Scope 3 emissions

REPORTING WORKBOOK FOR AFGC MEMBERS

AUSTRALIAN FOOD & GROCERY COUNCIL

CELEBRATING 30 YEARS 1995-2025

PUBLICATION DATE: 5 SEPTEMBER 2025

contents

purpose

The AFGC Scope 3 Emissions Reporting Workbook (Workbook) is designed to assist AFGC members to comply with any obligation they may have to prepare an annual sustainability report under section 292A of the Corporations Act. It provides a dataset of emission factors to guide members in the mandatory reporting of Scope 3 greenhouse gas emissions pursuant to section 296D of the Corporations Act.

This Workbook provides greenhouse gas emissions factors to support the calculation of emissions associated with purchased goods and services, largely from Australian sources. The Workbook only provides factors that represent midpoint estimates within a broader range of potential values.

These emission factors are estimates only. They are designed to estimate the relative contributions of emission sources in a single entity. It may not be suitable for any other purpose such as for tracking emission reductions over time or product comparisons.

usage & limitations

1. The data and guidance in this Workbook is provided solely to assist members to improve the completeness of their Scope 3 Emissions Reporting by making industry collated values available to them, when company-specific supply chain data is not available. The information provided is not a direct substitute for AFGC members obtaining professional guidance or conducting their own emissions assessments for Scope 3 reporting and should not be relied on for this purpose. Users are responsible for ensuring that their emissions reporting complies with applicable laws, standards and stakeholder expectations.

2. Commonwealth Treasury has issued a policy statement which provides guidance as to the extent of an organisation's obligation to collect Scope 3 data[1]. The guidance states that **entities are not required to collect exhaustive or highly detailed Scope 3 emissions data if doing so will involve excessive cost, effort or complexity**. This Workbook supports Treasury's policy approach by providing members with data comprising industry averages or estimates and formulas for the purposes of assisting them to calculate Scope 3 emissions and make Scope 3 disclosures.

3. The emission factors provided in this Workbook are from a range of industry sources. Some are based on many data points across a broad selection of circumstances, and some are from a small number or unknown sources. There is uncertainty in all of these sources, and this should be recognised by Workbook users, particularly when using the data for reporting or regulatory disclosure purposes.

4. Users of this Workbook should always rely on the primary data available to them before using the Workbook resources **which is provided for guidance purposes only.** AFGC will not be liable for any loss or damage suffered by a person arising from the use of this Workbook, and any users of this Workbook release AFGC from all liability in this regard.

5. There are 15 categories of Scope 3 emissions in the Greenhouse Gas Protocol[2]. AFGC has assumed that Purchased Goods and Services are likely to be the most significant of all categories for most AFGC members, but members must conduct their own evaluation for the purposes of reporting.

6. The emission factors provided in the Workbook are ***mid-range*** values, and in all cases, there will be higher or lower values that may be more applicable to an organisation's circumstances. This Workbook does not claim to have the statistical sampling power to verify which value is most accurate. All it does is provide the ***mid-range*** of already published emission factors and show the sources of this value.

7. The emission factors are not suitable for assessing emissions reductions (or increases) over time that may be required for processes such as the Science Based Target initiative (SBTi) or the generation of Australian Carbon Credit Units (ACCU) or similar tradeable units.

1 https://treasury.gov.au/sites/default/files/2024-01/c2024-466491-policy-state.pdf

2 https://ghgprotocol.org/sites/default/files/2023-03/Scope3_Calculation_Guidance_0%5B1%5D.pdf

how to use this workbook

This Workbook is designed to support AFGC members with reporting on the emissions related to their Purchased Goods and Services.

The Greenhouse Gas Protocol is the relevant standard applicable to Australian reporting organisations. This provides for 15 Categories of Scope 3 emissions (see Annexure 1).

AFGC recommends that members who are in the early stages of collecting Scope 3 emissions data focus initially on estimating their emissions from Category 1 - Purchased Goods and Services. This is likely to be the largest Category of Scope 3 emissions for most food and beverage companies.

- **STEP 1** - Identify the purchased goods and service items in your business
- **STEP 2** - Rank them according to expenditure in the relevant reporting period
- **STEP 3** - Working from the largest to smallest expenditure then identify the quantity purchased in the reporting period.
- **STEP 4** - Multiply each quantity by the most relevant emission factor in Tables 1 to 5 of this Workbook to get a total emissions for each item.
- **STEP 5** - Check that the units used in purchase records are the same units used in this Workbook and adjust as needed (e.g. kilograms not tonnes). See example below.

EXAMPLE OF HOW TO USE THIS WORKBOOK

A	B	C	D	E
Item purchased	**Units**	**Quantity Purchased**	**Emission Factor From Table XX**	**Equals C x D** **Scope 3 Emissions (kg CO2-e)**
Cream	litres	1,000	7.4 kg CO2/litre	7,400 kg CO2-e
Beef	kg	1,000	24.3 kg carcase weight (dressed)	24,300 kg CO2-e

updates to this workbook

Users are advised to check for updated editions of this Workbook for each reporting year.

EMISSIONS FACTORS TABLES (GREEN TABS)

- Table 1: Food and Fibre (Summary of all food and fibre emissions factors in a single table)
- Table 2: Transport
- Table 3: Packaging
- Table 4: Data Centres
- Table 5: Outsourced waste services

REFERENCES TABLES (YELLOW TABS)

- Dairy
- Eggs
- Chicken Meat
- Fish
- Red Meat
- Pork
- Grains
- Sugar
- Horticulture
- Fibre
- Vegetable Oils
- Chocolate

acknowledgements

The Australian Food and Grocery Council (AFGC) would like to acknowledge the support and guidance of the following parties in the preparation of this Workbook.

AFGC is solely responsible for the final content and any errors or omissions. AFGC is not suggesting that these parties have endorsed this Workbook or any of its content.

AFGC is grateful for the support from:

- **Australian Accounting Standards Board**
- **Australian Dairy Products Federation (Janine Waller)**
- **Australian Life Cycle Inventory Database**
- **Australian Packaging Covenant**
- **Australian Securities and Investments Commission**
- **Dairy Australia (Jhin Bagchi)**
- **thinkstep-anz**
- **Treasury**

Special thanks to Jack Holden from Ridge Road Advisory for both project management and technical support.

scope 3 emissions workbook

Table 1 Australian Sourced Food & Fibre Products

AUSTRALIAN FOOD & GROCERY COUNCIL

Limitations: These values provides an approximation relative to others emission sources in a single business at a single point in time. These values are not designed to compare competing products or categories. Nor are they designed for time series comparisions using different emission factors for the same products.

Values have been rounded.

Sources are hyperlinked to the the reference material for each category.

CONFIDENCE LEVEL KEY

High	Actual Supply Chain LCA or direct supplier data
Moderate	Published peer reviewed industry values or a generic LCA
Low	Small data samples or unpublished

RECOMMENDED MID-POINT EMISSION FACTORS

Category (Link to Sources)	Finished Good	Farm	Includes Processing Emissions	Units (kg CO2 per kg finished goods)	Notes	Confidence
Dairy	Flavoured milk	1.0	Yes	kg CO2/litre	Excludes distribution to retail	Moderate
	Full Cream Milk	1.1	Yes	kg CO2/litre		
	Yogurt	1.9	Yes	kg CO2/litre		
	Butter	20.0	Yes	kg CO2/kg		
	Cream	7.4	Yes	kg CO2/kg		
	Cheese (hard)	9.9	Yes	kg CO2/kg		
	Whole Milk Powder	7.9	Yes	kg CO2/kg		
	Whey Protein Isolate	113.8	Yes	kg CO2/kg		
Eggs	Caged eggs	1.3	Yes	kg CO2/kg	Excludes distribution to retail	Moderate
Chicken Meat	Chicken (uncooked)	4.8	Yes	kg CO2/kg	A retail ready product mix Excludes distribution to retail	Moderate

Fish	Aquaculture	13.2	Yes	kg CO2/kg	Includes retail emissions	Low
	Wild fish (uncooked)	4.5	Yes	kg CO2/kg		
Red Meat	Beef (uncooked)	24.3	Yes	kg CO2/kg carcase weight	A retail ready product mix Excludes distribution to retail	Moderate
	Lamb (uncooked)	13.9	Yes	kg CO2/kg carcase weight		
Pork	Fresh Pork	10.1	Yes	kg CO2/kg	Market ready pork incl retail emissions	Moderate
Grains	Grains incl cereals, pulses & oilseeds	0.3	No	kg CO2/kg	per kg harvested grain	Moderate
Sugar	Sugarcane	0.4	No	kg CO2-e /kg cane	Harvested cane arrival at Qld mill	Low
Horticulture	Fruit and Vegetables (fresh)	0.3	No	kg CO2-e /kg fresh products at farmgate	Mid point for a range of >20 fresh fruit and vegetables	Low
Fibre	Cotton	0.8	No	kg CO2-e per kg of gin ready cotton lint		Low
	Wool	28.7	No	kg greasy wool - 21 micron	CSIRO 2012	Moderate
	Wool (prime lamb co-product)	8.9	No	kg greasy wool - 28 micron	CSIRO 2012	Low
Vegetable Oils	Canola oil	1.2	Yes	kg oil at mill	Single purpose crop	Moderate
	Cottonseed oil	0.4	Yes	kg oil at mill	Oils and cotton fibre crop	Low
	Palm oil - SE Asia & RSPO Certified	3.4	Yes	kg oil at mill	SEA mill	Low
	Palm oil - SE Asia & Uncertified	5.3	Yes	kg oil at mill	SEA mill	Low
Chocolate	Dark Chocolate	13.9	Yes	kg dark chocolate		Low

Table 2 Transport Emission Factors

Limitations: These values provides an approximation relative to others emission sources in a single business at a single point in time. These values are not designed to compare competing products or categories. Nor are they designed for time series comparisions using different emission factors for the same products.

Sources: Based on the Australian Life Cycle Inventory Database Inititative - AucLCI (v1.42) Carbon Emission Factors

RECOMMENDED MID-POINT VALUE

Freight is expressed per metric tonne transported per km (tkm)

Mode	Unit	CO2-e	Unit (tonne per km)	Source: AustLCI Row number	AUS LCI Process name
Air	tonne per km (tkm)	1.91	kgCO2-e/tonne/km	569	air freight domestic
Rail	tonne per km (tkm)	0.04	kgCO2-e/tonne/km	750	transport, freight, rail
Road - small	tonne per km (tkm)	0.18	kgCO2-e/tonne/km	757	transport, truck, 16 to 28t, fleet average
Road - Large	tonne per km (tkm)	0.10	kgCO2-e/tonne/km	762	transport, truck, 40t load
Shipping	tonne per km (tkm)	0.01	kgCO2-e/tonne/km	782	transport, VCM freight ship

NOTES TO USERS

- Transport emissions factors are for ambient transport (no refrigeration but may be insulated)
- All values were rounded to 2 decimal places
- Aust LCI method used is "Total Carbon Incl Infrastructure" (Column J)
- The AusLCI Carbon Emissions Factors contains emissions data in kg CO2e for the AusLCI database. Data is included for several different impact assessment methods. The **Carbon Neutrality Assumption** method assumes that all biogenic carbon sequestered (e.g. during growth of agriculture) is eventually released back into the atmosphere, either naturally decomposed or burned, so that there is no net change of atmospheric carbon. As such this method includes factors from sources such as fossil fuels, as well as from biogenic methane, and excludes biogenic carbon. The Total Carbon method includes factors from sources such as fossil fuels as well as from biogenic sources, including biogenic methane. The Fossil Carbon method includes factors only from fossil fuel sources, and excludes biogenic carbon and biogenic methane.
- The **Biogenic Carbon** method includes factors only from biogenic sources, including biogenic methane and excludes other sources such as fossil fuels.
- All data is available with and without infrastructure included. **Infrastructure** refers to upstream impacts from capital equipment. E.g. the tractor manufacture in a track operation process, or factory construction in a manufacturing process. ****Biogenic** refers to impacts from carbon or methane stored in biomass. E.g. combustion of biomass, sequestration from agriculture.

SOURCE DOCUMENTS

https://www.auslci.com.au/Documents/Best_Practice_Guide_V2_13_4_18.pdf

https://www.alcas.asn.au/auslci-emissions-factors

AUSLCI LICENCE CONDITIONS

https://www.auslci.com.au/index.php/Licence

Table 3 Packaging

Limitations: These values provides an approximation relative to others emission sources in a single business at a single point in time. These values are not designed to compare competing products or categories. Nor are they designed for time series comparisions using different emission factors for the same products.

Sources: Based on the Australian Packaging Covenant (APCO) ARL Market Place Packaging Calculator

RECOMMENDED MID-POINT VALUE

Freight is expressed per metric tonne transported per km (tkm)

Packaging Format	Emissions Factor (kg CO2 -e per kg packaging sold)
Aluminium	17.00
Bioplastics	0.00
Carboard	0.17
EPS	0.31
Glass	0.53
HDPE	0.83
LDPE	0.83
Paper	0.17
PET	1.20
PP	0.31
PS	0.31
PVC	0.31
Rubber	1.07
Steel	1.70
Wood	1.35

Note: All formats assume zero recovered material is used in packaging materials (0% recyled content)

ADDITIONAL NOTES TO USERS

- Uses ARL Packaging Impact Calculator. This correlates with the actual emission factor for each format
- All values were rounded to 2 decimal places
- Assumes all packaging is consumed. If you have reliable recovery data then this emission factor can be reduced accordingly

SOURCE DOCUMENTS

https://www.arlmarketplace.org.au/calculations

https://www.arlmarketplace.org.au/resources/The%20Packaging%20Impact%20Calculator

CONDITIONS OF USE FROM SOURCE

NOTE: The Packaging Impact Calculator has been developed to provide businesses with an internal reference tool and guide. The calculator cannot be used for any on-pack or external claims of recyclability, material recovery, sustainability or environmental impact of your business's packaging.

Table 4 Data Centres (Outsourced software, IT, comms, streaming and cloud storage services)

Limitations: These values provides an approximation relative to others emission sources in a single business at a single point in time. These values are not designed to compare competing products or categories. Nor are they designed for time series comparisions using different emission factors for the same products.

Sources: Data centre emissions are rapidly growing and emission factors are not readily available at this stage. AFGC recommends that data centre (Scope 3) emissions be calculated as a percentage of an organisations in-house (Scope 2) electrical usage. This based on estimates of data centre use as a proportuion of total electricty demand at a grid or national scale. It is acknowledged this is likley to be an overestimate for large industrial electricity users and a lower emission factor may be more appropriate.

RECOMMENDED MID-POINT VALUE

Data Centre Electricity Use (tCO2-e)	Units
4%	of total in-house electricity (scope 2) emissions (tCO2-e)

NOTES TO USERS

- Outsourced services such as data centres, SaaS, storage, streaming, communications and AI are Scope 3 emissions
- In house IT services are captured in Scope 1 and Scope 2 emissions
- Data on this item is difficult. Demand is still rapidly building and the growth rate is well ahead of other energy users. Selected estimates are shown below and AFGC suggest the older CSIRO estimate may be too low for 2025 reporting hence a multiplier of 4% is recommended
- This estimate should be reviewed every year as its demand will coninue to rise but data centre efficiencies and grid emission factors will also improve over time
- **Industrial Electricity Users:** It is acknowledged this approach is likley to be an overestimate for industrial electricity users and lower estimates may be more appropriate.

ESTIMATES OF TOTAL ELECTRICITY DEMAND FROM DATA CENTRES AS A PERCENTAGE OF TOTAL DEMAND

Scale	Data Centre Electricity Use (as a % of total demand)	Source of estimate	Links
Global	1%	Varela et al (2025)	https://www.tandfonline.com/doi/full/10.1080/14693062.2025.2450054
Global	2%	International Energy Agency 2024, p31	https://iea.blob.core.windows.net/assets/18f3ed24-4b26-4c83-a3d2-8a1be51c8cc8/Electricity2024-Analysisandforecastto2026.pdf
Australia	3%	CSIRO (2021)	https://near.csiro.au/public/assets/669e70f6-9c53-4eb2-9728-37a13f76edb1/D_11_2.pdf
Australia	5%	Morgan Stanley	https://www.abc.net.au/news/2024-07-26/data-centre-electricity-grid-demand/104140808
Australia	7%	Australian Energy Council	https://www.energycouncil.com.au/analysis/data-centres-and-energy-demand-what-s-needed/

Table 5 Outsourced Waste Emissions

Waste related emissions may be covered by Scope 1 reporting.

If waste management is outsourced, then these are Scope 3 emissions. The AFGC recommends seeking advice from your waste providers or alternatively the use the Emissions Factors provided by the Australian Government in Section 4 of the Australian National Greenhouse Account Factors.

https://www.dcceew.gov.au/sites/default/files/documents/national-greenhouse-account-factors-2024.pdf

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Dairy

Limitations: These values provides an approximation relative to others emission sources in a single business at a single point in time. These values are not designed to compare competing products or categories. Nor are they designed for time series comparisons using different emission factors for the same products.

TABLE 6 EMISSION FACTORS BY DAIRY PRODUCTS

Finished Goods	Milk Allocation	Farm Emissions	Prccessing Emissions
	Litres of FPCM* (raw milk) per kg finished goods	kg CO2/kg farm emissions in finished goods	kg CO2/kg processing emissions in finished goods
Flavoured milk	1.0	0.9	0.12
Full Cream Milk	1.0	0.9	0.13
Yogurt	1.8	1.6	0.22
Butter	19.0	17.6	2.38
Cream	7.0	6.5	0.88
Cheese (hard)	9.4	8.7	1.18
Whole Milk Powder	7.4	6.9	0.93
Whey Protein Isolate Powder	107.8	100.3	13.53

Sources:

- Dairy Australia, Dairy Equivalence Calculator V2.7 for milk allocation to finished products
- Australian Dairy Sustainability Framework 2024 Report

TABLE 7 EMISSION FACTORS BY SUPPLY CHAIN

Sector	Emission Factor (raw milk)	Units	Notes	Source
Dairy Farms (raw milk)	0.93	kg CO2/kg FPCM	National average derived from the Australian Dairy Carbon Calculator	Australian Dairy Sustainability Framework 2024 Scorecard & Dairy Farm Monitor Project
Milk Processing	125.5	tCO2 -e per ML of milk processed	Includes milk transport from farm to processing. Excludes transport of finished goods	Australian Dairy Sustainability Framework 2024 Scorecard & Dairy Manufacturers Sustainability Council

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Eggs

Limitations: These values provides an approximation relative to others emission sources in a single business at a single point in time. These values are not designed to compare competing products or categories. Nor are they designed for time series comparisons using different emission factors for the same products.

TABLE 8 EMISSION FACTORS - EGGS

Sector	Emission Factor	Units	Notes	Source	Links
Eggs	1.3	kg CO2-e/kg eggs	Unccoked eggs from caged hens.	Australian Egg Corporation by S.G. Wiedemann and E.J. McGahan(2011)	https://www.freeranger.com.au/uploads/7/4/2/0/7420102/aecl_carbon_footprint.pdf

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Chicken Meat

Limitations: These values provides an approximation relative to others emission sources in a single business at a single point in time. These values are not designed to compare competing products or categories. Nor are they designed for time series comparisons using different emission factors for the same products.

TABLE 9 EMISSION FACTORS - CHICKEN MEAT (RAW)

Sector	Emission Factor	Units	Notes	Source	Links
Farm & processing emissions	4.8	kg CO2/kg uncooked meat	• Retail products mix of chicken meat products • Includes Land Use Change for imported soy meal	CSIRO - Copley & Weidemann (2022)	https://www.publish.csiro.au/an/Fulltext/AN22230#other1

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Fish

Limitations: These values provides an approximation relative to others emission sources in a single business at a single point in time. These values are not designed to compare competing products or categories. Nor are they designed for time series comparisons using different emission factors for the same products.

TABLE 10 EMISSION FACTORS - FISH

Product	Farm	Processing	Units	Notes	Sources
Aquaculture farmed fish	13.2	incl processing	kg CO2/kg retail ready products	incl processing and retail emissions for uncooked fish	Fisheries Reasearch & Development Corporation & Blueshift 2022
Wild fish	4.5	incl processing	kg CO2/kg retail ready products	incl processing and retail emissions for uncooked fish	https://www.frdc.com.au/fish-vol-30-2/calculating-seafoods-carbon-footprint

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Red Meat

Limitations: These values provides an approximation relative to others emission sources in a single business at a single point in time. These values are not designed to compare competing products or categories. Nor are they designed for time series comparisons using different emission factors for the same products.

TABLE 11 EMISSION FACTORS - BEEF

Sector	Emission Factor	Units	Notes	Source	Links
Farm emissions	13.1	kg CO2/kg liveweight	Sold from farm	Australian Beef Sustainability (ABSF) 2024 Annual Update	https://www.sustainableaustralianbeef.com.au/globalassets/beef-sustainability/documents/absf-annual-update-2024-web.pdf
Farm emissions	23.8	kgCO2/kg HSCW*	1kg livewight converts to 0.55 kg HSCW (Hot Standard Carcase Weight)	NSW DPI	https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0006/103992/dressing-percentages-for-cattle.pdf
Processing emissions - beef	0.48	kg CO2/ kg HSCW	This value is reported in ABSF as kg per **tonne** HSCW	Australian Beef Sustainability (ABSF) 2024 Annual Update	https://www.sustainableaustralianbeef.com.au/globalassets/beef-sustainability/documents/absf-annual-update-2024-web.pdf
Total emissions - Beef	24.3	kg CO2/ kg HSCW	Retail and cooking emissions are not included		

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TABLE 12 EMISSION FACTORS - LAMB

Sector	Emission Factor	Units	Notes	Source	Links
Farm emissions	6.7	kg CO2/kg liveweight	Sold from farm	Agriculture Victoria	https://agriculture.vic.gov.au/__data/assets/pdf_file/0007/1103983/2023-24-GHG-FMP-report.pdf
Farm emissions	13.4	kgCO2/kg HSCW	1kg livewight converts to 0.5 kg HSCW (Hot Standard Carcase Weight)	MLA	https://elearning.mla.com.au/lessons/manage-the-production-system-to-meet-market-specifications/
Processing emissions - lamb	0.48	kg CO2/ kg HSCW	No data exists so beef emissions factor has been used for lamd processing emissions	Australian Beef Sustainability 2024 Annual Update	https://www.sustainableaustralianbeef.com.au/globalassets/beef-sustainability/documents/absf-annual-update-2024-web.pdf
Total emissions - Lamb	13.9	kg CO2/ kg HSCW	Retail and cooking emissions are not included		

** HSCW is Hot Standard Carcase Weight which is saleable products after processing by products and waste are excluded*

Other Resources:

https://www.mla.com.au/globalassets/mla-corporate/research-and-development/final-reports/p.psh.1259-final-report-public-240322-2.pdf

https://www.goodmeat.com.au/globalassets/mla-corporate/research-and-development/final-reports/2021/b.cch.2109--project-overview.pdf

https://agriculture.vic.gov.au/support-and-resources/case-studies/on-farm-emissions-case-studies/a-measured-approach-to-reducing-carbon-emissions

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Pork

Limitations: These values provides an approximation relative to others emission sources in a single business at a single point in time. These values are not designed to compare competing products or categories. Nor are they designed for time series comparisons using different emission factors for the same products.

TABLE 13 EMISSION FACTORS - FRESH PORK

Sector	Emission Factor	Units	Notes	Source	Links
Farm & processing emissions	10.1	kg CO2/kg uncooked meat	Retail ready pork incl retail emissions, land use and land use change	CSIRO & Integrity Ag (2024) - Table 6	https://www.publish.csiro.au/AN/fulltext/AN23352

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Grains

Limitations: These values provides an approximation relative to others emission sources in a single business at a single point in time. These values are not designed to compare competing products or categories. Nor are they designed for time series comparisons using different emission factors for the same products.

TABLE 14 EMISSION FACTORS - GRAINS

Sector	Emission Factor	Units	Notes	Source	Links
Grains incl cereals, pulses & oilseeds (national average for the 25 GRDC levy crops) Wheat Flour	0.315	kg CO2/kg grain	Harvested grain excludes processing	CSIRO & GRDC	https://publications.csiro.au/publications/publication/PIcsiro:EP2022-0163

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Sugar

Limitations: These values provides an approximation relative to others emission sources in a single business at a single point in time. These values are not designed to compare competing products or categories. Nor are they designed for time series comparisons using different emission factors for the same products.

TABLE 15 EMISSION FACTORS - SUGAR

Sector	Emission Factor	Units	Notes	Source	Links
Sugar	0.41	kg CO2-e /kg raw sugar	For raw sugar at the milk includes harvested crop and processing	AusLCI (V1.42) Carbon Emissions Factors (H:524)	https://www.alcas.asn.au/auslci-emissions-factors

NOTES TO USERS

- All values were rounded to 2 decimal places
- Aust LCI method used is "Total Carbon" (Column H) - sequestration is excluded
- "The AusLCI Carbon Emissions Factors contains emissions data in kg CO2e for the AusLCI database. Data is included for several different impact assessment methods. The **Carbon Neutrality Assumption** method assumes that all biogenic carbon sequestered (e.g. during growth of agriculture) is eventually released back into the atmosphere, either naturally decomposed or burned, so that there is no net change of atmospheric carbon.
- As such this method includes factors from sources such as fossil fuels, as well as from biogenic methane, and excludes biogenic carbon. The **Total Carbon** method includes factors from sources such as fossil fuels as well as from biogenic sources, including biogenic methane. The **Fossil Carbon** method includes factors only from fossil fuel sources, and excludes biogenic carbon and biogenic methane.
- The **Biogenic Carbon** method includes factors only from biogenic sources, including biogenic methane and excludes other sources such as fossil fuels."
- All data is available with and without infrastructure included. **Infrastructure** refers to upstream impacts from capital equipment. E.g. the tractor manufacture in a track operation process, or factory construction in a manufacturing process. ****Biogenic** refers to impacts from carbon or methane stored in biomass. E.g. combustion of biomass, sequestration from agriculture

Source Documents:

https://www.auslci.com.au/Documents/Best_Practice_Guide_V2_13_4_18.pdf

https://www.alcas.asn.au/auslci-emissions-factors

AusLCI licence conditions:

https://www.auslci.com.au/index.php/Licence

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Horticulture

Limitations: These values provides an approximation relative to others emission sources in a single business at a single point in time. These values are not designed to compare competing products or categories. Nor are they designed for time series comparisons using different emission factors for the same products.

TABLE 16 EMISSION FACTORS - FRUIT & VEGETABLES

Sector	Emission Factor	Units	Notes	Source	Links
Fruit and Vegetables (fresh)	0.25	kg CO2-e /kg fresh products at farmgate	Mid point for a range of > 20 fresh fruit and vegetables	AusLCI (V1.42) Carbon Emissions Factors (H:535 - H: 566)	https://www.alcas.asn.au/auslci-emissions-factors

NOTES TO USERS

- All values were rounded to 2 decimal places
- Aust LCI method used is "Total Carbon" (Column H) - sequestration is excluded
- "The AusLCI Carbon Emissions Factors contains emissions data in kg CO2e for the AusLCI database. Data is included for several different impact assessment methods. The **Carbon Neutrality Assumption** method assumes that all biogenic carbon sequestered (e.g. during growth of agriculture) is eventually released back into the atmosphere, either naturally decomposed or burned, so that there is no net change of atmospheric carbon.
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- The **Biogenic Carbon** method includes factors only from biogenic sources, including biogenic methane and excludes other sources such as fossil fuels."
- All data is available with and without infrastructure included. **Infrastructure** refers to upstream impacts from capital equipment. E.g. the tractor manufacture in a track operation process, or factory construction in a manufacturing process. ****Biogenic** refers to impacts from carbon or methane stored in biomass. E.g. combustion of biomass, sequestration from agriculture

Source Documents:

https://www.auslci.com.au/Documents/Best_Practice_Guide_V2_13_4_18.pdf

https://www.alcas.asn.au/auslci-emissions-factors

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Fibre

Limitations: These values provides an approximation relative to others emission sources in a single business at a single point in time. These values are not designed to compare competing products or categories. Nor are they designed for time series comparisons using different emission factors for the same products.

TABLE 17 EMISSION FACTORS - FIBRE MATERIALS

Materials	Farm Emissions	Processing Emissions	Units	Notes	Sources
Cotton Lint	849	No	kg CO2-e per tonne of gin ready lint	• excludes cotton by products for stock feed • excludes any sequestration	CRCD 2019 unpub https://www.insidecotton.com/sites/default/files/article-files/CRDC_Updated_Carbon_Footprint_of_Australian_Irrigated_Cotton_FINAL.pdf
Wool	28.7	No	kg greasy wool - 21 micron	CSIRO 2012	https://publications.csiro.au/publications/publication/PIcsiro:EP104701/BTauthor/BVeady,%20sandra/RP1/RS25/RORECENT/RFAuthor=eady%2C%20sandra/STsearch-by-keyword/LIBRO/RI25/RT34
Wool (prime lamb co-product)	8.9	No	kg greasy wool - 28 micron	CSIRO 2012	

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Vegetable Oils

Limitations: These values provides an approximation relative to others emission sources in a single business at a single point in time. These values are not designed to compare competing products or categories. Nor are they designed for time series comparisons using different emission factors for the same products.

TABLE 18 EMISSION FACTORS - VEGETABLE OILS

Sector	Emission Factor	Units	Notes	Source	Links
Canola Oil	1.23	kg CO2-e /kg oil	• For single purpose (no grazing) canola seed grown in NSW without irrigation and then pressed for oil • Canola oil content (%) of 45% of dry matter of seed	AusLCI (V1.42) Carbon Emissions Factors (H:534) Hartfield Site by Allen and Morgan 2023	https://www.alcas.asn.au/auslci-emissions-factors https://australianoilseeds.com/wp-content/uploads/2024/03/2022_CanolaCountryReport_Final_for_Web.pdf https://www.hartfieldsite.org.au/media/2023%20Trial%20Results/2023_Hart_Trial_Results_Comparison_of_canola_varieties_including_genetically_modified_options.pdf
Cottonseed Oil	0.38	kg CO2-e /kg oil	For dual purpose crop at mill following GHG attribution to cotton lint and oil	AusLCI (V1.42) Carbon Emissions Factors (H:521)	https://www.alcas.asn.au/auslci-emissions-factors
Palm Oil - RSPO Certified	3.41	kg CO2-e /kg oil	• Rerefined, bleached and deodorised (RBD) oil at refinerey. • Excludes shiping emissions from SE Asia to Australia • SE Asia sourcing is assumed as Australian grown palm oil is not generally available	Schmidt J and De Rosa M (2019). Comparative LCA of RSPO-certified and non-certified palm oil – Executive	https://2-0-lca.com/publications/show/comparative-life-cycle-assessment-of-rspo-certified-and-non-certified-palm-oil/
Palm Oil -Uncertified	5.34	kg CO2-e /kg oil			

NOTES TO USERS

- All values were rounded to 2 decimal places
- Aust LCI method used is "Total Carbon" (Column H) - sequestration is excluded

- "The AusLCI Carbon Emissions Factors contains emissions data in kg CO2e for the AusLCI database. Data is included for several different impact assessment methods. The **Carbon Neutrality Assumption** method assumes that all biogenic carbon sequestered (e.g. during growth of agriculture) is eventually released back into the atmosphere, either naturally decomposed or burned, so that there is no net change of atmospheric carbon.
- As such this method includes factors from sources such as fossil fuels, as well as from biogenic methane, and excludes biogenic carbon. The **Total Carbon** method includes factors from sources such as fossil fuels as well as from biogenic sources, including biogenic methane. The **Fossil Carbon** method includes factors only from fossil fuel sources, and excludes biogenic carbon and biogenic methane.
- The **Biogenic Carbon** method includes factors only from biogenic sources, including biogenic methane and excludes other sources such as fossil fuels."
- All data is available with and without infrastructure included. **Infrastructure** refers to upstream impacts from capital equipment. E.g. the tractor manufacture in a track operation process, or factory construction in a manufacturing process. ****Biogenic** refers to impacts from carbon or methane stored in biomass. E.g. combustion of biomass, sequestration from agriculture

Source Documents:

https://www.auslci.com.au/Documents/Best_Practice_Guide_V2_13_4_18.pdf

https://www.alcas.asn.au/auslci-emissions-factors

AusLCI licence conditions:

https://www.auslci.com.au/index.php/Licence

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Chocolate

Limitations: These values provides an approximation relative to others emission sources in a single business at a single point in time. These values are not designed to compare competing products or categories. Nor are they designed for time series comparisons using different emission factors for the same products.

TABLE 19 EMISSION FACTORS - DARK CHOCOLATE

Sector	Emission Factor	Units	Notes	Source	Links
Dark Chocolate	13.93	kg CO2-e/kg dark chocolate	Imported dark chocolate (55% Cocoa + 45% sugar)	Barry Callebut Carbon Footprint Calculator using the WFLDB 3.5 sLUC methodology	https://www.barry-callebaut.com/en/manufacturers/sustainability-in-action/carbon-footprint-calculator?recipe=dark_chocolate&luc=wfldb_35_sluc&internal-url=

annexures

Annexure 1: Table showing extract of GHG Protocol (15 Categories of Scope 3 Emissions)

SCOPE 3 GREENHOUSE GAS PROTOCOL - EMISSIONS CATEGORIES

Note: Only selected Category 1 and Category 4 items are included in this Workbook

UPSTREAM CATEGORIES

1. Purchased goods and services
2. Capital goods
3. Fuel- and energy-related activities (not included in scope 1 or scope 2)
4. Upstream transportation and distribution
5. Waste generated in operations
6. Business travel
7. Employee commuting
8. Upstream leased assets

DOWNSTREAM CATEGORIES

9. Downstream transportation and distribution
10. Processing of sold products
11. Use of sold products
12. End-of-life treatment of sold products
13. Downstream leased assets
14. Franchises
15. Investments

Annexure 2: Mandatory Climate Reporting Dates

- AFGC Reporting Calendar and Calculator

contact us

DO YOU HAVE ANY QUESTIONS OR CONCERNS?

PLEASE CONTACT US AT AFGC@AFGC.ORG.AU FOR ASSISTANCE.