

Reason for Standard

Meat provides an important nutrition source for many people and cultures, but as industrial livestock production has grown over the past several decades, so have the animal welfare, climate, and human health impacts of raising animals for food.^{i,ii,iii}

Most animal welfare concerns pertain to large-scale, industrial livestock operations. Within these operations, large quantities of animals are housed and fed in crowded conditions usually without access to pasture or the outdoors. Animals in these operations frequently face abuse and psychological stress brought on by overcrowding and confinement.^{iv,v,vi} Industrial livestock operations often use synthetic growth hormones and antibiotics to speed growth rates and combat illness brought on by confinement and overcrowding. Some research suggests that residues of growth hormones or steroids can remain in the meat after slaughter, thus exposing consumers to synthetic hormones or steroids.^{vii} Livestock raised in confined and crowded facilities increase the spread of zoonotic diseases as pathogens are more likely to spread between animals and humans under those conditions, and perpetuate antibiotic resistance; 80% of all antibiotics sold in the United States are used in animal agriculture.^{viii,ix,x}

Beyond animal welfare and human health concerns, industrial livestock production poses significant environmental threats. It is responsible for approximately 12-18% of global greenhouse gas (GHG) emissions, as a source of not only CO₂, but also methane (CH₄) and nitrous oxide (N₂O).^{xi,xii} Most emissions come from a combination of animal waste, conversion of ecosystems (grasslands and forests) to intensive livestock operations, and enteric fermentation.^{xiii} While poultry doesn't contribute methane from enteric fermentation like ruminant livestock, they do produce large quantities of waste containing nitrogen and phosphorous (along with drugs and heavy metal residues, such as arsenic), which contribute to water and soil pollution.^{xiv,xv} Water and air pollution from large-scale, industrial operations can be significant.^{xvi} Compounding this issue, disparate impacts of this pollution are often experienced by underserved and marginalized communities.^{xvii,xviii}

As with other animal production systems, the poultry industry has become highly centralized, industrialized, and intensified over the past few decades—at the expense of animal wellbeing, rural communities, and human and environmental health.^{xix} Aside from the common animal welfare issues of caged and crowded indoor confinement and excessive physical alterations (such as severe debeaking), high ammonia levels inside chicken houses and the propagation of conventional breeds are additional concerns more specific to poultry. Conventional breeds are large-breasted, heavy birds that grow quickly and have very poor health, suffering from lameness, broken bones, footpad conditions, and cardiovascular problems.^{xx,xxi} These concerns are especially prevalent in broiler chickens, the most commonly eaten poultry in the US.^{xxii}

While there are many concerns associated with the conventional industrialized approach to raising poultry, there are alternative production methods that can greatly reduce or eliminate many associated harms and negative impacts. For example, poultry that is certified organic must meet specific United States Department of Agriculture (USDA) regulations that are backed by a federal law known as the Organic Foods Production Act (OFPA). Under this certification program, meat, pork, poultry, and dairy producers must meet organic production requirements that often result in improved animal welfare, enhanced biodiversity, lower greenhouse gas emissions, and

healthier soils that sequester more carbon.^{xxiii} At a minimum, organic certification also prohibits added growth hormones, antibiotics, the use of arsenic to control parasites, animal byproducts in feed, and genetically engineered feed ingredients.^{xxiv,xxv} Poultry must be cage free and is also required to have access to the outdoors, however, proposed regulations would tighten these requirements and impose stricter stocking density, among other improvements.^{xxvi,xxvii}

Often building on the foundational standards of organic but many times lacking verification or a consistent definition, regenerative agriculture also takes a more holistic approach to livestock production, crop cultivation, and land management.^{xxviii} For most regenerative practitioners, animal health and wellbeing are key components of this holistic approach. Outdoor access is foundational for raising poultry and farmers are encouraged to incorporate animals into native ecosystems through managed or rotational grazing of poultry on grasslands or incorporating birds into forests or tree crops, a practice known as agroforestry or silvopasture.^{xxix,xxx,xxxii}

Whether organic or verified regenerative, these practices offer alternative frameworks to conventional agriculture, with less impact on the climate and better animal welfare outcomes.^{xxxii,xxxiii,xxxiv}

As a retailer that prioritizes the welfare of people, animals, and the planet, PCC sets high standards for the poultry products sold in our stores, so that we can provide the most humane and sustainable choices for omnivorous shoppers.

Scope

This is a product-specific standard that applies to all fresh poultry meat, including any chef-inspired raw offerings and fresh PCC Private Label sausages.

Standard

1. Products

- 1.1. All poultry products sold at PCC under the scope of this standard must come from animals raised in accordance with the animal welfare requirements set forth in section 2.
 - 1.1.1. PCC encourages producers not within the scope of this standard to source meat raised from animals in compliance with the criteria outlined below in section 2.
- 1.2. Vendors within the scope of this standard must adhere to the GE Ingredients and Labeling Standard, specifically the section titled “Animal Products.”
- 1.3. PCC does not accept any poultry products from cloned animals or their offspring.
- 1.4. Poultry should not contain any artificial colors or flavors, protein binders, preservatives, or chemicals that increase weight, water retention, or mask potential food safety indicators such as color or odor changes.
- 1.5. PCC encourages vendors to pursue third-party certification programs to verify and add credibility to sustainability and animal welfare claims (e.g., organic, non-GMO, and Animal Welfare Approved).
- 1.6. Poultry carcasses must not be washed in chlorine or bleach following slaughter or during processing and handling.

2. Animal Welfare

2.1. Habitat & Housing

- 2.1.1. Birds must not be confined to cages or crates.
- 2.1.2. Animal density, both indoors and out, must allow for expression of natural behaviors, both physical and social.
- 2.1.3. Outdoor access areas must not be exclusively concrete and should be covered with vegetation, gravel, straw, mulch, or sand.

- 2.1.4. Birds must have access to outdoor runs and direct sunlight.
- 2.1.5. Shelters and housing must be well ventilated and allow fresh air to enter.
- 2.1.6. Birds must be able to dust bathe and have access to perches and other enrichment environments for mental and physical stimulation.
- 2.1.7. Birds must have access to housing or shelter that protects them from weather or climate extremes.
- 2.1.8. Heat must be provided in cold temperatures to maintain comfort.
- 2.1.9. Litter should be removed from housing or shelters on a regular basis.
- 2.1.10. Bedding should be kept in a dry, mold-free condition and replenished as necessary.
- 2.1.11. Predator protection measures should be in place, utilizing non-lethal predator control methods first.
- 2.1.12. Ammonia levels must be monitored in any indoor facilities and steps should be taken to ensure those levels remain low enough that they are not irritating to birds or workers.
- 2.1.13. Birds should have a minimum of 6 hours of continuous darkness every 24 hours.

2.2. Nutrition

- 2.2.1. Feed must not contain animal byproducts.
- 2.2.2. Feed must be distributed in a method that minimizes competition among birds.
- 2.2.3. Birds must have unrestricted access to clean, fresh water at all times.

2.3. Health & Handling

- 2.3.1. No sub-therapeutic or non-therapeutic antibiotics, hormones, or growth promoters may be used in any form to control or prevent disease, or to promote growth or feed efficiency.
- 2.3.2. Birds must receive preventative health care for disease and/or parasites.
- 2.3.3. Ill or injured birds must be provided immediate and necessary care.
- 2.3.4. Low-stress handling practices must be used before, during, and after transport to slaughter facilities.
- 2.3.5. Birds must be caught with both legs, not one.
- 2.3.6. Any physical alterations to animals must be done by a veterinarian or trained professional and employ pain management during and after procedures to minimize stress and pain to animals.
 - 2.3.6.1. PCC prohibits extreme debeaking, toe/web punching or notching, pinioning, declawing, detoeing, wattle trimming, or comb trimming.
 - 2.3.6.2. Minimal trimming of beak tip is permitted, so long as it is done without causing pain or undue stress to the bird and does not negatively impact the bird's ability to forage, eat, or express natural behaviors.
 - 2.3.6.3. Full removal of rooster spurs is discouraged unless necessary due to an emergency health situation and in such instance, the spur must be removed by a licensed veterinarian and using local or general anesthesia.
 - 2.3.6.3.1. Non-painful methods of trimming rooster spurs is permitted as needed when there are health and safety concerns.
- 2.3.6.4. PCC recommends employing livestock management practices that eliminate or reduce the need for any physical alterations done to curtail injuries among animals, such as maintaining adequate stocking densities to minimize stress and aggression in animals.

2.4. Transportation

- 2.4.1. Transportation times (including loading times) should not exceed 10 hours

2.5. Mortality

- 2.5.1. Birds must be rendered unconscious before slaughter in commercial facilities, except where smallholder farms utilize on-farm, humane slaughter practices.
- 2.5.2. Slaughter facilities must be regularly audited by a third party.

3. Better Chicken Commitment

- 3.1. PCC must offer at least one broiler chicken option in the fresh meat department that is compliant with all criteria outlined under the Better Chicken Commitment (BCC), unless there are no viable options that meet PCC's requirements for poultry as outlined above in Sections 1 and 2.
- 3.2. Broiler chicken suppliers are encouraged to use the Better Chicken Commitment criteria as outlined below as guidance for improving the welfare of birds.
- 3.3. BCC-Compliant chickens must meet the following criteria:
 - 3.3.1. Prohibit use of broiler cages.
 - 3.3.2. Maintain a maximum stocking density of six pounds per square foot.
 - 3.3.3. Provide birds with an enriched environment including litter, lighting and enrichment that meets GAP's new standards.
 - 3.3.4. Utilize a multi-step-controlled atmosphere slaughter processing system that induces an irreversible stun and eliminates pre-stun handling of birds, unless meeting the definition of a small holder farm.
 - 3.3.5. Raise slower growing breeds of broiler chicken accepted for use by RSPCA or Global Animal Partnership (GAP).
 - 3.3.6. Demonstrate compliance with the above criteria via third party auditing.

Standard-Specific Glossary

Agroforestry is the intentional integration of trees or shrubs with crop and animal production systems to create environmental, economic, and social benefits.

Animal byproducts include cooking oil from restaurants and food processors, blood and blood products, pork and horse protein, feather meal, manure, and hatchery waste.

Better Chicken Initiative or Better Chicken Commitment (BCC) is a collaborative effort of animal welfare organizations (notably Compassion in World Farming), poultry producers, and retailers to improve the welfare of chickens raised for meat. The BCC requires signatories to address several criteria identified as having the greatest impact on bird welfare. These include environmental enrichments, stocking density, slaughter methods, and growth rate. The primary goal of the BCC is to improve the baseline expectations for the health and wellbeing of broiler hens currently experiencing the worst welfare outcomes within the industry. Therefore, many of the changes required are primarily designed for large-scale producers.

Compassion in World Farming (CIWF) is an international advocacy organization committed to improving the welfare of livestock animals and end proliferation of consolidated factory farming. Through policy advocacy and business engagement, CIWF seeks to strengthen regulatory protections for animals and push companies to improve their internal practices and standards regarding the treatment of livestock.

Concentrated Animal Feeding Operations (CAFO) can be defined and understood in multiple ways. The regulatory definition from the Environmental Protection Agency (EPA) simply identifies CAFOs as large-scale meat, dairy, and egg facilities (Animal Feeding Operations (AFO)) that raise animals in confinement for at least 45 days per year. However, any AFO that discharges manure or wastewater into a natural or human-made ditch or waterway can be classified as a CAFO, regardless of its size. These facilities are regulated under the Clean Water Act.^{xxxv} Regulatory definitions aside, CAFOs are commonly understood as factory farms that house large numbers

of animals in inhumane conditions, relying heavily on antibiotics and growth hormones, and are major sources of air and water pollution. They contribute most significantly to climate change compared to other animal production systems, such as pasture raised animals or regenerative farms that incorporate livestock into land management.^{xxxvi}

Controlled Atmosphere Stunning (CAS) is a slaughter or pre-slaughter method wherein birds are exposed to gases rendering them unconscious or, depending on the gas used and duration of exposure, causing death. Common gases include carbon dioxide (CO₂) or inert gases like argon; some systems employ a mix. CAS slaughter is considered one of the more humane methods, as there is less handling stress on birds and more consistency in effectiveness. The cost of installation and operation, however, can be prohibitively expensive for some smaller-scale producers.

Debeaking, also known as beak conditioning, is the practice of removing a portion of a bird's beak. The beak is clipped or burned off using a hot blade or trimming machine, often without any anesthesia, thereby causing significant pain and stress. In some cases, nearly one-third or two-thirds of the beak will be removed, which can lead to chronic pain and feeding difficulty as birds grow. In large-scale industrial facilities, debeaking has been the primary method of controlling cannibalism and feather plucking, behaviors that become more rampant when birds are confined in close quarters without adequate enrichment or access to outdoors.

Declawing is the procedure of removing a bird's claws to prevent them from scratching themselves or other birds, which is a more common problem when large numbers of animals are kept in close confinement.

Detoeing, also known as toe clipping or trimming, is the act of removing the tip of a bird's toe to remove the toenail fully and permanently. This practice is most common for turkeys, as compared to other poultry, and is done using a hot blade, surgical scissors, or microwave technology.

Enteric fermentation is the digestive process in ruminant animals, including cattle, sheep, goats, and bison, which produces methane. The gas is a byproduct of microorganisms breaking down plant material during digestion.

"Free-range" does not have a legally mandated definition but does indicate that laying hens have some access to the outdoors. PCC has adopted a definition that is similar to Certified Humane^{xxxvii} and requires access to an outdoor area for at least 6 hours per day, weather permitting. The outdoor area could be covered with vegetation where possible; gravel, straw, mulch, or sand are also acceptable materials for ground cover. The minimum amount of uncovered outdoor area required per hen is 2 square feet, which is roughly 17 by 17 inches. Other definitions of free range may only require outdoor access with no requirements of space or quality of surroundings, or alternatively, offer stronger requirements.^{xxxviii}

Fresh meats: Raw, unprocessed meat or poultry products sold without preservatives, including celery powder, in the refrigerated and frozen meat section of PCC.

Genetically Engineered (GE)/Genetically Modified Organism (GMO): A living organism whose genetic material (DNA) has been artificially manipulated in a laboratory through genetic engineering. This process creates unique combinations of genes that do not occur in nature or through traditional breeding methods, involving plant, animal, bacterial, or viral genes. Variability in the definition has created challenges in achieving transparency and consensus around GMO labeling.

Greenhouse gases (GHG) are those that trap heat in the atmosphere and contribute to climate change. Carbon dioxide (CO₂) is one of the most well-known GHGs, as its emissions are the largest in quantity and it remains in the atmosphere for a long time. Other GHGs include methane (CH₄), nitrous oxide (N₂O), and fluorinated gases (most commonly associated with refrigerants).

Litter is the poultry equivalent of manure. It contains a mix of bird excrement and bedding and must be removed from chicken coops or houses on a regular basis.

National Organic Program (NOP) was established in 2000 under the Organic Foods Production Act of 1990 to regulate the production, processing, and sale of certified organic foods in the United States. The NOP resides within the USDA and manages organic certification standards, enforcement, and accreditation of independent

certifying bodies. The National Organic Standards Board (NOSB), a federal advisory committee, provides recommendations and guidance to the NOP on developing new rules and regulations related to organic certification.

Organic refers to the practices associated with organic food production and processing that prohibit the use of most synthetic inputs and pesticides, along with requiring other environmental and animal-friendly agricultural and food handling practices. Established by the Organic Foods Production Act (a federal law), the [National Organic Program](#) (NOP) within the US Department of Agriculture (USDA) manages the organic certification standards, enforcement, and accreditation of independent certifying bodies. Many other countries also have organic certification programs.

“Pasture raised” does not have a standardized definition but most definitions require that birds spend a significant portion of their lives on vegetated, open pasture. This form of raising usually means that birds are allowed to feed on bugs, worms, and seeds found in the pasture, along with supplemental feed. Some producers limit the definition to “seasonal pasture raised,” depending on climate conditions of the producer and amount of time birds can safely be allowed to roam.

Pinioning is the act of surgically removing one pinion joint, the joint of a bird's wing farthest from the body, to prevent flight. Pinioning is often done to waterfowl and turkey.

Poultry covers a wide range of birds, from indigenous and commercial breeds of chickens to Muscovy ducks, mallard ducks, turkeys, guinea fowl, geese, quail, pigeons, ostriches and pheasants.

Regenerative agriculture is a holistic land management and farming methodology that focuses on increasing and enhancing soil organic matter to improve nutrient content, water retention, and carbon sequestration. Unless certified by a third party with established regenerative standards, regenerative does not have an agreed upon definition or guarantee associated with the term's use.

Rooster spurs are extra nails that grow on the back of a rooster's legbone and are similar to fingernails, in that they are made of keratin and contain nerves and blood vessels in the center, known as a quick. Spurs can sometimes pose a safety risk to roosters or other birds because they can grow to be incredibly long and sharp. Especially if they grow improperly from the leg bone at an unusual angle, spurs can catch on objects or injure roosters. In instances where birds have deformed or extremely over-grown spurs, it can be necessary to trim or remove them for the safety and health of the bird and the flock.

Silvopasture is a type of agroforestry that combines trees with foraging land for livestock production.

Smallholder Farms are defined as independently owned farms whose principal operator(s) owns the farm business and demonstrates a strong commitment to sustainable farm practices and animal welfare. The principal operator is the person who is responsible for the on-site, day-to-day decisions of the farm or ranch business. Any slaughter of animals on smallholder farms must take place on farm property with attention to humane slaughter practices where reasonable given farm size and scale. Gross annual sales of a smallholder farm must fall under \$250,000.

Sub-therapeutic/non-therapeutic refers to a dose or concentration of a drug that is lower than usually prescribed to treat a disease effectively. For example, it can be common practice to add subtherapeutic doses of antibiotics to livestock feed to improve productivity.

Toe/web punching is the practice of making a hole in the flesh of a bird's toe or webbing between the toes for the purpose of identification or tracking.

Zoonotic diseases are infectious diseases that can be passed between animals and humans through direct contact or contact with contaminated vectors such as food or water. Common zoonotic diseases include the plague, salmonella, West Nile virus, rabies, and zoonotic influenza. Confinement of animals, or even people, increases the risk of spreading infectious diseases and there is growing concern that CAFOs are hotbeds for the spread of zoonotic diseases because of the close quarters, weakened immune systems of animals, excessive use of antibiotics, and improper waste management.^{xxxix}

ⁱ EPA, "Sources of Greenhouse Gas Emissions: Agriculture Sector Emissions," Overviews and Factsheets, United States Environmental Protection Agency, 2019, <https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions>.

ⁱⁱ Neus González et al., "Meat Consumption: Which Are the Current Global Risks? A Review of Recent (2010–2020) Evidences," *Food Research International* (Ottawa, Ont.) 137 (November 2020): 109341, <https://doi.org/10.1016/j.foodres.2020.109341>.

ⁱⁱⁱ Courtney Lindwall, "Industrial Agricultural Pollution 101," NRDC (blog), July 31, 2019, <https://www.nrdc.org/stories/industrial-agricultural-pollution-101>.

^{iv} "The Welfare of Intensively Confined Animals in Battery Cages, Gestation Crates, and Veal Crates" (The Humane Society of the United States, July 2012), <https://www.humanesociety.org/sites/default/files/docs/hsus-report-animal-welfare-of-intensively-confined-animals.pdf>.

^v "Animal Welfare," *A Greener World* (blog), accessed July 12, 2021, <https://agreenerworld.org/challenges-and-opportunities/animal-welfare/>.

^{vi} The Humane Society of the United States, "An HSUS Report: Welfare Issues with the Use of Hormones and Antibiotics in Animal Agriculture," January 2016, <https://www.humanesociety.org/sites/default/files/docs/hsus-report-issues-with-hormones-welfare.pdf>.

^{vii} Senthil Venkatraman et al., "Adverse Effects on Consumer's Health Caused by Hormones Administered in Cattle," *International Food Research Journal* 25 (February 1, 2018): 1–10. <https://www.proquest.com/openview/b2eb062a6ce426cffb8e6e53a84e316a/1?pq-origsite=gscholar&cbl=816390>.

^{viii} Bryony A. Jones et al., "Zoonosis Emergence Linked to Agricultural Intensification and Environmental Change," *Proceedings of the National Academy of Sciences of the United States of America* 110, no. 21 (May 21, 2013): 8399–8404, <https://doi.org/10.1073/pnas.1208059110>.

^{ix} Jeff Moyer et al., "The Power of the Plate: The Case for Regenerative Organic Agriculture in Improving Human Health," White Paper (Rodale Institute, 2020), <https://rodaleinstitute.org/wp-content/uploads/Rodale-Institute-The-Power-of-the-Plate-The-Case-for-Regenerative-Organic-Agriculture-in-Improving-Human-Health.pdf>.

^x "10 Things You Should Know about Industrial Farming," United Nations Environmental Program, July 20, 2020, <http://www.unep.org/news-and-stories/story/10-things-you-should-know-about-industrial-farming>.

^{xi} Neus González et al., "Meat Consumption: Which Are the Current Global Risks? A Review of Recent (2010–2020) Evidences," *Food Research International* (Ottawa, Ont.) 137 (November 2020): 109341, <https://doi.org/10.1016/j.foodres.2020.109341>.

^{xii} P.R. Shukla et al., "Climate Change and Land: An IPCC Special Report on Climate Change, Desertification, Land Degradation, Sustainable Land Management, Food Security, and Greenhouse Gas Fluxes in Terrestrial Ecosystems" (Intergovernmental Panel on Climate Change, 2019), <https://www.ipcc.ch/site/assets/uploads/2019/11/SRCC-L-Full-Report-Compiled-191128.pdf>.

^{xiii} Giampiero Grossi et al., "Livestock and Climate Change: Impact of Livestock on Climate and Mitigation Strategies," *Animal Frontiers* 9, no. 1 (January 3, 2019): 69–76, <https://doi.org/10.1093/af/vfy034>.

^{xiv} Ji-Hong Jeon, Chan-Gi Park, and Bernard A. Engel, "Evaluating Effects of Poultry Waste Application on Phosphorus Loads to Lake Tenkiller," *Sustainability* 7, no. 8 (August 2015): 10115–34, <https://doi.org/10.3390/su7081015>.

^{xv} P Gerber, C Opio, and H Steinfeld, "Poultry Production and the Environment – a Review," *Food and Agriculture Organization*, 2007, 27. http://www.fao.org/ag/againfo/home/events/bangkok2007/docs/part2/2_2.pdf.

^{xvi} JoAnn Burkholder et al., "Impacts of Waste from Concentrated Animal Feeding Operations on Water Quality," *Environmental Health Perspectives* 115, no. 2 (February 1, 2007): 308–12, <https://doi.org/10.1289/ehp.8839>.

^{xvii} Wendee Nicole, "CAFOs and Environmental Justice: The Case of North Carolina," *Environmental Health Perspectives* 121, no. 6 (June 2013): a182–89, <https://doi.org/10.1289/ehp.121-a182>.

^{xviii} Michael Greger and Gowri Koneswaran, "The Public Health Impacts of Concentrated Animal Feeding Operations on Local Communities," *Family & Community Health* 33, no. 1 (January 2010): 11–20, <https://doi.org/10.1097/FCH.0b013e3181c4e22a>.

^{xix} P. Gerber, C. Opio, and H. Steinfeld, "Poultry Production and the Environment – a Review," *Food and Agriculture Organization*, 2007, 27. http://www.fao.org/ag/againfo/home/events/bangkok2007/docs/part2/2_2.pdf.

^{xx} Compassion in World Farming, "Welfare Sheet: Broiler Chickens," Farm Animal Welfare Compendium, January 5, 2013, <https://www.ciwf.org.uk/media/5235309/Welfare-sheet-Broiler-chickens.pdf>.

^{xi} Ann C. Rayner et al., "Slow-Growing Broilers Are Healthier and Express More Behavioural Indicators of Positive Welfare," *Scientific Reports* 10, no. 1 (September 16, 2020): 15151, <https://doi.org/10.1038/s41598-020-72198-x>.

^{xxii} "Per Capita Consumption of Poultry and Livestock, 1965 to Forecast 2022, in Pounds," National Chicken Council, June 28, 2021, <https://www.nationalchickencouncil.org/about-the-industry/statistics/per-capita-consumption-of-poultry-and-livestock-1965-to-estimated-2012-in-pounds/>.

xxiii Ben Knuth et al., "Advancing Organic to Mitigate Climate Change," White Paper (Washington, D.C.: Organic Trade Association, 2020),
https://ota.com/sites/default/files/indexed_files/OrganicTradeAssociation_ClimateChange_WhitePaper_PlanetOrganic.pdf.

xxiv Agricultural Marketing Service, "Organic Livestock Requirements" (USDA National Organic Program, July 2013),
<https://www.ams.usda.gov/sites/default/files/media/Organic%20Livestock%20Requirements.pdf>.

xxv Agricultural Marketing Service, "Organic," United States Department of Agriculture, accessed July 7, 2021,
<https://www.ams.usda.gov/grades-standards/organic-standards#Livestock>.

xxvi Northeast Organic Farming Association of Vermont, "Guidelines for Organic Certification of Poultry" (USDA AMS), accessed October 15, 2021, <https://www.ams.usda.gov/sites/default/files/media/Poultry%20-%20Guidelines.pdf>.

xxvii "Organic Livestock and Poultry Practices Historical Documents," USDA Agricultural Marketing Service, accessed October 15, 2021, <https://www.ams.usda.gov/rules-regulations/organic-livestock-and-poultry-practices-historical>.

xxviii A Greener World, "What Is 'Regenerative'? 9 Reasons You Should Care," *A Greener World* (blog), November 13, 2020, <https://agreenerworld.org/a-greener-world/what-is-regenerative-9-reasons-you-should-care/>.

xxix Shibu Jose and Jeanne Dollinger, "Silvopasture: A Sustainable Livestock Production System," *Agroforestry Systems* 93, no. 1 (February 1, 2019): 1–9, <https://doi.org/10.1007/s10457-019-00366-8>.

xxx Paul Hawken, ed., *Drawdown: The Most Comprehensive Plan Ever Proposed to Reverse Global Warming* (Penguin, 2017).

xxxi "Literature Review: Crop & Livestock Integration," *Rodale Institute* (blog), August 6, 2019, <https://rodaleinstitute.org/science/articles/literature-review-crop-livestock-integration/>.

xxxii Jeff Moyer et al., "The Power of the Plate: The Case for Regenerative Organic Agriculture in Improving Human Health," White Paper (Rodale Institute, 2020), <https://rodaleinstitute.org/wp-content/uploads/Rodale-Institute-The-Power-of-the-Plate-The-Case-for-Regenerative-Organic-Agriculture-in-Improving-Human-Health.pdf>.

xxxiii Jason E. Rowntree et al., "Ecosystem Impacts and Productive Capacity of a Multi-Species Pastured Livestock System," *Frontiers in Sustainable Food Systems* (2020), <https://doi.org/10.3389/fsufs.2020.544984>.

xxxiv Hannah Gosnell, Susan Charnley, and Paige Stanley, "Climate Change Mitigation as a Co-Benefit of Regenerative Ranching: Insights from Australia and the United States," *Interface Focus* 10, no. 5 (October 6, 2020): 20200027, <https://doi.org/10.1098/rsfs.2020.0027>.

xxxv Natural Resources Conservation Service, "Animal Feeding Operations," United States Department of Agriculture, accessed July 2, 2021, <https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/plantsanimals/livestock/afo/>.

xxxvi "Why Are CAFOs Bad?," Sierra Club, February 24, 2015, <https://www.sierraclub.org/michigan/why-are-cafos-bad>.

xxxvii Certified Humane Egg Laying Hens Standard, <https://certifiedhumane.org/wp-content/uploads/Std18.Layers.pdf>.

xxxviii See *Animal Welfare Approved Laying Hen Standard*, <https://agreenerworld.org/wp-content/uploads/2019/02/AWA-Laying-Hen-Standards-2018-v3.pdf>.

xxxix Lisa Held, "Industrial Meat 101: Could Large Livestock Operations Cause the Next Pandemic?," *Civil Eats*, May 29, 2020, <https://civileats.com/2020/05/29/industrial-meat-101-could-large-livestock-operations-cause-the-next-pandemic/>.