



SYNLAIT MILK LTD

GREENHOUSE GAS INVENTORY
REPORT – FY19



INTRODUCTION

Synlait Milk Limited (Synlait) is a young, pioneering company headquartered in Dunsandel, Canterbury, and is one of the largest milk product manufacturers in New Zealand. Synlait has around 900 staff and works with over 250 milk suppliers to create the very best in milk nutrition for their global customers. Our main product categories are infant nutrition, ingredients, everyday dairy and adult nutrition.

Synlait has recently developed a comprehensive sustainability strategy, aligned with our purpose of “Doing milk differently for a healthier world”. Within this strategy, we have defined the following climate change targets:

- Off-farm: 50% reduction in CO₂eq per kg of product by 2028, vs 2017-18 base year
- On-farm: 35% reduction in CO₂eq per kg of milk solids by 2028, vs 2017-18 base year
 - 50% reduction in N₂O per kg of milk solids by 2028, vs 2017-18 base year
 - 30% reduction in CH₄ per kg of milk solids by 2028, vs 2017-18 base year
 - 30% reduction in CO₂ per kg of milk solids by 2028, vs 2017-18 base year

This document is our year 1 Greenhouse Gas (GHG) emissions inventory report for Synlait, for the period 1 August 2018 to 31 July 2019.

STATEMENT OF INTENT

This inventory report forms part of Synlait’s commitments to sustainability and environmental best practice and informs the senior management’s decision-making relating to the organisation’s sustainability strategy. Synlait intends to make this report publicly available through its website.

GHG INVENTORY SUMMARY FOR FY19

Table 1: GHG Emissions by scopes

	FY18 (base year) – tCO ₂ e	FY19 – tCO ₂ e
Scope 1	115,979	121,578
Scope 2	6,923	7,035
Scope 3	761,746 ¹	754,642
Total	884,648²	883,255
Emissions intensity	1,006 per \$M revenue	862 per \$M of revenue

¹ Our FY18 (base year) on-farm GHG data has changed due to an update in OVERSEER’s software (version 6.3.2). In our FY18 GHG Inventory Report, we disclosed 755,583 tCO₂e of on-farm GHG emissions and 789,829 tCO₂e of scope 3 emissions.

² Due to the change in our FY18 on-farm data (see above), our total number of GHG emissions has also been updated. In our FY18 GHG Inventory Report, we disclosed 912,731 tCO₂e of total GHG emissions.

Table 2: GHG Emissions by activities

Emissions sources	FY18 tCO ₂ e	FY19 tCO ₂ e
Scope 1		
LPG	470	503
Coal	108,301	113,643
Diesel - Haulage trucks	5,692	5,772
Distributed Natural Gas	163	169
Company Cars	73	76
Packing Gas	1,266	1,349
Rental Cars	14	46
Refrigerants	0	20
Scope 2		
Electricity	6,923	7,035
Scope 3		
Gas Transmission Losses	19	20
Electricity transmission losses	565	533
Waste to landfill	421	1,108
Road freight (outbound)	483	756
Road freight (inbound)	182	103
Sea freight (outbound)	21,419	24,639
Sea freight (inbound)	8,743	10,456
Air freight (outbound)	443	654
Inter-warehouse sea freight	0	282
Car mileage	4	9
Taxi	3	4
Air travel	1,814	1,829
Hotel	150	241
On-farm emissions	727,500 ³	714,008
Total GHG emissions	884,648	883,255

³ See above footnote: in our FY18 GHG Inventory Report, we disclosed 755,583 tCO₂e of on-farm GHG emissions.

Table 3: GHG emissions by type

FY19 emissions by type	Total-tCO ₂ e	CO ₂ - tCO ₂ e	CH ₄ -tCO ₂ e	N ₂ O-tCO ₂ e	HFC-tCO ₂ e
On-farm emissions	714,008	114,536	449,611	149,861	0
Off-farm emissions	169,247	166,511	1,803	913	20

Table 4: Emissions intensity – total and by type

<i>Emission intensity metrics – total</i>	FY18 tCO ₂ e	FY19 tCO ₂ e
On-farm emissions/tonne of milk solids ⁴	11.44 ⁵	11.18
Off-farm emissions/tonne of production ⁶	1.13	1.16

<i>FY19 emission intensity metrics – by GHG type</i>	Total-tCO ₂ e	CO ₂ - tCO ₂ e	CH ₄ -tCO ₂ e	N ₂ O-tCO ₂ e	HFC-tCO ₂ e
On-farm emissions/tonne of milk solids	11.18	1.79	7.04	2.35	0.00
Off-farm emissions/tonne of production	1.16	1.14	0.01	0.01	0.00

ORGANISATIONAL BOUNDARY

Organisational boundaries were set with reference to the methodology described in the GHG Protocol and ISO14064-1:2018 standards.

The following entities have been **included** in the emissions inventory:

- Synlait Milk Limited, and its three wholly-owned subsidiaries,
 - o Synlait Milk Finance Limited
 - o New Zealand Dairy Company Limited
 - o Eighty Nine Richard Pearse Drive

Synlait has the following ownership stakes which have been **excluded** from the emissions inventory:

- 25% shareholding in Sichuan New Hope Nutritionals
- 17% shareholding in Primary Collaboration New Zealand Limited
- 100% shareholding in Synlait Foods (Talbot Forest) Limited, which Synlait took control of on 1 August 2019

In terms of business units, Dunsandel (our main manufacturing site in Canterbury), Richard Pearse Drive (our blending and canning site in Auckland) and Synlait Innovation Centre in Palmerston North were included in the inventory.

⁴ While the reporting period for all our data corresponds to our financial year (August 1 to July 31), our on-farm GHG emissions are calculated for the period 1 July 2018 to 30 June 2019.

⁵ Due to the change in our FY18 on-farm data, our on-farm intensity metric has also been updated. In our FY18 GHG Inventory Report, we disclosed 11.87 on-farm emissions per tonne of milk solids.

⁶ Fresh milk is excluded from total production.

Pokeno was not operational during FY19 and therefore is excluded from the inventory. Finally, our Christchurch office was established during FY19 and is also excluded from the inventory.

OPERATIONAL BOUNDARY

Synlait has chosen to report on Scope 1 and Scope 2 emissions, as well as part of Scope 3 emissions.

Table 5: Scope 3 categories included in the inventory

Category	Comment
Category 1 – Purchased goods and services	Carbon, nitrous oxide and methane emissions from Canterbury dairy farms supplying Synlait were included in the inventory. However, emissions from dairy cows when they are wintering, i.e. when they are removed from milking platforms and sent to other farms during winter, were not taken into account in the inventory. Synlait only started receiving milk from Waikato suppliers at the end of FY19, therefore milk solids and GHG emissions from these farms were excluded from the inventory. They will be added to our inventory from FY20 onwards.
Category 3 – Fuel and energy related activities not included in Scope 1 or Scope 2	Transmission losses linked to the purchase of electricity and natural gas were included in the inventory.
Category 4 – Upstream transportation and distribution	Sea freight also has a component of road and rail; however, we have not received this information from suppliers. The sea freight factor has therefore been applied to the full distance. Inbound freight data only includes Synlait’s top 30 suppliers (on an emissions basis). Emissions were calculated by multiplying sea, air and road distance by the weight of the material.
Category 5 – Waste	Waste from all operational and office sites was included.
Category 6 – Business travel	Air travel (domestic and international), taxis and reimbursed travel in private cars were included.
Category 9 – Downstream transportation and distribution	Outbound sea, road and air freight were included. However, outbound couriers were excluded from the inventory. In FY19, we also included our inter-warehouse sea freight, i.e. finished inventory and raw materials that are transported by sea between premises under Synlait’s control for storage management purposes. This source of emissions had not been calculated in FY18. The total FY19 amount was 282 tCO ₂ e.

All other Scope 3 categories have been excluded from the inventory. In particular, emissions from construction activities and emissions from employee commuting have been excluded, although we intend to include them in our future reports.

METHODOLOGIES AND UNCERTAINTIES

The inventory has been prepared in accordance with the requirement of the Greenhouse Gas Protocol: ISO 14064-1:2018 specification. Where relevant, the inventory is aligned with industry or sector best practice for emissions measurement and reporting.

An operational control consolidation approach was used to account for emissions.

Synlait used a Microsoft Excel spreadsheet to calculate GHG emissions. Table 6 below shows the emissions factors used as well as their sources.

Table 6: Emissions factors and Source

Emissions sources	Scope	Unit	kgCO ₂ e/unit	Source
Stationary Combustion				
Distributed Natural Gas	1	KWh	0.193891037	NZ Ministry for the Environment, Guidance for Voluntary Greenhouse Gas Reporting – 2016: Using data and methods from the 2014 calendar year
Diesel	1	Litre	2.68	
LPG	1	Kg	3.02	
Coal - Bituminous	1		2.68	
Coal - Sub-Bituminous	1		2.00	
Coal - Lignite	1		1.43	
Coal - Default*	1		2.30	
Transport fuels where fuel data is available				
Regular Petrol	1	Litre	2.44	NZ Ministry for the Environment, Measuring Emissions: A Guide for Organisations, 2019 Summary of Emissions Factors
Premium Petrol	1		2.43	
Petrol - Default	1		2.43	
Diesel	1		2.69	
LPG	1		1.64	
Transport fuels where no fuel data is available (mileage claims)				
Car - Small (1350-1600cc)	1	Km	0.190	NZ Ministry for the Environment, Guidance for Voluntary Greenhouse Gas Reporting – 2016: Using data and methods from the 2014 calendar year
Car - Medium (1600-<2000cc)	1		0.209	
Car Large (2000-3000)	1		0.237	
Car - Default	1		0.209	
Purchased Electricity				
Purchased Electricity	2	kWh	0.0977	NZ Ministry for the Environment, Measuring Emissions: A Guide for Organisations, 2019 Summary of Emissions Factors
Transmission and distribution line losses for purchased electricity and gas				
Transmission losses Electricity	3	kWh	0.0074	Same as electricity above
Transmission Losses Natural Gas	3		0.0229	Same as natural gas above
Taxis and Rental Cars				
Car - small (1350-1600cc)	1	Km	0.190	NZ Ministry for the Environment, Measuring
Car - Medium (1600-<2000cc)	1		0.209	

Car large (2000-3000)	1		0.237	Emissions: A Guide for Organisations, 2019 Summary of Emissions Factors
Rental car - default	1		0.209	
Rental Car (\$ spent)	1	\$	0.0002358	
Taxi - distance travelled	3	Km	0.1995	
Taxi travel - dollars spent (GST inclusive)	3	\$	0.067	
Trains and Ferrys				
National Rail	3	pkm	0.05818	DEFRA GHG Conversion factors, 2012
Ferry	3		0.01928	
Bus	3	pkm	0.11195	
Air travel				
Domestic - Economy	3	pkm	0.26744	DEFRA GHG Conversion factors, 2017
Domestic - Premium Economy	3		0.26744	
Domestic - Business	3		0.26744	
Domestic - First	3		0.26744	
Short Haul International (<3,700km) - Economy	3		0.15845	
Short Haul International (<3,700km) - Premium Economy	3		0.23767	
Short Haul International (<3,700km) - Business	3		0.23767	
Short Haul International (<3,700km) - First	3		0.23767	
Long Haul International (>3,700) - Economy	3		0.138015	
Long Haul International (>3,700) - Premium Economy	3		0.22084	
Long Haul International (>3,700) - Business	3		0.40025	
Long Haul International (>3,700) - First	3		0.55209	
Waste to Landfill - default values (without gas recovery)				
Mixed Waste	3	kg	1.13	NZ Ministry for the Environment, Guidance for Voluntary Greenhouse Gas Reporting – 2016: Using data and methods from the 2014 calendar year
Office waste	3		1.84	
Refrigerant - Air conditioning				
R22	1	Kg	1810	Greenhouse Gas Protocol Global Warming Potential Values, AR4
R407c	1		1774	
R410a	1		2088	
CO2	1		1	
Freight				
Vans	3	Tonne/km	0.545875038	DEFRA GHG Conversion factors, 2017
Heavy Good Vehicle	3		0.10559	
Rail	3		0.03394115	
Sea freight	3		0.01605	
Air Domestic	3		5.11535	
Air Short Haul	3		1.99837	

Air Long Haul	3		1.45648	
Hotels				
Hotels - UK	3	Room per night	31.1	DEFRA GHG Conversion factors, 2017
Hotels - Australia	3		54.2	
Hotels - China	3		82.4	
Hotels - France	3		9.9	
Hotels - Germany	3		27.7	
Hotels - Indonesia	3		85.6	
Hotels - Japan	3		60.1	
Hotels - Malaysia	3		64.9	
Hotels - Saudi Arabia	3		180.8	
Hotels - Singapore	3		37.9	
Hotels - South Korea	3		83.0	
Hotels - Spain	3		45.0	
Hotels - Switzerland	3		9.3	
Hotels - Thailand	3		55.7	
Hotels - USA	3	36.4		
Hotels - Default	3	59.0		

On-farm emissions were directly obtained by OVERSEER, a software that models agricultural GHG emissions based on various parameters, such as the production of effluent, the application of nitrogen fertiliser and the supplements provided to the cows.

Emissions source inclusions

Table 7 below provides an overview of how data were collected for each GHG emissions source, the source of the data and an explanation of any uncertainties or assumptions made.

Table 7: Emissions source inclusions and source data uncertainties

Scope	GHG Emissions source	Data source	Uncertainty
1	Bottled LPG (litres)	Supplier invoices	Low uncertainty
1	Coal (kgs)	Supplier invoices	Low uncertainty
1	Distributed natural gas (kWh)	Supplier invoices	Low uncertainty
1	Diesel - Milk Haulage (litres)	Supplier invoices	Low uncertainty
1	Company cars (diesel + petrol litres)	Fuel card data	Low uncertainty
1	Packing Gas (kgs)	Supplier invoices	Low uncertainty
1	Air Conditioning (kgs)	Active Refrigeration	Low uncertainty
1	Rental Cars (kms)	Supplier reports	Low uncertainty
2	Electricity (kWh)	Supplier invoices	Low uncertainty
3	Waste to landfill (kg)	Supplier reports	Low uncertainty
3	Freight (tonne / km)	Internal data	Low uncertainty

3	Gas and electricity transmission losses (kWh)	Supplier reports	Low uncertainty
3	Car Mileage - Default (km)	Employee expense claims + general ledger account	Low uncertainty
3	Taxi (\$)		Low uncertainty
3	Air Travel Domestic (pkm)	Supplier reports	Low uncertainty
3	Air Travel International (pkm)	Supplier reports	Low uncertainty
3	Hotels (room per night)	Supplier reports	Low uncertainty
3	On-farm emissions	Overseer	High uncertainty - modelled data

Emissions source exclusions

Table 8: Emissions source exclusions

Scope	GHG Emissions Source	Reason for Exclusion
3	Outbound couriers	To-date we have been unable to collect this data from suppliers.
3	Inbound couriers	To-date we have been unable to collect this data from suppliers.
3	Inbound rail freight	The sector from seaport to inland port by rail has been excluded (de minimus).
3	Outbound rail freight	The sector from inland port to seaport by rail has been excluded (de minimus).
3	Airfreight received	To-date we have been unable to collect this data from suppliers.

Base year recalculation policy

Base year data may need to be revised when material changes occur and have an impact on calculated emissions. When the changes are estimated to represent more than 5% of Scope 1, 2 or 3 emissions, or when there are significant changes to our reporting boundaries or calculation methodology (such as an update in OVERSEER's software), our policy is to recalculate base year data and to disclose previously stated data in a footnote.

GHG information management and monitoring procedures

GHG emissions are measured annually and compared against the base year. The calculated GHG emissions are stored in an Excel summary for the relevant inventory year. A detailed management report outlining data collection processes, roles and responsibilities, GHG measurement methodology, document retention, archiving and record keeping procedures for each emissions source, will be prepared each year. It will also provide information on the internal review process and frequency along with the process to address errors and omissions in the GHG Inventory report.

Other emissions – HFCs, PFCs and SF6

We used R410 refrigerants during the year (see table 2).

Air conditioning is excluded from the inventory where offices are leased.

No operations use perfluorocarbons (PFCs) or sulphur hexafluoride (SF6), therefore there are no holdings.

Other emissions - biomass

No biomass is combusted in the operations and therefore no emissions from the combustion of biomass are included in this inventory.

Other emissions - deforestation

No deforestation has been undertaken by the organisation on land it owns and that is included in this inventory, therefore no emissions from deforestation are included in this inventory.

Pre-verified data

No pre-verified data has been included in this inventory.

VERIFICATION OF GHG INVENTORY

This report has been verified by Deloitte, a third-party independence assurance provider. A reasonable level of assurance has been given over the Scope 1 and 2 assertions and quantifications included in this report and a limited level of assurance over the Scope 3 assertions and quantifications.

Person responsible:	Hamish Reid, Director of Sustainability and Brand 	Frequency of report:	Once a year
Dated:	November 1, 2019	Base year:	2017-2018



INDEPENDENT REASONABLE AND LIMITED ASSURANCE REPORT TO THE BOARD OF DIRECTORS OF SYNLAIT MILK LIMITED

Report on Greenhouse Gas Emissions Inventory Report

We have undertaken a reasonable assurance engagement in relation to Scope 1 and 2 emissions and a limited assurance engagement in relation to Scope 3 emissions within the Greenhouse Gas Inventory Report (the 'Inventory Report') of Synlait Milk Limited and its subsidiaries ('Synlait Milk Limited') for the year ended 31 July 2019, comprising the Emissions Inventory and the explanatory notes set out on pages 1 to 10.

The Inventory Report provides information about the greenhouse gas emissions of Synlait Milk Limited for the year ended 31 July 2019 and is based on historical information. This information is stated in accordance with the requirements of International Standard ISO 14064-1 Greenhouse gases – Part 1: *Specification with guidance at the organisation level for quantification and reporting of greenhouse gas emissions and removals* ('ISO 14064-1:2018') and the Greenhouse Gas Protocol: *A Corporate Accounting and Reporting Standard (2004)* ('the GHG Protocol').

Board of Directors' Responsibility

The Board of Directors are responsible for the preparation of the Inventory Report, in accordance with ISO 14064-1:2018 and the GHG Protocol. This responsibility includes the design, implementation and maintenance of internal control relevant to the preparation of an Inventory Report that is free from material misstatement, whether due to fraud or error.

Auditors' Responsibility

Our responsibility is to express an opinion on Scope 1 and 2 emissions and a limited assurance conclusion on Scope 3 emissions in the Inventory Report based on the evidence we have obtained. We conducted our reasonable and limited assurance engagements in accordance with International Standard on Assurance Engagements (New Zealand) 3410: *Assurance Engagements on Greenhouse Gas Statements* ('ISAE (NZ) 3410'), issued by the New Zealand Auditing and Assurance Standards Board. That standard requires that we plan and perform the engagement so as to obtain reasonable assurance that Scope 1 and 2 emissions within the Inventory Report, and limited assurance that Scope 3 emissions within the Inventory Report are free from material misstatement, respectively.

Reasonable assurance for Scope 1 and 2 emissions

A reasonable assurance engagement undertaken in accordance with ISAE (NZ) 3410 involves performing procedures to obtain evidence about the quantification of emissions and related information in the Inventory Report. The nature, timing and extent of procedures selected depend on the assurance practitioner's judgement, including the assessment of the risks of material misstatement, whether due to fraud or error, in the Inventory Report. In making those risk assessments, we considered internal control relevant to the Company's preparation of the Inventory Report. We also:

- Assessed the suitability in the circumstances of the Synlait Milk Limited's use of ISO 14064-1:2018 and the GHG Protocol as the basis for preparing the Inventory Report;
- Evaluated the appropriateness of quantification methods and reporting policies used, and the reasonableness of estimates made by the Synlait Milk Limited; and
- Evaluated the overall presentation of the Inventory Report.

We believe that the evidence we have obtained is sufficient and appropriate to provide a basis for our reasonable assurance opinion in respect of the Scope 1 and 2 emissions.

Limited assurance for Scope 3 emissions

A limited assurance engagement undertaken in accordance with ISAE (NZ) 3410 involves assessing the suitability in the circumstances of the Company's use of ISO 14064-1:2018 and the GHG Protocol as the basis for the preparation of the inventory report, assessing the risks of material misstatement of the inventory report whether due to fraud or error, responding to the assessed risks as necessary in the circumstances, and evaluating the overall presentation of the inventory report. A limited assurance engagement is substantially less in scope than a reasonable assurance engagement in relation to both

the risk assessment procedures, including an understanding of internal control, and the procedures performed in response to the assessed risks.

The procedures we performed were based on our professional judgement and included enquiries, observations of processes performed, inspection of documents, analytical procedures, evaluating the appropriateness of quantification methods and reporting policies, and agreeing or reconciling with underlying records.

Given the circumstances of the engagement, in performing the procedures listed above we:

- Reviewed adherence to the principles and requirements outlined in ISO 14064-1:2018 and the GHG Protocol, which included a consideration of completeness and balance;
- Obtained an understanding of the process of compiling and validating information received from data owners for inclusion in the Inventory Report;
- Reviewed material quantitative data, including corroborative enquiry and examined selected supporting documentation and calculations; and
- Compared the Inventory Report to the reporting requirements of ISO 14064-1:2018 and the GHG Protocol.

Inherent Limitations

Scope 1, 2 and 3 emissions

Non-financial information, such as that included in Synlait Milk Limited Inventory Report, is subject to more inherent limitations than financial information, given both its nature and the methods used and assumptions applied in determining, calculating and sampling or estimating such information. Specifically, GHG quantification is subject to inherent uncertainty because of incomplete scientific knowledge used to determine emissions factors and the values needed to combine emissions of different gases.

As the procedures performed for this engagement are not performed continuously throughout the relevant period and the procedures performed in respect of the Company's compliance with ISO 14064-1:2018 and the GHG Protocol are undertaken on a test basis, our assurance engagement cannot be relied on to detect all instances where the company may not have complied with the ISO 14064-1:2018 and the GHG Protocol. Because of these inherent limitations, it is possible that fraud, error or non-compliance may occur and not be detected.

The Company uses publicly available emissions factors in preparation of the Greenhouse Gas Inventory. We have agreed these to their source, but the scope of the engagement does not provide assurance over the emissions factors or the agricultural science used to determine the emissions factors.

Scope 3 emissions

For the Scope 3 emissions, we note that a limited assurance engagement is not designed to detect all instances of non-compliance with the ISA 14064-1:2018 and the GHG Protocol, as it generally comprises making enquires, primarily of the responsible party, and applying analytical and other review procedures.

In addition, Scope 3 emissions relating to on-farm emissions (especially fertiliser and methane production for dairy cows) are inherently uncertain due to the fact that they arise from natural processes which may vary depending on contributing factors.

Our Independence and Quality Control

We have complied with the independence and other ethical requirements of Professional and Ethical Standard 1 (Revised): *Code of Ethics for Assurance Practitioners* issued by the New Zealand Auditing and Assurance Standards Board, which is founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behaviour.

Other than in our capacity as auditor and the provision of other assurance and taxation compliance services, we have no relationship with or interests in the Company or any of its subsidiaries.



The firm applies Professional and Ethical Standard 3 (Amended): *Quality Control for Firms that Perform Audits and Reviews of Financial Statements, and Other Assurance Engagements* issued by the New Zealand Auditing and Assurance Standards Board, and accordingly maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

Use of Report

Our report is provided solely for your exclusive use and solely for the purpose outlined above. Our report is not to be used for any other purpose, recited or referred to in any document, copied or made available (in whole or in part) to any other person without our prior written express consent. We accept or assume no duty, responsibility or liability to any other party in connection with the report or this engagement, including without limitation, liability for negligence in relation to the opinion expressed in this report.

Reasonable Assurance Opinion for Scope 1 and 2 Emissions

In our opinion, the Scope 1 and 2 emissions of Synlait Milk Limited within the Inventory Report for the year ended 31 July 2019 have been prepared, in all material respects, in accordance with the requirements of ISO 14064-1:2018 and the GHG Protocol.

Limited Assurance Conclusion for Scope 3 Emissions

Based on the procedures we have performed and the evidence we have obtained, nothing has come to our attention that causes us to believe that Synlait Milk Limited's Scope 3 emissions within the Inventory Report for the year ended 31 July 2019 are not prepared, in all material respects, in accordance with the requirements of ISO 14064-1:2018 and the GHG Protocol.

Deloitte Limited

Auckland, New Zealand
1 November 2019