportation in all three major metropolitan regions of California: Los Angeles, San Francisco, and San Diego. While data on the total dollar amount that San Diego county residents spend on food does not exist, San Diego county residents consistently allocated approximately 11 percent of their average annual expenditures to food (excluding alcohol) from 2010 to 2017 as shown in the chart on San Diego county food expenditures. This percentage has remained relatively constant and during this time frame, approximately 54 percent of this amount was for food purchased for consumption at home (mostly from supermarkets and grocery stores), while 46 percent was for food purchased away from home (restaurants, school meals, etc.) (6).

Compared with Los Angeles and San Francisco, San Diego county residents spent the lowest percentage of annual expenditures on food. Approximately 54 percent of this amount was spent on food purchased for consumption at home (mostly from supermarkets and grocery stores), while 46 percent was spent on food purchased away from home (restaurants, school meals, etc.) (6).

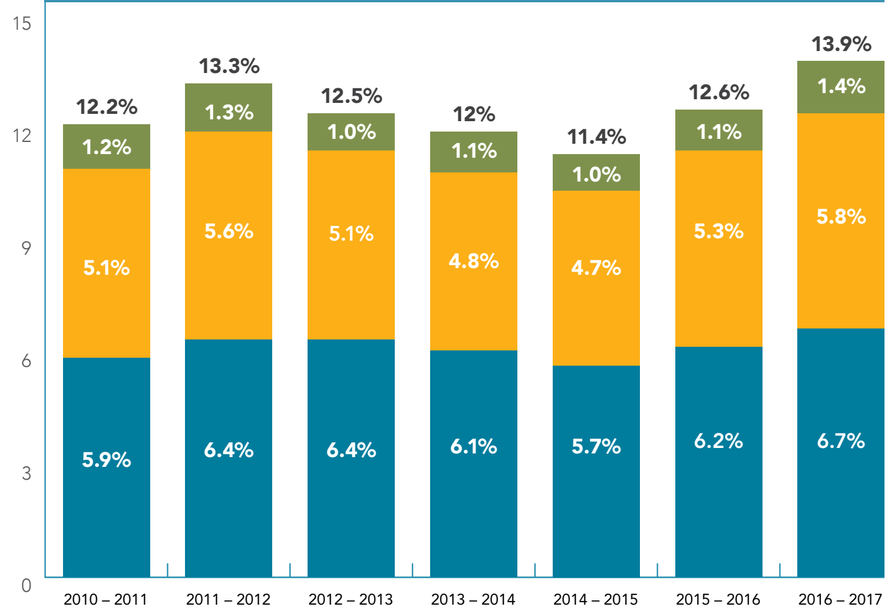
According to the 2012 Economic Census, the total annual retail food sales in San Diego county were approximately $14 billion (7). Of this amount, total direct to retail sales from San Diego county farmers were $50 million (8). The chart on San Diego county retail food sales for 2012 highlights that approximately 45 percent of retail food sales occur through supermarkets and grocery stores, 38 percent through restaurants, and less than 0.1 percent through direct sales (7).

WHAT ARE THE TRENDS IN CONSUMER DEMAND FOR LOCAL FOOD?

Over the past several decades, consumer purchasing behaviors – particularly among the Millennial age cohort, the largest, most diverse cohort in U.S. history – have shifted due to the growing awareness of the connection between food, the environment, and health. This awareness has led to increased consumer demand for better food, food that is fresh, healthy, local, organic, and sustainable. In response, farmers markets, community supported agriculture (CSA) programs, farm stands, and various markets for local meats and seafood around the country have been expanding exponentially. According to the National Restaurant Association, local food sourcing has been the top restaurant trend for over a decade. Even mainstream grocery stores and retailers like Whole Foods, Albertsons, Ralphs, and Walmart have begun implementing guidelines for local, fresh, and organic food sourcing (9).

Recent market trends demonstrate that consumers are more engaged with how food is produced and more interested in knowing where food comes from. In addition, similar trends in the tourism industry resulting in increased demand for hands on tourism are also beneficial to farmers. For example, the County Board of Supervisors implemented the Agriculture Promotion program in 2017 in the unincorporated county to promote agricultural tourism, also known as agritourism. This action by the Board allows for small scale agricultural operations in the unincorporated county to connect with

SAN DIEGO COUNTY FOOD EXPENDITURES (2010–2017)



Source: US Department of Labor Consumer Expenditure Survey, multiple years. http://www.bls.gov/cex/tables.htm#MSA

tourism by allowing agricultural homestays (guest rooms for visiting or obtaining education on an operating agricultural venture), agritourism uses (e.g. U-pick activities or on-site tours), agricultural stores (small and large), microbreweries/micro-distilleries (small and large, including tasting rooms), fishermen's market, and packaging/processing (e.g. boxing on-site agricultural products, grape crushing at a winery, etc.) (10).

These trends combined with the size of the local market, the popularity of San Diego as a tourist destination, and recent laws and regulations (e.g. the Cottage Food Law, Pacific to Plate, and the Agricultural Promotion Program in the unincorporated county of San Diego), present unique opportunities for producers to diversify their operations and revenue sources. Although producers are capitalizing on these opportunities as evidenced by the growth in agricultural and nature tourism operations, fishermen owned and operated markets, and the number of value-added products, there is room for growth.

In San Diego county there are several farms, ranches, and fisheries producing local food for local markets. In addition, there are several organizations and businesses committed to increasing local food production and availability. The county has 36 Certified Farmers' Markets (CFMs), 17 CSA programs, 21 farm stands, 1 dockside fishermen's market, and emerging local farm-to-table and ocean-to-table movements (11,12).

WHAT ARE THE CHALLENGES AND OPPORTUNITIES ASSOCIATED WITH INCREASING CONSUMER DEMAND FOR LOCAL FOOD?

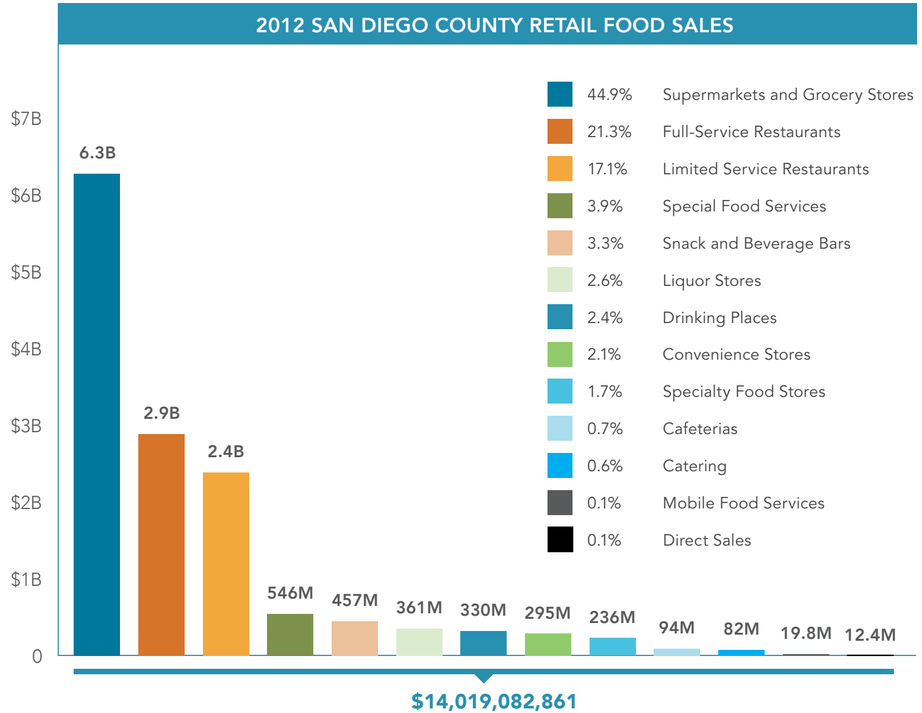
Despite growing consumer interest, access to local food is limited and not available to all communities, affecting low-income people and people of color disproportionately (more on food security and food access on Section 6 of this report).. Local food sales are likely still a small percentage of overall sales in San Diego county. Most food produced in the region is currently exported and as indicated previously, direct retail food sales account for less than 0.1 percent in the region (7).

Moving forward, there is an opportunity to better understand how much food produced locally remains within the county and whether opportunities exist to increase local food production and consumption in the region.

In addition, there is a need to increase the accessibility of local food to ensure that it can be available to all.

Most farm, fishing, and aquaculture operations in San Diego county are located within a 2.5 hour drive of a very cosmopolitan and ethnically diverse local and regional market comprising an estimated 20-million people (including the Los Angeles Metro Area, Riverside and Orange County, and Northern Baja California in Mexico). Although somewhat lacking for seafood products, there is supporting infrastructure available for most of the larger crops grown in the county (i.e. citrus and avocados) and a diversity of marketing options (for example CFMs and CSA programs) for some of the new and specialty crops grown as well (13).

Local farmers can benefit from the promotion of their products utilizing the "locally grown" or "locally made" nature of the goods they sell, such as the "San Diego Grown 365" promotional campaign. Similarly, local fishermen can benefit from use of the "San Diego Caught" label intended to increase visibility of seafood sourced in San Diego county, as well as provide traceability information, including fishing vessel, captain, date landed and the specific market or scientific name of the product.



Source: US Census Bureau, 2012 Economic Census. Results for the 2017 Economic Census will not be released until September 2019. Adjusted for inflation to 2018 dollars.

ACTION SPOTLIGHT

LOCAL FOOD PROMOTION

- Farm to Fork San Diego, a membership organization of local food producers, chefs, winemakers, and brewers, strengthens connections with consumers and supports increased local food sales in the region.
- Tuna Harbor Dockside Market, a fishing community-owned and operated open-air market with a mission to increase accessibility to the diversity of responsibly-sourced seafood in San Diego, raises awareness of local fisheries and aquafarms, inspires a sense of pride in San Diego's fishing heritage, and strengthens connections between consumers and producers.
- San Diego county has a vibrant craft brewing scene with over 150 local breweries.
- Although there is only one retail food cooperative in the region, there are several independent retailers that feature local food products in their stores.
- The farm to institution movement is strong in the region with nearly all 42 school districts purchasing local food along with increasing sales at local universities, colleges, and healthcare facilities.

References

(1) United States Census Bureau. QuickFacts. San Diego County, California. https://www.census.gov/quickfacts/fact/table/sandiegocountycalifornia/PST045218

(2) Lipkin, Michael. San Diego Has Nation's Second- Largest Millennial Population. San Diego Business Journal. March 3, 2016. https://sdbj.com/news/2016/mar/03/san-diego-has-nations-second-largest-millennial-po/

(3) Data USA. San Diego County, CA. https://datausa.io/profile/geo/san-diego-county-ca/

(4) County of San Diego. Department of Health and Human Services. 2016 Demographic Profiles. https://www.sandiegocounty.gov/content/dam/sdc/hhsa/programs/phs/CHS/demographics/FINAL_2016_Demographic_Profiles_1.30.18.pdf

(5) San Diego Hunger Coalition. Current Research on Hunger in San Diego County. https://www.sandiegohungercoalition.org/research

(6) United States Department of Labor, Bureau of Labor Statistics. Consumer Expenditures for the San Diego Area: 2016-7. https://www.bls.gov/regions/west/news-release/consumerexpenditures_sandiego.htm

(7) United States Census Bureau. Economic Census 2012. https://www.census.gov/programs-surveys/economic-census/data/tables.2012.html.html

(8) Census of Agriculture, 2017 Census Volume 1, Chapter 2: County Level Data. United States Department of Agriculture (USDA), National Agriculture Statistics Service. https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_2_County_Level/California/

(9) National Restaurant Association. 2019 State of the Restaurant Industry Report. https://www.restaurant.org/research/reports/state-of-restaurant-industry

(10) County of San Diego. Planning & Development Services. Agriculture Promotion Program. https://www.sandiegocounty.gov/pds/advance/agriculturepromotion.html

(11) Edible San Diego. A Map of Farms with CSA Programs in San Diego County. http://ediblesandiego.ediblecommunities.com/shop/map-farms-csa-programs-san-diego-county

(12) Local Harvest. Farm Stands near San Diego, CA. https://www.localharvest.org/san-diego-ca/farm-stands

(13) Lobo R.E., D.A. Jolly, B.D. Wallace and S.A. Parker. "A Look at Certified Farmers Markets Consumer Attitudes and Willingness to Support Locally Grown Agricultural Products in San Diego County." 1999. County Publication and Poster presented at the Second National Small Farm Conference in Saint Louis, Missouri.

Resources

San Diego Caught. 2019. https://www.facebook.com/sandiegocaught/

Tuna Harbor Dockside Market. 2017. http://thdocksidemarket.com/new/

Local Food Production:

Farm to Fork San Diego: https://www.farmtoforksd.com/

California State University San Marcos Office of Business Research & Analysis. San Diego Brewers Guild. Economic Impact of Craft Breweries in San Diego County. 2018. https://csusm.edu/coba/obra/reports/craft_beer/craft_report_18.pdf

The Farm to Institution Center. Community Health Improvement Partners (CHIP). https://www.sdchip.org/initiatives/the-farm-to-institution-center/

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SECTION 6

NUTRITION AND FOOD SECURITY

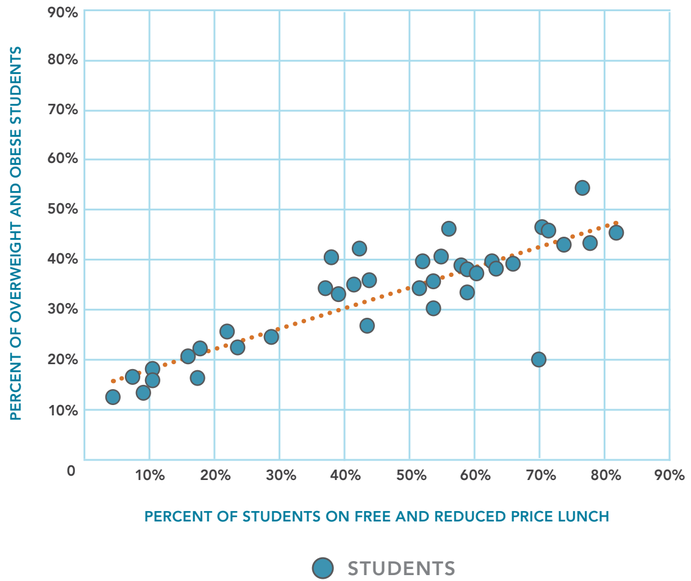
HOW DOES THE FOOD SYSTEM SHAPE HUMAN NUTRITION?

Nutrition provides the fuel necessary for life. The quality and availability of the food and drink we consume impacts the health and wellbeing of all people across our life span. The methods of production, processing and preparation, as well as the consumption choices people make, all play a role in whether food helps to nourish the body or results in adverse health impacts.

In the U.S., the population faces a unique challenge called the double burden of malnutrition, meaning people can be overweight, yet undernourished (1). It is not enough to simply have sufficient calories from ultra-processed products; it is essential that human beings have adequate intake of diverse micro nutrients (such as vitamins and minerals necessary for physiological functions to maintain health) and macro nutrients (such as carbohydrates, proteins, and fats necessary for energy production) (2). The shift towards large-scale commodity crop production coupled with technological advances have led to a rise in the production of inexpensive, highly processed, and nutritionally poor foods. These changes have had profound consequences on individual health, the environment, and local economies (3).

Prices and access to healthy foods remain a significant barrier to healthy eating. People are more likely to consume healthy food when they know where it comes from and are able to access and afford healthy food easily. In order to maintain a healthy and local food system, a community of consumers and producers understanding all the components of a food system (production, packaging, distribution, purchasing and disposal of food) is crucial to encouraging and facilitating decisions

THE RELATIONSHIP BETWEEN SCHOOL DISTRICT PERCENT OF OVERWEIGHT AND OBESE STUDENTS AND PERCENT OF STUDENTS RECEIVING FREE AND REDUCED PRICE LUNCH



that impact the health and the well-being of residents (3). In addition, as discussed later in this section, addressing inequities in food access opportunities is also important to ensure nutritious food is available to all.

WHAT IS FOOD INSECURITY AND WHY IS IT RELEVANT?

Food insecurity is a complex societal, community, and individual issue. International organizations define food insecurity as a situation that exists when people lack secure access to sufficient amounts of safe and nutritious food for normal growth and development and an active and healthy life (6).

Individuals facing food insecurity are at an increased risk for a variety of negative physical and mental health outcomes and health disparities, including obesity and chronic diet-related diseases such as diabetes, heart disease, and hypertension. Children experiencing food insecurity are at an increased risk for mental health problems, including delayed cognitive development and increased learning difficulties in school compared with food-secure children (7).

The cycle of food insecurity and chronic disease begins when an individual or family cannot afford enough nutritious food. The combination of stress and poor nutrition can make disease management even more challenging. Additionally, the time and money needed to respond to these worsening health crises drains the household budget, leaving little money for essential nutrition and medical care. This causes the cycle to continue. Many families experiencing food insecurity often have several, if not all, compounding factors which makes maintaining good health extremely difficult (8). The latest Community Health Needs Assessment conducted jointly by hospitals throughout San Diego county identified food security and access to food as the number one social determinant of health for San Diegans (9).

ARE SAN DIEGO COUNTY RESIDENTS EXPERIENCING FOOD INSECURITY?

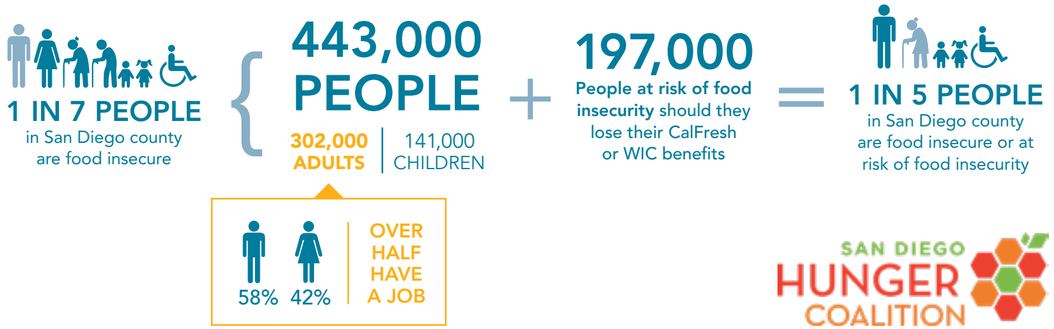
Many residents in the San Diego region are forced to make difficult tradeoffs between paying for food, housing, healthcare, and other necessities. While the economic recovery has resulted in low unemployment and other positive outcomes for San Diego county, about one-third of San Diego

ProduceGood rescues excess produce from residential orchards, farms and Farmers Markets and helps provide nutritious fruits and vegetables to the 141,000 children who are food insecure in the San Diego region.

county's population has insufficient income to make ends meet due to low wages, underemployment, unstable work schedules, and other challenges (10). According to the San Diego Hunger Coalition, in 2017 an estimated 443,000 (1 in 7) people in San Diego county experienced food insecurity. This represents 302,000 adults (of which over half are employed) and 141,000 children. Research also shows that there is disproportionality when it comes to the food-insecure population in the county. Of the total number of food-insecure adults in the region, 58 percent are women and 42 percent are men. Furthermore, forty three percent of low-income African Americans and 42 percent of low-income Latinos in the San Diego region experienced food insecurity, compared to 39 percent of low-income Whites and 33 percent of low-income Asians (11).

Additionally, there are 197,000 people at risk of food insecurity should they lose their benefits from the federal Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) or the Supplemental Nutrition Assistance Program also known as CalFresh Food in California. This represents 113,000 adults and 84,000 children. This means that the total population that is either currently food insecure or at risk of food insecurity (if they were to lose their WIC or CalFresh Food assistance) is 641,000, or 1 in 5 people (11).

WHO IS FOOD INSECURE IN SAN DIEGO COUNTY?



ACTION SPOTLIGHT

COUNTY OF SAN DIEGO EAT WELL PRACTICES

Momentum is building in support of healthy procurement practices and nutritional standards in institutional settings, such as government organizations, education institutions, and congregate living and care facilities. The County of San Diego's Eat Well Practices (Practices) are the nutrition and sustainability guidelines for food purchased and served at the County of San Diego organization. The Practices are based upon the latest dietary science and food systems literature, best practices from other organizations including other local governments, and stakeholder input including County staff.

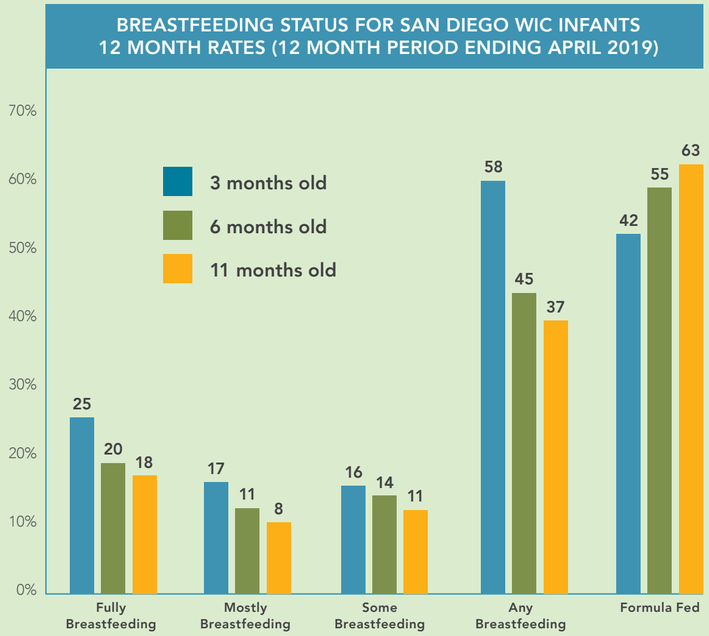
The Practices go beyond the common approach to nutritional standards that focus on micronutrient percentages or amounts, and instead look more holistically towards processing levels (from unprocessed/minimally processed to ultra-processed). In addition to considering processing levels, the Practices address the health of the population by framing healthy eating through the multi- layered food system so that food procurements and offerings by the County also consider sustainability, local agriculture, food waste, packaging, and some nutrient analysis guidelines. The Practices utilize a "triple bottom line" framework that considers the social, environmental, and economic impact of food and beverage offerings made by the County. The Practices have also served as a model for other organizations to improve food and beverage options, promote public wellness, and support a healthy food system.

WHAT IS THE FIRST SOURCE OF NUTRITION IN THE FOOD SYSTEM?

Infants and young children have special nutritional needs that must be met to establish a foundation for health. The first food in the food system, breast milk, is perfect for meeting the needs of newborn and growing babies. Breast milk provides babies a matchless source of nutrients and cellular, bacterial, immune, hormonal, anti-inflammatory, and anti-infection components and more (4).

Breastfeeding also provides positive ecological, financial, and health impacts for communities. Breastmilk is a valuable renewable natural resource that is the most ecologically sound food source available and creates no pollution (4). Children who consume breast milk have reduced incidences of health problems such as asthma, infections, and obesity, thereby lowering health care costs for families and for society.

According to the American Academy of Pediatrics, it is recommended that an infant should exclusively breastfeed for the first six months, followed by breastfeeding with the introduction of complementary foods until at least 12 months of age, and then a continuation of breastfeeding for as long as mutually desired by mother and baby. However, according to the Centers for Disease Control and Prevention the rate of infants exclusively breastfeeding or continuing to breastfeed throughout a year falls short. In the United States, 83 percent (or 4 out of 5) infants started to breastfeed at birth but only 25 percent breastfed exclusively through six months, and 36 percent (or about 1 out of 3) infants were breastfeeding at 12 months (4).



Community acceptance and support are integral components of breastfeeding success. Local efforts to support breastfeeding include advocating for worksite breastfeeding policies, breastfeeding friendly community healthcare centers and childcare providers, home visiting programs, educational forums for families and providers, scientific research, direct breastfeeding counseling, and the establishment of the first milk bank in San Diego (5).

In order to normalize breastfeeding in the San Diego region, it is essential that health professionals, business leaders, and policy makers have access to accurate information and that they play a critical role in supporting and promoting breastfeeding. Policies and other programs that support breastfeeding and lactation for all families can contribute to making San Diego county a healthier and thriving community.

JACOBS AND CUSHMAN SAN DIEGO FOOD BANK

The mission of the Jacobs & Cushman San Diego Food Bank (San Diego Food Bank) is to combat food insecurity in San Diego county. Food insecurity and poor nutrition can be alleviated by providing nutrient-dense foods and nutrition education. The San Diego Food Bank is committed to providing nutrient-dense food to partner agencies and clients through purchased and donated products along with fresh produce. In addition, the San Diego Food Bank provides nutrition education through CalFresh outreach to clients and partner agencies.

The San Diego Food Bank was established in 1977 and serves a network of 500 non-profit partners including: food pantries, soup kitchens, senior centers, residential programs and others. On average, the San Diego Food Bank serves 350,000 people per month and distributes about 30 million pounds of food (or 25 million meals) per year.

The following practices demonstrate the San Diego Food Bank's commitment to nutrition and wellness:

- Distributes about 9 million pounds of fresh fruits and vegetables per year.
- Promotes CalFresh enrollment through a mobile outreach program.
- Provides nutrition and wellness education by having a full-time nutrition expert; conducting nutrition education classes for seniors, children, and families; providing on-site nutrition education at various food distributions; and providing cooking demonstration videos to clients to promote healthy cooking.
- Operates the Healthy Mobile Pantry
  - Serves military sites, rural sites, and school campuses (elementary through college).
  - Nutrition expert attends various sites and provides educational materials, recipes, and virtual cooking demonstrations.
- Adheres to a nutrition policy that states that the San Diego Food Bank will support the distribution of foods that promote whole cooking, such as vegetable oils, baking goods, and other ingredients typically used in whole recipes.
- Will not distribute energy drinks, soda, candy, sport drinks, fruit juice (unless 100% pure fruit juice), ice cream, dietary supplements, or over-the-counter medications.

FEEDING SAN DIEGO

FEEDING SAN DIEGO ENVISIONS A HUNGER FREE AND HEALTHY SAN DIEGO.

Driven by the 1 in 7 San Diegans facing hunger in our community, Feeding San Diego takes steps each day to feed, rescue, and unite to create this reality.

Feed

We provide more than 26 million meals every year through a decentralized rescue and distribution network, including 300 local charities, schools, faith communities, and food pantries.

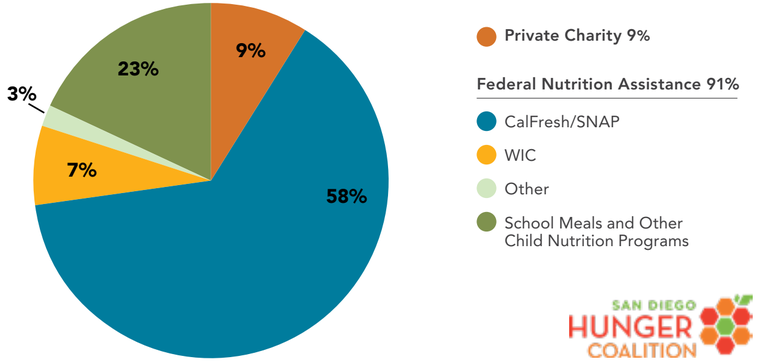
Rescue

97 percent of the food we provide to the community would otherwise go to waste. We rescue food from over 500 locations in San Diego county and over 225 farms and packing sheds throughout California. Over 50 percent of all the food we distribute is fresh produce.

Unite

Feeding San Diego unites the community around the issue of hunger and inspires people to become a part of the solution- through collaboration with partners and generous gifts of time, funds, and voice.

PERCENTAGE OF MEALS BY TYPE OF FOOD ASSISTANCE (2016)



THE FARM BILL

In California, there are two food assistance programs, SNAP and SNAP-Ed, that are funded by the federal Agricultural Improvement Act of 2018, commonly known as the Farm Bill.

SNAP: the federal Supplemental Nutrition Assistance Program (SNAP), formerly known as the Food Stamp program, provides financial assistance for purchasing food to low-income California residents. This program is known in California as CalFresh Food. In San Diego, nearly 470,000 people (1 in 9) received CalFresh benefits in 2018.

SNAP-Ed: a federally funded grant program that supports evidence-based nutrition education and obesity prevention interventions and projects for persons eligible for SNAP, through complementary direct education, multi-level interventions, and community and public health approaches to improve nutrition. This program is known in California as CalFresh Healthy Living.

WHAT KINDS OF FOOD ASSISTANCE PROGRAMS ARE AVAILABLE IN SAN DIEGO COUNTY?

In San Diego county, there are a number of food assistance programs for people facing hunger and malnutrition. This food assistance is provided through different delivery mechanisms including: community food distributions provided by food banks and pantries; WIC and CalFresh monthly benefits to be spent on groceries; free and reduced price school meals; and meals provided through other locally-administered programs, which are served at locations in the community or home-delivered for older adults.

Funding for food assistance comes from two primary sources: federal nutrition programs and private charitable resources. The overwhelming majority (91 percent) of food assistance serving San Diegans comes from federal nutrition programs. In 2016, federal programs brought 228.3 million meals to San Diego county, compared to 22.6 million meals paid for with private charitable resources. This means that for every 10 meals of food assistance in San Diego county, nine of those meals are provided by federal nutrition programs (12).

WHAT ARE FOOD DESERTS?

Food deserts are residential areas with limited access to affordable and nutritious food (13). Living in a food desert has been linked to poor diet and greater risk of obesity, while people who live near grocery stores are more likely to consume fruits and vegetables and less likely to be obese. To capture the idea that the ease of access to unhealthy food is also an important facet of poor diet, the term "food swamp" was coined by researchers to refer to neighborhoods where fast food and junk food inundate healthy alternatives. Low-income and racial-ethnic minorities are more likely than white residents to live near unhealthy food retailers, which has been associated with poor diet (14).

There are multiple definitions of food deserts, but the most commonly used version comes from the U.S. Department of Agriculture (USDA) which defines a food desert as a census tract that meets the following two conditions: 1) the poverty rate is above 20 percent (or at least 80 percent of families have incomes below the state or metropolitan median) and 2) a minimum of 500 people or 33 percent of residents live more than half a mile from the nearest supermarket. A supermarket is defined as a store that has

annual revenues over $2 million and sells food from all major departments including fresh meat, produce, dairy, and frozen foods (15).

There is significant variation among areas that meet the USDA's definition of food deserts. Some food deserts have no food stores at all, while others are home to a variety of markets that are too small to meet the USDA criteria, but serve an important role for local residents.

Federal and state policy programs such as the Healthy Food Financing Initiative tend to prioritize attracting large grocery stores to food deserts via tax credits and other financial incentives (13). Building on existing resources and supporting small stores through financial, marketing and technical assistance may, however, be a more effective and less costly approach to address urgent community needs.

Alternative schemes such as collective gardens, food hubs, community supported agriculture, street vendors and farmers markets may also be instrumental in addressing disparities in access to food. It is important to ensure that these types of programs serve residents of low-income neighborhoods and communities of color, rather than attracting affluent "foodies" and potentially causing disruption through gentrification (16). This requires acknowledging that there is a relationship between demographics and food deserts, specifically race, ethnicity and income (17). As researchers have documented in the San Diego region and other regions in the U.S., food deserts have emerged over time as the result of policy and planning decisions that often times have not been favorable to historically disadvantaged groups and have led to white flight, suburbanization, disinvestment and store closures among these areas (18).

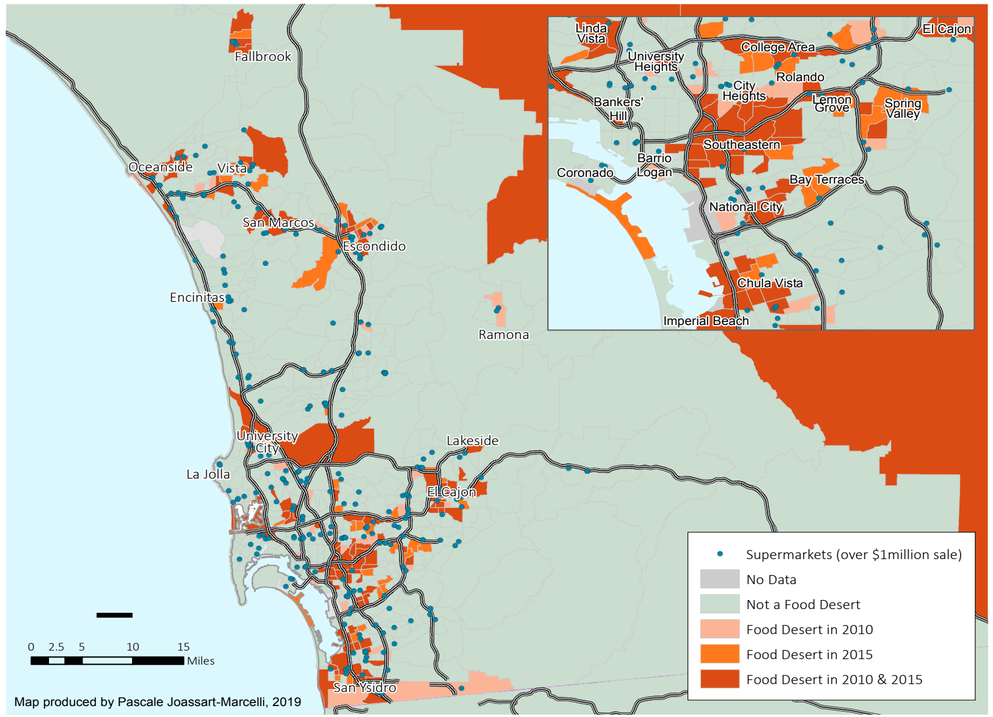
ARE THERE FOOD DESERTS IN SAN DIEGO COUNTY?

Based on the USDA definition, about a quarter of all census tracts in San Diego county are considered to be food deserts. They are primarily located in urbanized and densely populated areas located near downtown San Diego, in the South Bay (National City, Chula Vista and San Ysidro), North County (Oceanside, Escondido, Vista and San Marcos) and the Eastern cities of El Cajon and Santee.

In San Diego county, according to data from the USDA, over 700,000 people lived in food deserts in 2010 comprising approximately 23 percent of the total population. Computations by Dr. Pascale Joassart-Marcelli, a geographer who studies food access at San Diego State University, show that residents of these census tracts had much lower median household incomes than those living in the rest of San Diego county: $47,206 compared with $85,046. About a third of San Diego county's Latino and Black residents and 28 percent of foreign-born residents, lived in areas identified as food deserts, while less than a fifth of Whites and Asians resided in these census tracts (19).

Research shows that low-income neighborhoods of San Diego such as City Heights, have small markets, many of which are run by immigrants and ethnic entrepreneurs which play a key role in ensuring that residents have access to food that is fresh, affordable, and culturally appropriate (20). The following map shows food desert areas in the San Diego region. Work is being done to include additional layers, such as areas with disadvantaged communities. Please note that the large region in orange on the top right corner of the map is mostly natural open space.

SAN DIEGO COUNTY FOOD DESERTS



ACTION SPOTLIGHT

ADDRESSING FOOD DESERTS

BrightSide Produce

BrightSide Produce provides a service that increases the accessibility, availability and affordability of fresh fruits and vegetables by serving as a produce distributor that reaches food insecure customers in both underserved and university communities with the help of university students. The funding model for BrightSide relies on the proceeds from deliveries of produce on the San Diego State University campus to fund deliveries to BrightSide stores in underserved communities. By employing university students and volunteers and servicing multiple food insecure communities, BrightSide provides a sustainable, long-term solution for distribution that can be scalable to more communities as the venture grows.

Live Well Community Market Program

The Live Well Community Market Program (LWCMP) works with small- to medium-sized, independently operated community food markets that are located in low-income, ethnically diverse, and/or high minority population neighborhoods to improve and increase access to healthy affordable foods. The LWCMP provides technical assistance to work with owners and operators of small- to medium-sized markets to: improve interior and exterior store designs, expand promotion and availability of fresh and healthy foods, attract new shoppers and nurture shopper loyalty, and increase the bottom line. In 2016, a recognition framework was developed to incentivize and recognize healthy food and beverage changes in small- to medium-sized markets as well as to recognize full compliance with all alcohol, tobacco, and business regulations and recommendations. The LWCMP is funded by the County of San Diego and implemented by partner agencies.

Top left: Produce cooler at Louie's Market Place in Oak Park in 2015 before a makeover with the *Live Well Community Market Program*. Photo credit: UC San Diego Center for Community Health

Top right: Produce cooler at Louie's Market Place in 2017 after a makeover with the *Live Well Community Market Program*. Photo credit: UC San Diego Center for Community Health

Bottom: Volunteers paint a mural on Center City Market in City Heights during a community build day market makeover, 2019. Photo credit: UC San Diego Center for Community Health

References

(1) World Health Organization. 2018. Nutrition. Double Burden of Malnutrition. http://www.who.int/nutrition/double-burden-malnutrition/en/

(2) Monteiro, C.A. et al. 2013 Ultra-processed products are becoming dominant in the Food System. Obesity Reviews. Vol. 14, S2. 2013, 21-18pp. Online at: https://onlinelibrary.wiley.com/doi/full/10.1111/obr.12107

(3) Ellsworth & Feenstra. (2010). Assessing the San Diego County Food System: Indicators for a More Food Secure Future.https://static1.squarespace.com/static/54b30bbae4b0fc4c2291385e/t/56096c47e4b0566c6094504f/1443458119325/SDFSWG_Final_Report_optimized.pdf

(4) Centers for Disease Control and Prevention (CDC). 2018. https://www.cdc.gov/breastfeeding/

(5) San Diego County Breastfeeding Coalition: https://www.breastfeeding.org/

(6) FAO, IFAD, UNICEF, WFP and WHO. 2017. The State of Food Security and Nutrition in the World 2017. Building resilience for peace and food security. Rome, FAO. http://www.fao.org/state-of-food-security-nutrition/en/

(7) Office of Disease Prevention and Health Promotion. U.S. Department of Health and Human Services. 2018. Food Insecurity. Healthy People 2020. https://www.healthypeople.gov/2020/

(8) Feeding America. 2018. Hunger and Health 101. What are the Connections between Food Insecurity and Health? https://hungerandhealth.feedingamerica.org/understand-food-insecurity/hunger-health-101/

(9) Hospital Association of San Diego & Imperial Counties; and Institute for Public Health, San Diego State University. 2016. San Diego 2016 Community Health Needs Assessment.

(10) San Diego Regional Economic Development Corporation. Future of Growth in San Diego. The Economic Case for Inclusion. San Diego: February 2018.

(11) San Diego Hunger Coalition. 2019. Hunger Free San Diego Issue Brief: 2017 San Diego County Food Insecurity. San Diego, CA, 4pp.

(12) California Department of Public Health WIC Program Administrative Data shared through the San Diego County WIC Infant and Childhood Obesity Risk and Prevention Project of the five San Diego County WIC Local Agency Programs: American Red Cross WIC Program, North County Health Services WIC Program; San Diego State University Research Foundation WIC Program; San Ysidro Health Center WIC Program; Scripps Health WIC Program. Project Contact: KM Merchant, PhD; Research & CQI Manager, SDSU Research Foundation WIC Program; kmerchant@sdsu.edu.

(13) Office of Community Services. US Department of Health and Human Services. https://www.acf.hhs.gov/ocs/programs/community-economic-development/healthy-food-financing

(14) Cooksey-Stowers, K., Schwartz, M. B., & Brownell, K. D. (2017). Food Swamps Predict Obesity Rates Better Than Food Deserts in the United States. International journal of environmental research and public health, 14(11), 1366. doi:10.3390/ijerph14111366

(15) USDA. 2017. Food Access Research Atlas. Documentation. United States Department of Agriculture. Economic Research Service. Accessed at https://www.ers.usda.gov/data-products/food-access-research-atlas/documentation/

(16) Joassart-Marcelli, Pascale and Bosco, Fernando J. 2017. Alternative Food and Gentrification: How Farmers' Markets and Community Gardens are Transforming Urban Neighborhoods. In Winnifred W. Curran, and Trina Hamilton (Eds.), Just Green Enough. New York: Routledge. Pp. 92—106.

(17) American Civil Liberties Union (ACLU) and New York Law School. Racial Justice Program. Unshared Bounty: How Structural Racism Contributes to the Creation and Persistence of Food Deserts. https://www.racialjusticeproject.com/wp-content/uploads/sites/30/2012/06/NYLS-Food-Deserts-Report.pdf

(18) Joassart-Marcelli, Pascale. 2018. The Good Food District: Historical Background and Current Needs. Report on Needs, Resources, Priorities, and Impacts: Part 1. San Diego, CA: Department of Geography, San Diego State University, and Project New Village. https://fep.sdsu.edu/Docs/Report_V3.pdf; McClintock, N., 2011. From industrial garden to food desert: Demarcated Devaluation in the Flatlands of Oakland, California. In Agyeman, J., & Alkon, A. H. (Eds.) Cultivating food justice: Race, class, and sustainability. Cambridge: MIT Press. Pp.89-120.

(19) USDA. 2017. Food Access Research Atlas Data Download 2015. United States Department of Agriculture. Economic Research Service. Accessed at https://www.ers.usda.gov/data-products/food-access-research-atlas/download-the-data/

(20) Joassart-Marcelli, Pascale, Rossiter, Jamie S., and Bosco, Fernando J. 2017. Ethnic Markets and Community Food Security in an Urban 'Food Desert.' Environment and Planning A 49(7): 1642 –1663.

Resources

County of San Diego. Eat Well Practices. http://bosagenda.sdcounty.ca.gov/agendadocs/doc?id=0901127e804f6533

County of San Diego. Food Donation Action Plan for the San Diego Region. Live Well San Diego Food System Initiative. http://www.livewellsd.org/content/dam/livewell/TipsandToolsOrgs/Food-Donation-Action-Plan-for-the-San-Diego-Region.pdf

Feeding San Diego: https://feedingsandiego.org

Joassart-Marcelli, Pascale and Bosco, Fernando J. 2017. Alternative Food and Gentrification: How Farmers' Markets and Community Gardens are Transforming Urban Neighborhoods. In Winnifred W. Curran, and Trina Hamilton (Eds.), Just Green Enough. New York: Routledge. Pp. 92—106.

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SECTION 7

LABOR AND EMPLOYMENT IN THE FOOD SYSTEM

HOW MANY PEOPLE ARE EMPLOYED BY THE FOOD SYSTEM IN SAN DIEGO COUNTY?

Human labor is essential for every component of the food system, which includes production, processing, distribution, retail, service, and waste management. For example, food workers include laborers in fields and fisheries (production), bakers and slaughterhouse workers (processing), drivers and warehouse workers (distribution), grocery store cashiers and stockers (retail), restaurant servers, cooks, dishwashers, and street vendors (service), and solid waste collection and disposal workers (waste management).

The food system is a major sector of employment in the San Diego regional economy and it has continually increased. Since 2001, all jobs in the county have grown by 15.3 percent and specifically, food system jobs have grown by 37.3 percent, which is more than double the growth rate of all jobs in the county (1). According to data from the U.S. Census American Community Survey 5-year Estimates (ACS) (2013-2017) , there are approximately 162,000 jobs in the San Diego region food economy, including farming, fishing, food manufacturing, wholesale and retail, catering, restaurant and other food services. These jobs represent approximately ten percent of the San Diego regional economy (2). Farming and fishing employment accounted for 12,677 of these jobs – about 8 percent of the food system workforce but less than 1 percent of the county's employment. The majority of food-related employment is found in food service, eating and drinking places, accounting for over 100,000 jobs or 63 percent of the food economy. This is not surprising given the importance of tourism in the San Diego region and the significance of food in attracting visitors to the region. Food sales, including supermarkets, grocery stores, and wholesale outlets, supported another 35,000 jobs. Food processing and manufacturing added about 11,000 jobs (2).

Jobs not highlighted in the total food economy jobs (162,000) but included in the food system, are solid waste collection with approximately 1,046 employees, and diet and weight reducing centers with approximately 235 employees (1). With these additions, the approximate total food economy is 163,281 jobs in San Diego county.

WHAT DO WAGES IN THE FOOD SYSTEM LOOK LIKE?

Wages within the food system in San Diego county are significantly lower than in the rest of the economy. Data analysis using ACS estimates from 2013 to 2017 shows that median wages in food-related jobs in San Diego county were $11.76 compared to $20.11 in all other jobs[1]. However, the top 13 percent of workers earn hourly wages above $50, reaching above $100 for the top 2 percent (2).

As a result of low wages, poverty is higher among food workers in comparison with other non-food sectors. Estimates from 2013-2017 show that 12 percent of people working in the San Diego county food system lived in poor households, compared to 6 percent of other workers. Adjusting the poverty threshold to reflect the very high cost of living in San Diego county[2], reveals much higher rates of working poverty among food workers (30 vs. 18 percent). Compared to other workers in the local economy, food system workers also experience inequality as reflected in the high proportions of workers without health insurance coverage (23 vs. 10 percent), and individuals utilizing CalFresh benefits (12 vs. 6 percent) (2).

Estimates from 2013 to 2017 also show that, some of the lowest paid jobs in the San Diego food system were in food services- the largest and one of the fastest growing segments of the regional food economy. This includes dishwashers, food preparation and serving-related workers, cooks in fast food restaurants, and hosts and hostesses. For instance, in the restaurant industry, the median hourly wages of bartenders and cooks were $13.79 and $13.07 respectively (2). However, 2017 data from the U.S. Department of Labor, Bureau of Labor Statistics, Occupational Employment Statistics (OES) shows that bartenders in the San Diego-Carlsbad metropolitan area have an hourly mean wage of $16.70/hr making this region the ninth top paying metropolitan area in the country for the bartending occupation (3, 4). These numbers illustrate both the overall low-wages and the inequality that exists within the food system.

WHAT ARE SOME SOCIOECONOMIC ISSUES FOR LABOR IN THE FOOD SYSTEM?

While consumers interact face-to-face with many food system workers, such as cashiers, servers, bartenders, etc., a subset of this

1) The State of California's Annual Minimum Wage increases began January 1, 2017. California's minimum wage in 2017 was $10.00/hour and will increase by a dollar each year until 2023 with $15.00/hour (State of California, Department of Industrial Relations. Minimum Wage. December 2016. https://www.dir.ca.gov/dlse/FAQ_MinimumWage.htm). At the city level, jurisdictions may have higher minimum wages than the State. For example, City of San Diego's minimum wage in 2017 was $11.50 and will be $13.00/hour beginning in 2020 (City of San Diego, Office of the City Treasurer. Minimum Wage Program. September 26, 2019. https://www.sandiego.gov/treasurer/minimum-wage-program).

2) The common approach of raising the poverty threshold to 200 percent of the official level was used in this analysis. For example, this would mean that a household of 1 adult and 2 children would need to earn above $39,498 to escape poverty.

group has lower visibility, such as workers in the fields, processing plants, kitchens, etc. (including undocumented food system workers). The lower visibility of some food system workers and the informality in certain sectors of the food economy may contribute to low earnings, wage disparities, economic insecurity, and inconsistent legal protections in this industry sector, as found by a study conducted by the Center on Policy Initiatives, which highlights inconsistencies in the application of labor laws, including wages, breaks, overtime pay, and scheduling (5).

Low-wages, informality, and economic insecurity are also related to race, ethnicity, immigration status, and gender. Jobs in the San Diego county food system distinguish themselves from other jobs in the region by their high proportion of immigrants and people of color, who have historically experienced discrimination in the labor market. Analysis using ACS estimates from 2013 to 2017 also shows that 37 percent of food system workers were immigrants (compared to 27 percent in non-food jobs) and 64 percent were people of color (compared to 51 percent in non-food jobs). The vast majority of workers throughout the food system were Latinos, especially in farming where Mexican immigrants alone represent 55 percent of the workforce. Within specific sectors, women tend to be represented in low-wage subcategories. For instance, in the food service industry, few women work as chefs, bartenders, or managers of high-end restaurants – jobs that tend to pay higher wages. In contrast, many are employed as servers in cafeterias, fast-food, and lower-end restaurants where wages are significantly lower. In San Diego county, less than 20 percent of chefs are women, while 56 percent of fast-food workers and 76 percent of servers are women (2).

Comparison of Workers and Wages of the San Diego Region Food System with the Non- Food Sector using estimates from ACS (2013-2017)

	Hourly Wages			
	Median	Average	Standard deviation	Number of workers
Non-Food	$20.11	$30.07	$78.51	1,453,273
Farming & Fishing	$10.78	$15.88	$18.83	12,677
Food Sales (Retail & Wholesale)	$13.73	$17,80	$19.28	35,946
Restaurants and Food Services	$11.36	$13.71	$17.22	102,281
Food Manufacturing	$14.71	$19.02	$20.82	10,949

References

(1) CPI. Employment and Wages in the San Diego County Food System. August 15, 2017. https://cpisandiego.org/2017/08/15/employment-and-wages-in-the-san-diego-county-food-system/

(2) United States Census. American Community Survey 5-Year Estimates (2013-2017). US Census Bureau. Department of Commerce. Data compiled and analyzed by Pascale Joassart-Marcelli in 2019.

(3) United States Department of Labor, Bureau of Labor Statistics, May 2017 Metropolitan and Nonmetropolitan Area Occupational Employment and Wage Statistics. San Diego-Carlsbad, CA Metropolitan Area. Occupational Codes 35-0000 through 35-9099. https://www.bls.gov/oes/2017/may/oes_41740.htm#35-0000

(4) United States Department of Labor, Bureau of Labor Statistics, Occupational Employment and Wages, May 2017, 35-3011 Bartenders. "Top paying metropolitan areas for this occupation" Table (scroll about 3/4 of the way down the page). https://www.bls.gov/oes/2017/may/oes353011.htm

(5) CPI. 2015. Shorted: Wage Theft, Time Theft, and Discrimination in San Diego County Restaurant Jobs. San Diego, CA: Center on Policy Initiatives and San Diego State University Department of Sociology. https://d3n8a8pro7vhmx.cloudfront.net/onlinecpi/pages/1065/attachments/original/1435177677/cpiWageTheftReportFINALweb.pdf?1435177677

Resources

Food Chain Workers Alliance and Solidarity Research Cooperative, "No Piece of the Pie," 2016. Accessed on July 29, 2019. http://foodchainworkers.org/wp-content/uploads/2016/11/FCWA_NoPieceOfThePie_Exec-Summary_FINAL.pdf

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SECTION 8

EDUCATION AND WORKFORCE DEVELOPMENT

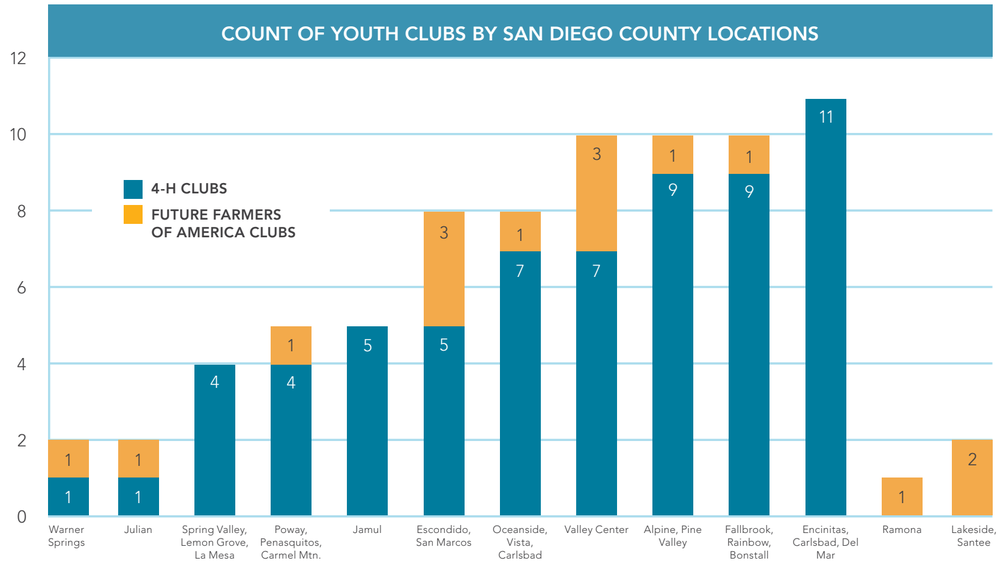
In order for the San Diego food system to remain sustainable and resilient in the long term, it is essential that a well-trained workforce be prepared to address the challenges of the future across all aspects of the food system. The intent of this section is to provide an overview of both the formal and non-formal training/ educational programs for different components of the food system that are currently available in the region and to identify the challenges and opportunities associated with workforce development.

Left: Photo by Tomoko Matsubayashi. Coastal Roots Farm in Encinitas offers education and volunteer opportunities.

WHAT TYPES OF EDUCATION AND WORKFORCE DEVELOPMENT PROGRAMS ARE CURRENTLY AVAILABLE IN SAN DIEGO COUNTY?

ELEMENTARY AND SECONDARY EDUCATION

Opportunities to learn about many aspects of the local food system are available to students in San Diego county beginning in elementary and high school through Farm to School programs, 4-H, and Future Farmers of America Clubs. Classes in hydroponics and/or freshwater aquaculture are available at a few high schools in the county, such as Patrick Henry High School and Hoover High School.



POST-SECONDARY EDUCATION

Several local colleges and universities offer post-secondary education in food system-related topics including sustainable agriculture, horticulture, agribusiness, and culinary arts.

SAN DIEGO COUNTY POST-SECONDARY EDUCATION IN AGRICULTURE AND FOOD PRODUCTION

San Diego City College San Diego, CA	A.S. in Sustainable Urban Agriculture A.S. in Plant Science 3 certificates in agriculture production
Miracosta College Oceanside, CA	A.A. in Sustainable Agriculture A.S. in Viticulture and Enology Various horticulture programs
Archi's Institute for Sustainable Agriculture Escondido, CA	6 & 12-week courses in Organic Agri-business with credit through Cal Poly Pomona
Cuyamaca College	Ornamental Horticulture program
Southwestern College	Landscape and Nursery Technology

SAN DIEGO COUNTY POST-SECONDARY EDUCATION IN FOOD PROCESSING AND HANDLING

Mesa College	A.S. & Certificate in Culinary Arts Management
San Diego State University	B.S. in Hospitality and Tourism Management

SAN DIEGO COUNTY POST-SECONDARY EDUCATION IN NUTRITION

San Diego State University	B.S. in Foods & Nutrition

CONTINUING EDUCATION

In addition to formal, degree-granting educational opportunities, there are a range of organizations that provide adult and continuing education opportunities including trainings and workshops related to food system topics.

CONTINUING EDUCATION PROGRAMS IN FOOD SYSTEMS

- Master Gardener
- Wild Willow Farm and Education Center
- Community Gardens throughout the region
- University of California Cooperative Extension
- International Rescue Committee farms
- Kitchens for Good
- Brightside Produce

WHAT ARE THE CHALLENGES AND OPPORTUNITIES FOR INCREASING EDUCATION AND WORKFORCE DEVELOPMENT?

Agriculture and seafood production face similar challenges in education and workforce development with the average age of commercial farmers and fishermen about or over 50 years old. There is an opportunity to utilize the knowledge and experience of the current workforce to train a new generation of farmers and fishermen to grow and collaborate in order to overcome barriers and market the benefits of the locally sourced and produced agriculture and seafood.

Traditional farming and fishing are both high-cost, high-risk endeavors that require access to land or waterfront, and capital. These factors pose significant barriers to those who may wish to enter the food production workforce. In addition, some face a stigma associated with farmers and fishermen, particularly children of parents who left farming to "find a better life".

For those who are interested in entering careers in the food system, there is a scarcity of training programs available. The need is far greater than the collective capacity of providers at this time. Educational opportunities are further limited because the populations who could most benefit from training face numerous barriers to program participation, including transportation, childcare, financial support during the duration of programs, and stable housing.

Despite these challenges, there is growing demand for fresh food across all social and economic classes and people continue to seek connections to the land, the ocean, and their food. Through the internet, information on growing, selling, and marketing food is now widely available. Opportunities also exist online for communities to develop farmer-to-farmer support networks and to collaborate across sectors and organizations.

There are vast numbers of people who would benefit from education and workforce programs across San Diego county. In addition, there are many model programs in the region upon which others could build and there is funding available for programs that can successfully address workforce readiness. Farming and aquaculture can be reimagined for small spaces and urban settings as growing edible gardens for schools, institutions, restaurants and private residences continue to gain popularity. There is also significant research and support to encourage regenerative and responsible farming and fishing practices that promote biodiversity in the region.

FARM TO SCHOOL PROGRAMS

FARM TO SCHOOL

Farm to School (F2S) programs provide students access to healthy, local foods and education opportunities through local food procurement, nutrition education, and school garden development. These programs generate the following benefits for students and their communities:

- **Economic Development and Job Creation:** According to the United States Department of Agriculture, every dollar invested in local food has a multiplier effect in stimulating local economic activity.
- **Student Engagement and Academic Achievement:** Activities provide opportunities for student's social and emotional growth, improved life skills, social skills, and behavior.
- **Environmental Sustainability:** Increased F2S activities are correlated with reduced food waste, along with increased sustainable approaches to food production, processing, packaging, and transportation.

THE FARM TO SCHOOL (F2S) LANDSCAPE IN SAN DIEGO COUNTY

According to CHIP's 2016-17 State of Farm to School in San Diego County report (1):

- **Across school districts in San Diego county,** more than $19M is spent on local, California-sourced food (a 500+ percent increase from school year 13-14 to 16-17), 11 percent of which is sourced directly from San Diego county growers. 78 percent of school districts in the county led activities related to F2S, with over 481 salad bars and 228 school gardens reported.
- **The Farm to School Taskforce (F2ST)** was formed in 2010 through Community Health Improvement Partners (CHIP), which spearheads the F2S movement in San Diego county and facilitates collaboration among school districts, growers, distributors, and other stakeholders in the county around F2S. F2ST member organizations represent 74 percent of overall San Diego county student enrollment and spans 23 of the 42 school districts.

OPPORTUNITIES FOR GROWTH

- **F2S Institutionalization:** While there is growing F2S support in San Diego county, sustainability of efforts requires institutionalization through school district wellness policies and funding, along with State and county-level support. F2S sustainability is a major challenge, as most school districts do not have the policies and resulting funding infrastructure to support the consistency in programming.
- **Grow efforts around local food promotion:** With school meal participation remaining relatively stagnant over the last few years, focused F2S marketing is needed to shift community perception of school food quality. Local food marketing to improve parental perception would likely increase school meal participation, providing school district food service additional funds for improving kitchen infrastructure, improving meal quality, and purchasing local foods.
- **Economic incentives:** Policy initiatives to financially incentivize local sourcing is recommended, particularly for smaller school districts, to take on the initially higher costs of local food and prompt further F2S activities and healthier school meals.

9 SCHOOL DISTRICTS PURCHASE DIRECT FROM LOCAL FARMS[1]

TOP FARM-TO-SCHOOL ACTIVITIES[1]

64.9% Integrating F2S in the Cafeteria (24 School Districts)

45.9% Using Smarter Lunchroom Strategies (17 School Districts)

37.8% Working with Distributor to Source local food (14 School Districts)

35.1% Developing School Gardens (13 School Districts)

FOOD PURCHASING[1]

11% of local food is sourced from within the County ($2.0M)

$68.1M FOOD OVERALL

$19.1M LOCAL FOOD OVERALL

$11.9M PRODUCE

$5.8M LOCAL PRODUCE

ACTION SPOTLIGHT

ENCINITAS UNION SCHOOL DISTRICT

A F2S EXAMPLE

Healthy Day Partners created the Encinitas Union School District (EUSD) Farm to School program in 2013 to support their foundational pillars of health and wellness and environmental stewardship. EUSD started with a few raised beds at individual school sites and that has grown into a district-owned certified organic farm at their 10-acre Farm Lab, which was transformed from a parking lot into an organic farm with the help of Coastal Roots Farm. The farming is currently done through a partnership with The Ecology Center.

Over 20,000 pounds of organic produce was harvested at Farm Lab over the past year that was incorporated directly into the district's school lunch program. Fresh produce (including lettuce, carrots, watermelon and cucumbers) was served daily on the salad bar, and tomatoes, peppers and basil were used to make pizza and pasta sauces from scratch. Harvested sweet potatoes were served in burritos and as a vegetable side. When students buy lunch in EUSD, they are eating an organic, locally sourced, scratch made meal.

The farming partnership has produced up to 40 percent of the district's produce needs annually; the end goal is 75 percent. This past spring over 200 trees were planted to support the districts citrus, stone fruit and avocado needs in the coming years.

In addition to housing Farm to School crop fields, Farm Lab boasts 6 classrooms that host all 5,400 students in the district for project-based learning engagements that center around agroecology and environmental stewardship.

ACTION SPOTLIGHT

UNIVERSITY OF CALIFORNIA

UC CE

The University of California Division of Agriculture and Natural Resources (UC ANR) and the University of California Cooperative Extension (UCCE) supports the food system in the San Diego region with applied research, technical assistance, non-formal education, and resources for a variety of food and agricultural audiences. These audiences range from crop producers in residential, school, and community gardens to urban and small-scale farms to larger commercial farms, agritourism, and direct marketing enterprises. Licensing preparation resources and continuing education training is also available for vertebrate, insect, and disease pest control professionals, who provide services towards healthy food production. Healthy food and nutrition education including consumer awareness, and food safety and preparation is delivered to limited resource residents through train-the-trainer and direct-to-consumer activities.

UCCE provides beginning beekeeper training and resources, a critical program in fostering a healthy beekeeping industry and environment in the San Diego region. UC ANR supports the Master Gardener program, training volunteers who deliver residential, school and community garden information. Additionally, the 4-H Youth Development program is supported by UC ANR. With more than 25 community and military clubs currently active throughout San Diego county, youth members are gaining essential life, leadership, and career building skills, many related directly to food systems.

ACTION SPOTLIGHT

KITCHENS FOR GOOD

KITCHENS FOR GOOD

The Kitchens For Good (KFG) model is based on similar models around the country. The basic premise is around using kitchens as multi-faceted centers for synergistic operations. For example, KFG rescues produce with its partners and turns that rescued produce into healthy meals for the food insecure. While KFG uses some volunteers for that effort, the primary labor is provided by the students in its Culinary Job Training Program. Thus, the synergy amongst the various enterprises strengthens the whole.

The largest difference and the greatest reason for KFG's particular success, unlike almost every other non-profit model, is that KFG is and always will be, a revenue first model. Simply put, KFG developed a revenue stream to ensure sustainability first and then began its programs. To this day, 60 percent of KFG's total operating budget comes from earned revenue that is generated from its businesses.

Lastly, KFG has a laser focus on who the organization is and what it does. At the top of its organizational chart are its students. Every person who works for KFG is a teacher and has responsibility for getting students employed. At KFG's core, the organization is about getting, and keeping, its students/graduates employed.

Chuck Samuelson, Kitchens For Good Founder
"Where Food Changes Lives"

WILD WILLOW FARM AND EDUCATION CENTER

Wild Willow Farm is a 5-acre working, educational farm that was established in 2010. Located just 15 minutes south of downtown San Diego on the banks of the Tijuana River, the farm grew out of a need to reconnect people to agriculture by creating a space where there are opportunities to learn how to grow food and find community.

Wild Willow Farm is demonstrating an alternative food system that promotes diversity in the soil, in the food grown and, in the people served. The Farm educates consumers and growers on the importance of healthy productive soils as part of their global commonwealth and at the foundation of the food system. Over 400 students have graduated from the Farming 101 course designed to educate future farmers, gardeners and food activists on soil building, composting, irrigation, pest management, and propagation.

On an annual basis, Wild Willow Farm:

- Serves over 1,500 students, parents, and teachers through hands-on educational tours
- Connects over 350 volunteers to the land and their food
- Delivers over 7,000 lbs. of food to the community through their CSA program

References

1) Community Health Improvement Partners (CHIP). September 2018. The State of Farm to School in San Diego County 2016-17. https://f2icenter.org/wp-content/uploads/2018/09/FINAL-F2S-Report-1.pdf

Resources

Community Health Improvement partners (CHIP): The Farm to Institution Center: https://www.sdchip.org/initiatives/the-farm-to-institution-center/

ECOLIFE Conservation. 2016. Aquaponics at Patrick Henry High. Available at: https://www.youtube.com/watch?v=JlbiFZgojvY

Encinitas Unified School District Farm Lab: http://www.eusdfarmlab.com/farm-to-school.html

Dawn Thilmany McFadden, David Conner, Steven Deller, David Hughes, Ken Meter, Alfonso Morales, Todd Schmit, David Swenson, Allie Bauman, Megan Phillips Goldenberg, Rebecca Hill, Becca B.R. Jablonski, and Debra Tropp. The Economics of Local Food Systems: A Toolkit to Guide Community Discussions, Assessments, and Choices. U.S. Department of Agriculture, Agricultural Marketing Service, March 2016. Web.

National Farm to School Network. The Benefits of Farm to School. Updated April 2017. http://www.farmtoschool.org/Resources/BenefitsFactSheet.pdf

SDUSD (San Diego Unified School District). 2018. SDUSD Farm to School. Twitter. Available at: https://twitter.com/SDFarmtoSchool/status/1060236745457963008

Solana Center: Composting Key to Regenerative Agriculture. https://www.solanacenter.org/news/blog/composting-key-regenerative-agriculture

UC Agriculture and Natural Resources: https://ucanr.edu/

UC Cooperative Extension, San Diego County: http://cesandiego.ucanr.edu/

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SECTION 9

WASTED FOOD

HOW MUCH FOOD IS WASTED AND WHAT IS THE SIGNIFICANCE?

Wasted food or food loss is any food that is grown and produced for human consumption, but that is ultimately not eaten. According to the Natural Resources Defense Council (NRDC), in the United States 40 percent of the food that is grown is never consumed, resulting in over 50 million tons of wasted food that ends up in landfills annually (1). Food loss results in significant economic and environmental impacts in the US. The nonprofit think-tank ReFED, found that over $200 billion in resources are required to grow, process, and transport food that becomes waste each year (2).

Not only are valuable resources wasted when food is not consumed, organic material that is left to decompose in landfills creates methane, a greenhouse gas that contributes to climate change. To address these impacts of wasted food, source reduction strategies that are designed to prevent food from becoming waste in the first place are the highest priority and provide the greatest social, economic, and environmental benefits. Project Drawdown, a research and communication organization focused on collaborating with various stakeholders to research, analyze, and provide climate change solutions, identified the reduction of wasted food as the third ranked strategy to reduce emissions of carbon dioxide (3).

When food does reach a point in its lifecycle when it is no longer considered marketable, it continues to remain valuable to feed people facing food insecurity and to feed animals and the soil through composting. At the State level, 6 million tons of food is thrown away each year, which makes 18 percent of all the material that goes to the landfills (4). In San Diego county, over 500,000 tons of food is wasted each year, while 1 out of every 7 residents face food insecurity (5). Food recovery and rescue efforts focus on the collection of edible food for distribution to local food assistance programs. Food that is no longer suitable for donation can be diverted from landfills for agricultural and industrial uses and for composting and anaerobic energy production.

FOOD LOSS AT EACH STAGE OF THE FOOD SYSTEM IN THE UNITED STATES (IN TONS)(1)

62,543,648 TOTAL TONS

FOOD PRODUCTION

10,100,000 TONS

Market Conditions: A crop's price at time of harvest may not warrant the labor and transport costs required to bring it to market.
Imperfect Produce: Selective harvest for appearance, shelf life, and other requirements leads to crops left in the field.
Labor Shortages: When harvest timing is critical, a labor shortage can lead to lower harvest rate.
Bycatch*: Unintended and/or unmarketable seafood species are caught during fishing, but not sold.
* (10.1 M tons only for farm waste, no data for bycatch)

PROCESSING AND MANUFACTURING

1,065,000 TONS

Trimming: Removal of edible but undesirable portions (peels, stems, skin, fat) along with inedible portions (bones, pits).
Processing Inefficiencies: Some steps in operations may lose more edible food than necessary.
Equipment, Packaging, and Forecasting Errors: Mistakes and malfunctions can lead to surplus or unsaleable product.

STORAGE AND DISTRIBUTION

7,972,268 TONS

Improper Handling: Overhandling, improper temperature, lengthy transportation, and disruptions to cold chain can lead to damaged product.
Stock Management: Large inventories, full shelves, and improper stock rotation can lead to excess, old, or damaged product.
Displays: Excessive product may be displayed in order to create the effect of abundance, which is believed to increase sales.

CONSUMPTION-COMMERCIAL

16,845,585 TONS

Kitchen Practices: Overproduction, trim waste, mishandling, and poor inventory management. High staff turnover exacerbates these problems.
Portions: Large and inflexible portions lead to diners not eating everything on their plate.
Expansive Menu Options: Extended menus complicate inventory management and require more ingredients to be kept on hand. All you-can-eat offerings have particularly high waste.

CONSUMPTION-RESIDENTIAL

26,560,793 TONS

Lack of Awareness and Information: Many consumers are not aware of how much food they waste or its implications. Some also lack information or skills to properly store and "use up" food.
Poor Storage: Food spoils in homes due to suboptimal storage, poor visibility in refrigerators, partially used ingredients, and misjudged food needs.
Poor Planning: Consumers may overbuy because they fail to plan meals, fail to use a shopping list, inaccurately estimate what is needed for meal preparation, or decide on impromptu restaurant meals.

WHERE DOES WASTED FOOD COME FROM?

CITY-LEVEL WASTED FOOD DATA

Capturing sector-specific data of wasted food at the city level is challenging, but city-wide analysis provides valuable information for designing specific reduction strategies.

The North County Food Policy Council, Palomar College Geographic Information Systems (GIS) Department, and the San Diego Food System Alliance (SDFSA) partnered to create GIS layers that display estimated quantities of wasted food produced at sector-specific sites. Estimates are based on waste hauler data and CalRecycle's wasted food conversion factors.

The map shows data from Oceanside, Vista, Escondido, San Marcos, Del Mar, Chula Vista, and La Mesa.

IS FOOD LOSS PREVENTABLE?

IN HOUSEHOLDS

According to a 2017 NRDC report, households in New York, Nashville, and Denver were found to average 44 percent of wasted food as inedible for human consumption, i.e. coffee grounds, eggshells, banana peels, etc. The remaining 56 percent of wasted food was preventable and rescuable for donation (6).

Strategies for Households:

Strategically directed educational campaigns can teach people how to properly store food, shop smarter, cook from root-to-leaf/nose-to-tail, and meal plan for success.

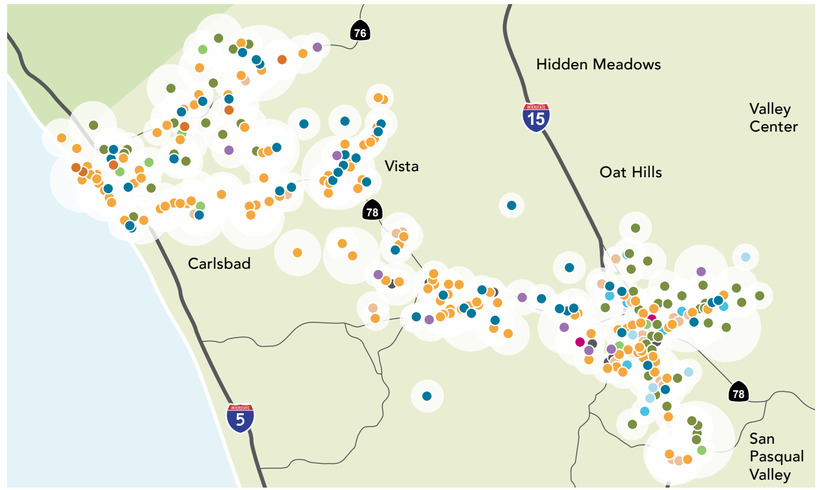
IN ORGANIZATIONS

Data from the SDFSA Smart Kitchens San Diego initiative, which has implemented wasted food tracking technology in fourteen hotels, hospitals, and universities in San Diego county, provides a glimpse of what wasted food looks like in large organizations. Blinded data from a 10-month period shows that out of all food loss, approximately 15 percent occurs as trimmings and byproducts. The remaining 85 percent could be prevented or recovered for donation as nourishing meals (7).

Strategies for Restaurants/Organizations:

Commercial kitchens and restaurants can employ waste tracking and analytics systems, smaller portions and plates, and trayless dining to reduce food loss.

SAN DIEGO REGIONAL FOOD SYSTEMS GIS MAP



Estimates quantities of food waste produced at sector-specific sites. A partnership between San Diego Food System Alliance, the North County Food Policy Council, and Palomar College's GIS Department

Strategies for Food Processors, Manufacturers, and Entrepreneurs:

Food processors, manufacturers, and entrepreneurs can maximize efficiencies by embracing imperfect produce and improving packaging technology.

WHAT EFFORTS ARE UNDERWAY TO PREVENT AND REDUCE FOOD LOSS AT THE SOURCE IN SAN DIEGO COUNTY?

The best method for reducing wasted food is not generating it in the first place. Source reduction is the best strategy for preventing food from becoming waste. Investing in food waste prevention offers the greatest social, environmental, and economic benefits and should always be prioritized as the top strategy for reducing food loss. According to ReFED, prevention creates three times the Societal Net Economic Value of recovery and recycling combined (2).

SAVE THE FOOD SAN DIEGO (STFSD) CONSUMER EDUCATIONAL CAMPAIGN

STFSD is a countywide food waste awareness partnership that leverages the national "Save The Food" public service campaign. STFSD is raising awareness and inspiring behavior change for food loss reduction and donation of edible food to those in need.

Activities:

- Working collaboratively with local and state government agencies to develop and support peer networks and resources for both wasted food generators and food recovery networks.
- Providing education and technical assistance for the reduction and possible donation that wasted food producers across sectors, including households, restaurants, retailers, institutions, and schools.
- Building regional networks and catalyzing resources and infrastructure needed for both wasted food source reduction and increased healthy food donation.

Impact to date:

- Two million San Diego county residents have been reached through a consumer education campaign that has employed billboards, radio plays, digital ads, mailers, newsletters, and community convenings.
- Over 200 Save The Food San Diego champion institutions have been engaged. Champions received a monthly social media toolkit with tips and tricks for reducing wasted food.

WHAT EFFORTS ARE UNDERWAY IN SAN DIEGO COUNTY TO RECOVER FOOD BEFORE IT IS WASTED?

FOOD RECOVERY AND DONATION

Together, the San Diego Food Bank and Feeding San Diego distributed 51.2 million pounds of food locally in 2017, serving hundreds of thousands of people each year through their more than 550 non-profit partner agencies (pantries) with feeding programs. The food banks receive food donations from a range of sources including locally run food donation drives, the U.S. Department of Agriculture (USDA), growers, gleaners, retailers, and wholesalers.

> *The term "pantry" refers to feeding organizations of various sizes and scope, from small, volunteer-run operations that collect and distribute non-perishable items, to large organizations that may collect and distribute all kinds of food and may also prepare and serve (or deliver) meals to food-insecure customers.*
>
> *Gleaning, as defined by USDA, is "the act of collecting excess fresh foods from farms, gardens, farmers' markets, grocers, restaurants, state/county fairs, or any other sources in order to provide it to those in need." (10).*

Pantries either receive deliveries or pick up food directly from the food banks' warehouses and from retailers and distribute the food to people in need in their communities. Some larger pantries may also serve as food donation hubs for smaller pantries in the community. Pantries also conduct their own food drives and receive donations directly from donors, such as households, gleaners, supermarkets, and restaurants.

Food banks and pantries distribute donated food to the end consumer through boxed

distributions, consumer choice systems, and many other programs.

Challenges

While this food donation network is effective in recovering food for donation, there are numerous challenges that need to be addressed in order to continue to assist food-insecure individuals and families:

- Understanding applicable regulations, exemptions, registrations or permitting needs for food pantries.
- Most pantries and gleaners do not have reliable access to transportation to pick up donated food thus they rely on volunteers for their operations and use their volunteers' vehicles to pick up food from donors.
- Pantries often lack access to a refrigerator or freezer and therefore have limited ability to accept donated food that requires refrigeration.
- Some potential donors fear that if the food they donate causes someone to become ill, then they may be held liable. This perceived liability might dissuade donors from donating food. In fact, food donors are fully protected from liability when donating food to a non-profit in good faith.
- Some individuals and businesses may not know how to safely donate food or where to donate it. Similarly, individuals or families experiencing food insecurity might not know where or how to access food or nutrition assistance programs.

AGRICULTURAL USES

Food not suitable for donation to people experiencing food insecurity may be valuable for farmers as animal feed.

Examples:

- Konyn Dairy in San Pasqual Valley is using spent grains donated by local breweries to feed animals.
- The Ramona Unified School District donates food scraps from schools to feed animals in a neighboring animal sanctuary.

Opportunities:

- The San Diego County Farm Bureau can serve as a source of information about which farms are in need of spent grain or other food donations.
- Explore online platforms for creating food systems networks that have been adopted in other counties throughout the state.

INDUSTRIAL USES

Fats, oils, and grease are materials that should not be disposed of through sinks and sewer systems as they clog pipes and can impact sewer lines and water treatment facilities. Furthermore, liquid fats, oils, and grease should not be sent to landfills because they can be converted into fuel for various industrial uses. There is increasing interest in finding strategies to utilize wasted food for biofuel and bio-products in order to incorporate use of alternative energy sources and mitigate the environmental and economic impact of wasted food (14).

Examples:

- New Leaf Biofuel collects used cooking oil from restaurants in San Diego county and converts the cooking oil that would otherwise be discarded, into biodiesel fuel, which is a clean alternative to petroleum diesel.
- Buster Biofuels partners with different businesses and corporations to collect and repurpose their used kitchen oils and grease to convert it into biofuel.

ACTION SPOTLIGHT

SALAD BAR WASTE REDUCTION

SAN DIEGO UNIFIED SCHOOL DISTRICT

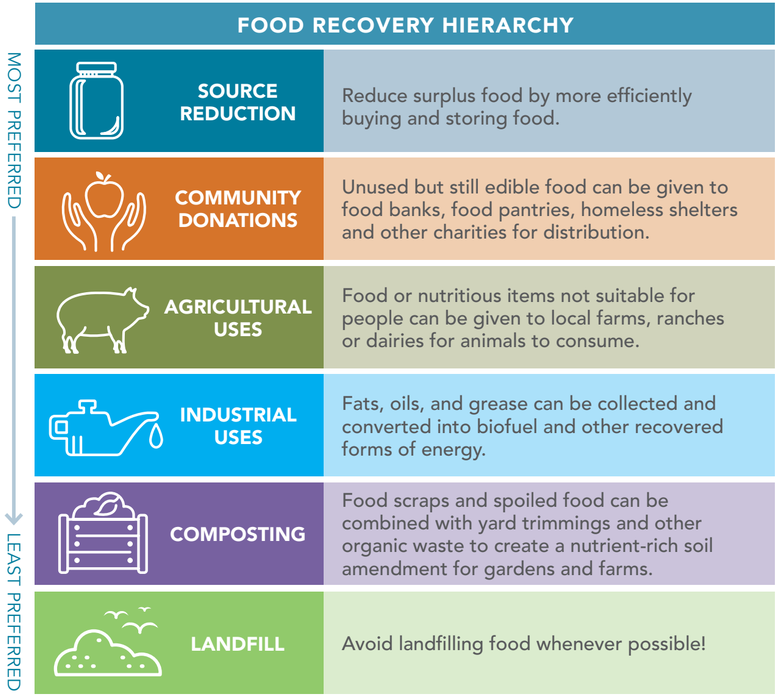
With one simple and low-cost act, the San Diego Unified School District (SDUSD) reduced their average salad bar waste by 66 percent. That's the equivalent of 2,070 lbs. of food per day across the district's 180 schools (9).

How did they do it?

SDUSD asked staff to reduce the size of some of the serving pans on their salad bar from four inches deep to two inches deep. This change limits the amount of excess food that gets put on the line, availing it for use the next day or for donation.

Down-sizing serving pans was part of the district's comprehensive effort to reduce and divert wasted food from landfills and save money. In addition, SDUSD partners with Feeding San Diego to rescue edible food from the 19 kitchens and provides opportunities for schools to compost any leftover salad bar waste on-site through a Café to Compost program.

Created by the Environmental Protection Agency, the Food Recovery Hierarchy prioritizes ways businesses and residents can reduce and recycle wasted food. The Food Recovery Hierarchy prioritizes actions that create the most benefits for the environment, society, and the economy.



ACTION SPOTLIGHT

FOOD DONATION ACTION PLAN

In 2016 the County of San Diego led the creation of a Food Donation Action Plan that was produced in collaboration with food system and food donation stakeholders in the region. The goal of the plan is to both support and improve food donation in the San Diego region in order to help address food and nutrition insecurity, while also reducing food loss (11).

The Plan includes 21 recommendations to:

- Enhance food safety
- Improve pantry capacity including refrigeration and transportation
- Provide food distribution materials
- Improve and increase outreach to potential food donors and pantry customers
- Develop guidance for pantries to establish volunteer driver programs
- Provide trainings to improve pantry operations
- Conduct further research to leverage existing infrastructure and resources

The County Board of Supervisors took action on December 12, 2018 to waive Department of Environmental Health permit and registration fees for pantries and to provide funding to support food donation efforts and food safety (12). These actions are an important step in supporting safe food donation in the region, as outlined in the Food Donation Action Plan, by helping pantries and related operations to obtain the necessary health permit or registration to operate and eliminating the financial burden this can cause. This action allows pantries to maximize their resources in fulfilling their mission of feeding food-insecure individuals.

Opportunities

According to the San Diego County Residential Possibilities report published by My Momma's Place in 2018, an estimated 1 in 5 (or approximately 100,000) single family residential households in San Diego county grow fruit producing trees. If just 10 percent of the produce from these trees were donated, over 2 million pounds of fruit could be diverted to those in need (13).

GLEANING IN THE SAN DIEGO REGION

San Diego county is privileged to have a good climate, a long growing season and a great history of agriculture. Many areas still have abundant groves of fruit trees. There is an estimated potential of 111,997 fruit and citrus trees in residential yards in the county. If 10 percent of those residents donate to gleaners, 2,352,000 pounds of fruit and citrus produced yearly can feed the needy and be kept out of the landfill. San Diego gleaners are providing a solution from this enormous surplus from entering the landfill, while also helping provide nutritious produce to food insecure San Diego county residents (13).

The three largest gleaning groups in San Diego county: ProduceGood, Senior Gleaners and Harvest CROPS have contributed greatly in reducing wasted food.

HarvestCROPS

Since 2009, Harvest CROPS has recovered 269,000 pounds of produce gleaned from residential backyards, providing 807,000 servings with the help of 4,950 volunteers.

- 63,835 pounds of produce recovered in 2018
- 191,505 servings provided in 2018
- 31 tons of edible produce diverted from landfill in 2018
- 729 volunteers in 2018

ProduceGood

ProduceGood provides an avenue for farmers to easily donate their surplus produce through the Market Share program. This initiative was started by the SDFSA Wasted Food Prevention and Recovery Working Group and filled an unmet need to rescue unsold produce from Farmers' Markets. The Market Share program is currently operating at the Hillcrest, Leucadia, La Jolla, and Solana Beach Farmers' Markets. Approximately 2,000 pounds a week or 52 tons a year of edible food is recovered from these 4 markets. ProduceGood sources, collects, and supplies 11,000 fresh servings per week to the Charitable Fresh Produce Provision Network of agencies that distribute to or directly serve those in need. These include the two major food banks in San Diego county, twelve nonprofit agencies and one for-profit organization that houses and feeds low income and disadvantaged people in the county. Since 2010, ProduceGood has recovered over 340,000 pounds, and provided over 1 million servings through its role as a connector between 118 fresh produce sources and food insecure populations.

- 155,000 pounds of produce recovered in 2018
- 465,000 servings provided in 2018
- 78 tons of edible produce diverted from landfill in 2018
- 140 growers
- 26 feeding/receiving agencies
- 1,000 volunteers

Senior Gleaners

Since 1994, gleaner volunteers have recovered over 7.5 million pounds of produce gleaned from residential backyards and store pick up, providing over 22.5 million servings and diverting 3,750 tons of food waste from the landfill.

- 280,536 total pounds recovered in 2018
- 124,580 pounds of produce recovered from backyards in 2018
- 155,956 pounds of food recovered from grocery stores in 2018
- 841,608 servings provided in 2018
- 140 tons of edible produce diverted from landfill in 2018
- 184 picking events in 2018
- 20 feeding/receiving agencies delivered to in 2018
- 62 volunteers

RESIDENTIAL GLEANING POSSIBILITIES IN THE SAN DIEGO REGION

2,352,000 POUNDS
of fresh produce from one season in one year that could be available for gleaning from homes in the region

1,176 TONS
of edible food diverted from the landfill, avoiding 4,892,083 metric tons of carbon dioxide equivalents

OVER 7 MILLION
Servings of fresh produce

Source: San Diego County Residential Gleaning Possibilities. My Momma's Place.

COMPOSTING AND ANAEROBIC DIGESTION

If food can no longer be fed to humans or to animals, and cannot be used for industrial uses, composting and/or anaerobic digestion can be considered the next steps for managing wasted food.

COMPOSTING

Composting is nature's way to recycle. It is the controlled, natural decomposition of organic matter (i.e. animal manure, grass, twigs, food waste). Macro and microorganisms break down organic materials into compost, or humus, a nutrient-rich soil amendment that can be used to improve the health and efficiency of our region's soils.

Examples:

- SDFSA's Healthy Soils Toolkit provides model language for jurisdictions to consider zoning changes to facilitate siting of organic processing facilities.
- The County offers ongoing composting trainings for unincorporated residents.
- The County offers ongoing composting assistance to businesses and institutions in the unincorporated area.
- Public composting demonstration sites exist throughout unincorporated San Diego county.
- The County has implemented an on-site composting program in order to provide training and resources to unincorporated schools, community gardens, farmers, ranchers, and businesses.
- The County offers low-cost backyard compost bins for unincorporated residents.

Opportunities and Challenges:

- Residential and commercial education and training around on-site composting could be increased.
- The agriculture sector could play a role in processing organic materials into healthy soils while reducing their use of fertilizer, conserving water, and increasing their resilience against climate change.
- Increase education to gleaners about composting rather than landfilling fallen fruits and vegetables.
- Streamline land use rules and zoning for decentralized composting approaches.
- Local government promotion of small-scale composting by establishing it as a permitted use throughout its jurisdiction.
- With limited locations available to process wasted food, seek opportunities to co-locate facilities at landfill and wastewater treatment sites.

ANAEROBIC DIGESTION

Anaerobic digestion is a collection of processes by which microorganisms break down biodegradable material in the absence of oxygen. The initials "AD" may refer to the process of anaerobic digestion or the built system where anaerobic digestion takes place, also known as a digester. Food scraps (including fats, oils and greases) unfit for human or animal consumption can be processed in a digester. The anaerobic digestion process converts food scraps and other organic material into a renewable energy source called biogas. The materials left over after the AD process is finished can be sent for composting.

Opportunities and Challenges:

- Facilities are available for processing yard trimmings and landscape materials, but limited infrastructure exists for processing food scraps.
- There are limited locations available to process organics though there may be opportunities to co-locate facilities at landfill and wastewater treatment sites.

IS THERE A LEGISLATIVE EFFORT TO REDUCE WASTED FOOD?

New legislation and regulations are designed to divert organic material from landfills, including food, as a way to reduce greenhouse gases. Additionally, there are laws that support reduction of wasted food by facilitating food donation and helping people make informed decisions about when food is still safe to eat versus when it should be discarded.

Solid Waste: Organic Waste – AB 1826 (2014)

This law requires businesses and multifamily complexes that generate a specified amount of organic waste per week to arrange for recycling services for that waste, and for jurisdictions to implement a recycling program to divert organic waste from businesses subject to the law. Strategies for businesses to reduce organic waste may include donation of surplus edible food. Jurisdictions can exempt businesses and multifamily complexes from the requirements of the law if the business or multi-family complex implements actions (such as food donation) that result in the recycling of organic waste.
(continued on page 132)

ACTION SPOTLIGHT

FOOD LOSS REDUCTION EFFORTS

AT LOCAL ORGANIZATIONS AND SCHOOL DISTRICTS

Sheraton San Diego Hotel & Marina

In 2017, a program was established at the Sheraton Hotel & Marina in San Diego to eliminate sending usable food to the landfill or compost. The Hotel has partnered with the San Diego Rescue Mission, who has a staff and refrigerated truck that picks up food from the Hotel 3 times a week. Benefits of the program are being seen in the methods of food preparation by monitoring potential waste, and in 2018 the Hotel donated a total of 36,000 pounds.

San Diego Airport Authority

The Airport Authority started a wasted food diversion program in 2013. Food scraps generated by the on-site food prep in all 40 of the airport's restaurants, three prep kitchens, and the USO Airport Center are composted at the Miramar Greenery. They also have a food donation program that is directed to their USO Sport Center.

Sharp Memorial Hospital

Since 2012, the hospital has composted all their wasted food at the Miramar Greenery. In 2016 the hospital also started donating their edible food scraps to local charities.

Ramona Unified School District

The District's innovative and award-winning program finds the highest and best uses for unserved food and food scraps. Unserved food is collected by a local pantry and donated to feed people; vegetative and bakery food scraps suitable for animal feed are delivered to the district's agricultural program; food scraps are donated to feed animals in a neighboring sanctuary; and high school students compost other food scraps in an on-site Earth Tub composting unit. Landscape trimmings help provide the "brown" carbon materials needed in the composting process, and the finished compost is used in school landscapes and gardens.

San Diego Unified School District

The District partners with Feeding San Diego on a food rescue program that began in September 2016. Through their Love Food Not Waste pilot program the District recovered leftover prepared food from over 170 school kitchens. The food is consolidated at 19 production kitchens where local hunger relief organizations, coordinated through Feeding San Diego, pick up the school food on a daily basis. These organizations are then able to provide a meal to those facing food insecurity in and around the school communities.

Vista Unified School District

All 27 school sites in Vista Unified School District utilize share coolers and participate in a donation program. During meal service, sometimes students choose more food than they care to eat – by placing those un-opened foods into the share cooler, the foods become accessible to any other student who may want to eat it. Whatever remains at the end of the day are included in the donations to the San Diego Food Bank. In addition, the schools donate any foods and/or beverages that cannot be served to students, including unserved entrees that cannot be reheated. For the 2017/2018 school year, Vista Unified was able to donate 38,036 pounds of food that would have otherwise ended up in the landfill.

Short-lived Climate Pollutants: Methane Emissions: Dairy and Livestock: Organic Waste: Landfills – SB 1383 (2016)

This law requires statewide reduction of organic disposal volumes by 50% by 2020 and 75% by 2025 and recovery of 20% of edible food by 2025. Food waste prevention, food donation, and having the necessary infrastructure in place to manage food donations will be key in meeting these requirements.

Bill Emerson Good Samaritan Food Donation Act – H.R. 2428 (1996)

The purpose of this law is to encourage the donation of food and grocery products to nonprofit organizations that distribute food to people in need. The Good Samaritan Act provides that a person or gleaner be protected from civil and criminal liability from the nature, age, packaging, or condition of food donated in good faith to a nonprofit organization for ultimate distribution to needy individuals.

California Good Samaritan Food Donation Act – AB 1219 (2017)

This law expands liability protections to cover past-date foods that are evaluated to be fit for human consumption by the donor at the time of donation, and states that no person, gleaner, or food facility will be liable for any damage or injury resulting from the consumption of the donated food, except for injury resulting from the negligence or intentional misconduct in the preparation or handling of donated food.

Tax Deduction for Charitable Contributions (Internal Revenue Code, Section 170)

This section of the Internal Revenue Code pertains to the allowance of deduction for charitable contributions and gifts and encourages donations by allowing "C" corporations to earn an enhanced tax deduction for donating selected surplus property, including food.

Food Donations and Pupil Meals: Schools – SB 557 (2017)

This law allows food service staff, students, and faculty at public schools to donate leftover unopened food to "share tables" (share tables are predesignated tables where individuals can place unopened food and drinks that they are not going to consume for others to take) that are available to students during the course of the school year, or to a food bank or any other nonprofit charitable organization. The California Department of Education is tasked to update specified guidelines on the donation of leftover food.

Food Labeling: Quality and Safety Dates – AB 954 (2017)

This law addresses confusing food date labels such as "sell by," best by," and "best before" to prevent people from throwing away safe food. The bill requires the California Department of Food and Agriculture to publish information to food manufacturers, processors, and retailers that promotes the consistent use of uniform terms on food labels to communicate quality and safety dates.

Limited Service Charitable Feeding Operation - AB 2178 (2018)

This law exempts limited service charitable feeding operations, such as food pantries doing limited preparations, from the definition of food facility. The purpose of this law is to provide greater regulatory flexibility for non-profit charitable feeding operations to serve wholesome food to those in need with a primary focus on food safety and provide a clear direction and guidance to both operators and local enforcement agencies.

References

(1) Dana Gunders, et al., "Wasted: How America is Losing Up to 40 Percent of Its Food from Farm to Fork to Landfill," 2nd edition, Natural Resources Defense Council (2017).

(2) ReFED. "A Roadmap to Reduce U.S. Food Waste by 20 Percent". 2016. https://www2.deloitte.com/us/en/pages/operations/articles/refed-roadmap-to-reduce-us-food-waste.html

(3) Project Drawdown. https://www.drawdown.org/solutions/food/reduced-food-waste

(4) California Department of Resources Recycling and Recovery (CalRecycle). Food Scraps Management: Organic Materials Management. https://www.calrecycle.ca.gov/organics/food/

(5) San Diego Hunger Coalition. 2018. Hunger Free San Diego Issue Brief: 2016 San Diego County Food Insecurity.

(6) Natural Resources Defense Council (NRDC). Hoover, Darby and Laura Moreno. Estimating Quantities and Types of Food Waste at the City Level. October 2017. R-17-09-B. https://www.nrdc.org/sites/default/files/food-waste-city-level-report.pdf

(7) San Diego Food System Alliance. Smart Kitchens San Diego. http://www.sdfsa.org/smart-kitchens-san-diego/

(8) Food Recovery Network. https://www.foodrecoverynetwork.org/california

(9) San Diego Food System Alliance. 2018 EMIES Awards. http://www.sdfsa.org/emies2018

(10) USDA. Let's Glean! United We Service Toolkit. https://www.usda.gov/sites/default/files/documents/usda_gleaning_toolkit.pdf

(11) County of San Diego. Food Donation Action Plan for the San Diego Region. Live Well San Diego Food System Initiative. June 2018. http://www.livewellsd.org/content/dam/livewell/TipsandToolsOrgs/Food-Donation-Action-Plan-for-the-San-Diego-Region.pdf

(12) County of San Diego. Board of Supervisors, Regular Meeting, Planning and Land Use Matters. December 12, 2018. Agenda Item 5: https://www.sandiegocounty.gov/content/dam/sdc/bos/agenda/sop/121218sop.pdf

(13) San Diego County Residential Gleaning Possibilities. My Mommas Place. Karen Clay. July 1, 2018. Available at www.mymommasplace.com/

(14) United States Environmental Protection Agency (EPA). Sustainable management of Food: Industrial Uses for Wasted Food. https://www.epa.gov/sustainable-management-food/industrial-uses-wasted-food#fog

(15) California Department of Resources Recycling and Recovery (CalRecycle). Compost and Mulch: Home Page. https://www.calrecycle.ca.gov/Organics/CompostMulch/

Resources

County of San Diego: Food Storage Recipe Tip Cards, Food Recovery Newsletter, Food Donation Guide and Checklist

Buster Biofuels http://busterbiofuels.com/

County of San Diego: Waste Not, Leftovers Wanted

https://www.sandiegocounty.gov/content/dam/sdc/dpw/SOLID_WASTE_PLANNING_and_RECYCLING/Files/SDWAST_NewFinal%20(1).pdf

Crop Mobster www.cropmobster.com /

Harvest CROPS. Community Residents Offering Produce Seasonally. http://harvestcrops.org/

Feeding San Diego https://feedingsandiego.org/

Jacobs & Cushman San Diego Food Bank https://sandiegofoodbank.org/

New Leaf Biofuel http://www.newleafbiofuel.com/

ProduceGood https://producegood.org/

San Diego County Farm Bureau www.sdfarmbureau.org

San Diego Food System Alliance. Healthy Foods, Healthy Soils Toolkit: http://www.sdfsa.org/toolkit/

Senior Gleaners of San Diego County http://seniorgleanerssdco.org/

Solana Center for Environmental Innovation: https://www.solanacenter.org/

U.S. Environmental Protection Agency, San Diego Food Recovery: https://www.sandiegocounty.gov/content/dam/sdc/dpw/SOLID_WASTE_PLANNING_and_RECYCLING/Files/SD%20Area%20Food%20Recovery%202017%20Final%20Revised%20Document%207.26.17.pdf

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APPENDICES

The following tables include metrics that were identified as key to tracking progress in the different areas of the San Diego region food system. The metrics were selected by the Stakeholder Advisory Group during the creation of the State of the Food System Report and they informed the development of each of the sections of this report. A wish list of additional metrics is also included to help inform potential future research opportunities to help close the gap for local food system data.

SECTION 1: INPUT					
SUBTOPIC	METRIC	SUMMARY/ANALYSIS	OTHER/ PAST YEARS	DEPT REFERENCE/SOURCE	LINKS
Land					
	Acreage of land in agriculture	2018: 242,554 acres	2017: 243,029 acres	County of San Diego Agriculture, Weights & Measures' Crop Statistics & Annual Report 2018	https://www.sandiegocounty.gov/awm/crop_statistics.html
	Acreage and % of cropland for food production	230,279 acres, which is approximately 95% of agricultural land.	2017: 230,480 acres which is about 95% of all agricultural land	County of San Diego Agriculture, Weights & Measures' Crop Statistics & Annual Report 2018	https://www.sandiegocounty.gov/awm/crop_statistics.html
Soil					
	Number of operations using fertilizers (total, including lime and soil conditioners)	2017: 3,103 farms	2012: 3,546 farms 2007: 5,184 farms	2007 & 2012 & 2017 Census of Agriculture	https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_2_County_Level/California/st06_2_0003_0003.pdf
	Commercial fertilizer expenditures	2017 CA: 2,082,908 ($1,000), San Diego county: 29,587 ($1,000)	2012 CA: $1,806,062 ($1,000), San Diego county: $27,006 ($1,000)	2017 Census of Agriculture	https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_2_County_Level/California/st06_2_0003_0003.pdf
	GHG emission reduction targets from Agriculture	5% emissions from agriculture (163,696 metric tons of carbon dioxide equivalents), associated with livestock, fertilizer use, soil management, and agricultural equipment		County of San Diego Climate Action Plan	https://www.sandiegocounty.gov/content/sdc/pds/ceqa/Climate_Action_Plan_Public_Review.html
Water					
	Number of polluted waterways and relevant clean-up plan	Please visit links provided for qualitative information.		San Diego Regional Water Quality Control Board; San Diego Coastkeeper	https://www.sdcoastkeeper.org/learn/swimmable/san-diego-water-quality/regulatory-process ; https://www.waterboards.ca.gov/sandiego/water_issues/programs/tmdls/index.html

SECTION 1: INPUT					
SUBTOPIC	METRIC	SUMMARY/ANALYSIS	OTHER/ PAST YEARS	DEPT REFERENCE/SOURCE	LINKS
	Water usage trends and sources	Total water use in San Diego county in 2017 = 477,024 acre feet. (Residential: 64%, Commercial & Industrial: 17%, Agricultural: 10%, Public & Other: 9%)		San Diego County Water Authority	https://www.sdcwa.org/annualreport/2017/water-supply-reliability.php
	Urban, agricultural, recycled water use	2017 Water supply diversification: 40% Metropolitan Water District, 21% Imperial Irrigation Water District, 17% All-American & Coachella Canal Lining, 9% Seawater Desalination, 5% Local Surface Water, 5% Recycled Water, and 3% Groundwater	See link for 2020 and 2035 projections.	San Diego County Water Authority	https://www.sdcwa.org/annualreport/2017/water-supply-reliability.php
Ocean					
	Number of commercial fishing ports (docks/wharves & associated facilities)	16 fuel and pump-out docks total -- 13 sanitary stations and fuel docks, 3 fuel docks only. Port of SD: Tuna Harbor Basin Mooring		Port of San Diego	https://www.portofsandiego.org/maritime/commercial-fishing
	Number of commercial fishing boat registrations	5,499 (2018)	5,412 (2017)	California Department of Fish and Wildlife	https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=59824&inli
	Number of commercial fishing incubator and commercial fishing training programs	Port of San Diego's Blue Economy Incubator, Commercial Fishing Apprenticeship Program		Port of San Diego; California Sea Grant	https://www.portofsandiego.org/waterfront-development/blue-economy; https://caseagrant.ucsd.edu/project/education-making-waves/commercial-fishing-apprenticeship-program
	Total acreage/ percentage dedicated to commercial fishing	21 acres/4% of harbor water and 8.5 acres/1% of waterfront land (including San Diego Bay, Mission Bay and Oceanside)		Port of San Diego Master Plan. 2017. San Diego Unified Port District.	https://pantheonstorage.blob.core.windows.net/waterfront-development/Port-Master-Plan.zip
	Total acreage of embayments/harbors dedicated to marine aquaculture	25 acres of water and 2.5 acres of land at Agua Hedionda Lagoon (Carlsbad)		Port of San Diego Master Plan. 2017. San Diego Unified Port District.	https://pantheonstorage.blob.core.windows.net/waterfront-development/Port-Master-Plan.zip

WISHLIST: (land) number of farms using manure, $ spent on farmland conservation programs, total conserved acreage in agricultural use, acreage and % of land (and/or lakes) dedicated to freshwater hydroponics or aquaculture, (soil) acreage and % of "prime soils", acreage and % of "soils of statewide importance", number of farms enrolled in CREP, EQIUP, & CSP programs, (animal feed) total spent on animal feed, total spent on aquaculture feed, antibiotics, (seeds) total spent on seeds, plants, vines, and trees for food production, aquaculture seeds, (water) dollars spent on chemicals by farmers, measures of water quality and pollution in coastal water and embayments, (ocean) # of marine aquafarm incubator and marine aquaculture training

SECTION 2: FOOD PRODUCTION

SUBTOPIC	METRIC	SUMMARY/ANALYSIS	OTHER/ PAST YEARS	DEPT REFERENCE/SOURCE	LINKS
Commercial Agriculture					
	Total agricultural sales	2018: $1,769,815,715	2017: $1,774,206,410	County of San Diego Agriculture, Weights & Measures' Crop Statistics & Annual Report 2018	https://www.sandiegocounty.gov/awm/crop_statistics.html
	Gross cash farm income	2017: Average net cash income of operations per farm - 32,395; average market value of agricultural products sold per farm -$ 163,601	2012: Average net gain cash farm income - $314,058; average market value of agricultural products sold per farm -$549,397 (all reported statewide)	2012 & 2017 Census of Agriculture	https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_2_County_Level/California/st06_2_0001_0001.pdf
	Farm revenue by crop variety	2018: Nursery and Cut Flowers: $1,247,987,124; Forest Products: $831,974	Please see below for food production farm revenue under each subtopic.	County of San Diego Agriculture, Weights & Measures' Crop Statistics & Annual Report 2008 - 2018	https://www.sandiegocounty.gov/awm/crop_statistics.html
	Number of farms	2017: 5,082 farms	2012: 5,732 farms	2012 & 2017 Census of Agriculture	https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_2_County_Level/California/st06_2_0001_0001.pdf
	Farm sizes	San Diego county average size of farm is 44 acres (median of 5 acres); California average of 348 acres.	3,528 farms are 1 to 9 acres; 1,084 farms are 10 to 49 acres; 281 farms are 50 to 179 acres; 125 farms are 180 to 499 acres; and 64 farms are 500 or more acres (2017)	2017 Census of Agriculture	https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_2_County_Level/California/st06_2_0001_0001.pdf
	Land in farms	242,554 acres	2017: 243,029 acres	County of San Diego Agriculture, Weights & Measures' Crop Statistics & Annual Report 2018	https://www.sandiegocounty.gov/content/dam/sdc/awm/docs/2018_Crop_Report_web.pdf

SECTION 2: FOOD PRODUCTION

SUBTOPIC	METRIC	SUMMARY/ANALYSIS	OTHER/ PAST YEARS	DEPT REFERENCE/SOURCE	LINKS
	Age distribution of farmers	21 to 40 years (11.42%), 41-50 years (10.05%), 51-60 years (22.37%), 61-70 years (31.51%), over 70 years (24.66%)		University of California Cooperative Extension Grower Needs Assessment	https://f2icenter.org/wp-content/uploads/2018/10/Growers-Needs-Assessment.pdf
	Number of farms by race of principal farmer	4,730 farms are of white principal farmers (2017)	5,381 farms are of white principal farmers (2012)	2012 & 2017 Census of Agriculture	https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_2_County_Level/California/
	Years on present farm	2 years or less- 513 farms, 3 to 4 years- 1,008 farms, 5 to 9 years- 1,617 farms, 10 years or more 5,459 farms (2017)	2 years or less- 168 farms, 3 to 4 years 305 farms, 5 to 9 years 1,297 farms, 10 years or more 3,962 farms (2012)	2007 & 2012 & 2017 Census of Agriculture	https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_2_County_Level/California/st06_2_0045_0045.pdf
	Total crop acreage and percent of acreage dedicated to food production	230,279 acres, which is about 95% of total agricultural acreage dedicated to food production		County of San Diego Agriculture, Weights & Measures' Crop Statistics & Annual Report 2018	https://www.sandiegocounty.gov/awm/crop_statistics.html
	Economic impact of agriculture	Commercial agriculture has a total economic impact of approximately $2.88 billion.		County of San Diego Agriculture, Weights & Measures	https://www.sandiegocounty.gov/content/dam/sdc/awm/docs/SDAgImpact.pdf
	Number of certified growers and registered organic growers	218 local certified growers and 360 registered organic growers		County of San Diego Agriculture, Weights & Measures' Crop Statistics & Annual Report 2018	https://www.sandiegocounty.gov/awm/crop_statistics.html
	Number of certified vendors	2017: 293 certified vendors	2016: 270 certified vendors	County of San Diego Agriculture, Weights & Measures' Crop Statistics & Annual Report 2008 - 2018	https://www.sandiegocounty.gov/awm/crop_statistics.html
	Acreage of certified organic farms	10,799 acres in 2017		County of San Diego Agriculture, Weights & Measures	
	Acreage of certified organic farms producing food	10,799 acres in 2017		County of San Diego Agriculture, Weights & Measures	

SECTION 2: FOOD PRODUCTION					
SUBTOPIC	METRIC	SUMMARY/ANALYSIS	OTHER/ PAST YEARS	DEPT REFERENCE/SOURCE	LINKS
Urban agriculture					
	Number of neighborhood/ community gardens	112 gardens		Community Garden Roster (Master Gardener Association of SD County)	https://www.mastergardenersd.org/community-gardens/
Vegetables					
	Vegetables - acreage and value	2018: 2,217 acres valued at $131,260,784	2017: 3,264 acres valued at $136,940,824	County of San Diego Agriculture, Weights & Measures' Crop Statistics & Annual Report 2018	https://www.sandiegocounty.gov/awm/crop_statistics.html
	Number of farms producing vegetables	333 farms producing vegetables		County of San Diego Agriculture, Weights & Measures	
	Number of certified organic farms producing vegetables	51 farm businesses are organic vegetable farms		County of San Diego Agriculture, Weights & Measures	
Fruits & Nuts					
	Fruits and nuts - acreage and value	2018: 33,049 acres valued at $322,949,527	2017: 30,710 acres valued at $331,590,283	County of San Diego Agriculture, Weights & Measures' Crop Statistics & Annual Report 2018	https://www.sandiegocounty.gov/awm/crop_statistics.html
	Number of farms producing fruits and nuts	2,180 farm businesses		County of San Diego Agriculture, Weights & Measures	
	Number of certified organic farms producing fruits and nuts	329 (of the 2,180 farm businesses) are organic		County of San Diego Agriculture, Weights & Measures	
Livestock & Poultry					
	Number of animal raising operations in the County	Cattle and Calves: 244, Sheeps and Lambs: 101, Milk Goats: 92, Hogs and Pigs: 72, Poultry: 451, Honey: 169 (2017)	Cattle and Calves: 315, Sheeps and Lambs: 116, Milk Goats: 48, Hogs and Pigs: 50, Poultry: 378, Honey: 114 (2012)	1992-2017 Census of Agriculture	https://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_2_County_Level/California/; https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_2_County_Level/California/st06_2_0011_0011.pdf

SECTION 2: FOOD PRODUCTION					
SUBTOPIC	METRIC	SUMMARY/ANALYSIS	OTHER/ PAST YEARS	DEPT REFERENCE/SOURCE	LINKS
	Number of organic animal raising operations in the County	7 registered organic farms in the county that raise livestock.	This data point is a snapshot in time, as the number can vary throughout the year. Data from Summer of 2019.	County of San Diego Agriculture, Weights & Measures	
	Number of animal operations with a third-party certification ensuring humane treatment	Certified Humane Raised and Handled - 2, Animal Welfare Approved - 7		Certified Humane Raised and Handledand Animal Welfare Approved	https://certifiedhumane.org/whos-certified-2/ ; https://agreenerworld.org/shop-agw/product-search/
	Total number of cattle and calves	2018: 10,900	2017: 10,800	County of San Diego Agriculture, Weights & Measures' Crop Statistics & Annual Report 2018	https://www.sandiegocounty.gov/awm/crop_statistics.html
	Total number of hogs and pigs	2018: 1,382	2017: 1,302	County of San Diego Agriculture, Weights & Measures' Crop Statistics & Annual Report 2018	https://www.sandiegocounty.gov/awm/crop_statistics.html
	Total value of chickens	2018: $5,045,034	2017: $4,711,829	County of San Diego Agriculture, Weights & Measures' Crop Statistics & Annual Report 2018	https://www.sandiegocounty.gov/awm/crop_statistics.html
	Total number of layers (egg-laying hens)	26,427,177 dozen, $38,847,950 (2017)	27,192,480 dozen, $29,768,000 (2016)	County of San Diego Agriculture, Weights & Measures' Crop Statistics & Annual Report 2017	https://www.sandiegocounty.gov/awm/crop_statistics.html
	Livestock and poultry value	2018: $18,759,533	2017: $18,167,205	County of San Diego Agriculture, Weights & Measures' Crop Statistics & Annual Report 2017	https://www.sandiegocounty.gov/awm/crop_statistics.html
	Livestock and poultry products value (milk and eggs)	2018: $40,825,539	2017: $46,227,998	County of San Diego Agriculture, Weights & Measures' Crop Statistics & Annual Report 2018	https://www.sandiegocounty.gov/awm/crop_statistics.html
Honey					
	Honey - value	2018: $418,563	2017: $769,371	County of San Diego Agriculture, Weights & Measures' Crop Statistics & Annual Report 2018	https://www.sandiegocounty.gov/awm/crop_statistics.html

SECTION 2: FOOD PRODUCTION					
SUBTOPIC	METRIC	SUMMARY/ANALYSIS	OTHER/ PAST YEARS	DEPT REFERENCE/SOURCE	LINKS
	Number of farms and acreage producing honey	25 commercial bee keepers and certified producers, no data on acreage		County of San Diego Agriculture, Weights & Measures	
Grains, beans & field crops					
	Field crops - acreage and value	2018: 194,013 acres valued at $3,763,857	2017: 196,506 acres valued at $4,120,952	County of San Diego Agriculture, Weights & Measures' Crop Statistics & Annual Report 2018	https://www.sandiegocounty.gov/awm/crop_statistics.html
	Number of farms producing grains	57 grain producers		County of San Diego Agriculture, Weights & Measures	
	Number of certified organic farms producing grains	2 certified organic farms		County of San Diego Agriculture, Weights & Measures	
Hops & Beer					
	Number of hop producers	7 hop producers		County of San Diego Agriculture, Weights & Measures	
	Number of craft breweries	148 independent craft brewers, 178 total operating craft brewery locations		San Diego Brewers Guild	https://csusm.edu/coba/obra/reports/craft_beer/craft_report_18.pdf
Hard Cider, Spirits & Wine					
	Number of distilleries, wineries and cideries	13 distilleries, 62 wineries, 10 cideries			https://ciderguide.com/california-cider-map-directory/ ; https://www.sddistillers.com/ ; https://sandiegowineries.org/
	Number and acreage of wine grape producers	289 wine grape production sites, 12,270 acres		County of San Diego Agriculture, Weights & Measures	

SECTION 2: FOOD PRODUCTION					
SUBTOPIC	METRIC	SUMMARY/ANALYSIS	OTHER/ PAST YEARS	DEPT REFERENCE/SOURCE	LINKS
Fisheries & Aquaculture					
	Number of fishing operations	2017: 20 operations	2016: 20 operations	California Employment Development Department - Quarterly Census of Employment and Wages (2008-2017)	https://www.labormarketinfo.edd.ca.gov/qcew/cew-select.asp
	Number of marine aquaculture farms or facilities	5 marine aquaculture facilities -- 2 nearshore, 3 inland	Only 1 is commercial (Carlsbad Aquafarm), the rest are pilot programs	San Diego Coastkeeper; Carlsbad Aquafarm	https://www.sdcoastkeeper.org/blog/marine-conservation/does-san-diego-have-aquaculture; http://carlsbadaquafarm.com/
	Total commercial fish landings by weight and value	2017: 2,246,752 pounds valued at $10,071,731	San Diego: 562,348 pounds; Mission Bay: 428,285 pounds; Oceanside: 351,901 pounds; Point Loma: 899,986 pounds, La Jolla: 1,668 pounds; Other ports: 2,564 pounds (2017)	California Department of Fish and Wildlife	https://www.wildlife.ca.gov/Fishing/Commercial/Landings#260042120-2017

WISHLIST: (commercial) number of female-owned farms, number of farms owned by farmers of color, # of hydroponic and aquaponic operations, (urban agriculture) acreage and number of urban farms, acreage and number of certified organic urban farms, average size of urban farm, average of urban farmers, number of female-managed urban farms, number of urban farms managed by farmers of color, agricultural sales from urban farms, number of urban farms direct marketing and % of sales to direct markets, (livestock & poultry) number of farms by product category (beef, pork, poultry), (hops & beer) weight of hops produced, value of hops sold, barrels or gallons of beer produced, number of breweries owned by women, number of breweries owned by person of color, locally owned breweries, (hard cider, spirits & wine) sales from distilleries, wineries and cideries, (fisheries & aquaculture) number of producers using sustainable fishing practices, total sales from fisheries, number of commercial fishing licenses, total sales from aquafarms.

SECTION 3: FOOD MANUFACTURING & PROCESSING

SUBTOPIC	METRIC	SUMMARY/ANALYSIS	OTHER/ PAST YEARS	DEPT REFERENCE/SOURCE	LINKS
	Products that are imported for manufacturing and processing	Import wheat flour, corn meal, and yeast for tortilla and bakery manufacturing. Import cacao and coffee beans for chocolate and coffee manufacturing.		County of San Diego Agriculture, Weights & Measures' Economic Contributions of San Diego County Agriculture Report	https://www.sandiegocounty.gov/content/dam/sdc/awm/docs/SDAgImpact.pdf
	Products that are exported for manufacturing and processing	Export fluid milk production, cattle, and calves for processing.		County of San Diego Agriculture, Weights & Measures' Economic Contributions of San Diego County Agriculture Report	https://www.sandiegocounty.gov/content/dam/sdc/awm/docs/SDAgImpact.pdf
	Number of cottage food production/types	259 Cottage Food Operations: 166 Class A operations which are direct sales only and 93 Class B operations which are direct and indirect sales		County of San Diego Department of Environmental Health	
	Revenue generated from cottage food producers	Each cottage food producer is limited to no more than $50,000 in gross annual sales. There is no data on exact revenue generated.		County of San Diego Department of Environmental Health	

WISHLIST: number of food processors/manufacturers, food manufacturing as a % of total overall manufacturing, revenue generated annually by food manufacturers, number of food manufacturers by category, number of packing houses/types of goods

SECTION 4: STORAGE & DISTRIBUTION

SUBTOPIC	METRIC	SUMMARY/ANALYSIS	OTHER/ PAST YEARS	DEPT REFERENCE/SOURCE	LINKS
	Main food distributors	US Foods, Sysco, Specialty Produce, Sunrise Produce, American Produce, and Diamond Jack		Community Health Improvement Partners; 2018 San Diego County Food Hub Needs Assessment	https://f2icenter.org/wp-content/uploads/2018/11/SDC-Food-Hubs-Needs-Assessment-Report.pdf
	Number of and sales at grocery stores	696 grocery stores -- $5,463,597,000		County of San Diego Health and Human Services Agency, Community Health Statistics Unit	
	Number of Certified Farmers' Markets	36 Certified Farmers' Markets		County of San Diego Agriculture, Weights & Measures	https://www.sandiegocounty.gov/awm/farmers_markets.html
	Number of Community Supported Agriculture (CSA) programs	17 CSA programs		Edible San Diego	http://ediblesandiego.ediblecommunities.com/shop/map-farms-csa-programs-san-diego-county
	Number of Farm Stands	21 Farm Stands in San Diego County.		Local Harvest	https://www.localharvest.org/san-diego-ca/farm-stands

WISHLIST: number of food storage facilities, number of food hubs, revenue generated annually by storage facilities, aggregators and distributors, number of and sales at institutions, number of and sales at independently owned grocery stores, number of and sales at restaurants, aggregate sales at farmers markets, sales at CSA's, sales at Farm Stands

SECTION 5: CONSUMER DEMAND

SUBTOPIC	METRIC	SUMMARY/ANALYSIS	OTHER/ PAST YEARS	DEPT REFERENCE/SOURCE	LINKS
	The percent of income spent on food	San Diego county: 12.5% of income for food, and United States: 12.7% of income for food		Bureau of Labor Statistics	https://www.bls.gov/regions/west/news-release/consumerexpenditures_sandiego.htm
	The percent of food at home and food away from home	San Diego households spent 54% of food dollars on food at home and 46% on food away from home. For the U.S. 56% at home and 44% on food away from home.		Bureau of Labor Statistics	https://www.bls.gov/regions/west/news-release/consumerexpenditures_sandiego.htm
Local Food					
	Number of farmers using the San Diego Grown 365 label	106 contracts with SD Grown 365 label		San Diego Farm Bureau	
	Promotion of 365 labels at County workshops, in publications, etc.	Brand is only passively promoted through the Farm Bureau's printed material (e.g. Quarterly newsletter).		San Diego Farm Bureau	

WISHLIST: (at home and away from home) $ and % of where (supermarkets, convenience stores, etc.) people purchase their food, (local food) $ and % of food sales that are local, $ and % of local food sales by outlet, # of fishermen's markets, # of each kind of producer present at each market as a vendor, # of fishermen using the San Diego Caught label

SECTION 6: NUTRITION & FOOD SECURITY

SUBTOPIC	METRIC	SUMMARY/ANALYSIS	OTHER/ PAST YEARS	DEPT REFERENCE/SOURCE	LINKS
	Adult overweight and obesity rates	Approximately 33% of adults in San Diego county are overweight and 26% are obese. (2010 data)		Centers for Disease Control and Prevention	https://www.cdc.gov/nccdphp/dch/programs/communitiesputtingpreventiontowork/communities/profiles/pdf/CPPW_CommunityProfile_B2_SanDiego-County_CA
	Childhood overweight and obesity rates	Approximately 17.4% of San Diego county fifth, seventh, and ninth grade children enrolled in public schools are overweight and 16.8% are obese. (2014-15 school year)		Community Health Improvement Partners - San Diego County Childhood Obesity Initiative	https://sdcoi.org/wp-content/uploads/2018/03/stateofchildhoodobesity-sdcountyfinal1.pdf
	Percent adults who eat fast food at least once a week	Data from 2007-2010 show that adults in the U.S. consumed an average of 11.3% of their daily calories from fast food.		Centers for Disease Control and Prevention	https://www.cdc.gov/nchs/products/databriefs/db114.htm
	Percent of children who eat fast food at least once a week	In 2011-2012, children and adolescents in the U.S. consumed on average 12.4% of their daily calories from fast food.		Centers for Disease Control and Prevention	https://www.cdc.gov/nchs/products/databriefs/db213.htm
	Sugary drink consumption for adults	2014 sugar drink consumption 1+ times per day (18+ years): SD County - 16%, California - 17.4%		California Health Interview Survey database	http://ask.chis.ucla.edu/AskCHIS/tools/_layouts/AskChisTool/home.aspx#/geography
	Number of meals eaten outside of the home (eg. at a restaurant)	20% of Americans visit quick service restaurants once a week.		Statista	https://www.statista.com/topics/1957/eating-out-behavior-in-the-us/

SECTION 6: NUTRITION & FOOD SECURITY

SUBTOPIC	METRIC	SUMMARY/ANALYSIS	OTHER/ PAST YEARS	DEPT REFERENCE/ SOURCE	LINKS
Breastfeeding					
	Percent of women who breastfeed	San Diego county - 96.1% any breastfeeding, 80.9% exclusive breastfeeding; California - 94%: any breastfeeding, 69.4% exclusive breastfeeding (2016)		CalWIC	http://www.calwic.org/storage/documents/Factsheets2017/San_Diego.pdf
	National Breastfeeding Rates	Nationally, among infants born in 2015, 83% (1/5) started to breastfeed but only 25% exclusively through 6 months, and 36% (1/3) at 12 months.		Center for Disease Control and Prevention	https://www.cdc.gov/breastfeeding/data/reportcard.htm
Food Security					
	Retail Food Environment Index (RFEI)	Data shows the different estimates of the RFEI throughout SD County. The mean estimate (20.2) is greater than the median estimate (17.4), meaning there are more of less healthy retailers of the total food retailers.		California Department of Public Health	https://data.chhs.ca.gov/dataset/modified-retail-food-environment-index
	Population living more than one mile away from a supermarket	Provides a map. Go to "San Diego, CA", select all of the "Low Income & Low Access Layers 2015", select "Low Income" of "Components Layers 2015"		U.S. Department of Agriculture, Economic Research Service	https://www.ers.usda.gov/data-products/food-access-research-atlas/go-to-the-atlas/
	Number of zip codes without a grocery store	Population living without grocery type stores in neighborhood: 103,387		County of San Diego Department of Agriculture, Weight & Measures	

SECTION 6: NUTRITION & FOOD SECURITY

SUBTOPIC	METRIC	SUMMARY/ANALYSIS	OTHER/ PAST YEARS	DEPT REFERENCE/ SOURCE	LINKS
	CalFresh Program Recepients	374,996		Eligibility Operations, County of San Diego Health and Human Services Agency	
	Number of markets participating in the LWCMP	Currently there are 20 sites. (Summer 2019)	This number is a snapshot in time as markets continue to join and also leave the program.	County of San Diego Health & Human Services Agency	
	Number of farmers markets accepting EBT	13 farmers markets accept EBT		San Diego County Land Use and Environment Group- Performance	https://performance.sandiegocounty.gov/stat/goals/mtj4-7wcj/bcmn-r9nj/ja4d-k5uj
	Percent of students qualifying for free/ reduced lunch	2108-2019: San Diego county- 53.4% and California -61%		California Department of Education	https://www.cde.ca.gov/ds/sh/cw/
	Annual distribution of food from food banks	FY 2017-2018, 28 million pounds (23.3 meals, 9.5 of which was fresh produce)		San Diego Food Bank, Feeding San Diego	https://sandiegofoodbank.org/about/hunger-facts-research/ ; https://feedingsandiego.org/ar-2016-2017/index.html
	Number of people served at food banks on a monthly basis	San Diego Food Bank - 350,000 people/month; Feeding San Diego - 63,000 people/week		San Diego Food Bank, Feeding San Diego	https://sandiegofoodbank.org/about/ ; https://feedingsandiego.org/about/

SECTION 6: NUTRITION & FOOD SECURITY

SUBTOPIC	METRIC	SUMMARY/ANALYSIS	OTHER/ PAST YEARS	DEPT REFERENCE/ SOURCE	LINKS
	Food insecurity calls to 211 San Diego	Please visit 211 website (link provided) and go to 'Nutrition' to see data		211 San Diego	https://211sandiego.org/partners/data-reports/
	Food insecure households	443,000 (1 in 7) people: 302,000 are adults	44% of adults and 45% of children live in households below 200% of FPL and experience food insecurity (2016)	San Diego Hunger Coalition	https://static1squarespace.comstatic/55130907e4b018f9300f3e63/t/5b7f2e4403ce64cbcbc5a60e/1535061572952/HFSD+Data+Release+-+2016+Food+Insecurity+FINAL.pdf
	Children who are food insecure	141,000 children (2017)	22.3% of total children population- 163,000 children (2016)	San Diego Hunger Coalition	https://www.sandiegohungercoalition.org/research/

WISHLIST: (food security) overall poverty and income levels by age, gender, race, ethnicity, etc., WIC participation rates, redemption rate of CalFresh and WIC at Farmers' Markets, units of food and water available for emergency preparedness.

SECTION 7: LABOR & EMPLOYMENT

SUBTOPIC	METRIC	SUMMARY/ANALYSIS	OTHER/ PAST YEARS	DEPT REFERENCE/SOURCE	LINKS
	Number of people employed in the food system	163,281 jobs in the San Diego county food system		Center on Policy Initiatives; U.S. Census (Compiled and analyzed by Pascale Joassart-Marcelli)	https://cpisandiego.org/2017/08/15/employment-and-wages-in-the-san-diego-county-food-system/
	Number of people employed in farming and fishing	12,677 people		U.S. Census Bureau, American Community Survey 5-year Estimates (ACS) (2013-2017) (Compiled and analyzed by Pascale Joassart-Marcelli)	
	Wages in farming, fishing, and forestry	Managerial positions: $15, farming and fishing: $10.78, agricultural workers: $9.80 (median hourly wages)		U.S. Census Bureau, American Community Survey 5-year Estimates (ACS) (2013-2017) (Compiled and analyzed by Pascale Joassart-Marcelli)	
	Number of people employed in food preparation and serving related jobs	102,281 people and accounts for 63% of total food system employment		U.S. Census Bureau, American Community Survey 5-year Estimates (ACS) (2013-2017) (Compiled and analyzed by Pascale Joassart-Marcelli)	
	Wages for food preparation and serving related jobs	Bartenders: $13.79, Cooks: $13.07, Servers: $10.26, Fast-food workers: $9.69, and Dishwashers, Bussers, and Assistants: $9.53 (median hourly wage)		U.S. Census Bureau, American Community Survey 5-year Estimates (ACS) (2013-2017) (Compiled and analyzed by Pascale Joassart-Marcelli)	

SECTION 7: LABOR & EMPLOYMENT

SUBTOPIC	METRIC	SUMMARY/ANALYSIS	OTHER/ PAST YEARS	DEPT REFERENCE/SOURCE	LINKS
	Number of people employed in food manufacturing	10,949 people		U.S. Census Bureau (Compiled and analyzed by Pascale Joassart-Marcelli)	
	Wages in food manufacturing	$14.71 (median hourly wage)		U.S. Census Bureau (Compiled and analyzed by Pascale Joassart-Marcelli)	
	Food system jobs as a percentage of County employment	10% of the regional economy		U.S. Census Bureau (Compiled and analyzed by Pascale Joassart-Marcelli)	
State and Nationwide					
	Employment and wages for food preparation and serving related jobs (National Average)	9.2% of total employment ; $12.30 mean hourly wage		Bureau of Labor Statistics	https://www.bls.gov/regions/west/news-release/occupationalemploymentandwages_sandiego.htm
	Number of people employed in agriculture statewide	Estimated CA Annual Average for 2018 was 420,400 people employed	Estimated California Annual Average for 2017 was 418,300 people employed	California Secretary of State Office's Employment Division	https://www.labormarketinfo.edd.ca.gov/data/ca-agriculture.html

WISHLIST: number of employees in food storage, aggregation and distribution, total and average wages in food storage, aggregation and distribution, number of migrant and seasonal farm and food workers

SECTION 8: EDUCATION & WORKPLACE DEVELOPMENT

SUBTOPIC	METRIC	SUMMARY/ANALYSIS	OTHER/ PAST YEARS	DEPT REFERENCE/SOURCE	LINKS
	Number of school gardens	688 school gardens (July 2018)		Master Gardeners Association of San Diego County	http://www.mastergardenersd.org/search-school-gardens/
	Number of Farm to School programs	252 programs		2015-2016 State of Farm to School Report, Community Health Improvement Partners	http://www.sdchip.org/wp-content/uploads/2016/06/2015-16-State-of-F2S-in-SD-County.pdf
	Number of schools participating in a Garden-to-Café/Culinary Garden program	28 schools are participating in these programs in San Diego, Carlsbad, Encinitas, Ramona, San Marcos, Solana Beach, Oceanside, and Vista.		County of San Diego Department of Environmental Health	
	Participation rates in 4H, FFA and afterschool programs	2017-2018: 3,408 participants	2016-2017: 2,226 participants	University of California Agriculture and Natural Resources	
	Number of food system incubator programs	Archie's Acres - the Veterans Sustainable Agriculture Training program		San Diego Food System Alliance	http://www.sdfsa.org/farming/
	Number of colleges offering a degree in agriculture	4 in San Diego County (Mira Costa, Southwestern College, San Diego City College, and Cuyamaca College)		Niche	https://www.niche.com/colleges/search/best-colleges-for-agricultural-sciences/

WISHLIST: participation rates in Master Gardener program, number of farm camps/education centers, number of farm internship/apprenticeship programs, number of fishing or aquaculture apprenticeship programs, number of universities/colleges offering a degree in aquaculture, fishing, fisheries biology

SECTION 9: WASTED FOOD					
SUBTOPIC	METRIC	SUMMARY/ANALYSIS	OTHER/ PAST YEARS	DEPT REFERENCE/SOURCE	LINKS
	Amount of food wasted annually in the U.S.	40 percent of the food that is grown is never consumed, resulting in over 50 million tons of wasted food that ends up in landfills annually (2012)		Natural Resources Defense Council	https://www.nrdc.org/resources/wasted-how-america-losing-40-percent-its-food-farm-fork-landfill
	Value of wasted food in the U.S.	Over $200 billion in resources are required to grow, process, and transport food that becomes waste each year		ReFed	https://www2.deloitte.com/us/en/pages/operations/articles/refed-roadmap-to-reduce-us-food-waste.html
	Value of wasted food (globally)	About $680 billion (US dollars)		Food and Agriculture Organization of the United Nations	http://www.fao.org/save-food/resources/keyfindings/en/
	Percent of Organic Material in the Region's Landfills	1,384,993 tons (2018) where 40% of that is compostable (made up of 20% food waste, 16% green materials, and 4% wood)		County of San Diego Department of Public Works	
	Food scraps sent to landfills or incinerators per year	532,689 tons (2018) with the potential for 15 % of that to be edible or recoverable.		County of San Diego Department of Public Works	
	Percent of green waste recycled	Total organics disposal: 1,335,464 tons where 41% was compostables (including food), 16% green materials, 4% wood disposal (2017)		County of San Diego Department of Public Works	
	Tons of food gleaned	ProduceGood, Senior Gleaners, and Harvest CROPS: 499,371 pounds were recovered in 2018	From 4 San Diego gleaning groups, 498,000 pounds were gleaned in 2016	ProduceGood, Senior Gleaners, Harvest CROPS, and San Diego Hunger Coalition	
	Number of organics processing facilities	20 organics processing facilities in San Diego county		County of San Diego Department of Public Works	

WISHLIST: % of food scraps diverted to feed people and animals and produce compost, tons and % of food service and consumer food waste, tons and $ value of food rescued, number of composting facilities and % certified to process food waste, tons and $ value of compost sold