



Canteen or Private Kitchen – Which Lunch is more sustainable?

Monika Wirges¹, Melanie Lukas¹, Katrin Bienge¹, Christa Liedtke^{1,2}, Holger Rohn³,

¹Wuppertal Institute for Climate, Environment, Energy GmbH, Research group sustainable production and consumption, Doeppersberg 19, 42103 Wuppertal, Germany
Email: katrin.bienge@wupperinst.org

²Design Faculty, Folkwang University of the Arts, Klemensborn 39, 45239 Essen, Germany

³Faktor 10 – Institut für nachhaltiges Wirtschaften gemeinnützige GmbH, Alte Bahnhofstraße 13, 61169 Friedberg, Germany

Introduction

Modern life's pace leads people to eat out more often e.g. in canteens instead of preparing meals at home. The whole European food sector accounts for 17 % of greenhouse gas emissions and 26 % of natural resource use in final consumption, but there is a notable lack of data differentiating the ecological impact of meals consumed in canteens and meals consumed in private households. Up to now only few suggestions have been made about the most sustainable way of food preparation in canteens, mostly without the analysis of primary data.

We therefore pose the real-world orientated research question: Is it more sustainable to eat at home than in a canteen? This study is based on the first results aggregated within the German NAHGast project, which seeks to initiate, support, and promote transformation processes for a sustainable business in the hospitality sector.

NAHGast aims at developing, testing, and distributing concepts for sustainable production and consumption in the field of out-of-home catering in Germany.

Methods

The meal Spaghetti Bolognese prepared in a canteen kitchen (assuming a daily quantity of 1000 meals) and a private kitchen (four people) is regarded. The resource use according to the Material Footprint is calculated considering ingredients, preparation (meat storage), cooking, keeping warm, cooling (7 steps in canteens, 2 steps at home), and food waste. Data has been derived from one case study in a hospital canteen, but, as the study will continue, more case studies and meals (n=5) will be available.

Results

The first results indicate that the preparation of lunch within canteens is more resource efficient. For instance, the Material Footprint of a meal in a canteen is about 2.79 kg (incl. 25% food waste), whereas a meal at home has a footprint of 4.06 kg (incl. 12% food waste). The main reason for this is the use of gas fired equipment in the canteen instead of electric stoves at home. However, even though the actual preparation is done using more energy efficient equipment, additional preparation steps (e.g. chilling, keeping warm of the meals) partly diminish this advantage.

Indications & Conclusion

The first results show that food production in canteens can preserve resources. However, the impact of side effects - such as how the food is processed and how much food waste is generated - should not be underestimated. Additionally, more meals and canteens need to be analysed to get a better understanding of how out-of-home catering can contribute to a sustainable development in the food sector.

Table 1: Comparison of the material intensity of a canteen and a private meal of Spaghetti Bolognese

Canteen		Private household	
Steps	Material Footprint	Steps	Material Footprint
Ingredients	1.86 kg	Ingredients	1.86 kg
Meat is stored in cooling chamber until needed	<0.01 kg	Meat is stored in refrigerator until needed	0.01 kg
1. Spaghetti are cooked in cooking kettles using gas	0.02 kg	1. Spaghetti are cooked in a pot on an electric stove	0.36 kg
2. Spaghetti are put in a chiller to cool	0.01 kg	2. Sauce is prepared in a 2nd pot on an electric stove using all ingredients	1.40 kg
3. Cooked spaghetti are stored in a cooling chamber for one day	0.07 kg		
4. Spaghetti are put in combi-steamer (using gas) to heat up	<0.01 kg		
5. Spaghetti are ready to serve and are kept warm	0.05 kg		
6. Sauce is prepared using pressure kettles (using gas)	0.07 kg		
7. Sauce is kept warm and ready to serve	0.16 kg		
food waste about 25 %	(additional) 0.56 kg	food waste about 0 - 12 %	(additional) 0 - 0.46 kg
SUM	2.79 kg per meal		3.63 - 4.06 kg per meal

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