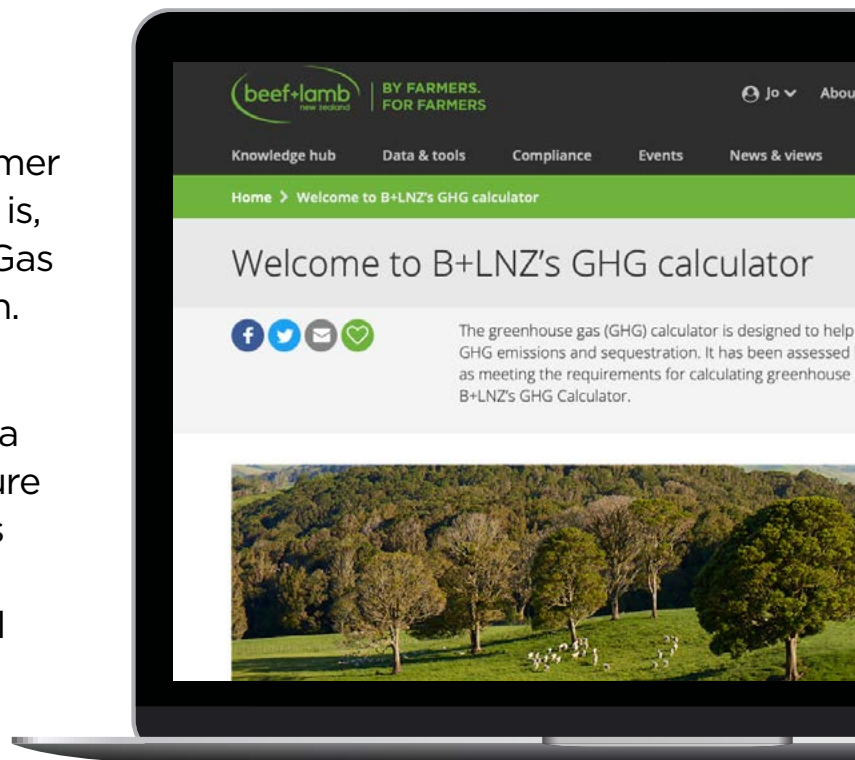




GHG CALCULATOR – KNOW YOUR NUMBERS

By 2022, every sheep and beef farmer should ‘know their numbers’ – that is, have calculated their Greenhouse Gas (GHG) emissions and sequestration.


Funded by the Red Meat Profit Partnership, the GHG Calculator is a tool for red meat farmers to measure and report on-farm GHG emissions and sequestration. It is simple, accurate and reflects the individual farm’s situation.



BEFORE YOU START: INFORMATION YOU WILL NEED

Before you use the Calculator, make sure you have the information you will need.

 **GST number** (used solely as a unique identifier)

 **Farm Class** (see Appendix 2)

 **Land Area**

- Total: _____ ha
- Effective (grazed) area. More detail in Step 1:
_____ ha
- Vegetation
 - Exotic forest: _____ ha
 - Indigenous forest (Reaches over 5m height when mature): _____ ha
 - Indigenous shrubland (under 5m height at maturity): _____ ha

 **Nitrogen fertiliser, lime and dolomite applied**

TOTAL amounts, not per hectare. Your fertiliser suppliers should be able to provide you with an annual summary. You can use **Table 1** to work out total amounts of nitrogen (N) applied. Appendix 1 provides more details.

- Non-urea nitrogen fertiliser (such as DAP)
- Urea with urease
- Urea without urease
- Lime _____ kg
- Dolomite _____ kg

 **Stock Numbers**

- Open and Close
 - Stock you own that are on your farm
 - Stock you graze on-farm for someone else
 - Stock you own that graze off farm
 - Dates grazed stock move on and off farm
- Births
- Purchases
- Sales

Your numbers for Open and Close, Births, Purchases, Sales and Used On-Farm can be found in your Financial Statements produced by your accountant.

Table 1: Nitrogen Fertiliser Summary

a. Urea WITHOUT urease			
Type	Amount (kg)	Nitrogen content (%)	Amount of N applied
Eg Urea	21,000	46%	9,660
Total Nitrogen in Urea without urease			
b. Urea WITH urease			
Type	Amount (kg)	Nitrogen content (%)	Amount of N applied
Total Nitrogen in Urea with urease			
c. NON-UREA Nitrogen Fertiliser			
Type	Amount (kg)	Nitrogen content (%)	Amount of N applied
Total Nitrogen in Non-Urea Nitrogen Fertiliser			

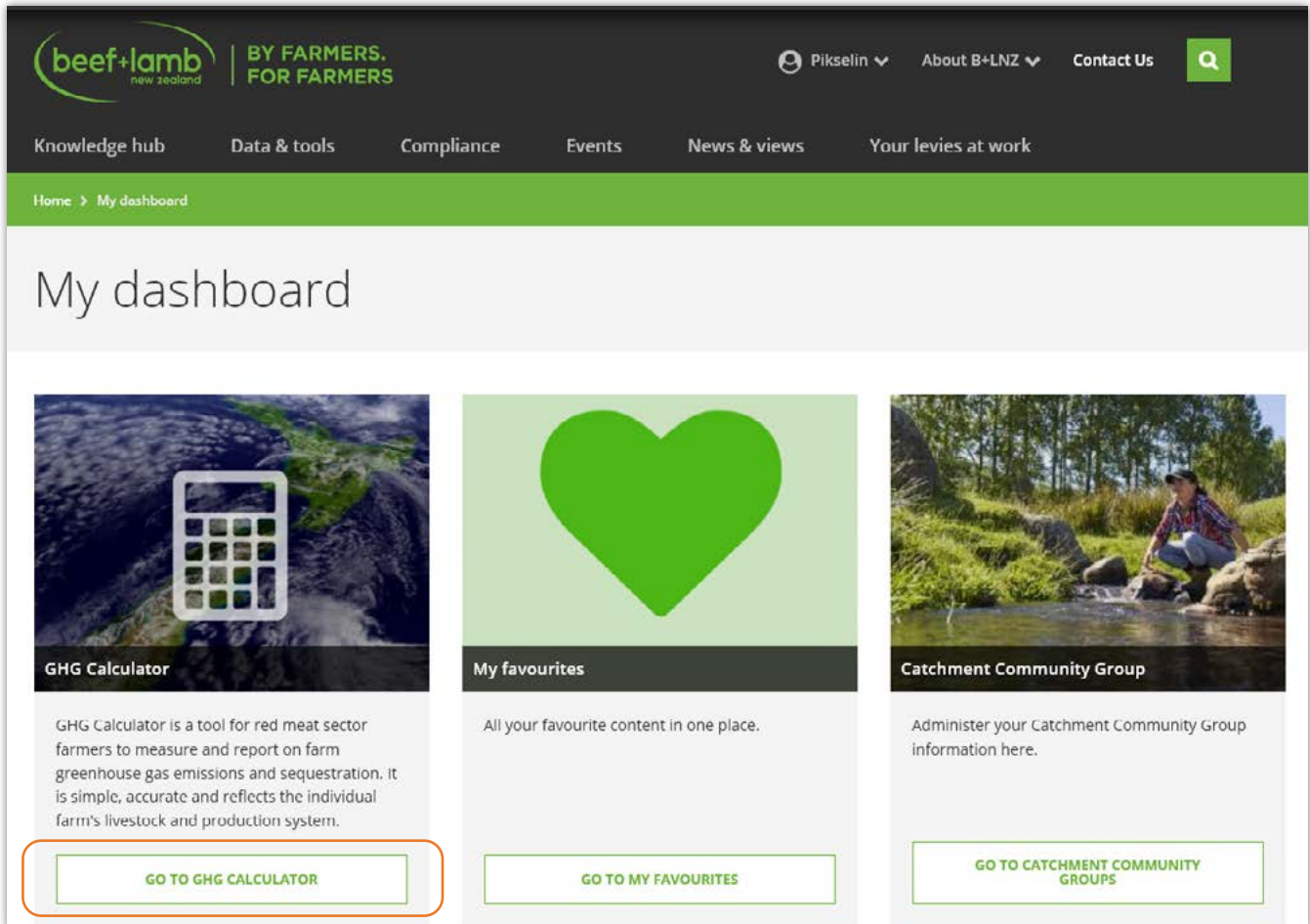
Complete the sections that you are able to, you can always come back when you have better information – you will be prompted if a data field is required to progress. Remember, the more complete the data you enter is, the better understanding you will have of your farm's profile.

HOW TO USE THE GHG CALCULATOR

1 Log In to the 'Dashboard' on B+LNZ's website

The calculator is located on Beef + Lamb New Zealand's 'Dashboard' – if you don't already have an account, you'll need to create one at www.beeflambnz.com/user.

Click 'Go to GHG Calculator'



2 Calculate your number

Click on "Start the GHG Calculator" and then 'Start New' (you can also find previous calculations saved here).

For more assistance, there are some 'User Guide' videos on the B+LNZ YouTube channel at www.youtube.com/user/beeflambnz, just search for "GHG Calculator" on that channel.

As a minimum, you can calculate emissions with just land area and vegetation details, and open and close stock numbers (including grazed stock). B+LNZ recommends you enter all other information suggested, however, to get a more accurate number.

What you'll need

- Livestock reconciliation – aggregated numbers such as those in the statement of accounts
- Fertiliser use – based on a summary from your provider.
- Vegetation area – you'll need to be able to enter an estimate for your farm.

The user guide has more information.

Disclaimer

While B+LNZ's GHG Calculator has been based on extensive research, industry consultation and assessment by the He Waka Eke Noa programme as meeting the requirements for calculating greenhouse gas emissions, B+LNZ will not be liable for any costs or claims that may arise in connection with your use of this tool.

Privacy and security

Any personal information that you provide to B+LNZ through the GHG calculator is stored securely. For more details, please see [Terms of Use](#) and our [Privacy Policy](#).

If you need help

Contact enquiries@beeflambnz.com

[START THE GHG CALCULATOR](#)

Step 1: Your farm (required)

- i. **Farm name** – 50 characters; you can add scenario name also if you wish or analyse the farm business as separate farms. For example: “Hill Farm: Status Quo 2019”
 - ii. **Region** – based on B+LNZ’s Economic Service regions
 - iii. **Farm Class** – based on the Region you are in. Select the description that best suits your farm, the farm class definitions can be found in Appendix 2.
 - iv. **Total Farm Area (hectares)** – include land leased by you; exclude land you lease to someone else
 - v. **Effective Area (hectares)** – exclude land not farmed (such as wetlands and forestry and exclude any area that is a dairy milking platform)
 - vi. **Analysis date**
 - vii. **Analysis Season** – ensure your information is for the same year so that your information will align correctly later
 - viii. **Farm GST Number** – this will not be shared, it acts as a unique farm identifier to ensure properties are not counted twice.
-

Step 2: Fertiliser and lime use (See Appendix 1 for more detail)

The elemental weight of nitrogen (N) is required, in kilograms – the actual amount of N itself, not the total fertiliser. B+LNZ have supplied a conversion chart for the most common types (see Appendix 1) so you can convert the product weight into elemental weight. If the product you have used is not on this chart, then the percent N should be on the invoice or seek guidance from your fertilizer representative.

- i. **Enter total amount of lime used on farm (in kilograms, not tonnes)**
 - ii. **Enter total amount of dolomite used on farm (in kilograms, not tonnes)**
 - iii. **Enter total elemental N weight (kg) applied on farm for fertilisers containing N:**
 - Non-urea N fertilisers
 - Urea **without** urease inhibitor
 - Urea **with** urease inhibitor (such as SustainN, Agrotain, N-Protect)
-

Step 3: Vegetation (exotic and indigenous; area at Open, in hectares)

- i. **Exotic forest less than 29 years old**
 - Existing
 - Harvested this year
- ii. **Indigenous forest (mature canopy over 5 metres; include areas of manuka)**
 - Regenerating (less than 100 years old)
 - Established (over 100 years old)
 - Harvested this year
- iii. **Shrubland (mature canopy height less than 5 metres)**
 - Less than 30 years old
 - 30 years or more old
 - Harvested this year

Once completed, click ‘**Livestock Balances**’ to move to the next section.

Step 4: Livestock balances (required)

- i. **Sheep** – Enter Open and Close numbers for:
 - Owned-On: Sheep you own that are on-farm
 - Owned-Off: Sheep you own that are grazed off-farm
 - Grazed-On: sheep you don't own, that are grazing on your farm.
- ii. **Beef Cattle** – Enter Open and Close numbers for:
 - Owned-On: beef cattle you own that are on-farm
 - Owned-Off: beef cattle you own that are grazed off-farm
 - Grazed-On: beef cattle you don't own, that are grazing on your farm. Do not include dairy grazers here – they are included in the next section.
- iii. **Dairy Cattle** – Represents owned and non-owned grazing, non-milking dairy cattle. Enter open and close numbers for:
 - Owned-On: dairy cattle you own that are on-farm
 - Owned-Off: dairy cattle you own that are grazed off-farm
 - Grazed-On: dairy cattle you don't own, that are grazing on your farm.
- iv. **Deer** – Enter Open and Close numbers for:
 - Owned-On: deer you own that are on-farm
 - Owned-Off: deer you own that are grazed off-farm
 - Grazed-On: deer you don't own, that are grazing on your farm.

- Ensure that livestock classes have been 'aged up' at season's close. For example, a flock of ewe hoggets at season's open will be aged up at the close of the season and become two-tooths. This is generally already done in your Financial Statements.
- Stock Units are set for comparison, you don't need to alter these even if they don't accurately reflect your stock.
- Remember to separate Open and Close stock numbers in Financial Statements into those owned-on and those owned-off (grazing), if applicable.
- Take care with stock 'aging up' – that is becoming the next age group at close. Lambs born in the financial year will end it as hoggets, for example; while those starting the year as hoggets will end it as 2-tooths. This is the most common cause of errors in stock reconciliations.

Once completed, click '**Grazing movements**' to move to the next section.

Step 5: Livestock balances – grazing

Stock grazed on (If no stock grazed on, click the red X button to remove this section)

- i. Select stock class from the drop-down menu
- ii. Enter number that arrived
- iii. Enter number that left
- iv. Date arrived: select either 'On hand at open' or enter date they arrived on farm
- v. Date left: select either 'On hand at close' or enter date they left
- vi. The calculator will then automatically work out what proportion of the year the stock were on your farm
- vii. To add more stock, click 'Add 1' to add a line or 'Add 5' to add 5 lines.

Off-farm grazing (If no stock grazed off, click the red X button to remove this section)

- i. Select stock class from the drop-down
- ii. Enter number that departed
- iii. Enter number that returned
- iv. Date departed: select either 'Off Farm at open' or enter date they left the farm
- v. Date returned: select either 'Off farm at close' or enter date they returned
- vi. The calculator will then automatically work out what proportion of the year the stock were actually on your farm
- vii. To add more stock, click 'Add 1' to add a line or 'Add 5' to add 5 lines.

Once completed, click '**Livestock movements**' to go to the next section.

Step 6: Livestock movements

Here you enter births, purchases, sales and 'used on farm' (such as dog-tucker and personal use). Stock numbers on hand at open and close will be automatically populated by earlier sections, as will grazing movements on and off.

For each stock class, enter:

- i. Births
- ii. Purchases
- iii. Sales – separate into store and prime
- iv. Used on farm (stock killed for dog tuckers, home-kill and the like).

Losses will be automatically calculated – check these to make sure you've got the right information entered. This provides you with a check on that livestock have been aged up or have been traded as the correct livestock class.

Note: Ensure that animals are sold as the correct livestock class, this is more of an issue with non-June balance dates. For example, with a March balance date:

- Lambs get aged up and become hoggets for the start of April, may be recorded as being sold as lambs in May
- Then lambs have been sold that haven't been recorded as births – creating negative losses
- And, those hoggets at open have disappeared – creating exaggerated adult sheep losses.

Once completed, click **Results** to complete the calculation.

Step 7: Results

Click **Save Results** to keep the calculation.

The table outlines gross emissions by each gas type methane (CH⁴), nitrous oxide (N²O) and carbon dioxide (CO²), as well as providing a conversion to CO² equivalents (CO²-e). It also outlines any offsets, and provides an estimate net CO²-e emissions in the bottom line

B+LNZ supports a split-gas approach, which means treating CH⁴ (a short-lived gas) differently from N²O and CO² (long-lived gasses) because their impact on global warming behaves differently. However, a commonly used metric for comparisons of warming is CO²-e so this is presented to you.



For help with this tool, you can email us at GHGCalculator@beeflambnz.com



APPENDICES

Appendix 1: Fertilisers

Elemental N Weight

For nitrogen-containing fertilisers (such as Urea, DAP or Crop20), enter the total elemental N weight – the actual amount of nitrogen applied, not the total fertiliser weight.

This is total fertiliser applied multiplied by the percentage of N it contains. For example:

- 21 tonnes of Urea x 46% N = 9,660 kg N
- 17 tonnes of Cropmaster20 x 18.8% N = 3,196 kg N

Some typical fertiliser analyses are contained in the table below – see your Fertiliser Company for analyses of other products.

Table 2: Nutrient content of some common N-containing fertilisers

Product Name	Nutrient Content (%)				Kg of elemental N per tonne	Fertiliser type
	N	P	K	S		
Urea	46.0				460	Urea without urease inhibitor
Flexi-N	43.2				432	
N-Protect	45.9				459	Urea with urease inhibitor
Sustain	45.9				459	
Sustain 25K	23.0		25.0		230	
Ammo 31	30.4			13.8	304	Non-Urea N fertiliser
Ammo 36	35.6			9.2	356	
Ammonium Sulphate	20.0			23.0	200	
Cropmaster 15	14.8	10.0	10.0	7.4	148	
Cropmaster 20	18.8	10.0		12.0	188	
Cropzeal 20N	18.6	10.5		11.5	186	
Cropzeal Boron Boost	16.5	19.5		1.0	165	
DAP	17.6	20.0		1.0	176	
DAP13S	10.6	14.8		12.6	106	

Product trade names are used here for illustration only and no endorsement or otherwise by B+LNZ is intended. For details of other fertiliser products, contact your supplier.

Appendix 2

Farm Class

Beef + Lamb New Zealand's Sheep and Beef Survey classify NZ sheep and beef farms into 8 farm classes, depending on a number of features.

The eight farm classes

South Island high country

Extensive run country at high altitude carrying fine wool sheep, with wool as the main source of revenue. Located mainly in Marlborough, Canterbury and Otago.

South Island hill country

Mainly mid-micron wool sheep mostly carrying between two and seven stock units per hectare. Three quarters of the stock units wintered are sheep and one quarter beef cattle.

North Island hard hill country

Steep hill country or low fertility soils with most farms carrying six to 10 stock units per hectare. While some stock are finished a significant proportion are sold in store condition.

North Island hill country

Easier hill country or higher fertility soils than Class 3. Mostly carrying between seven and 13 stock units per hectare. A high proportion of sale stock sold is in forward store or prime condition.

North Island finishing farms

Easy contour farmland with the potential for high production. Mostly carrying between eight and 15 stock units per hectare. A high proportion of stock is sent to slaughter and replacements are often bought in.

South Island finishing-breeding farms

A more extensive type of finishing farm, also encompassing some irrigation units and frequently with some cash cropping. Carrying capacity ranges from six to 11 stock units per hectare on dryland farms and over 12 stock units per hectare on irrigated units. Mainly in Canterbury and Otago. This is the dominant farm class in the South Island.

South Island finishing farms

High producing grassland farms carrying about 10 to 14 stock units per hectare, with some cash crop. Located mainly in Southland, South and West Otago.

South Island mixed cropping and finishing farms

Located mainly on the Canterbury Plains. A high proportion of their revenue is derived from grain and small seed production as well as stock finishing.

Acknowledgements

Beef + Lamb New Zealand would like to acknowledge RMPP for funding development of this calculator, and thanks to the many farmers and advisors who helped test and refine this tool. B+LNZ's Economic Service provided information and advice essential to its development.

User guides are made possible by sheep and beef farmer investment in the industry. Beef + Lamb New Zealand is not liable for any damage suffered as a result of reliance on the information contained in this document. Any reproduction is welcome provided you acknowledge Beef + Lamb New Zealand as the source.

