Deutscher Bundestag

Parlamentarischer Beirat für
nachhaltige Entwicklung
und Zukunftsfragen

Ausschussdrucksache

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INSTITUT FÜR ERNÄHRUNGSPSYCHOLOGIE AN DER GEORG-AUGUST-UNIVERSITÄT GÖTTINGEN

Fachgespräch zum Thema „Nachhaltige Ernährung“

Parlamentarischer Beirat für nachhaltige Entwicklung und Zukunftsfragen

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Universitätsmedizin

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37073 Göttingen

Definition von Nachhaltigkeit in der Ernährung: **Planetar/Umwelt**

The Lancet Commissions

The EAT–*Lancet* Commission on healthy, sustainable, and just food systems

Johan Rockström, Shakuntala Haraksingh Thilsted, Walter C Willett, Line J Gordon, Mario Herrero, Christina C Hicks, Daniel Mason-D'Croz, Nitya Rao, Marco Springmann, Ellen Cecilie Wright, Rina Agustina, Sumati Bajaj, Anne Charlotte Bunge, Bianca Carducci, Costanza Conti, Namukolo Covic, Jessica Fanzo, Nita G Forouhi, Matthew F Gibson, Xiao Gu, Ermias Kebreab, Claire Kremen, Amar Laila, Ramanan Laxminarayan, Theresa M Marteau, Carlos A Monteiro, Anna Norberg, Jemimah Njuki, Thais Diniz Oliveira, Wen-Harn Pan, Juan A Rivera, James P W Robinson, Marina Sundiang, Sofie te Wierik, Detlef P van Vuuren, Sonja Vermeulen, Patrick Webb, Lujain Alqodmani, Ramya Ambikapathi, Anne Barnhill, Isabel Baudish, Felicitas Beier, Damien Beillouin, Arthur H W Beusen, Jannes Breier, Charlotte Chemarin, Maksym Chepeliev, Jennifer Clapp, Wim de Vries, Ignacio Pérez-Domínguez, Natalia Estrada-Carmona, Dieter Garten, Christopher D Golden, Sarah K Jones, Peter Søgaard Jørgensen, Marta Kozicka, Hermann Lotze-Campen, Federico Maggi, Emma Marzi, Abhijeet Mishra, Fernando Orduna-Cabrera, Alexander Popp, Lena Schulte-Uebbing, Elke Stehfest, Fiona H M Tang, Kazuaki Tsuchiya, Hannah H E Van Zanten, Willem-Jan van Zeist, Xin Zhao, Fabrice DeClerck

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Our assessment of justice integrates three dimensions—distributive, representational, and recognitional—within a

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EAT-Lancet Report 2025: 9 planetare Grenzen

1. Klimawandel (CO_2, Methan, Lachgas)
2. Biodiversität
3. Landnutzungsänderung
4. Süßwasserveränderung
5. Biogeochemische Flüsse (Phosphor, Stickstoff)
6. Neuartige Substanzen (Novel Entities)
7. Ozeanversauerung
8. Atmosphärische Aerosolbelastung
9. Stratosphärischer Ozonabbau

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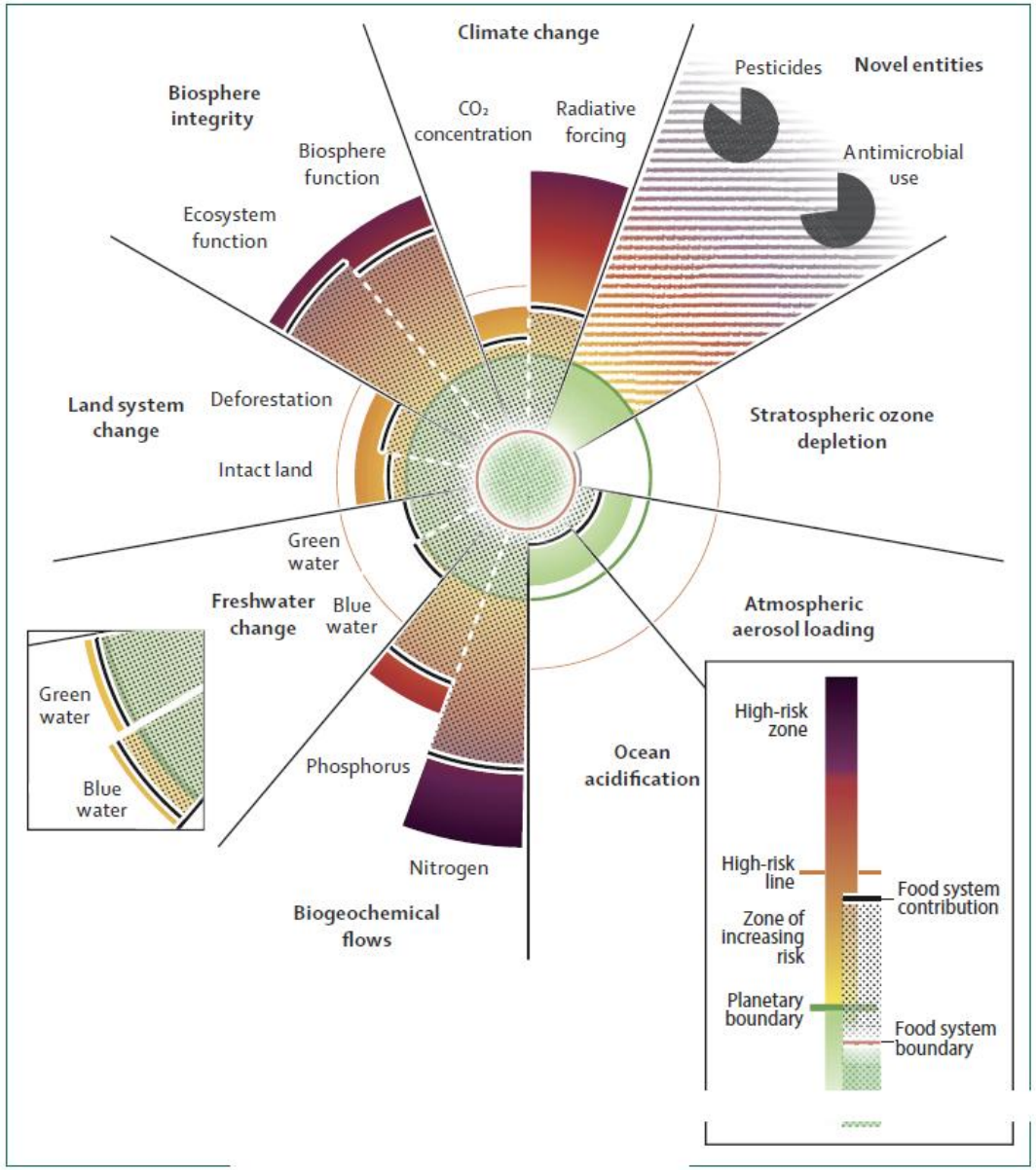

Figure 1: Status of food system pressures across all nine planetary boundaries (indicated by the black dotted pattern) and the food system boundaries (red line)

2019/2025: Planetary Health Diet der EAT Lancet Commission

Planetare Gesundheit

Individuelle Gesundheit

Figure 1

An integrated agenda for food in the Anthropocene recognizes that food forms an inextricable link between human health and environmental sustainability. The global food system must operate within boundaries for human health and food production to ensure healthy diets from sustainable food systems for nearly 10 billion people by 2050.

https://eatforum.org/eat-lancet-commission/the-planetary-health-diet-and-you/

Definition von Nachhaltigkeit in der Ernährung: **Gesundheit**

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EAT-Lancet Report 2025: Menschliche Gesundheit

	Per capita recommended intake (g/day [range])	Per capita recommended intake (kcal/day)
Plant foods*		
Whole grains†	210 (20–50% of daily energy intake)	735
Tubers and starchy roots‡	50 (0–100)	50
Vegetables§	300 (200–600)	95
Fruits¶	200 (100–300)	145
Tree nuts and peanuts	50 (0–75)	275
Legumes‖	75 (0–150)	275
Animal-sourced foods**		
Milk or equivalents (eg, cheese)	250 (0–500)	145
Chicken and other poultry	30 (0–60)	60
Fish and shellfish††	30 (0–100)	25
Eggs	15 (0–25)	20
Beef, pork, or lamb	15 (0–30)	45
Fats, sugar, and salt		
Unsaturated plant oils‡‡	40 (20–80)	355
Palm and coconut oil	6 (0–8)	55
Lard, tallow, and butter§§	5 (0–10)	..
Sugar (added or free)	30 (0–30)	115
Sodium	<2	..

Definition von Nachhaltigkeit in der Ernährung: **Gerechtigkeit**

EAT-Lancet Report 2025: Gerechtigkeit/Menschenrechte

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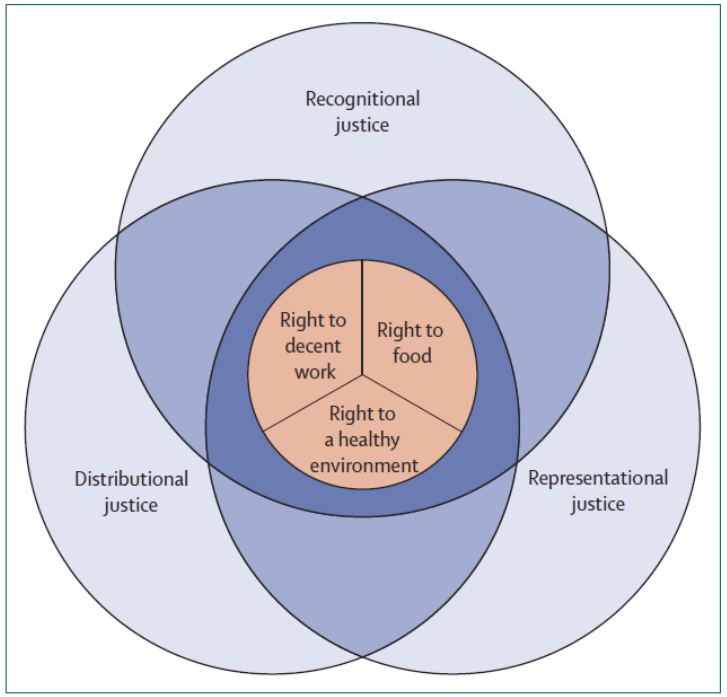


Figure 8: Conceptual framework of the justice section
The three justice dimensions and three human rights are inter-related and inter-dependent. Achieving the three justice dimensions of distributive, recognitional, and representational justice requires meeting the three human rights.

Wissenschaftlicher Beirat
für Agrarpolitik, Ernährung und
gesundheitlichen Verbraucherschutz
beim Bundesministerium für
Ernährung und Landwirtschaft

Politik für eine nachhaltigere Ernährung

Eine integrierte Ernährungspolitik entwickeln und faire Ernährungsumgebungen gestalten

Gutachten

Juni 2020

Abbildung ZF-1: Die vier zentralen Ziele einer nachhaltigeren Ernährung („Big Four")

Eine gesundheitsfördernde Ernährung, die zu einer höheren Lebenserwartung, mehr gesunden Lebensjahren und mehr Wohlbefinden für alle beiträgt.

Eine Ernährung, die soziale Mindeststandards entlang von Wertschöpfungsketten gewährleistet.

Eine Ernährung, die mehr Tierwohl unterstützt und damit den sich wandelnden ethischen Ansprüchen der Gesellschaft gerecht wird.

Eine umwelt- und klimaschützende Ernährung, die zu den mittel- und langfristigen Nachhaltigkeitszielen Deutschlands passt.

Quelle: Eigene Darstellung.

EAT Lancet Commission:
Planetary Health Diet

DGE:
Ernährungsempfehlungen 2024 für Deutschland

Hauptziele der DGE-Empfehlungen 2024 (sog. FBDGs)

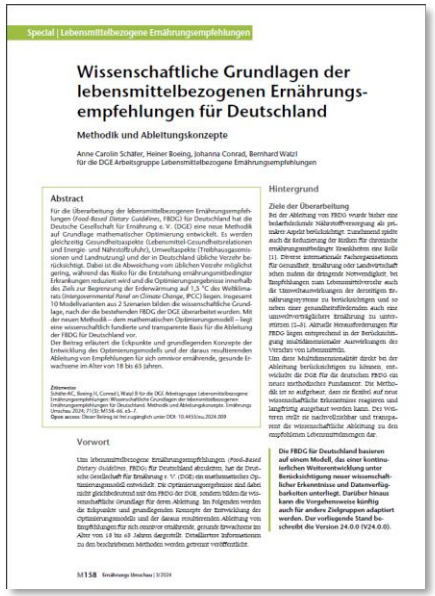
- Erkrankungen vorbeugen (Reduktion der Krankheitslast)
- Klimaschutz und Minimierung der Landnutzung
- Anschlussfähigkeit (über die Nähe zum bisherigen Verzehr)

Zur Erstellung der Empfehlungen wurde erstmals ein evidenzbasierter Algorithmus entwickelt, der die obigen drei Hauptziele gleichzeitig optimiert und weitere Faktoren wie die ausreichende Nährstoffaufnahme einbezieht.

Wissenschaftliche Grundlagen der lebensmittelbezogenen Ernährungs-empfehlungen für Deutschland

Methodik und Ableitungskonzepte

Anne Carolin Schäfer, Heiner Boeing, Johanna Conrad, Bernhard Watzl
für die DGE Arbeitsgruppe Lebensmittelbezogene Ernährungsempfehlungen


Special | Lebensmittelbezogene Ernährungsempfehlungen

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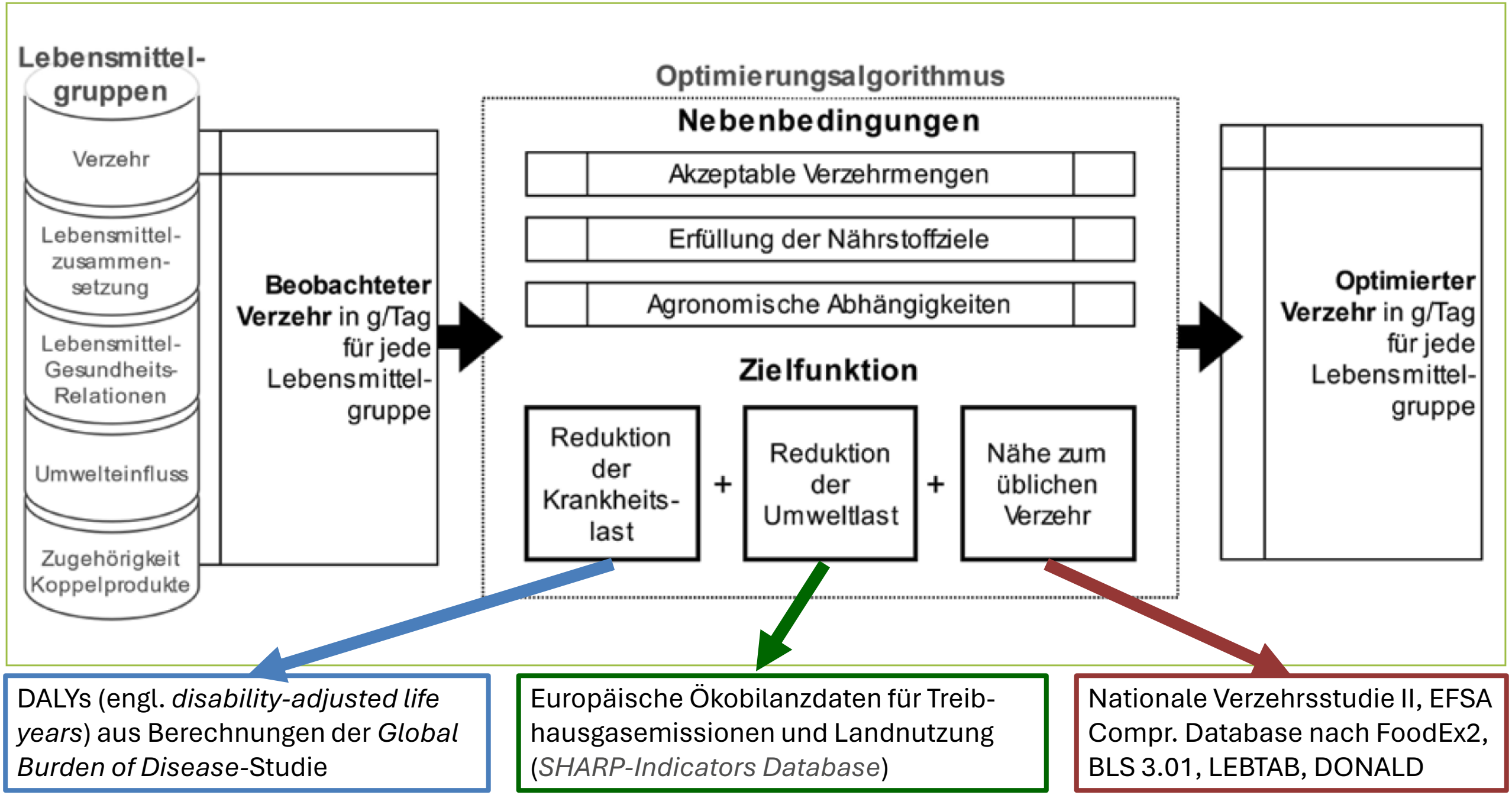
Abstract

Hintergrund

Vorwort

Schäfer AC, Boeing H, Conrad J, Watzl B für die DGE Arbeitsgruppe Lebensmittelbezogene Ernährungsempfehlungen: Wissenschaftliche Grundlagen der lebensmittelbezogenen Ernährungsempfehlungen für Deutschland. Methodik und Ableitungskonzepte. Ernährungs Umschau 2024; 71(3): M158–66. e5–7.


Lebensmittel-gruppen
Verzehr
Lebensmittel-zusammen-setzung
Lebensmittel-Gesundheits-Relationen
Umwelteinfluss
Zugehörigkeit Koppelprodukte
Beobachteter Verzehr in g/Tag für jede Lebensmittel-gruppe
Optimierungsalgorithmus
Nebenbedingungen
Akzeptable Verzehrmengen
Erfüllung der Nährstoffziele
Agronomische Abhängigkeiten
Zielfunktion
Reduktion der Krankheits-last
+
Reduktion der Umweltlast
+
Nähe zum üblichen Verzehr
Optimierter Verzehr in g/Tag für jede Lebensmittel-gruppe
DALYs (engl. disability-adjusted life years) aus Berechnungen der Global Burden of Disease-Studie
Europäische Ökobilanzdaten für Treib-hausgasemissionen und Landnutzung (SHARP-Indicators Database)
Nationale Verzehrsstudie II, EFSA Compr. Database nach FoodEx2, BLS 3.01, LEBTAB, DONALD

European Journal of Epidemiology (2019) 34:765–775
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NUTRITIONAL EPIDEMIOLOGY

Intake of 12 food groups and disability-adjusted life years from coronary heart disease, stroke, type 2 diabetes, and colorectal cancer in 16 European countries

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Received: 11 December 2018 / Accepted: 20 April 2019 / Published online: 27 April 2019

Abstract
Our aim was to estimate and rank 12 food groups according to disability-adjusted life years (DALYs) from coronary heart disease (CHD), stroke, type 2 diabetes (T2D), and colorectal cancer (CRC) in 16 European countries. De novo published non-linear dose–response meta-analyses of prospective studies (based on 297 primary reports), and food consumption data from the European Food Safety Authority Comprehensive European Food Consumption Database in Exposure Assessment, and DALY estimates from the Institute for Health Metrics and Evaluation were used. By implementing disease-specific counterfactual scenarios of theoretical minimum risk exposure level (TMRELs), the proportion of DALYs attributed to 12 food groups was estimated. In addition, a novel modelling approach was developed to obtain a single (optimized) TMREL across diseases. Four scenarios were analysed (A: disease-specific TMREL/all food-disease associations; B: disease-specific TMREL/only significant food-disease associations; C: single TMREL/all food-disease associations; D: single TMREL/only significant food-disease associations). Suboptimal food intake was associated with the following proportions of DALYs; Scenario A (highest-estimate) and D (lowest-estimate): CHD (A: 67%, D: 52%), stroke (A: 49%, D: 30%), T2D (A: 57%, D: 51%), and CRC (A: 54%, D: 40%). Whole grains (10%) had the highest impact on DALYs, followed by nuts (7.1%), processed meat (6.4%), fruit (4.4%) and fish and legumes (4.2%) when combining all scenarios. The contribution to total DALYs of all food groups combined in the different scenarios ranged from 41–52% in Austria to 51–69% in the Czech Republic. These findings could have important implications for planning future food-based dietary guidelines as a public health nutrition strategy.

Keywords Disability-adjusted life years · Food groups · Comparative risk assessment · Population health-impact · Type 2 diabetes · Coronary heart disease · Stroke · Colorectal cancer

Electronic supplementary material The online version of this article (https://doi.org/10.1007/s10654-019-00523-4) contains supplementary material, which is available to authorized users.

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4 Endpunkte, die in den FBDG-Algorithmus eingehen: DALYs (Krankheitslast) aufgrund von

- KHK (Herzkrankheiten)
- Schlaganfall
- Diabetes Typ 2
- Darmkrebs

Intake of 12 food groups and disability-adjusted life years from **coronary heart disease**, **stroke**, **type 2 diabetes**, and **colorectal cancer** in 16 European countries

vegetables, fruits, whole grains, refined grains, nuts, legumes, eggs, dairy, fish, red meat, processed meat, and SSB

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Intake of 12 food groups and disability-adjusted life years from coronary heart disease, stroke, type 2 diabetes, and colorectal cancer in 16 European countries

Table 3 Disability-adjusted life years attributable to 12 food groups in 16 European countries based on the 4 scenario analyses

Food group	Health impact ranking, Proportion	Disease-specific TMREL All associations (Scenario A)	Disease-specific TMREL Significant associations (Scenario B)	Single TMREL All associations (Scenario C)	Single TMREL Significant associations (Scenario D)
Wholegrain	1 10%	2,149,382 (2,101,443–2,198,486)	2,051,943 (2,001,020–2,103,723)	1,997,744 (1,952,477–2,044,162)	1,879,065 (1,831,945–1,927,466)
Nuts	2 7.1%	1,505,070 (1,471,147–1,540,030)	1,366,224 (1,327,532–1,405,928)	1,490,186 (1,456,137–1,525,291)	1,372,538 (1,334,036–1,411,727)
Processed meat	3 6.4%	1,627,698 (1,592,038–1,663,918)	949,806 (920,396–980,572)	1,677,518 (1,640,408–1,715,219)	981,639 (951,177–1,013,119)
Fruit	4 4.4%	871,116 (854,532–887,939)	980,187 (961,342–999,227)	818,101 (802,323–834,134)	908,337 (890,765–926,085)
Fish	5 4.2%	857,500 (839,760–875,659)	882,500 (862,297–903,083)	812,755 (794,325–831,574)	892,270 (871,985–912,875)
Legumes	6 4.2%	1,018,455 (996,977–1,040,518)	651,384 (632,080–671,307)	1,052,068 (1,029,882–1,074,804)	654,384 (635,023–674,148)
SSB	7 3.9%	734,798 (715,407–754,791)	825,269 (803,612–847,352)	756,512 (736,527–777,112)	833,618 (811,964–855,786)
Red meat	8 3.7%	1,067,779 (1,045,837–1,090,172)	513,665 (498,147–529,598)	847,201 (829,783–865,016)	529,416 (513,453–545,873)
Vegetables	9 3.1%	657,911 (643,665–672,496)	735,626 (719,639–751,972)	539,540 (526,546–552,899)	602,009 (587,606–616,785)
Dairy	10 2.5%	598,562 (586,262–610,922)	642,843 (630,088–655,827)	357,083 (349,768–364,446)	392,300 (384,393–400,305)
Refined grain	11 2.4%	960,979 (937,118–985,421)	82,321 (76,282–88,720)	810,404 (786,904–834,523)	84,049 (77,827–90,577)
Eggs	12 0.4%	44,495 (37,329–51,680)	61,070 (56,557–65,849)	190,475 (183,530–197,587)	62,355 (57,714–67,231)

SSB sugar sweetened beverages; *TMREL* theoretical minimum risk exposure level

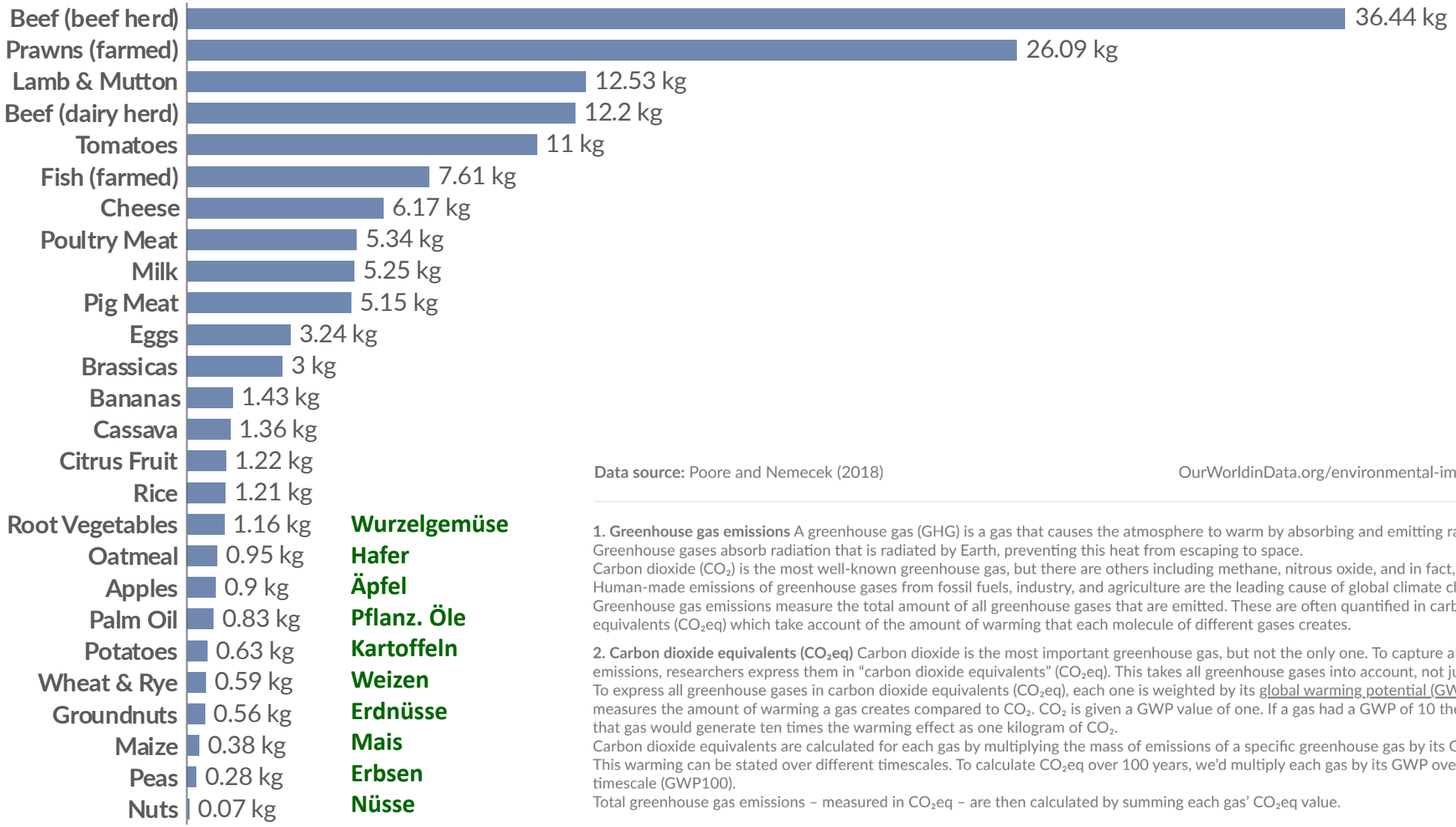
Umwelteinfluss (Nachhaltigkeit)

- Zur Erfassung der Umweltlast der Lebensmittel wurden Ökobilanzdaten für **Treibhausgasemissionen** und **Landnutzung** eingesetzt.
- Es handelt sich um europäische Daten aus **Lebenszyklusanalysen** (d. h. von der Produktion über den Transport bis zur Zubereitung eines Lebensmittels).
- Zur vollumfänglichen Darstellung der Umweltlast von Lebensmitteln ist die Berücksichtigung weiterer Indikatoren wünschenswert (z. B. Wasserverbrauch und Eutrophierungspotenzial durch Phosphor- oder Stickstoffeintrag), jedoch liegen dazu gegenwärtig keine geeigneten und/oder ausreichend differenzierten Daten vor.

Greenhouse gas emissions per 1000 kilocalories

Our World in Data

Greenhouse gas emissions[1] are measured in kilograms of carbon dioxide-equivalents[2].



Data source: Poore and Nemecek (2018)

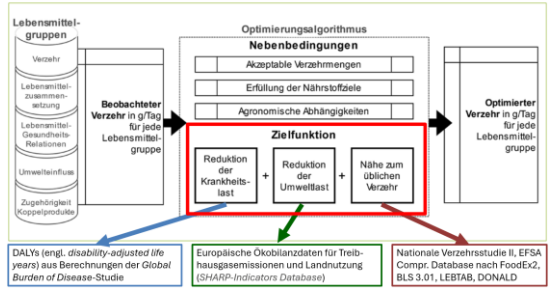
OurWorldinData.org/environmental-impacts-of-food | CC BY

1. Greenhouse gas emissions A greenhouse gas (GHG) is a gas that causes the atmosphere to warm by absorbing and emitting radiant energy. Greenhouse gases absorb radiation that is radiated by Earth, preventing this heat from escaping to space.
Carbon dioxide (CO_2) is the most well-known greenhouse gas, but there are others including methane, nitrous oxide, and in fact, water vapor.
Human-made emissions of greenhouse gases from fossil fuels, industry, and agriculture are the leading cause of global climate change.
Greenhouse gas emissions measure the total amount of all greenhouse gases that are emitted. These are often quantified in carbon dioxide equivalents (CO_2eq) which take account of the amount of warming that each molecule of different gases creates.

2. Carbon dioxide equivalents (CO_2eq) Carbon dioxide is the most important greenhouse gas, but not the only one. To capture all greenhouse gas emissions, researchers express them in "carbon dioxide equivalents" (CO_2eq). This takes all greenhouse gases into account, not just CO_2.
To express all greenhouse gases in carbon dioxide equivalents (CO_2eq), each one is weighted by its global warming potential (GWP) value. GWP measures the amount of warming a gas creates compared to CO_2. CO_2 is given a GWP value of one. If a gas had a GWP of 10 then one kilogram of that gas would generate ten times the warming effect as one kilogram of CO_2.
Carbon dioxide equivalents are calculated for each gas by multiplying the mass of emissions of a specific greenhouse gas by its GWP factor.
This warming can be stated over different timescales. To calculate CO_2eq over 100 years, we'd multiply each gas by its GWP over a 100-year timescale (GWP100).
Total greenhouse gas emissions – measured in CO_2eq – are then calculated by summing each gas' CO_2eq value.

Modell-variante	Gewicht (%) „Reduktion der Krankheitslast“	Gewicht (%) „Reduktion der Umweltlast“	Gewicht (%) „Nähe zum üblichen Verzehr“
1	40	20	40
2	35	25	40
3 (Gleich-verteilung)	30	30	40
4	25	35	40
5	20	40	40

Tab. 1: **Gewichtung der in der Zielfunktion berücksichtigten Aspekte**



FBDG Lebensmittelgruppe	NVSII[1] (g/d)	Optimierungsergebnisse[2] für Modellvariante 3[3] (g/d)	
		Szenario 1	Szenario 2
Trinkwasser	1003	1074	1047
Kaffee und Tee	749	97	97
Gemüse	91	247	245
Obst	154	300	300
Säfte	226	61	61
Pflanzliche Öle	3	12	13
Hülsenfrüchte	5	5	5
Nüsse und Samen	5	31	13
Kartoffeln	37	37	37
Getreide (gesamt)	234	319	309
davon Vollkorn	12	104	31
Milchäquivalente	451	379	394
Ei und Eiprodukte	12	12	12
Fisch und Meeresfrüchte	15	26	18
Geflügel	20	0	23
Rotes Fleisch	42	9	11
Verarbeitetes Fleisch	52	8	9
Streichfette	20	11	10
En% Diskretorische Lebensmittel	22	7	8
Treibhausgasemissionen (kg CO_2-Äqu.)	6,18	3,31	3,49
Landnutzung (m^2)	7,48	3,62	3,73
DALYs (gewonnene Lebensjahre in Gesundheit) in Mio., Durchschnitt aus [21, 22])	–	4,37	2,67

Optimierte Verzehrmengen in g/Tag für sich omnivor ernährende Erwachsene im Alter von 18 bis 65 Jahren (V24.0.0), Energie: 2029 kcal/d

[1] beobachteter Verzehr laut NVS II

[2] Die Optimierungsergebnisse sind nicht gleichbedeutend mit den FBDG der DGE. Die FBDG werden aus den Optimierungsergebnissen abgeleitet.

[3] Gewichtung: 30 % Reduktion der Krankheitslast, 30 % Reduktion der Umweltlast, 40 % Nähe zum üblichen Verzehr

Äqu.: Äquivalente; DALYs: engl. *disability-adjusted life years*; FBDG: engl. *Food-Based Dietary Guidelines*; NVS II: Nationale Verzehrsstudie II

Szenario 1: Der Algorithmus optimiert ohne Vorgabe für Fleisch

Szenario 2: Der Algorithmus optimiert mit der Vorgabe von 300 g Fleisch/Woche

-> Anschlussfähige Version der Optimierung

Lebensmittelgruppe	Portion in g	Bezeichnung	Anzahl Portionen für Modellvariante 3		Zeitbezug
			Szenario 1	Szenario 2	
Obst und Gemüse	110	Portion	5	5	täglich
Säfte	200	Glas	2	2	wöchentlich
Pflanzliche Öle	10	Esslöffel	1	1	täglich
Hülsenfrüchte	125	Portion (frisch[1])	1	1	wöchentlich
Nüsse und Samen	25	Portion	1	1	täglich
Kartoffeln	250	Portion	1	1	wöchentlich
Getreide, Brot, Nudeln[2] davon mind. 1/3 Vollkorn	60	Portion	5	5	täglich
Milch und Milchprodukte	250[3]	Portion	2	2	täglich
Eier	60	Stück	1	1	wöchentlich
Fisch	120	Portion	2	1	wöchentlich
Fleisch (Rind, Schwein, Geflügel) & Wurst	120 30	Portion Scheibe	1 2	2 2	wöchentlich
Butter und Margarine	10	Esslöffel	1	1	täglich

Lebensmittelbezogene Ernährungsempfehlungen der DGE

Sie sind wissenschaftlich abgeleitete Empfehlungen zur Auswahl von Lebensmitteln für eine gesundheitsfördernde Ernährung.

Lebensmittelgruppe:

Gemüse

Verzehr nach NVS II:

91 g/d

Neue Empfehlung 2024:

275 g/d

Lebensmittelbezogene Ernährungsempfehlungen der DGE

Sie sind wissenschaftlich abgeleitete Empfehlungen zur Auswahl von Lebensmitteln für eine gesundheitsfördernde Ernährung.

Lebensmittelgruppe:

Obst

Verzehr nach NVS II:

154 g/d

Neue Empfehlung 2024:

275 g/d

Lebensmittelbezogene Ernährungsempfehlungen der DGE

Sie sind wissenschaftlich abgeleitete Empfehlungen zur Auswahl von Lebensmitteln für eine gesundheitsfördernde Ernährung.

Lebensmittelgruppe:

Pflanzliche Öle

Verzehr nach NVS II:

3 g/d

Neue Empfehlung 2024:

10 g/d

Lebensmittelbezogene Ernährungsempfehlungen der DGE

Sie sind wissenschaftlich abgeleitete Empfehlungen zur Auswahl von Lebensmitteln für eine gesundheitsfördernde Ernährung.

Lebensmittelgruppe:

Vollkorn-Getreide

Verzehr nach NVS II:

12 g/d

Neue Empfehlung 2024:

100 g/d

Lebensmittelbezogene Ernährungsempfehlungen der DGE

Sie sind wissenschaftlich abgeleitete Empfehlungen zur Auswahl von Lebensmitteln für eine gesundheitsfördernde Ernährung.

Lebensmittelgruppe:

Hülsenfrüchte

Verzehr nach NVS II:

5 g/d

Neue Empfehlung 2024:

18 g/d

Lebensmittelbezogene Ernährungsempfehlungen der DGE

Sie sind wissenschaftlich abgeleitete Empfehlungen zur Auswahl von Lebensmitteln für eine gesundheitsfördernde Ernährung.

Lebensmittelgruppe:

Nüsse & Samen

Verzehr nach NVS II:

5 g/d

Neue Empfehlung 2024:

25 g/d

FBDG Lebensmittelgruppe	NVSII[1] (g/d)	Optimierungsergebnisse[2] für Modellvariante 3[3] (g/d)	
		Szenario 1	Szenario 2
Treibhausgasemissionen (kg CO_2-Äqu.)	6,18	3,31	3,49
Landnutzung (m^2)	7,48	3,62	3,73
DALYs (gewonnene Lebensjahre in Gesundheit) in Mio., Durchschnitt aus [21, 22])	–	4,37	2,67

Optimierte Verzehrmengen in g/Tag für sich omnivor ernährende Erwachsene im Alter von 18 bis 65 Jahren (V24.0.0), Energie: 2029 kcal/d

Zusammenfassung

- Nachhaltige Ernährung berücksichtigt planetare Grenzen (Treibhausgase, Landnutzung, …), menschliche Gesundheit und Gerechtigkeit, (WBAE auch Tierwohl)
- Die Planetary Health Diet (2019/2025) ist ein globales Konzept zur gleichzeitigen Erreichung der o.a. Ziele (außer Tierwohl)
- Die Deutsche Gesellschaft für Ernährung hat 2024 lebensmittelbezogene Empfehlungen für Deutschland veröffentlicht, die die wichtigsten der o.a. Ziele beinhalten
- Der Nutzen für die menschliche Gesundheit und Nachhaltigkeit wäre erheblich
- Größter Hebel ist die Steigerung des Verzehrs pflanzlicher Lebensmittel aus den Kategorien: Vollkorngetreide, Nüsse, Obst, Hülsenfrüchte und Gemüse
- Zusätzlicher Hebel: Reduktion von Lebensmittelabfällen entlang der gesamten Wertschöpfungskette