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WASTE



Summary report

The water and carbon footprint of household food and drink waste in the UK: A summary for Scotland



A report containing quantification and analysis of the water and carbon footprint of different types of household food and drink waste in the UK. In addition to raising awareness, the information can be used in developing national and regional policies targeting a reduction in the impacts of our carbon and water footprint related to our food system. It can also be used by the food industry to understand and minimise water-related business risk associated with food supplies to the UK.

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Zero Waste Scotland is the new programme created by the Scottish Government to support delivery of its Zero Waste Plan.

Our work is delivered as part of the UK-wide Waste & Resources Action Programme (WRAP).

Our vision is a world without waste, where resources are used sustainably. Find out more at www.zerowastescotland.org.uk

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To make things happen, we work with business, communities and government in over 100 countries – protecting wild places, tackling climate change and enabling people to live more sustainably. Find out more at wwf.org.uk

Front cover photography: Watering Seedling (Graham Flack)

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Summary

In a new report¹, Zero Waste Scotland (as part of the UK-wide Waste & Resources Action Programme) and WWF-UK have quantified the amounts of water and carbon that are wasted across the UK due to avoidable food and drink waste. This summary report highlights what this means for Scotland.

Introduction

In 2009, WRAP identified that UK households dispose of 8.3 million tonnes of food and drink waste every year, most of which could have been eaten. This equates to 0.7 million tonnes a year in Scotland². This avoidable food waste has a value of at least £1 billion. However, financial cost is not the only impact. By wasting food, we also waste the water and energy that was used to grow and process those foods, create greenhouse gas emissions, and have a range of other environmental impacts.

The purpose of this report is to further raise awareness and to highlight the consequences on the Scottish and global environment of the large amount of food wasted in Scotland. One of the main objectives of this report is to quantify the water and carbon footprints of household food waste in Scotland, and to present the results in the context of impacts across the supply chain. The report builds on work published by WWF-UK that quantified the water footprint of the UK. Zero Waste Scotland and WWF-UK have worked together to produce this report which, for the first time, provides an estimate of the amount of water wasted within Scotland and abroad due to household wasting of food and drinks in Scotland. In addition, it also analyses this information in the context of water scarcity at production regions.

The quantification of water and carbon footprints of food and drink waste is of great potential interest to a range of stakeholders such as consumers, food retailers, suppliers and producers, NGOs,

¹ *'The water and carbon footprint of household food and drink waste in the UK', WRAP/WWF, March 2011.*

² *All Scotland figures have been calculated on a pro-rata basis by population.*

environmental agencies, water management policy groups, national and regional governments. The information can be used in wide variety of contexts such as:

- identifying foods with high and low environmental impacts;
- identifying where to focus efforts to reduce the environmental impact of food production;
- understanding the way in which changes to the food supply chain can contribute to wider environmental policy objectives; and
- supporting activity in preventing food waste.

The water footprint of Scotland is calculated as the amount of water used to produce goods and services consumed in Scotland, as the sum of direct (e.g. household water use) and indirect (water used along the supply chains of goods and services) water. Based on previous research by WWF-UK, this can be estimated as 8,600 million cubic metres of water per year. Our research has found that the water footprint of avoidable food waste is 520 million cubic metres per year representing nearly 6% of all of Scotland's water requirements. The avoidable part of the water footprint of the household food waste is 243 litres per person per day, approximately one and a half times the daily average household water use in Scotland of 150 litres per person per day. Of this, over a quarter is wasted within Scotland, equivalent to 0.8 million people's direct water use within Scottish households every year.

We have estimated that avoidable food waste in Scotland is responsible for greenhouse gas emissions of 1.7 million tonnes CO₂ equivalent per year, accounting for the whole life cycle. Avoidable food waste represents approximately 3% of Scotland's domestic greenhouse gas emissions, with further emissions abroad. In contrast to the water footprint, approximately three quarters of emissions associated with food which is then wasted occur within the UK. The emissions are equivalent to those produced by 600 thousand cars per year. The most significant contributors to avoidable carbon emissions are milk waste, coffee

waste and wheat products (bread, cake etc.). The research also suggests that for some food and drink items, indirect emissions associated with land use change caused by levels of demand for those items are greater than direct emissions.

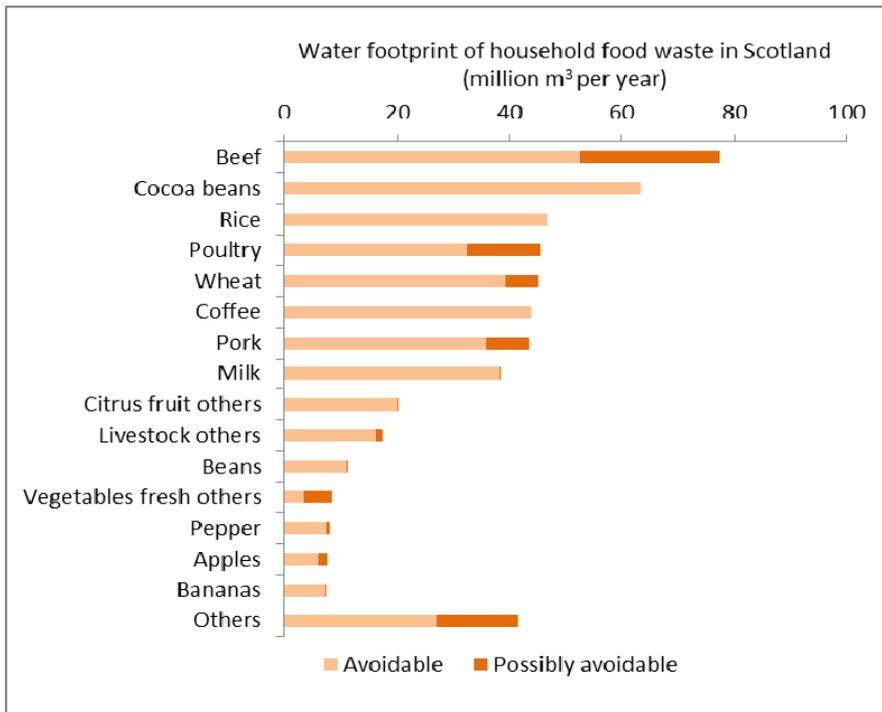
The impact of greenhouse gas emissions is global; in terms of climate change, it does not matter where they are emitted. For water however, the location of wasted water is an essential part of the impact. The report includes a number of case studies to illustrate this issue for three different food products (wheat, tomatoes and beef). The report also identifies where in the world water is used to produce the part of the food being wasted in Scotland and discusses the context of water scarcity in these production regions, with case studies for two countries.

The findings of this research highlight that actions to reduce food waste can have a significant impact on the amount of water we use and the amount of greenhouse gases we emit. They reinforce the messages from Zero Waste Scotland and WWF-UK on the importance of preventing food waste at all stages of the supply chain. By reducing food waste, householders can save money and also make a significant contribution to addressing current environmental concerns in Scotland and abroad.

Results

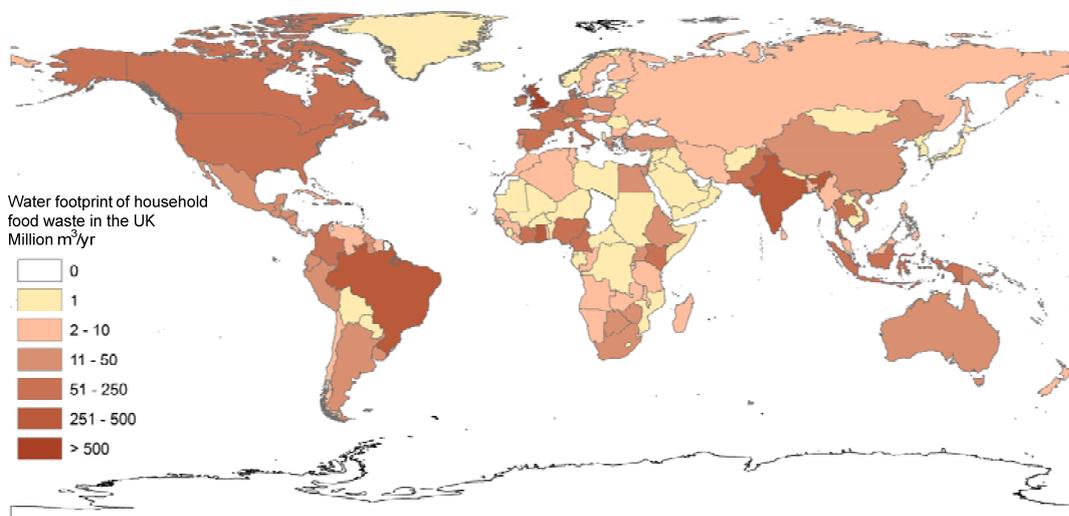
The products with the largest share of the water footprint of household food waste in Scotland are presented in **Figure 1** below. Beef and cocoa products are the two products with the highest water footprints within household food waste.

Figure 1 Total water footprint of household food waste in Scotland for major food categories



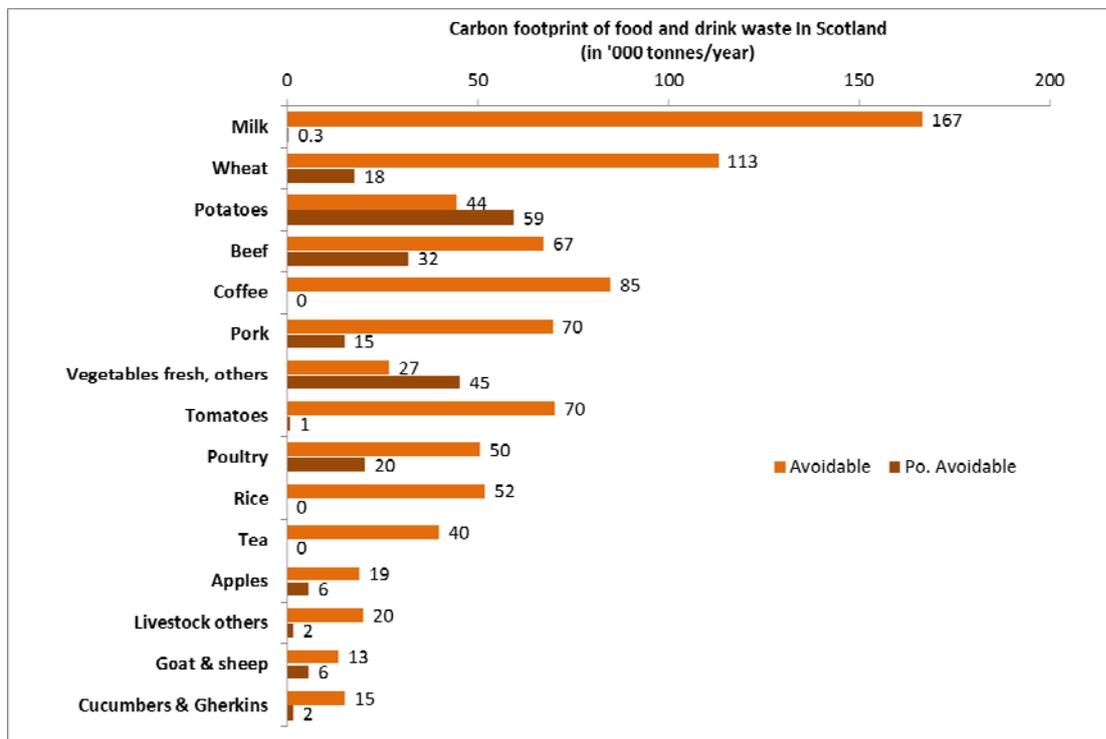
A complete map of the water footprint of Scotland's household food waste is presented in **Figure 2**.

Figure 2: Scotland's external water footprint of household food waste



The products with the greatest share of the carbon footprint of household food waste in Scotland are presented in **Figure 3**.

Figure 3: Total carbon footprint of household food waste in Scotland for major food categories



Many of the food and drink products which feature highly in terms of water footprint are also significant in terms of their carbon footprint. Milk, beef, pork products, poultry, coffee, rice and apples are identified as large contributors to both indicators. Some notable differences between the carbon and water footprint data include bananas, citrus fruit, peppers and cocoa, which have relatively high avoidable water footprint and relatively low avoidable carbon footprint, and potatoes, tea and cucumbers and gherkins, which have a relatively high avoidable carbon footprint, but low avoidable water footprint.

Egypt, Israel, Pakistan, India, Thailand and Spain are examples of countries where water stress is very high and the external water footprint of Scotland's food waste is also relatively high. Conversely, though Ghana and Brazil support a large part of the

external water footprint of household food waste in Scotland, because the water stress in these countries is low, the positive socioeconomic impacts in these countries might outweigh the negative externalities in the hydrology of these areas.

Conclusions

This report identifies the water footprint of meeting Scotland's food and drink needs, and the carbon footprint across the supply chain of delivering this, from farm to plate, including emissions associated with land use change. Avoidable food waste represents approximately 6% of the Scottish water footprint, and approximately 3% of Scotland's domestic greenhouse gas emissions, with further emissions abroad. This is equivalent to almost twice the household water requirements of Scotland in total. Considering only the water which is wasted within Scotland, it is equivalent to the household water demands of 800 thousand people. Associated greenhouse gas emissions, excluding land use change, are equivalent to the annual greenhouse gas emissions from 600 thousand cars.

The key conclusion is clear: reducing food waste can make a significant contribution to reducing the water and carbon footprints of Scotland. On average, avoiding 1kg of food waste could avoid 1000 litres of water being wasted and emissions of 3.8 kg CO₂ eq. Considering impacts on land use change, a further 0.9kg CO₂ eq could be avoided. This research provides a framework around which to discuss how food waste could be reduced to provide the greatest environmental benefit.

The full research report is available on Zero Waste Scotland's website, at www.zerowastescotland.org.uk



Why we are here

To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.

www.wwf.org.uk



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