

Forward Thinking: Waste Not, Want Not



Food waste initiatives, consumers' behavior, zero-waste grocers and restaurants and the sale of "ugly" produce are driving food waste management and reduction.

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Many Mouths To Feed

There has been an ongoing concern about the growing population and the world's consumption habits. Many developed and developing countries are changing their behavior and incorporating more Westernized diets including meat, dairy and other agriculturally produced food.

According to the United Nations Department of Economic and Social Affairs (UN DESA) 2015 report^a, the current world population of 7.3 billion is expected to reach 8.5 billion by 2030, 9.7 billion in 2050 and 11.2 billion in 2100.

This is a lot of mouths to feed and raises the question about sustainable resources and food waste management for our growing population. Food waste initiatives, consumers' behavior, zero-waste grocers and restaurants and the sale of "ugly" produce are driving food waste management and reduction. Food waste byproducts such as animal feed, fertilizer, compost and energy are also an important facet of food waste reduction but will not be addressed in this article.

America's Farm to Fork Problem

According to the United Nations (UN), an estimated one-third of all food is lost or wasted worldwide and globally costs up to \$940 billion per year. "If food waste were a country, it would be the third largest producer of greenhouse gases in the world, after China and the U.S.," states the UN.

Feeding America, the nation's largest domestic hunger-relief organization, estimates that as much as six billion pounds of fresh produce go to waste every year.^b According to a July 2016 *Guardian* article, roughly 60 million tons (or \$160 billion) worth of produce is wasted annually by retailers and consumers.^c The Environmental Protection Agency has found that food is the single largest contributor to landfills^d



It is reported that 25 – 40% of food grown, processed and transported in the U.S. will never be consumed. The amount of food waste is astonishing when it is reported that one in seven Americans are food insecure. Food waste management and reduction is a growing concern among consumers, food manufacturers, grocery stores and restaurants as well as governmental agencies and nonprofit organizations

Food Waste Initiatives

The U.S. is recognizing the need to manage and reduce America's food waste. Organizations such as The Food Waste Reduction Alliance^e (FWRA) and ReFED^f are finding solutions to reduce food waste through education and best practices. FWRA is an initiative of the Grocery Manufacturers Association (representing food and beverage companies), the Food Marketing Institute (representing food retailers), and the National Restaurant Association (representing the foodservice industry). ReFED is a collaboration of over thirty

^a <http://www.un.org/en/development/desa/news/population/2015-report.html>

^b <http://www.feedingamerica.org/about-us/how-we-work/securing-meals/>

^c <https://www.theguardian.com/environment/2016/jul/13/us-food-waste-ugly-fruit-vegetables-perfect>

^d <http://www.theatlantic.com/business/archive/2016/07/american-food-waste/491513/>

business, nonprofit, foundation and government leaders, which created the Roadmap, a data-driven guide and action plan of 27 opportunities to collectively reduce food waste at scale.

In 2015, the U.S. Department of Agriculture (USDA) and Environmental Protection Agency (EPA) announced a joint effort to reduce food waste by 50% by 2030.^e In June 2016, the UN announced the Food Loss and Waste Accounting and Reporting Standard (FLW Standard), a set of global definition and reporting requirements for companies, countries and others to consistently and credibly measure, report on and manage food loss and waste.^h

“Food waste management and reduction is a growing concern among consumers, food manufacturers, grocery stores and restaurants, as well as governmental agencies and nonprofit organizations.”

Food waste is not just a U.S. issue, it is a global concern. About 88 million tons of food is wasted annually in the European Union, with associated costs estimated at 143 billion euros, according to the European Commission.ⁱ In 2015, a social supermarket organized by the Stockholm City Mission opened, which sells foods that are donated by major Swedish retailers. The products are sold for 70% less and are near or just passed their sell-by date. This is to address food waste and for shoppers who can prove that they have higher needs for discounted prices.

In February this year, the French senate passed a law and became the first country in the world to ban supermarkets from throwing away or destroying unsold food, forcing them to donate it to charities and food banks. Across the pond, in July, Unilever partnered with environmental charity the Hubbub Foundation and food waste specialist Wrap, to help reduce the amount of food waste in the UK at consumer, business and policy level.^j

Why Do Americans Throw Out So Much Food?

Food waste happens all along the supply chain, from the farm to the manufacturer to the retailer or restaurant to the consumer. Food waste and management is gaining public attention and individual consumers are slowly realizing the impact of their actions. According to FWRA, for every \$1,000 in revenue grocery stores generate, 10 lbs of food waste is created.

^e <http://www.foodwastealliance.org/>

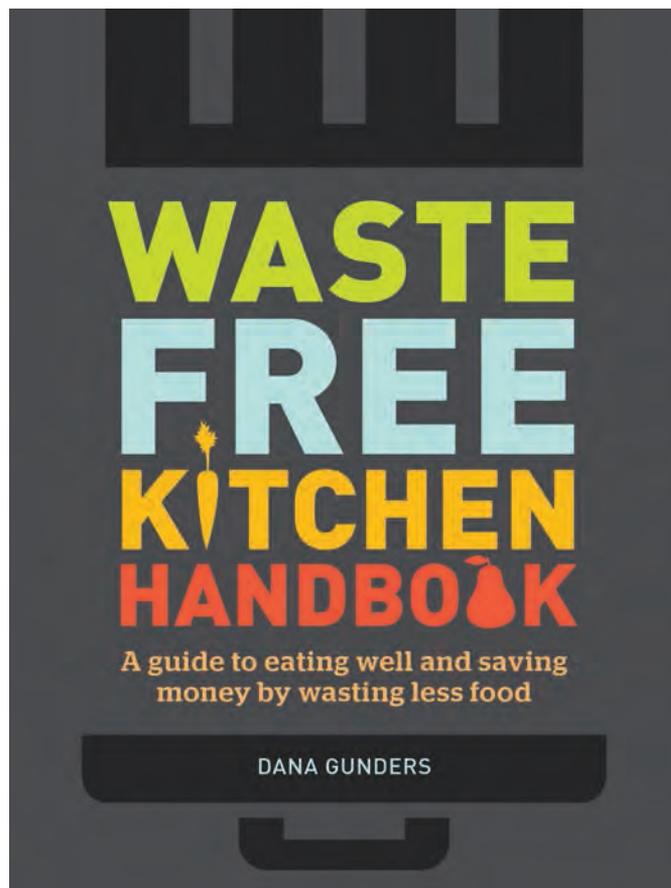
^f <http://www.refed.com/>

^g <https://www.nrdc.org/experts/dana-gunders/us-sets-first-ever-goals-reduce-food-waste>

^h <http://www.un.org/sustainabledevelopment/blog/2016/06/un-announces-first-ever-global-standard-to-measure-food-loss-and-waste/>

ⁱ http://ec.europa.eu/food/safety/food_waste/index_en.htm

^j <http://www.foodbev.com/news/unilever-in-new-partnership-to-increase-awareness-of-food-waste/>



Waste-Free Kitchen Handbook is a practical, user-friendly guide to help people identify their own habits and use more of the food they buy (photo courtesy of Dana Gunders).

Researchers at Ohio State University conducted a U.S. food waste study of 500 respondents to understand why Americans throw out so much food and the results were published in PLOS ONE in July 2016.^k The study found that 77% of the respondents feel a general sense of guilt when throwing away food. At the same time, only 58% indicated they understand that throwing away food is bad for the environment, and only 42% believe wasted food is a major source of wasted money. 68% of respondents believe that throwing away food after the package date has passed reduces the chance of foodborne illness, while 59% believe some food waste is necessary to be sure meals are fresh and flavorful.

According to data from Mintel's "Food Packaging Trends - US - June 2016" report, more than half (53%) of consumers agree fresh produce spoils before they can eat/use it while 56% of consumers would be motivated to select one food product over another if its packaging better prevented food from going bad.^l The research also revealed that four in five (80%) U.S. food shoppers agree that reducing food waste is as important as reducing packaging waste. In an effort to limit waste, half

^k <http://www.livescience.com/55494-american-food-waste-attitudes.html>

^l <http://www.mintel.com/press-centrefood-and-drink/reduce-reuse-or-recycle-half-of-americans-prefer-to-buy-foods-with-minimalno-packaging-in-order-to-reduce-waste>

(52%) of consumers prefer to buy foods with minimal/no packaging.

While researching agriculture, Dana Gunders, a staff scientist for the Food & Agriculture Program at the Natural Resources Defense Council (NRDC), discovered that 40% of all food in America goes uneaten. Shocked by this astounding number and wanting to give consumers a way to waste less, Gunders, wrote the “Waste-Free Kitchen Handbook: A Guide to Eating Well and Saving Money by Wasting Less Food.” “Nobody wants to waste food but we don’t necessarily know what changes to make in our own lives in order to waste less,” said Gunders.^m It is a practical, user-friendly guide to help people identify their own habits and use more of the food they buy.

Approximately eight million tons of food are wasted in Spain each year, according to the Spanish Ministry of Agriculture, Food and the Environment.ⁿ In an effort to reduce waste, the **Yo No Desperdicio** website and app provide a sharing tool to exchange food. Currently there are 420 registered users and more than 100 pounds of food has been exchanged including dairy, fruits, vegetables, sodas, eggs and canned foods.

Zero-Waste Grocers

Trendincite’s “Forward Thinking: Health and Wellness Reboot” article, which appeared in the April 2016 issue of *Perfumer & Flavorist* magazine, explored clean labels and the growing trend for consumers to scrutinize ingredients. In July 2012, Trendincite’s “Forward Thinking: Sustain to Gain” article examined eco-friendly packaging and better business practices that addressed sustainability.

Four years later, sustainable products, services and business practices are gaining traction and visibility. These two trends are overlapping and not only are consumers paying attention to what is in their food but they also want to know more about the packaging of their food.

According to Asia Pulp & Paper’s survey, nearly two-thirds (62%) of Americans want sustainable food packaging and clear, understandable labeling reflecting these materials.^o And half of all Americans (51%) are more likely to recommend a brand or product if it includes sustainability/environmental-related information.

U.S. consumer products are notorious for wasteful packaging. As You Sow, a nonprofit foundation focused on corporate social responsibility, estimates that \$11 billion of recyclable materials are wasted annually.^p Single-use food and beverage



Imperfect Produce, an ugly produce delivery service, partnered with Whole Foods to test market the sale of ugly fruits and vegetables in some of its Northern California stores (photo courtesy of Imperfect Produce).

packaging is a prime source of the estimated 269,000 tons of plastic pollution, according to NRDC.^q

According to research from Mintel’s “Global Packaging Trends 2016” report, consumers are more likely to agree that glass is reusable (49%) and effective at retaining freshness (38%).^r However, recycling food packaging is not the norm and may be driven by lack of clear communication on the packaging. One quarter (25%) of consumers agree that it’s not always clear which food packaging is recyclable and only two in five (42%) consumers report recycling most of the food packaging they use. Furthermore, only 13% make an effort to avoid foods in packaging that cannot be recycled.

To reduce the amount of unnecessary packaging waste produced and address the environmental concerns, grocery stores have begun offering products in bulk with little or no packaging.

In 2012, Texas-based **In.gredients** grocer pioneered this trend and was the first package-free, zero-waste grocery store in the U. S. Customers bring their own reusable containers and bags to shop for fresh local and organic groceries.

Similar in concept, in 2014, Berlin’s **Original Unverpackt** launched as Germany’s first zero-waste supermarket. After witnessing the devastating effects of climate change, habitat degradation, overfishing and pollution, Vancouver marine biologist, Brianne Miller, launched **Zero Waste Market** as pop-up shops last fall. Dedicated to eliminating plastic and packaging, Zero Waste Market will open a brick-and-mortar store later this year. It will be Canada’s first zero-waste grocery store offering fresh, local, organic, and ethically sourced produce and package-free goods. Global consumers are welcoming this concept and three zero-waste grocers are expected to launch by the end of this year: **Filler** in Brooklyn, New York, **Zero Market** in Denver, Colorado and **LØS Market** in Scandinavia.

^m <https://www.nrdc.org/experts/dana-gunders/why-i-wrote-waste-free-kitchen-handbook>

ⁿ http://www.magrama.gob.es/imagenes/es/Libro%20de%20la%20estrategia_ENG_baja_tcm7-286285.pdf

^o <http://www.fastcasual.com/articles/why-sustainable-packaging-is-a-must-have-for-restaurant-success/>

^p http://www.asyousow.org/ays_report/unfinished-business-the-case-for-extended-producer-responsibility-for-post-consumer-packaging/

^q <https://www.nrdc.org/experts/peter-lehner/fast-food-trash-nation-time-cut-down-packaging-waste>

^r <http://www.mintel.com/global-packaging-trends>

Age of Imperfection

Fruits and vegetables are large contributors to food waste because often they fail to meet consumers' expectations and supermarkets' cosmetic ideal. There is no documented statistic on how many "ugly" fruits and vegetables are discarded. However, NRDC has "typically found that growers reported cosmetic-related losses ranging up to 20% of production in a given year."

Recognizing that these discarded edible and nutritious produce can be eaten and combat food waste, several supermarkets around the world are selling ugly fruit and vegetables at discounted prices.

For example, in 2014, Intermarché, the third largest supermarket chain in France, launched an ugly fruit and vegetable campaign and sold them at a 30% discount. Similarly, Woolworths in Australia launched the "Odd Bunch Campaign" selling discounted ugly fruits. In 2015, Coop Sweden, one of the country's largest food retailers, began selling ugly produce because they noted 15% to 30% of fruit and vegetables were being discarded because of their appearance. In addition, a select number of outlets in conjunction with fruit and vegetable supplier EverFresh, sell produce that are nearing their expiration date at reduced prices.

The sale of misshapen produce is also emerging in the U.S. According to California-based startup **Imperfect Produce**, an

"Food waste is a global issue and occurs in multiple stages including production, processing, retailing and consumption."

ugly produce delivery service, "One in five fruits and vegetables grown don't fit grocery stores' strict cosmetic standards." The company launched in 2015 through an IndieGoGo campaign.

To test the concept, in April this year, Whole Foods partnered with Imperfect Produce to sell ugly fruits at some of its Northern California stores. In March, Giant Eagle, Pittsburgh's largest grocery, announced a small pilot program to sell less-than-perfect produce at a discount at five area stores.

The newest and largest player to sell ugly fruit is Walmart. In May, Walmart began selling imperfect potatoes in stores in Texas. However, in July, Walmart announced a new initiative to sell ugly apples in 300 Florida stores. By virtue of Walmart's size and purchasing power this move will surely impact the industry.

No Leftovers

In addition to consumers, food manufacturers and grocery stores, restaurants are a large producer of waste. According to a 2013 study conducted by Business for Social Responsibility (BSR), on behalf of the Food Waste Reduction Alliance, U.S.

(Continued on Page 34)

(Continued from Page 31)

restaurants surveyed, reported that 84% of the generated food waste ended up in the landfill^s

From a consumer perspective, it is estimated that as much as 10% of restaurant food purchases end up in the trash. Restaurants are recognizing the need for food waste management and have been doing a variety of activities to address it.

According to National Restaurant Association's (NRA) annual What's Hot 2016 Culinary Forecast, which surveyed nearly 1,600 professional chefs, "Environmental Sustainability" and "Food Waste Reduction/Management" were cited as two culinary trends within the top 20 trends.^t When asked "Which current culinary trend will be the hottest menu trend 10 years from now?" 41% of respondents surveyed predicted that the environmental sustainability trend will grow the most in the next 10 years.

To address food waste and as part of the eco-friendly movement, chefs have been promoting root to stem cooking and nose to tail cooking, which both strive to use all parts of a vegetable or animal leaving no waste.

For example, last year, Chef Dan Barber of Blue Hill unveiled the **wastED** pop-up restaurant to create delicious meals from usually tossed ingredients such as bruised produce, meat scraps and fish bones. Chef Steven Satterfiel of Miller Union in Atlanta, recently launched his first cookbook "Root to Leaf: A Southern Chef Cooks Through the Seasons." Concerned with the problem of global food waste, Italian chef Massimo Bottura, started the Food for Soul initiative. For the 2016 Rio Olympics, Bottura established **RefettRio Gastromotiva**, a cafeteria with a team of international chefs who repurpose the leftovers from Olympic Village and serve them to locals living in Rio de Janeiro's impoverished favelas.

^s <http://www.triplepundit.com/special/food-waste/its-time-to-rethink-food-waste-in-restaurants/>

^t <http://www.restaurant.org/Downloads/PDFs/News-Research/WhatsHot2016>

Minimal Waste Eateries

Reducing waste and creating minimal or zero waste in restaurants is challenging. However, a handful of restaurants are emerging and are successfully implementing minimal and zero waste initiatives.

Industrial designer Josh Treuhaft launched the **Salvage Supperclub**, an event-based immersive dining experience in New York and California, "where chefs deliver creative and inspiring dishes using ingredients that would have otherwise gone to waste (from local farms, food co-ops, grocery stores, restaurants and beyond)."

Copenhagen's **Rub & Stub** restaurant uses local surplus food donated by fishmongers, bakers and farmers nearing its expiration date. The menu changes daily because the chefs do not know which ingredients they are going to receive. Part of the Danish Refugee Council, the majority of the restaurant is run entirely by volunteers and proceeds go to charity.

Brighton Mills **Silo**, a restaurant, bakery, brewery and coffee house opened in 2014 as UK's first zero-waste eatery. The flour for the restaurant's bread is milled on site while alcohol is brewed in the basement. The restaurant recycles all of its waste using an onsite compost machine, which is proudly on display. Supplies are delivered in reusable containers and ingredients are sourced from local farmers and producers directly.

In the town of Kamikatsu, Tokushima, Japan, there are no incinerators and no garbage trucks. 98% of town residents compost all their organic material and wash and sort their trash into 34 different categories resulting in over 80% of all garbage becoming composted, recycled, and actively reused. Aware of the town's "zero waste" policy and these strict regulations, **Rise and Win Brewery Brewing Co. BBQ & General Store** hired architect Hiroshi Nakamura and opened in 2015. The building's façade is constructed of recycled mill ends from local cedar and the exterior color was created with persimmon juice. Inside light fixtures are made of old bottles and tables



Silo a zero-waste eatery recycles all of its waste using an onsite compost machine (photo courtesy of Silo Brighton).



Toast Ale is a pale ale made from surplus loaves of bread (photo courtesy of Toast Ale & Publicis).

and chairs are recycled from the townspeople's trash. Rise and Win's signature Leuven White craft beer is formulated with the otherwise discarded peels of Yuzuko, a Kamikatsu specialty citrus, while the by-products of malt are used in the making of granola and other confections.

It is estimated that 24 million slices of bread are currently thrown out every day by UK households and it is the largest contributor of wasted food in UK. To change this, Food Waste founder Tristram Stuart partnered with Hackney Brewery to craft **Toast Ale**, a pale ale made from surplus loaves of bread. To make the beer, the discarded bread is made into breadcrumbs, toasted and then brewed with malted barley, hops and yeast.

A Conscious Change

Food waste is a global issue and occurs in multiple stages including production, processing, retailing and consumption. The supply chain directly impacts the amount of food wasted and we are all responsible—from farm to manufacturer to retailer or restaurant to consumer. Food waste reduction is dependent on changes in behavior and cannot easily or quickly be rectified

However, through public education, awareness and a conscious effort to change behavior, food waste is slowly being managed and reduced. Governmental agencies, nonprofit organizations, food manufacturers, grocery stores, restaurants and consumers are implementing new initiatives, laws, policies and procedures to reduce waste.

As consumers continue to be educated and aware, they will be more conscientious about their food consumption and waste. Zero-waste grocers and restaurants, as well as stores that offer “ugly” produce are a few examples of services that are helping consumers adapt and slowly change their behavior to reduce waste. Change takes time and with a global effort, food waste reduction can and hopefully will be achieved for future generations.

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