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## More accurate measure of food's water footprint

Claire Harris

**Australian and Swiss researchers have been working together and with agricultural enterprises and major food companies to develop a standardised approach to measuring 'water footprints' – the amount of water embodied in food and other consumer products.**



Milk production on dairy farms with rainfed pastures can have quite a low water footprint at the farm gate.

Credit: istockphoto

The National Association of Retail Grocers of Australia recently highlighted that Australia's food and grocery industry is 'at a crossroads' as population-driven demand grows faster than food production, pointing to challenges ahead for sustainable development<sup>1</sup>. Water is one of the most significant and increasingly scarce resources that producers need to meet this demand.

While many businesses have been trying to use water more sustainably, Dr Brad Ridoutt – an expert in water footprinting with CSIRO's Sustainable Agriculture Flagship – says that current methods of measuring and accounting for water use do not take all environmental impacts into account.

'At the moment, we're seeing generalisations being made about water use, such as that it takes 15 000 L of water to produce 1 kg of a product,' says Dr Ridoutt. 'There are currently many different ways to calculate the water footprint of a product and there is no way to adequately compare between the methods.'

In the past, the term 'water footprint' has been used to describe calculations of the total amount of 'virtual' or 'embedded' water used

in making a product, without considering variations in growing and manufacturing systems, and with values often averaged across the globe. Dr Ridoutt says these average numbers can be confusing, and lead to inaccurate assumptions: for example, when comparing meat and vegetarian diets.

Developing a more 'holistic' water footprinting method to calculate a product's impact on the environment has been the focus of research by Dr Ridoutt and others at CSIRO, working with researchers from Swiss university, ETH Zurich. In turn, this work is feeding into the International Organization for Standardization's development of a water footprint standard.

The new footprinting method is applied along the entire product life cycle. It takes into account, for example, what sort of water has been used at all stages of the life cycle (eg natural rainfall over agricultural land, water from rivers, lakes and groundwater resources); the context of local water scarcity; and whether the water would otherwise be used for another activity of critical importance.

The water footprint is then expressed as a unit called water-equivalent ( $H_2O_e$ ) – similar to the  $CO_2e$  (carbon dioxide-equivalent) unit used in carbon footprinting.

The results of a study the researchers carried out with Mars Australia some years ago demonstrate the importance of considering specific water use across the whole supply chain. When examining the water footprints of two Mars signature products – Peanut M&M's and Dolmio pasta sauce – the researchers found that M&M's used more than five times the total amount of water than the pasta sauce. However, when the type of water being used and the local water scarcity was taken into account, the water footprint of the M&M's (31 L  $H_2O_e$  per 250 g packet) was actually one-tenth the footprint of the sauce (350 L  $H_2O_e$  per 375 g jar).<sup>2</sup>



Scientists have developed a more comprehensive way to determine the complex water footprint of food products.

Credit: Claire Harris

Recent work by CSIRO and Victorian Department of Primary Industries in the dairy sector shows that in some cases, the water footprints of farms can be extremely small.

'In the Gippsland region, the average water footprint for the case study farms was 1.9 L  $H_2O_e$  per litre of fresh milk at the farm gate,' says Dr Ridoutt.

'This means that taking into account the way the water use contributes to local water scarcity, the water footprint of producing 1 L of milk on these farms had the equivalent impact as the direct consumption of only 1.9 L of water.

'This was a rainfed farming system with no irrigation, located in a region with abundant rainfall, and the impacts of using that water are very low. We found a low water footprint. The key lies in understanding where in the life cycle of the product improvements can be made – this water footprinting method enables that.'

According to an Australian Food and Grocery Council study, 84 per cent of 1000 Woolworths shoppers interviewed in Victoria were concerned about the impact their shopping was having on the environment.<sup>3</sup> But, there is a big gap between the sentiment expressed by shoppers and their action at the checkout to purchase more sustainable products. Some experts believe that this partly comes down to a lack of information for businesses and consumers.

According to Ms Clare Hughes from CHOICE, there is an increasing appreciation of accreditation schemes for food products – such as organic, free range, fair trade, and carbon-reduction labelling schemes.

'When it comes to making sustainable choices, what we're hearing from consumers is that they want more information about how their food is produced,' says Ms Hughes.

'Because of the impact of drought in recent years, many Australians would be well aware that water is a key element of food production and processing, and so water is a key element of thinking about sustainability.

'What we don't want to see is lots of different schemes with different logos showing different information – such as water use or carbon footprint – competing for space on product labels. The methods for measuring sustainability are still hotly debated. Ideally, we'd like to see agreement on a single sustainability label that incorporates the range of sustainability indicators taken into consideration

'Not all consumers will prioritise sustainability when they're making purchasing choices. However, sustainability labelling provides an enormous opportunity to educate consumers about the importance of sustainable choices,' says Ms Hughes.

Dr Ridoutt agrees. He says that consumers are still in the dark when it comes to having accurate information about how different products are affecting our precious water resources.

'If Australian producers are on the front foot and are able to supply the information that consumers want, then that can only mean a competitive advantage,' he says. 'We need to take the blindfolds off.'

<sup>1</sup> National Association of Retail Grocers of Australia (2010). The challenge to feed a growing nation, November 2010. [www.narga.net.au/documents/2010/NARGA\\_lowres\\_web.pdf](http://www.narga.net.au/documents/2010/NARGA_lowres_web.pdf)

<sup>2</sup> Ridoutt BG, Eady SJ, Sellahewa J, Simons L, Bektash R (2009). Water footprinting at the product brand level: case study and future challenges. *Journal of Cleaner Production* 17, 1228–1235. doi:10.1016/j.jclepro.2009.03.002.

<sup>3</sup> AFGC Green Shopper Summary Report 2010 produced by Net Balance. Available through: [www.afgc.org.au/media-releases/221-green-shopping-is-a-mutual-responsibility-survey-.html](http://www.afgc.org.au/media-releases/221-green-shopping-is-a-mutual-responsibility-survey-.html)

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