

INCREASING RELIABLE, SCIENTIFIC DATA AND INFORMATION ON FOOD LOSSES AND WASTE IN SOUTH AFRICA

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KEY FINDINGS

The new updated estimate for food losses and waste in South Africa is 10.3 million tonnes per annum. This is in the same order of magnitude of previous estimates (10.2 million tonnes), but the distribution of the losses and waste across the value chain is different. This equates to 34.3% of local production, but 45% of the available food supply (production plus imports less exports) in the country being lost or wasted. South Africa is a net exporter of food. The majority of the losses and waste (49%) are incurred in the processing and packaging stage of the value chain. This is also the stage where the most value is added. The most significant difference between the 2013 and 2021 studies was found to be in the consumption stage, where food waste increased from 5% to 18%. The new estimate is based on South African specific data informing the assumptions on percentage losses and waste at each stage of the food value chain, whereas previous estimates used assumptions for sub-Saharan Africa. Despite South Africa's geographical location in the sub-Saharan African region, food value chains in South Africa are modern with unique features when compared with the more traditional food systems with lower levels of sophistication in the rest of the sub-Saharan Africa region. This study highlighted the need to apply local data in formulating assumptions for estimating country-level food losses and waste. Although the order of magnitude estimate is aligned with previous estimates, it is important to understand where in the value chain the losses and waste are most acute, so as to inform evidence-based interventions to reduce food losses and waste in line with Sustainable Development Goal 12.3.

INTRODUCTION

It is estimated that between one third and half of all food produced globally for human consumption is lost or wasted (Gustavsson *et al.*, 2011; IChemE, 2013). These losses and wastes are the result of inefficiencies along the food value chain; and give rise to economic, social and environmental impacts amounting to US\$940 billion (Hanson and Mitchell, 2017). The first South African study estimated losses and waste in the order of 9.04 million tonnes per annum, or 31.4% of the average annual agricultural production for the country (Oelofse and Nahman, 2013). This estimate was updated by also accounting for imports and exports resulting in the total food waste estimate increasing to 10.2 million tonnes per annum, or 32.8% of available food supply in the country at a cost to society of R61.5 billion per annum (2.1% of South Africa's GDP) (Nahman and de Lange, 2013).

On interrogation of the methodology used in both the global and local estimates (Gustavsson *et al.*, 2013), it became apparent that the assumptions for sub-Saharan

Africa are not necessarily appropriate for South African specific food waste estimates.

This study therefore critically analysed the methodology and assumptions used in the previous studies towards increasing the accuracy of the estimate through application of assumptions that are appropriate in the local South African context.

METHOD

A literature review supplemented with local data collection was applied to verify the appropriateness of the assumptions used in previous estimates. Care was taken to ensure that assumptions are based on:

- locally produced commodities;
- local agricultural practices, harvesting methods, processing technologies and retail systems; and
- typical scale of operations in South Africa.

Table 1: Assumptions for estimating food loss and waste in South Africa as a percentage of food entering the stage of the supply chain (2021).

Commodity group	Agricultural production	Post-harvest handling and storage	Processing and Packaging	Distribution	Consumption
Cereals	1.0	5.8	36.5	2.0	14.5
Roots and Tubers	10.0	9.8	9.0	2.3	1.5
Oil seeds and pulses	1.0	38.4	60.0	2.0	17.0
Fruit and Veg	9.0	18.3	31.6	5.5	20.5
Meat	6.0	5.2	<1.0	7.0	10.0
Fish and seafood	0.8	0.4	31.1	7.0	2.0
Milk	1.0	12.0	3.0	3.4	14.0

Data on actual quantities (tonnes) of food supply for each commodity entering the value chain in South Africa were sourced from the Food Balance Sheets published by the Statistics Division of the Food and Agriculture Organisation (FAOSTAT, 2021). To compensate for year-on-year variations in production, the average food supply per commodity group over a 5 years period (2014-2018) was calculated. The average annual food supply figure was used as the starting point for the food loss and waste calculations.

The quantity of food losses and waste at each stage was then calculated by multiplying the quantity of food entering each stage of the food value chain for each commodity group (as per the FAO data) by the percentage that is lost or wasted (Table 1). Fruit and vegetables entering the processing stage of the value chain is the only exception to this rule in our calculations. Oelofse and Muswema (2018) determined that only 43.5% of all fruit and vegetables produced per year is sent for processing. Therefore, only 43.5% of the output from the post-harvest handling and storage stage (input minus the calculated losses and waste) are assumed to enter the processing stage of the value

chain. The remaining 56.5% (1 556 990 tonnes) not sent to processing, were again added to the input entering the distribution stage of the value chain. This was done to compensate for the fact that the 32% losses assumed (calculated from Oelofse and Muswema, 2018) during processing and packaging are based on processing losses only.

RESULTS

The new updated estimate of food losses and waste in South Africa comes to 10.3 million tonnes (Table 2). This equates to 34.3% of local production and 45.4% of the available food supply in South Africa being lost or wasted. The distribution of the waste across the different stages of the value chain is illustrated in Figure 1 and the losses and waste by commodity group is illustrated in Figure 2. The bulk of food losses and waste is associated with processing and packaging. Food waste at consumption is 18%, more than three times higher than previous estimates. Cereals contribute half of the overall losses and waste, followed by fruit and vegetables (19%), milk (14%) and meat (9%).

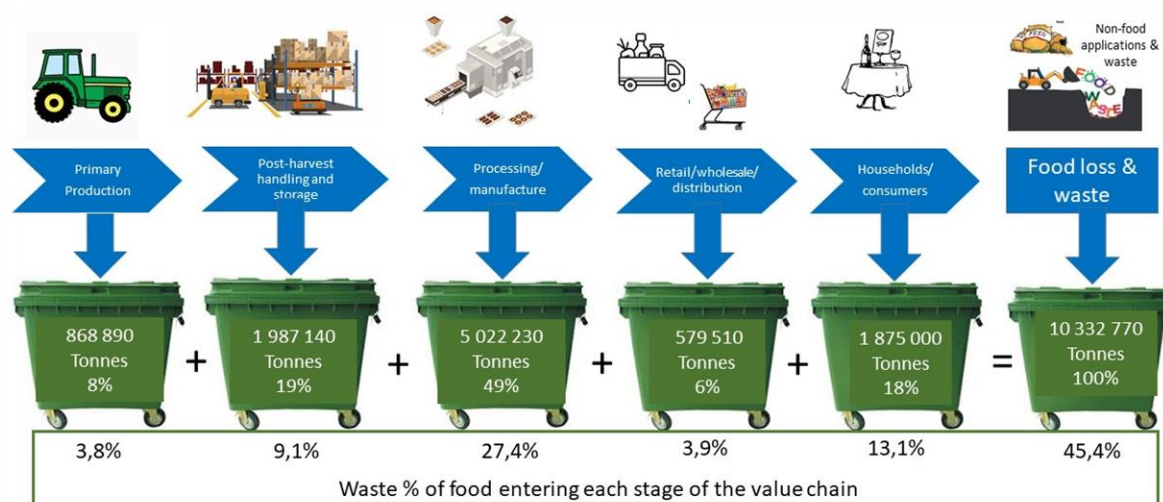


Figure 1: Average annual food losses and waste along the food value chain in South Africa (for the period 2014-2018)

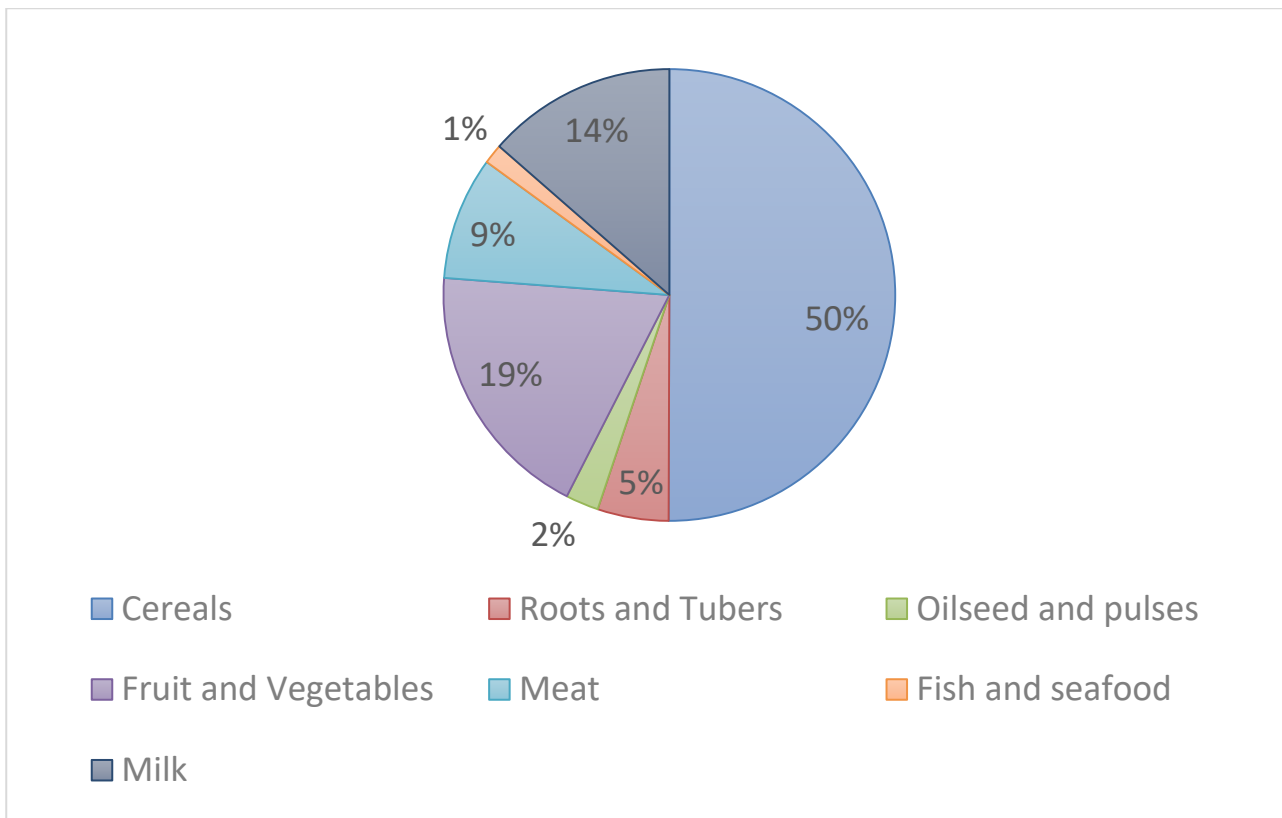


Figure 2: Per annum food losses and waste by commodity group in South Africa

It should be noted that not all losses along the supply chain is viewed as waste by industry as it is often diverted into non-food products including animal feed, and various other industrial applications.

CONCLUSIONS AND RECOMMENDATIONS

The methodology used in the early assessments is appropriate but the assumptions were not aligned with local conditions in South Africa. The order of magnitude of the losses and waste in this study are aligned with earlier estimates by Nahman and de Lange (2013), but the spread of the losses across the value chain has changed. The 18% losses at the consumption stage (three times that of previous estimates) is of particular concern since consumption stage waste is of high value with limited re-purposing options and often avoidable.

The following main recommendations are forthcoming from the research:

- There is a need for more large studies to enable extrapolations of data to larger areas.
- There is a need for data on informal or less formal food production and processing systems along the value chain to add nuance to South Africa’s data.

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Table 2: Quantities of food waste (in thousands of tonnes) at each stage of the value chain for South Africa (calculated based on data from FAOSTAT, 2021)

Commodity group	Average annual Food production (1000t)		Post-harvest handling and storage		Processing and Packaging		Distribution		Consumption		Total	
	Food entering	Food waste	Food entering	Food waste	Food entering	Food waste	Food entering	Food waste	Food entering	Food waste	Food entering	Food waste
Cereals	10 265,60	102,66	10 162,94	589,45	9 573,49	3 494,33	6 079,17	121,58	5 957,58	863,85	5 171,86	5 171,86
Roots and Tubers	1 818,00	181,80	1 636,20	160,35	1 475,85	132,83	1 343,03	30,89	1 312,14	19,68	525,55	525,55
Oilseed and pulses	304,20	3,04	301,16	115,64	185,51	111,31	74,21	1,48	72,72	12,36	243,84	243,84
Fruit and Vegetables	3 730,40	335,74	3 394,66	621,22	1 206,45	381,24	2 392,20	131,57	2 260,63	463,43	1 933,20	1 933,20
Meat	3 576,80	215,68	3 361,12	175,45	3 185,67	0,00	3 185,67	223,00	2 962,67	296,27	910,40	910,40
Fish and seafood	366,44	2,75	363,69	1,60	362,09	119,85	242,24	16,96	225,28	4,51	145,66	145,66
Milk	2 722,40	27,22	2 695,18	323,42	2 371,75	782,68	1 589,08	54,03	1 535,05	214,91	1 402,26	1 402,26
Total	22 783,84	868,89	21 914,95	1 987,14	18 360,82	5 022,23	14 905,58	579,51	14 326,07	1 875,00	10 332,77	10 332,77
Waste % of food entering each stage of the value chain		3,81		9,07		27,35		3,89				13,09

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Disclaimer: The content and views included in this Briefing Note are based on independent analysis and do not necessarily reflect the position of the Department of Science and Innovation or the CSIR

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