

Defining Upcycled Foods

A Definition for Use Across Industry, Government, and Academia

BY THE UPCYCLED FOODS DEFINITION TASK FORCE

Table of Contents

Executive Summary	2
Definition	2
Elements	2
Introduction	3
Objective	5
The Upcycling Process	5
Using the Definition	6
Upcycled Foods Definition Task Force Members	7
Definition and Elements of “Upcycled Food”	8
Definition	8
Elements	9

Executive Summary

Definition

Upcycled foods use ingredients that otherwise would not have gone to human consumption, are procured and produced using verifiable supply chains, and have a positive impact on the environment.

Elements

1. Upcycled foods are made from ingredients **that would otherwise have ended up in any food waste destination.**¹
2. Upcycled foods are **value-added products.**
3. Upcycled foods are **for human consumption.**
4. Upcycled foods **have an auditable supply chain.**
5. Upcycled foods **indicate which ingredients are upcycled on their labels.**

¹ The term "food waste destination" is meant to encompass instances of food loss and food waste and is explained in more detail in the elements section of the document. It indicates ingredients that otherwise would have exited the human food supply chain and gone to any of the 10 possible destinations described in the Food Loss and Waste Accounting and Reporting Standard, below.

Introduction

This document is intended to provide industry, government, academia, and any other interested parties with a standardized, workable definition of the term “upcycled food”. The definition represents the consolidated views of the Upcycled Foods Definition Task Force, an ad hoc task force that included a range of stakeholders and experts in the fields of food loss and waste, marketing, law and regulation, government, and the nonprofit sector. Through an interdisciplinary, multi-stakeholder process convened over several months, the Upcycled Foods Definition Task Force developed this definition and set of defining elements to provide clarity around the term and to give stakeholders a common understanding of upcycled foods from which to continue to build this sector.

The mission of the upcycled foods sector is to reduce food loss and waste, thereby decreasing the negative impact on the environment of overproduction and waste while increasing access to safe, sustainable food sources for people around the world. The annual market value of food that is lost or wasted globally is roughly \$940 billion.² Despite this surplus of food, over 820 million people across the globe are undernourished, and one in nine suffer from food insecurity and hunger.³ In the United States alone, food waste has been estimated to range between 35 to 103 million tons of food, with ReFED estimating that the total loss is around 62.5 million tons annually.⁴ Of that amount, 52.4 million tons end up in landfills or other incinerators and 10.1 million tons are lost as on-farm waste.⁵ Upcycled foods can be a part of the solution to this food waste problem.

Food waste is often talked about as a pounds-per-capita issue, yet this limited lens is insufficient to fully describe the facets of the food supply chain that could benefit from more sustainable and innovative approaches to food. Upcycled foods are typically made using ingredients that would not be considered marketable food products, whether they are sub-grade produce, by-products of other manufacturing, or scraps from food preparation, each of which normally exits the food supply chain. By diverting these food components from their traditional end-of-life destinations and incorporating them as safe and nutritious ingredients, upcycled foods can change the way manufacturers and others think about organic waste and contribute to the reduction of food waste in ways that go beyond a pure landfill-reduction strategy and start conceptualizing food surplus and byproducts as valuable raw materials.

² FOOD & AGRIC. ORG. OF THE UNITED NATIONS [FAO], FOOD WASTAGE FOOTPRINT & CLIMATE CHANGE 1 (2015) <http://www.fao.org/3/a-bb144e.pdf>.

³ FAO, THE STATE OF FOOD SECURITY AND NUTRITION IN THE WORLD: SAFEGUARDING AGAINST ECONOMIC SLOWDOWNS AND DOWNTURNS 6 (2018), <http://www.fao.org/3/ca5162en/ca5162en.pdf>.

⁴ REFED, A ROADMAP TO REDUCE U.S. FOOD WASTE BY 20 PERCENT — EXECUTIVE SUMMARY 2 (2016).

⁵ *Id.*

The word “upcycled” evokes not only food waste reduction, but also the broader goals of environmental sustainability and community nutrition.⁶ Decreasing food waste decreases resource waste, including inefficient use of land and water, and reduces carbon emissions from growing, transporting, and disposing of food. Food that is lost or wasted has an estimated carbon footprint of 3.3 gigatons,⁷ uses roughly 28% of agricultural land,⁸ and accounts for roughly 70 billion tons, or 8%, of total global greenhouse gas emissions.⁹ Upcycled foods have a positive impact on the environment by decreasing the overall greenhouse gas emissions from wasted materials or by reducing overproduction and the related waste of land, water, and other farm inputs. Because many upcycled foods are by-products, these upcycled foods allow our food system to get “more” out of “less” by creating two or more products out of resources that formerly produced only one product. By producing more from less, we can harness nutritional value from foods and by-products that would otherwise have gone to waste. Utilizing by-products also reduces waste from overproduction on farms by lowering the resources required to create another product.

In the future, it may be that some foods are only considered “upcycled” for a limited amount of time, or only if they continue to meet certain innovation or food waste prevention criteria. By narrowing the list of products that would use the phrase on their labels (and avoiding oversaturation of the market) this distinction could give producers the additional recognition needed to justify investing in unique and innovative ways to prevent food (and inedible parts) from being removed from the human food supply chain.

Having a recognized definition of upcycled foods can help the private sector and consumers to make more sustainable choices and can also help policymakers to invest in upstream food waste prevention. For example, the government could choose to give a procurement preference to foods that utilize a certain amount of upcycled ingredients, or to offer incentives to businesses to incorporate upcycled components. Such incentive programs add a new solution to the toolkit policymakers and advocates use for prevention of food waste. Upcycled foods can supplement the current set of policy opportunities, which often are focused on waste reduction, such as encouraging composting by providing curbside pickup or drop-off services for residents alongside traditional garbage management. Upcycling takes place at an earlier stage of the food system than traditional waste management,

⁶ Many current definitions (cited at the beginning of this document under “Definition”) use words like “recycle” and “reuse” both of which have been used by the environmental movement and waste reduction movement.

⁷ FAO, FOOD WASTAGE FOOTPRINT: IMPACTS ON NATURAL RESOURCES 6 (2011) <http://www.fao.org/3/i3347e/i3347e.pdf>.

⁸ *Id.*

⁹ FAO, FOOD WASTAGE FOOTPRINT, *supra* note 2.

preventing ingredients from entering a food waste destination and allowing policymakers to combat the problem earlier in the process.

Objective

The objective of the Upcycled Foods Definition Task Force (hereinafter “task force”) was to produce a clear definition for the term “upcycled food” for use in policy, measurement, private sector, and communication to the general public, that considers the needs of government, non-profit, consumers, and industry stakeholders.

The Upcycling Process

Where does “upcycled” food come from? Food, including by-products, and other inedible parts would normally travel to a number of destinations when it exits the human food supply chain. The upcycling process begins by interrupting that chain, stopping a food product or inedible part from leaving the human food supply chain, resulting in “diverted” ingredients. A sizable portion of food grown for human consumption is currently not feeding people and instead going to a destination like compost or landfill.¹⁰ Instead of going to any of 10 identified food waste destinations, that food can be diverted and put to other uses through upcycling. Diverting this product and repurposing it into a new product yields “upcycled ingredients”. These upcycled ingredients can be used to create “upcycled foods” for human consumption. Food and inedible by-products of food may also be used in other “upcycled” products, for example as components of animal feed or of cutlery made from plant fibers. Though these inedible products are valuable alternative uses of inputs that would have otherwise exited the human supply chain, non-food products are not “upcycled food” and therefore outside the scope of this document.

Unless or until upcycled certification programs are developed, companies should self-certify that their products meet this upcycled foods definition, especially if they choose to use the phrase on their products or in their marketing material. Companies and others seeking to use the term “upcycled food” should maintain records that their products and supply chains have incorporated the elements below in order to comply with the definition. Such records may be useful for explaining the meaning of the term to consumers, constituents, and other researchers, and to protect those using the term in the event that litigation is brought by consumers or others who feel the label is misleading.

¹⁰ For a more detailed discussion of potential food waste destinations, see Food Loss and Waste Protocol, *Food Loss and Waste Accounting and Reporting Standard. Executive Summary* (2016) <https://www.flwprotocol.org/> (describing the destinations for food and/or inedible parts including “animal feed” and “sewer” which appear at the top and bottom of the visual in this report).

Self-certification models are already used in the food industry. The Food and Drug Administration (FDA) uses a self-certification model for companies to establish that their products are “generally recognized as safe” or GRAS. Instead of applying for pre-market approval from FDA for a new food additive, a company looking to add an ingredient to the food system can determine on its own that a product is GRAS. There are two main ways to show a substance is GRAS: 1) showing scientific evidence of its safety¹¹ or 2) showing that there was a substantial history of consumption of the substance in food before 1958.¹² After a company makes a GRAS determination, it may voluntarily submit that determination for review by FDA, after which FDA may issue an advisory letter as to the sufficiency of the GRAS statement.¹³ FDA may also ask companies to produce documentation proving their product’s GRAS status, and recommends that companies putting a new product into the food system voluntarily submit a GRAS notice to FDA.¹⁴ A similar model, albeit without FDA or other agency involvement, could be used by upcycled food companies to self-certify that their product and supply chain reflects consideration of the elements below until certification programs or verified labels are developed.

Using the Definition

There are many ways this upcycled foods definition could be used by producers, companies, marketing professionals, policymakers, and researchers exploring the potential of upcycled foods. Upcycled food companies looking to use the term on a label or in other marketing material can use this definition and elements to guide them in voluntarily complying with the best practices for supply chain monitoring and internal record-keeping, and to reduce confusion among consumers about upcycled foods. Researchers could begin to quantify the effect of upcycling on our food system, using the definition to refine their datasets and structure research projects. Policymakers can use this definition to expand their sustainability initiatives to include new tools for waste management and prevention. They could set a goal of a certain percentage of upcycled products in procurement policies, add upcycling as an alternative to composting or recycling for businesses that must divert food waste, or provide incentives for companies to use upcycled ingredients. Businesses could use a

¹¹ 35A Am. Jur. 2d Food § 27 (2020). (“To prove that a substance is generally recognized as safe, the proponent must submit evidence establishing that scientifically trained experts, qualified to evaluate the substance, believe it is generally recognized as safe, and show that there is scientific data establishing the safety of the substance for use as a food supplement.”).

¹² U.S. FOOD AND DRUG ADMIN., GENERALLY RECOGNIZED AS SAFE (GRAS) (Sep. 06, 2019) <https://www.fda.gov/food/food-ingredients-packaging/generally-recognized-safe-gras> (describing how safety can also be established through experience based on common use in foods, but justifying that experience requires submitting proof of a substantial history of consumption for food by a significant number of consumers prior to 1958.).

¹³ U.S. FOOD AND DRUG ADMIN., ABOUT THE GRAS NOTIFICATION PROGRAM (Jan. 2018) <https://www.fda.gov/food/generally-recognized-safe-gras/about-gras-notification-program>.

¹⁴ For more information on GRAS notices and FDA’s guidance for industry, see FOOD AND DRUG ADMINISTRATION, REGULATORY FRAMEWORK FOR SUBSTANCES INTENDED FOR USE IN HUMAN FOOD OR ANIMAL FOOD ON THE BASIS OF THE GENERALLY RECOGNIZED AS SAFE (GRAS) PROVISION OF THE FEDERAL FOOD, DRUG, AND COSMETIC ACT: GUIDANCE FOR INDUSTRY (Nov. 2017) <https://www.fda.gov/media/109117/download>.

certain amount of upcycled ingredients in processed food products to meet their voluntary or mandated sustainability goals in terms of zero waste or greenhouse gas reductions. This definition is designed to make drafting policies and quantifying impacts easier for all stakeholders interested in upcycled foods.

As referenced above, unless or until upcycled certification programs are created, companies, researchers, and other interested parties should use this definition to shape their practices and labeling decisions. Companies should be prepared to self-certify that their use of the term “upcycled food” meets this definition if asked by consumers or other third parties. While the upcycled foods field may benefit in the future from the development of an upcycled food certification program, at present, attaining such a certification is not necessary in order for users to comply with the definition as described below.

Upcycled Foods Definition Task Force Members

Members of the task force were assumed to be independent experts not representing the official views of their employers or any organization. No upcycled food companies directly participated on the task force, but they were consulted and their perspectives solicited throughout the process. Organizations listed below are provided only for context.

Name	Organization
Elizabeth Balkan	Natural Resources Defense Council
Emily Broad Leib	Harvard Law School Food Law and Policy Clinic
Alexandria Coari	ReFED
Marjorie DePuy	FMI, the Food Industry Association
Jonathan Deutsch	Drexel University
Marissa Golison	Consumer Brands Association (formerly Grocery Manufacturer’s Association)
Ben Gray*	Upcycled Food Association
Allison Kolberg+	Harvard Law School Food Law and Policy Clinic
Monica McBride	World Wildlife Fund
Jimmy Nguyen	United States Department of Agriculture
Kai Robertson	Independent Expert
Olivia Spratt^	Drexel University
Ashley Zanolli	Independent Expert

*Task Force Facilitator and Researcher

+Student Researcher and Document Drafter

^Student Researcher

Note: Turner Wyatt, CEO Upcycled Food Association, was also involved in task force discussions. Philip Curtis (ReFED) and Maddie Keating (NRDC) were involved during initial portions of the process.

Definition and Elements of “Upcycled Food”

Definition

Upcycled foods use ingredients that otherwise would not have gone to human consumption, are procured and produced using verifiable supply chains, and have a positive impact on the environment.

Background and Intent

The U.S. government considers “food” to be a general term that refers to anything that provides nutritive value to the body.¹⁵ The Federal Food, Drug, and Cosmetic Act defines food as (1) articles used for food or drink for man or other animals, (2) chewing gum, and (3) articles used for components of any such article.¹⁶

The term “upcycled foods” is intended to refer to foods that are wholly or partially composed of diverted ingredients, which are ingredients that would otherwise have ended up in a food waste destination. Like any other item in the food supply, upcycled foods must meet food safety standards as set by the FDA, USDA, and other food safety laws.¹⁷ Upcycling food is a food waste prevention solution.

The five elements outlined below are intended to provide context and specific examples to further flesh out the key elements of the definition. An upcycled food should have a supply chain and product attributes that reflect the elements. Verifying whether an upcycled ingredient was properly sourced in a way that shows it would have otherwise been bound for a food waste destination likely will be a central component of any upcycled food certification processes, future legislation regarding upcycled food, and research regarding the effects of upcycled food on food security and the environment. Food waste destinations are described in more detail below in the elements section.

Resources and Additional Considerations

In addition to the final language above, several other definitions of upcycled food are currently used by different industry players.

- **Ellen McArthur Foundation:** “upcycling denotes a process of converting materials into new materials of higher quality and increased functionality.”¹⁸

¹⁵ 35A Am. Jur. 2d Food § 1, *supra* note 11.

¹⁶ 21 U.S.C. § 321(f) (2018).

¹⁷ See e.g. FDA Food Safety Modernization Act (FSMA), Pub. Law 353 (2011) (codified at 21 U.S.C. 301 et seq.).

¹⁸ Ellen MacArthur Foundation, *Circularity Indicators. An Approach to Measuring Circularity, Methodology* (2019) www.ellenmacarthurfoundation.org.

- **Merriam-Webster:** “transitive verb: to recycle (something) in such a way that the resulting product is of a higher value than the original item; to create an object of greater value from (a discarded object of lesser value)”¹⁹
- **ReFED:** “creatively reusing a ‘waste’ material to create a product of higher quality or value than the original”²⁰
- **ReGrained:** “to creatively reuse by-products and unlock their highest value.”²¹
- **Oxford University Press (Lexico):** “Reuse (discarded objects or material) in such a way as to create a product of higher quality or value than the original.”²²
- **William McDonough and Michael Braungart** (authors, *Cradle to Cradle* and *The Upcycle*): designing not just for health but for abundance, proliferation, and delight.²³

Elements

1. Upcycled foods are made from ingredients that would otherwise have ended up in any food waste destination.

Background and Intent

The upcycled foods definition focuses on diverting ingredients and by-products of traditional food production from food waste destinations and processing those ingredients into a new product for human consumption. The term “food waste destination” is intended to encompass instances of food loss and food waste. For example, sugar cane that would have been sent to a food waste destination like a landfill could be diverted before it reaches that destination and reprocessed into an upcycled product, regardless of whether it would have traveled to the landfill from a field or food production facility.

Recycling focuses on recovering an input like a plastic bag or water bottle that would normally be put into a landfill and repurposing it for a second or third use before eventually sending it to a landfill or other waste destination. “Upcycling” similarly denotes a transformation of the input from an item that would have been bound for the waste stream into a fully usable ingredient, thus reducing

¹⁹ Merriam-Webster, *Definition of “Upcycle”*, MERRIAM-WEBSTER.COM DICTIONARY (2020) <https://www.merriam-webster.com/dictionary/upcycle>.

²⁰ REFED, *GOING BARNANAS FOR NEW WAYS TO USE FOOD* (Apr. 17, 2017) <https://www.refed.com/content-hub/going-barnanas-for-new-ways-to-use-food/>

²¹ ReGrained, *Upcycled Definition* (2020) <https://www.regrained.com/>.

²² Lexico, *Meaning of upcycle in English*, LEXICO.COM POWERED BY OXFORD UNIVERSITY PRESS AND DICTIONARY.COM (2020) <https://www.lexico.com/definition/upcycle>.

²³ WILLIAM MCDONOUGH AND MICHAEL BRAUNGART, *THE UPCYCLE: BEYOND SUSTAINABILITY – DESIGNING FOR ABUNDANCE* 11 (Duncan Bock, Elizabeth Mitchell eds., 1st ed. 2013).

overall waste. However, instead of merely reusing an item, upcycling puts that item to a higher or better use, turning that input into a component of an entirely new product.

Verifying whether inputs would have ended up in a food waste destination is central to the idea of upcycled foods. These determinations will differ for each product and supply chain. Some ingredients may be diverted from landfills, while others may be recovered before going to compost, and some from animal feed uses. Still others, like banana peels or eggshells, inedible by-products, could be processed and reintroduced into the food system as part of a new edible product.

Proving that a diverted ingredient would have ended up in a food waste destination is closely related to the “auditable supply chain” element. This element could be used as a baseline data point for certification or measurement studies, by helping to determine the degree of waste reduction due to upcycling and its environmental offsets.

Finally, the upcycled food definition does not restrict the definition of food waste to items that were initially intended for human consumption. Unused animal feed and by-products could be diverted and upcycled into food products for human consumption, provided they met applicable food safety standards.

Resources and Additional Considerations

Other methods for defining food waste were considered during the drafting process. The U.S. government has several agencies that monitor food loss and waste, including USDA, FDA, and the Environmental Protection Agency (EPA).²⁴ USDA’s Economic Research Service (ERS) defines food loss as “the edible amount of food, postharvest, that is available for human consumption but is not consumed for any reason.”²⁵ However, in their official documents and for ease of administration, they use “food loss and waste” to describe reductions in edible food mass anywhere along the food chain.²⁶

²⁴ All three agencies are members of the ‘Winning on Food Waste Alliance’, set up as “a Federal Government and Nongovernmental Organization Formal Collaboration on Industry Education and Engagement with Respect to the Importance of Food Waste Reduction”. FOOD AND DRUG ADMINISTRATION, MOU 225-19-033: MEMORANDUM OF UNDERSTANDING AMONG THE UNITED STATES FOOD AND DRUG ADMINISTRATION, THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, THE UNITED STATES DEPARTMENT OF AGRICULTURE, AND THE FOUNDING PARTNERS OF THE FOOD WASTE REDUCTION ALLIANCE (Oct. 2019).

²⁵ U.S. DEPARTMENT OF AGRICULTURE, FOOD WASTE FAQs (2019) <https://www.usda.gov/foodwaste/faqs>.

²⁶ *Id.* See also U.S. DEPARTMENT OF AGRICULTURE, FOOD LOSS AND WASTE (Feb. 20, 2020) <https://www.usda.gov/foodlossandwaste> (listing both terms in the title but using food waste as a single term throughout).

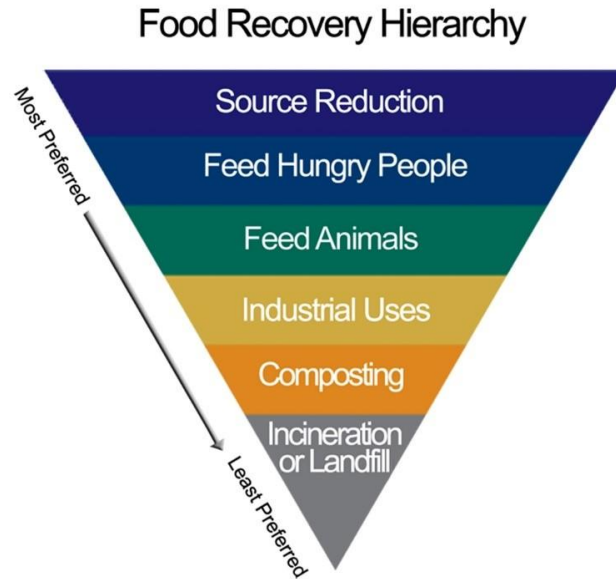


Figure 1: USDA and EPA use the Food Recovery Hierarchy to describe food waste reduction.²⁷

Others have used the terms “food loss” and “food waste” to refer to different places in the food system cycle where food that could have been put to use exits the cycle.²⁸ As defined by the UN Food and Agriculture Organization (FAO), food loss is “the decrease in the quantity or quality of food resulting from decisions and actions by food suppliers in the chain,” including during production, postharvest and processing.²⁹ Food waste is food loss that occurs at the end of the food chain, including from retailers, food service providers, and consumers, or post-consumer food loss.³⁰ The World Resources Institute, as Secretariat of the multi-stakeholder Food Loss and Waste Protocol, has published definitions for 10 possible “food loss and waste destinations” through the global Food Loss and Waste Accounting and Reporting Standard (FLW Standard).³¹ These destinations have been incorporated into the visual framework below.

Figure 2: Sample food waste destinations as defined under the FLW Standard.³²

²⁷ *Id.* For more on the hierarchy, visit EPA’s Food Recovery Hierarchy website: <https://www.epa.gov/sustainable-management-food/food-recovery-hierarchy>.

²⁸ For more information and a detailed explanation of the differences between food loss and waste, see FAO, *Food loss or waste? Anything but the same, says FAO expert*, FAO REGIONAL OFFICE FOR EUROPE AND CENTRAL ASIA (Feb. 09, 2015) <http://www.fao.org/europe/news/detail-news/en/c/277058/>.

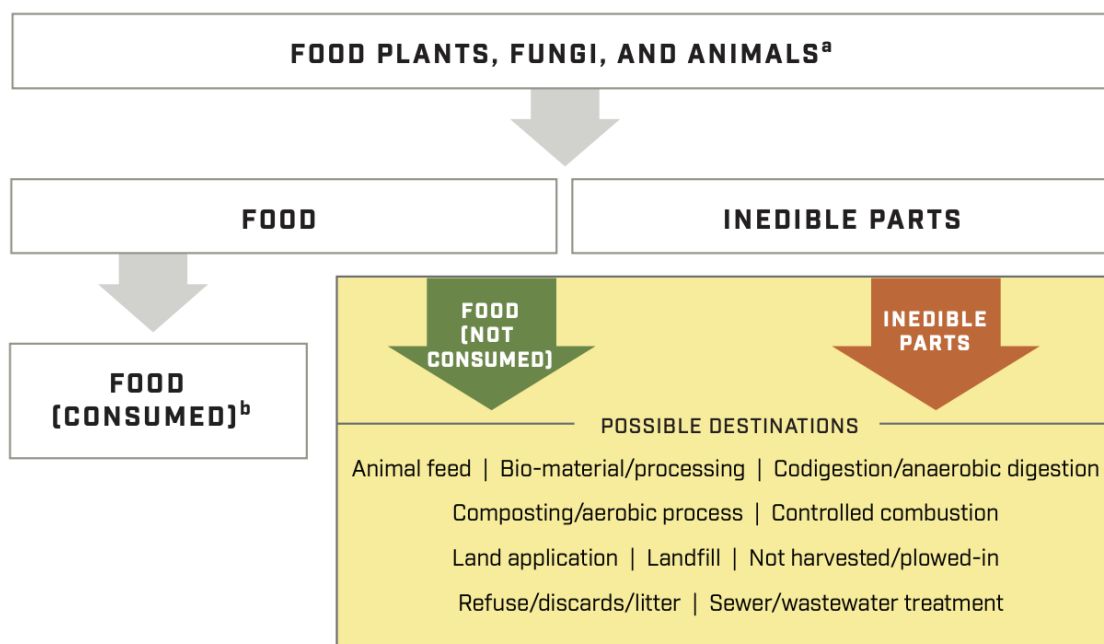
²⁹ FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, FOOD LOSS AND FOOD WASTE (Dec. 13, 2019) <http://www.fao.org/food-loss-and-food-waste/en/>.

³⁰ *Id.*

³¹ Food Loss and Waste Protocol, *About the FLW Protocol*, WORLD RESOURCES INSTITUTE (2020) <https://www.flwprotocol.org/about-flw-protocol/>.

³² Food Loss and Waste Protocol, *Food Loss and Waste Accounting and Reporting Standard: Executive Summary, Version 1.0*, WORLD RESOURCES INSTITUTE 3 (2016) https://www.flwprotocol.org/wp-content/uploads/2019/03/FLW_Standard_Exec_Summary.pdf.

Material Types and Possible Destinations Under the *FLW Standard*



As defined in the *FLW Standard*:

a) Intended for human consumption (i.e., excludes crops intentionally grown for bioenergy, animal feed, seed, or industrial use)

b) At some point in the food supply chain (including surplus food redistributed to people and consumed)

Notes: The green (left) and red (right) arrows represent the two possible material types in an *FLW* inventory. These material types go to one or more possible destinations (listed within the yellow shaded box) once they are removed from the food supply chain. The *FLW Standard* provides accounting and reporting requirements and guidance for everything within the yellow shaded box (i.e., everything removed from the food supply chain). Source: Adapted from FAO (2014). *Definitional Framework of Food Loss*. Working paper of the Global Initiative on Food Loss and Waste Reduction. Rome, Italy: FAO.

In order to ensure “upcycled foods” are contributing to the goals and objectives outlined in this document, and are made from ingredients diverted from a food waste destination, future certification programs may want to consider how common or widespread the product is. Products may exist that use diverted ingredients that would otherwise go to food waste destinations, but because the product has existed for such a long time, its supply chain is firmly established and it cannot be said to be contributing to the reduction of food waste. Two example products that may fall into this category are whey protein powders and hot dogs. When both of these products initially entered the market, they were arguably upcycling formerly wasted ingredients (whey protein as a by-product of milk production and hot dogs coming from meat trimmings as a by-product of butchering). Hot dogs have been made in the United States since

the late 1800s³³ and are generally produced from the meat left over on an animal after larger cuts (ribs, tenderloins, etc.) have been removed.³⁴ However, in the years since their introduction, both have become mainstream products produced by a wide variety of vendors and coming from different sets of source material, many of which are no longer considered by-products or waste.

Researchers could use multiple methods for assessing for how long a new product could be considered an “upcycled food”. Among the alternatives discussed by the task force were:

- Until the use of the input is considered “business as usual” by the industry or certifier.
- Until a product achieved “market saturation” which could be measured by percent All Commodity Volume (ACV) which measures the percent of retail outlets in a defined market in which a product is sold.³⁵

The task force did not include any novelty or common use provision in the elements, but it may be included in the future as a consideration in certification programs or to meet the goals of certain users of the definition.

2. Upcycled foods are value-added products.

Background and Intent

The value-added element is intended to differentiate upcycled food from purely diverted items. “Upcycling” connotes a process through which inputs that would otherwise have been removed from the human food supply chain and ended up in a food waste destination are transformed or processed into new, different, or more complex foods.

The USDA defines ‘value-added’ in their Value-Added Producer Grant program.³⁶ In that program, value is added “by changing commodity’s physical state, by marketing the commodity’s special identity or character, by keeping the commodity physically apart in production and distribution, by aggregating and marketing food for local markets, [or] by linking farmers with local and regional supply networks in which they are an equal partner and realizing value by transforming natural resources into energy on the farm.”³⁷

³³ National Hot Dog and Sausage Council, *Hot Dog History* (2016) <https://www.hot-dog.org/culture/hot-dog-history>.

³⁴ FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, PRE-COOKED MEAT PRODUCTS 149 (accessed April 7, 2020) <http://www.fao.org/tempref/docrep/fao/010/ai407e/ai407e05.pdf>. (“The raw meat materials used for precooked-cooked products are lower-grade muscle trimmings, fatty tissues, head meat, animal feet, animal skin, blood, liver and other edible slaughter by-products.”).

³⁵ Sally Martin, *All About ACV: CPG Data Tip Sheet*, CPG DATA INSIGHTS (2015) <https://www.cpgdatainsights.com/distribution/all-about-acv/>.

³⁶ U.S. DEPARTMENT OF AGRICULTURE, VALUE-ADDED PRODUCER GRANTS (2020) <https://www.rd.usda.gov/programs-services/value-added-producer-grants>.

³⁷ See AGMRC, *Value Added Producer Grants*. AGRICULTURAL MARKETING RESOURCE CENTER (2020) <https://www.agmrc.org/value-added-producer-grants>.

The value-added element is also meant to provide a verifiable criterion to use to differentiate between diverted ingredients and upcycled foods. Diverted ingredients do not become upcycled foods until value is added to them in the sense of being processed or transformed into a new product. For example, whole produce that is retrieved from a field or diverted from a landfill where it would otherwise have gone to waste is a diverted ingredient, but until that ingredient is processed in some way or added to other inputs to create a new product, that ingredient is not an “upcycled food” for marketing and labeling purposes. An off-grade or surplus apple that would have been sent to a landfill could not be relabeled and sold alone as an “upcycled” apple under an “upcycled food” label, but a new dehydrated apple snack or applesauce made from those apples could be. Similarly, surplus pineapple in a grocery store that is donated to another user instead of discarded might be a diverted ingredient, and if the store processes the pineapple into store-prepared bags for frozen pineapple chunks, those bags could be considered upcycled foods.

Resources and Additional Considerations

Several other definitions of “value-added” in addition to the USDA definition were considered during the drafting process. The task force considered modeling the element off of the value-maximizing framework for upcycling organic materials used by the Ellen MacArthur Foundation, where products are “valorized” when they have been put to a “higher use”.³⁸ This would include edible food products that are looped back into food production, as well as inputs that are inedible but upcycled into a different, non-edible use such as organo-mineral fertilizer. The “higher use” criterion implies a hierarchy of food waste destinations that is not reflected in the upcycled food definition, but the language remains a helpful way to describe the upcycling process and was used extensively by the task force in discussions of how value might be added to diverted ingredients to create upcycled foods.

3. Upcycled foods are for human consumption.

Background and Intent

The human consumption element is intended to differentiate upcycled foods from other products that contain diverted or upcycled ingredients, including, but not limited to, animal feed and other inedible products.

Diverted or upcycled ingredients can be used in animal feed, but those products would not be considered upcycled foods. Some diverted ingredients

³⁸ See Ellen MacArthur Foundation, *Circularity Indicators. An Approach to Measuring Circularity, Methodology* (2019) www.ellenmacarthurfoundation.org.

can be fit for human consumption before upcycling and incorporation into a final product, but others, like eggshells or banana peels, may not be consumable by humans in their pre-upcycled state; however, if those products can be incorporated into a food product for human consumption while following all food safety standards, then the final product can be considered upcycled food.

Allowing for broader use of the term “upcycled” as a descriptor of products beyond food is important, especially because the most beneficial use of some diverted ingredients could be one other than human consumption. However, for marketing and research purposes the term “upcycled food” should be reserved for products fit for and intended for human consumption.

Resources and Additional Considerations

This distinction between “food” and “feed” aligns with the Food and Drug Administration's (FDA) use of these terms. FDA defines food as products for human and animal consumption, but regulates animal feed and animal food additives separately from human food and additives.³⁹ The distinction is also used by scientists who assess the environmental impact of animal agriculture through greenhouse gas emissions, often as a way to fully demonstrate the land use and greenhouse gas impact of all stages of raising animals for food, as opposed to using land to grow food for humans directly.⁴⁰ Other agencies also define food as for human consumption:

- **National Oceanic and Atmospheric Administration (NOAA):** distinguishes between grains grown primarily for humans (food) and grain grown primarily to feed animals (feed) in its global map of crop production.⁴¹
- **Food and Agriculture Organization of the UN (FAO):** A study by FAO “found that livestock rely primarily on forages, crop residues and by-products that are not edible to humans and that certain production systems contribute directly to global food security, as they produce more highly valuable nutrients for humans, such as proteins, than they consume.... This study determines that 86% of livestock feed is not suitable for human consumption.”⁴²

³⁹ See 35A Am. Jur. 2d Food § 1, *supra* note 11 (providing an overview of food as anything with nutrient value that can be absorbed by the body); 21 U.S.C. § 321(f) (2018) (defining “food” in the Food, Drug, and Cosmetic Act); 21 CFR 170.3(g) (defining “substance” within the FDA regulations). “Feed” is defined separately. 21 U.S.C.A. § 321(x).

⁴⁰ See e.g. Arianna Di Paola et. al., Human food vs. animal feed debate. A thorough analysis of environmental footprints, 67 LAND USE POLICY 652 (Sep. 2017) <https://www.sciencedirect.com/science/article/abs/pii/S0264837717303435>.

⁴¹ NATIONAL OCEANIC AND ATMOSPHERIC ASSOCIATION, SCIENCE ON A SPHERE: AGRICULTURE: FOOD VS. FEED (2020) <https://sos.noaa.gov/datasets/agriculture-food-vs-feed/>.

⁴² FAO, AGA NEWS: MORE FUEL FOR THE FOOD/FEED DEBATE (Dec. 3, 2018) http://www.fao.org/ag/againfo/home/en/news_archive/2017_More_Fuel_for_the_Food_Feed.html.

4. Upcycled foods have an auditable supply chain.

Background and Intent

The auditable supply chain element is meant to reinforce the notion that upcycled food production should use processes that are supported by records of the company using the label and that could in theory be verified by a third party in order to show they meet the definition for “upcycled.” Products that call themselves upcycled without establishing supply chain transparency and auditability run the risk of eroding consumer trust in and understanding of the label, damaging other industry members who are making a good faith effort to incorporate all elements of the definition into their product or project.

If a consumer or government organization has a question about an upcycled food, the producer should be able to put forward documentation of the supply chain that shows how the upcycled ingredients were initially diverted from a food waste destination, the processing techniques used to upcycle the ingredient, and how that ingredient was incorporated into the final food product, including how much of it was used in the final product. In addition to helping food producers meet the traditional food safety standards with which all companies in the food industry must comply, this combination of transparency and accountability will ensure that the label conveys a reliable, consistent message to consumers and regulators.

Those looking to quantify the impact of upcycled foods in the future will rely on the ability to analyze and verify each step in the supply chain to prove all aspects of the definition are met, such as ensuring that diverted ingredients are truly removed from a food waste destination. Future certification or third-party verification could review supply chain records to enforce proper use of the upcycled food label and ensure consumer trust in the label.

Resources and Additional Considerations

As with all companies in the food industry, those producing upcycled foods should have Food Safety Management Systems (FSMS) based on Hazard Analysis and Critical Control Point (HACCP) or Hazard Analysis and Risk-Based Preventive Control (HARP-C) principles in place to manage food safety risks and prevent food contamination. For all upcycled food producers, it will be critical to implement rigorous, recognized and credible food safety and quality programs based on global standards.⁴³ However, in addition to traceability of all ingredients and components of the food product, upcycled foods should also keep track of additional information such as evidence that the component

⁴³ An example of a food safety program that aligns with these standards can be found at: SQF Institute, SQF Fundamentals Program (Apr. 30, 2020, 4:26 PM) <https://www.sqfi.com/what-is-the-sqf-program/sqf-fundamentals-program/>.

would otherwise have been wasted and an understanding of the quantity of the diverted ingredient added to the ultimate food product.

The Fair Trade movement is one example of a food movement whose members, farmers, companies, and consumers rely on the existence of an auditable supply chain to verify products. Different Fair Trade certifiers independently check that their standards for local sustainability, pricing, and labor conditions are being met across the supply chain from farmer to consumer and place labels reflecting that audit on Fair Trade products.⁴⁴ The existence of an auditable supply chain is synonymous with the meaning of the Fair Trade label on food. The label assures consumers that the product they are purchasing has been produced in a way that accords with the human rights standards that are central to the Fair Trade movement.

5. Upcycled foods indicate which ingredients are upcycled on their labels.

Background and Intent

The ingredient labeling element is intended to mitigate consumer confusion and misunderstanding about the component(s) of the food product that are upcycled. Along with record-keeping, transparency is a key element of a trustworthy label. Proper labeling is intended to reduce confusion and misunderstanding among consumers, researchers, and other users. Upcycled foods producers should disclose which ingredients are upcycled on the product label, and may choose to include more information about the amount of the upcycled ingredient that is included. This disclosure and transparency will help consumers better understand the product they are buying and reduce any potential claims that the label is misleading.

Consumer protection lawsuits are sometimes brought by classes of consumers who feel that a product label is inaccurate or deceptive. For example, a consumer who is looking to purchase an upcycled food might view foods with a negligible amount of upcycled ingredients as misleading. The consumer may make the case that such food is not worthy of an upcycled food label and therefore having it on the product is deceptive. Producers who are unable to back up claims on a label may be forced to pay damages to consumers who purchased the product and possibly forced to remove the misleading label.⁴⁵ Proper disclosure of upcycled ingredients, along with records showing that

⁴⁴ See e.g. FairTrade Foundation, What FairTrade Does (2020), <https://www.fairtrade.org.uk/What-is-Fairtrade/What-Fairtrade-does><https://www.fairtrade.org.uk/What-is-Fairtrade/What-Fairtrade-does>.

⁴⁵ Misleading label litigation brought by classes of consumers under state consumer protection law is fairly common. FDA regulates labeling only after the products have been on the market and only if the label has made a misleading claim; FDA does not pre-approve food labels. For more information, see Center for Food Safety and Applied Nutrition, Guidance for Industry: Food Labeling Guide, January 2013 (current as of Sept. 16, 2018) <https://www.fda.gov/regulatory-information/search-fda-guidance-documents/guidance-industry-food-labeling-guide>.

ingredients were indeed diverted from a food waste destination, can help mitigate against a potential lawsuit.⁴⁶

In the future, if an upcycled certification program is developed, it could consider different ways to measure and indicate the beneficial impact of using certain upcycled ingredients, allowing for such benefits to be advertised alongside the upcycled label. In the meantime, companies using the “upcycled food” label should ensure the label is not misleading, by indicating which ingredients in the product are upcycled, and by avoiding use of the term unless there is evidence to back up the claim, and if the amount of such ingredients used in the product is negligible.

Resources and Additional Considerations

The task force also considered whether the element should recommend using a multi-faceted labeling scheme to provide transparency to consumers as to the amount of upcycled ingredient included in the food product. For example, the USDA Organic label differentiates between organic food labels based on the percentage of organic ingredients included in the food product. The USDA uses four categories for labeling based on product composition: “100 Percent Organic”⁴⁷, “Organic” (meaning the product contains a minimum of 95 percent organic ingredients)⁴⁸, “Made with Organic ____” (lists the organic ingredient)⁴⁹, and specific organic ingredient listings (i.e. ‘Ingredients: water, barley, beans, organic tomatoes, salt.’⁵⁰). For now, the task force agreed that aligning definitions to different percentages of upcycled ingredients would not be advisable, but that the product label should clarify which ingredients are upcycled. By providing this specific information, producers of upcycled foods can reduce confusion among consumers and help other stakeholders like researchers and policymakers to properly make decisions based on the upcycled foods label.

⁴⁶ For more information on the different kinds of lawsuits brought against food manufacturers, see 159 Am. Jur. Proof of Facts 3d 433 (2017),

⁴⁷ U.S. DEPARTMENT OF AGRICULTURE: AGRICULTURAL MARKETING SERVICE, ORGANIC LABELING STANDARDS (2020) <https://www.ams.usda.gov/grades-standards/organic-labeling-standards>.

⁴⁸ *Id.*

⁴⁹ *Id.*

⁵⁰ *Id.*

DISCLAIMER

This definition and any elements of language herein were drafted and are published for the purposes of creating a shared understanding of the terms discussed. Those with particular legal questions about labeling their products should consult with an attorney. In no event shall any of the Upcycled Foods Definition Task Force members, researchers, or any other contributing organization named in this document be held liable for damages arising out of, relating to, or in connection with any use of this document regardless of the theory upon which the claim is based.

THE UPCYCLED FOODS DEFINITION TASK FORCE

SPRING 2020