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Carbon footprinting food and farming

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The carbon footprint of a farm measures the total amount of greenhouse gases (GHGs) produced by that farm over a year. There are several different gases that cause global warming, and the most important agriculturally related ones are carbon dioxide (CO_2), nitrous oxide (N_2O) and methane (CH_4). Each of these gases has different impacts on the atmosphere, so in order to simplify things the global warming impact of each gas is compared to that of 1 kg of carbon dioxide and presented as carbon dioxide equivalents (kg CO_2-equivalents). So 1kg of methane causes more damage to the atmosphere than carbon dioxide and has a global warming potential equivalent to that of 25 kg of carbon dioxide. Nitrous oxide is much more damaging then carbon dioxide, and 1 kg of nitrous oxide is equivalent to 298 kg of carbon dioxide.

Carbon dioxide tends to be released from burning fossil fuels, and is typically emitted when electricity is generated from oil, gas and coal. It is also emitted on farm as an exhaust gas from vehicles. Most methane is emitted from the rumens of sheep and cattle, while nitrous oxide is given off from the soil. The exact amount of nitrous oxide emitted from soils varies with soil type and also with the amount and type of fertiliser applied to the land.

The carbon footprint of a farm can be expressed as the amount of greenhouse gases emitted per hectare (i.e. kg CO_2-equivalents /ha) or per volume of final product (i.e. kg CO_2-equivalents / litre of milk or kg CO_2-equivalents / kg of lamb). Field vegetables tend to have low carbon footprints, and meat products have higher footprints - this is largely because of the methane emitted from the livestock. As food is processed, stored and refrigerated so the amount of energy needed to produce the final product goes up, and more greenhouse gases are released. So, processed dairy products, like cheese and butter, tend to have high carbon footprints. Unfortunately for some people the food items with the highest carbon footprints include wine and alcoholic spirits.

The science of carbon footprinting is still in its infancy, but over the next few months CALU hopes to run a series of events based around reducing the carbon footprint of food and farming.