

THE EVIDENCE FOR VEGANISM

Scientific Evidence on Animals, Health, Agriculture, and the Environment

A collection of concise findings from peer-reviewed research, scientific institutions, and major international datasets examining vegan diets and the broader impacts of animal agriculture.

Each claim is kept short enough to be useful as a reference or social-media comment, while the source and URL directly beneath it allow the underlying evidence to be independently checked.

Related findings are combined only when doing so preserves their scientific meaning, population, comparison, timeframe, and evidence type.

1. LAND, CROPS & FOOD EFFICIENCY

 **Agriculture: ~50% of Earth's habitable land | livestock: ~80% of agricultural land | crops for direct human food: ~16%.**

Source: FAO data / Our World in Data; Poore & Nemecek, Science (2018)

URL: <https://ourworldindata.org/global-land-for-agriculture>

URL: <https://doi.org/10.1126/science.aag0216>

 **Meat + dairy: ~83% farmland | ~18% calories | ~37% protein.**

Source: Poore & Nemecek, Science (2018)

URL: <https://doi.org/10.1126/science.aag0216>

 **No animal products: ~76% less agricultural land needed.**

Source: Poore & Nemecek, Science (2018)

URL: <https://doi.org/10.1126/science.aag0216>

 **Global soy: ~77% animal feed | ~7% direct human food.**

Source: USDA PSD / Food Climate Research Network data

URL: <https://ourworldindata.org/soy>

 **Corn: >95% of U.S. feed-grain production + use.**

Source: USDA Economic Research Service

URL: <https://www.ers.usda.gov/topics/crops/corn-and-other-feed-grains/>

 **Feeding human-edible crops to animals loses calories | direct crop consumption can feed more people from the same land.**

Source: Cassidy et al., Environmental Research Letters (2013)

URL: <https://doi.org/10.1088/1748-9326/8/3/034015>

 **Deforestation: ~90% agriculture | ~50% cropland expansion | ~38.5% livestock grazing.**

Source: UN FAO, Global Remote Sensing Survey

URL: <https://www.fao.org/forest-resources-assessment/remote-sensing/remote-sensing-survey/en>

2. WATER & POLLUTION

 **Global freshwater withdrawals: ~72% agriculture.**

Source: UN FAO

URL: <https://www.fao.org/land-water/water/water-scarcity/en/>

 **Farm nitrogen + phosphorus can pollute waterways | excess nutrients can cause eutrophication + dead zones.**

Source: UN FAO; U.S. Environmental Protection Agency

URL: <https://www.fao.org/land-water/water/water-pollution/en/>

URL: <https://www.epa.gov/nutrientpollution>

 **Animal manure contains nitrogen + phosphorus | runoff can carry pollutants into waterways.**

Source: U.S. Environmental Protection Agency

URL: <https://www.epa.gov/npdes/animal-feeding-operations-afos>

 **Livestock ammonia contributes to harmful PM2.5 | animal foods cause most U.S. food-related air-quality health damage.**

Source: Domingo et al., PNAS (2021)

URL: <https://doi.org/10.1073/pnas.2013637118>

3. CLIMATE & BIODIVERSITY

 **Food systems: ~1/3 of human-caused GHG emissions.**

Source: Crippa et al., Nature Food (2021)

URL: <https://doi.org/10.1038/s43016-021-00225-9>

 **Food-production GHGs: ~57% animal foods | ~29% plant foods | beef alone ~25%.**

Source: Xu et al., Nature Food (2021)

URL: <https://doi.org/10.1038/s43016-021-00358-x>

 **No animal products: modeled ~49% lower food GHGs | ~50% less acidification | ~49% less eutrophication.**

Source: Poore & Nemecek, Science (2018)

URL: <https://doi.org/10.1126/science.aag0216>

 **Agricultural expansion destroys + fragments wildlife habitat.**

Source: IPBES Global Assessment

URL: <https://www.ipbes.net/global-assessment>

 **50% animal-food replacement: modeled ~31% lower farm GHGs + near-halt to net forest loss by 2050.**

Source: Kozicka et al., Nature Communications (2023)

URL: <https://doi.org/10.1038/s41467-023-40899-2>

4. HUMAN HEALTH & NUTRITION

 **Appropriately planned vegan diets: nutritionally adequate for adults + can offer long-term cardiometabolic benefits.**

Source: Academy of Nutrition and Dietetics (2025; corrected publication record 2026)

URL: <https://doi.org/10.1016/j.jand.2025.02.002>

URL: <https://pubmed.ncbi.nlm.nih.gov/41474402/>

Protein

 **Plant foods can provide all essential amino acids | vegan diets can meet protein requirements | meal-by-meal protein combining isn't necessary.**

Source: Mariotti & Gardner, Nutrients (2019)

URL: <https://doi.org/10.3390/nu11112661>

Fiber + Cholesterol

 **Fiber: naturally in plant foods | meat, eggs + milk: 0g.**

Source: NIH MedlinePlus; USDA FoodData Central

URL: <https://medlineplus.gov/dietaryfiber.html>

URL: <https://fdc.nal.usda.gov/>

 **Whole plant foods: essentially cholesterol-free | animal foods can contain dietary cholesterol.**

Source: USDA FoodData Central

URL: <https://fdc.nal.usda.gov/>

Randomized Vegan Trial

 **Vegan RCT, 8 weeks: ~14 mg/dL greater LDL drop | ~2.9 µIU/mL greater fasting-insulin drop | ~1.9 kg greater weight loss.**

Source: Landry et al., JAMA Network Open (2023)

URL: <https://doi.org/10.1001/jamanetworkopen.2023.44457>

Plant Protein + Longevity

 **Higher plant protein: associated with ~8% lower mortality | ~12% lower CVD mortality.**

Source: Naghshi et al., BMJ (2020)

URL: <https://doi.org/10.1136/bmj.m2412>

 **+3% energy from plant protein: associated with ~5% lower mortality.**

Source: Naghshi et al., BMJ (2020)

URL: <https://doi.org/10.1136/bmj.m2412>

Plant-Based Dietary Patterns

 **Plant-based diets: associated with ~16% lower all-cause mortality risk.**

Source: Quek et al., Nutrition Journal (2023), systematic review + meta-analysis

URL: <https://doi.org/10.1186/s12937-023-00877-2>

 **Healthy plant-based diets: associated with ~15% lower CVD risk | ~21% lower Type 2 diabetes risk.**

Source: Quek et al., Nutrition Journal (2023), systematic review + meta-analysis

URL: <https://doi.org/10.1186/s12937-023-00877-2>

Cancer

 **Processed meat: WHO/IARC Group 1 carcinogen | 50g/day: ~18% higher colorectal cancer risk.**

Source: WHO / International Agency for Research on Cancer

URL: <https://www.who.int/news-room/questions-and-answers/item/cancer-carcinogenicity-of-the-consumption-of-red-meat-and-processed-meat>

 **Red meat: WHO/IARC Group 2A probable carcinogen.**

Source: WHO / International Agency for Research on Cancer

URL: <https://www.who.int/news-room/questions-and-answers/item/cancer-carcinogenicity-of-the-consumption-of-red-meat-and-processed-meat>

 **Group 1 = strength of evidence that it can cause cancer, not equal danger to tobacco.**

Source: WHO / International Agency for Research on Cancer

URL: <https://www.who.int/news-room/questions-and-answers/item/cancer-carcinogenicity-of-the-consumption-of-red-meat-and-processed-meat>

Type 2 Diabetes + Modeled Global Health

 **Higher red-meat intake: associated with higher Type 2 diabetes risk.**

Source: Gu et al., American Journal of Clinical Nutrition (2023)

URL: <https://doi.org/10.1016/j.ajcnut.2023.08.021>

 **Global vegan scenario: modeled ~8.1M fewer deaths/year by 2050.**

Source: Springmann et al., PNAS (2016)

URL: <https://doi.org/10.1073/pnas.1523119113>

5. PUBLIC HEALTH

 **Livestock antibiotic use can select for resistant microbes | misuse + overuse accelerates antimicrobial resistance | resistant microbes can spread among animals, humans + ecosystems.**

Source: World Organisation for Animal Health; World Health Organization

URL: <https://www.woah.org/en/what-we-do/global-initiatives/antimicrobial-resistance/>

URL: <https://www.who.int/news-room/fact-sheets/detail/antimicrobial-resistance>

 **Most emerging infectious diseases in a major study originated in animals.**

Source: Jones et al., Nature (2008)

URL: <https://doi.org/10.1038/nature06536>

 **Livestock intensification can affect zoonotic-disease risk.**

Source: Gilbert et al., Animal (2021)

URL: <https://doi.org/10.1016/j.animal.2020.100123>

6. SENTIENCE & COGNITION

 **Sentience = capacity to experience feelings.**

Source: Lambert et al., Animals (2022)

URL: <https://doi.org/10.3390/ani12091182>

 **Fish are sentient: 349 papers | 142 species + subspecies reviewed | evidence includes pain, fear + anxiety.**

Source: Lambert et al., Animals (2022)

URL: <https://doi.org/10.3390/ani12091182>

 **Fish can learn, remember + change behavior from experience.**

Source: Brown, Animal Cognition (2015)

URL: <https://doi.org/10.1007/s10071-014-0761-0>

 **Evidence review: octopuses, squid, cuttlefish, crabs, lobsters + crayfish are sentient.**

Source: Birch et al., LSE Scientific Evidence Review (2021)

URL:

<https://www.lse.ac.uk/business/consulting/reports/review-of-the-evidence-of-sentiences-in-cephalopod-molluscs-and-decapod-crustaceans>

 **Bivalves: central + peripheral nervous systems | oysters: cerebral + visceral ganglia.**

Source: Yurchenko et al., Frontiers in Zoology (2018)

URL: <https://pmc.ncbi.nlm.nih.gov/articles/PMC5896133/>

 **Bivalves: evidence of nociception, predator detection/escape behavior + learning.**

Source: Sneddon (2015); Crook & Walters (2011); Wageningen University & Research (2022)

URL: <https://journals.biologists.com/jeb/article/218/7/967/14518/Pain-in-aquatic-animals>

URL: <https://doi.org/10.1093/ilar.52.2.185>

URL: <https://research.wur.nl/en/publications/welfare-of-bivalves-in-aquaculture-a-first-literature-scan-and-pl/>

 **Pigs: learning + memory | complex social behavior | sophisticated cognitive abilities.**

Source: Marino & Colvin (2015)

URL: <https://escholarship.org/uc/item/8sx4s79c>

 **Chickens: learning + memory | social cognition | distinguish individual animals.**

Source: Marino, Animal Cognition (2017)

URL: <https://doi.org/10.1007/s10071-016-1064-4>

 **Cattle: learning + memory | measurable emotional responses | social relationships + individual personalities.**

Source: Marino & Allen (2017)

URL: <https://doi.org/10.26451/abc.04.01.06.2017>

7. ANIMAL WELFARE & FARMING

 **Farm animals can experience pain, fear + distress | transport can cause heat stress, thirst + fatigue.**

Source: European Food Safety Authority

URL: <https://www.efsa.europa.eu/en/topics/topic/animal-welfare>

 **Farming can restrict highly motivated natural behaviors + involve painful procedures.**

Source: European Food Safety Authority

URL: <https://www.efsa.europa.eu/en/topics/topic/animal-welfare>

8. FISHING & AQUACULTURE

 **Bycatch = unintended capture of non-target animals | can include turtles, mammals, seabirds + fish | can injure or kill.**

Source: NOAA Fisheries

URL: <https://www.fisheries.noaa.gov/national/bycatch/understanding-bycatch>

 **Aquaculture feed can contain wild-caught fish, fishmeal + fish oil | supplying fisheries can produce bycatch.**

Source: Global aquaculture-feed review

URL: <https://pmc.ncbi.nlm.nih.gov/articles/PMC11482329/>

9. ECONOMICS & RESOURCE USE

 **Plant-based diets can cost less in high-income countries | vegan diets were among the cheapest modeled healthy diets.**

Source: Springmann et al., Lancet Planetary Health (2021)

URL: [https://doi.org/10.1016/S2542-5196\(21\)00251-5](https://doi.org/10.1016/S2542-5196(21)00251-5)

 Global vegan scenario: modeled ~\$1.07T/year health savings by 2050.

Source: Springmann et al., PNAS (2016)

URL: <https://doi.org/10.1073/pnas.1523119113>

 Food-related climate damage creates measurable economic costs.

Source: Errickson et al., Nature Food (2021)

URL: <https://doi.org/10.1038/s43016-021-00265-1>

10. EVIDENCE KEY

~ = approximately.

Associated with = observational association, not automatic proof of causation.

Modeled / scenario = estimated outcome under specified assumptions.

RCT = randomized controlled trial. GHG = greenhouse gas. PM2.5 = fine particulate air pollution. CVD = cardiovascular disease.

Group 1 carcinogen = sufficient evidence that an agent can cause cancer; Group 1 agents do not all carry equal risk.

EVIDENCE STANDARD

No claim enters this collection simply because it supports veganism.

Every factual claim has a source directly underneath it, with one or more URLs leading to supporting evidence.

Related statistics are combined only when doing so preserves their scientific meaning.

Numbers remain attached to their original population, comparison, timeframe, or model.

Associations remain associations. Models remain models.

Claims remain short without changing their scientific meaning.

Primary research, systematic reviews, and authoritative scientific sources are preferred whenever available.

Unsupported or insufficiently verified claims are excluded.

Present the evidence clearly and let the data speak for itself.